ROYAL COLLEGE OF PHYSICIANS LONDON | 27-28 JUNE 2016

EUROPEAN HEALTHCARE DESIGN

RESEARCH • POLICY • PRACTICE

FINAL PROGRAMME

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Great Ormond Street Hospital, London

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With over 50 years of innovation in hospital design, Llewelyn Davies is one of the world's leading healthcare architects. The pioneering work of the firm embraced change, flexibility and a patient centred approach which remains as relevant today as ever before. Llewelyn Davies has worked closely with some of London's most renowned Trusts, including University College London Hospital (UCLH), Royal National Orthopaedic Hospital, Royal Brompton & Harefield Hospital and since 2005, Great Ormond Street Hospital (GOSH), one of the world's leading tertiary care paediatric hospitals.

The Morgan Stanley Clinical Building (Phase 1 of the Mittal Children's Medical Centre for GOSH) was completed in 2012 with Phase 2, the Premier Inn Clinical Building, due for completion in 2017. These projects have received critical acclaim within the healthcare community and external bodies including the GLA and English Heritage. At a smaller scale, Llewelyn Davies has continued its innovatory approach to healthcare design in projects for UCLH Charity, including the Cotton Rooms, Britain's first cancer patient hotel and ISEH, an Olympic legacy sports research and treatment facility.

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Dear colleagues,

We are delighted to welcome you to the European Healthcare Design 2016 Congress & Exhibition.

Providing an international forum for researchers, policy-makers and practitioners, the congress will stimulate a new dialogue around the relationship between health service design, technology and the built environment.

Healthcare systems and services around the world are facing unprecedented pressures to improve the quality of service provision at the same time as maintaining fiscal balance.

Demand pressures created by an ageing population, rapid increases in the rates of non-communicable diseases, changing public expectations, and rising costs from new medical technologies are being realised within the context of a financial, economic and sovereign debt crisis.

Continuous improvements are no longer enough, and more radical interventions and re-engineering of European and global health systems are urgently required.

Organised by Architects for Health and SALUS Global Knowledge Exchange, the congress aims to take a whole-system approach to understanding how to redesign health systems and services through the exchange of knowledge, research and international best practice.

As health services evolve and new technologies are adopted to meet our changing needs, the environments, typologies and networks of buildings within which those services are delivered will also need to change. Hospitals and health centres will be expected to show leadership in re-orientating healthcare towards the active promotion of health, working closely with their public health colleagues to keep people healthy and leading independent, illness-free lives for longer.

Meeting the challenge to create a new dialogue around healthcare design, the organisers, in collaboration with our venue host, the Royal College of Physicians, our endorsing event partners, which include leading international research organisations, healthcare providers, professional bodies, and the healthcare industries, are delighted to welcome you to London.

In addition to a two-day conference programme with expert speakers from across Europe, North America and Australasia, the event will also host a welcome drinks reception (p25), an exhibition of the latest design solutions (p150–162), a garden party (p25), study tours (p27-29) of some of the UK's most innovative new health facilities, and a new and exciting awards programme (p31-41).

We look forward to your participation in this exciting congress and to working with you to create and share new knowledge around the value of design in transforming services, and in improving the quality of healthcare in Europe and around the world.

CHRIS SHAW
Chairman
Architects for Health

SUSAN FRANCIS
Programme director
Architects for Health

MARC SANSOM
Director
SALUS Global Knowledge Exchange

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CONTENTS

THE ROYAL COLLEGE OF PHYSICIANS

The second European Healthcare Design Congress & Exhibition, 27–28 June 2016, will 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 is 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'.

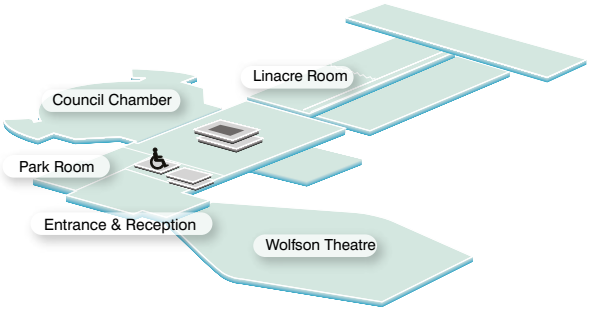
Sir Lasdun won the competition to design the new headquarters in 1959. He was surprised at being asked to design for such a traditional body, given his modernist philosophy, and he made it clear that he would not create a classical-style building. Ultimately, he responded to the challenge with a skilful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

- **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.
- **Award-winning Grade 1 listed modern building** - An atmosphere of space and light with a contrasting mix of old and new facilities.
- **Rare heritage collection -** With over 500 years of history and more than 50,000 antiquarian books.
- **High-quality food and service -** Eclectic cuisine, bespoke menus and first-class service.
- **Professional venue for international conferences -** Member of Unique Venues of London, International Association of Conference Centres, and London and Partners, to name a few.
- **Private 'Physic Garden' for events** - Filled with rare plants and flowers from all over the world, ideal for barbecues, receptions and al fresco dining.
- **Professional and friendly events team -** Dedicated event managers, catering experts and technicians. Full support is provided before, during and following events.

GROUND FLOOR



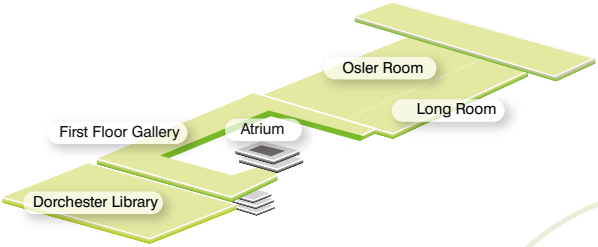
Wolfson Theatre
- Main conference plenary sessions, breakout sessions and EHD2016 Awards presentation

Council Chamber
- Breakout sessions

Linacre Room
- Breakout sessions

Park Room
- Organisers' office

FIRST FLOOR



Dorchester Library
- Poster gallery and EHD2016 Awards shortlist gallery

Long Room and Osler Room
- Exhibition and Welcome Drinks Reception

Wolfson Theatre

08.00	**Registration opens**

Session 1

Health policy, service design and quality improvement

Chair: Richard Darch, Capita Property and Infrastructure, UK

Supported by: CAPITA

08.45	**Welcome and introduction** **Susan Francis** Architects for Health, UK
09.00	**Keynote address: Design principles for service delivery** **Nigel Edwards** CEO, Nuffield Trust, UK
09.25	**Keynote address: New models of care: transforming quality, access, efficiency and patient experience** **Sam Jones** Director – new care models programme, NHS England, UK
09.50	**Keynote address: Hospitals without walls: the future of health** **Ian Bullock** CEO, Royal College of Physicians, UK
10.15	**Panel discussion** **Nigel Edwards, Sam Jones, Ian Bullock**

