ROYAL COLLEGE OF PHYSICIANS LONDON | 12 - 14 JUNE 2023

EUROPEAN HEALTHCARE DESIGN

RESEARCH • POLICY • PRACTICE

FINAL PROGRAMME

FAULT LINES AND FRONT LINES

STRENGTHENING HEALTH SYSTEM RESILIENCE

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SALUS
GLOBAL KNOWLEDGE EXCHANGE

AfH 30 YEARS

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Delivering healthier outcomes

Dear colleagues,

The impacts of climate change, a pandemic, active conflicts, economic volatility and inflation have laid bare global health inequalities, creating hunger, poverty, displacement and disease that are testing the resilience of our health systems and infrastructure.

Our political, social and economic systems and institutions, including our health systems, need to be strengthened to create a buffer against this turbulence and sustain the services and infrastructures on which we depend. A resilient and high-performing health and care system can be the tie that binds society and communities together.

The existential challenges of climate change, war, economic crisis, pestilence, and food, water and energy security will require governments and healthcare systems to invest in a much greater reserve of already stressed human, physical and capital resources. Should we be measuring success through the prism of resilience – system, service and infrastructure planning and design that can sustain and develop our social, economic and cultural, as well as physical structures?

The global workforce crisis in healthcare is centre stage. By 2030, the world will be short of 15 million health workers, with 43 million needed to achieve universal health coverage. But attracting and recruiting more health workers to join exhausted professions is only part – albeit a critical part – of the solution.

New models of care and advances in technology and the life sciences, from AI to personalised medicine, have the potential to transform the quality, access and equity of care for more people in new settings closer to the patient, at the same time as improving the sustainability of supply chains and infrastructure.

Rapid progress is now being made to embed low-carbon design and construction in some areas of the world, but global standards are required. Questions, too, remain over the definition of net zero, whether we should be measuring embodied or operational carbon, and the standards required for how resources and materials are used efficiently over their design life. As huge global consumers of energy, health systems are being hit hard by the threat to energy security and rapidly rising costs, bringing into sharp focus how the sector's carbon footprint can be reduced across the whole system.

Building the urgent capacity required across health and care systems will require visionary and strategic-level thinking to plan our health systems in a way that aligns and accelerates evolving professional roles to new, more radical service models of care across new settings and sustainable infrastructure.

EHD2023 will explore the latest research, policies and practice examples on the role of design and planning through the prism of resilience, demonstrating innovation and the application of new ideas on the future of health systems and hospitals that are better connected to our cities and communities.

The Congress features two days of insightful, provocative and entertaining talks, workshops and panels. Days one and two will open with keynote plenary sessions, before splitting into four streams. And the final session of day two will be devoted to the EHD2023 Awards ceremony, supported by lead sponsor IHP. All sessions will be streamed virtually for delegates unable to attend in person.

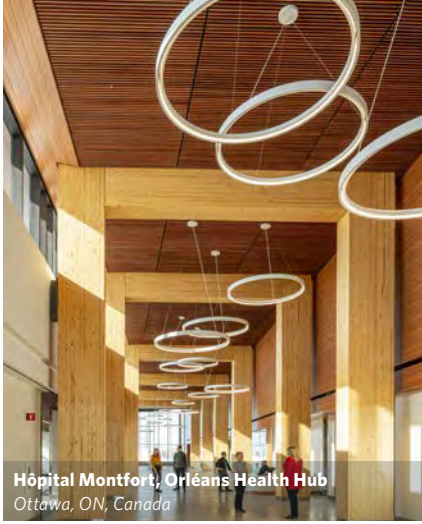
The Congress will also host a video+poster gallery of innovative research and design projects (pp31-39), an interactive art room (p147), an exhibition of design and technology solutions (pp164-165), a Welcome Reception, a Garden Party (p41), and study tours (pp43-45).

As always, welcome to the Royal College of Physicians, London – we hope you enjoy a fantastic Congress.

JOHN COOPER
Past chair
Architects for Health

MARC SANSOM
Director
SALUS Global Knowledge Exchange

The Pavilion at the Hospital of the University of Pennsylvania
Philadelphia, PA, USA



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Rush University Medical Center Joan & Paul Rubschlager Building
Chicago, IL USA

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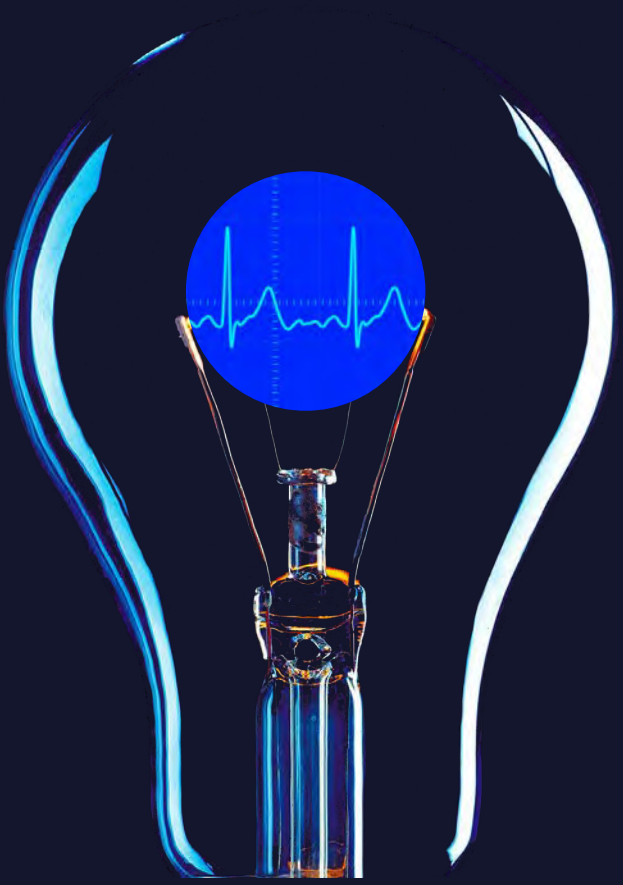
Where ideas



become reality

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Leading into the future

SALUS Global Knowledge Exchange and Architects for Health are excited to announce the appointment of Sunand Prasad as the new programme chair and director for the European Healthcare Design 2024 Congress, Exhibition and Awards.

The appointment of Sunand, who will represent Architects for Health in its collaboration as organisers with SALUS, marks the end of an era, as John Cooper steps down after serving the Congress with distinction since its launch in 2015.

John Cooper, EHD programme chair and director (left) and Sunand Prasad, EHD programme director-elect (right)

John, who has been a leading figure in healthcare design and a principal in practice for 40 years, has been actively engaged in reshaping the healthcare environment and improving and reforming its architecture, combining an expert understanding of health planning with genuine design skills at both a strategic and a detailed level.

After co-founding Avanti Architects in 1981, John joined Anshen Dyer in 2002 (reformed as Anshen+ Allen in 2006) as a healthcare director, before establishing JCA in 2009 with Hrafnhildur Ólafsdóttir. The practice has designed buildings and masterplans in the UK, Ireland, Switzerland, South Africa, Iceland, Australia, Kashmir, and Palestine – providing John with an international perspective and a wide-ranging knowledge of best practice. He has led government report panels and provided peer review on major projects in the United Kingdom, Ireland, and Australia.

These experiences underpinned John's leadership as programme chair and director, helping establish European Healthcare Design as the world's leading forum for knowledge exchange in the field. John will continue to engage in future Congresses and symposiums, supporting SALUS and Architects for Health and continuing to contribute to the healthcare design community worldwide.

The appointment of Sunand Prasad marks the start of an exciting new phase of development for European Healthcare Design, in an age likely to be shaped by the existential crisis of the planetary health and climate crisis.

As the co-founder of the acclaimed and award-winning architectural practice Penoyre & Prasad, which merged with Perkins&Will in 2019, Sunand has been immersed in healthcare design throughout his career. At the core of Sunand's architectural practice, alongside interdisciplinary collaboration, is a passionate belief that expertise and aesthetic judgement are all-important but must be catalysed by the everyday experience of people to create truly successful environments.

Sustainability has been a key focus of Sunand's work for 30 years, and he is currently chair of the UK Green Building Council. As president of the Royal Institute of British Architects (RIBA) from 2007 to 2009, Sunand was an early champion of action on climate change.

He has served in several key advisory and policy positions, including as a founding member of the UK Government's Commission for Architecture & the Built Environment; a London Mayor's Design Advocate; and chair of the Trustee Board of Article 25, the humanitarian architecture charity, and of the Editorial Board of the *Journal of Architecture*.

Sunand's passion, expertise, networks and knowledge will help lead and define the future role and contribution of European Healthcare Design, as the Congress continues to bridge the gap between research, practice and policy and shape the healthcare systems and environments of the future.

THE ROYAL COLLEGE OF PHYSICIANS

The 9th European Healthcare Design Congress & Exhibition, 12–14 June 2023, will, once again, be held at the prestigious headquarters of the Royal College of Physicians (RCP) in London.

Since its foundation in 1518, the RCP has had five headquarters in London. The current Grade 1 listed building in Regent's Park was designed by architect Sir Denys Lasdun and opened in 1964. Considered a modernist masterpiece, it's one of London's most important post-war buildings.

In 1992, Sir Lasdun was awarded the Royal Institute of British Architects' Trustee Medal in recognition of his work at the RCP, considered to be "the best architecture of its time anywhere in the world".

Sir Lasdun won the competition to design the new headquarters in 1959. He was surprised at being asked to design for such a traditional body, given his modernist philosophy, and he made it clear that he would not create a classical-style building. Ultimately, he responded to the challenge with a skilful integration of centuries-old traditions and his own vision.

As an award-winning and highly versatile venue for conferences, meetings, banquets, training and outdoor events, the building has an atmosphere of space and light, with stylish, modern architecture and a selection of both old and new styles to suit all tastes.

The venue offers:

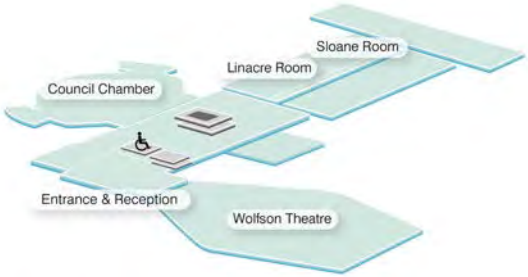
- **A central London location** – overlooking Regent's Park, with good access to road, rail and tube.
- **Magnificent conference and banqueting facilities** – tiered auditoriums, exhibition space, event and dining facilities, including the stunning Council Chamber and the 'jewel in the crown', the Dorchester Library.
- **An award-winning Grade 1 listed modern building** – an atmosphere of space and light with a contrasting mix of old and new facilities.
- **A rare heritage collection** – with 500+ years of history and more than 50,000 antiquarian books.
- **High-quality food and service** – eclectic cuisine, bespoke menus and first-class service.
- **A professional venue for international conferences** – a member of Unique Venues of London, International Association of Conference Centres, and London and Partners, to name a few.
- **A private 'Physic Garden' for events** – filled with rare plants and flowers from all over the world, suitable for barbecues, receptions and al fresco dining.
- **A professional and friendly events team** – dedicated event managers, catering experts and technicians. Full support is provided before, during and following events.

GROUND FLOOR

Wolfson Theatre
- Main conference plenary sessions, breakout sessions and the EHD2023 Awards ceremony

Council Chamber
- Breakout sessions, and breakfast workshop

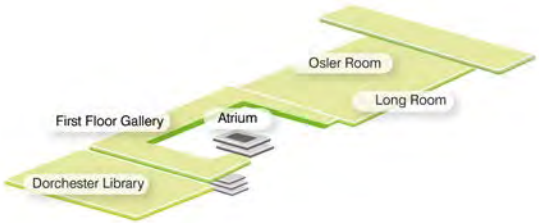
Linacre and Sloane Room
- Breakout sessions



FIRST FLOOR

Dorchester Library
- Video+Poster gallery and the EHD2023 Awards shortlist gallery

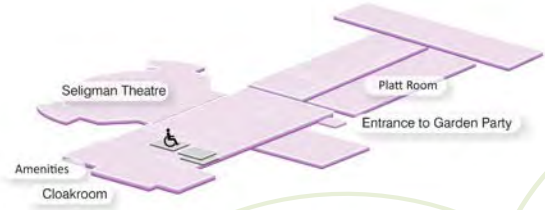
Long Room and Osler Room
- Lunch, exhibition and the Welcome Drinks Reception



LOWER GROUND FLOOR

Seligman Theatre
- Breakout sessions and the Art Room

Platt Room and Garden
- The Art Room and Garden Party



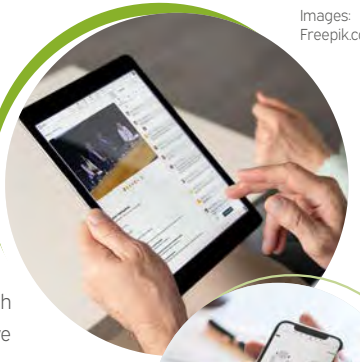
EHD LIVE ON SALUS TV

Use the EHD2023 app to enhance your event experience: prepare your agenda; connect with colleagues and friends – old and new; explore the exhibition and Video+Poster Gallery; and catch up on recorded talks and sessions. The app will help you discover, connect and engage with attendees at the Congress.

DOWNLOAD THE APP

The event mobile application is available on both the Google and Apple App Stores. To download it, search for **European Healthcare Design** or scan the QR code below. Once downloaded, you'll need to sign into the app using the email address you used when registering for the Congress.

FUNCTIONS AND FEATURES



Images: Freepik.com

- **QR code** – In-person delegates should access their QR code on the app to check-in to the in-person event. First, log in to the app, then click on your image in the top right of the screen, where your QR code will appear – click on it and check-in at the registration desk. You can also edit your profile and view your virtual briefcase and bookmarked content here.
- **Watch LIVE sessions** – Through the app, you will be able to watch LIVE sessions and catch up with talks and sessions you may have missed under the 'Agenda' tab.
- **Sponsors, exhibitors and partners** – Under the 'Expo' tab, you can visit sponsors', exhibitors' and event partners' stands to learn more about their latest design innovations, view their videos, download brochures and, if you're interested, share your contact details, or set up in-person and virtual chats and meetings.
- **Video+Poster Gallery** – Explore the Video+Poster Gallery also under the 'Expo' tab. Visit the Video+Poster Gallery to learn more about the showcased design projects, watch short video presentations, download the posters, and read the abstracts.
- **Awards Gallery** – Shortlisted projects for the European Healthcare Design 2023 Awards feature their own poster, which can be viewed in the Awards Gallery alongside recordings of the live judging webinars.
- **People** – Engage with other attendees under the 'People' tab. Filter attendees by specific job roles, sectors, interests and more. From here, you can set up a meeting with other delegates – click on their profile, choose a date and time, and add a personalised message. You can also chat with other attendees by clicking 'CHAT' on their profile.
- **Lounge** – If you're joining the Congress virtually, you still have the chance to connect and network with other delegates in the 'Lounge'. Here, you can pull up a chair at a table to join a video call with other delegates.
- **Schedule** – Create your own personalised schedule based on your interests and meetings and view this in your own personalised agenda at the top of the app.
- **Discussion** – Join in with fellow attendees in a discussion forum and share your thoughts on the Congress streams and topics beyond the Congress.
- Share your involvement with the Congress on social media by using the hashtag #EHD2023 and tagging us on Twitter with the handle @EHD_2023

The European Healthcare Design 2023 Congress is delivered by SALUS Global Knowledge Exchange in collaboration with Architects for Health and our esteemed international programme committee, the members of whom are outlined below. From shaping the Congress themes, to evaluating submission abstracts, to chairing sessions, their knowledge, time and effort are a huge part of the success of the Congress, and we thank them for their contributions.

John Cooper BA Dip Arch, RIBA
Director, JCA, UK;
Past chair, Architects for Health, UK

Stephanie Williamson
Co-chair,
Architects for Health, UK

Prof Noemi Bitterman PhD
Academic director, Masters of Industrial Design (MID),
Technion, Israel

Tina Nolan BArch, MBA
Managing director, director of healthcare strategy + planning, Lexica;
Health Planning Academy, UK

John Cole CBE
Honorary professor,
Queen's University Belfast, UK

Göran Lindahl PhD
Associate professor, head of division, building design,
Chalmers University, Sweden

Christine Chadwick
Consultant advisor,
Archus, Canada

Sasha Karakusevic BDS, MBA
Project director, NHS Horizons;
Senior fellow, Nuffield Trust, UK

Nirit Pilosof PhD
Head of research in innovation and transformation,
Sheba Medical Centre; Faculty member, Tel Aviv University, Israel

David Allison FAIA, FACHA
Alumni distinguished professor; Director of architecture + health,
Clemson University, USA

Harry van Goor MD, PhD
Professor of surgical education,
Radboudumc, Netherlands

Marte Lauvsnes
Manager, advisory and planning department,
Sykehusbygg, Norway

Cemal Sozener MD, EDAC
Associate professor,
University of Michigan Medical Center, USA

Duane Passman
Director,
Percipio Consulting, UK

Davide Ruzzon
Director of TUNED,
Lombardini22, Italy

Karin Imoberdorf Dipl Arch, MPH
Architect,
LEAD Consultants, Switzerland

Ganesh Suntharalingam OBE
Intensivist,
London North West University Healthcare NHS Trust, UK

08.00	**REGISTRATION OPENS**

Session 1
Opening plenary
Chair: John Cooper, Architects for Health, UK

08.45	**Welcome and introduction** **John Cooper,** Programme chair, European Healthcare Design; past chair, Architects for Health, UK
09.00	**Keynote: Visioning our future health system: Barriers and opportunities** **Dr Jennifer Dixon,** Chief executive, The Health Foundation, UK
09.25	**Keynote: The global sustainable development challenge in healthcare** **Dr Stephanie Allen,** Senior partner – health, Kearney Global Consulting, Australia (In collaboration with the Geneva Sustainability Centre – IHF)
09.50	**Panel discussion**
10.15	**COFFEE, EXHIBITION AND VIDEO+POSTER GALLERY**

Session 2
Designing the European super hospital
Chair: Tina Nolan, Lexica, UK

10.45	**The new Royal Liverpool University Hospital: Strengthening resilience in the Northwest** **Jessica Karsten,** HKS Architects, UK **David Lewis,** NBBJ, UK
11.05	**Hvidovre and North Zealand Hospitals – back to the future** **Mungo Smith,** MAAP Architects, Australia
11.25	**The Danish Hospital reform: The New Regional Hospital Gødstrup** **Birgitte Gade Ernst,** Arkitema, Denmark
11.45	**Infrastructure for happiness: The case of Hospital Nova** **Freja Stahlberg-Aalto,** JKMM Architects, Finland **Teemu Kurkela,** JKMM Architects, Finland **Juho Pietarila,** JKMM Architects, Finland
12.05	**Panel discussion**
12.30–14.00	**LUNCH, EXHIBITION AND VIDEO+POSTER GALLERY**

Session 3
Transforming mental health by design
Chair: Christine Chadwick, Archus, Canada

14.00	**A national step-change in facilities for secure mental health** **Ruairi Reeves,** Medical Architecture, UK **Karl Burton,** Scott Tallon Walker Architects, Ireland
14.20	**How design can promote better wellbeing for patients, staff and visitors, alongside the wider community** **Roddy Langmuir,** Cullinan Studio, UK **David Powell,** Alder Hey Children's NHS Foundation Trust, UK
14.40	**Towards a new architecture for mental health** **Teva Hesse,** 4D Studio Architects, (formerly at C.F. Moller Architects UK), UK **Anna Barnes,** South West London and St George's Mental Health NHS Trust, UK
15.00	**Panel discussion**
15.30	**COFFEE, EXHIBITION AND VIDEO+POSTER GALLERY**

Session 4
Integrating art and nature
Chair: Sunand Prasad, Perkins&Will, UK

16.00	**The art of inclusion – how community and art can foster belonging in healthcare architecture** **Tara Veldman,** Billard Leece Partnership, Australia
16.20	**Therapeutic hospital gardens – building a framework delivering quality healthcare** **Katharina Nieberler-Walker,** Griffith University, Cities Research Institute, Australia
16.40	**Panel discussion**

Session 5
Keynote plenary
Chair: Sunand Prasad, Perkins&Will, UK

17.00–18.00	**Keynote: Sitopia: How food can save the world** **Carolyn Steel,** Author and architect, UK
18.00–20.30	**WELCOME DRINKS RECEPTION** (Exhibition, Video+Poster Gallery) *Osler and Long Room*

Hosted by: A+H 30 YEARS Supported by: mts

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Stream 2 begins at 10.45 in the Seligman Theatre, after the day's opening plenary session (08.45–10.15).

Session 6
Community health and wellbeing
Chair: Hank Adams, HDR, USA

10.45	**Designing a new healthcare model to address the social determinants of health: A case study** **Sarah Prodor,** Architecture 49, Canada **Bryan Darrell,** Government of Nova Scotia, Canada **Kathryn Edwards,** WSP, Canada
11.05	**Local estates configuration to enable integrated care** **Smriti Singh,** The PSC, UK **Charlotte Bambridge,** The PSC, UK
11.25	**Integrated health and wellbeing** **Neil Orpwood,** HLM Architects, UK **Jack Wagstaff,** The North West Surrey Health & Care Alliance, UK **Melanie Jacobsen Cox,** HLM Architects, UK
11.45	**Healthcare in unexpected places** **Polly Barker,** TP Bennett, UK
12.05	**Panel discussion**
12.30–14.00	**LUNCH, EXHIBITION AND VIDEO+POSTER GALLERY**

The Art Room
Platt Room and Garden

Organised by: Art in Site

10.15–17.00	**The in-between space: a live drawing artwork** See page 147 for the full abstract and details on this interactive session.

SALUS GLOBAL KNOWLEDGE EXCHANGE

Session 7

Health system transformation in the Asia-Pacific
Chair: Matthew Holmes, Jacobs, Australia

14.00	**Thailand Healthcare System by Design: An integrated approach** **Surapong Lertsithichai,** Chulalongkorn University, Thailand
14.20	**Hospital of the future: Setting a new benchmark for resilient design in Singapore** **Deborah Wingler,** HKS, USA **Angela Lee,** HKS, Singapore **Sarah Holton,** HKS, USA
14.40	**Care in healthcare: The patient and provider experience, hospitals without walls, and community convergence** **Jason-Emery Groen,** HDR, Canada **Francesqca Jimenez,** HDR, USA
15.00	**Panel discussion**
15.30	**COFFEE, EXHIBITION AND VIDEO+POSTER GALLERY**

Session 8

Sustainable service transformation
Chair: Göran Lindahl, Chalmers University, Sweden

16.00	**Mater transformation: Shaping systems at the front line** **Aileen Igoe,** Mater Hospital, Ireland **Siobhan Manning,** Mater Hospital, Ireland **Una Cunningham,** Mater Hospital, Ireland
16.20	**Are telephone fracture clinics a sustainable alternative for the patient, the climate, and financially?** **Katherine Chin,** Guy's and St Thomas' NHS Foundation Trust, UK
16.40–17.00	**Panel discussion**

Stream 2 will be brought to a close at 17.00, whereupon delegates are invited to return to the Wolfson Theatre for the day's closing plenary session (17.00–18.00).

Stream 3 begins at 10.45 in the Council Chamber, after the day's opening plenary session (08.45–10.15).

Session 9

Targeting net-zero carbon by design
Chair: Warren Percival, RSK, UK

10.45	**Applying parametric modelling and Passive House design principles to support net-zero healthcare environments** **Geoff Southern,** Arcadis, UK
11.05	**Healthy hospitals for a healthy planet – balancing carbon versus space** **Gavin Crook,** AECOM, UK **Anuradha Sabherwal,** NBBJ, UK
11.25	**Climate change resilience framework for health systems and hospitals** **Maï Shafei,** Health Care Without Harm, Belgium
11.45	**Future-proofing health planning and investment: The introduction of modular healthcare buildings to strengthen health resilience** **Sarka Oldham,** Vanguard, and Q-bital Healthcare Solutions, UK
12.05	**Panel discussion**
12.30–14.00	**LUNCH, EXHIBITION AND VIDEO+POSTER GALLERY**

Session 10
Sustainable hospital design
Chair: Richard Mann, AECOM, UK

14.00	**Adapting to climate change through sustainable hospital design in developing countries: A case study on New Betio Hospital, Kiribati** **Shari Blanch,** Jacobs, Australia
14.20	**Velindre Cancer Centre: Towards the greenest hospital in the UK** **Michael Woodford,** White Arkitekter, UK **Anna Lisa McSweeney,** White Arkitekter, UK
14.40	**Dalal Jamm – a future-proof hospital campus in the subtropical climate of Dakar** **Coen van den Wijngaart,** archipelago architects, Belgium **Laurent Grisay,** archipelago architects, Belgium
15.00	**Panel discussion**
15.30	**COFFEE, EXHIBITION AND VIDEO+POSTER GALLERY**

Session 11
Strategy and leadership in sustainable design
Chair: Chris Liddle, HLM Architects, UK

16.00	**IEMA NED Note and the importance of sustainability at a board level to help challenge and facilitate sustainable design at a trust level** **Katherine Risk,** Nature Positive, UK **Warren Percival,** RSK, UK **Luka Brown,** Nature Positive, UK
16.20	**A system approach to tackling climate change** **Alison Foster,** Royal Berkshire NHS Foundation Trust, UK **Maria Vahdati,** University of Reading, UK **Peter Moore,** Reading Borough Council, UK
16.40–17.00	**Panel discussion**

Stream 3 will be brought to a close at 17.00, whereupon delegates are invited to return to the Wolfson Theatre for the day's closing plenary session (17.00–18.00).

Stream 4 begins at 10.45 in the Linacre and Sloane Room, after the day's opening plenary session (08.45–10.15).

Session 12

Designing the inpatient ward
Chair: Paul Bell, Ryder Architecture, UK

10.45	**Single versus multi-occupancy patient rooms: The 'old' discussion revisited based on 'new' lessons from the Covid-19 pandemic and 100-per-cent single-occupancy inpatient accommodation** **Liesbeth van Heel,** Erasmus MC, Netherlands **Michael Cassells,** NHS Scotland Assure, UK
11.05	**Challenging the accepted to explore the possible – a blue-sky approach to the sustainability agenda** **Morag Lee,** Hassell, Australia **Mark Davie,** Aurecon, Australia
11.25	**A personalised environment – how to design tailor-made rooms for people with intellectual disabilities and behavioural problems in long-term care facilities** **Andrea Möhn,** AM_A Andrea Möhn Architects, Netherlands
11.45	**Re-imagining the bedroom unit in mental health design: A space for identity, empowerment and recovery** **Shannon Wiley,** Montgomery Sisam Architects, Canada **Karine Quigley,** Montgomery Sisam Architects, Canada
12.05	**Panel discussion**
12.30–14.00	**LUNCH, EXHIBITION AND VIDEO+POSTER GALLERY**

Session 13

Designing for rehabilitation
Chair: Ben Bassin, Massey Family Foundation Emergency Critical Care Center, USA

14.00	**Exploring the role of the inpatient rehabilitation environment in stroke survivor behaviour, wellbeing and safety** **Ruby Lipson-Smith,** The Florey Institute of Neuroscience and Mental Health, Australia
14.20	**The National Rehabilitation Centre as a prototype project for rehabilitation** **Paul Bell,** Ryder Architecture, UK **Miriam Duffy,** Nottingham University Hospitals NHS Trust, UK
14.40	**Inpatient room for neurorehabilitation: Researching the dimensional spaces to optimise care** **Francesca Giofre,** Sapienza University of Rome, Italy **Elisabetta Alesse,** Fondazione Santa Lucia IRCCS (Scientific Institute for Research and Healthcare), Italy
15.00	**Panel discussion**
15.30	**COFFEE, EXHIBITION AND VIDEO+POSTER GALLERY**

Session 14

Health and life sciences innovation
Chair: Coen van den Wijngaart, archipelago, Belgium

16.00	**Labs that work for the planet** **Peter Coxhead,** Lexica, UK **Meriem McKenzie,** Lexica, UK
16.20	**Integrating health and research on the Edinburgh BioQuarter** **David Martin,** Stantec, UK **Aaron Taylor,** Stantec, UK
16.40–17.00	**Panel discussion**

Stream 4 will be brought to a close at 17.00, whereupon delegates are invited to return to the Wolfson Theatre for the day's closing plenary session (17.00–18.00).

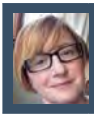
08.00	**REGISTRATION OPENS**

Session 15
Opening plenary, day two
Chair: Jaime Bishop, Architects for Health, UK

08.45	**Welcome and introduction** **Jaime Bishop,** Architects for Health, UK
09.00	**Keynote: Re-imagining the future hospital: Patient and clinical perspectives on safety, wellbeing and value** **Dr Paul Barach,** Jefferson College of Population Health, USA; Sigmund Freud University, Austria; University of Birmingham, UK
09.25	**Keynote: Follow the patient: Driving quality improvement through the patient voice** **Ben Clench,** Traumatic brain injury survivor, UK
09.50	**Panel discussion**
10.15	**COFFEE, EXHIBITION AND VIDEO+POSTER GALLERY**

Session 16
Designing for cancer care
Chair: Katie Wood, Arup, UK

10.45	**Agile design and human scale focus: How cancer centre design can aspire to both** **Catherine Zeliotis,** Stantec, UK **Diego Morettin,** DIALOG, Canada
11.05	**Long-life loose-fit buildings and estates strategies to ensure health system resilience in cancer care** **Dominic Hook,** BDP, UK
11.25	**Creating a cancer treatment garden in Shanghai** **Michael Street,** HDR, USA **Thomas Smith,** HDR, USA
11.45	**Redefining world-class cancer care from the inside-out: Employing a transformative design process for the new MSK Cancer Care Pavilion** **Abbie Clary,** CannonDesign, USA **Roger McClean,** Memorial Sloan Kettering Cancer Center, USA
12.05	**Panel discussion**
12.30–14.00	**LUNCH, EXHIBITION AND VIDEO+POSTER GALLERY**



Session 17
Designing for women and children
Chair: Stephanie Williamson, Architects for Health, UK

14.00 **Delivering women's and children's care: A comparative study of two centres – British Columbia, Canada and Birmingham, UK**

Conor Ellis, Archus, UK
Max Martin, BDP, UK

14.20 **Designing for neurodiverse children within healthcare: Case study – Nicklaus Children's Hospital, Miami**

Hala El Khorazaty, Perkins&Will, UK
Amy Sickeler, Perkins&Will, USA

14.40 **The silent hospital: A "smart" step towards building staff resilience and patient recovery**

Roberta Fuller, Royal Cornwall Hospitals NHS Trust, UK
Rob Faro, TClarke, UK
Samantha Prime, University of Plymouth, UK
Michael Fjeldstad, DNV Imatis, Norway

15.00 **Panel discussion**

15.30 **COFFEE, EXHIBITION AND VIDEO+POSTER GALLERY**

Session 18
Designing for older people and dementia
Chair: Lianne Knotts, Medical Architecture, UK

16.00 **New architectural models for the comprehensive care of the elderly population with multiple chronic diseases**

Albert Vitaller Santiró, Vitaller Arquitectura, Spain
Eva Roense i Simó, Vitaller Arquitectura, Spain

16.20 **Dementia-friendly patient room**

Elke Reitmayer, Bern University of Applied Sciences, Switzerland
Minou Afzali, Swiss Center for Design and Health, Switzerland

16.40–17.00 **Panel discussion**

Session 19
Awards ceremony
Chair: John Cooper, Architects for Health, UK

17.00 **European Healthcare Design Awards 2023**

Presented by: Jaime Bishop, Architects for Health, UK

Supported by (Lead Partner): IHP Integrated Health Projects by VINCI Sir Robert McALPINE

17.45–17.50 **Closing address**

John Cooper, Architects for Health, UK

18.30–22.00 **GARDEN PARTY**

Supported by: Jacobs

Stream 6 begins at 10.45 in the Seligman Theatre, after the day's opening plenary session (08.45–10.15).

Session 20
Strategic planning and investment
Chair: Richard Darch, Archus, UK

10.45	**Power for the people! Calling for a revolution in hospital investment to build capacity and effectiveness** **Rhonda Kerr,** Guidelines and Economists Network International (GENI), Australia
11.05	**Planning backwards for a healthy future** **John Kelly,** Lexica, UK **Melanie Relf,** Lexica, UK
11.25	**Integration of physical and mental health** **Kate Bradley,** MJ Medical, UK
11.45	**The support structure for strategic planning for long-term hospital renovations** **Lidor Gilad,** Itten+Brechbühl, Switzerland **Catherine Jaquier-Bühler,** Itten+Brechbühl, Switzerland **Marwen Feriani,** Itten+Brechbühl, Switzerland
12.05	**Panel discussion**
12.30–14.00	**LUNCH, EXHIBITION AND VIDEO+POSTER GALLERY**

The Art Room
Platt Room and Garden

Organised by: Art in Site

10.15–17.00	**The in-between space: a live drawing artwork** See page 147 for the full abstract and details on this interactive session.

Session 21

Resilience planning for disasters and pandemics
Chair: Danny Gibson, MJ Medical, UK

14.00	**Covid-19 effects on healthcare facilities and patient care: Providers' first-hand learning and what that means for the future of healthcare design** **Francesqca Jimenez,** HDR, USA **Katie Fricke,** HDR, USA **Jeri Brittin,** HDR, USA
14.20	**The many roads to resilient design** **Julie Frazier,** Perkins&Will, USA
14.40	**Building for healthcare resiliency: A multi-pronged approach examining pandemic response of multiple facilities across the US military health system** **Deborah Wingler,** HKS, USA
15.00	**Panel discussion**
15.30	**COFFEE, EXHIBITION AND VIDEO+POSTER GALLERY**

Session 22

From briefing to post-occupancy evaluation
Chair: David Allison, Clemson University, USA

16.00	**Breaking down the silos: Doing the possible and then the impossible** **Tara Veldman,** Billard Leece Partnership, Australia **Isabelle Mansour,** Mott MacDonald, Australia **Benjamin Woenig,** Visione Group, Australia **Lesley Alway,** Strategic Health Resources, Australia This presentation will report on a workshop held by the Australian Health Design Council (AHDC) at the inaugural Australasian Health Design Conference 2022.
16.20	**Why are there not more post-occupancy evaluations?** **Gemma Ham,** MJ Medical, UK **Danny Gibson,** MJ Medical, UK
16.40–17.00	**Panel discussion**

Stream 6 will be brought to a close at 17.00, whereupon delegates are invited to return to the Wolfson Theatre for the day's closing plenary session (17.00–17.50).