10.30	**COFFEE, EXHIBITION AND POSTER GALLERY**

Wolfson Theatre

Session 2

Innovations in health system and service design

Chair: Liz Paslawsky, advisor, SALUS Global Knowledge Exchange Australia

11.00	**Understanding patient demand: a better way to make the NHS work** **Hamish Dibley** Independent management consultant, Dibley Consulting, UK
11.25	**The 2030 plan: processes and tools for system-wide health service, infrastructure and masterplanning** **Denise Blackwell** Principal, Blackwell Management Group, Canada **Robin Snell** Principal, Parkin Architects, Canada
11.50	**Panel discussion** **Hamish Dibley, Denise Blackwell, Robin Snell, John Cole, Sylvia Wyatt**

12.30	**LUNCH, EXHIBITION AND POSTER GALLERY**

Wolfson Theatre

Session 3

International hospital design: urban, cultural and economic centres

Chair: Chris Shaw, chair, Architects for Health, UK

Supported by: HDR

14.00 **The P3 hospital as cultural centre: the architecture and public spaces of the new CHUM**
Azad Chichmanian, Partner, NEUF architect(e)s, Canada
Kevin Sticht, Chief operating officer, CannonDesign, Canada

14.25 **A world-class university hospital for a new health system in Stockholm**
Charlotte Ruben, Architect and partner, White Arkitekter, Sweden

14.50 **Humber River Hospital: digitalisation drives a new standard for healthcare facility design and operation**
Jerry Jeter, Vice-president / principal, HDR, USA
Dr Rueben Devlin, President and CEO, Humber River Hospital, Canada

15.15 **Panel discussion**

Council Chamber

Session 4

Service redesign: technology, data and architecture

Chair: Cliff Harvey, North York General Hospital, Canada

14.00 **Designing our way out of emergency**
Jonathan Wilson, Principal and UK healthcare sector leader, Stantec, UK
Ray Pradinuk, Principal and head of research, Stantec, Canada
Drew Digney, Executive medical director, Nanaimo, Oceanside and Alberni-Clayoquot region, Vancouver Island Health Authority, Canada

14.25 **Critical care design of tomorrow: how technology fits in**
Dr Diana Anderson, Dochitect, medical planner, Stantec Architecture, USA
Dr Neil Halpern, Chief, critical care medicine service, Memorial Sloan Kettering Cancer Center, USA

14.50 **Designing technology: mapping professional healthcare figures with personas for P4 medicine**
Adriano Gariglio, Service design researcher, e-Services for Life and Health, San Raffaele Scientific Institute, Italy

15.15 **Panel discussion**

Linacre Room

Session 5

Landscape design: nature and the therapeutic environment

Chair: Colin Porter, Landscape Gardens and Health Network, UK

14.00 **Healing gardens in healthcare – the necessity of nature**
Clare Cooper Marcus, Professor emerita, University of California, USA

14.25 **Designing greenspace for health, the future of cities and hospitals: a case study of Tlemcen University Hospital, Algeria**
Catherine Simpson, Urban designer and landscape architect, HLM, UK

14.50 **Healing gardens in Italian architectures for health: a panorama's quali-quantitative evaluation**
Stefano Capolongo, Associate professor, Politecnico di Milano, Italy
Co-authors: Andrea Rebecchi, PhD candidate, and Gloria Triboli, student, Politecnico di Milano, Italy; Monica Botta, architect, Monica Botta Architetto, Italy

15.15 **Panel discussion**

15.30 **COFFEE, EXHIBITION AND POSTER GALLERY**

Wolfson Theatre

Session 6

Scientific advances, innovation and social change

Chair: Sylvia Wyatt, advisor, Age UK, UK

16.00 **Innovation, health and social change**
John Cooper
Director, John Cooper Architecture, UK

16.25 **Designing 'smarter hospitals': the impact of data and advanced analytics**
Christine Chadwick
National senior director, infrastructure solutions, GE Healthcare, Canada
Andy Day
Head of GE Partners group, GE Healthcare, USA

16.50 **Panel discussion**

Council Chamber

Session 7

Hospital design: intelligent modelling and mapping

Chair: Jim Chapman, Manchester School of Architecture, UK

16.00 **SMART hospital architecture: the development of a data-driven simulation model**
Johan van der Zwart
Researcher, Norwegian University of Science and Technology (NTNU), Norway
Tor Åsmund Evjen
Project manager BIM, St Olav's Hospital, Norway

16.25 **Building better healthcare – technologies to facilitate evidence-based design processes**
Fraser Greenroyd
Research engineer, Loughborough University, UK
Rebecca Hayward
Senior people-flow consultant, BuroHappold Engineering, UK
Shrikant Sharma
Group director, BuroHappold Engineering, UK

16.50 **Panel discussion**

Linacre Room

Session 8

Elderly care design: community and culture

Chair: Mungo Smith, director, MAAP Architects, Australia

16.00 **Potter Street redevelopment – a paradigm shift in residential care in Australia**
Allen Kong
Director, Allen Kong Architect, Australia

16.25 **One-stop Multi-Services Centre**
Alice Liang
Principal, Montgomery Sisam Architects, Canada
Helen Leung
Chief executive, Carefirst Group, Canada

16.50 **Panel discussion**

Wolfson Theatre

Session 9

Keynote plenary

Chair: Jonathan Wilson, principal and healthcare sector lead, Stantec, UK

Supported by: Stantec

17.00 **Keynote address: Hopeful ageing: the power of the arts and design to contribute to a life worth living**
John Zeisel
President and founder, Hearthstone Alzheimer Care, and the I'm Still Here Foundation, USA

17.40 **Panel discussion**

17.50 **Closing remarks**

18.30–22.00 **Welcome drinks reception, exhibition and poster gallery**
Osler and Long Rooms

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Council Chamber

07.30 **Breakfast workshop: Why design matters: a people-centred approach to healthcare**
Chairs: Helen Hamlyn Centre for Design, Royal College of Art; Design Council; HELIX Centre, Royal College of Art and Imperial College

Supported by: CRT HEALTH

A workshop to understand how user-centred design methodologies are applied in practice

John Mathers and Clare Devine, Design Council, UK

Rama Gheerawo, **Ed Matthews and Jonathan West**, Royal College of Art, Helen Hamlyn Centre for Design, UK

Matthew Harrison HELIX Centre, UK

Wolfson Theatre

08.00 **Registration opens**

Session 10

Keynote plenary
Chair: Robin Guenther, Perkins+Will, USA

Supported by: PERKINS+WILL

08.50 **Welcome and introduction**
Susan Francis
Architects for Health, UK

09.00 **Keynote address: Can healthcare heal our communities and the planet?**
Gary Cohen
Founder and president, Health Care Without Harm, USA

09.30 **Panel discussion**
Gary Cohen, Health Care Without Harm, USA; **David Pencheon**, director, NHS Sustainable Development Unit, NHS England; Anja Leetz, Health Care Without Harm Europe, Belgium

10.15 **COFFEE, EXHIBITION AND POSTER GALLERY**

Wolfson Theatre

Session 11

International hospital design: supportive and sustainable settings for children
Chair: John Cole, Queens University Belfast, Northern Ireland, UK

Supported by: AECOM

10.45 **Creating successful places – a vision for sustainable user-centred design**
Benedict Zucchi
Director of architecture, BDP, UK

11.10 **Innovation and the new Alder Hey Children's Hospital**

David Powell Development director, Alder Hey Children's NHS Foundation Trust, UK

Iain Hennessey Consultant paediatric and neonatal surgeon, Alder Hey Children's NHSFT, UK

David Houghton Project manager, Alder Hey Children's NHSFT, UK

Ged Couser Architect director, BDP, UK

11.35 **How things have changed: a 10-year comparison of three iconic Australian hospital developments**
Keith Davis
Director, health services, Norman Disney & Young, Australia

12.00 **Designing supportive settings for children and families**
Hieronimus Nickl
Architect, Nickl & Partner Architekten, Germany

12.25 **Panel discussion**

12.45 **LUNCH, EXHIBITION AND POSTER GALLERY**

Wolfson Theatre

Session 12

Integrated care: Designing across primary, acute and community care

Chair: John Hicks, AECOM, UK

13.45 **Learning from Ghana**
Polly Barker
Project director, TP Bennett, UK

14.10 **Harnessing flexible infrastructure to support the 'Five-year forward view'**
Steven Peak
Director, Vanguard Healthcare Solutions, UK
Sarah Lloyd
Anaesthetist, Lloyd's Healthcare Solutions, UK

14.35 **Outpatient, outreach: reframing urban design and mental health**
Guela Solow-Ruda
Partner, ARK, Canada

15.00 **Panel discussion**

Council Chamber

Session 13

Health capital investment, planning and design

Chair: Matthew Tulley, Great Ormond Street Hospital, UK

13.45 **A new capital investment model for Canada**
Cliff Harvey
Vice-president, North York General Hospital, Canada

14.10 **UCLH NHS Foundation Trust – the cancer services journey through transformation and innovation**
Kieran McDaid
Director of capital, estates and facilities, UCLH, UK
Tracey Middleton
Deputy director, estates and facilities, UCLH, UK
Alison Fawthrop
Head of healthcare planning, UCLH, UK
Jonathan Gardner
Cancer programme director, UCLH, UK

14.35 **Authoring for advocacy: writing a design brief on behalf of patients, families and staff at GOSH**
Stephanie Williamson
Deputy director, Great Ormond Street Hospital for Children NHS FT, UK
Louisa Desborough
Communications project manager, Great Ormond Street Hospital for Children NHS FT, UK

15.00 **Panel discussion**

Linacre Room

Session 14

Building the research base: workplace and patient room design

Chair: Jill Maben, King's College London, UK

13.45 **Physical design strategies to reduce patient falls**
Dr Debajyoti Pati
Professor and Rockwell endowment chair, Texas Tech University, USA

14.10 **Design matters for nurses: the role of workplace design in nurse attraction and retention**
Kieren Morgan
Principal, HASSELL, UK
Michaela Sheahan
Researcher, knowledge and sustainability, HASSELL, UK
Co-authors: Dr Lucio Naccarella, chief investigator, health systems and workforce unit, University of Melbourne, Australia; Professor James Buchan, global advisor, Queen Margaret University, UK

14.35 **What we learn about neonatal ICU design through behavioural observations of nurse activities**
Yilin Song
PhD student, Texas A&M University, USA
Co-author: Xuemei Zhu, associate professor, Texas A&M University, USA

15.00 **Panel discussion**

15.15 **COFFEE, EXHIBITION AND POSTER GALLERY**

Wolfson Theatre

Session 15

Nuero-architecture, mental health and behavourial change design

Chair: Chris Liddle, HLM, UK

15.45	**Neuro-architecture: how buildings influence the brain, body and behaviour** **Eve Edelstein** Director, Human Experience Lab, Perkins+Will, USA
16.10	**Culturally responsive design: case study of the new psychiatric hospital at Al Wakra in Qatar** **Mungo Smith** Director, MAAP Architects, Australia
16.35	**Panel discussion**

Council Chamber

Session 16

Environmental health and sustainable design

Chair: Duane Passman, Brighton & Sussex University Hospitals NHS Trust, UK

15.45	**Dell Children's Hospital: innovation and sustainable design of the first LEED Platinum hospital** **Nolan Rome** Senior vice-president and business development leader, WSP Parsons Brinckerhoff, USA
16.10	**Supporting human + environmental health** **Colin Rohlfing** Vice-president / director of sustainable development, biophilia, HDR, USA **Lily Livingston** Sustainable leader, biophilia, HDR, USA
16.35	**Panel discussion**

Linacre Room

Session 17

Humanising healthcare: art, poetry and culture

Chair: Susan Francis, Architects for Health, UK

15.45	**Creative approaches to engagement ease transition and support care at Southmead Hospital** **Jane Willis** Director, Willis Newson, UK **Ruth Sidgwick** Arts programme manager, North Bristol NHS Trust, UK
16.10	**Artists, poets and curators in hospitals: only a distraction** **Sue Ridge** Artist and lecturer, Chelsea College of Arts, UK **John Davies** Poet, UK
16.35	**Panel discussion**

Wolfson Theatre

Session 18

Keynote plenary

Chair: Chris Liddle, HLM, UK

16.45	**Keynote address: Designing for quality improvement in mental health services** **Lord Nigel Crisp** Independent member of the House of Lords and former chief executive of the NHS in England
17.15	**European Healthcare Design Awards 2016**
17.55	**Closing remarks** **Susan Francis and Chris Shaw** Architects for Health, UK

18.30–22.00	**Garden party** **Medicinal Gardens**

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P01 **Beyond the counselling workspace: spaces of significance in treatment of self-harm**
Stephanie Liddicoat (Australia)

P02 **Healthy circulation – an investigation into the design, impact and efficiency of circulation spaces in healthcare environments**
Marc Levinson (UK)

P03 **Interior elements required to relax users of family houses in Japan**
Junko Abe-Kudo (Japan)

P04 **The art of sustainability**
Susie Hall (UK)

P05 **Repeatable rooms and standardised components achieve clinical and cost efficiencies at Scarborough Hospital**
David Kershaw (UK); James Hayward (UK); Rosemary Jenssen (UK)

P06 **Biophilic design: the benefits for all of connecting healthcare spaces with nature**
Ged Couser (UK)

P07 **National policies for the inclusion of service users back into the neighbourhood**
Dr Evangelia Chrysikou (UK)

P08 **Application of building information modelling (BIM) to the design, construction and operations management of a complex proton-beam therapy facility in central London**
Paulina Zakrzewska (UK); Tahir Ahmed (UK); Kieran McDaid (UK); Professor Michael Pitt (UK)

P09 **The 10 biggest errors when choosing hospital flooring**
Carsten Klever (Germany); Guy Stanton (UK)