08.30–10.00	**Breakfast design workshop: De-institutionalising furniture for healthcare** See page 149 for the full abstract on the issues that will be discussed in this workshop. **Panel: Rose Jago, Andrew Bertram, Matthew Hammond,** MJ Medical, UK **Wayne Tilbury-Larter,** Knightsbridge Furniture, UK **Oliver Mitchell, Nigel Davies,** Teal Healthcare, Teal LifeCare & Teal Living, UK	Organised by: mjmedical

Stream 7 begins at 10.45 in the Council Chamber, after the day's opening plenary session (08.45–10.15).

Session 23

Smart hospital design, planning and operations
Chair: Brenda Bush-Moline, Stantec, USA

10.45	**Maximising the digital benefits of capital projects by planning and thinking as a system: Lessons learned from the Monklands Replacement Project** **Alison Evans,** Currie & Brown, UK **Kathryn Henderson,** NHS Lanarkshire, UK **Graeme Reid,** NHS Lanarkshire, UK
11.05	**Project VISION: Data-driven design – empowering the third eye** **Michele Cohen,** NORR Architects & Engineers, Canada **Frank Panici,** NORR Architects & Engineers, Canada **Andrew Petrosoniak,** Advanced Performance Healthcare Design, Canada
11.25	**Using digital twins and simulation in planning of complex healthcare projects** **Thomas Leitner-Marzano,** Ramboll Denmark, Denmark
11.45	**Science, technology and digital transformation: Smart hospital innovations** **Richard McAuley,** Brandon Medical, UK
12.05	**Panel discussion**
12.30–14.00	**LUNCH, EXHIBITION AND VIDEO+POSTER GALLERY**

Session 24
Equitable digital health and wellbeing
Chair: Sasha Karakusevic, NHS Horizons, UK

14.00	**Digital placemaking for health and wellbeing in North East London** **Jo Morrison,** Calvium, UK **Louise Phillips,** NHS North East London, UK
14.20	**Seamless monitoring of physiological date in domestic space: A cross-national and multilinguistic study** **Noemi Bitterman,** Technion, Israel Institute of Technology, Israel **Shlomit Bauman,** HIT-Holon Institution of Technology, Israel
14.40	**'Leave no-one behind': Unlocking the potential of digital health equity to strengthen health system resilience for all people with chronic conditions** **Lucio Naccarella,** University of Melbourne, Australia **Nana Folmann Hempler,** Copenhagen University Hospital, Denmark
15.00	**Panel discussion**
15.30	**COFFEE, EXHIBITION AND VIDEO+POSTER GALLERY**

Session 25
Digital design of command and control
Chair: Duane Passman, Percipio Consulting, UK

16.00	**From nurse station to control tower: Operating hybrid care models across the healthcare ecosystem** **Nirit Pilosof,** University of Cambridge, Israel **Eivor Oborn,** University of Warwick, UK
16.20	**Importance of interconnectivity within command centres** **Beau Herr,** Arcadis, USA **Phi Kim Ho,** Arcadis, Canada
16.40–17.00	**Panel discussion**

Stream 7 will be brought to a close at 17.00, whereupon delegates are invited to return to the Wolfson Theatre for the day's closing plenary session (17.00–17.50).

Stream 8 begins at 10.45 in the Linacre and Sloane Room, after the day's opening plenary session (08.45–10.15).

Session 26

Innovation in emergency, critical and surgical care
Chair: Cemal Sozener, Univeristy of Michigan Medical School, USA

10.45	**Future-proofing emergency departments: Adaptable environments for supporting community crises** **Brian Silva,** CannonDesign, USA **Ellen Leise,** CannonDesign, USA **Steven Petrovic,** University of Cincinnati Health, USA **Ben Bassin,** Emerging Healthcare Design Consulting, USA
11.05	**Clinical perspectives: Enhanced collaboration for innovative operating theatres** **Eve Edelstein,** Clinicians for Design International, USA **Hala El Khorazaty,** Perkins&Will, UK
11.25	**Designing and constructing new hospital facilities that can be "flexible in use" for high infrastructure-dependent patients using Design for Manufacture** **Anne Symons,** UCL, UK **Grant Mills,** UCL, UK
11.45	**Application of digital twin tools to test models of care and health infrastructure planning assumptions** **Carla Edwards,** TSA Management, Australia **Robyn Brigden,** TSA Management, Australia
12.05	**Panel discussion**
12.30–14.00	**LUNCH, EXHIBITION AND VIDEO+POSTER GALLERY**

Session 27

Clinician wellness and engagement
Chair: Ganesh Suntharalingam, London North West University Healthcare NHS Trust, UK

14.00 **Clinical time not stakeholder engagement: What is the optimum model?**

Emma Stockton, Great Ormond Street Hospital NHS Foundation Trust, UK
Marc Levinson, Murphy Phillipps, UK
Elizabeth Whelan, Made for Health, UK
Tom Best, King's College Hospital, UK
(Organised by Building Blocks for Clinicians)

14.20 **Realising clinician faculty wellness through facility design**

Niraj Dangoria, Stanford University School of Medicine, USA
Paul Woolford, HOK, USA

14.40 **Bytes: Design decisions on a video consulting area**

Harry van Goor, Radboud University Medical Center, Netherlands

15.00 **Panel discussion**

15.30 **COFFEE, EXHIBITION AND VIDEO+POSTER GALLERY**

Session 28

Inclusive design and accessibility
Chair: Jim Chapman, Client advisor, UK

16.00 **Evaluating the built environment for multisensory independent navigation and facility readiness for persons with disabilities**

LarriJo Boone, EwingCole, USA
Suzy Genzler, EwingCole, USA

16.20 **Co-designing a collaborative wayfinding system for vision-impaired users**

Michel Verheem, ID-LAB, Australia

16.40–17.00 **Panel discussion**

Stream 8 will be brought to a close at 17.00, whereupon delegates are invited to return to the Wolfson Theatre for the day's closing plenary session (17.00–17.50).


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Image credit: © Brick Visual/NBBJ

Hosted in the Royal College's historic Dorchester Library, the Video+Poster gallery offers delegates the chance to learn about many wonderful research projects and design schemes, enriching the oral presentations taking place across the two days.

Supported by AECOM, the Video+Poster Gallery is a great place to spend time during the coffee breaks, lunch, and in the early morning before the Congress sessions begin.

Each poster is accompanied by a 5-minute pre-recorded video by the authors, telling the narrative of the poster and bringing it to life. The videos are accessible on the mobile app and event platform (see p10 to download), so delegates can watch the video on their own personal device as they view each poster, and then message and connect with the authors if they wish to learn more using the chat function in the app.

Posters of the shortlisted projects for the European Healthcare Design Awards (see pp38-39; and pp47-63) will also be on display.

P01 The disposable culture of maternity care and design – can we make it more sustainable?
Sarah Joyce, University of Leeds, UK
events.hubilo.com/EHD2023/booth/159825

P02 A qualitative investigation into the implications of immersive technologies in the healthcare sector and its built environment
Eunsil Yang, UCL Bartlett School of Sustainable Construction, UK
events.hubilo.com/EHD2023/booth/159826

P03 Designing to promote safety and occupational health in Covid-19 care: Lessons learned about areas for doffing of PPE in inpatient units
Herminia Machry, University of Kansas, USA; Zorana Matic, Northeastern University, USA; Jesse T. Jacob, Emory University School of Medicine, USA
events.hubilo.com/EHD2023/booth/159827

P04 Planning and design of a resilient network of care
Anthony Roesch, HOK, USA; Deirdra Orteu, Imperial College Healthcare NHS Trust, UK
events.hubilo.com/EHD2023/booth/159828

P05 Empowering hospital systems in achieving top-quality design and planning of their large-scale healthcare facilities, focusing on Asian healthcare construction
Sumandeep Singh, HKS, Singapore
events.hubilo.com/EHD2023/booth/159829

P06 The modernisation programme for the Princess Elizabeth Hospital, Guernsey – flexibility of services and buildings in a small island setting to strengthen resilience
Michael Clarke, MC Consult, UK; Andrew Street, Arcadis, UK; Jan Coleman and Robin Bailey, States of Guernsey, Guernsey
events.hubilo.com/EHD2023/booth/159830

P07 **Developing visions for the hospital of the future to achieve integrated sustainable and resilient-to-climate-change healthcare real estate**
Federica Pascale, Anglia Ruskin University, UK
events.hubilo.com/EHD2023/booth/159831

P08 **Identifying barriers to health innovation in London**
Kelsea Little, Lexica, UK
events.hubilo.com/EHD2023/booth/159832

P09 **Sabará Children's Hospital**
Lara Kaiser, Gabriel Freditas, Manuel Cadrecha, Perkins&Will, Brazil
events.hubilo.com/EHD2023/booth/159833

P10 **Older aged patients' experience with hospital food services on surgical and internal medicine wards of tertiary hospitals**
Katarina Vojvodic, Institute of Public Health of Belgrade, Serbia
events.hubilo.com/EHD2023/booth/159834

P11 **A case study on the performance evaluation of senior housing in South Korea from the wellbeing perspective of elderly residents**
Mingi Kim, Miseon Jang, Jiyun Kim, Jeonbuk National University; Yeunsook Lee, Yonsei University, Korea
events.hubilo.com/EHD2023/booth/159835

P12 **The New University Hospital Monklands: A case study**
David Ross, Keppie Design, UK
events.hubilo.com/EHD2023/booth/159836

P13 **Regenerative design for better health and wellbeing**
Andrew Tempany, Lynne Houlbrooke, RSK Group, UK
events.hubilo.com/EHD2023/booth/159837

P14 **Integrating resilience into design**
Sophia Hami, Miguel Angel Lopez, Sammy Shams, HKS, UK
events.hubilo.com/EHD2023/booth/159838

P15 **Delivering the southern hemisphere's first standalone heart hospital**
Paul Emmett, Conrad Gargett, Australia; Yee Jien, John Wardle Architects, Australia; Bernadette Commiti, Victorian Heart Hospital, Monash Health, Australia
events.hubilo.com/EHD2023/booth/159839

P16 **Transformation – a thousand moments of care: Quietly charting a course in patient-centred healthcare design**
Frank R Panici, NORR Architects and Engineers, Canada; Siamak Hariri, HPA Architecture, Canada; Rudy Dahdal, North York General Hospital, Canada
events.hubilo.com/EHD2023/booth/159840

P17 **'Behaviour': Design to heal and feel well**
Iris Hobo, Harry van Goor, Radboud University Medical Center, Netherlands
events.hubilo.com/EHD2023/booth/159841

P18 **The art of distraction**
Melanie Jacobsen Cox, Andy Illingworth, HLM Architects, UK
events.hubilo.com/EHD2023/booth/159842

P19 **"Bricks": Design decisions for a health(y) Radboudumc campus**
Willemineke Hammer, EGM architects, Netherlands
events.hubilo.com/EHD2023/booth/159843

P20 **The Florence Project**
Michal Eitan, Bezalel Academy of Art and Design Jerusalem, Israel
events.hubilo.com/EHD2023/booth/159844

P21 **Wellness approach**
Melanie Jacobsen Cox, HLM Architects, UK
events.hubilo.com/EHD2023/booth/159845

P22 **Addressing healthcare resilience through new genotypes of hospitality buildings**
Debajyoti Pati, Farzane Omidi, Texas Tech University, USA; Armin Piriyaei, Jennie Evans, HKS Architects, USA
events.hubilo.com/EHD2023/booth/159846

P23 **Shaping the healthcare estates of the future**
Hannah Callingham, Lucy Symons-Jones, Lexica, UK
events.hubilo.com/EHD2023/booth/159847

P24 **The architectural medicine system and the architectural doctor: Providing interoperability for health and wellness in the built environment**
Timothy Rossi, Architectural Medicine, USA
events.hubilo.com/EHD2023/booth/159848

P25 **The importance of a collaborative approach between clinical medicine and the hospital estate: Optimising environments and furthering the adoption of new technologies to support clinical service planning strategies**
Sarka Oldham, Lucy Meecham Jones, Vanguard, and Q-bital Healthcare Solutions, UK
events.hubilo.com/EHD2023/booth/159849

P26 **Going up! The evolution of mental health facilities from countryside to city**
Victor Muniz, Mark Carter, Ryder Architecture, UK
events.hubilo.com/EHD2023/booth/159850

P27 **Applying mixed-reality for healthcare simulation in participatory architectural planning**
Jan A. Eckert, Swiss Center for Design and Health, Switzerland
events.hubilo.com/EHD2023/booth/159851

P28 **A phased, clinically led, and strategic approach to infrastructure development programmes**
Charlotte Bambridge, Samuel Rose, The PSC, UK; Nicola Collas, University Hospitals Plymouth NHS Trust, UK
events.hubilo.com/EHD2023/booth/159852

P29 **Innovation in ventilation: Aligning infection prevention with energy efficiency**
Alyson Prince, Archus, UK; Kathy Warye, Infection Prevention, USA
events.hubilo.com/EHD2023/booth/159853

P30 **Digital health, illustrated**
Levina Siswanto, Kate Bradley, Kieren Morgan, MJ Medical, UK
events.hubilo.com/EHD2023/booth/159854

P31 **Establishing a resilience team and building trust – insights from the process**
Shani Brosh, Carmel Medical Center, Israel
events.hubilo.com/EHD2023/booth/159855

P32 **Home modification experience and continuity of living for older adults**
Yoonseo Hwang, Chungbuk National University, Korea; Miseon Jang, Jeonbuk National University, Korea; Yeunsook Lee, Yonsei University, Korea
events.hubilo.com/EHD2023/booth/159856

P33 **Hidden in plain sight – The Orange Door: An integrated service model that provides help and support to those experiencing family violence and to parents for the wellbeing and development of children**
Tonya Hinde, Billard Leece Partnership, Australia
events.hubilo.com/EHD2023/booth/159857

P34 Mapping design and clinical guidelines to the process of care: Stroke rehabilitation in Australia
Ruby Lipson-Smith, MARCS Institute of Brain Development and Behaviour, Western Sydney University; The Florey Institute of Neuroscience and Mental Health; Juan Pablo Saa, Julie Bernhardt, Professor, The Florey Institute of Neuroscience and Mental Health, Australia – On behalf of the NOVELL Collaboration; www.novellredesign.com
events.hubilo.com/EHD2023/booth/159858

P35 100-per-cent single-occupancy rooms: Impact on the microbiological safety of the hospital environment
Adriënne S. van der Schoor, Anne F. Voor in 't holt, Juliëtte A. Severin, Margreet C. Vos, Erasmus MC University Medical Center, Netherlands
events.hubilo.com/EHD2023/booth/159859

P36 West Suffolk Future System: An inclusive briefing and design process
Elly Williams, Ryder Architecture, UK; Helena Jopling, West Suffolk NHS Foundation Trust, UK; Jane McMahon, Adcuris Consulting, UK
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P37 Barrier-free hospitals – more than just a couple of ramps
Birgit Dietz, Eva Henrich, Bavarian Institute of Architecture for the Elderly and Cognitively Impaired, Germany
events.hubilo.com/EHD2023/booth/159861

P38 Humanising cancer clinics: Co-producing an interdisciplinary tool to examine the link between cancer patients' mental health and architecture
Lusi Morhayim, Yasmin Garcia-Sterling, Keri Wong, University College London, UK; Katriina Whitaker, University of Surrey, UK
events.hubilo.com/EHD2023/booth/159863

P39 In a tight spot: The challenge of delivering incremental improvement to optimise the clinical environment on a hospital site with little room to move
Alexis Carlyon, Jon Clarke, Royal Cornwall Hospitals NHS Trust, UK
events.hubilo.com/EHD2023/booth/159864

P40 Tying capital to improvement: Understanding the impact of investment, and disinvestment on system transformation
Malcolm Lowe-Lauri, Archus, UK
events.hubilo.com/EHD2023/booth/159865

P41 Ageing hospitals and facilities – to reuse or replace?
Paul Yeomans, Lianne Knotts, Medical Architecture, UK
events.hubilo.com/EHD2023/booth/159866

P42 Art from the start
Arabella Creed, Lucy Grimble, Jack Hirons, University of Dundee, UK; Lauren Shaw, NHS Tayside, UK
events.hubilo.com/EHD2023/booth/159867

P43 Maximising social impact on capital healthcare projects
Ruth French, Elliott Shaw, Ryder Architecture, UK
events.hubilo.com/EHD2023/booth/159868

P44 Accessing the right mental healthcare in the right environment
Rachelle McDade, Perminder Gill, Currie & Brown, UK
events.hubilo.com/EHD2023/booth/159869

P45 The importance of a clear brief: Balancing clinical requirements and fire strategy at a neuro-critical care unit
John Wiggett, Jim Haigh, AD Architects, UK
events.hubilo.com/EHD2023/booth/159870

P46 Designing for future generations: Working for now
Hannah Moscrop, Rhiannon Freshney, Velindre University NHS Trust, UK
events.hubilo.com/EHD2023/booth/159871

P47 Turning healthcare on its head: System-level estates planning in Scotland
Nicola Clemo, Andrew Branch, Anna Daley, Archus, UK
events.hubilo.com/EHD2023/booth/159872

P48 Between embodied and operational carbon emission: What makes flooring sustainable?
Andy Gordon, Gerflor, UK; Eric Berteau, Gerflor, France
events.hubilo.com/EHD2023/booth/159873

P49 Investigating the impact of window blind positions on patient experience in a cardiac intensive care unit: A comparison between on-site observations and computer simulations
Roxana Jafarifiroozabadi, Alina Osnaga, Lawrence Technological University, USA
events.hubilo.com/EHD2023/booth/159874

P50 Towards new criteria for comfort in healthcare infrastructure
Peter-Willem Vermeersch, archipelago architects, Belgium
events.hubilo.com/EHD2023/booth/159875

P51 Healthcare resilience through design excellence: The Ottawa Hospital
Jason-Emery Groen, Mike Ryan, HDR, Canada Joanne Read, Karen Stockton, The Ottawa Hospital, Canada
events.hubilo.com/EHD2023/booth/159876

P52 Online co-design applications: A new medium for collaboration in the design of healthcare environments
Sara Bayramzadeh, Hamid Estejab, Kent State University, USA
events.hubilo.com/EHD2023/booth/159877

P53 Engaging performance-based and evidence-based knowledge to design future-proof healing environments: Transformation from multidisciplinary to transdisciplinary
Peter-Willem Vermeersch, archipelago architects, Belgium
events.hubilo.com/EHD2023/booth/159878

P54 A paradigm shift for elder and end-of-life care: How radical inclusivity leads to resiliency
Mahina Wright, HDR, Canada
events.hubilo.com/EHD2023/booth/159879

P55 Developing a statistical model to estimate the impact of room environment on patients' length of stay in a cardiac intensive care unit
Roxana Jafarifiroozabadi, Lawrence Technological University, USA; Andrea Franks, AnMed Health, USA
events.hubilo.com/EHD2023/booth/159880

P56 Bringing new life to maternity care in Belfast
Peter Wilson, Jason Pearson, AECOM, UK
events.hubilo.com/EHD2023/booth/159881

P57 How enhanced 3D digital tools can support the transformation of existing healthcare buildings
Charlotte Ruben, Linda Mattson, White Arkitekter, Sweden
events.hubilo.com/EHD2023/booth/159882

P58 New restaurant works at Altnagelvin Hospital, Londonderry, Northern Ireland
Gonzalo Vargas, Todd Architects, UK
events.hubilo.com/EHD2023/booth/159883

P59 NHS Scotland – net-zero route maps to 2040
Siobhan Gibbons, Hannah Dunn, Reece Finney, Jacobs, UK; Rob Dixon, Stephanie Parker, Energy Systems Catapult, UK
events.hubilo.com/EHD2023/booth/159884

P60 Climate change resilience framework for health systems and hospitals
Maï Shafei, Health Care Without Harm (Europe), Belgium; Stelios Karozis, National Center for Scientific Research Demokritos, Greece
events.hubilo.com/EHD2023/booth/159885

P61 Delivering more for less – validating performance to inform the next generation of healthcare buildings
Chris Taylor, Richard Mann, AECOM, UK; Paul McNally, Clatterbridge Cancer Centre, UK
events.hubilo.com/EHD2023/booth/159886

P62 Future healthcare: Thinking differently about how we deliver care
Rachelle McDade, Currie & Brown, UK; Anthony Mistretta, Perkins&Will, USA
events.hubilo.com/EHD2023/booth/159887

P63 Is the progressive procurement model the key to more resilient hospital projects?
Suzanne Crysdale, Michael Moxam, Stantec, Canada; David Longley, Matthew Kenny, Trillium Health Partners, Canada
events.hubilo.com/EHD2023/booth/159888

P64 Young Maggie Centre: An appropriate design model for caring for children and their families living with life-limiting conditions
Hedyeh Gamini, Richard Tucker, Mirjana Lasanovska, Deakin University, Australia
events.hubilo.com/EHD2023/booth/159889

P65 Blackpool Victoria Hospital – emergency ambulance discharge/triage facility
Alan Kondys, Vincent Boodea, Integrated Health Projects, UK; Clare Boyd, Blackpool Teaching Hospitals NHS Foundation Trust, UK
events.hubilo.com/EHD2023/booth/159890

P66 The evolution of bone marrow transplants and the impact/design of the respective facilities
Linda Vela, CannonDesign, Canada; Ian McDermott, University Health Network, Canada
events.hubilo.com/EHD2023/booth/159891

P67 How indoor airflow and quality impacts hospital-associated infection: A narrative literature review
Nazli Jafari, Zeekara Baset Nadi, Farimah Raisali, Sara Bayramzadeh, Kent State University, USA
events.hubilo.com/EHD2023/booth/159892

P68 A new state-of-the-art design to deliver dedicated orthopaedic care, improve efficiency in care, and patient and staff experience
Nick Peaker, NORR, UK
events.hubilo.com/EHD2023/booth/159893

P69 Delivering system capacity at a new patient care tower during a pandemic urgently needed ICU beds put into circulation
Aaron Smith, Frank Panici, NORR Architects & Engineers, Canada; Tom Parker, St Michael's Hospital, Unity Health Toronto, Canada
events.hubilo.com/EHD2023/booth/159894

P70 Anaesthesiologists' perceptions of noise in operating rooms: Survey results
Eve Edelstein, Clinicians for Design International, USA; Robert Brustowicz, Children's Hospital / Harvard Medical School, USA; Priti G Dalal, Penn State Health, USA; Imelda Tjia, Texas Children's Hospital / Baylor College of Medicine, USA; Margaret Allen, Akron Children's Hospital, USA; Benjamin French, Xiaoke Feng, Christy J Crockett, Vanderbilt University Medical Center, USA
events.hubilo.com/EHD2023/booth/159895

LLEWELYN DAVIES

As one of the leading healthcare architects globally, Llewelyn Davies has a vibrant history of facilitating a dialogue between art and architecture in hospitals and healthcare buildings. From the ground-breaking collaboration between Bridget Riley and John Weeks for St. Mary's Hospital in Paddington in the 1980s, to Jason Bruges' Nature Trail for Great Ormond Street Hospital, Llewelyn Davies' design ethos puts a strong emphasis on an integrative approach to art and architecture always with a common goal to improve the environment for patients, staffs and visitors.

With over 250 hospitals now completed, Llewelyn Davies demonstrates a distinguished history in both healthcare and master planning, extending over 6 decades in more than 75 countries, and encompassing a spectrum of innovation. The fundamental design principles of the modern hospital were essentially invented and shaped by the founding partners, John Weeks and Lord Richard Llewelyn-Davies. Their pioneering work, notably in understanding the need for continuous flexibility, was extraordinary and remains as relevant to hospital design today and the future as ever before.

1 Addenbrookes Treatment Centre, 'Asklepion' by Ivan Black
2 SNF University Pediatric Hospital of Thessaloniki in collaboration with Renzo Piano Building Workshop
3 Bridget Riley, St. Mary's Hospital
4 Great Ormond Street Hospital, 'Digital Nature Trail' by Jason Bruges

Supporting Stream 5 – Art and Architecture as 'Silver Knowledge Leader'

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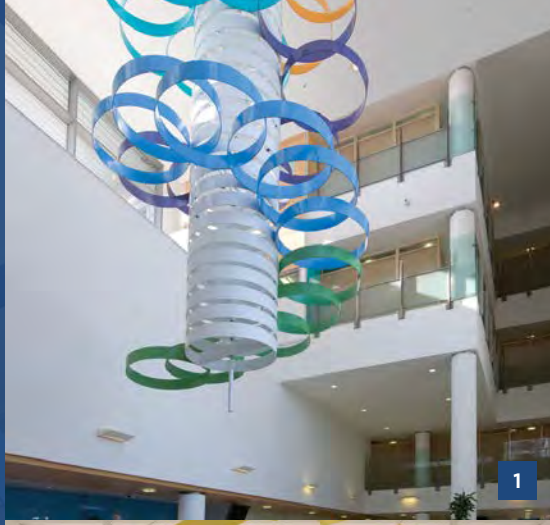
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Lead Awards Partner:

IHP Integrated Health Projects by VINCI Sir Robert McALPINE

Healthcare Design (Over 25,000 sqm)

Category sponsor: archipelago

A01 Albert Einstein Learning and Research Center, Brazil

A02 Ataşehir Hospital & Children's Pavilion, Turkey

A03 Cleveland Clinic London, UK

A04 Radboudumc Main Building, Netherlands

Healthcare Design (Under 25,000 sqm)

A05 Sabanera Health Dorado, Puerto Rico

A06 Te Huhi Raupō – Taranaki Base Hospital Renal Unit, New Zealand

A07 The Pears Building, Institute of Immunity and Transplantation, UK

Future Healthcare Design

Category sponsor: IHP Integrated Health Projects by VINCI Sir Robert McALPINE

A08 Leeds Teaching Hospitals NHS Trust – Hospitals of the Future Project, UK

A09 Mary Elizabeths Hospital, Denmark

A10 National Rehabilitation Centre, UK

A11 Velindre Cancer Centre, UK

Design for Health and Wellness

Category sponsor: lexica.

A12 Te Huhi Raupō – Taranaki Base Hospital Renal Unit, New Zealand

A13 Woonzorgcentrum Zierik7, Netherlands

Mental Health Design

Category sponsor: Gerflor GRADUS

A14 Campbelltown Hospital Redevelopment, Australia

A15 Child and Adolescent Mental Health Hospital Korbeel and Patio, Belgium

A16 Skaraborg Psychiatric Hospital department, Sweden

A17 Trinity Building for the SWLSTG Mental Health NHS Trust, UK

SALUS GLOBAL KNOWLEDGE EXCHANGE

AfH 30 YEARS

AWARDS SHORTLIST GALLERY

Interior Design and Arts

A18 Campbelltown Hospital Redevelopment, Australia

A19 Evelina Clinical Research Facility Artwork, UK

A20 Woonzorgcentrum Zierik7, Netherlands

Design for Adaptation and Transformation

Category sponsor: RSK

A21 ICCU Extension, Tallaght University Hospital, Ireland

A22 Ledplastikcentrum at Bromma Hospital, Sweden

A23 Princess Margaret Cancer Centre Space Transformation Project, Canada

Product and Technology Design Innovation

A24 BeaconMedaes Central Destruction Unit, UK

A25 Guldmann Trainer Module – Trafford General Hospital, UK

A26 Nobi Smart Lamps, Belgium

A27 Pathmaker, Spain

Design for Sustainable Development

In collaboration with: European Health Property Network

A28 Clock View Hospital, UK

A29 Dumfries and Galloway Royal Infirmary, UK

A30 New Psychiatric Hospital in Slagelse, Denmark

A31 The Royal Children's Hospital, Australia

Design Research Project

Category sponsor: Medical Architecture

A32 Building for pandemic resiliency: A comparative analysis of multiple facilities across the US military health system

A33 Exploring the effect of physical environment on resident's wellbeing and staff's care practice of dementia care facilities in Sweden and Canada: An international longitudinal study

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WELCOME DRINKS RECEPTION

Hosted by: Supported by:

Venue: Osler and Long Rooms
Date: Monday 12 June
Time: 18.00–20.30

The Welcome Drinks Reception takes place immediately after the close of the first day's proceedings on the evening of Monday 12 June, in the Osler and Long Rooms, offering a fantastic chance to network and unwind.

The European Healthcare Design 2023 exhibition will also be open during the Welcome Drinks Reception. Throughout the evening, a jazz trio from the Royal Academy of Music will provide a captivating musical performance.

To mark and celebrate 30 years of activity, Architects for Health (AfH) will be launching a new book, reflecting on how far the organisation has come and showcasing some of the projects it is proud to have been involved in. Providing an opportunity to pause and reflect, the book also looks to the future, considering what potential challenges architects, healthcare planners, hospital leaders, and regulators will need to respond to over the next 30 years; what role AfH will continue to play; and how it will fit into the bigger picture. Opinion pieces from thought leaders on the challenges ahead will also be featured.

GARDEN PARTY

Venue: Medicinal Gardens
Date: Tuesday 13 June
Time: 18.30–22.00

Supported by:

Jacobs

Held outside in the informal surroundings of the medicinal gardens of the Royal College of Physicians, the Garden Party will immediately follow the end of the Congress and the European Healthcare Design Awards ceremony, giving delegates the chance to celebrate with the winners.

Opened in 1965, the medicinal gardens were extensively replanted in 2005–06, thanks to a generous grant from the Wolfson Foundation, and they now feature more than 1300 plants.

Throughout the evening, a jazz quartet from the Royal Academy of Music will give a captivating musical performance. Featuring spectacular garden lighting, lanterns and candles, the Garden Party will offer a great opportunity at the close of the Congress to network and socialise, and enjoy the British summer!

To reflect the surroundings, and as a relaxing end to an intense two days of Congress activity, the dress code will be smart casual, with delegates treated to a barbecue buffet dinner and drinks.

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Participants in the European Healthcare Design 2023 Congress get the opportunity to choose one of three study tours featuring some of the UK's latest benchmark healthcare projects and architectural landmarks. All tours are now fully booked.

Study tour 1: Liverpool

Departure point: Melia White House Hotel Lobby
Date: 14 June 2023
Time: 06.00–19.00

Alder Hey Children's Hospital

At the time of completion in 2015, Alder Hey Children's Hospital was the only hospital in a park in Europe, and set a new benchmark for the delivery of modern healthcare for children. Designed by BDP, the purpose-built, £237m development was one of the most ambitious medical construction projects ever undertaken in the UK.

Returning to the campus for the first time since the hospital became an EHD Award winner in 2016, the tour group will have the opportunity to visit a number of new buildings on the campus, including:

The Institute in the Park
Designed by Hopkins Architects – a new research and education building, housing a mixture of spaces to support the needs of the NHS trust and its university partners.

The Alder Centre
Designed by Allford Hall Monaghan Morris – a building and gardens dedicated to providing healing for bereaved parents and anyone affected by the death of a child.

The Catkin Centre and Sunflower House
Designed by Cullinan Studio – providing mental health services, including a new outpatients and residential tier 4 facility, designed around courtyard gardens against the backdrop of a new park, which will be shared between the hospital and the community.

STUDY TOURS

Study tour 2: London

Departure point: Melia White House Hotel Lobby
Date: 14 June 2023
Time: 08.30–17.30

Children's Day Treatment Centre, Evelina London Children's Hospital

Due to complete in May, the Children's Day Treatment Centre is a five-storey building providing a day surgery facility for the Evelina London Children's Hospital. Designed by ADP, it includes an admissions area; two general admission theatres; first- and second-stage recovery areas; a discharge facility; and staff and clinical support accommodation. Owing to a constrained site, modern methods of construction were used for panellised baguette cladding with a steel-framed solution. To avoid crossover between pre-op and post-op, a 'one-way' flow loop was designed, so patients travel into theatre at one end and out the other end to recovery. Integral to a child's care journey, the artwork continues the hospital's natural world design concept of theming different floors to a different setting. 'Space' is the theme used, chosen in collaboration with children and young people.

Great Ormond Street Hospital

The Zayed Centre for Research into Rare Disease in Children

Opened in late 2019, this multi-award-winning building was designed by Stanton Williams Architects and brings together clinical activity, research and workspaces, to better integrate these activities and increase the impact and scope of medical discoveries.

A collaboration between Great Ormond Street Hospital and University College London, the building puts research on show to the public, patients and families and, through translational research, aims to reduce the bench-to-bedside-time of new medical breakthroughs.

The Great Ormond Street Sight and Sound Centre, supported by Premier Inn

This historic listed building originally provided healthcare for London's Italian population. After its closure in 1990, the building was purchased by Great Ormond Street and used for non patient-facing services. The building has now been fully refurbished, extended and remodelled to designs by Sonnemann Toon Architects, which transformed it into a modern healthcare facility. The brief was to provide welcoming, homely spaces that would be easy to navigate for children and young people with sight and hearing impairment.

Study tour 3: London

Departure point: Melia White House Hotel Lobby
Date: 14 June 2023
Time: 09.00–18.00

The Royal Marsden

Oak Cancer Centre

Designed by BDP, the new Oak Cancer Centre (OCC) for the Royal Marsden Hospital (RMH) is located within the existing RMH campus in Sutton, south London. The OCC site is adjacent to the Institute of Cancer Research, the RMH's research partner, and sits within a planned wider 'London Cancer Hub' masterplan. This emerging 'Knowledge Cluster' aims to become a global centre for cancer innovation, augmenting it with complementary organisations to create a thriving community of scientists, clinicians and innovative companies. The building also incorporates a Rapid Diagnostic Centre and a floor dedicated to research.