P10 **Health ironies – practising civic stewardship**
Arthur Acheson (UK); Marianne O'Kane Boal (UK)

P11 **Design-driven co-design of healthcare architecture**
Professor Peter Fröst (Sweden); Johanna Eriksson (Sweden); Göran Lindahl (Sweden)

P12 **The New QEII Hospital – a local hospital for a garden city**
Peter Liddell (UK); Jacqui Bunce (UK)

P13 **Children's hospital experiences**
Neil Orpwood (UK)

P14 **Assessing the complexity of a healthcare facility as an evaluation tool for reaching economic, social and environmental sustainability in hospital buildings**
Stefano Capolongo (Italy); Maddalena Buffoli (Italy); Marco Gola (Italy); Andrea Rebecchi (Italy)

P15 **Out-of-hospital emergency care: developing a model based on evidence from patients, family members and professionals**
Päivi Leikkola (Finland); Riitta Mikkola (Finland); Mari Salminen-Tuomaala (Finland); Eija Paavilainen (Finland)

P16 **Evaluation of hospital design strategies for future change**
Nirit Putievsky Pilosof (Israel); Yehuda E Kalay (Israel)

P17 **Shaping environments for the future – a look at Guernsey's mental health service**
Andrew Street (UK)

P18 **The P21+ Repeatable Rooms and Standard Components programme: the service-user perspective**
David Kershaw (UK); C Jones (UK)

P19 **User instructions: a way to optimise wellbeing benefits of gardens in healthcare facilities**
Dr Shulin Shi (Hong Kong)

P20 **Five-star service as standard: service design strategies for improving cancer care**
Jocelyn Bailey (UK); Zoe Stanton (UK)

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P21 **Meeting the terror challenge – improved health services planning for a large-scale terrorist attack**
Richard Look (UK); Shrikant Sharma (UK); David Greenwood (UK)

P22 **The choreography of care**
Cressida Toon (UK); Gary Toon (UK); Agata Zamasz (UK)

P23 **The power of patient, staff and community involvement in masterplanning for mental health and addictions: a lean-led approach**
Gina Kish (USA); Barbara Miszkiel (Canada); Isobel Keefe (Canada)

P24 **Best practices for integrated technologies in healthcare facilities**
Katie Wood (Canada); Justin Trevan (Canada)

P25 **More than just a broken body**
Moritz Spellenberg (UK); Thomas Best (UK); Kathryn Childs (UK)

P26 **Design innovation in emergency care**
Paul Bell (UK)

P27 **Art and design for health: a model for building innovation capacity to promote dignity and support inclusion**
James Moxey (UK); Ross Head (UK)

P28 **Designing for community-specific mental health – the Australian context**
Tracy Lord (Australia)

P29 **How do clinical institutions develop flexible clinical care clusters to encourage future disruptive discoveries to improve patient care?**
Louis Meilink, Jr (USA); Christine Grimes (USA)

P30 **Patient flow: design to improve patient flow through acute medicine**
Lais de Almeid (UK); Gianpaolo Fusari (UK); Ed Matthews (UK); Derek Bell (UK)

P31 **Future ICU: improving the patient experience of critical care**
Gabriele Meldaikyte (UK); Gianpaolo Fusari (UK); Ed Matthews (UK); Dr John Goldstone (UK)

P32 **Fitting a proton-beam therapy facility into your building**
Jill Reay (UK); Robert Hill (UK); Fearnley Evison (UK)

P33 **Inspiring hope through design**
Charles Stokes (UK)

P34 **A social sustainability approach to evidence-based birth environment design**
Mette Blicher Folmer (Denmark); Karin Jangaard (Denmark)

P35 **Negotiation in design: the participatory process in designing healthcare facilities of public hospitals in Thailand**
Soranart Sinuraibhan (Thailand); Saithiwa Ramasoot (Thailand); Supreeya Wungpatcharapon (Thailand); Kuanchai Kakaew (Thailand)

P36 **Landscapes for health: whose values, whose benefits?**
Bridget Snaith (UK)

P37 **Bringing proton-beam therapy to the UK**
Franko Covington (UK); Ranald MacKay (UK)

P38 **Engaging interiors**
Velimira Drummer (UK); Lynn Befu (USA)

P39 **Is there a relationship between seasonal changes in daylight hours and clinical measures in patients following deep brain stimulation (DBS) surgery? A feasibility study**
Rona Inniss (UK); Tina Day (UK); Jill Maben (UK)

P40 **Promoting the role of green space in healthcare interventions**
Colin Porter (UK)

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A01 Akershus University Hospital (New Ahus), Norway

A02 Alder Hey Children's Hospital, UK

A03 Ng Teng Fong Hospital and Jurong Community Hospital, Singapore

Healthcare Design (Under 25,000 sqm)

A04 Banbridge Health and Care Centre, UK

A05 Jim Pattison Outpatient Care and Surgery Centre, British Columbia, Canada

A06 Mother-Child and Surgical Centre, SZX Kaiser-Franz-Josef-Hospital, Vienna, Austria

A07 New QEII Hospital, UK

NHS Healthcare Design

A08 Alder Hey Children's Hospital, UK

A09 St Bartholomew's Hospital, UK

Mental Health Design

A10 Aabenraa Psychiatric Hospital, Denmark

A11 Clock View Hospital, UK

A12 Old See House, Belfast, UK

A13 Vallei project, Arkin Clinic, Netherlands

Design for Conversion or Infill

A14 St Pancras Public Mortuary, UK

A15 St Thomas' Hospital, East Wing – recladding, UK

Design for Health and Wellness

A16 Carefirst One-Stop Multi Services Centre, Ontario, Canada

A17 Wanarn Clinic, Western Australia, Australia

Interior Design and Arts

A18 Alder Hey Children's Hospital, UK

A19 New QEII Hospital, UK

A20 Three Bridges Medium Secure Unit, Thames Lodge, UK

Future Healthcare Design

A21 Al Maha Center for Children and Young Adults, UAE

A22 National Center for Cancer Care and Research, UAE

A23 Shanghai International Hospital, China

Design Research

A24 Assessing the value of design: the Bridgepoint PoE, Canada

A25 Clinic 20XX: Designing for an ever-changing present, USA

A26 Design matters for nurses, Australia

Design Innovation for Quality Improvement

A27 Axis Flo-Motion for Alder Hey Children's Hospital, UK

A28 Ava Recliner, USA

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Venue: Osler and Long Rooms
Date: Monday 27 June
Time: 18.30–20.30

Keynote address: Innovation, design and delivering world class healthcare
Sir Robert Naylor, chief executive, University College London Hospitals NHS Foundation Trust

The keynote address will be preceded and followed by a classical musical performance by the Royal Academy of Music.

Since its foundation in 1822, the Royal Academy of Music has made an inestimable impact on the musical landscape, both in the UK and abroad. Indeed, it has permeated the music profession at all levels, with Academy alumni including classical giants Sir Simon Rattle and Sir Harrison Birtwistle, along with pop stars Elton John and Annie Lennox.

Every year, talented young musicians from more than 50 countries come to the UK to study at the Academy, attracted as they are by world-renowned teaching and a rich culture that broadens their musical horizons.

The European Healthcare Design 2016 exhibition will also be open during the drinks reception.

GARDEN PARTY

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Venue: Medicinal Gardens
Date: Tuesday 28 June
Time: 18.30–22.00

Held outside in the informal surroundings of the medicinal gardens of the Royal College of Physicians, the European Healthcare Design 2016 Congress Garden Party will immediately follow the end of the congress and the European Healthcare Design Awards ceremony.

Celebrate with the winners in the Royal College's beautiful medicinal gardens. Opened in 1965, the gardens were extensively replanted in 2005–06, thanks to a generous grant from the Wolfson Foundation, and now feature more than 1300 plants.

Throughout the evening, a jazz quartet comprising students of the Royal Academy of Music will deliver 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 barbeque buffet dinner.

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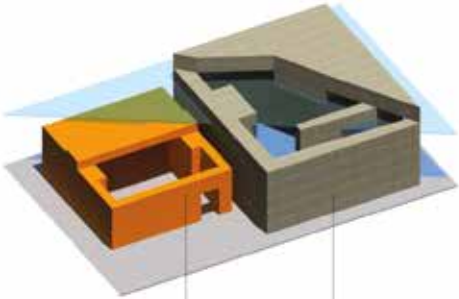

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Participants in the European Healthcare Design 2016 Congress will get the opportunity to join three unique study tours, featuring some of the latest benchmark UK healthcare projects and iconic landmarks.

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Study tour 1: London

(Maximum 25 participants)

Departure point: Melia White House Hotel
Date: 29 June, 2016
Time: 08.15–15.00

Architectural guided walk, South Bank

A relaxing way to get to know the English capital, this riverside tour along London's South Bank offers a chance to discover the City's Roman origins, and opportunities to view the Tower of London, Shakespeare's Globe theatre, Gothic churches, famous markets and pirate boats.

New Cancer Centre at Guy's Hospital

Scheduled for completion this autumn, the new Cancer Centre at Guy's Hospital, designed by Rogers Stirk Harbour + Partners and Stantec, will be a hub for southeast London, providing specialist cancer services, training, development and research. The centre will be divided into 'zones' or 'villages', with most of the related treatment facilities grouped in one place. Embedded artwork, use of light and outdoor spaces play a key part in creating a positive experience for patients, staff and visitors.

Lunch at the Shard

Lunch will be provided in a private dining area at Aqua Shard on level 31 of the tallest building in Europe, the iconic Shard, designed by Renzo Piano.

Fortius Clinic

Fortius Clinic is a newly built, two-floor facility in King William Street, London. At 12,000 sq ft, it has nine consulting rooms, as well as treatment rooms and a pain management centre. It also has a state-of-the-art imaging suite, including a 3T MRI scanner, ultrasound and X-ray. TP Bennett has designed the clinic to create a relaxed patient experience, with a light, spacious and welcoming feel, and clean, simple lines. The generous circulation spaces are curved and organic, eliminating the constriction associated with narrow corridors and keeping the space fluid and connected.

Study tour 2: London

(Maximum 25 participants)

Departure point: Melia White House Hotel
Date: 29 June, 2016
Time: 08.45–15.00

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University College London Hospitals (UCLH)

The day will feature presentations on the innovative design and construction techniques applied to UCLH projects, followed by tours of three sites that will deliver pioneering healthcare. The morning will provide an overview of UCLH's transformation journey and its approach to building information modelling (BIM). Focus will then turn to understanding the design challenges, solutions and lessons learnt from UCLH's Phase 4/ proton-beam therapy (PBT) project – one of only two UK sites that will be offering this specialist radiotherapy. The session will conclude with a look at the Macmillan Cancer Centre, with Steffian Bradley Architects and UCLH introducing the Phase 5 scheme – a pioneering centre for the diagnosis and treatment of conditions affecting the ear, nose, throat and mouth.

Phase 4 site, Macmillan Cancer Centre, Phase 5 site

The tour will begin at the Phase 4/PBT viewing deck. The full site is spread over nine floors – five above ground and four below – and involves one of the largest excavations ever seen in London. Taking just over 50 months to complete, the centre will welcome its first patients in 2019. The tour will then move on to the Macmillan Cancer Centre, before a visit to the Phase 5 site. Also scheduled for completion in 2019, the Phase 5 centre will deliver dental, hearing speech and balance services from two floors below ground and five above.

Lunch at the British Museum

Providing a refined dining experience with a casual feel, the British Museum's Great Court Restaurant is located on the upper level of the redesigned Great Court, the largest covered public square in Europe. Designed by Foster and Partners, the two-acre space is enclosed by a spectacular glass and steel roof, with the world-famous Reading Room at its centre. The roof was constructed out of 3,312 glass panes, of which no two are the same.

A f H ARCHITECTS FOR HEALTH

SALUS GLOBAL KNOWLEDGE EXCHANGE

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Study tour 3: Liverpool

(Maximum 15 participants)

Departure point: Melia White House Hotel
Date: 29 June, 2016
Time: 06.30–20.00

Alder Hey in the Park

The new Alder Hey Children's Hospital in Liverpool, which opened in October 2015, covers 65,000 sqm, contains 270 beds and cost £200m. The layout, by BDP, reflects the specifications of the children who helped steer the design from its inception – in particular, the desire to maintain contact with nature while in the hospital. Featuring green roofs and gardens, the Park wraps itself over and around the building. With an emphasis on high-quality personalised spaces for patients, the design provides 75% single bedrooms and impressive views of the surrounding parkland. The hospital's large technical core has 16 theatres, a 48-bed intensive care unit and a large imaging department.

Clock View Hospital

Clock View is the first of several projects identified for locality-based psychiatric services in Merseyside. The overarching aim of these projects is to modernise and de-stigmatise mental healthcare, by placing new facilities in easily accessible locations and helping regenerate the economy. The new hospital provides 80 inpatient beds for adult acute mental health and dementia services, in five pavilion wards – one of which provides a new psychiatric intensive care unit – in a landscaped setting. Each service user has their own private bedroom with ensuite, and access to a wide range of shared therapeutic activities. Each ward has its own safe private garden, accessible at all times.

We are proud to be the lead sponsor of the European Healthcare Design 2016 Awards

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The European Healthcare Design Awards 2016

Lead Awards Sponsor

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The European Healthcare Design Awards 2016 celebrate and recognise professional excellence in the design of healthcare environments both in Europe and around the world.

The European Healthcare Design Awards 2016 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.