Maggie's at The Royal Marsden

Central to the vision of Maggie Keswick Jencks and her husband Charles for a new kind of cancer care was their belief in the potential of architecture to reassure people and make them feel valued. Nearly 25 years later, designing a Maggie's has given Ab Rogers Design the opportunity to extend its love of creating spaces that engage people on a human level and make them alert to their surroundings through the firm's first complete building. Ab Rogers designed the centre's four staggered, red fanning volumes from the inside out.

The Pears Building, Institute of Immunity and Transplantation

The Pears Building accommodates the UCL Institute of Immunity and Transplantation, offices for the Royal Free Charity, and a 35-bed patient hotel. One of only five specialist immunology centres in the world, the Pears Building is a leading research organisation that enables UCL to deliver research excellence and the Royal Free Hospital to combine local patient care with world-class expertise. Opportunities for spontaneous interaction are built-in, with visual connectivity between departments. Lab and write-up spaces are arranged around a central atrium, which incorporates generous circulation, break-out spaces, and booths to support informal meeting, professional collaboration, and socialising.

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+ 7 emergency ambulance hubs delivered nationally in 2023
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Celebrating the finest in global healthcare design

Lead Awards Sponsor

IHP Integrated Health Projects by VINCI BUILDING Sir Robert McALPINE

The European Healthcare Design Awards 2023 celebrate and recognise professional and research excellence in the design of healthcare environments both in Europe and around the world.

The awards aim to have a significant influence on the creation of environments that promote health and wellbeing, embed quality improvement, and support the delivery of treatment and care in an accessible, economic and equitable way. They will contribute towards the development of knowledge and standards in the design of healthcare environments around the world.

Organised by SALUS Global Knowledge Exchange and Architects for Health, the awards comprise ten categories across primary, community, secondary and tertiary levels of international healthcare provision and delivery, in addition to the Susan Francis Design Champion Award. They will be presented at an illustrious ceremony during the final session of the Congress on Tuesday 13 June.

Recipients of the awards will be multidisciplinary project teams demonstrating outstanding vision, leadership and knowledge in the design, development and implementation of projects that have positively transformed the delivery and experience of healthcare for the patients and community they serve.

Live judging webinars of the shortlisted entries for each category were broadcast on SALUS TV in May. Visit the event platform and app to view the recordings.

All award entries also have the opportunity to be featured on a fully searchable map of healthcare projects on the SALUS Global Knowledge Exchange (www.salus.global).

The Susan Francis Design Champion Award

The signature prize of the European Healthcare Design Awards, the Susan Francis Design Champion Award, is presented to a visionary healthcare leader who has championed, advocated and monitored the value of design across one or more major healthcare projects, working in close collaboration with multiple stakeholders to deliver excellence and set new standards in design quality. The award also honours the legacy of Susan Francis, co-creator of the European Healthcare Design Congress, who sadly passed away following illness in April 2017.

Healthcare Design (Over 25,000 sqm)

An outstanding healthcare project in a secondary or tertiary care setting that demonstrates high levels of sustainability and urban integration, creates an effective clinical environment, promotes service improvement, and provides a supportive environment for staff, patients and their families.

Lead judge:
Kate Copeland,
Australian Health Design Council,
Australia

Panel judges:
Paul Bell,
Ryder Architecture, UK

Bill Hercules
WJH Health, USA

Shortlist

Albert Einstein Learning and Research Center, Brazil
Commissioned by Sociedade Beneficente Israelita Brasileira Albert Einstein
Designed by Perkins&Will and Safdie Architects
(pic: top)

Ataşehir Hospital & Children's Pavilion, Turkey
Architect of record: Acibadem Project Management
Executive architect: Lina Architecture
Interior design and interior architecture: Gensler and Norm Architects
(pic: opposite page, bottom)

Cleveland Clinic London, UK
Commissioned by Cleveland Clinic London
Designed by PLP Architecture with HKS
Built by Sir Robert McAlpine
(pic: opposite page, top)

Radboudumc Main Building, Netherlands
Commissioned by Radboudumc
Designed by EGM architects
(pic: bottom)

Longlist

Campbelltown Hospital Redevelopment, Australia
Commissioned by Health Infrastructure NSW
Designed by Billard Leece Partnership

Goedstrup Regional Hospital, Denmark
Commissioned by Region Midtjylland
Designed by Arkitema

Hubbard Center for Children, USA
Commissioned by Children's Hospital & Medical Center of Omaha
Designed by HDR

New Ward of Taizhou Hospital, Japan
Commissioned by Taizhou Enze Medical Center (Group)
Designed by Nihon Sekkei

Royal Liverpool University Hospital, UK
Commissioned by Liverpool University Hospitals NHS Foundation Trust
Designed by NBBJ and HKS Architects

The Lighthouse Hospital, Finland
Commissioned by Varha
Designed by Arkkitehtiryhmä Reino Koivula

Victorian Heart Hospital, Australia
Commissioned by Monash Health
Designed by Conrad Gargett + Wardle

Healthcare Design (Under 25,000 sqm)

An outstanding healthcare project in a community or primary care setting that demonstrates high levels of sustainability and urban integration, transforming the quality of care services in an accessible location, and supporting the integrated needs of staff, patients and the community.

Lead judge:
David Powell,
Velindre Cancer Centre;
Alder Hey Children's Hospital, UK

Panel judges:
Coen van den Wijngaart,
archipelago architects, Belgium

Brenda Bush-Moline,
Stantec, USA

Shortlist

Sabanera Health Dorado, Puerto Rico
Commissioned by Prisa Group
Designed by Prisa Group, V Architecture, and Perkins&Will Team
(pic: top)

Te Huhi Raupō – Taranaki Base Hospital Renal Unit, New Zealand
Commissioned by Te Whatu Ora
Designed by Warren and Mahoney
(pic: bottom)

The Pears Building, Institute of Immunity and Transplantation, UK
Commissioned by the Royal Free Charity
Designed by Hopkins Architects

Longlist

Abbey Centre, UK
Commissioned by Camden Council
Designed by AHR Architects
Contractor: Wates

Broadford Hospital, Skye, UK
Commissioned by Hub North Scotland on behalf of NHS Highland
Designed by Oberlanders Architects and Rural Design Architects

Devizes Health Centre, UK
Commissioned by NHS Bath and North East Somerset, Swindon and Wiltshire Integrated Care Board in partnership with NHS Property Services
Designed by DKA
Consultant: Archus

Dortmund Hospital North - Surgical Suite Expansion & Renovation, Germany
Commissioned by Klinikum Dortmund
Designed by Heinle Wischer Partnerschaft freier Architekten

Foleshill Health Centre, UK
Commissioned by Community Health Partnerships with Coventry and Warwickshire NHS
Designed by Tooley Foster 1892

Heartlands Treatment Centre, UK
Commissioned by University Hospitals Birmingham NHS Foundation Trust
Designed by The Design Buro (Coventry)
Consultant: Archus

High Level Infection Unit, Netherlands
Commissioned by Radboudumc
Designed by EGM architects

Institute for Specialized Medicine & Intervention (ISMI), Canada
Commissioned by Institute for Specialized Medicine & Intervention (ISMI)
Designed by HOK

King's College Hospital, UK
Commissioned by King's College Hospital NHS Foundation Trust
Designed by Premier Modular

Marie Curie Hospital for Children, Romania
Commissioned by Asociatia Daruieste Viata (Give Life NGO)
Designed by Tesseract Architecture

New Mental Health Facility in Sagrat Cor Healthcare Complex, Martorell, Spain
Commissioned by Congregación de Hermanas Hospitalarias del Sagrado Corazón de Jesús
Designed by Vitaller Arquitectura

Orthopaedic Elective Centre – National Treatment Centre, UK
Commissioned by NHS Fife
Designed by NORR Consultants

SJD Pediatric Cancer Center Barcelona, Spain
Commissioned by Hospital Sant Joan de Déu Barcelona
Designed by Pinearq

Southern Cross Queenstown, Australia
Commissioned by Queenstown Commercial
Designed by Warren and Mahoney

Future Healthcare Design

A future healthcare project that can demonstrate the potential for outstanding outcomes in masterplanning, placemaking, wellness, pandemic preparedness and sustainable development, in alignment with the strategic requirements of the healthcare provider to transform their services within the wider community, regional or national health system.

Lead judge:
Cliff Harvey,
Union of International Architects Public Health Group, Canada

Panel judges:
Warren Percival,
RSK, UK

Christopher Shaw,
Past chair, Architects for Health, UK

Shortlist

Leeds Teaching Hospitals NHS Trust – Hospitals of the Future Project, UK
Commissioned by Leeds Teaching Hospitals NHS Trust
Designed by Perkins&Will with Schmidt Hammer Lassen
(pic: top)

Mary Elizabeths Hospital, Denmark
Commissioned by Region Hovedstaden
Designed by 3XN in collaboration with Arkitema, Niras, and Kristine Jensens Tegnestue
(pic: opposite page, bottom)

National Rehabilitation Centre, UK
Commissioned by Nottingham University Hospitals NHS Trust
Designed by Ryder Architecture
(pic: opposite page, top)

Velindre Cancer Centre, UK
Commissioned by Velindre University NHS Trust
Designed by White arkitekter
(pic: bottom)

Longlist

Al-Widad Medical Center, Saudi Arabia
Commissioned by Al-Naghi Group
Designed by HDR

Herzog Medical Center Campus Masterplan, Canada
Commissioned by Herzog Medical Center
Designed by Farrow Partners

House of Senses, Denmark
Commissioned by Clemens Foundation
Designed by Karlsson Architects

Samajik Health Science Institute & Research Centre, Bangladesh
Commissioned by Grameen Telecom Trust
Designed by MASS Design Group

The Peter Gilgan Mississauga Hospital, Canada
Commissioned by Trillium Health Partners
Designed by Stantec

Design for Health and Wellness

An inspirational project that encompasses services outside of traditional healthcare settings and, through an alignment of the care philosophy with the design of the environment, helps promote positive behaviours towards healthy living and wellness..

Lead judge:
John Cooper,
Architects for Health;
JCA, UK

Panel judges:
Charlotte Ruben,
White Arkitekter, Sweden

Ruairi Reeves,
Medical Architecture, UK

Shortlist

Te Huhi Raupō – Taranaki Base Hospital Renal Unit, New Zealand
Commissioned by Te Whatu Ora
Designed by Warren and Mahoney
(pic: top)

Woonzorgcentrum Zierik7, Netherlands
Commissioned by Allévo, locatie Cornelia
Designed by Gortemaker Algra Feenstra architects
(pic: bottom)

Longlist

Abbey Centre, UK
Commissioned by Camden Council
Designed by AHR Architects
Contractor: Wates

Heathlands Care Home, UK
Commissioned by Bracknell Forest Council
Designed by Arcadis IBI Group

ICU of the Future, Australia
Commissioned by The Prince Charles Hospital Critical Care Research Group
Designed by Conrad Gargett

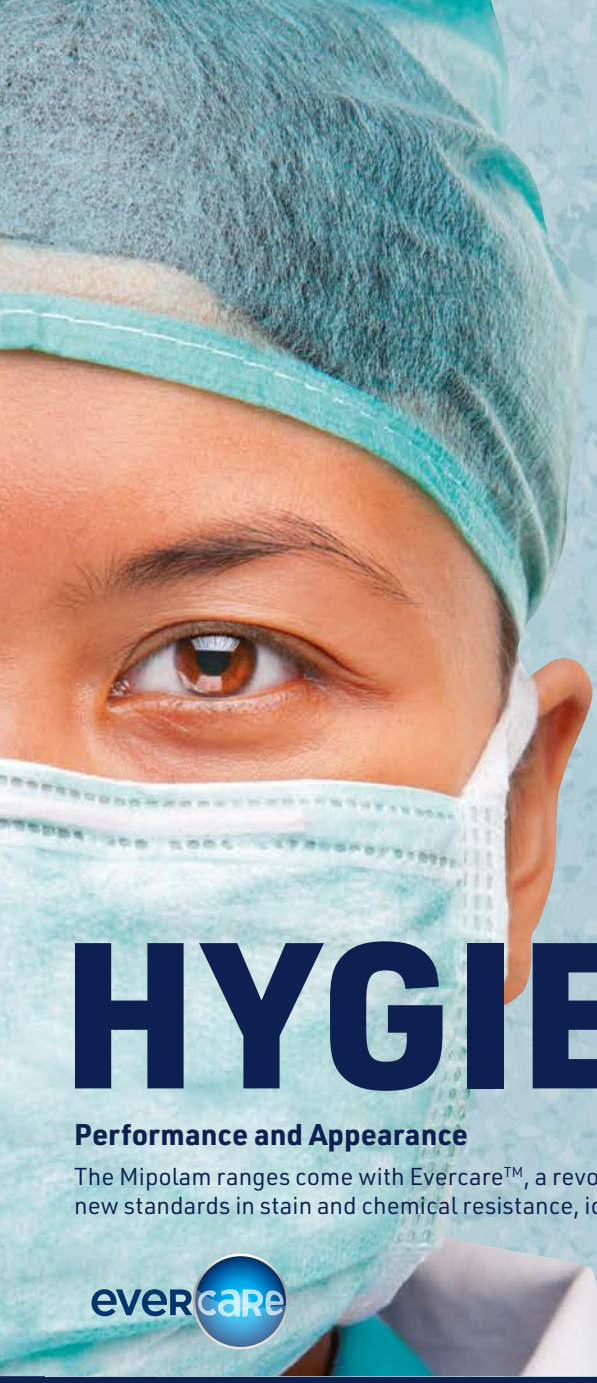
Institute for Specialized Medicine & Intervention (ISMI), Canada
Commissioned by Institute for Specialized Medicine & Intervention (ISMI)
Designed by HOK

Michael Garron Hospital, Phase 1 New Patient Tower, Canada
Commissioned by EllisDon Infrastructure MGH / Infrastructure Ontario
Designed by B+H and Diamond Schmitt Architects

Oasis Health and Wellbeing Centre, UK
Commissioned by Royal Berkshire NHS Foundation Trust

Stanford University School of Medicine Center for Academic Medicine, USA
Commissioned by Stanford School of Medicine Office of Facilities Planning and Management
Designed by HOK

VIP/IPD ward of Mortaz General Hospital, Iran
Commissioned by Abadis Medical Group
Designed by Sepina Architecture Group



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Mental Health Design

A mental health project that, through innovative design thinking, achieves a reconciliation between the needs of the patient/resident for a humanistic environment that supports ongoing therapy, care and recovery, and the requirement for appropriate levels of safety, security and supervision.

Lead judge:
Beatrice Fraenkel,
Design in Mental Health Network, UK

Panel judges:
Christine Chadwick,
Archus, Canada

Femke Feenstra
Gortemaker Algra Feenstra, Netherlands

Shortlist

Campbelltown Hospital Redevelopment, Australia
Commissioned by Health Infrastructure NSW
Designed by Billard Leece Partnership
(pic: left)

Child and Adolescent Mental Health Hospital Korbeel and Patio, Belgium
Commissioned by Groep Zorg H. Familie vzw
Designed by VK architects+engineers

Skaraborg Psychiatric Hospital department, Sweden
Commissioned by Västfastigheter
Designed by Semrén & Månsson Arkitekter
(pic: right)

Trinity Building for the SWLSTG Mental Health NHS Trust, UK
Commissioned by South West London and St George's Mental Health NHS Trust
Designed by C.F. Moller Architects UK

Longlist

National Forensic Mental Health Service Hospital, Ireland
Commissioned by Health Service Executive
Designed by Scott Tallon Walker Architects and Medical Architecture

Nationwide Children's Hospital, Big Lots Behavioral Health Pavilion, USA
Commissioned by Nationwide Children's Hospital
Designed by NBBJ

New Mental Health Facility in Sagrat Cor Healthcare Complex, Martorell, Spain
Commissioned by Congregación de Hermanas Hospitalarias del Sagrado Corazón de Jesús
Designed by Vitaller Arquitectura

Interior Design and Arts

An inspirational project that demonstrates exceptional skill in creating a compassionate healthcare environment that reflects and communicates the values of the healthcare provider through the integrated application of interior design with the visual arts.

Lead judge:
Ruth Charity,
Oxford University Hospitals NHS Foundation Trust, UK

Panel judges:
Marte Lauvsnes,
Sykehusbygg, Norway

Birgitte Gade Ernst
Arkitema, Denmark

Shortlist

Campbelltown Hospital Redevelopment, Australia
Commissioned by Health Infrastructure NSW
Designed by Billard Leece Partnership
(pic: right)

Evelina Clinical Research Facility Artwork, UK
Commissioned by Guy's and St Thomas' NHS Foundation Trust
Funded by Guy's and St Thomas' Foundation
Designed by Art in Site with Kiriko Kubo
(pic: left)

Woonzorgcentrum Zierik7, Netherlands
Commissioned by Allévo, locatie Cornelia
Designed by Gortemaker Algra Feenstra architects

Longlist

Maternity and gynecology ward – flower meadow for patients, Poland
Commissioned by Institute of the Polish Mother's Memorial Hospital
Designed by m+design

Transforming the hospital environment to enhance the patient experience, UK
Commissioned by Northumbria Healthcare NHS Foundation Trust
Designed by Northumbria Healthcare NHS Foundation Trust

VIP/IPD ward of Mortaz General Hospital, Iran
Commissioned by Abadis Medical Group
Designed by Sepina Architecture Group

Design for Adaptation and Transformation

An outstanding healthcare project that has had a transformational impact on resolving complex and difficult service design challenges.

Lead judge:
Jim Chapman,
Manchester School of Architecture, UK

Panel judges:
Beau Herr,
Arcadis, USA

John Kelly,
Lexica, UK

Shortlist

ICCU Extension, Tallaght University Hospital, Ireland
Commissioned by Tallaght University Hospital
Designed by Scott Tallon Walker Architects
(pic: left)

Ledplastikcentrum at Bromma Hospital, Sweden
Commissioned by Vectura Properties
Designed by White arkitekter

Princess Margaret Cancer Centre Space Transformation Project, Canada
Commissioned by Princess Margaret Cancer Centre
Designed by NORR Architects & Engineers and Hariri Pontarini Architects
(pic: right)

Longlist

Berlin Emergency Relief Projects / Ukrainian Arrival Center, Germany
Commissioned by Land Berlin / Senatsverwaltungen WGPG and IAS / Landesamt für Flüchtlingsangelegenheiten
Designed by Heinle Wischer Partnerschaft freier Architekten

Emergency Ambulance Discharge/Triage Facility, UK
Commissioned by Blackpool Teaching Hospitals NHS Foundation Trust
Designed by Gilling Dod Architects
Contractor: Integrated Health Projects (IHP)

New National Cervical Cancer Screening Laboratory, Ireland
Commissioned by HSE Estates Dublin
Designed by Rhatigan Architects

VIP/IPD ward of Mortaz General Hospital, Iran
Commissioned by Abadis Medical Group
Designed by Sepina Architecture Group

Product and Technology Design Innovation

An innovation in medical or digital technology or product design that has had a transformational impact on the design of healthcare services and/or the patient environment, improving the quality, sustainability, accessibility and experience of care.

Lead judge:
Danny Gibson,
MJ Medical, UK

Panel judges:
Tom Stables,
RCA, UK

Andrew Frost,
MTS Health, UK

Shortlist

BeaconMedaes Central Destruction Unit, UK
Designed, installed and maintained by Medclair and BeaconMedaes UK

Guldmann Trainer Module – Trafford General Hospital, UK
Commissioned by Manchester University NHS Foundation Trust
Developed and designed by Guldmann
(pic: right)

Nobi Smart Lamps, Belgium
Designed by Watif Design Agency and Nobi Smart Lamps, Belgium
(pic: left)

Pathmaker, Spain
Designed by MySphera
Implemented by East Kent Hospitals University NHS Foundation Trust with support of Vitalhub

Longlist

Pregnancy Risk Flagging System, Netherlands
Commissioned by e/MTIC consortium (Maxima Medical Center and TU/e) – Eindhoven MedTech Innovation Center
Designed by Philips Experience Design

Ryno wardrobe, UK
Designed by Pineapple Furniture

Temperature-controlled AirFlow technology (TcAF), Sweden
Designed by Avidicare

Design Research Project

An independently assessed, completed and novel research study that can demonstrate innovation, relevance and practical application. The research should be original, showing critical thinking in a new field of investigation or by applying innovative methods and analysis to existing issues.

Lead judge:
Göran Lindahl,
Chalmers University, Sweden

Panel judges:
Grant Mills,
UCL, UK

Shortlist

Building for pandemic resiliency: A comparative analysis of multiple facilities across the US military health system
Authored by: Deborah Wingler, PhD, HKS, USA; Rutali Joshi PhD, HKS, USA; Abhishek Bhargava, PhD, WSP, USA; Brenda McDermott, Defense Health Agency, USA; Nolan Rome, WSP, USA; and Brent Willson, HKS, USA

Exploring the effect of physical environment on resident's wellbeing and staff's care practice of dementia care facilities in Sweden and Canada: An international longitudinal study
Authored by: Sook Young Lee, PhD, Yonsei University, South Korea; Lillian Hung, PhD, RN, University of British Columbia, Canada; and Habib Chaudhury, PhD, Simon Fraser University, Canada

Longlist

DemensX 3.0
Authored by: Christian Karlsson, Karlsson Arkitekter, Denmark

Health Street: Health creation as a new mission for our high streets
Authored by: Lisa Finlay, Heatherwick Studio, UK

High-street integrated care hub: A prototype study
Authored by: Jack Sardeson, Arup, UK

In collaboration with: European Health Property Network

Design for Sustainable Development

An exemplar healthcare project completed over five years ago that has demonstrated fitness for purpose, flexibility and high performance over time, adapting to new service configurations and meeting international standards in sustainability, including social, economic, human and environmental factors..

Lead judge:
Jonathan Erskine,
European Health Property Network, UK

Panel judges:
Jamie Bishop,
Architects for Health; Fleet Architects, UK

Mohammed Ayoub,
HDR, USA

Shortlist

Clock View Hospital, UK
Commissioned by Mersey Care NHS Foundation Trust
Designed by Medical Architecture
(pic: bottom)

Dumfries and Galloway Royal Infirmary, UK
Commissioned by NHS Dumfries and Galloway
Designed by Ryder Architecture and NBBJ
(pic: opposite page, top)

New Psychiatric Hospital in Slagelse, Denmark
Commissioned by Region Zealand
Designed by Karlsson Architects / VLA
(pic: opposite page, bottom)

The Royal Children's Hospital, Australia
Commissioned by State Government of Victoria, Department of Health
Designed by Billard Leece Partnership and Bates Smart
(pic: top)

SALUS GLOBAL KNOWLEDGE EXCHANGE

Longlist

Eastwood Health and Care Centre, UK
Commissioned by NHS Greater Glasgow and Clyde
Designed by Hoskins Architects

GoCo House, Sweden
Commissioned by Goco Development
Designed by Semrén & Månsson Arkitekter

Ghana District Health Programme, Ghana
Commissioned by tp bennett
Designed by tp bennett

King's College Hospital, UK
Commissioned by King's College Hospital NHS Foundation Trust
Designed by Premier Modular

Rijnstate Elst, Netherlands
Commissioned by Rijnstate
Designed by Gortemaker Algra Feenstra architects

Womens & Childrens Unit, UK
Commissioned by North Middlesex University Hospital NHS Trust
Designed by AHP Architects & Surveyors
Contractor: Kier Construction

Dr Jennifer Dixon (UK)
Chief executive,
The Health Foundation

Keynote: Visioning our future health system: Barriers and opportunities

Health systems are under pressure everywhere, whether they're well-funded or not. In many western industrialised countries, the last decade has been characterised by slower economic growth, the ageing of the population, increased burden of morbidity, a global labour shortage of health and care workers, and increasing need to address climate change. Looking forward over the next 30 years, these challenges are set to intensify.

But alongside these challenges are opportunities. In particular, the development of science and new technologies, not least the effective use of artificial intelligence and quantum computing. If harnessed well, these hold significant promise to assess and help mitigate the risks of illness, diagnose and manage illness, curb the increasing need for health and care workers, and reduce our carbon emissions.

But how best to get from here to there?

Jennifer's talk will dissect these issues using the UK as a case example. She will address the question of how best to chart an intelligent path into the future from here, by identifying the issues and conditions for progress that are applicable to many other countries.

Keynote: The global sustainable development challenge in healthcare

Is sustainability in healthcare a moral imperative, an expensive impost, or the latest trend? Dr Stephanie Allen will argue that sustainability in healthcare can be all of these things but should be a catalyst for change, delivering higher-quality, more accessible and affordable healthcare. Working in partnerships with others will be critical to our success.

Dr Allen has over 25 years' experience working in healthcare consulting. This has spanned the public and private sectors, with governments and insurers, health policymakers, payers and providers, and new market entrants, such as technology and data companies, retail and transport organisations, as well as health start-ups.

Dr Stephanie Allen
(Australia)

Senior partner – health, Kearney Global Consulting (In collaboration with the Geneva Sustainability Centre – IHF)

Jessica Karsten (UK)
Senior architectural designer,
HKS Architects

David Lewis (UK)
Partner,
NBBJ

The new Royal Liverpool University Hospital – strengthening resilience in the Northwest of England

The new Royal Liverpool University Hospital is an exemplary facility helping to strengthen the resilience of healthcare provision for the city of Liverpool. The hospital serves as a landmark building with strong connections to the surrounding community and addresses the complex clinical and technical needs of the hospital, while maintaining a critical focus on enhancing user experiences.

The contemporary design sits within an exciting new medical masterplan that reconnects, engages with, and enhances its immediate local context, extending into the wider city. The grand, bright central atrium welcomes users and unites the hospital entry and main circulation points. Beautifully landscaped courtyards bring natural daylight in and create strong connections to nature throughout the building. This continuous interaction with light and nature aims to promote wellbeing and support recovery, while the building organisation strives to create intuitive wayfinding, reducing stress and encouraging patient independence while enhancing their experience. The main staff areas are located on the upper levels of the building, offering invaluable respite space, combined with views across the city, supporting staff welfare.

The 95,000 sq m hospital includes 650 single en-suite bedrooms, making it the largest healthcare facility in the UK to provide 100-per-cent single bedrooms. Privacy, dignity, and robust infection control measures were at the forefront in the clinical planning strategies to include single-occupancy treatment areas. The main acute services include cardiology, respiratory care and general surgery, together with regional and national specialist services, including renal dialysis, endoscopy, ophthalmology, haematology, and vascular surgery. Standardisation was employed to allow for flexibility to respond to changing healthcare environments.

To optimise the Trust's clinical planning strategies, support services are located within a separate Clinical Sciences and Support Building, which sits adjacent to the main building, connected through a link bridge. This building includes services such as labs, main pharmacy, research facilities, and a loading dock.

By enhancing the clinical provision and promoting humanistic environments, the new Royal Liverpool University Hospital balances flexibility with clinical performance, patient and staff experience, and technical build excellence, leading the way in multifaceted acute hospital delivery.

Hvidovre and North Zealand Hospitals – back to the future

Mungo Smith (Australia)
Director,
MAAP Architects

Much has been written about the hospital of the future, focusing on technology and generic qualitative attributes while avoiding the impact of typology and form. However, location, access arrangements and site selection seem to have a greater influence on design than clinical and operational requirements, and so the resulting built-forms are varied and more significantly impacted by context than their functional needs.

This paper examines two hospitals conceived 50 years apart in the Capital Region of Denmark. They appear different but on closer inspection seem remarkably similar. Hvidovre Hospital was first mooted in 1950, to serve a new suburb of Copenhagen. It was initially designed in 1963, following a design competition, and completed in 1976. North Zealand will be completed in 2023, following a design competition in 2013. Both are part of the Danish 'Super hospitals' programme – the former is being upgraded and extended, the other is a replacement for Hillerod Hospital, which opened in 1943. Both are low-rise and could be considered in the tradition of the "mat" building, which had its heyday in the 1960s and 1970s.

This is not the orthodoxy of current hospital design, which has reverted to the tower-on-podium exemplar of the 1940s and 1950s, or variations thereof. Key issues to address include the lack of daylight, which continues to bedevil hospital design, and the lack of flexibility, which is related to the first.

Other critical factors include accessibility, wayfinding, and the impact of private transport. What lessons can be learned by comparing these two hospitals? Are the similarities superficial or fundamental? Should new hospitals be subjected to the same constraints as commercial buildings when considering their location and site area requirements? Should these external constraints assume priority over the core purpose and functional requirements?

This paper will compare the design principles adopted in both hospitals. Despite the advances in technology and training in the past 50 years, there are inherent attributes in the design of Hvidovre Hospital that could extend its life for another 50 years. This case study is based on observation and review of two hospitals using research, analysis and experience.

Birgitte Gade Ernst
(Denmark)

Partner, director,
Arkitema

The Danish hospital reform: The New Regional Hospital Gødstrup

This paper addresses the background, the process, and the art and architecture of the new Regional Hospital Gødstrup in Denmark, inaugurated in 2022.

In 2007, the Danish government decided to redesign the Danish hospital structure as the quality of services varied too much from region to region. Also, many Danish hospital facilities were built in the 1970s and were in dire need of renovation. As a result, in 2009, 41.4 billion DKK (4.7 billion GBP) was dedicated to a new national hospital concept centred on fewer, but very large, fully equipped acute-care hospitals, strategically placed throughout the country within a one-hour driving radius. One of these new "Super hospitals" is the New Regional Hospital Gødstrup.

The 137,000m^2 hospital is an open field project. A new motorway and railway extension were built to accommodate the facilities. The base of the new hospital building houses the inpatient and outpatient clinics and common areas, as well as the emergency ward, diagnostic imaging, operation theatres and offices. The wards, with a total of 640 beds, are situated above the base for views and privacy. All laboratory functions, technical facilities and a psychiatry unit are located in adjoining buildings.

Research shows that hospitals with close contact to nature help promote patient recovery and staff wellbeing. Emphasising Gødstrup's contact to the heath landscape of Jutland was the source of inspiration for the proposal. A sense-oriented design used materials that promote a comfortable and homely ambience.

Elements of healing architecture, such as daylight, contact to nature, optimised workflow and wayfinding, use of scale, texture and art, are embedded in the design. In common areas, wayfinding is supported by artworks by Erik A. Frandsen.

Extensive employee involvement processes and workshops were carried out during the programming. The main purpose of employee involvement has been to ensure functionality in the work environment, and to create motivation, knowledge and ownership of the project, thus ensuring a constructive commitment to the professional solutions of the hospital.

We will follow up with the hospital's staff and management this spring and look forward to sharing their experiences with Congress delegates.

Infrastructure for happiness: The case of Hospital Nova

This talk presents the Hospital Nova in central Finland, which sought to improve the user experiences of the physical environment by patients and hospital personnel in parallel with developing a new organisational and process-based hospital design concept.

A topical question in the design of healthcare buildings and healthcare systems is how to achieve environments that at the same time respect and help to heal patients, attract and support medical personnel in a global situation of staff shortage, while also taking a stance for a more sustainable and well-functioning society. Here, sustainability is viewed in a broad sense as comprising economic, social and technical sustainability. In Finland, the main aim of ongoing healthcare and welfare reform is to integrate primary and tertiary care with social services. This integration goes beyond systems and databases, extending into the physical environment.

Purpose: The purpose of this paper is to present a Finnish hospital design model that responds to these topical challenges of healthcare environments, both on a process-based and organisational level, and on an experiential level, for staff and patients regarding the architecture. Hospital Nova is the first new central hospital to be built in Finland since the 1970s. Thus, it provides an opportunity to redefine and rethink the architectural and functional concept of the hospital as a human-friendly hybrid healthcare building – an infrastructure of happiness. The aims of this infrastructure are not only to heal the patient but to provide rich spatial experience, feelings of enjoyment, and optimal flow of functions, people and stuff in a sustainable and economically sound manner.

Methods and results: Analysis is performed of Hospital Nova's design solutions based on six innovations; 1) the rethinking of hospital functions applying the spatial typologies of 'shopping mall', 'hotel', 'hot hospital' and 'factory'; 2) new operating system focusing on process of flows; 3) a new Finnish model for hot hospital; 4) the outpatient department viewed as a healthcare shopping mall of 360 consultation rooms; 5) flexibility as a spatial and technical system; and 6) the patient experience founded in a rich aesthetic, drawing on the surrounding Finnish nature, lakes and forests.

Freja Stahlberg-Aalto (Finland)

Architect, Dr.Sc.(Arch),
JKMM Architects

Teemu Kurkela (Finland)

Architect, partner,
JKMM Architects

Juho Pietarila (Finland)

Architect, partner,
JKMM Architects

Ruairi Reeves (UK)

Director,
Medical Architecture

Karl Burton (Ireland)

Associate,
Scott Tallon Walker Architects

A national step-change in facilities for secure mental health

Heralding a new era in mental health services and forensic mental health in Ireland, the new National Forensic Mental Health Service Hospital in County Dublin exploits the therapeutic value of nature in a discreetly secure setting, where both the service model and design promote patient recovery.

Replacing one of the first secure mental health hospitals in Europe, the new campus has been designed to support new models of care, with the flexibility and interchangeability to adapt to future changes in service delivery. It accommodates 170 high-, medium-, and low-secure mental health beds with dedicated facilities for male adults, female adults, children and young people, and patients with learning disabilities.

This talk will describe how the project's healing design promotes health outcomes, including reduced stays and shorter waiting times; decreased violence and self-harm; and improved quality of life. This will cover:

- the concept of a small village, village green and village centre enables an active programme of activity and rehabilitation;
- the very demanding requirements of a secure mental health hospital, including security, safety, robustness, access, and logistics, are integrated inconspicuously within the design; and
- generous spaces, good daylight, good acoustics, and a constant visual connection with the surrounding landscape create a calm therapeutic environment that has already been recognised in awards for wellness, interior design, and sustainability, since its recent completion.

Learning outcomes include:

- creating a therapeutic and normalised environment, even for the very demanding requirements of high-secure mental health, starting with the design brief;
- how a sense of community is created within a large hospital;
- how patient autonomy is enabled to minimise unnecessary work demands on staff;
- how flexibility and adaptability provide long-term resilience; and
- how the creation of a high-quality workplace is designed to retain staff.