Organised by Architects for Health and SALUS Global Knowledge Exchange, the awards comprise ten categories across primary, community, secondary and tertiary levels of international healthcare provision and delivery. They will be presented at an illustrious ceremony during the final session of the 2nd European Healthcare Design 2016 Congress & Exhibition on 28 June. It is intended that they will contribute towards the development of knowledge and standards in the design of healthcare environments around the world.

Recipients of the awards will be multidisciplinary project teams that have demonstrated 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.

Evaluation committee

The awards evaluation committee features international researchers, practitioners and policy advisors, who bring specialist multidisciplinary expertise to the specific categories they have been invited to judge.

The shortlist and winner of each award are determined by a category chair, supported by two other judges with proven expertise in their field. This robust evaluation methodology ensures a balanced and transparent decision-making process.

The award recommendations of the category chairs are then approved by a second review committee, chaired by Susan Francis, programme director, Architects for Health.

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GLOBAL KNOWLEDGE EXCHANGE

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:
Simona Agger, chair, European Health Property Network, Italy

Panel:
Trisha Down, head of health and capital planning, North Bristol NHS Trust, UK
Dr Diana Anderson, dochitect, medical planner, Stantec, USA

Shortlist

Akershus University Hospital, Norway. Commissioned by: Helse Sør-Øst RHF. Designed by: C F Møller Architects

Alder Hey Children's Hospital, UK. Commissioned by: Alder Hey Children's NHS Foundation Trust. Designed by: BDP. Civil and structural engineering by: WSP | Parsons Brinckerhoff. Environmental engineering by: Hoare Lea

Ng Teng Fong General Hospital and Jurong Community Hospital, Singapore. Commissioned by: Ministry of Health, Singapore, and Jurong Health Services. Designed by: CPG Consultants in collaboration with HOK and Studio 505 *(pictured)*

Longlist

Angel Women's and Children's Hospital, Chongqing, China. Commissioned by: Angel Group (Holding) Co. Designed by: Robarts Spaces

Bendigo Hospital, Australia. Commissioned by: Department of Health & Human Services, Victoria Government. Designed by: Silver Thomas Hanley, in conjunction with Bates Smart Architects. Engineering services designed by: Norman Disney & Young

Blacktown Mount Druitt Hospital, Clinical Services Building, Australia. Commissioned by: Health Infrastructure NSW. Designed by: Jacobs

Humber River Hospital, Toronto, Canada. Designed by: HDR Architecture

Kaari Hospital, Finland. Commissioned by: Kuopio University Hospital. Designed by: Lukkaroinen Architects

Oakville Trafalgar Memorial Hospital, Canada. Commissioned by: Halton Health Services. Designed by: Parkin Architects

Reinier de Graaf Gasthuis, Netherlands. Designed by: EGM Architecten

The new Royal Children's Hospital, Melbourne, Victoria, Australia. Commissioned by: Department of Health, Victorian State Government. Designed by: Billard Leece Partnership, in conjunction with Bates Smart Architects

South East Regional Hospital, Bega, NSW, Australia. Commissioned by: NSW Health Infrastructure. Designed by: BVN

St Bartholomew's Hospital, London, UK. Commissioned by: Barts Health NHS Trust. Designed by: HOK

University Medical Center New Orleans, USA. Designed by: NBBJ

University of North Carolina Hospitals, Hillsborough Campus, USA. Commissioned by: Louisiana State University. Designed by: ZGF Architects

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SYKEHUSBYGG

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:
Marte Lauvsnes, project and development hospital planning manager, Sykehusbygg, Norway

Panel:
Charlotte Ruben, architect, White Arkitekter, Sweden
Ganesh Suntharalingam, medical lead, NW London Critical Care Network, UK

Shortlist

Banbridge Health and Care Centre, UK. Commissioned by: Southern Health and Social Care Trust. Designed by: Avanti Architects with Kennedy FitzGerald Architects

Jim Pattison Outpatient Care and Surgery Centre, Canada. Commissioned by: Fraser Health Authority. Designed by: Kasian Architecture, Interior Design and Planning *(pictured)*

Mother-Child and Surgical Centre, SZX Kaiser-Franz-Josef-Hospital, Vienna, Austria. Commissioned by: City of Vienna. Designed by: Nickl & Partner Architekten AG

New QEII Hospital, UK. Commissioned by: NHS Hertfordshire. Procured and delivered by: Assemble Community Partnerships (NHS LIFT). Designed by: Penoyre & Prasad

Longlist

Battle Building at University of Virginia Health System, USA
Commissioned by: University of Virginia Foundation. Designed by: Stanley Beaman & Sears

Moura Community Hospital, Queensland, Australia
Commissioned by: Department of Health, Queensland. Designed by: Destravis

Qingdao United Family Hospital, China
Commissioned by: United Family Healthcare. Designed by: Robarts Spaces

Skandion Clinic, Sweden
Commissioned by: Akademiska Hus. Designed by: Link Arkitektur

Tamworth Hospital, Australia
Commissioned by: Health Infrastructure NSW. Designed by: McConnel Smith & Johnson

University of Arizona Cancer Center at Dignity Health St Joseph's Hospital and Medical Center, USA
Designed by: ZGF Architects

Supported by:

NHS Healthcare Design

An outstanding healthcare project in any setting for the UK's National Health Service (NHS) that demonstrates new design thinking to sustainably transform the quality of care services in a compassionate and humanistic environment for staff, patients and families.

Lead judge:
Beatrice Fraenkel, chair, Mersey Care NHS Trust, UK

Panel:
Duane Passman, director of 3Ts, Brighton & Sussex University Hospitals NHS Trust, UK
Karin Imoberdorf, partner, senior project manager, Lead Consultants, Switzerland

Shortlist

Alder Hey Children's Hospital, UK
Commissioned by: Alder Hey Children's NHS Foundation Trust
Designed by: BDP *(pictured)*
Civil and structural engineering by: WSP | Parsons Brinckerhoff
Environmental engineering by: Hoare Lea

St Bartholomew's Hospital, UK
Commissioned by: Barts Health NHS Trust
Built by: Skanska
Designed by: HOK

Longlist

Banbridge Health and Care Centre, UK
Commissioned by: Southern Health and Social Care Trust
Designed by: Avanti Architects with Kennedy FitzGerald Architects

Farnham Road Hospital, UK
Commissioned by: Surrey and Borders Partnership NHS Foundation Trust
Designed by: Managing CDM
Consultants: PM Devereux

Fremantle Court, UK
Commissioned by: Fremantle Trust
Designed by: Hunters

New QEII Hospital, UK
Commissioned by: NHS Hertfordshire
Procured and delivered by: Assemble Community Partnerships (NHS LIFT)
Designed by: Penoyre & Prasad

Three Bridges Medium Secure Unit, Thames Lodge, UK
Commissioned by: West London Mental Health Trust
Designed by: David Morley Architects

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:
Alice Liang, principal, Montgomery Sisam Architects, Canada

Panel:
Warren Kerr, national director, Hames Sharley; adjunct professor of architecture, University of Western Australia
Justin De Syllas, consultant, Avanti Architects, UK

Shortlist

Aabenraa Psychiatric Hospital, Denmark. Commissioned by: Region of Southern Denmark. Designed by: White Arkitekter *(pictured)*

Clock View Hospital, UK. Commissioned by: Liverpool & Sefton Health Partnership for Mersey Care NHS Trust. Designed by: Medical Architecture

Old See House, UK. Commissioned by: Belfast Health and Social Care Trust. Designed by: RPP Architects with Richard Murphy Associates

Vallei project, Arkin Clinics, Netherlands. Commissioned by: Arkin. Designed by: D/DOCK

Longlist

Farnham Road Hospital, UK
Commissioned by: Surrey and Borders Partnership NHS Foundation Trust
Designed by: Managing CDM
Consultants: PM Devereux

Fremantle Court, UK
Commissioned by: Fremantle Trust
Designed by: Hunters

Humber River Hospital, Canada
Designed by: HDR Architecture

South East Regional Hospital, Bega, NSW, Australia
Commissioned by: NSW Health Infrastructure
Designed by: BVN

Three Bridges Medium Secure Unit, Thames Lodge, UK
Commissioned by: West London Mental Health Trust
Designed by: David Morley Architects

Design for Conversion and Infill

An outstanding healthcare project that is small in scale but has a high transformational impact on resolving complex and difficult service design challenges in a location with significant constraints.

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

Panel:
Jane McElroy, principal, NBBJ, UK
John Jenner, consultant, Portal Architecture, UK

Shortlist

St Pancras Public Mortuary, UK
Commissioned by: London Borough of Camden
Designed by: Paul Murphy Architects *(pictured)*

East Wing Recladding at St Thomas' Hospital, UK
Commissioned by: Essentia, Guy's and St Thomas' NHS Foundation Trust
Designed by: Hopkins Architects

Longlist

Fortius Diagnostics Clinic, UK
Designed by: TP Bennett

Royal Belfast Hospital for Sick Children – MRI, UK
Commissioned by: Belfast Health & Social Care Trust
Designed by: AECOM

11 Harley Street, London, UK
Commissioned by: Howard De Walden Estates
Designed by: Sonnemann Toon Architects

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:
Liz Paslawsky, consultant advisor, SALUS Global Knowledge Exchange, Australia

Panel:
Chris Shaw, senior director, Medical Architecture, UK
Helina Kotilainen, architect, National Institute for Health and Welfare, Finland

Shortlist

Carefirst One-Stop Multi-Services Centre, Canada
Commissioned by: Carefirst Seniors & Community Services Association
Designed by: Montgomery Sisam Architects

Wanarn Clinic, Western Australia, Australia
Commissioned by: Ngaanyatjarra Health Service
Designed by: Kaunitz Yeung Architecture *(pictured)*

Longlist

Blacktown Mount Druitt Hospital, Clinical Services Building, Australia
Commissioned by: Health Infrastructure NSW
Designed by: Jacobs

Ng Teng Fong General Hospital and Jurong Community Hospital, Singapore
Commissioned by: Jurong Health Services
Designed by: CPG Consultants in collaboration with HOK and Studio 505

South East Regional Hospital, Bega, NSW, Australia
Commissioned by: NSW Health Infrastructure
Designed by: BVN

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:
Susan Francis,
programme director,
Architects for Health, UK

Panel:
Vicky Jones, freelance arts and creativity consultant, Australia
Pamela Bate, partner, Hopkins Architects, UK

Shortlist

Alder Hey Children's Hospital, UK.
Commissioned by: Alder Hey Children's NHS Foundation Trust.
Designed by: BDP

New QEII Hospital, UK.
Commissioned by: NHS Hertfordshire. Procured and delivered by: Assemble Community Partnerships (NHS LIFT. Designed by: Penoyre & Prasad with Art in Site *(pictured)*

A coordinated approach to art and interior design at Thames Lodge Medium Secure Unit, UK.
Commissioned by: West London Mental Health NHS Trust.
Produced by: Willis Newson working artists Alison Miller, Ali Brown and Sue Mayfield, and David Morley Architects.

Longlist

Blacktown Mount Druitt Hospital Clinical Services Building, Australia
Commissioned by: Health Infrastructure NSW
Designed by: Jacobs

GRIIDA Art Project – Guy's Hospital, UK
Commissioned by: Essentia, Guy's and St Thomas' NHS Foundation Trust
Designed by: ADP Architecture

Ng Teng Fong General Hospital and Jurong Community Hospital, Singapore
Commissioned by: Ministry of Health, Singapore, and Jurong Health Services
Designed by: CPG Consultants in collaboration with HOK and Studio 505

UCSF Medical Center, USA
Designed by: Stantec

Women's & Infants' Specialty Health (WISH) Department, Parkland Health & Hospital System, USA
Designed by: 5G Studio Collaborative

Supported by:

Future Healthcare Design

A future healthcare project that can demonstrate the potential for outstanding outcomes in masterplanning, place making, wellness and sustainability, 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:
Bas Molenaar, emeritus professor, Technical University Eindhoven, Netherlands

Panel:
Celeste Alvaro, principal and founder, CARE (Architecture + Health Research), Canada
John Cole, honorary professor, Queen's University Belfast, UK

Shortlist

Al Maha Center for Children and Young Adults, UAE
Commissioned by: Hamad Medical Corporation.
Designed by: HDR | Rice Daubney

National Center for Cancer Care and Research, Doha, Qatar. Commissioned by: Hamad Medical Corporation.
Designed by: Stantec *(pictured)*

Shanghai International Hospital, China
Commissioned by: Parkway Health. Designed by: HOK

Longlist

Adana High Security Psychiatric Hospital, Turkey
Commissioned by: Ronesans Holding
Designed by: Perkins+Will

Al Amal Hospital, UAE
Commissioned by: UAE Ministry of Public Works
Designed by: KMD Architects

Al Wakra New Psychiatric Hospital, Respite and Recovery Centre (Hamad Medical Corporation), UAE
Commissioned by: Private Engineering Office
Designed by: MAAP Architects

Brighton and Sussex University Hospitals – Teaching, Trauma and Tertiary, UK
Designed by: BDP

Centre Hospitalier de l'Université de Montréal, Canada
Commissioned by: Construction Santé Montréal
Designed by: CannonDesign and NEUF architect(e)s

Istanbul Ikitelli Integrated Health District – Basaksehir Hospital, Turkey
Commissioned by: Rönesans Holding
Designed by: Perkins+Will

Manchester Proton Beam Therapy Centre, UK
Commissioned by: Christie NHS Foundation Trust
Designed by: HKS

Proton Beam Therapy Centre, UCLH, UK
Designed by: Scott Tallon Walker Architects

Royal Hospital for Sick Children and Department of Clinical Neurosciences, Edinburgh, UK
Commissioned by: NHS Lothian
Designed by: HLM

Royal Liverpool University Hospital, UK
Designed by: NBBJ

Zentralinstitut für Seelische Gesundheit, Mannheim (ZI) – Central Institute of Mental Health J4, Germany
Designed by: HDR | TMK Planungsgesellschaft

Design Research

An independently assessed, completed research study that can demonstrate current relevance and practical application in the design of healthcare services and environments. The research should show application of a rigorous methodology, and how it is supporting innovation and inspiring future studies.