How design can promote better wellbeing for patients, staff and visitors, alongside the wider community

Using the newly completed Catkin Centre and Sunflower House mental health facilities at Alder Hey Children's Hospital in Liverpool as a case study, we'll illustrate how the design of indoor and outdoor spaces, including a new park, could offer a blueprint for NHS projects, embracing connections to nature aimed at promoting the wellbeing of the traditional patient circle and the surrounding community.

We'll describe the key drivers for the brief of the Alder Hey Children's Hospital over the last decade, as well as the new mental health facilities provided by the Catkin Centre and Sunflower House, reviewing what has worked well to promote wellbeing, as well as the key challenges faced by the hospital trust, before introducing the idea of creating a new outpatients and residential tier-four facility and the drive to focus the project around patient wellbeing.

The challenges in designing the Catkin and Sunflower projects as non-institutional buildings within the institution of the NHS will then be discussed, with an explanation of the design intent of the project aimed at promoting the wellbeing of all who use and visit the Centre, designed around courtyard gardens against the backdrop of a new park, which will be shared between hospital and community. Innovations include layout and spatial design approach, as well as the widespread use of timber for structure and finish – all targeting a more supportive, holistic therapeutic environment.

We'll also feedback on the success or otherwise of innovations in the project since it opened its doors in 2022.

Roddy Langmuir (UK)
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David Powell (UK)
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Alder Hey Children's NHS FT

Teva Hesse (UK)

Design director,
4D Studio Architects (formerly at C.F. Møller Architects UK)

Anna Barnes (UK)

Associate director – Integrated Programme Delivery Team, South West London and St George's Mental Health NHS Trust

Towards a new architecture for mental health

The South West London and St George's Mental Health NHS Trust provides high-quality mental healthcare, treatment and recovery support for about 20,000 people from southwest London and beyond, at any given moment.

The previous inpatient/outpatient accommodation on the 33-hectare former asylum site dated from the 1840s. The campus was underutilised and inefficient; as an alternative to an outright land disposal, the Mental Health NHS Trust embarked on a wholesale transformation of its estate.

The resulting estates modernisation programme has focused on the de-stigmatisation and integration of mental healthcare in a community. It places outpatient and training facilities, as well as secure and acute inpatient wards, in the midst of a new development, which will grow to include 900 new homes, a new 13-hectare public park, new transport links, and site-wide sustainable energy infrastructure. The new hospital buildings will also provide retail outlets, parking, and community spaces for the emerging neighbourhood.

The standard design drivers and guidance for mental health facilities are normally generated from an assessment and mitigation of risk. Mental healthcare is typically provided in surroundings that reduce service-user empowerment, limit active engagement in recovery, and depend on overstretched staff to manage risk and provide daily therapeutic interventions.

The design of the new Springfield University Hospital, in contrast, meets a broader set of therapeutic needs. These include less-institutional environments with ample daylight, natural ventilation, quiet spaces, flexible group rooms, and free access to gardens. Activity spaces comprise beverage bays; window seats; remote working desks; computer stations; games tables; therapy rooms; kitchens; therapy gardens; and exercise areas, which can be accessed and used by service users on their own initiative while under indirect staff supervision. The hospital facilitates activities that make a patient's day worthwhile: a good night's sleep; learning new skills; private contemplation; collective gathering; reading; exercising; listening to music; resting in a planted garden; etc.

The design recognises the ever-increasing pressure on staff resources and prioritises resilience and agile working among staff. This paper will describe the design process and illustrate examples of design innovation.

The art of inclusion – how community and art can foster belonging in healthcare architecture

During the design process of Campbelltown Hospital Redevelopment, artists and the community were invited in to integrate art into the very fabric of the new hospital; an art-meets-architecture response, reflecting the specifics of place, space and people, and fostering a sense of belonging to the community. Central to the process was the inclusion of local Aboriginal people, including one of our artists with Indigenous identity – contributing deep understanding and commitment to meaning, heritage, and First Nations' protocols within the landscape, which were translated through art into the hospital environment.

This deep collaboration with community, together with the arts organisation, health service, government infrastructure department, redevelopment team and university is an innovative model. The project aimed to:

- improve patient, staff, and carer experience in health services through engagement with the arts in the broadest sense;
- create a sense of place in health services, enhancing design and 'wayfinding';
- capitalise on the arts as a mechanism for engaging communities with health services;
- promote health messages through the arts;
- increase access to the arts through health services; and
- foster sustainable partnerships between health and arts sectors, and integrate the arts into the design of new spaces.

Workshops were held in the field with local Aboriginal elders, inviting people to draw the nature around them and bring those images into the hospital, including medicinally and culturally significant plants with a link to hospital departments, transposing nature to the interiors of the hospital. Through deep listening and community consultation, the design personifies a celebration of Dharawal heritage, connecting to country through the integrated art strategy. The artworks feature across all 12 levels of the new hospital, with a vast mural combining most of the plant images used.

The case study on this programme at Campbelltown Hospital analyses the collaborative co-design process between artists, architects, community multiple agencies, and redevelopment teams. It reflects on the outcomes and benefits of art, co-created with community and integrated into the architecture, on wellbeing and a sense of belonging, and delight within the hospital environment.

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Therapeutic hospital gardens – building a framework delivering quality healthcare

Clinical hospital environments are stressful and can increase anxiety for people, particularly when they are ill or concerned for a loved one. Hospitals look, feel and smell unfamiliar, and they are nothing like our normal living environments. Health-promoting gardens can be established in hospitals to improve wellbeing, with good examples being the Bendigo Hospital Victoria and the Queensland Children's Hospital in Australia, the KTP Hospital in Singapore, and the Legacy Hospitals in the USA.

This research on therapeutic hospital gardens (THG), positioned at the nexus of healthcare design, healthcare governance, and human and environmental health, is comprehensive in its approach to establish a globally recognised THG framework. Thirty-six landscape architects, architects, health planners, hospital CEOs, government department representatives, advisors to governments, and healthcare, medical and hospital environmental experts participated in semi-structured interviews on how health-promoting gardens are currently established in practice.

These expert views are based on professional experiences of leading, designing and using significant hospital projects featuring THGs, and demonstrate lessons learned from practice on how such gardens can be built.

The already established THG definition combined with these expert insights are informing the development of a THG framework. Significantly, this framework will enable medical and environmental experts to work together to establish purposefully designed and well-integrated THGs that improve people's lives and consistently achieve health and environmental benefits for users and staff.

Keynote: Sitopia: How food can save the world

Carolyn Steel (UK)
Author and architect

Living in the modern world, it can be hard to 'see' food. We all eat every day, yet few of us know where our food comes from. Industrialisation has obscured the vital connections without which our lives would swiftly grind to a halt: the complex supply chains that transport our beans, sardines and carrots from land and sea to our supermarkets, cafes, kitchens and tables.

Whether or not we see it, however, food's influence is everywhere: in our bodies, habits, homes, cities, landscapes, politics, economics and climate. We live in a world shaped by food: a place I call 'sitopia' (from Greek *sitos*, food + *topos*, place). Yet by failing to value food, we've created a bad sitopia – one that now threatens our very future on the planet.

Climate change, deforestation, soil erosion, water depletion, pollution, mass extinction, diet-related disease, and zoonotic pandemics are just some of the 'externalities' of the way we now eat. Our lives are built on the illusion of cheap food, when in reality, no such thing exists. Yet there is a remedy: by restoring food's true value and harnessing its power for good, we can rebalance our relationship with nature and with one another.

Sitopia is not utopia; yet by valuing food and consciously shaping the world through it, we can come close to the utopian dream of building a healthy, fair and resilient society.

Sarah Prodor (Canada)
Healthcare practice leader,
Architecture 49

Bryan Darrell (Canada)
Director, infrastructure
management,
Government of Nova Scotia

Kathryn Edwards (Canada)
Senior director, healthcare lead,
WSP Canada

Designing a new healthcare model to address the social determinants of health: A case study

Located on the picturesque island of Cape Breton, Nova Scotia, New Waterford is a remote community with a history of population decline, ageing demographics, above-average rates of addiction and high unemployment. When the time came to look at replacing the ageing healthcare infrastructure across the Cape Breton Regional Municipality, it was clear that holistic change was needed to improve the social determinants of health in the community.

The replacement of New Waterford Hospital was an opportunity to rethink the delivery of health services to better align with the needs of the community and address gaps in service to improve health and wellbeing. The New Waterford Hub was developed to bring together complementary programmes that contribute to a healthier society. The mix of education, community programmes, long-term care, and health services weave together to grow and support the New Waterford community members at all ages and stages of their lives. This model helps increase access and break down barriers to care.

This presentation will look at the social drivers that contributed to the development of the New Waterford Hub, which combines health clinics, a long-term care facility, and a grades 6-12 education centre, including a theatre, community garden, food bank and community centre. Exploring potential solutions to social issues faced by the community, we'll delve into the challenges involved with bringing together diverse set of standards and functional programmes, user groups and multiple owners into a single campus of care, and how consensus building was key.

We'll also review how the project's goals were challenged by legislative, contractual and ownership barriers. We'll review the architectural, engineering and building code challenges associated with the different uses and needs. Architectural and engineering solutions were applied to support the care requirements while adapting to the operational realities of bringing together different user groups into a single facility.

Taking the lessons learned from the project, we'll explore the potential application of this mixed-use healthcare approach to other isolated communities, helping ensure that a more holistic approach to education, health and wellness care is available to all Canadians, not just those in dense urban centres.

Local estates configuration to enable integrated care

The major strategic healthcare challenge facing all developed economies is the mismatch between the healthcare systems we've inherited and the healthcare problems we face. The UK is addressing this challenge in several ways: through major structural reform of the NHS; more emphasis on out-of-hospital provision; and population health management.

In the NHS's Long Term Plan, health and care providers based around neighbourhoods are asked to take a population health approach to their local area. This represents a profound change in the care model, and requires different roles, technologies and ways of working. Consequently, this changes what space is needed by healthcare providers and how it's used.

The PSC worked with the Local Care Partnership in Plymouth – the group of local health and care providers providing care within Plymouth, including University Hospitals Plymouth NHS Trust – to design an estates blueprint for the city. The Local Care Partnership model is one of the ways in which the English healthcare system is modernising to meet today's health needs. Instead of a few large health providers delivering acute interventions, a range of services is provided locally, closer to people's homes, and helping people live well, not just make them better.

To develop the estates blueprint, several smaller local areas based around neighbourhoods with particular population characteristics were identified. Working with each local area at a time, we outlined the current and future needs of the local population. Through a series of workshops, we agreed priority patient cohorts, which then informed the services needed within that area to best serve the local population and the estates required.

The blueprint project helped make the Local Care Partnership a reality – people working in health and care services could see the benefit of working together. Our approach brought together services facing practical barriers to developing more integrated care. The estates blueprint represents a shared view among health and care providers of the local health and care needs for the entire local population, rather than patients seen within their organisations. The blueprint is important in shifting the system away from simply delivering individual interventions towards delivering population health management.

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Melanie Jacobsen Cox
(UK)

Head of healthcare,
HLM Architects

Integrated health and wellbeing

For too long, healthcare has focused on treatment as opposed to wellness. Integrated health and wellbeing brings together organisations that have direct impact on the wider community wellbeing. Critical to the success and sustainability of this system change is collaboration between acute, primary and social services care viewed under the umbrella of new integrated care boards.

Over the last three years, HLM and Well North Enterprises have worked with the NW Surrey Alliance and Surrey Heartlands ICB with the aim of delivering services that provide greater emphasis on keeping people healthy locally. A site-wide review in 2019 of St Peters Hospital Campus for Ashford & St Peter's NHS FT led to the identification of community success stories across the four immediate local boroughs.

This talk focuses on case studies across these three years, including:

- understanding the starting point in relation to services, relationships, and assets;
- identifying opportunities and initiatives with greatest impact;
- prioritising need and assessing relocations from an acute setting to a community setting;
- health on the high street;
- collaboration, mixed-use development and the role of developers;
- wider determinants of public health;
- identification of interested parties and individuals;
- system-owned buildings to simplify leases, costs and accessibility;
- community 'bookable' rooms;
- alignment with fuller report; and
- well staff, better patients.

Our work identifies a process that can be applied nationally but respects different neighbourhood requirements, alongside a truer understanding of areas that may seem affluent but remain underserved. This will illustrate how the demographic needs of a community can be identified alongside the existing services provision, by understanding what works, what can be replicated, and where more support is needed. By using online tools to record the community experiences, we can create a map of achievements that allows for connections to be added and success stories shared. Our experience in Surrey will demonstrate that larger stakeholders have a role to play through assets rationalisation and provision of integrated health facilities within a primary care setting, which deliver a better patient experience and reduce pressure on acute sites.

Healthcare in unexpected places

Polly Barker (UK)
Director,
TP Bennett

One of the developments that we have seen over the last few years are requests from clients for health and diagnostics to be provided where people are based, for example, in workplaces and on high streets – embedded in the community rather than on remote hospital sites.

Taking healthcare into the community: We've worked with clients to install operating theatres and x-ray machines into the basement of Harley Street houses. We've retrofitted hospitals into old lawyers' offices. We've worked with the charity ChangePlease to build a dental surgery on a bus, enabling healthcare to come to the patient. And we've looked at converting high street shops into diagnostic centres, bringing diagnostics centres with MRI machines and x-rays next door to pubs and retail shops.

We're doing this using design skills and technical know-how that we learnt on other projects, such as Fortius Clinic.

Taking healthcare into the workplace: We've worked with large corporate clients to put consultation spaces into offices – Schroders Horsham (and other examples) – and with Surrey and Borders NHS Trust, to put a mental health outpatients clinic in an NHS office building. We've worked with Push Doctor in Manchester to create remote healthcare workspaces, which never see a patient physically.

Key learning points include:

- we need to be flexible about the spaces in which healthcare is provided, without compromising safety or standards;
- a large proportion of healthcare is two people talking, so let's make the space where that happens as positive and convenient as possible; and
- we've seen over the last two years how much healthcare can be provided remotely, so let's learn from developments in workplace design to create supportive and social spaces for remote clinicians.

Surapong Lertsithichai
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(Thailand)

Researcher,
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Thailand Healthcare System by Design: An integrated approach

With an increase in the elderly population and changes in epidemiology, it's anticipated that the Thai population will develop more chronic diseases, and that the health system, designed for a more balanced population, will become less effective. Thailand has created a healthcare system with a balanced population in mind, deploying a primary care system designed to accommodate preliminary illnesses and alleviate crowded situations from large hospitals favoured by many, leaving more room for effective care for the elderly. However, the Thai population still prefers health services from large hospitals and is less concerned about health prevention, contributing towards an imbalanced health system.

This 'Healthcare System by Design' research was initiated to analyse current problems and demand of healthcare stakeholders in Thailand. Using our University Healthcare Center as a case study, the intention was to develop an improved healthcare system through an integrated design approach, with all primary stakeholders involved in every process. Beginning with a literature review of relevant cases, data collection from health-related organisations, public surveys, and additional observations, interviews with stakeholders were subsequently conducted. The information gathered was processed and analysed through a series of co-creation workshops with primary stakeholders to design the ideal healthcare system.

Findings from subsequent co-creation workshops revealed challenges in all components of the healthcare system, including services, health workforce, medical products, vaccines and technologies, and health information. It also identified similar solutions towards use of more information technology in managing data, such as telemedicine, electronic health records, and secure use of personal health records under the new Thai Privacy Data Protection Act. Policies to promote health education and encourage equality in health service access are also solutions to implement an effective primary healthcare system. Moreover, the gap between what stakeholders identified as a plausible and a preferable future of the healthcare system was quite large.

Finally, based on the analysis, a conceptual framework for a desired primary healthcare system was developed, and a prototype system based on solutions proposed to be deployed in the case study organisation.

Hospital of the future: Setting a new benchmark for resilient design in Singapore

As part of SingHealth's wider regional health system, Eastern Integrated Health Campus is envisioned to provide care and promote wellness in the eastern region of Singapore. This 1500-bed campus, consisting of an acute care hospital, community hospital, and specialty outpatient care complex, will serve as a catalyst for care transformation and workforce transformation, as well as a model for resilient design in the region.

A team of architects, clinicians, researchers and data scientists came together for an integrated project that was structured into four distinct yet interconnected work streams: facility design; operations design; experience design; and research. In this session, delegates will hear from the designer, clinician, and researcher perspective on how the team capitalised on evidence-based design to guide the integrated design process and set the stage for a future living lab, which will be a first in the region.

The team will share how visioning and design thinking workshops were used to ensure alignment of the project vision, identify key performance indicators for the project, and engage multidisciplinary teams in identifying and prioritising improvement ideas and innovation opportunities to inform both planning strategies and the development of new care models.

The team will also share how an extensive mock-up process, using scenario-based simulations across both physical and virtual platforms, as well as CAVE technologies, was used to evaluate and refine more than 40 distinct room typologies.

Planning strategies will also be discussed related to care transformation, workforce transformation, and flexible, future-ready environments, including strategies related to right-siting patients within and outside the hospital – incorporating senior-friendly design; providing environments that promote joy at work for staff; extending the existing workforce through automation and robotics; and creating environments that allow for hyper-agility over time.

This project sets a new benchmark for developing a fully integrated system solution to resilient design that addresses some of Singapore's most pressing health challenges.

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Care in healthcare: The patient and provider experience, hospitals without walls and community convergence

A collision of forces – a global pandemic, exponential advances in medical science and life sciences, climate change, mental ill health, an explosion of digital technologies, and importantly, a movement towards value-based, population health models focusing on prevention – is accelerating change across the hospital and healthcare landscape in Australia.

We're experiencing a shift from 'healthcare' to 'health, wellbeing and preventive care' and now, more than ever, healthcare leaders and innovators are recognising that designing for the patient and provider experience is central to improving health and wellbeing outcomes and enabling care model innovations underpinned by digital transformation.

With research, health and science converging, hospitals are transforming from conventionally monolithic closed systems to places and precincts where walls are broken down, connections to transport, public space and country are prioritised, and community converges. There is also increased demand for integrated innovation precincts that bring community, flexibility and personalisation to the forefront. The Westmead Hospital Precinct Redevelopment and biomedical innovation precinct, Sydney Biomedical Accelerator, co-located at the University of Sydney and Royal Prince Alfred Hospital, are two of Australia's largest innovation precincts and global benchmarks for future innovation and health precinct development.

Concurrently, in a shift towards designing sustainable, restorative spaces that address the social determinants of healthcare in Australian cities and regions, we're currently delivering ten community hospitals in Victoria that will provide patients who are not critically unwell with improved access to a broad range of walk-in hospital, community health and social care services closer to home, as well as relieving pressure on major hospitals with preventive care. Located near major population growth areas, the hospital programme is working in consultation with ten communities, and First Nations user groups, to improve healthcare accessibility, both in-person and via telehealth services, across burgeoning regions.

Today, we have a once-in-a-generation opportunity to integrate human-centred design outcomes with technological innovations to deliver community-driven, hyper-connected and regenerative precincts at scale. If we can maintain, restore and promote health through state-of-the-art design, we'll be well-positioned to deliver smart healthcare infrastructure and hospitals across Australia, and globally, for years to come.

Mater Transformation: Shaping systems at the front line

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In 2017, the Irish Government proposed Sláintecare – a cross-party policy setting out a roadmap to deliver whole-system reform through the provision of integrated healthcare.

Working with more than 250 interdisciplinary healthcare teams on hundreds of challenges, Mater Transformation has developed a holistic model for healthcare improvement, which draws on design, lean and collective leadership methodologies.

Design: Through an empathetic lens to understand service-user needs, design thinking allows teams to build a vision of how care might be fundamentally re-imagined. In 2016, Mater Transformation began a collaboration with the National College of Art and Design and has since connected 150-plus designers with hundreds of healthcare workers to create services, tools and touch-points designed around the needs of patients and staff.

Lean: A person-centred approach to Lean Six Sigma enables de-construction of healthcare systems in order to reconfigure services. The Mater Lean Academy specialises in applying Lean methodologies to healthcare. To date, the academy has worked with more than 2500 healthcare staff across 50 organisations through a suite of bespoke accredited programmes.

Collective leadership: These complementary methodologies are underpinned by a collective leadership approach that allows us to break down silos and flatten hierarchical structures. The goal is to build self-managed, resilient teams that adapt to the complexities and changes in healthcare contexts.

Application of this model is demonstrated through case examples – e.g. where Mater Transformation partnered with the hospital's dermatology department to reconfigure the service in the context of long wait lists and waiting times. Initially, a 56-per-cent reduction in the outpatient waiting list was achieved through reworking of internal hospital processes.

Adopting a whole-system approach, however, Mater Transformation co-designed novel physical and interactive tools to enable models of self-management and build the capability of community services to manage dermatology conditions at source. This fundamental shift has future-proofed the service in demand and capacity management. Patients will receive a more integrated seamless service – in the right place, first time.

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Are telephone fracture clinics a sustainable alternative for the patient, the climate, and financially?

Covid-19 led to the use of non-face-to-face (NF2F) orthopaedic clinics. We evaluated whether NF2F clinics are sustainable according to the triple bottom line framework by assessing the impact on patients, the environment, and financial cost.

Methods: A retrospective cohort study was conducted on 261 patients from a large UK district general hospital who had either a face-to-face (F2F) or a non-face-to-face orthopaedic fracture consultation in March to April 2020. A purpose-designed survey asked patients about their overall experience, usual mode of transport, and preference for future consultations. Distance between patients' registered address and the hospital, and their usual mode of transport, was used to calculate CO_2 emissions.

Results: Fifty-eight per cent of the patients had a NF2F consultation and 80 per cent of those would be happy to do so again. All NF2F appointments were telephone consultations, however, 84 per cent had access to, and knowledge of, equipment for video consultations. There was no significant difference in convenience, ease of communication, subjective patient safety, or overall satisfaction between patients who received F2F or NF2F.

With regard to the environmental impact, 82 per cent of all patients would have or did attend clinic using a car; 5 per cent by taxi; 3 per cent by bus; 6 per cent via another form of transport; and 4 per cent walked. The total reduction in CO_2 emissions by holding consultations via telephone was 563.9kgCO_2e (66 per cent) or 3.1kgCO_2e per person. By providing NF2F appointments for 104 patients, CO_2 emissions associated with the running of an outpatient clinic reduced by 58 per cent.

In financial terms, NF2F consultations reduced monetary costs for patients. For those who no longer drove to clinic, they saved on average £8.96 on parking and petrol costs.

Conclusion: NF2F clinics align with the NHS Long Term Plan to reduce F2F outpatient appointments by one-third and with the NHS goal to achieve net-zero carbon emissions by 2045. Overall, this work suggests that NF2F appointments are an acceptable alternative to F2F in terms of patient preference, the climate, and financially, which is particularly relevant given the increasing cost of living.

Applying parametric modelling and Passive House design principles to support net-zero healthcare environments

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The total energy usage from all energy sources across the NHS estate amounted to 11.3bn kWh/year. To reach net zero the NHS must reduce its carbon footprint by over 25MtCO_2e.

One of the greatest opportunities for change is in estates and facilities. How healthcare buildings are designed and run are crucial to the survival of the service. We need to build in resilience while prioritising investment. We must create spaces that perform myriad functions and house highly specialised technology, as well as promoting health and wellbeing.

Herein lies a few challenges – what's best for patient care isn't necessarily best for building efficiency, and what's cost effective might not work in an environment that is inherently one of the most expensive to run. When the UK was hit with unprecedented heatwave highs last year, culminating in category 4 warnings, healthcare staff worked tirelessly to keep people in care alive and as comfortable as possible. Stable temperatures are key, which often means energy-intensive air conditioning. The more sustainable alternative is natural ventilation, alongside optimal building orientation, glazing, and use of thermal mass.

Passive House – a way to significantly improve comfort while meeting sustainable targets – is increasingly being considered for healthcare buildings. Last year, we delivered British Columbia's tallest Passive House building, which follows LEED Gold principles. Located just outside of Vancouver's Yaletown district, the 21,000 sq ft building is an all-electric, near-zero-emissions facility that offers flexible and technology-rich spaces. The building uses an electric air-source heat pump to deliver domestic hot water heating efficiently, along with space heating in the winter and cooling in the summer. A heat recovery ventilator filters indoor air, ensuring optimal air quality.

By embracing Passive House design principles and using a range of parametric design tools, we can fine-tune building massing, glazing and orientation, and then combine appropriate use of air conditioning to meet functionality, durability and sustainability demands. We can then harness embedded renewable energy or help healthcare providers partner with local authorities to build solar farms that can run their estate.

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Healthy hospitals for a healthy planet – balancing carbon versus space

The mandate to design all new NHS buildings as net-zero carbon (NZC) is undoubtedly right, but progress in tackling the climate emergency is uncomfortably slow. Hospitals use a lot of energy and therefore emit a lot of carbon. They run 24 hours a day, 365 days a year, and must be kept running without reproach.

Most large acute city centre hospitals will not achieve the true definition of carbon zero – where the energy needed to function (operational) is met by technology, such as photovoltaics, wind turbines or fuel cells, with no harmful emissions. Worse still, the vast amounts of carbon necessary to build new facilities (embodied) also need compensation.

Newly released carbon emission thresholds will impact how we design and build hospitals. Even after implementing innovative architectural designs, applying efficient systems, and constructing in the cleanest way, most new hospitals will rely on financial offsetting. So how can we make the most efficient use of the NHS's limited resources to help mitigate the climate crisis and move away from a reliance on carbon offsetting?

The energy and carbon targets for creating NZC hospitals are achievable through well-tested, new technologies, such as an all-electric energy system, a high-performance, climate-sensitive envelope, and efficient space planning. But it all comes at the cost of space. To hit these targets, in addition to infection control concerns, hospital ventilation systems must be more efficient. The only solution seems to be making everything larger – plant rooms, risers, and ceiling voids.

This significantly impacts demand for services space, which will need to be compensated by reducing clinical space within a fixed building volume – meaning fewer bedrooms, consultation rooms and theatres.

This presentation will discuss two important hospital schemes where we've explored innovative ideas and solutions that can help achieve a NZC healthcare building design. We'll present the challenges and impacts of NZC on designing healthcare spaces through a case study on the Cambridge Cancer Research Centre. We'll focus on the design opportunities within the constraints to find the right design solutions, including adopting new technologies for a climate-positive hospital building.

Climate change resilience framework for health systems and hospitals

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Climate change strikes at the very core of the healthcare sector's mission to keep people healthy. Individual hospitals and entire healthcare systems are affected operationally, financially, and structurally by the rising frequency of extreme weather events.

Our health is intrinsically linked to the environment we live in; climate change therefore directly impacts the health of patients and communities. As climate change worsens, an increasing number of people will face the health consequences of extreme weather events, so they must be placed at the heart of climate change adaptation policies.

Life Resystal is a ground-breaking project that will ensure that health infrastructures across Europe are prepared for the impacts of climate change. We're working with seven pilot hospitals and two health systems to ensure we can develop hands-on and universally applicable tools and resources. We're engaging stakeholders across the European healthcare sector to make them more robust.

The project is developing a number of resources to improve the climate resilience of healthcare facilities and health systems. These include the Upscaling Adaptation Starting Package (UASP), which is composed of tools and methodologies for implementing adaptation measures at hospitals. The project will also produce guidance documents for health systems wishing to implement a climate resilience strategy and enhance the resilience of regional and national health infrastructures in Europe.

This project will support improved climate risk and vulnerability assessment of health systems, as well as an improved understanding of interdependencies between infrastructures, e.g. transport, energy networks, telecommunications, and clinical services, to ensure a more secure and resilient health service provision. The project will also support investment decisions that consider and encourage climate change adaptation.

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Future-proofing health planning and investment: The introduction of modular healthcare buildings to strengthen health resilience

In response to the Covid-19 pandemic, health systems globally were confronted with an immediate challenge to both the availability of physical infrastructure that maximised infection control and the supply of healthcare professionals to respond to the rapid increase in patients. The need to refurbish existing infrastructure, coupled with the need to rapidly increase available space and accommodate the fast emergence of new technologies, paved the way for the introduction of modern methods of construction (MMC).

The regenerative and 'future-proof' nature of MMC facilities – in particular, modular buildings – allows health systems to maximise outcomes financially, and for both human and physical resources. The provision of innovative solutions to combat the current unprecedented elective care backlog and create dynamic work environments for staff is widely recommended to strengthen healthcare systems and ensure their longevity.

Furthermore, the nature of modular architecture ensures that it can be maintained to keep up with changes in clinical practice and policies. This means that facilities can house the most up-to-date technologies and be adapted to align with changing needs over time. Modern environments equipped with the latest technologies not only increase clinical throughputs but also provide an environment that promotes staff wellbeing, recruitment and retention.

This presentation will prove the hypothesis that in order to 'future-proof' health planning and investment decisions, MMC solutions are required. MMC addresses the physical infrastructure needs and strengthens health system resilience by providing an environment that enhances recruitment strategies and nurtures healthcare professionals, leading to an improved quality of care for both staff and patients.

Research will consist of both primary and secondary research methods. Case studies from Roehampton, UK, Newcastle, UK, Trollhättan, Sweden, and Prince Charles Hospital, Australia will be used alongside information retrieved from academic papers and industry reports. A mixed methods approach will be employed to explore the hypothesis and determine conclusions.

We will evaluate how the adoption of MMC in healthcare planning can strengthen health system resilience. The impact of MMC on wider issues faced by healthcare providers, including workforce and sustainability, will be assessed – exploring the idea that MMC can strengthen health system longevity.

Adapting to climate change through sustainable hospital design in developing countries: A case study on New Betio Hospital, Kiribati

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Designing and constructing hospitals in a developing country is a complex process, often with minimal site infrastructure, limited building standards, remote locations, and unskilled labour. Consider how the increasing impact of extreme weather events and sea-level rise, as a result of climate change, is adding further complexity. These hospitals strengthen the healthcare system in countries that often have poor health outcomes, but they're also required to maintain operation in the face of rapidly changing environmental conditions.

Literature on sustainable hospital design in developing countries is limited, yet 85 per cent of the world's population live in developing countries and are particularly vulnerable to climate change impacts. This presentation reviews a recent case study to provide insights on the design process and adapting for climate change in a remote developing country.

Kiribati is on the front line when it comes to climate change. Tarawa, the main island, is home to 60,000 people and has its highest point above sea-level at only two metres. People live under the ever-present threat of sea-level rise and are experiencing more frequent and prolonged droughts. In 2020, our team of architects, engineers, and project managers were engaged by the Ministry of Foreign Affairs and Trade, New Zealand, to design a 3000 sq m hospital on a greenfield site in Betio, Kiribati, in the hope of addressing key health concerns, including reducing high infant mortality rates. The ability to design a sustainable hospital relied on three key elements; the design team's previous experience, consultation with Kiribati clinicians, and the early-contractor involvement process. Through these processes, the design team could redefine established principles to ensure the hospital would address social, economic, and environmental sustainability, and could adapt to significant climate change impacts.

Outcomes and implications: This case study provides a vital source of information to encourage successful design processes and improve hospital design in developing countries when considering climate change adaptation principles. By breaking down the Western paradigm of a 'hospital' into its basic components, the team could take key elements and formulate a concept that responds to the local context and needs without sacrificing health outcomes.

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Velindre Cancer Centre: Towards the greenest hospital in the UK

In 2020, the NHS outlined targets to reduce its direct emissions by 80 per cent by 2032. This, coupled with the New Hospital Programme, raises questions about how healthcare facilities are designed and constructed so that these targets are achieved.

The New Velindre Cancer Centre is an ambitious client, aiming for a highly sustainable hospital for the health of the environment, its occupants, and the community.

We aim to deliver the UK's greenest hospital by using a design methodology driven by whole-life carbon assessments, minimising carbon in the structure, and challenging traditional construction methods by prioritising bio-based materials from responsible supply chains that support a circular economy. This includes a timber structure, wherever possible, and other natural materials, such as hemp block, and lime and clay plasters. These products are naturally breathable, flexible, and anti-fungal, and support health and wellbeing.

Throughout the design, the project team consistently benchmarked the new NHS England sustainability guide. The proposal has lower embodied carbon than equivalent facilities, and the NHS England targets. The proposed design's embodied carbon is 360kg CO_2 / sq m, which is below the 421kg CO_2 / sq m of the reference scheme, and significantly below the RIBA 2030 climate challenge benchmarking of <500kg CO_2 / sq m by 2030 for non-domestic buildings.

The design is divided into three component parts: high-tech, medium-tech and low-tech. High-tech spaces, such as LINACs and imaging, are to be formed in low-carbon concrete frame with high cement replacement content. Medium-tech spaces are primarily low-carbon concrete to suit the performance function, while low-tech spaces are to be full timber-frame construction. Internal partitions are to be timber stud-lined with alternatives to gypsum-based boards, while all internal finishes have been assessed for planetary impact, low toxicity, durability, and infection control requirements.

As the design progresses, the details of how these ambitious targets will be achieved are being developed. The design is pushing the construction team to develop ways to achieve the low-carbon targets within the UK's regulatory framework. When completed, this hospital will provide an exemplar low-carbon hospital and pave the way for the NHS to achieve its carbon-reduction goals.

Dalal Jamm – a future-proof hospital campus in the subtropical climate of Dakar

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Frequency of hot extremes will increase in nearly all inhabited regions. Overheating therefore becomes an increasingly relevant design challenge, linking sustainability issues on building (bioclimatic architecture) and city scales (heat island) with social issues on a global scale (energy poverty, climate compensation, public health).

To create future-proof healthcare infrastructure, we look for holistic building solutions that withstand impeding climate emergencies, by making optimal use of available local resources, in order to promote health for the community and the planet.

Practical application: The Dalal Jamm hospital campus, in Dakar, is designed as a healthcare masterplan, offering green space, clean air and daylight for patients, visitors and staff alike. The 27,000 sq m project comprises both a semi-public garden park and a three-level hospital building with a 300-bed capacity. The masterplan offers a smooth transition from open public areas, via distinct circulation flows, to the closed care units. This sequence allows expansion of the hospital and buffers hot temperature extremes.

Outcomes: The hospital is optimally adapted to local climate conditions and local needs of the community. Traditional, local, low-tech building solutions were integrated into our vision for a future-proof hospital campus:

- a north-south orientation for the main facades to reduce solar heat gain and maximise efficiency of passive solar control features;
- inner courtyards and openings proportioned and positioned to activate natural ventilation and provide optimal daylight inside;
- a ramp connecting all three levels provides alternative vertical circulation for logistics when there are power shortages;
- the gardens around the hospital generate micro-climates that cool the air before entering the building; and
- low-tech solutions are optimised through high engineering for health service purposes – PV panels supply electricity required for refrigeration; air-conditioning is reserved for the operating area and laboratories.

Implications: To anticipate future challenges, we design robust structures that are sensitive to a specific context and are welcoming to the local community. A low-tech approach levers site and budget restrictions to create future-proof healthcare infrastructure with maximum impact on public health in Dakar. Connection with local resources and community promotes accessible care and an overall increase in quality of life.

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IEMA NED Note and the importance of sustainability at a board level to help challenge and facilitate sustainable design at a trust level

In the face of global climate and biodiversity crises, the Covid-19 pandemic, and a range of social and economic risks, sustainability has moved up the agenda. These interrelated and compounding challenges will ultimately affect and, in some cases, determine the health of our planet and people across the world.

The NHS has a range of opportunities to contribute to sustainability goals, to improve the resilience of its services, and have a positive impact on people and the planet. For example, planting trees outside hospital buildings could improve patient wellbeing, while supporting buildings against heatwaves, or installing solar panels, could reduce carbon emissions and save money on energy bills.

Implementing sustainability across NHS trusts and health boards will require significant engagement and ownership by leadership, with key roles including non-executive directors (NEDs) and board members. However, our research and discussions in the NHS have revealed that, often, NEDs and board members feel they don't have the knowledge or confidence to raise or challenge on sustainability. Additionally, they have a range of competing challenges, such as financial constraints, and long waiting lists that require significant amount of time and focus.

There are several actions that can be taken by NEDs, boards, and those who support them to be more proactive and effective in encouraging sustainability. This can include awareness building, detailed training, greater connectivity to sustainability roles within the trust or health board, and allocation of sustainability oversight to one or more roles. There is also an opportunity to develop improved data and tools to support decisions to incorporate sustainability, i.e. integration of sustainability into capital investment for new hospital buildings or maintenance. This will require up-front time and effort but, ultimately, will result in more sustainable and resilient facilities and operations.

How these tools and roles are developed to empower NEDs and board members is of growing importance, as sustainability continues to evolve as a field. See our report here: https://www.iema.net/resources/reading-room/2022/10/24/launch-of-iema-guidance-on-sustainability-for-nhs-non-executive-directors-ned

A system approach to tackling climate change

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In 2007, as part of the Local Strategic Partnership (LSP), Reading formed Reading Climate Change Partnership (RCCP) consisting of the main anchor institutions (Council, University, NHS) and other key stakeholders across the town. The RCCP launched its first climate change strategy for 2008-2013, followed by a second for 2013-2018.

In 2018, despite the dissolution of the LSP, there was commitment from partners to continue with the RCCP. In 2019, Reading Borough Council was one of the first local authorities to declare a climate emergency and, at the height of the pandemic, launched the 'Climate emergency strategy, 2020-2025', with an action plan to achieve net-zero carbon by 2030.

In 2021, the NHS issued a requirement that NHS organisations must produce board-approved 'Green Plans' to achieve net-zero carbon for scope 1 and 2 by 2040, and scope 3 by 2045. Owing to its involvement in the RCCP, the Royal Berkshire NHS Foundation Trust revised this target to 2030, in line with system partners.

The partnership has delivered significant benefits, not only for the NHS trust but also the wider community, including driving the NHS to be more ambitious; sharing the latest best practice, research and intelligence, and encouraging wider engagement in climate action; and working in collaboration on projects of mutual benefit, such as:

- a pipeline of students and research to support thinking on solutions to achieve net-zero carbon and new hospital programme thinking;
- improvements in laboratory sustainability;
- published research on urban heat resilience;
- published research on the impact of climate change on hospital admissions;
- early work on collaboration around sharing district heat pumps;
- joined-up public health initiatives, such as in travel and transport; and
- reductions in carbon and cost through increased circular economy.

Results: Reading Borough Council reports a 71.3-per-cent reduction in corporate emissions since 2008-09. This reduction was the fourth highest reduction out of 374 UK local authority areas. The University of Reading has halved its carbon emissions since 2008-09. In 2022, the Trust reported the biggest annual drop in carbon emissions than any previous recorded years, with a programme that aims to continue this trend with its system partners.

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Single versus multi-occupancy patient rooms: The 'old' discussion revisited based on 'new' lessons from the Covid-19 pandemic and 100-per-cent single-occupancy inpatient accommodation

The Covid-19 pandemic placed healthcare design at the heart of the crisis. Hospitals faced challenges such as rapidly increasing their ICU capacity, enabling physical distancing measures and, above all, keeping patients and staff safe. Infection prevention and control (IPC) and how ward design supports this are a value of good facility design that should be revisited and studied with the recent pandemic in mind. It's been suggested that single-occupancy rooms in wards and ICUs dramatically reduced the transfer of Covid-19 between patients, patients to healthcare workers (HCW), and vice versa, compared with multi-occupancy rooms.

Aim: To inform policy decision-making and guidance about inpatient ward design with pandemic preparedness and resilience in mind, this study will evaluate what kind of IPC design features were present in several major and recently built hospitals in Europe, and how they 'survived' the stress-test of Covid-19, focusing on their inpatient accommodation.

Methods: This study will collect data and practices from three European health systems and make comparisons between experiences and available data from several major hospital facilities with 100-per-cent single occupancy rooms, and what is known about those with multi-occupancy rooms. Using a practice-based approach, in-depth online (group) interviewing will be combined with document analysis to uncover and examine the role of the ward configuration on patient and staff safety in these hospitals during the Covid pandemic.

Results: Preliminary results suggest that single rooms offer a microbial safer environment for both patients and HCW, enable patient-family interaction at all times, alleviate organisational stress in admitting 'suspected cases', and reduce the need for cohort nursing, limiting the associated burden for HCW to wear full personal protective equipment throughout their shift.

Conclusion: Experiences during the pandemic in hospitals with 100-per-cent single-occupancy inpatient accommodation should be considered, while revisiting discussions around single versus multi-person occupancy patient rooms to provide guidance for future healthcare facilities.

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Challenging the accepted to explore the possible – a blue-sky approach to the sustainability agenda

The nature of healthcare facilities has always reflected the societal environment in which they're set, with design priorities mirroring the economic and cultural priorities of the time. Over the last 20 years, we've seen evidence-based design, patient-centred care, infection prevention, and inclusive design all jostling for priority.

As we move away from the pandemic issues of the last few years, other key criteria are emerging – such as sustainability. But where does this agenda sit among the long list of design priorities needing to be addressed in every healthcare development project? If we were to adopt sustainability as our guiding philosophy, what would the impact be? Would some of our other current key assumptions and design principles have to take a back seat? And what are we willing to compromise?

In this research project, we explore the impact of a radical approach to healthcare sustainability. By making it the key driver and analysing the subsequent effects not only on design but on operation, materials management and staffing, we look to challenge and re-examine accepted norms.

We've chosen to focus our study on one particular element of healthcare design – the inpatient ward. We believe this environment will provide us with the ability to dissect and analyse some of the main issues inherent in the healthcare environment, such as:

- Construction impact: Do we really need single rooms? Can the patient benefit be justified against the additional build and operational cost?
- Clinical change: Can we maximise remote monitoring of patients in their own homes, potentially with mobile nursing support, to minimise inpatient beds?
- Environmental needs: Is the sealed clinical box really the most appropriate and environmentally responsive environment for care delivery?
- Waste disposal: Are disposables really the only 'safe' solution, or should we be looking to revert back to sterilising and reusing equipment, etc?

By bringing together a range of healthcare-sector professionals – doctors, management, contractors and designers – we're looking to initiate a lively debate on these and other relevant issues. It's hoped that by challenging the norms, we can encourage the exploration of a wider and more considered response to the sustainability agenda.

A personalised environment – how to design tailor-made rooms for people with intellectual disabilities and behavioural problems in long-term care facilities

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This best practice example shows how the behaviour of people with intellectual disabilities in long-term care facilities with significant behavioural problems changed for the better after a tailor-made modification of their physical environment.

Owing to the often aggressive and misunderstood behaviour of patients, healthcare facilities are often confronted with the difficulty of how to design the personal environment of patients so that they do not wound themselves and others. This often ends up with bare rooms, devoid of any atmosphere, which in turn often lead to even more destruction and aggression.

We discovered in 2011-2013, during the transformation of 'Dolf's Room', that there seems to be a relationship between the patient's behaviour and the design of the environment. The transformation of this patient's living environment, tailored to his personality, had led to a positive change in his behaviour. Inspired by this, five more projects followed where similar results could be perceived.

Purpose: In the course of these projects, a clear systematic approach of the architects emerged, which this talk highlights.

Methods: The architects' approach is based on many years of experience with the target group, the precise and unbiased observation of the patients' behaviour in their personal environment, as well as interviews with the patients' carers and behavioural therapists. What can be perceived in terms of the atmosphere and materiality of the personal environment, as well as the question of the patient's fascination with a particular subject or place? Who and where does he want to be, what is his (desired) identity? Biography work is also important for this. The transformation of the room and the living environment aims at creating this "ideal state".

Results: Observations formed the basis for the architects to be able to design tailor-made environments. The transformation – the changes of the built environment, the process flow, the nursing staff, and some aspects still to be studied – seem to lead to a very positive change in terms of the patients' behaviour and thus, for the nursing staff themselves and the patient's family.

In all projects, this approach, centred on the patient's personality and desire for identity, seemed to create a sense of security and wellbeing for the patients, an overview of the space, and thus control and self-determination, and pride and human dignity through the natural materials. These best practice examples show that a personalised and tailor-made approach seems to be appropriate for patients with severe behavioural problems.

Shannon Wiley (Canada)
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Montgomery Sisam Architects

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Montgomery Sisam Architects

Re-imagining the bedroom unit in mental health design: A space for identity, empowerment and recovery

In residential mental health facilities, patients have little to no agency over their self or surroundings. This lack of agency triggers, among other things, a stress response with sometimes severe physiological and psychological consequences. The built environment is a key contributor in this relationship.

Mental health design is still largely governed by risk management and a prescriptive set of rules to prevent incident and self-harm. There is a need, nonetheless, to find design opportunities with which to enhance patient perceptions of safety, comfort and control in their milieu, particularly in their most intimate space – the bedroom. This research asks: how can we, as designers, begin to dismantle the current clinical model of the bedroom derived from acute care and re-conceive its different elements and attributes to enhance opportunities for hope, identity and empowerment?

Method: This research has two streams. The first comprised a micro-case study review to collect wide-reaching and diverse evidence on bedroom design in different residential sectors, including mental health, elder care, shelters, supportive housing and student residences, as well as works of art, film and poetry. The second stream is ongoing and comprises a series of charrettes with stakeholders, architects and allied professionals to discuss results and generate new ideas. This talk will help advance this discussion and cultivate feedback.

Outcomes: Current findings reveal the bedroom is a critical unit in the larger ecosystem of care and recovery. It's also a space with greater potential in its design and capacity to support recovery-based models. Findings from charrettes are anticipated to inform a new toolkit with which to advance alternate ways of thinking and doing in mental health design.

Implications: Bedroom design and its contributions to quality of care and quality of life merit greater scrutiny. This research attempts to broaden thinking among architects and other professionals on what architecture designed for safety, comfort and control means in these spaces, and how we might begin to re-imagine these spaces in ways that disrupt pre-existing design processes and outcomes, and empower inpatients in their identity, resiliency and recovery.

Exploring the role of the inpatient rehabilitation environment in stroke survivor behaviour, wellbeing and safety

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Hospital design can impact patient outcomes but there is limited evidence on stroke rehabilitation. Clinical guidelines for stroke rehabilitation recommend targeted, goal-directed practice in and out of therapy, as well as additional activity (physical, cognitive, and social) to promote learning and recovery post-stroke. Emotional wellbeing is critical, as depression, stress, boredom, lack of motivation, and perceived lack of autonomy can hinder practice and recovery. There is little understanding of the impact of the physical environment on stroke survivor behaviour and emotional wellbeing in this context.

Aim: Our aim was to explore, from the stroke survivor perspective, the role of the physical environment in factors crucial to stroke recovery: stroke survivor activity; sleep; emotional wellbeing; and safety.

Methods: We conducted a mixed-methods multiple case study in two inpatient rehabilitation facilities in Victoria, Australia. Data were collected on building design; stroke survivors' physical, cognitive and social activity (behavioural mapping observation); emotional wellbeing and sleep (validated questionnaires); and safety (retrospective audit of falls and injuries). Stroke survivors also participated in walk-through semi-structured interviews to explore their experience of the physical environment, and opinion of the role of the physical environment in their behaviour, emotional wellbeing and safety. Data were synthesised using convergent mixed methods.

Twenty stroke survivors participated at Case 1 and 16 at Case 2. Four interrelated themes emerged: 1) entrapment and escape; 2) power, dependency and identity in an institutional environment; 3) the rehabilitation facility is a shared space; and 4) the environment should be legible and patient-centred. Quantitative data revealed patterns in stroke survivor activity and safety. Qualitative and quantitative findings were merged using joint display tables and narrative integration. The convergent mixed-methods approach provided a deeper understanding of this complex topic than either the qualitative or quantitative methods alone.

Conclusions: This study helped generate a new conceptual model of the role of the physical environment in stroke survivors' experience, behaviour, wellbeing and safety, highlighting importance of variety and interest in the environment, privacy without isolation, and patient-centred design. This model can be used by designers, healthcare providers and policymakers to inform the design of rehabilitation environments.

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Chief allied health professional,
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The National Rehabilitation Centre as a prototype project for rehabilitation

The National Rehabilitation Centre (NRC) is a pioneering international exemplar project in rehabilitative medicine. The whole programme is pushing the boundaries of what can be achieved for people with potentially life-changing illness or injury, including technological and engineering solutions, as well as clinical advances. The NRC building has been designed to reflect this transformational approach.

The project is located on the Stanford Hall Rehabilitation Estate, adjacent to the award-winning Defence Medical Rehabilitation Centre (DMRC). The scheme was initiated by the late 6th Duke of Westminster's legacy in 2011, and the two centres will share facilities and expertise.

The NRC is a specialist facility for the delivery of inpatient acute rehabilitative healthcare, integrating both research and education functions. While the NRC design meets clinical requirements at ward level, non-ward areas have been designed to provide flexibility in the use of these spaces in future. The whole building has been designed to create a centre where patients immediately feel they have their best chance at gaining their full potential.

Education and research elements are embedded through the facility to foster collaboration. This will enable research outcomes to be embedded almost immediately into clinical practice, fostering true applied research. Academic visitors will be welcomed into the integrated space and enjoy the boardroom and seminar room facilities.

The NRC is not a typical clinical environment. Many patients will spend an extended time in the facility undergoing a demanding rehabilitation protocol. Departmental locations and configurations have been developed with a wide range of stakeholders. The pavilions facing south accommodate the common areas most frequently used and benefit from the southerly views over the landscape, with external courtyards designed for different purposes.

Bed spaces all face south, enjoying fresh air, fantastic views to nature and excellent daylighting. Wards are divided into distinct zones to suit the model of care. Bedrooms are designed flexibly and serve a wide range of patient types to suit the Trust's future needs. Collaboration spaces, activity zones, retail services, and breakout areas all encourage flexible and integrated use, creating an environment without boundaries for patients, clinicians, researchers and students.

Inpatient room for neurorehabilitation: Researching the dimensional spaces to optimise care

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Architect,
Fondazione Santa Lucia IRCCS
(Scientific Institute for Research
and Healthcare)

This paper presents the results of research commissioned by the Fondazione Santa Lucia IRCCS (Scientific Institute for Research and Healthcare) in Rome and conducted at the Department of Architecture and Design, Sapienza University. It aimed to define the minimum standard size for hospital rooms with two beds and one bed (excluding toilet facilities) located in complex operational units for highly specialised neurorehabilitation.

The methodology used may be considered experimental; that is, based on experience and the collection of qualitative and quantitative data, with the aim of reaching a standard size parameter for a neurorehabilitation inpatient room. First of all, we performed a classification, coding and description of 88 activities that take place in the inpatient room, using devices such as interviews with healthcare personnel and a reconnaissance of existing literature.

Subsequently, 19 of these activities were chosen, deemed to have the greatest impact in spatial terms. Video footage was taken, simulating how the activities are performed in order to identify the sub-activities.

On the basis of the collected materials, 18 information sheets were prepared that graphically represent the ways activities are performed within the room, and highlight the movement and flows of people, equipment, aids and medical furnishings, leading to a definition of the total square metres required. Two detailed versions were prepared for seven of the activities: one that considers equipment, aids and furnishings in use at the Fondazione Santa Lucia IRCCS and, similarly, one that considers equipment, etc, defined as 'standard'.

Based on the results of these calculations, further in-depth analysis was conducted on the four activities with the greatest spatial impact. The healthcare furniture component was added to the square metres required for carrying out the activities, and defined as 'standard', and a mediated average of the obtained square-metre values was made.

Given the analysis of the complexity of the activities performed and the overall space required, including the essential hospital furnishings, the results of the research confirm the minimum surface area standard of 20 sq m per bed for a neurorehabilitation inpatient room, and, consequently, 40 sq m for a room with two beds.

Peter Coxhead (UK)
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Meriem McKenzie (UK)
Director of life sciences,
Lexica

Labs that work for the planet

The reality of climate change impacts occurring around the world, combined with the experience of the Covid-19 pandemic, highlights the urgency of a sustained, radical response to avoid an existential threat to our species in the coming decades. The emergence of new zoonotic diseases and the spread of existing diseases to new geographies represent a dual threat to human health. Population health needs to adapt to this new reality and redesign health systems to accommodate a broader span of health conditions.

Objectives: This paper will explore how health and life science laboratory developments are able to adapt to reduce carbon emissions, while being agile to face the biggest disease challenges.

Methodology and findings: The UK Government invests in and maintains a high level of research activity into new and existing diseases, many of which are climate change affected, through a multi-pronged approach by different government departments. The Government funds science programmes through a network of scientists and research organisations, which undertake primary research, translational research, surveillance, and commercialisation in order to maintain the highest levels of defence against diseases impacting on animal and human populations. To maintain this vital capability, the Government:

- continues to invest in science programmes, including short- and long-term studies;
- maintains surveillance within both the UK geographical environment and globally, in partnership with overseas research institutes;
- maintains and develops relationships with international partners;
- maintains a network of laboratories and supporting infrastructure in which research can be undertaken;
- invests in new capital facilities to enable new capabilities to be developed; and
- invests and supports innovations to enable new discoveries and technologies to be commercialised.

Conclusions: Research is not an easy option. It's an expensive, carbon-intensive activity that yields mostly long-term benefits, is relatively low profile in the public consciousness, and is fraught with complexity. However, failure to continue with this investment brings risks that far outweigh the costs – see foot and mouth disease, Ebola, MERS, SARS, and, most recently, Covid-19. Time and time again, scientific research proves its worth in averting the very worst impacts of diseases exacerbated by climate change.

Integrating health and research on the Edinburgh BioQuarter

David Martin (UK)
Design director, Buildings, Stantec

Aaron Taylor (UK)
Senior principal and sector lead, Stantec

Discovery and disruption fuel the continued integration of healthcare and research, strengthening the resilience of health systems worldwide. The new Institute for Regeneration and Repair (IRR) is one such project, expanding the University of Edinburgh's research enterprise while further strengthening the Edinburgh BioQuarter – a health innovation district whose mission is: "To embrace and contribute to the next innovations in healthcare practice; to translate ground-breaking research and discoveries into new treatments and cures that will change people's lives".

The BioQuarter sits at the nexus of a new generation of sites that strengthen health system resilience through convergence of clinical and research activities that are integrated with industry partners to drive the development of therapies, medicines and technologies.

Presented through three interlocking stories, we'll explore one project within this evolving community of health and discovery, a facility able to meet the challenges of 21st-century medicine and research in driving innovation through collaboration. It's a story of:

- an interdisciplinary facility that bridges between healthcare and industry partners – at the Individual, the lab studio, the building, the institute, and the campus scales;
- new lab studios, which create a platform for intellectual curiosity to thrive, and how we drew inspiration from American virologist Jonas Salk, who asked architect Louis Kahn to "create a facility worthy of a visit by Picasso" when briefing him to design the Salk Institute; and
- liminal space, and how it creates specific spaces for scientific inquiry to foster collaboration at the highest levels, promote engagement and teamwork, and attract a new generation of renaissance scientists.

Together with the existing Centre for Regenerative Medicine and the new Centre for Tissue Repair, the new Institute for Regeneration and Repair (IRR) will bring together 600-plus researchers with a focus on tissue regeneration and repair. We believe that buildings for science can perform with precision, reflect their special location, possess great beauty, and inspire people – creating such places is our goal. Located adjacent to the Edinburgh Royal Infirmary, this advanced sciences building draws on its proximities to clinical environments and the University of Edinburgh Medical School to pioneer translational research.

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Joseph Bracops hospital (BE)

Integrated Oncology Centre and laboratories UNILAB (BE)

Tarbes et Lourdes hospital (FR)

Keynote: Re-imagining the future hospital: Patient and clinical perspectives on safety, wellbeing and value

Dr Paul Barach (USA/UK)
Jefferson College of Population Health;
Sigmund Freud University, Austria;
University of Birmingham

Healthcare systems have been making strides in improving patient safety, as demonstrated by the reduction of healthcare–associated infections and other complications of care. But the Covid-19 pandemic degraded patient safety and staff wellness so quickly and severely, it suggested that our healthcare systems lack a sufficient resilient safety culture and infrastructure. The pandemic and the breakdown it caused presents an opportunity and an obligation to re-evaluate healthcare design and operations, with an eye towards building a more resilient healthcare delivery system, capable not only of achieving safer routine care but also of maintaining high safety levels and staff wellness in times of disasters and emergencies.

A change in outcomes – clinical or experiential – requires a major shift in the culture of healthcare. This is particularly important owing to the way that healthcare creates anxiety in both patients and staff, threatens everyone's psychological safety, and contributes to staff burnout. Creating salutogenic environments that promote health and wellbeing, as well as a supportive culture, can help promote healing for the patient and nurture staff. To drive change, we need highly effective processes for co-creating design and for truly understanding what patients, staff and communities value. We must continue this process beyond completion of the hospital building itself. This ambition means rethinking how the organisation and the wider system functions, and how its internal and external systems and relationships operate. We must identify and rewrite many of the current underlying design principles, cultural norms, and other practices that dictate how hospitals operate and how patients and staff experience them. Digital technology, new building design based around sound human factors, and changes in the operating rules for services can all help support this transformation.

Senior executives and boards of directors in healthcare systems today feel overwhelmed by an onslaught of urgent priorities: quality; equity; preparedness; supply-chain shortages; new payment models; staff burnout; and decarbonisation, to name a few. They may not welcome the duty to push patient and staff safety back to strategic prominence. Nevertheless, "first do no harm", including to our healthcare staff, remains a sacred obligation for all in healthcare, and success requires "constancy of purpose for improvement". Without renewed board and executive leadership and accountability for safety, and without concerted, persistent investment in developing new approaches that permit the delivery of safe and equitable care across the healthcare continuum, during both normal and extraordinary times, millions upon millions of patients, families, and healthcare staff will pay the price for inaction.

Ben Clench (UK)
Traumatic brain injury survivor

Keynote: Follow the patient: Driving quality improvement through the patient voice

Ben Clench is a survivor of a major traumatic brain injury (TBI). Since his injury, he has become a passionate campaigner and advocate for improving receptiveness to the patient voice and providing better patient-centred care for TBI patients.

For healthcare providers to facilitate truly patient-centred care, there needs to be much greater involvement with and support from patients in the design and delivery of services. However, although patient-centred design is known to improve outcomes, it tends not to be given the importance required. Clearly, patients could play a greater role in informing the thinking of clinicians and strategic healthcare planners. This could create direct benefits – more successful health and care services and better clinical outcomes.

Often, there is admirable focus on collecting information but less drive to analyse it. Mining big data successfully is likely to create actionable findings that could drive improvement. Input from the patient voice is generally sought through surveys – missing other opportunities to collect rich sources of data, such as complaints and unsolicited feedback. It could be said that post-treatment feedback is, in effect, a retroactive measure. We should capitalise on opportunities presented by new technologies for real-time, ongoing feedback throughout the patient journey. This would enable providers to deliver truly personalised care.

Drawing on various stories from Ben's lived experience, this presentation will cover:

· the importance of the patient voice in the delivery of patient-centred care, from design to delivery;

· current methods and future opportunities in collecting and acting on patient feedback to improve the design of care pathways, health and care infrastructure, and health outcomes; and

· an example of how further improvements in collecting and understanding the patient voice and feedback might help address some of the current challenges in short- and long-term treatment pathways for TBI patients.

In many ways, the story of how Ben came to experience and recover from his TBI is synonymous with the very concept of health system resilience – i.e. the ability to manage, adapt to and learn from sudden, unplanned and extreme changes. As professionals, we should be asking: what inspiration can we take from Ben's journey in our mission to improve system resilience?

Agile design and human scale focus: How cancer centre design can aspire to both

Catherine Zeliotis (UK)
Principal,
Stantec

Diego Morettin (Canada)
Partner,
DIALOG

Cancer treatment advances are rapid, buoyed by rampant and accelerating advances of technology: targeted therapies, radical advances in radiology and imaging, and widespread use of virtual communication. Cancer centre design needs to respond to these evolutions with a nimble, agile approach that retains within the 'mothership' the sophisticated skill sets and expensive equipment but moves back to the community the softer services in settings that are more convenient and more effective for the patient.

The challenge remains: how to design the ever-more sophisticated core services of the comprehensive cancer centre in a way that retains flexibility and adaptability but also addresses the patient's need for a therapeutic, supportive human-scale environment. The Calgary Cancer Centre (CCC) centralises screening, research, education, treatment, and patient- and family-centred care for the most complex cases, while supporting a wider network of community treatment facilities. This paper examines how the transformational design of the CCC addresses new ways of treatment by focusing on wellness and agile design:

Wellness

- Through engagement with patient advisors, the team created a central courtyard, the 'Heart', around which the welcome, research, and co-located public and supportive care spaces are organised.
- Addressing emotional needs of patients and care teams via wide-ranging links to nature and daylight, including vault levels.
- Physical integration of building form and landscape spaces within the medical campus, and the wider urban and geographic context.

Agile design

- Standardisation of outpatient assessment clinic modules and co-location of systemic treatment areas optimises multidisciplinary care, allowing for future space changes or expansion.
- Precision oncology and experimental therapeutics – extensive pathology, wet lab research, and education facilities embed translational research and knowledge transfer at the heart of the building, with direct links to the adjacent university.
- Designing with emerging technologies, offering precision diagnostics and high-definition radiotherapy, including use of MRI linac and internal radiation seed therapy.

Adaptable design, optimum clinical adjacencies, access to daylight and nature, and encouraging patient choice have created a durable and resilient chassis for the evolution of cancer services.

Dominic Hook (UK)
Architect director,
BDP

Long-life loose-fit buildings and estates strategies to ensure health system resilience in cancer care

Resilient health systems need resilient physical real-world healthcare buildings and estates. How can this ever be possible if the business-as-usual sticking plaster approach to healthcare estates capital projects frequently squanders the potential of the fundamental finite valuable asset – the land? And when it's so finite and has been rapidly consumed by panic building projects addressing current urgent spatial needs, can the prospect of land disposal (or selling off the family silver) ever be contemplated?

Healthcare campus buildings are more often than not commissioned and briefed to address a current and particularly pressing need, or where funding suddenly becomes available, for a limited time only. They are then located on campus sites, where there happens to be an area that can be developed available, rather than where, from a clinical connectivity perspective, they would ideally be located. A brief is formulated around addressing the demand / capacity / spatial requirement, or it's the cloth cut to suit the envisaged budget that stands a chance of getting business case approval. Consideration of what a given site has to offer from a development capacity perspective rarely has a bearing. A real estate developer would never dream of approaching a private development in such a way and squandering the potential of a finite and valuable resource.

Healthcare estates capital projects are also often compromised by short-term surmountable constraints. Underdevelopment of healthcare campus plots is fundamentally unsustainable in many senses of the word.

The soon-to-be-completed Oak Cancer Centre for the Royal Marsden Hospital in Sutton, a specialist emergency care hospital delivered through the National Hospital Programme, is planned to be built for Epsom & St Helier NHS University Hospital's Trust on an adjacent site. The London Knowledge Cluster vision for the wider estate, branded as the London Cancer Hub, will be used as a case study to discuss these points, as well as making reference to a number of other masterplans and healthcare building projects.

Creating a cancer treatment garden in Shanghai

Michael Street (USA)
Health planning principal,
HDR

Thomas Smith (USA)
Design director,
HDR

The case for how the cancer treatment experience can be transformed through the incorporation of natural light and other biophilic design strategies is demonstrated at the new Concord Shanghai Cancer Centre in China.

Concord Medical Services is a private healthcare provider in China, specialising in comprehensive cancer care. The company has developed a strategic/academic relationship with the MD Anderson Cancer Center, hosting several multi-national oncology research conferences. While the new Cancer Centre is not directly affiliated to or branded as MD Anderson, the clinical care models and the facility itself were designed with its guidance.

The Concord Shanghai Cancer Centre is currently under construction within the New Hongqiao International Medical Center, a masterplanned campus that includes an academic medical centre, a central shared resource building, and a collection of specialty hospitals, each with an international partner to deliver the highest level of care. The 400-bed facility will include a full spectrum of inpatient and ambulatory oncology services, specialty labs, a 100-bay infusion centre, 12 rad-onc vaults, and four proton therapy vaults.

The facility will become an international benchmark for fighting cancer with the latest technology, while providing an environment to foster the patient healing process. The architectural form of the hospital is composed of three basic elements that balance rational and organic forms, and technology with nature: a serpentine inpatient tower that maximises daylight; an admin/research tower; and a hospital podium with an ambulatory clinic wing that embraces a central garden. This creates respite areas and brings the natural environment and daylight into the radiation centre below.

The facility is clad in natural and high-tech materials to create an environment that both calms and inspires confidence. Transparency between the interior and exterior environment immerses patients within the central garden throughout their care. This connection between the inside and outside is accentuated by a consistent design philosophy that balances nature and technology.

The Concord Shanghai Cancer Centre is an exemplary project that incorporate best practices from both a Chinese and American cancer care delivery perspective, and the latest clinical technologies, within an environment that will support wellness, healing and patient outcomes.

Abbie Clary (USA)

Principal, co-director of global health practice,
CannonDesign

Roger McClean (USA)

Director, design and construction,
Memorial Sloan Kettering Cancer Center

Redefining world-class cancer care from the inside-out: Employing a transformative design process for the new MSK Cancer Care Pavilion

Cancer remains the world's second-leading cause of death. Memorial Sloan Kettering Cancer Center (MSK) is one of the world's most respected comprehensive centres devoted to revolutionising the understanding of cancer as a disease and improving the ability to prevent, diagnose and treat it.

To build on its legacy, the institution is embarking on a campaign to erect a new 30-plus-storey Cancer Care Pavilion at its flagship New York City campus. The complex expansion project will play a pivotal role in MSK's strategy to address evolving cancer care needs over the next century.

The ambition, scale, siting and complexity of the Pavilion requires a holistic and integrated approach to design that draws on intensive research and data-driven insights. MSK has engaged CannonDesign, in association with Foster + Partners, to bring its bold vision to fruition. To do this, the team is employing an insights-driven design methodology that fuses international design expertise in high-rise core and shell architecture with diversity, equity and inclusion; social impact; experience strategy; "future of" visioning; programming; architecture; planning; interior design; a prefabrication/modular strategy; and sustainable design.

While the project is in its early phases, the design team has set unquestioned outcomes for this project. In this presentation, the team will explore the insights derived from the team's integrated research and prototyping process, as it designs for incredible human experiences within and beyond the Pavilion walls for patients, their families and staff. The team will share how the building's architecture is being planned to respond to the city's urban density while also engaging its surrounding community and setting a new standard for climate-smart healthcare. Attendees will gain a rare look into the planning, design and development of what promises to be one of the world's most prominent and technically challenging cancer care projects of our generation.

Delivering women's and children's care: A comparative study of two centres – British Columbia, Canada and Birmingham, UK

Conor Ellis (UK)
Head of strategic advisory,
Archus

Max Martin (UK)
Principal,
BDP

This presentation will contrast two new tertiary regional women's and children's health organisations in Birmingham and British Columbia, alongside observations from other live or recent major projects at Ireland's New Children's Hospital, Great Ormond Street, Alder Hey, and Børneriget in Copenhagen.

Birmingham W&C is a two-site solution, a mix of older and listed buildings with planned investment for new buildings via a proposed c£700m project. It takes a pragmatic view of the need to move away from congested, heavy inner-city sites, with significant problems in the adoption of medical innovation, and with outdated buildings that block new pathways and the ability to deliver safe, effective care.

The split of the sites across several miles presents challenges, with consolidation to a single site deemed unaffordable and possibly unnecessary. Birmingham includes significant research facilities and includes a globally renowned genetics department. It serves more than 1.5 million and delivers care to 50,000 women and 90,000 children and young people a year.

British Columbia's children's and women's hospitals are located on a single campus, which requires a phased approach to redevelopment of ageing estate. The facilities will deliver specialist care for women and children, in more than 190 possible municipalities, over a wide distance and covering all socio-economic and indigenous backgrounds. BC Women's is also one of the country's largest maternity hospitals and the only tertiary maternity care hospital in the province.

The authors will demonstrate that the differences must be addressed early, via techniques for not only ensuring the right size and right location via demographic and non-demographic toolkits but also by embracing meaningful clinical and stakeholder engagement, reaching outside the campus to resonate with the local population.

Using social media and local engagement, we can deliver not only right-located services but flexible, right-sized services that meet the needs of a wide range of care groups, covering many conditions and differing and specific requirements. This includes not only age, religion, care condition, or ethnic considerations but also digital location and creating appropriate high-class environments that provide the right balance of reassurance and trust in specialist care, to improve staff and patient wellbeing.

Hala El Khorazaty (UK)
Senior project designer,
Perkins&Will

Amy Sickeler (USA)
Design principal and director,
Perkins&Will

Designing for neurodiverse children within healthcare: Case study – Nicklaus Children's Hospital, Miami

Neurodiversity in children has become more evident since the Covid-19 crisis as an outcome of isolation from social norms, and as an outcome of society's needs for diversity, empathy and inclusivity understandings. This has increased parents' and caregivers' understanding of where children may belong on the spectrum of neurodiverse needs and perceptions.

The neurodiversity movement seeks to positively reframe certain neurological conditions processing and thinking differences, such as autism spectrum disorders (ASDs), dyslexia, OCD/ADHD, dyspraxia, and others by concentrating on their strengths, allowing them to flourish in environments better equipped for their needs.

This current study offers a detailed description of research on neurodiversity among children for Nicklaus Children's Hospital in Miami, Florida. It's inspired by our studies on technologies and spaces catering for neurodiverse children, and allowing for a collective interplay of design constraints for a surgical tower and patient rooms, inclusivity, and appropriation of neurodiverse needs, experiences and activities. The design divides the user experience into four separate phases:

- The first phase focuses on the environmental approach, where behaviour is curated by the landscape and the exterior building environment, with areas for engagement and or respite.
- The second phase relates to entering the hospital and experiencing the lobby. In this phase, focus is on designing for playful persuasion and interaction while allowing for safe intimate seating.
- The third phase is concerned with the family waiting areas. The design focuses on emotional visibility and safety; i.e. allowing more natural expression of feelings and securing need of protection, as experiences change with the needs of the family and child.
- The fourth phase relates to patient beds. For the body to heal, children need to imagine and believe in a healthier version of themselves. Providing play and rest in a diverse type enables children to interact within and while they're healing.

In this paper, we explore the ideas, study and research behind each phase for healing, and how it informs the design, experiences, structures and materials within the space to allow for a more inclusive design.

The silent hospital: A 'smart' step towards building staff resilience and patient recovery

The Royal Cornwall Hospital is the only acute hospital in Cornwall and will soon be the recipient of New Hospital Programme (NHP) funding to transform the site in Truro with a modern women and children's hospital. This scheme co-locates all paediatric, maternity, neonatal and gynaecology services in one building, and will be supported by modern digital technologies for both the relevant clinical services and the wider hospital site.

Objectives: The ambition is to explore equipment and patient tracking; digital wayfinding and space utilisation; and innovations to support more efficient facilities management, and energy monitoring, environment control and building systems integration. Remote digital monitoring and care delivery solutions are also under consideration. The goal is to be a test bed for local and international businesses to co-design and evaluate innovations. This will ensure technologies are fit for purpose to support the developing integrated care system model, and will increase commercial viability for industry and return on investment for the NHS. The Women and Children's Hospital Programme is championing this agenda.

Methodology: The session will cover the evolution of a digital health ecosystem for Devon and Cornwall to bring together the NHS, academia, and business, to work in partnership. This collaborative model provides optimum conditions for evidence-based digital health innovation and health system transformation to thrive. The partnership between the Royal Cornwall Hospitals NHS Trust, an engineering company, and the University of Plymouth will take delegates on a journey from small beginnings with a "silent hospital" pilot study, to a fully fledged digital health technology strategy for the new women and children's hospital and beyond.

Results and implications: Taking in matters as diverse as stakeholder engagement; delivering digital maturity against a challenging resource environment; finding and retaining the right workforce; demonstrating savings and efficiency through digital deployment; and reaching out beyond the UK to learn from innovators in Europe and beyond, this talk will share a case study of smarter working in one of the more remote corners of England, as well as insights to support others dealing with co-ordinating digital innovation alongside the daily operational challenges in healthcare.

Roberta Fuller (UK)

Head of hospital reconfiguration and programme director, Women and Children's Hospital Programme, Royal Cornwall Hospitals NHS Trust

Rob Faro (UK)

Director – UK South, TClarke

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New architectural models for the comprehensive care of the elderly population with multiple chronic diseases

The Covid-19 pandemic has reinforced the need for healthcare assistance, especially among the elderly population with disabilities and those with mental health issues, such as dementia. These actions should also focus and enhance a co-ordinated healthcare environment centred on the person.

Owing to the high proportion of the elderly population that need support from social public institutions in Barcelona, the Catalan Governments have recognised the need for a reserve of beds, in the form of a comprehensive care centre (polypathological centre). The intention is to look after people with special needs, avoiding their transfer between facilities and the unnecessary exposure to healthcare environments, which may become hostile and pernicious due to patients' own health and cognitive and emotional conditions.

The benefits are obvious, as this would reduce congestion of hospital A&E and admissions into intensive care and high-dependency units. The new facility also has the capacity to absorb pandemical (or similar) emergency healthcare situations in the city.

User profiles are:

- individuals with dementia or behavioural disorders due to neurodegenerative diseases and acquired cerebral damage;
- individuals who receive integral medical care and require more intensive attention than those received in nursing homes;
- individuals with psychogeriatric complexities and other organic pathologies, and with relevant conduct disorders who need to be treated clinically; and
- individuals in need of isolation owing to contagious illnesses.

Owing to the geographical location and architectural design strategy, the new building offers a large functional and flexible capacity, responding in many ways to the high complexity situations within these healthcare and social environments. Besides, this facility will make it possible to sectorise or isolate spaces or areas when required without losing practicality. The layout has arisen from the functionality and flexibility of the building, accommodating single bedrooms with the option of fitting up to two patients if the system is at high demand.

The building is located in the northern area of Barcelona, in a green area surrounded by a couple of hospitals and a few nursing homes.

Dementia-friendly patient room

In our ageing society, the number of physically and cognitively impaired patients in acute hospitals is also increasing. The design of the hospital environment plays an essential role in patient-friendly care for those affected. It can contribute to their safety, orientation and wellbeing. In one case, staff in a Swiss acute hospital realised that elderly patients with dementia had difficulties finding their way around the patient room.

Methods: The spatial environment of the hospital's patient rooms was analysed and evaluated with qualitative methods by an interdisciplinary research group, the Health Care Communication Design (HCCD) working group of the Bern University of Applied Sciences. The researchers developed recommendations on how to improve the interior design to meet the needs of elderly patients. In the analysis, the team used a four-step process based on evidence-based knowledge: formal analysis; hospital-specific requirements; interdisciplinary discussion; and recommendations.

Based on these recommendations and in close collaboration with the research team, an external practice partner developed a low-threshold and cost-effective redesign of the interior. The concept was implemented in one patient room and this prototype has been in use since. A clear colour code facilitates orientation so that one's own bed, the corresponding wardrobe, and the side table can easily be identified. A large landscape picture makes it possible to let one's gaze wander, and clear, easy-to-read information about the daily routine helps with orientation.

After several months, the interior design was evaluated through focus group interviews with staff members. Furthermore, patients who were cared for in this room and their relatives had the possibility to give written feedback on the new design.

Results: The redesign of the patient room supported cognitively and physically impaired elderly patients to have better orientation. Feedback was predominantly positive – from staff, as well as patients and relatives. Staff pointed out that they preferred working in the new environment because the atmosphere was "more homely", compared with other patient rooms. The new environment had a positive effect on communication topics between nurses and patients: disorientation was no longer the main subject.

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Power for the people! Calling for a revolution in hospital investment to build capacity and effectiveness

Hospital investment should be directed towards access to care and continuous improvement. Reviewing 18 OECD countries for access to appropriate care in efficient hospitals identified capital investment as a critical element. Pandemic experience has clarified which systems were resilient in providing access to appropriate care in effective hospitals.

Purpose: The Australian Hospital Performance Indicator Framework was adapted to evaluate hospital capital investment methods for key values. Are existing systems of capital allocation for hospitals sufficient for the challenges they face now and in the future?

Methods: Indicators of patient access, equity, efficiency, quality, responsiveness, sustainability, and appropriateness of care were evaluated for two systems of capital allocation for hospitals. The capacity for continuous improvement and adoption of innovation in hospital was also evaluated. Included in the 33 measures for effective capital allocation for hospitals were the capacity for clinical service delivery to be able to absorb short-term fluctuations due to reasonably foreseeable factors, and to provide a trustworthy base for future investment. Patient outcomes and adherence to clinical standards and government standards were evaluated for centralised prioritised capital allocation systems; and a diagnosis and activity-based system of capital allocation.

Results: Since 2020, the ability to treat patients in hospitals has been significantly linked to resourcing and the capital investment method.

Conclusions: The existing system of capital allocation for acute care was inequitable; limited patient access; failed to fund appropriate quality care; was unresponsive to clinical and patient requirements; and was environmentally and economically unsustainable. Moreover, the existing system for funding future services isn't funding medical equipment, hospital information and communications systems, and facilities for equitable access to contemporary standards of care in hospitals or to support a resilient future. Evaluation of the existing system and the proposed diagnosis-based model of funding capital showed the new model addresses many shortcomings. Additionally, the diagnosis-based model of capital funding aligns with the activity-based model of funding recurrent costs. To rebuild a degraded system, a new model is recommended that will more effectively fund equitable access to appropriate services for patients and provide access to the necessary tools for clinicians to enhance efficiency.

Planning backwards for a healthy future

John Kelly (UK)
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The Russian writer Leo Tolstoy said all happy families are alike, but each unhappy family is unhappy in its own way.

In healthcare, this is only half true. While the functioning healthcare systems tend to share the same critical success factors, the underperforming ones also have a lot in common. Just like families, healthcare systems are happier when there is good communication between system partners, clarity around roles, responsibilities, and shared values.

Dysfunction occurs when these characteristics are missing or are impaired, and relationships are overly transactional. This is why during the wilder days of the NHS' internal market, some of the dialogues between purchasers and providers echoed a despairing parent haranguing a teenager to tidy their bedroom.

We will consider what strategic planning approaches offer the best and worst chances of spreading happiness – from the most to least successful healthcare systems – by examining different strategies over time and across the world. Examples will include the NHS Long Term Plan, China's barefoot doctors, and the development of health maintenance organisations in the USA. These will be assessed against dimensions including top-down versus bottom-up, direct versus indirect political control, and clinically versus managerially led.

One approach is the concept of planning backwards. This involves defining a desirable end-state, and then considering what needs to be done, when and by whom, to fulfil the vision. This should be considered across multiple domains, such as improved outcomes, digital maturity and workforce sustainability.

Much of the literature on successful backward planning describes relatively small projects. We will consider its scalability to something as complex as health system redesign, with reference to a real-world example.

In this battle between history and progress, we're reminded that, in Tolstoy's words, "the two most powerful warriors are patience and time". These qualities are often at odds with the political cycle, amply illustrated by the drafting-in of a former health secretary to review England's integrated care systems only months after their formal establishment.

Kate Bradley (UK)
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Integration of physical and mental health

There has long been a historical separation of physical and mental health but with an increase in co-morbidities, the co-dependency on both services for all patients is increasing.

As the NHS takes further steps towards improved integration, this study looks at the 2016 King's Fund report 'Bringing together physical and mental health', to review steps taken and implemented on the integration of physical and mental health. The report highlighted that people feel they are seen only through the lens of their condition, with consultants tending to focus on a particular part of their body or particular symptom rather than as a whole person.

An international literature review was undertaken on the integration of physical and mental health services. Research identified that targeted approaches for children and young people can reduce the whole-life cost impact through the life of the long-term condition. As such, the research focus was restricted to the integration of physical and mental health for children and young people in an acute setting. Through the literature review, a set of criteria has been developed to evaluate existing and future models of care that provide integration for children and young people.

Three case studies have been identified where physical and mental health stakeholders have begun to implement increased integration of physical and mental health within the built environment in the acute setting.

The first case study relates to an island-based healthcare system where, owing to the island size, there is no specialist inpatient provision for children with acute mental health illness. Mainland mental health units would normally serve acute inpatient care needs.

The second case study relates to a regional-based healthcare system, which is developing an integrated system around a new children's hospital. This will co-locate mental and physical health services and look to treat the whole child.

The third case study relates to a children's hospital relocating CAMHS services to the same site as physical health. The new clinical hub, which is currently under construction, will include mental health outpatient facilities and a new 12-bed specialist inpatient mental health unit, alongside other cross-dependent community health services.

The support structure for strategic planning for long-term hospital renovations

Thinking about the future of hospital projects in a sustainable way requires a careful approach. Two of our important transformation processes in existing hospitals show how an 'open building' approach enable us to find creative solutions in existing buildings.

A separation of the primary, secondary and tertiary system is the base of our work, which is a part of the history of an organism that continues to grow and transform.

The process of the refurbishment of the Insel University Hospital in Bern started in 1956. With the new building for the secondary system, the IEO, which combines examination and treatment units and medical services, we managed to create synergies and improve treatment processes. The IEO is the first building in Switzerland planned and executed following the principle of system separation, which takes into consideration the different service lives and flexibility of the various parts of the building.

Since 1970, the CHUV hospital in Lausanne has been adapted through a sequence of renovations, extensions and new buildings. We started the long-term collaboration in 1999 with the renovation of the emergency room. We had the chance to determine the short-, medium- and long-term developments, according to the masterplan for the hospital we drew up in 2006. Clarifying and optimising the flows, bringing departments together, and creating landmarks for patients, visitors and staff are some of the focal points in this project.

To permit the renovation of the existing operating blocks while keeping the hospital in full operation, we introduced a transitional operation wing inside the existing building. This provisional solution made it possible to renovate the operating wing in one go, which reduced the duration of the work.

For the last 23 years, we've supervised sensitive projects in an occupied site while keeping the hospital in operation. We believe that the monitoring of the global vision with macro tools, such as the masterplan, are significant for the objectives and actions to be carried out in a vision of coherent development over the long term.

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Covid-19 effects on healthcare facilities and patient care: Providers' first-hand learning and what that means for the future of healthcare design

Frontline healthcare leaders' lived experiences of the Covid-19 pandemic offer insights into the needed evolution of the healthcare landscape. Research from previous crises indicated that, along with public health strategies and communications, healthcare environments could play an essential role in pandemic preparedness and response.

The problem: A qualitative study explored the real-time, real-world challenges healthcare organisations faced in responding to the pandemic. The aim was to investigate how Covid-19 immediately affected healthcare organisations' staff and patients, operational workflows, and care delivery; how healthcare sites and facilities supported organisations' pandemic response efforts; how or if organisations modified their built environments to accommodate a pandemic response of unknown magnitude; and how healthcare organisations plan to apply lessons to their operations and facilities in the future.

Methodology: In-depth semi-structured interviews were conducted with frontline leaders and caregivers from eight healthcare organisations, in geographically diverse regions of the USA, in August-October 2020. Interviews focused on experiences of the pandemic, especially related to facility design and usage.

Findings: While the interviews touched on many aspects of healthcare operations, eight lessons specifically pertained to healthcare facility planning and design: 1. Focus on staff spaces for respite and safety; 2. Flexible design reigns supreme; 3. Plan for an emergency department that never stops; 4. Private conversion-ready patient rooms present opportunities; 5. Design for negative pressure capability; 6. Install robust and redundant mechanical systems; 7. Unit design depends on culture and workflow; and 8. Technology integration enhances staff and patient experience. This presentation will discuss these findings in more detail and assess their value in planning for future emergent events.

Conclusions: The most important lesson from this study is not to make decisions based on what did or didn't work in response to Covid-19, but to make decisions that support holistic human health and support facilities' resilience to withstand any event or crisis. Now and in the future, flexible design is crucial for healthcare delivery, but what is "flexible design"? As part of this talk, examples of flexible design and other healthcare planning strategies to support resilience and rapid response will be explored.

The many roads to resilient design

Julie Frazier (USA)
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When a natural disaster occurs, healthcare facilities are impacted: while people vacate closed offices and schools, local hospitals must not only ensure continuous operation but support a sudden influx of patients.

As extreme natural events increase in frequency and severity, demand for resilient design grows alongside calls to protect investments and reduce liability. It's critical that designers understand current resources for risk assessment and planning. This paper will offer a definition of resilience in healthcare design: what it means and what it takes to be a resilient hospital, and what this strength contributes to a community. Then, it will discuss third-party tools and resources available to guide architects in efforts to identify, evaluate and address risk.

Two case studies will be discussed to demonstrate real-world efficacy. Resilience is interconnected and requires systems thinking. It means thriving despite acute shocks, like an earthquake, and supporting the community through chronic stresses, like an ageing population. Forces acting against structural and community integrity vary with location, and there is no one-size-fits-all prototype for resilience, but powerful guidelines exist to empower architects with context-appropriate planning.

Central to the paper will be RELi – a holistic rating system scalable from interior renovations to urban planning, and the first resilient design guideline of its kind in the US to gain national consensus. RELi is a credit catalogue with a thorough list of actions that can make almost any project more resilient. It's purposefully comprehensive and holistic, including a category devoted to an integrative design process and methodologies. It expands into pressing concerns like financing, social cohesion, and economic equity – essential components of resilience, and issues important to younger professionals entering the industry.

The first and second pilot projects for RELi will serve as case studies for resilient design. The first, a hospital in Texas designed to remain operable through a Category 3 hurricane and act as community refuge, was tested mid-construction by one of recent history's costliest storms and took no damage. The second, a hospital in "tornado alley", reveals strategies to combat myriad hazards, from high winds and seismic events to epidemics and civil unrest.

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Building for healthcare resiliency: A multi-pronged approach examining pandemic response of multiple facilities across the US military health system

The Covid-19 pandemic has had a profound impact on healthcare delivery around the globe. These impacts are anticipated to fundamentally change medical facility design in future. In collaboration with the US Army Medical Command, the authors conducted functional performance evaluations (FPEs) of 15 medical treatment facilities (MTFs) within the continental US to understand the effectiveness of existing Covid-19 modifications and to document recommendations for potential facility improvements to ensure future pandemic preparedness. The purpose of this study is to provide a comparative analysis across the 15 MTFs to understand characteristics that contribute to pandemic resiliency in healthcare systems.

Methods: A multi-method approach was utilised to evaluate each MTF across five constructs: safety; flow; surge capacity; staff wellbeing; and flexibility. Surveys were used to measure staff perception regarding their experience with the facility and their perception of the effectiveness of facility response during Covid. Additionally, interviews with staff were used to garner feedback about their experience with the MTF during Covid, and identify potential environmental and operational facilitators and barriers. Field audits were conducted to capture and document significant spaces, inefficiencies, and positive design features, through written text, imagery, and annotations. Audits consisted of architectural and MEP insights.

Results: Survey data from more than 1000 participants suggest that access control, people and communication flow, need for breaks, and convertibility contribute significantly to the overall staff experience with the facility during the pandemic. Time-series analysis, factoring in the geographic location of facilities, Covid data of the county by week, and survey responses, was conducted. The calculation of sentiment scores of about 1200 statements from the staff interviews was due to have been completed by January 2023.

Implications: Globally, healthcare organisations are challenged to understand how Covid-19 has fundamentally changed healthcare. Study findings have the potential to inform policies and industry guidelines to better support pandemic resiliency, now and in the future, as well as prioritise future capital investments. To achieve true resiliency, it's essential to consider not only a facility's ability to respond to unforeseen circumstances but also the resiliency of the overall system.

Breaking down the silos: Doing the possible and then the impossible

This presentation will describe and report on a workshop session held at the inaugural Australasian Health Design Conference, hosted on 28 and 29 November 2022 in Melbourne, Australia, by the Australian Health Design Council (AHDC). The conference theme, 'Breaking down the silos', helped participants explore "how health design professionals, including architects, health planners, hospital representatives, clinicians, engineers, service providers, and researchers, can unlock a wealth of collective knowledge and allow excellence in design to flourish".

Purpose: This session explored how a carefully conceived brief is a critical determinant of high-quality design, with presentations from an architect, a health planner and an enterprise architect. The following key questions were asked:

- How do we break down the silos during the design brief development?
- What does a perfect brief look like?
- How do we maximise collaboration between the different cohorts?

Key outcomes were summarised as follows:

1. Stewardship – through care-model led design: Models of care and service delivery need to be developed and agreed by health service executives and relevant health agencies before defining the infrastructure requirements.
2. Partnership – through unrushed human-centred design: Through an extensive and extended consultation process, project user groups, with membership representative of all stakeholders – including staff, patients, carers and different design disciplines – should be involved early in the design development. Early involvement of builders, architects, engineers, ICT, wayfinding strategists and landscape designers is important. The process is enhanced by clear communication, keeping all parties engaged and well informed.
3. Ownership – through a clear understanding of the brief's purpose: A strategic brief will not predict the future but lay the groundwork to make it possible. A departmental brief describes the anticipated future models and prescribes the necessary infrastructure requirements. An overarching brief outlines the operating models for the whole of the health service that impacts future design.

During the presentation, we'll further develop and elaborate on discussion points and themes.

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Why are there not more post-occupancy evaluations?

Post-occupancy evaluation (POE) is a process of systematically evaluating the performance of buildings after they've been built and occupied for some time, analysing how occupants assess the built environment and obtaining feedback on a building's performance in use. Buildings don't always perform as planned, so learning from operational projects can be cost-effective and greatly enhance workplace productivity, along with improving and informing decision-making on future projects.

The NHS has made efforts to carry out POEs of new hospitals. Planning of post-implementation evaluations is part of the five-case model for developing public-sector business cases and is integral to the P23 contract.

But in reality, do post-occupancy evaluations actually take place? Despite growing evidence of the value of POEs, the healthcare industry seems to have been somewhat slow to adopt their regular use.

Efforts have been made to make POEs part of the mainstream "kit of tools" and services that architects and designers provide, showing the willingness exists, so what are the reasons for the poor POE completion rate? Is it that POE is viewed as an unfamiliar process, not mandatory, lacking a standardised approach, or perhaps costly and time consuming? Motivation following a lengthy project delivery process, along with a view that POE is a form of criticism, may also be issues. However, with the increasingly understood benefits of design, coupled with ever-increasing pressures on both resource and costs, implementation of a familiar and routine POE process must be seen as essential and responsible.

Methodology: We've sent out Freedom of information requests to all Trusts to ascertain how many have carried out a POE after completing a capital project; whether the feedback of these POEs has been published; and whether the results of the POEs have been beneficial to the Trust and shared across the wider NHS.

Results: Findings from this research include but are not limited to understanding of the procurement requirements to complete a POE; understanding of the benefits of conducting a POE; the number of POEs carried out and published in the UK; what benefits have been realised through POEs; and reasons for the lack of POEs.

Stantec

IMPROVING HEALTH WORLDWIDE THROUGH THE POWER OF DESIGN

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Maximising the digital benefits of capital projects by planning and thinking as a system: Lessons learned from the Monklands Replacement Project

Scotland is committed to the early adoption of digital technology to support transformational change in the NHS and working towards a single national digital platform. As organisations focus on more system-level working, what lessons can be learned from the experience of the £650m Monklands Replacement Project (MRP) in the context of an ambitious national digital strategy across health and care partners?

To maximise digital benefits, system partners must plan beyond current system pressures and the challenges of digital platforms and interoperability, and facilitate a cultural shift towards thinking and planning as integrated digital organisations.

Digital design has been a priority on the MRP from the outset. The team is identifying, mapping and quantifying a range of expected outcomes across the health system that can be achieved through targeted investment. Outcomes include addressing inequalities, promoting wellbeing, and ensuring sustainability in service delivery.

The paper will draw on several key areas where the project team and health board have collaborated to develop solutions that deliver patient benefits and improve efficiency across the care continuum.

Examples include:

- how service transformation, enabled by digital innovation and real time information, will provide the structure for safe, smarter and more efficient care built around earlier interventions;
- the role of command centres to collate, assess and respond to patient needs throughout their care journey through organised, relevant, reliable data;
- how to drive digital evolution and service transformation while maintaining patient care and the integrity of 'business as usual' for services already under strain; and
- how digital innovation will deliver societal benefits, including a contribution to net-zero carbon.

The paper will consider how incremental steps required for digital progression can be designed so they're scalable and appropriate for the full spectrum of community and hospital services, while also having the level of ambition and clarity of detail to be integrated into an ongoing major capital project. It will explore how learning from the delivery of NHS Lanarkshire's Digital Hospital at the new Monklands can be applied to the challenge of delivering digital system ambitions.

Project VISION: Data-driven design – empowering the third eye

The healthcare environment is directly impacted as clinical care becomes more complex, while designing a physical space to support healthcare teams has marked clinical, financial and logistical effects.

Extended reality (XR) simulation offers a highly immersive experience through visual, tactical and behavioural realism. We developed Project VISION (Virtual reality Insights through Simulation and Observation of Novel designs) – an initiative linking architects, healthcare simulation experts and construction teams, to establish a way of applying XR within a broader simulation-informed design process. By integrating XR technology, we sought to enhance collaboration in the design process to support the design of novel clinical environments.

Methods: Using the design and construction of a freestanding outpatient surgical facility, Project VISION trialled the extended reality (XR) simulation design process. Building on themes from existing literature and simulation best practices, we developed clinical scenarios for both AR/VR simulation with a focus on human-centred design. Multidisciplinary participants engaged in modified pluralistic walkthroughs, with data captured using various approaches, including structured debriefings, video review and direct observations. Data are used to confirm existing design assumptions, design solutions iteratively, and uncover novel designs.

Results: XR simulation allows for a cost-effective approach to understanding preliminary clinical environments while supporting evidence-based design decisions. Direct observations by the design teams of clinicians within the virtual clinical environment uncovered a deeper understanding of workflows, processes and space requirements. This process accelerates design decisions without compromising decision quality and adds greater certainty for both the architect and construction teams. These XR sessions required only modest time and resource investments with valuable returns on project efficiency. We identified potential threats to patient safety and piloted novel designs for threat mitigation.

Conclusions: A design process integrating mixed-reality simulation offers an opportunity to accelerate the design of new clinical environments. Project VISION demonstrates the opportunity to engage multidisciplinary clinicians to understand the interaction between high-performing clinical teams, workflows, systems and the built environment. Our findings support the addition of XR simulation into healthcare design projects based on gains related to efficiency, cost savings and mitigation of patient safety threats.

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Using digital twins and simulation in planning of complex healthcare projects

As the complexity of planning, designing, building and operating healthcare buildings increases while affordability and cost pressures also jump, we've researched how digital twins and simulation (DT&S) can raise the quality of our planning and consulting, and the outcome for customers. In recent years, we've focused on developing our skills on digital twins and simulation for automated logistics systems, and their associated flow and processes.

In this presentation, we'll explore some example projects that had different demands and demonstrate the DT&S approaches we used to meet those demands. It will consider:

- an operational planning tool for manual transport – for a Danish hospital, our DT&S considered the availability of trucks, personal, buffer locations, and elevator capacity;
- a simulation of a fully automated central sterile department in Sweden – our DT&S considered system dimensioning, bottleneck analysis, and it was used for stakeholder communication;
- using a dynamic simulation tool for pneumatic tube systems, to support system design, including analysis of the existing system and possible extensions;
- a feasibility study for a high-rise hospital in Asia, which is developing a logistics transport-system; and
- virtual testing of technical logistics systems – focusing on shortening their testing and commissioning time, and reducing the inefficient use of resources waiting for errors to be corrected.

We'll also present:

- the DT&S systems we're using;
- the physical framework and business processes for DT&S systems;
- how DT&S support client decision-making, communication, public relations, and marketing activities;
- how DT&S support designers and contractors with design development, scenario planning, virtual testing, and operational support;
- the outcomes from the sample projects with video material and numeric analysis;
- the benefits created in the sample projects;
- the power of creating digital twins;
- how DT&S complement a full consultancy service offering; and
- how we're combining existing digital tools and knowledge to create the next level of advice for multiple stakeholders.

Science, technology and digital transformation: Smart hospital innovations

Richard McAuley (UK)
National specification manager, Brandon Medical

This paper will look at power usage monitoring and data gathering from within the operating room (OR) and how these can be interfaced with external systems to enhance the delivery of smart hospitals.

The estate BMS platform can monitor, record and analyse a wide range of data sets that allow for the creation of usage patterns, implied CO_2e impact and consumption data. Although the data analysis tools are commercially available for a BMS platform, the deployment stumbling block is often the collection of live data feeds from within the OR. This is especially the case when dealing with medical devices, surgical operating rooms, and other Group 2 areas. Taking a holistic design approach, it's often the interface between clinical and non-clinical areas that can cause the most design risk.

We'll look at a data-gathering tool within the surgical environment in the form of the intelligent theatre control panel (iTCP). Interfacing the capabilities of the iTCP as a data-gathering node for the site-wide BMS system vastly expands the range of parameters available for analysis, and provides the opportunity to fully integrate the OR into the BMS and wider facilities management scheme.

Norfolk and Norwich University Hospitals NHS Foundation Trust (NNUH) has undertaken an upgrade programme to its existing operating theatre and procedure rooms, a key component of which was the inclusion of carbon reduction technologies. Upgrades included replacement of existing halogen operating theatre lights with LED operating theatre lights, and replacement of the legacy theatre control panels with an iTCP system with BMS integration.

We'll discuss how the deployment of dual LED light systems, combined with the iTCP control and monitoring system, demonstrated a measurable reduction of CO_2e over the lifespan of the theatres when compared with legacy halogen lights. For the NNUH project, with two paediatric and three general procedure operating rooms, the measured lifetime saving is about 17.5 tonnes of CO_2e.

Learning outcomes include:

- an overview of theatre control panels;
- measuring and managing power consumption;
- interfacing the iTCP with commercial BMS systems;
- typical layout examples and design considerations; and
- the practical example of the NNUH deployment.

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Digital placemaking for health and wellbeing in North East London

North East London's population is projected to grow significantly over the coming years, with Barking and Dagenham, Tower Hamlets and Newham three of the UK's fastest growing boroughs. As the number of residents increases, so will their use of location-specific digital products, services and experiences to connect with each other and their neighbourhoods.

This research explores how innovative place-based digital technologies can support better health and wellbeing outcomes for North East London's diverse communities. Insights from the research will be embedded into the healthcare infrastructure planning processes across NHS NEL and inform strategies for the neighbouring public realm.

Adding digital technologies to the ways that places are experienced and understood provides opportunities for exclusion, unless digital products and services are designed holistically, thoughtfully and with diverse stakeholder communities. As such, this participatory research involves local residents, patients, carers, and NHS and local authority staff.

Adopting a mixed methods approach, the research framework is phased and interconnected. The first stage studies the sites of investigation through the lenses of 'people, place, technology and data'. Findings from stage one inform stage two. Here, stakeholder communities explore the futures of geolocated healthcare and wellbeing through online and onsite activities. Data collected from one instrument are analysed and the findings help shape the next. The final stage reports on the project and provides recommendations for future research and practice.

The study reveals the willingness and ability of diverse communities to explore digital placemaking for health and wellbeing. It highlights the need to formalise closer ties between the NHS and local authorities to streamline workflows, and the implementation of future digital products and services. The study also informed the design of new resources to support digital placemaking.

In conclusion, this project sets the scene for what future inclusive geolocated healthcare might be, and how it can be achieved in North East London. Critically, consideration of residents' emerging digital experiences of place needs to be embedded early in NHS healthcare infrastructure planning processes, as well as in the surrounding public realm. For society to fully benefit from the opportunities revealed by this study, 'care-full' innovation is key.

Seamless monitoring of physiological date in domestic space: A cross-national and multi-linguistic study

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Seamless monitoring of physiological parameters at home, including blood pressure, heart rate, and weight, is part of the "health goes home" trend, enabling early detection, treatment, follow-up of wellness, and supporting safe and healthy living. Yet, there is a gap between smart technological capabilities and their integration into domestic space and daily life.

Aim: To evaluate cross-national opinions on adoption of smart technologies in domestic space, including multimodal control (natural user interface), adaptable furniture design, lighting sources and control, and seamless monitoring of physiological data integrated within home furniture.

Methods: A multilingual questionnaire was distributed simultaneously in ten different countries, each in its native language, examining user preferences on integration of smart technologies in domestic space. Data were analysed in each country and between countries, correlated with age, gender, education, technology score, and local subjective perception of smart technology.

Results: In total, 1217 people from ten different countries participated in our study. The average age of the entire population was 41.8 ±14.1 years (mean ±SD), 49 per cent were female, and 59 per cent held academic degrees. No statistical difference was found between willingness for seamless domestic measurements of blood pressure, heart rate or weight. Significantly high willingness was found for sensors embedded at home to alert in emergencies, such as falls. A positive linear correlation was found between willingness for seamless measurement of physiological data and technology score, but no correlation at emergency situation. No correlation was found between privacy violation concerns and technology score. A negative significant correlation was found between age and willingness for smart furniture for measuring physiological data.

Conclusion: There are cross-national differences in adoption of smart technologies in domestic space, in accordance with technological score. Surprisingly, the negative correlation found between age and the desire for physiological monitoring at home implies that adults haven't yet assimilated the benefits of smart home monitoring for quality of life and safety. However, there was general agreement about the advantage of monitoring in dangerous situations. There are still barriers in adoption of smart technologies in domestic space compared with public space, which cannot be explained by privacy concerns.

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'Leave no-one behind': Unlocking the potential of digital health equity to strengthen health system resilience for all people with chronic conditions

Health system resilience is the ability to prepare, manage and learn from shocks (natural, financial, health and other crises). Covid-19 has had unprecedented shocks across health systems and resulted in escalation of digital health interventions. Digital health has the potential to strengthen health system resilience for all. However, when implemented without digital health equity considerations, digital health interventions risk exacerbating existing health inequities.

Purpose: Given increasing demands on health systems and the fact that disadvantaged communities experience much higher rates of chronic disease and poorer health outcomes, it's now more important than ever to focus on how digital health equity can strengthen health system resilience. While digital health equity principles, digital determinants of health, and digital health equity frameworks exist, variable attention is given to digital health equity to strengthen health system resilience. This paper targets health systems policy, practice and research leaders.

Methods: This paper is informed by Australian NHMRC Connected Health – CRE, which aims to transform Australia's digital health ecosystem using digital technology to improve the health and wellbeing of populations with chronic conditions. Presentations from Connected Health researchers will discuss Australian, Danish and Finnish digital health interventions with the potential to strengthen health system resilience for all. Key questions will be explored, such as: what challenges face digital health in strengthening health system resilience for all?; and how do we unlock the potential of digital health equity to drive digital health interventions to transform chronic disease outcomes?

Results: The presenters will discuss next steps, including identifying challenges and enablers facing digital health to strengthen health system resilience for all; and identifying policy, practice and research collaborators to work with Connected Health to unlock the potential of digital health equity to strengthen health system resilience for all.

Conclusions: The paper has research implications – identifying evidence (digital health equity) to practice (health system resilience) gaps; and practice implications (identifying digital health equity regulatory, financial, workforce and technical strategies) to unlock the potential of digital health equity to strengthen health system resilience for all.

From nurse station to control tower: Operating hybrid care models across the healthcare ecosystem

The acceleration of digital health during Covid has augmented opportunities to transform how care is provided and where it is delivered. New programmes for remote care and home hospitalisation led to the development of hybrid models integrating physical and virtual care across the healthcare ecosystem.

To control operations and manage the growing complexity, hospitals are designing control centres, using digital twin technologies that represent the real world and provide a method to synchronise and optimise processes while improving user experience. In line with this global trend, Sheba Medical Centre in Israel is planning a control centre for the operational management of hybrid models of care with physical and virtual beds across the hospital and home.

The study documents emerging models of control centres, transforming the concept of generic nurse stations through Covid-19 control rooms into smart hospital operation towers. We investigate the diverse models and use of digital twin technologies for service innovation and collaboration between healthcare organisations.

A particular focus is on how digital technologies can enable a patient-centred holistic approach, overcoming silos between medical professions and care specialities. The research is based on qualitative semi-structured interviews with Sheba MC management, medical staff from the hospital and HMOs, developers of IT and telemedicine start-ups, and participation in design meetings.

The results illustrate diverse models of control centres with multiplied design strategies regarding centralisation, specialisation, and patient-centred versus system-centred approaches applied both to the design of the physical place and the design of the digital platform.

The study demonstrates the need for collaboration with governmental and community agencies, and the challenge of integrating data sets of patient medical records, operation systems, spatial data, and telemedicine technologies from diverse sources. Yet, it also highlights the potential to analyse dependencies between digital twins of people-processes-places, and predict and simulate future scenarios, to support medical decisions and improve patient experience in dynamic complex hybrid models of care.

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Importance of interconnectivity within command centres

Much has been written and discussed about telemedicine and its role during the pandemic to provide virtual healthcare consulting solutions. However, telemedicine is just one part of the total picture that digital transformation makes available. Information is ubiquitous and the key is to collect, collate and interpret.

Ongoing digital transformation provides a framework where differing sources can be gathered and interconnected in ways that better inform decision-making in real time. Digital transformation provides access to healthcare that was previously not possible. Response and action can be more immediate to the needs of the patient, and treatment methodologies more timely, leading to better outcomes. Healthcare solutions have tended to be a cause-and-effect relationship with patient needs. However, by receiving more information sooner in the discovery process, healthcare providers can anticipate the detrimental or ineffective actions and encourage more effective decision-making earlier in the process.

In this talk, attendees will understand the importance of interconnectivity within command centres and how they can help create more effective efficiencies throughout facilities, systems, and the community as a whole. Serving as collaborative communication hubs, command centres in healthcare facilities are becoming an essential operational ingredient to co-ordinate disparate clinical and non-clinical activities that are actively interdependent. This collection and co-ordination, enhanced by artificial intelligence, occur within the data nexus, a place for information collaboration and operational decision support to connect those interdependencies seamlessly.

As we navigate future crises, adopting digital technologies plays a much larger role in chronic health management and emergency and critical care management. However, systems such as telemedicine place a significant burden on communication systems. This talk will highlight how telemedicine can be best integrated within the command centre, so that patients will benefit from ongoing co-ordinated care.

Delegates will learn how clinic appointments, material deliveries to the home, and nurse home visits can be co-ordinated within the command centre to ensure efficient use of staff time. The session will also explore how the command centre provides the next level of data collection and co-ordination to track and monitor all events, boosting resiliency within the system.

HLM Architects

Thoughtful design to improve wellness

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GIA Healthcare Commendation 2022

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Future-proofing emergency departments: Adaptable environments for supporting community crises

Like many healthcare organisations, UC Health, an academic medical campus located in Cincinnati, Ohio, experienced major challenges during the Covid-19 pandemic. At the onset, when anxiety was high and data were low, there was a great need to social distance and protect the clinical team and non-Covid individuals from those presenting with the virus. At peak, emergency departments (ED) were challenged by high volumes that strained the clinical space available.

While this experience represented the imperative to utilise non-care space creatively, other potential scenarios like mass casualty incidences (MCIs) require a similar activation of additional space to support rapid spikes in presenters, while simultaneously maintaining operations for day-to-day ED volumes. UC Health has also experienced incidences where large groups of people (e.g. public safety personnel) arrive at the emergency department in support of injured individuals. In such instances, 'people management' is necessary to avoid disruption to ED flow and maintain a safe environment for all on campus.

In this presentation, we'll demonstrate the innovative solutions applied to an adjacent space to a renovated ED serving as added social distanced seating for the entire University of Cincinnati Medical Center (UCMC) campus during normal operations; accommodate a separate, dedicated entrance to the emergency department without cross-contaminating other ED presenters and visitors (including mass triage scenarios); and provide separation for people during large gatherings. Elements of the design support the necessity for security and safety and are flexible enough to accommodate clinical or non-clinical environments. Furniture flexibility to support all scenarios and concealed medical devices exposed when needed allow the space to be swiftly activated for the current needs of the ED and community.

UC Health has received congressional funding for this project through the CARES (Coronavirus, Aid, Relief, and Economic Security) Act, as this project is benefitting the readiness of the only Level 1 trauma centre in Cincinnati and surrounding communities to provide a future-proof, resilient facility. Once complete, the space activation will be folded into regional readiness training for emergency scenarios and serve as an example of the future of Level 1 trauma centres.

Clinical perspectives: Enhanced collaboration for innovative operating theatres

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Few design professions have first-hand experience of workflows at the cutting edge of care. But given the growing need for greater healthcare capacity and the increased complexity of care, enhanced collaboration leading to innovative space utilisation is now an essential part of user engagement.

This talk reveals perspectives from a panel of clinical and surgical specialists to challenge recent case studies of operating theatres, pre/post or mediroom care models. Clinicians' assessments of typical user engagement processes are shared, and suggestions for more practical engagement methods proposed.

Case studies prompt discussion to reveal the impact of design on improving clinical operations, patient flow efficiencies, effectiveness, and staff and patients' experience. A study at the Bristol Royal Hospital for Children demonstrated how 360-degree mapping of a proposed space revealed if the expansion would increase the capacity and total throughput of surgical theatres by moving some surgeries to smaller theatres. Multidisciplinary teams of surgeons, nurses, technicians and facility managers engaged in a simulation of the most complex surgeries to be conducted. Five specialties gathered in a mock-up space, while ergonomics, patient movements and workflows were mapped using cameras. The perspective of the patient on the gurney or operating table, and the spatial constraints on each clinical team member, showed where entries and paths should be constructed, where room dimensions were too tight, where equipment could be placed, and where sightlines or movement would be impeded.

Other discussions respond to the need to provide an efficient, lean, value-driven process despite space constraints due to refurbishment of existing facilities. Conclusions reflect how the dimensions of the room can be underestimated during planning but become evident within the mock-up when the flow of people and use of equipment are observed. Clinical process management might need to limit the number, type and procedure frequency. The location of pathways within the theatre could impact staff flow; infection; overspill of equipment into corridors; or create opportunities for more efficient space utilisation.

By translating knowledge from the cutting edge of care, the complexity of healthcare processes, ergonomics and team workflows can be used to inform spaces with greater flexibility.

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Designing and constructing new hospital facilities that can be "flexible in use" for high infrastructure-dependent patients using Design for Manufacture

The Covid-19 pandemic highlighted a lack of facilities to cope with large numbers of seriously ill medical patients who require both Level 3 critical care and isolation facilities. In response, many hospitals utilised the operating theatres, as they have the necessary infrastructure requirements (medical gases, ventilation, etc). This caused an immediate shutdown of elective surgery in many hospitals, resulting in a serious backlog. At the same time, the construction industry has been focusing on developing modern methods of construction (MMC) and design for manufacture (DfMA). These two elements presented the ideal opportunity to develop an innovative clinical solution, adopting a platform that could be delivered using MMC and DfMA.

Methodology: An action-based design sciences approach is used to develop a new unit with standard rooms, adopting an innovative hospital manufacturing platform. A physical mock-up suite, with a digital twin, is being constructed to demonstrate how a clinically led, customisable platform can be deployed. The suite is designed and manufactured for clinical flexibility in-use and future reconfigurability by adopting an infrastructure-first approach, using a concept of mobile and movable equipment to create multi-functionality.

Results: The project demonstrates how advanced approaches to modern hospital manufacture working with design and construction integrators and specialist suppliers can provide a flexible surge hub based on an interventional therapy / isolation room. It also explores how it can be configured into a unit that can work alongside existing operating theatres, emergency departments and critical care (L3), coping with high-level isolation [L4], for which there is no design guidance.

Conclusions: The pandemic provided an opportunity to review traditional healthcare facilities and innovate clinical requirements alongside MMC and DfMA. The introduction of a new hot-floor principle based on common infrastructure requirements aims to remove redundancy, simplify, and create repeatability in high-level isolation critical care, resuscitation, emergency department and operating theatre settings. The first step has been taken in developing a new kit of parts that could create clinical adaptability in use and design repeatability. The aim is to extend this evidence by demonstrating the value of innovation at system, service, room and component levels.

Application of digital twin tools to test models of care and health infrastructure planning assumptions

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Health facility infrastructure projects provide a significant opportunity to redesign patient journeys to improve patient flow and experiences of care through the development of future models of care and infrastructure design.

A recent health infrastructure planning project brought an innovative approach to the planning of the emergency department (ED) by applying future-focused data-driven insights to test models of care and inform design to support safe and efficient patient care in the right setting, by the right care provider, at the right time.

Digital twin modelling approaches were applied, in addition to the traditional planning approach, to provide certainty in the proposed models of care and the design solution through data-driven insights.

The digital twin of the ED represents the real-world system based on rigorous analysis and comparison with empirical data. Building a digital twin can aid in understanding how the system of care delivery behaves and in communicating the implications of the constraints. The digital twin was used to investigate the future performance of the ED under a number of patient arrival forecasts, ED redevelopment configurations, and alternate models of care. The investigations focused on key metrics, including emergency treatment performance, patient length of stay, and waiting times.

Results were presented in highly interactive browser-based dashboards. These visual and data-rich dashboards help with "telling the story".

The digital twin approach enabled the testing of proposed infrastructure design and model-of-care solutions prior to significant capital investment, through an engaging and interactive approach. The clinicians are now able to further refine service models, together with identifying staff requirements to ensure optimal patient flow prior to a final design solution.

An unexpected benefit was the transparent collaborative approach that engaged the entire team from clinicians through to administration and health planners. The entire team were involved in "designing" the digital twin, resulting in a high degree of buy-in to the results and findings.

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Clinical time not stakeholder engagement: What is the optimum model?

If we want to design hospitals that augment healthcare, frontline clinicians need to be central to the vision, briefing, design, construction, occupation, and evaluation of new spaces.

We're in an era when burnout is acknowledged as a threat to the NHS workforce. Effective participation in construction projects takes significant time. This needs to be recognised from the inception of projects and 'buying back' clinical time needs to be incorporated into the capital cost of the project.

At the 'Building Blocks for Clinicians' courses, a consistent theme from participants is that they're consulted too little and too late, even when it's their department being remodelled. In an already disenfranchised workforce, this increases the sense of being 'done to'. Opportunities for co-production and design development are lost.

When clinical involvement in design is consistent, considered and valued, the effect on healthcare projects is transformative. We're aware of several healthcare projects where the involvement of clinicians has been the driving force in design development and project success. Examples include:

- The Children's Cancer Centre at Great Ormond Street Hospital: A funded multidisciplinary group of frontline staff have redirected the project from being a ward block to a centre that promotes and prioritises activity, education and psychological wellbeing of children and families undergoing cancer treatment.
- King's College Critical Care Unit: A project directed by a strong clinical vision about the importance of a therapeutic environment in preventing ICU delirium and supporting staff efficiency.

In this session, we'll discuss with a panel of clinicians how their involvement shaped the project and how they managed conflicting priorities. We'll explore what happens when clinicians are engaged to 'tick-box' stakeholder engagement. Finally, we will suggest a model for sustainable clinical involvement in health building projects.

Realising clinician faculty wellness through facility design

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Paul Woolford (USA)
Design principal,
HOK

Six years ago, in response to growing concern over physician burnout, we asked the question if a facility can assist in combating and avoiding this issue.

We gathered a group of faculty leaders and conducted a fact-gathering process, which included focus groups, surveys, and many meetings and discussions. The outcome of this process was a programme for a new facility that was focused on the concepts of respite and rejuvenation. This effort was in response to two new hospitals being built at Stanford Medicine, and the need to provide office space for the expanded faculty.

Rather than think of this as just another office building, we focused on creating an environment for the faculty that provided a space for their academic and intellectual pursuits, while also creating a haven for them, centred around the concepts of respite and rejuvenation. The desired programmatic outcomes for this new facility were quite lofty, but so were other considerations, which included creating a new gateway to the university, programmatic connections between historic university buildings and the large adjacent arboretum, providing adequate parking, and more.

The building has now been designed, built, and occupied since 2019. While the pandemic initially limited building occupancy, the community in this building is now thriving. The building has been recognised by a number of awards for achieving outstanding results in design, sustainability, and creating an outcome that provides clinical faculty with a thoughtful, creative home for their academic and intellectual pursuits.

This talk will revisit the initial concepts and process, underscoring the importance of faculty engagement and their continued participation in the process. We will walk through the design process and how the key concepts envisioned in the programming process translated into building design. We will showcase the design and walk through how we're achieving the desired outcomes. Finally, we will engage the audience in a discussion around how the concepts of wellness are integral to the concepts of diversity, equity and inclusion, and how they are manifesting themselves in our physical context.

The underlying message of this presentation is that the physical context within which we live is critical in supporting the wellness and resiliency of our faculty and the healthcare provider community.

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Bytes: Design decisions on a video consulting area

Video consulting, replacing in-person patient-to-provider visits, has been demonstrated to be acceptable, safe and (cost-)effective in a number of clinical areas and settings.

Most research, however, has focused on technology and initial adoption with limited consideration of how and where to efficiently organise video consulting. Further, little is known about how a building can contribute to a cost-effective, scaled-up and sustainable video consulting service with optimal patient and provider reported outcomes and experiences.

With the completion of a new main hospital building at our campus, we had the opportunity to repurpose an open meeting area called 'Garden Room' for video consulting, with the objective to centralise and standardise this service. We followed the same six key design features that were used for the main building – surrounding nature; open; identity; healthy; amazement; and professional – actively contributing to health and healing. These were conceptualised in co-creation with staff, other caregivers, patients and supporting personnel in an 'indoor orangery', characterised by a variety of plants, green colour, light and transparency, natural and recycled or recyclable materials, and noise regulation measures.

As a whole, the design was aimed at optimal function and wellbeing of providers (a workplace to be), with patients staying in their own environment and experiencing the virtual engagement in the same way as an in-person visit.

In this paper, we'll first discuss the different settings and workplaces of video consulting based on the literature and own research. Thereafter, we briefly present our studies on patients and provider experiences with video consulting in the past three years, and the landmark results of the Cost4Visit study, showing high own financial costs for in-person visits. Data of these studies underly the design and intended function of this video-consulting indoor orangery. Lastly, we take a virtual tour through the orangery, highlighting the main design features and functions, and discussing the early experiences of staff and other care providers with emphasis on 'different behaviour by design'.

Evaluating the built environment for multisensory independent navigation and facility readiness for persons with disabilities

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This case study evaluates the built environment at the intersection of inclusive design and disability.

Utilising the eight principles of inclusive design framework (Mace, LR, Hardie, GJ, and Place, JP, 1990), the study aimed to co-create the ideal welcome experience for persons with disabilities on the Novant Health campus, using evidence-based design established in the past. It seeks to co-create an ideal multisensory navigable environment for persons across a spectrum of disabled experiences, centring on themes of belonging and inclusion, wayfinding, and departmental preparedness.

Methodology: This work was conducted in collaboration with hospital leadership, persons with disabilities of the surrounding community, and an architectural firm. By assessing the current state of the built environment with consideration of multi-sensory supportive features for implementation, we seek to improve independent navigation of the facility and the experience of belonging and inclusion for persons with disabilities. The data collected include patient disability surveys, literature review, co-creation workshops, ethnographic observations, activity mapping, and journey mapping.

Results and implications: A meta-analysis of the collected data was conducted to explore main themes, needs and barriers, with a recommendations document produced for implementation. Implications of this study highlight the importance of addressing disability as a universal lived experience that every human will encounter, therefore built environments need to consider a variety of disability-accessible features to ensure the environment is not a barrier to healthcare service. Implications highlight that physical barriers can be a result of a combination of factors, including attitudinal, operational and communication barriers that prevent persons with disabilities from receiving robust healthcare services.

Michel Verheem
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Founder and principal wayfinding strategist, ID-LAB

Co-designing a collaborative wayfinding system for vision-impaired users

Australia has an extensive health system comprising more than 1300 public and private hospitals admitting around 30 million patients every year, with more new and upgraded hospital facilities planned.

Investment is high, but it hasn't necessarily translated into quality and accessible care for all users. Planning and design oversights at critical stages have meant facilities aren't always fit for purpose, with many found to be discriminatory and inequitable. For users, inequality of access is a human rights issue. For affected facilities, design oversights have proven to be immensely costly.

Australia's Federal District Court has determined that one of the nation's newest and biggest hospitals, the $1.8 billion Sunshine Coast University Hospital (SCUH), must spend millions to correct 17 breaches that discriminated against vision-impaired users. The decision sets a precedent for future hospitals around minimum building standards for accessibility, outlining in law that the safety, dignity and experience of all users matter.

To ensure the entire facility environment would work for – not against – vision-impaired users, SCUH needed to incorporate the needs of this target user group into its redesign. By applying a holistic design lens, SCUH can create a wayfinding experience that works for the entire community, not only certain subsets.

Using an intensive co-design process, the voices, ideas and experiences of vision-impaired users will form stronger foundations for the redesign of SCUH, enabling better shared decision-making, more targeted user testing, and improvement of facility elements that have vision-impaired peoples' needs in mind from the start.

This paper will follow a practice-based approach to:

- collate a detailed analysis of the existing design flaws within SCUH;
- detail our collaborative approach with target users through interviews, ideation, prototyping and testing, to ensure the needs of sighted and vision-impaired needs are considered;
- outline wayfinding recommendations and solution rationale; and
- provide a work-in-progress design development plan and performance specifications for physical landmarks, digital wayfinding tools, and pre-visit information.

This paper will provide valuable insights into what is a rare opportunity: to create a truly user-centred wayfinding solution that considers and incorporates the needs of all users, whether sighted or vision-impaired.

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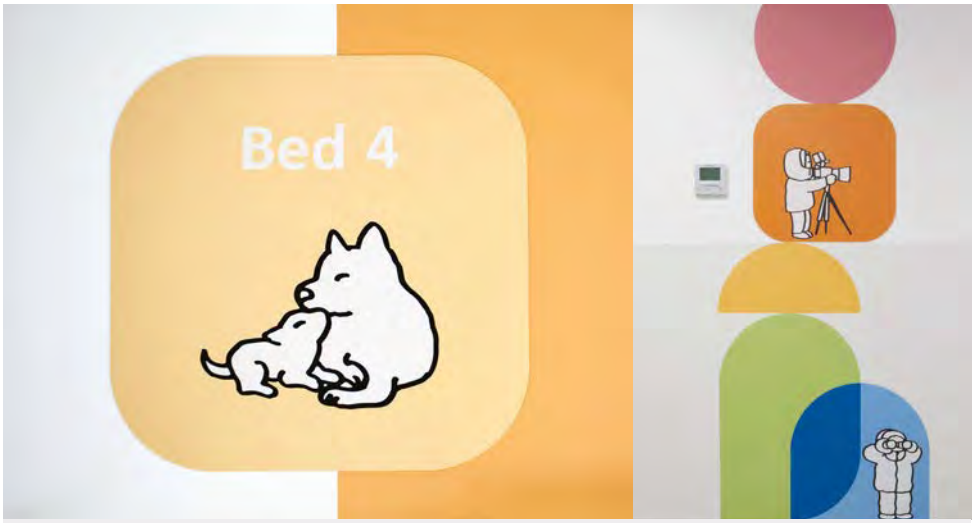

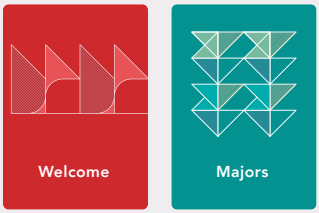

Art & Wayfinding at Homerton Hospital

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Dr Simon Eccles, Chief Clinical Information Officer for Health and Care. On our work for Adults' Emergency dept. at St Thomas' Hospital

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Art in Site

The Art Room

Monday 12 – Tuesday 13 June, Platt Room and Garden

10.15–17.00

The in-between space: A live drawing artwork

Come join us downstairs in the Platt Room for "The in-between space" – a large-scale interactive art installation bringing ideas from the conference to life.

From the opening keynote through to the closing garden party, the Art in Site team will be gathering insights and provocative questions from attendees and lecturers. Using the power of live illustration, we're transforming these ideas into a big drawing, helping us all stand back and see the conference afresh. What connections will we make this year between innovations and future solutions? What are the tensions and emerging truths? Are there new resonant spaces that need a name? What does a hospital look like when play is at the core of its design? Can clinical practice and storytelling work together to inspire trust and empathy?

This is your chance to add your perspective to an evolving artwork, which will capture the spirit of this year's conference. No former experience or art expertise is required – just drop in any time to chat and enjoy seeing everyone's thoughts made manifest.

Workshop leaders

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Creative strategist,
Art in Site

Louisa Williams (UK)
Director,
Art in Site

Martin Jones (UK)
Director,
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Paola Rozo (UK)
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Breakfast design workshop

Tuesday 13 June, Council Chamber

08.30–10.00

De-institutionalising furniture for healthcare

Furniture in clinical environments can be dated and drab, often favouring low-cost functionality at the expense of well-designed, attractive alternatives. Such an approach is evident throughout much of the NHS estate, perpetuating an institutional feeling in many of our healthcare buildings. There should also be an increased focus on sustainability – both in reducing the carbon footprint through the use of more natural materials and in reducing environmental / social damage resulting from mass-production processes.

We are conducting a study through a review and tour of furniture manufacturers in an effort to seek alternatives to the standard NHS furniture palette, with a view to creating evidence-based alternatives. These should provide good value for money; be safe; meet infection control requirements; have good whole-life costs; and be sustainable.

A set of criteria has also been developed through a literature review based on some of the following aspects, which can influence furniture selection: costs and lead times across materials; supply limitations / concerns long-term; use of natural and recycled materials; infection control risks; whole-life costing; and end-of-life processes.

To gain a greater understanding of these aspects, we are collaborating with two leading medical furniture manufacturers – Knightsbridge Furniture and Teal. In this workshop, both manufacturers will be presenting on the challenges they encounter when trying to develop modern, innovative and functional pieces within the limitations of budgetary restrictions and infection control regulations.

The objective is to offer furniture alternatives that are not only compliant and cost-effective but are also attractive and consistent with the architecture of the space, be it public or clinical.

Workshop leaders

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Andrew Bertram (UK)
Senior consultant, MJ Medical

Matt Hammond (UK)
Procurement consultant, MJ Medical

Wayne Tilbury-Larter (UK)
Director of sales, Knightsbridge Furniture

Oliver Mitchell (UK)
Head of design, Teal Healthcare, Teal LifeCare & Teal Living

Nigel Davies (UK)
Marketing manager, Teal Healthcare, Teal LifeCare & Teal Living

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SALUS Global Knowledge Exchange

SALUS is an entrepreneurial global media, research, publishing, events and training organisation with a vision to improve human and planetary health through the global exchange of knowledge.

Our mission is to create, share and disseminate knowledge about the relationship between human health and the natural, built and social environments. We view the two great challenges of our age – the need to maintain and improve human health in the face of ageing populations and chronic disease, and addressing climate change through more sustainable management of our finite resources – as inextricably linked.

Knowledge exchange – events, broadcasting, and research:

European Healthcare Design Congress: Launched in 2015, the Congress brings together 1000+ interdisciplinary researchers and practitioners, in person and virtually, from the fields of health system and service design, technology and infrastructure.

International symposiums: New for 2023, SALUS is running a series of international symposiums, providing a deep dive into a range of specialist themes. Following the success of Cancer Care Design International in February, we will launch Sustainable Healthcare Design on 14 September at The King's Fund, London, followed by Digital Health and Transformation in late autumn.

Healthy City Design International Congress: Launched in 2017, the Congress brings together 400+ leading researchers, practitioners and policy thinkers, in person and virtually, from across the fields of urban health and sustainable development / planetary health. This year, for the first time, the Congress will be held at the Spine, the Royal College of Physicians' headquarters in Liverpool.

SALUS TV: Making the virtual experience richer and more entertaining, SALUS TV enables talks and content from SALUS events and webinars to be live streamed and made available on-demand for audiences to access anywhere around the world, making knowledge on designing for human and planetary health more accessible.

The SALUS journal and online community: A resource providing a digital platform for publishing, mapping and archiving research, policy and practice in the field of designing for human and planetary health. In eight years, SALUS has published more than 6000 articles and abridged research papers, and 3000 hours of video talks and posters.

Research advisory: In collaboration with its global network of researchers, practitioners and policy thinkers, SALUS' independent research advisory supports city planning authorities and national and local health systems to develop their future thinking and strategy at the intersection of design and planning for health, wellbeing and sustainable development. In its most recent publication, SALUS produced a 'Guiding principles' document to support the development of Veraine, a planned new healthy community, in Pickering, Canada.

Contact: Marc Sansom
Director

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Jaime Bishop, Co-chair

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Architects for Health

Architects for Health has been a forum for sharing best practice, knowledge, innovation and thought leadership in the healthcare built environment since 1992.

AfH was the brainchild of a handful of individuals working in healthcare who saw the need for a forum that would promote best practice, innovation and design quality. Through the Phil Gusack Talk we created a space for debate and controversy; we've encouraged future generations with our hugely popular Student Design Awards, and we've celebrated successful projects with the AfH Awards, now incorporated into the European Healthcare Design Awards and Design Matters.

None of this has been achieved without the support of our industry partners and sponsors, for which we are eternally grateful.

We also support an academic programme at the European Healthcare Design Congress, in addition to offering numerous opportunities for social and professional networking

AfH started off as a group solely comprising architects but it has since developed into a much broader forum. It is now offering NHS employees access to its programme free of charge (up to three colleagues per NHS organisation).

Our work reaches across the UK and internationally: we are a world leader in promoting healthcare design and proudly partner with SALUS Global Knowledge Exchange to deliver the European Healthcare Design Congress.

Join us at: architectsforhealth.com/membership/

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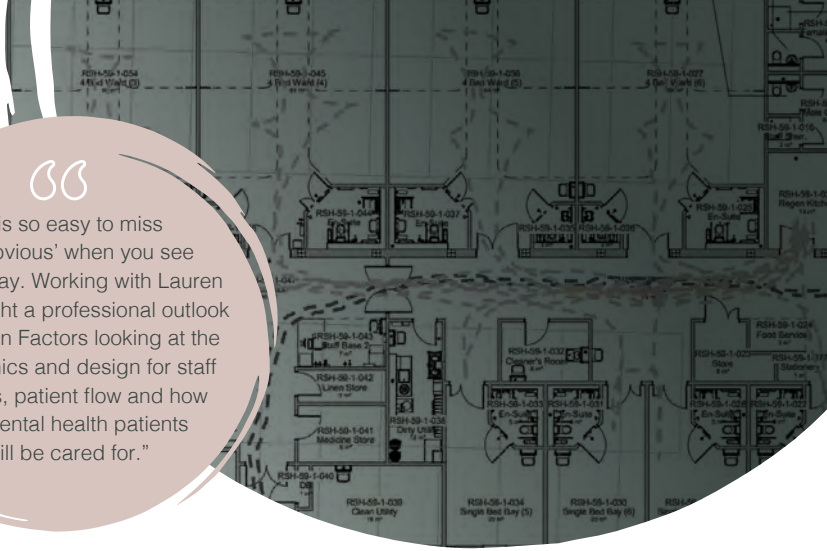

> “It is so easy to miss the ‘obvious’ when you see it every day. Working with Lauren she brought a professional outlook for Human Factors looking at the ergonomics and design for staff facilities, patient flow and how our mental health patients will be cared for.”

Developing systems Evaluating spaces Supporting staff

We specialise in providing technical human factors input to the design of systems and spaces for health care. In designing our new hospitals, we must grasp the opportunity of creating spaces that are not only pleasant to be in, but also improve the safety of the care received. Our methods use clinical scenarios, patient and staff journeys to prioritise the design requirements, and support the testing of clinical designs as they are developed.

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Alder Hey Children's NHS Foundation Trust

Contact:
David Powell,
Development director

W: www.alderhey.nhs.uk

Providing community and hospital care, Alder Hey is based in Liverpool and is the UK's largest children's NHS trust. The new Alder Hey in the Park hospital opened in October 2015.

Alder Hey has developed as: a centre of excellence for cancer, as well as spinal, heart and brain conditions; a Department of Health centre for head and face surgery; a centre of excellence for muscular dystrophy, and the first UK centre of excellence for childhood lupus.

One of four national centres for childhood epilepsy surgery – a joint service with the Royal Manchester Children's Hospital – Alder Hey is also a designated children's major trauma centre; a leading diagnostic centre; and a centre for research, innovation and education.

AHDC – Australian Health Design Council

Contact:
Kate Copeland,
Chair

W: www.aushdc.org.au

The AHDC was formed in 2011 and is a non-government organisation of professionals involved and/or interested in quality design of health facilities. It is the conduit between knowledge providers and knowledge users in Australian health design.

The aims of the AHDC are:

· to promote high-quality, efficient, effective, and safe health facility design that responds to the needs of the Australian populace, in terms of respecting the rights and requirements of patients, the health workforce, and the community in a sustainable natural/built environment;

· to promote training, education and research in health facility design to ensure the long-term sustainability of the industry; and

· to bring together health design professionals for networking, knowledge sharing and to promote innovation in health facility design.

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Chalmers University of Technology

Contact:
Göran Lindahl,
Professor,

W: www.chalmers.se/en/centres/

The Centre for Healthcare Architecture (CVA) is a national Swedish arena for the creation, development, exchange, and dissemination of knowledge about healthcare environments.

CVA regularly produces reports, webinars and events focusing on issues related to healthcare infrastructure. As an academic centre, CVA conducts research, research training, and contributes to basic and further training in the field.

The research focus for CVA is buildings and physical environments as a support and an integrated part of the healthcare systems we all use.

Design Council

Contact:
Edward Hopson,
Director of place

W: www.designcouncil.org

The Design Council champions great design: design that improves lives and makes things better, improving our built environment, and tackling complex social issues.

As an enterprising charity, our work places design at the heart of creating value by stimulating innovation in business and public services. We inspire new design thinking, encourage public debate, and inform government policy to improve everyday life and help meet tomorrow's challenges today.

European Health Property Network

Contact:
Jonathan Erskine,
Executive director

W: www.euhpn.eu

The European Health Property Network brings together organisations and individuals across Europe with interests in how best to plan, design, construct and finance all kinds of healthcare buildings, from the largest hospitals to the smallest clinics. We act as a knowledge-sharing hub for members, and run regular webinars, seminars and workshops on a range of topics. Recent events have focused on healthcare infrastructure sustainability, lessons for hospitals from the pandemic, the future of capital investment planning, and trends in emerging technologies. Our members comprise healthcare architects and engineers; planning and guidance authorities; finance and procurement specialists; senior clinicians; hospital directors; and health system planners. We work in collaboration with a range of other networks and organisations across Europe and beyond.

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Great Ormond Street Hospital for Children NHS Foundation Trust

Great Ormond Street Hospital was the first dedicated children's hospital in the UK, opening in 1852. Today, GOSH is a tertiary and quaternary hospital, specialising in complex treatments for rare conditions. Flagship services include cancer, cardiac, respiratory and neurosciences. With our research partner, the UCL Institute of Child Health, we form the UK's only academic biomedical research centre specialising in paediatrics.

Recent developments include the multi-award-winning Zayed Centre for Rare Diseases in Childhood. This landmark building brings together researchers and clinicians in collaborative workspaces and laboratories to advance the treatment and management of rare diseases. In 2021, GOSH opened the first dedicated facility for the care of children with hearing and sight impairment.

Contact:
Crispin Walkling-Lea,
Head of healthcare planning

W: www.gosh.nhs.uk

Guy's and St Thomas' NHS Foundation Trust

Essentia designs, builds and maintains healthcare infrastructure, and is part of Guy's and St Thomas' NHS Foundation Trust. We combine public-sector values with commercial focus, innovative thinking and modern technology to create a fantastic patient experience.

Guy's and St Thomas' NHS Foundation Trust has 22,700 staff and comprises five of the UK's best-known hospitals – Guy's, St Thomas', Evelina London Children's Hospital, Royal Brompton and Harefield – as well as community services in Lambeth, Southwark and Lewisham. The Trust is part of King's Health Partners – one of England's academic health sciences centres – bringing together world-class clinical services, teaching and research with our partners King's College Hospital NHS Foundation Trust, South London and Maudsley NHS Foundation Trust, and King's College London.

Contact:
Jennifer Whinnett,
Senior healthcare planner

W: www.guysandstthomas.nhs.uk

Healthcare Design Leadership

Healthcare Design Leadership is a not-for-profit community interest company that provides training to empower healthcare leaders to maximise their input in the briefing, planning, design, construction and commissioning process. Our multidisciplinary faculty consists of clinicians, healthcare planners, architects, contractors, engineers and researchers, all industry leaders in their respective fields with decades of experience in planning and delivering new healthcare buildings.

By supporting NHS leaders to enhance their skills in the nexus of hospital development, healthcare buildings of the future can be truly transformational and fit for future generations. The Healthcare Design Leadership course provides an immersive introduction to the whole project life cycle, providing opportunities for hands-on experience of the process and products developed at each stage.

Contact:
Danny Gibson, Rob Etchell

W: www.
healthcaredesignleadership.com

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Healthcare Planning Academy

Contact:
Richard Darch,
Tina Nolan,
Danny Gibson

W: www.healthcareplanningacademy.com

The Healthcare Planning Academy is a membership organisation for healthcare planning professionals, which aims to maintain and continuously improve standards and knowledge by providing a professional development resource and an industry-wide framework of recognised accreditation.

Throughout the year, the Academy supports its members to stay ahead of the curve by running regular seminars and events on a range of healthcare planning topics, discussing the latest trends and advances in the planning and design process for health infrastructure.

The Healthcare Planning Academy is actively welcoming applications from new members who can demonstrate proficiency and experience in healthcare planning, with membership options inclusive of those at any stage of their professional development including new entrants.

The Helen Hamlyn Centre for Design

Contact:
Rama Gheerawo,
Director

W: www.hhcd.rca.ac.uk

The Helen Hamlyn Centre for Design is the Royal College of Art's largest and longest-running centre for design research. It's an international leader in people-centred and inclusive design – the process of designing products, services and systems for ease of use by the maximum number of people - design thinking and creative leadership.

Founded in 1991 and endowed by the Helen Hamlyn Trust, the purpose of the Centre is to conduct design research and projects with industry that will contribute to improving people's lives. The Centre takes an interdisciplinary approach, which is based around the activities of three research labs – Age & Ability, Healthcare, Inclusive Design for Social and Business Impact. Each lab has developed its own empathic and innovative research methods, working in partnership with a wide range of business, industry, government, academic and third-sector partners.

Imperial College Healthcare NHS Trust

Contact:
Matthew Tulley,
Redevelopment director

W: www.imperial.nhs.uk

Imperial College Healthcare is the sixth largest NHS trust and London's largest teaching hospital. It provides care for 2.4m people in northwest London, and for patients beyond in need of specialist treatment.

The Trust's delivery of clinical excellence and education is underpinned by its focus on research and innovation. In partnership with Imperial College London Faculty of Medicine, it's part of the UK's first new academic health science centre. The Trust is also part of the National Institute for Health Research (NIHR) and the NIHR Health Informatics Collaborative. The Trust submitted its strategic outline case for the redevelopment of St Mary's Hospital in Paddington in 2021, making the case for state-of-the-art clinical facilities for adults and children, with 840 beds, plus dedicated research, education and innovation spaces.

Moorfields Eye Hospital NHS Foundation Trust

Moorfields Eye Hospital NHS Foundation Trust is the leading provider of eye health services in the UK and a world-class centre of excellence for ophthalmic research and education. We have a reputation, developed over two centuries, for providing the highest quality of ophthalmic care.

Treating patients at more than 25 sites in and around London, we treat and care for patients with a wide range of eye problems, from common complaints to rare conditions that require treatment not available elsewhere in the UK. The volume and variety of conditions treated by our clinicians gives them a specific range of skills and knowledge. With our partners at the UCL Institute of Ophthalmology, we are a national and international centre for research into eye conditions and treatments, leading one of the most extensive ophthalmic research programmes in the world.

Contact:
Nikki Nagler,
Head of communications

W: www.moorfields.nhs.uk

North Bristol NHS Trust

North Bristol NHS Trust employs more than 12,000 staff and provides healthcare for the residents of Bristol, South Gloucestershire and North Somerset from our award-winning hospital building at Southmead and other sites in the Bristol area.

We are the regional major trauma centre and an internationally recognised centre of excellence in a range of services and major specialities.

Our Brunel PFI hospital development has set the standard for high-quality design focused on creating the best possible internal environments and biodiverse green spaces for health and wellbeing.

Contact:
Tricia Down,
Associate director, strategic estate development and sustainable health

W: www.nbt.nhs.uk

Sykehusbygg

Founded in 2014, Sykehusbygg (the Norwegian Hospital Construction Agency) is owned by Norway's four regional health authorities, which, in turn, derive their funding from the Norwegian Ministry of Health. The agency aims to ensure national know-how for hospital planning, design, engineering and construction remains at the highest international level. Sykehusbygg seeks to facilitate and contribute to progressive hospital development projects through innovation, experience, standardisation, project management, and best practices.

Sykehusbygg looks to ensure that experience from management and operation of hospital property is considered in new hospital projects. The agency must be used by all major Norwegian hospital development projects (over NOK 500 million). The agency only serves the four regional health authorities and their underlying authorities, as well as parties entering into joint ownership with these bodies.

Contact:
Marte Lauvsnes,
Project and development hospital planning manager

W: www.sykehusbygg.no

UIA-PHG

Contact:
Ray Pentecost,
Director

W: www.uia-phg.org

The UIA-PHG is one of the working bodies of the UIA, the Union International des Architects or International Union of Architects. It was founded in 1955 and represents members and guests from all continents.

It is the vision of the UIA-PHG that world public health can profit by the dedication of architects to provide efficient, safe and aesthetic healthcare buildings and an environment that can contribute to a more rapid healing of patients, as well as an improvement in staff operations and satisfaction.

To accomplish this vision, the UIA-PHG seeks to share its knowledge and experience not only within the group but also with other architects; engineers and consultants; healthcare managers and providers; healthcare organisations; governments; as well as the general public. It also looks to initiate research projects that contribute to better healthcare buildings and environments.

Velindre University NHS Trust

Contact:
David Powell,
Project director – New Velindre Cancer Centre

W: velindre.nhs.wales

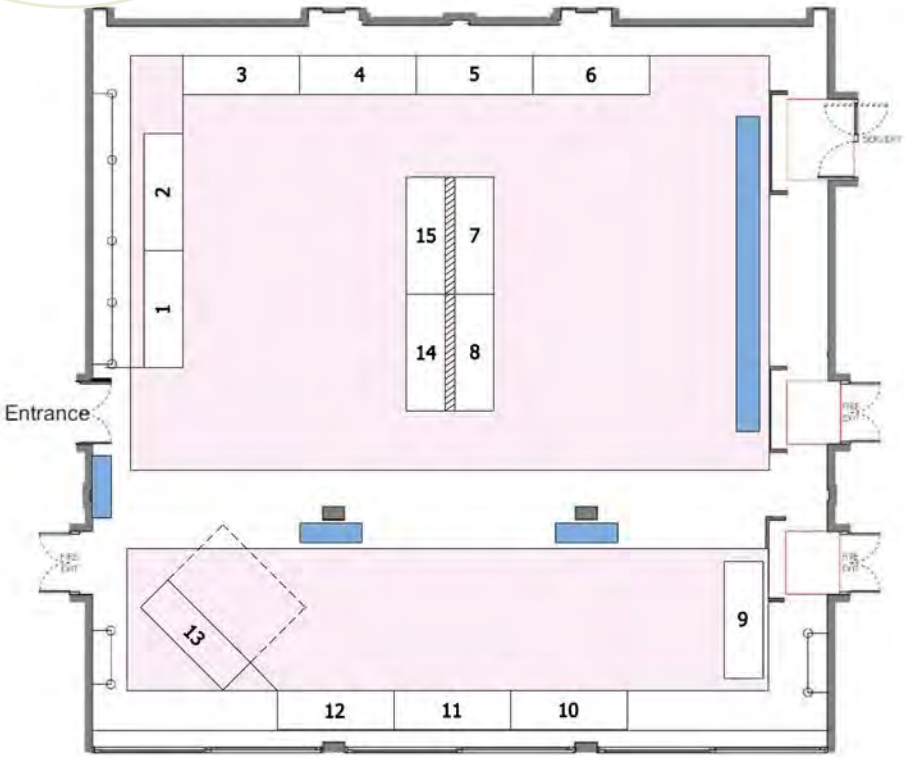
Velindre University NHS Trust provide specialist cancer and blood services across South and Mid Wales through Velindre Cancer Centre and the Welsh Blood Service. Delivering quality, care and excellence to our patients and donors is at the heart of our organisation.

Through our Transforming Cancer Services in South East Wales Programme, we are working to build a new Velindre Cancer Centre in Whitchurch, Cardiff, with a satellite radiotherapy centre in Abergavenny. Our design focus for the new cancer centre is both patient-centred and environmentally focused – our ambition is that this will be the greenest hospital in the UK. We will combine a state-of-the-art facility for treatment and research with the healing power of nature, ensuring our outdoor space is calming, encourages improved biodiversity, and gives back to the environment and community.

OPENING TIMES:

Monday 12 June 10.00-17.00
Monday 12 June 18.00-20.30
Tuesday 13 June 10.00-16.30

Please take time during the coffee and lunch breaks set aside for networking to visit the exhibition and explore some of the innovative and creative design solutions featured by organisations from the commercial, non-profit and media sectors that are making a significant contribution to healthcare design across Europe and the world. The exhibition will also be open during the Welcome Drinks Reception on the evening of Monday 12 June.



1. Gerflor Flooring UK
2. Architects for Health
3. Morgan Human Services
4. Grosvenor Interiors
5. Avidicare
6. Press and media
7. Inpro Europe
8. Porcelanosa
9. SALUS Global Knowledge Exchange
10. Veritas Medical Solutions
11. Brandon Medical
12. UKIHMA
13. Arjo UK
14. Guldmann
15. MTS Health

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- The optional Powered Dynamic Positioning System (PDPS) allows caregivers to handle patients with ease

1. **References**: Alamgir, H., O. W. Li, et al. (2009). "Evaluation of ceiling lifts in health care settings: patient outcome and perceptions." AAOHN J 57(9): 374-380. .Alamgir, H., O. W. Li, et al. (2009). "Evaluation of ceiling lifts: transfer time, patient comfort and staff perceptions." Injury 40(9): 987-992.Alamgir, H., S. Yu, et al. (2008). "Efficiency of overhead ceiling lifts in reducing musculoskeletal injury among carers working in long-term care institutions." Injury 39(5): 570-577.Chhokar, R., C. Engst, et al. (2005). "The three-year economic benefits of a ceiling lift intervention aimed to reduce healthcare worker injuries." Appl Ergon 36(2): 223-229.Dutta, T., P. J. Holliday, et al. (2012). "A biomechanical assessment of floor and overhead lifts using one or two caregivers for patient transfers." Appl Ergon 43(3): 521-531.Engst, C., R. Chhokar, et al. (2005). "Effectiveness of overhead lifting devices in reducing the risk of injury to care staff in extended care facilities." Ergonomics 48(2): 187-199.Marras, W. S., G. G. Knapik, et al. (2009). "Loading along the lumbar spine as influence by speed, control, load magnitude, and handle height during pushing." Clin Biomech (Bristol, Avon) 24(2): 155-163.S ilverwood, S. and M. Haddock (2006). "Reduction of musculoskeletal injuries in intensive care nurses using ceiling-mounted patient lifts." Dynamics 17(3): 19-21.
2. **Source:** 01.LG.00.1.GB.1.AHG https://www.arjo.com/int/products/safe-patient-handling/ceiling-lift/maxi-sky-2/

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Contact:
Richard Mann,
Healthcare and science leader,
UK and Ireland

W: www.aecom.com

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Our teams are engaged across the entire health economy, from the scientific research that enables the delivery of modern healthcare, through to acute hospitals, specialist centres, mental health facilities, and community health and wellbeing centres. Our ability to combine technical expertise and innovation to deliver fully integrated planning, design, construction and operations management services allows us to add value, as our clients adapt to new frontiers of healthcare delivery.

archipelago

Contact:
Coen van den Wijngaart,
Executive partner; director,
business development

W: www.archipelago.be/en

AWARDS CATEGORY PARTNER

Based in Brussels and Leuven, archipelago creates contextual and sustainable architecture to better live, care, work and learn – offering a holistic vision for complex projects, among other large-scale hospital projects. We bring life to projects with a sensitive, methodical approach supported by research and innovation, a touch of ingenuity, and the collective expertise of an inspired and committed team.

Our 140-strong team creates peaceful environments that reduce stress, encourage mobility and promote healing. We combine innovative approaches with experience to provide welcoming, functional and scalable health spaces. The circular economy sits at the centre of our architectural vision. Sustainability requires us to do more with less, anticipate the evolution of our buildings, and care for the wellbeing of their users without compromising comfort and design quality. .

Archus

Contact:
Jo Hall,
Head of business development,
marketing & communications

W: www.archus.uk.com

GOLD DESIGN LEADER

Archus is a team of experts who provide strategic and infrastructure advice for health and social care clients across the UK and internationally.

Our team includes health planners, clinicians, project managers, strategic advisors and technical specialists who collaborate to develop strategies for future service delivery and implement changes to health systems.

Our end-to-end advice provides support at every stage of the asset and system life cycle, bringing people together to deliver positive change and shape the future of healthcare.

Arjo UK

Contact:
Malcolm Harvey,
Project manager

Simon Saulis,
National clinical consulting manager

W: www.arjo.co.uk

EXHIBITION PARTNER

At Arjo, we believe that empowering movement within healthcare environments is essential to quality care.

With products and solutions that ensure ergonomic patient handling, personal hygiene, disinfection, diagnostics, and the effective prevention of pressure ulcers and venous thromboembolism, we help professionals across care environments to continually raise the standard of safe and dignified care.

Empowering movement is at the heart of everything we do and we are committed to improving the everyday lives of people affected by reduced mobility and age-related health challenges.

Art in Site

Contact:
Peter Shenai,
Creative strategist

W: www.artinsite.co.uk

SILVER KNOWLEDGE LEADER

Art in Site is a London-based studio of artists, designers, and strategists. Our mission is to create healthy environments – places to heal, learn, explore, thrive and connect – through integrated art and interior design.

We believe art is foundational for improving healthcare services. In our emergency department interiors, we are helping reduce violence and aggression and raising trust in doctors. Our mental health artwork is inspiring hope and restoring community touchpoints. And our work in children's environments is opening up safe, inspiring ways to play – crucial to physical and psychological development.

This June, it's our 20th birthday. To celebrate two decades of innovation in healthcare spaces, we've developed a live art installation at the conference. Visit the Platt Room to say hello and find out more.

Avidicare

Contact:
Peter Ljubetic,
International sales director

W: www.avidicare.com

EXHIBITION PARTNER

Avidicare is committed to the vision 'Towards zero infections'. We offer design support and customised ventilation solutions for any area where airborne contamination poses a risk to patients or staff.

Our goal is to reduce airborne transmission of infections, increase comfort and save energy. Solutions are based on our patented Temperature-controlled AirFlow technology (TcAF), the first real innovation in airflow design for decades. The Opragon system is a revolutionary combination of the classic mixed ventilation, which dilutes the number of bacteria-carrying particles in the periphery of the room and a uni-directional flow in the middle of the room.

With TcAF, Opragon generates a superior level of purity throughout the whole operating room and with a lower energy consumption than traditional ultra-clean ventilation systems.

Brandon Medical

Brandon Medical is a UK company that delivers smart turnkey equipment for acute and primary healthcare worldwide.

For over 75 years, British engineering ethos and strong work ethic have fuelled continuous product innovation and development to provide healthcare professionals with reliable, high-quality and affordable medical equipment packages for operating theatres and critical care in more than 70 countries around the globe.

We are acknowledged experts in manufacturing medical lighting, medical power and control systems, and medical audio-video systems. Brandon Medical has decades of practical expertise in configuring acute care areas for a regulatory and recommendatory compliant solution – with high levels of engineering contingency and resilience while maintaining a commercial design philosophy.

Contact:
Paul Grainger,
Director of UK sales, east

W: www.brandon-medical.com

EXHIBITION PARTNER

GBS Health+

GBS Health+ is an architectural design practice that specialises exclusively in healthcare buildings .

The company is multi-award winning, has been in practice for 90 years, and has completed more than 500 healthcare projects in the UK and worldwide.

Contact:
Nigel Spawton RIBA,
Partner

W: www.gbsarchitects.co.uk

BAG PARTNER

Gerflor Flooring UK

Gerflor is an international manufacturer of flooring, wall protection and interior finishing accessories. Our solutions are world-class, high-quality, sustainable, design-led and innovative for all the contract markets we serve. Every day in a healthcare setting, 100 million patients, are healed on a Gerflor floor and more than 200,000m^2 of the company's floors are installed around the world.

We lead with a focus on safety, hygiene, comfort and durability. All this is coupled with modern in-house designs and a strong R&D commitment. We are present in more than 100 countries, with 4200 employees operating in 29 subsidiaries, and 12 production sites globally.

From product design to end of life, the circular economy is a core priority, with Gerflor committed to making five key sustainable principles central to its operational and product development activities.

Contact:
Chris Pursey,
Key account manager – healthcare

W: www.gerflor.com

BRONZE INNOVATION LEADER

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Grosvenor Interiors

Contact:
Colin Horn,
Director

W: www.grosvenorinteriors.co.uk

EXHIBITION PARTNER

At Grosvenor Interiors, our mission is to make 'better spaces to get better in'. All of us need hospital care at some time in our lives. We trust in the skills of nurses and doctors to get us well. But other factors also aid recovery. We believe passionately that where patients recover, the quality of the environment around them directly influences how they recover. We believe that good hospital interior design has an essential role in good healthcare.

Since 2007 we have been helping numerous charities and NHS trusts all over the UK to enhance interior spaces, providing enhancements such as large-scale, immersive wall imaging, bespoke joinery, custom furniture, and lighting. When dealing with healing environments, one size doesn't fit all, and by adopting a bespoke approach to each project, we provide effective, calming and uplifting spaces that enhance the hospital journey for all users.

Guldmann

Contact:
Lee Hubery,
New-build project manager

W: www.guldmann.com

EXHIBITION PARTNER

Guldmann is a Danish-based firm that works with the development, manufacture and sales of welfare technology for people with reduced capabilities, and work tools for those who help and care for them.

With more than 40 years' experience, Guldmann is passionate about creating more 'time to care'. We focus on improving work procedures and the working environment in the health and care industries, where moving, lifting and positioning, as well as mobilisation and rehabilitation, are prime concerns.

Our product range includes ceiling hoists, mobile lifters, slings, and lifting accessories. Our lifting and moving solutions, with services from project consultancy and personnel instruction to service and assembly, help ensure that resources in the care system are put to most effective use, and thus provide more time for actual care assignments.

HDR

Contact:
Hank Adams,
Global director, health

W: www.hdrinc.com

GOLD DESIGN LEADER

We use the power of design thinking to re-imagine space, environments, programming, planning, operations and function. We blend our deep knowledge of healthcare delivery with our understanding of how environments can shape behaviours and outcomes to create solutions for clients that respect the human impact of their work – solutions that champion human-centred design, solve real problems, make lives better, and advance wellness, wellbeing, healing and cures.

Through design and consideration of three important elements – patient care, context and community – we are working to reshape the way healthcare is perceived and delivered. Advancing health and wellness on a global scale and in local communities is at the heart of our endeavours.

European Healthcare Design 2023

krion®
Unlimited Surfaces

PORCELANOSA

Contact: Sasha Fewtrell
Mobile: 07921 471178
Email: sasha.fewtrell@porcelanosa.co.uk

HLM Architects

Contact:
Chris Liddle,
Director

Melanie Jacobsen Cox,
Head of healthcare

W: www.hlmarchitects.com

SILVER KNOWLEDGE LEADER

Thoughtful design and the desire to make spaces that improve lives sit at the heart of every discipline within HLM Architects – but in healthcare environments, this is even more important.

For over 40 years we've been designing award-winning healthcare projects that provide healing environments that help minimise the time people spend in them. From landscape to interiors, we challenge ageing healthcare infrastructure and design healthcare environments that aim to avoid stress, unhappiness, illness and pain, while understanding the constraints in delivering a health facility.

Our knowledge and expertise can be applied to all areas of healthcare, from primary care centres to rehabilitation environments, and we are conscious and responsive to rapidly changing technologies that make future-proofing areas, such as oncology, challenging..

Inpro Europe

Contact:
Jonathan Tomlin,
Sales director

W: www.inprocorp.com

EXHIBITION PARTNER

Inpro Europe is based in Italy, controlled and managed by Inpro Corporation USA for the sales development of Inpro products in all European countries, and constituting an international hub for others.

Our mission is to offer safe, durable handrails, wall guards, corner guards, wall protection sheet, made of sustainable materials to protect the buildings and the people who use them. We offer a wide choice of colours and patterns to satisfy all our customers' needs.

In 2019, we exclusively brought to the UK & European market the JointMaster range of expansion joints. These are used in public buildings, as well as car parks, retail developments, airports, and office premises. Our Fireline 520 &140 fire barriers are not only expertly engineered to handle building movement even in seismic conditions but are ready to protect in the unthinkable occurrence of a fire.

Integrated Health Projects (IHP)

Contact:
Jason Gibbings,
IHP framework director

W: www.ihprojects.co.uk

LEAD AWARDS PARTNER

Integrated Health Projects by VINCI BUILDING Sir Robert McAlpine

Integrated Health Projects is a leading provider of healthcare solutions for almost 20 years. As an integrated alliance, IHP combines the stability, capacity, coverage and experience of Vinci Building UK and Sir Robert McAlpine. Both are major firms working in the UK and abroad, focused on development, construction and facilities management.

IHP was formed in April 2003 to act as a principal supply chain partner for ProCure21/21+/22 and we have been appointed on 200-plus projects, valued at more than £2.5bn. We have now secured our place on all Lots in the P23 Framework. We work with NHS clients to provide best value for money through imaginative and sustainable solutions that offer capital, operational and life-term efficiencies. We are also a pioneer in standardisation, delivering low-carbon solutions across the building life cycle.

veritas®
Medical Solutions




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100% RE-USABLE & RECYCLABLE

SIGNIFICANT WATER REDUCTION IN PROCESS

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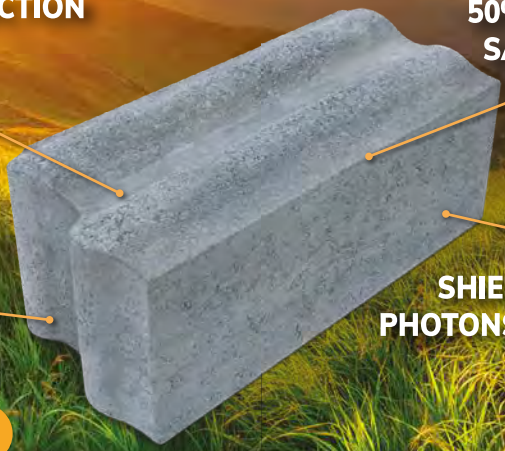

100% SHIELDING GUARANTEE

SHIELDS BOTH PHOTONS & NEUTRONS

VERISHIELD®
Modular Radiation Shielding

Jacobs

We have worked with healthcare providers around the globe for more than 50 years, re-imagining approaches to create and sustain thriving and resilient health systems, and contributing to personal, societal and economic wellbeing. Our local and global experience is vast, from supporting net-zero roadmaps for NHS Scotland in the UK, to health rebuild programmes in New Zealand, following the earthquakes in 2010 and 2011. In New South Wales, Australia, we support the major hospital upgrades and replacement programme, through to delivering a range of projects in Asia and the Middle East. In the US, we've delivered more than £36bn of health infrastructure.

Contact:
Matthew Holmes,
Global solutions director,
health infrastructure

W: www.jacobs.com

GOLD DESIGN LEADER

Lexica

Lexica is a leading specialist consultancy, supporting international and UK-based health and life sciences organisations with the planning, delivery, and continuous improvement of their services and facilities.

We are a multi-disciplinary team with expertise in healthcare strategy and planning; property consultancy; cost management; project management; programme management; infrastructure solutions; net zero; transformation and digital; and life sciences strategy.

Contact:
Tina Nolan, Managing director

W: www.lexica.co.uk

DIAMOND THOUGHT LEADER

AWARDS CATEGORY PARTNER

Llewelyn Davies

Our name has a distinguished history in both health and masterplanning, extending over five decades and encompassing a spectrum of innovation.

The fundamental design principles of the modern hospital were essentially invented and shaped by the company's founding partners, John Weeks and Lord Richard Llewelyn-Davies. Their pioneering work, notably in understanding the need for continuous flexibility, was extraordinary and remains as relevant to hospital design today, and in the future, as ever before.

Contact:
Robert Etchell,
Director

SILVER KNOWLEDGE LEADER

Medical Architecture

We are specialists in healthcare architecture. We mix strategic planning and evidence-based design to create therapeutic environments that promote wellbeing and recovery.

We work closely with our clients to develop a clear vision for their estate, sharing the pride that comes with providing the best possible healthcare. We have constantly evaluated our work and evolved our thinking to ensure we push the field of healthcare architecture forward.

Our team of healthcare designers are based in London and Newcastle upon Tyne, with current projects in the UK, Europe and North America.

Contact:
Paul Yeomans,
Director

W: www. medicalarchitecture.com

AWARDS CATEGORY PARTNER

MJ Medical

Contact:
Nathaniel Hobbs,
Director

W: www.mjmedical.com

SILVER KNOWLEDGE LEADER

MJ Medical is a leading healthcare planning and design consultancy. Established for over 35 years, we've helped plan, design and equip more than 300 healthcare facilities across 75 countries.

Our extensive and diverse global experience enables us to deliver innovative services that are sensitive to local cultural and socio-economic considerations. The knowledge base we derive from our research and development programme supports the provision of intelligent, flexible healthcare buildings able to respond to future changes in clinical best practice, medical technology, and the needs of communities.

Our team of experienced economists, academics, architects, engineers, procurement specialists, and clinicians deliver tailored, evidence-based solutions at all stages of the healthcare facility development process.

Morgan Human Systems

Contact:
Lauren Morgan,
Director

W: www.morganhumansystems.co.uk

EXHIBITION PARTNER

We specialise in providing technical human factors input to the design of healthcare systems and spaces. In designing new hospitals, we must grasp the opportunity of creating spaces that are not only pleasant to be in but also improve the safety of the care received. Our methods use clinical scenarios, and patient and staff journeys to prioritise design requirements, and support the testing of clinical designs.

James Butcher, from the West Suffolk NHS Foundation Trust, described our involvement as "the vital process in bringing the design to life and understanding multiple critical pathways for all involved".

With first-hand experience of working in a number of NHS provider organisations, we've explored the ways in which the current clinical working environments do not enable safe clinical care and bring these experiences to future hospital design challenges.

MTS Health

Contact:
Ruth Strickland,
Chief operating officer

W: www.mtshealth.co.uk

SILVER KNOWLEDGE LEADER

EXHIBITION PARTNER

MTS Health is a leading provider of equipment asset management, advisory and procurement, supported by a team of bio-medical engineers, clinical scientists, procurement specialists, and project personnel. It works alongside NHS trusts and other health organisations preparing whole hospital equipment schedules; equipment budgets; specifications; procurement; installation; and technical advisory.

MTS is working with NHS clients to plan the strategic management of their medical equipment assets. We are providing cost reductions, cost avoidance, CQC compliance and governance, and providing interim and permanent personnel on site to achieve this.

MTS has commissioned more than 40 large hospital redevelopments in the UK and internationally, and is a market leader in supporting the New Hospital Programme in the planning of its redevelopments.

Percipio Consulting

Contact:
Duane Passman,
Director

W: www.
percipiohealthcareplanning.co.uk

LANYARD PARTNER

Percipio Consulting brings understanding and unrivalled experience to the development of major infrastructure programmes and projects in the NHS.

Strategic, tactical and operational consultancy and advice to all major NHS programmes and projects includes strategy development and masterplanning; development of the brief; stakeholder analysis and review; business case development (including advice on benefits assessment); critical friend reviews and project turnarounds; programme and project governance advice; implementation support; and operational commissioning.

Porcelanosa

Contact:
Sasha Fewtrell,
Specification manager

W: www.porcelanosa.com/uk

EXHIBITION PARTNER

Porcelanosa is one of the world's leading manufacturers and suppliers of a wide range of tiles and other products.

Krion is a new-generation solid surface developed by Krion, a company belonging to Porcelanosa Group. Krion is highly recommended for the health sector, as its anti-bacterial properties and additive-free composition make it suitable for medical centres, clinics, hospital rooms, and operating theatres, where maximum hygiene conditions are necessary. In addition, Krion solid surface is completely aseptic and easy to clean.

Furthermore, the chemical soldering between the different pieces and the potential to curve them enable the creation of continuous surfaces without joins or corners, preventing the accumulation of microorganisms, which are a contamination risk.

RSK Group

Contact:
Warren Percival,
Healthcare director

W: www.rskgroup.com

DIAMOND THOUGHT LEADER

AWARDS CATEGORY PARTNER

RSK Group is a leading, international sustainability and environmental engineering consultancy providing technical services and specialist contracting. With more than 11,000 employees and offices across the UK and 40 countries, RSK is the largest privately owned environmental and sustainability firm in Europe. The group includes several integrated business units delivering technical support and consultancy across a wide variety of client type, sector and size.

RSK supports clients across the value chain, working directly with NHS trust estates teams and sustainability leads, or with appointed designers, architects, project management firms and contractors. From small refurbishments and strategic property advice to site development and disposal services, our specialist business units work together to form multidisciplinary teams to address your sustainability, asset management, engineering and capital delivery challenges.

Ryder Architecture

Contact:
Paul Bell,
Partner

W: www.ryderarchitecture.com

SILVER KNOWLEDGE LEADER

We are more than an architectural practice – we're a team of teams with diverse and extensive expertise. We lead projects in our own integrated way, delivering exceptional value and a positive impact for our clients and communities.

Founded in Newcastle upon Tyne in 1953, we now have teams collaborating across the UK and internationally, with a shared commitment to our ethos of 'Everything architecture' – to improve the quality of the world around us and, in doing so, improve people's lives.

Stantec

Contact:
Brenda Bush-Moline,
Global health sector leader

W: www.stantec.com

SILVER KNOWLEDGE LEADER

Stantec employs more than 4000 architects, medical planners, engineers, and project managers in six countries. Teams are supported by proprietary health research, experience in lean design, and alternative project delivery models. The firm collaborates across sectors to bring best-in-class design – delivering progressive healthcare environments that improve patient outcomes and attract and retain top talent. Its London studio has been serving the NHS and private sector in the UK since 1990, and forms part of its global integrated practice in the UK, Canada, US, Australia, and the Middle East.

UK International Healthcare Management Association

Contact: Geraldine Marson,
Membership manager

W: www.ukihma.co.uk

EXHIBITION PARTNER

The UK International Healthcare Management Association (UKIHMA) is a national membership organisation that brings together the best of UK healthcare expertise to offer international clients integrated turnkey solutions. We work closely with partners in the UK Department for International Trade, Healthcare UK, and UK Export Finance in offering a portfolio of support from trusted specialists. UKIHMA offers a single point of contact to a mix of skills and expertise spanning the NHS, prestigious academic institutions, and a diverse range of commercial-sector experts, to provide UK-led solutions for international clients.

Veritas Medical Solutions

Contact:
Robert J. Farrell,
Chief executive

W: www.veritas-medicalsolutions.com

EXHIBITION PARTNER

Veritas provides shielding for constructing all sizes and types of linear accelerator, MR guided linac and proton treatment rooms, high dose rooms, and industrial applications. Veritas will handle every aspect of design, engineering, testing support, and assembly – in a fraction of the time needed with traditional design-build methods. Stackable VeriShield shielding modules and SmartDoor shielded door systems save significant space. And innovative SmartDoors for proton applications now allow the construction of direct-entry treatment rooms, which reduces the footprint of the shielded rooms and cuts the time for personnel to access the treatment area.

Equipment Capital Planning, Advisory and Procurement

MTS Health is the UK's leading provider of Capital Planning Equipment Asset Management, Advisory and Procurement Services

MTS are supported by a specialist team of Bio-Medical Engineers, Clinical Scientists, Radiographers and CIPS Qualified Procurement experts.

In our 24th year of operation, MTS has successfully commissioned over 40 large hospital developments in the UK and Internationally.

We are currently supporting NHS Trusts who are part of the New Hospitals Programme.

Services provided include:

- Medical Equipment Planning
- Business Cases
- Cost Advisory
- Room Data Sheet Management
- IoMT
- Specification and Technical Advisory
- Procurement and CIP Savings.
- Medical Device Management

MTS is working with NHS and Private Sector Hospital clients to work collaboratively with all project stakeholders such as NHS Trust personnel, Architects, Construction companies and other Professional Advisors.

Please contact Ruth Strickland, Chief Operating Officer on 01442 216785 +44(0)7775 522948
Email: info@mtshealth.co.uk

RSK

A GLOBAL LEADER IN THE DELIVERY OF SUSTAINABLE SOLUTIONS

RESPONSIBLE
SUSTAINABLE
KNOWLEDGEABLE

The NHS is critical in protecting the health of the UK population, and accounting for 4% of total emissions, plays a pivotal role in reaching net zero. We provide practical solutions to support NHS net zero ambitions, supporting development, renewal and disposal of NHS assets.
We work directly with NHS Trust estates teams, sustainability leads, appointed designers, architects, project management and contractors to provide:

- Environment and planning services
- Geosciences and engineering
- Technical services
- Property consultancy
- Corporate, advisory and sustainability

Contact **Warren Percival, Director**
Email: wpercival@rsk.co.uk · Phone: +44 (0)7793 365862

rskgroup.com