Lead judge:
Dr Ruzica Bozovic Stamenovic, associate professor, University of Belgrade, Serbia

Panel:
Dr Linda Jones, senior lecturer, Massey University, New Zealand

Shortlist

Assessing the value of design: the Bridgepoint PoE. Authored by: Celeste Alvaro, Deyan Kostovski and Andrea Wilkinson

Clinic 20XX: Designing for an ever-changing present. Authored by: Upali Nanda PhD, and team. Center for Advanced Design Research & Evaluation, HKS

Design matters for nurses. Authored by: Dr Lucio Naccarella, University of Melbourne, and Prof James Buchan, Princess Margaret University, Edinburgh. Research partner: HASSELL. Funded by: HASSELL and Australian Commonwealth Department *(pictured)*

Longlist

Beyond the counselling workspace
Stephanie Liddicoat, University of Melbourne

Building better healthcare
Fraser L Greenroyd, research engineer, Loughborough University, Dr Rebecca K Hayward, senior people-flow consultant, BuroHappold Engineering, and Dr Shrikant Sharma, group director, BuroHappold Engineering

Critical care design
Dr Diana Anderson, dochitect, medical planner, Stantec, and Dr Neil Halpern, chief, critical care medicine service, Memorial Sloan Kettering Cancer Center, USA

Health planning and facilities briefing system
Rick Shands, director and projects manager, Total Alliance Health Partners International (TAHPI)

Improving hospital efficiency through data-driven management
Janice C Blanchard, adjunct affiliate researcher, RAND, and Robert S Rudin, information scientist, RAND

Open room for future healthcare environments
Professor Stefano Capolongo et al, Politecnico di Milano

Smart hospital architecture: the development of a data-driven simulation model
Dr Johan van der Zwart, researcher, NTNU, Dr Sylvia Elkhuizen, assistant professor and coordinator of healthcare logistics, Institute of Health Policy and Management, Netherlands, and Tor Asmund Evjen, project manager BIM, St Olav's Hospital

Design Innovation for Quality Improvement

A technological or product innovation that has had a transformational impact on the design of healthcare services and/or the patient experience, improving the quality, efficiency and accessibility of care in a specific healthcare setting or across the continuum of primary, community and secondary care.

Lead judge:
Eve Edelstein, director, HxLab, Perkins + Will, USA

Panel:
Colum Lowe, independent design and design management consultant, Being, UK
Christine Chadwick, national senior director, infrastructure solutions, GE Healthcare, Canada

Shortlist

Axis Flo-Motion for Alder Hey Children's Hospital, UK
Designed by: Axis Automatic Systems and BDP

Ava Recliner
Designed by: 5d Studio
Developed by: Nemschoff *(pictured)*

Longlist

Barrier-free bathrooms, Sweden
Designed by: Väinö Korpinen

Centralised Coordination Centre at Health First, Florida, USA
Designed by: TeleTracking Technologies

Dräger Polaris 600 surgical light, UK
Designed by: Drägerwerk AG & Co and Draeger Medical UK

Nigel Edwards (UK)

Chief executive
Nuffield Trust

Keynote address: Design principles for service delivery

There are some odd design 'rules' in healthcare. They include: the obsession with organising around medical disciplines rather than patient problems; the disconnection between primary and home care; the common occurrence of the sickest patients being seen by the most junior doctor; and the system of outpatient care, which could be viewed as nothing more than patient storage.

But, according to Nigel Edwards, a set of new design principles for service delivery is beginning to take shape and challenge the old concepts. Some, such as standardising where appropriate, and centralising where necessary and decentralising where possible, already apply in many health systems.

Others are still gaining influence and include: understanding the population's health needs and creating systems that allow for services to be matched to patient characteristics based on need and risk; developing the capability to deal with the complexity of patient needs and matching these to services; focusing on flow and aligning the different parts of the health system and the pace at which they work; and managing a system rather than individual institutions.

Other new design principles for the delivery of modern health services include: sharing information for coordination, continuity, improved access, etc; focusing purposefully on the design and improvement of the health system; considering the measurement of outcomes and key processes; and working closer with the wider community.

Keynote address: New models of care: transforming quality, access, efficiency and patient experience

In January 2015, the NHS invited individual organisations and partnerships to apply to become 'vanguard' sites for the new care models programme, one of the first steps towards delivering the 'Five Year Forward View' and supporting improvement and integration of services.

The first 29 vanguard sites were chosen in March of that year. There were three vanguard types: integrated primary and acute care systems; enhanced health in care homes; and multi-specialty community provider vanguards.

Eight urgent and emergency vanguards were added in July, before a further 13 vanguards were announced in September. Known as acute care collaborations, this most recent wave aims to link local hospitals together to improve their clinical and financial viability.

In total, 50 vanguards were selected following a rigorous process, involving workshops and engagement of key partners and patient representative groups. Each vanguard site will take a lead on the development of new care models, which will act as the blueprints for the NHS to redesign and restructure itself, as well as provide inspiration to the rest of the health and care system.

The vanguards are already improving the care received by millions of people across England. Through the programme, complete redesign of whole health and care systems is under consideration. This could mean fewer trips to hospital, with cancer and dementia specialists holding clinics in local surgeries, creating one point of call for family doctors, community nurses, and social and mental health services, or improving access to blood tests, dialysis or even chemotherapy closer to home.

It will also join up the often confusing array of A&E, GP out-of-hours, minor injuries clinics, ambulance services, and 111, so that patients know where they can get urgent help easily and effectively, seven days a week.

Sam will provide an update on the programme and highlight some of the key lessons to date.

Sam Jones (UK)

Director – new care models programme
NHS England

Keynote address: Hospitals without walls: the future of health

Changing patterns of disease have led to an over-reliance on specialists, yet there is a lack of coordination of clinicians with specialist expertise, as well as an increasing disease burden on society. Issues of poor quality care and unsafe environments, too, are never far from the headlines, and are symptomatic of a systematic breakdown in care.

Healthcare in the 21st century needs to look beyond the four walls of the traditional hospital and become a more agile, dynamic and fluid service focused around a patient type increasingly likely to present multiple, chronic health problems.

Patients in the 21st century require a holistic approach to meeting all their clinical, care and support needs. They need collaboration at all levels and across all sectors, including health, social care, housing and local government.

Medical care and support teams should be organised around the needs of patients. Specialist care needs to be delivered closer to home and beyond the walls of the hospital. And to provide a continuity of care, the role of generalists will not only need to change but be valued as much as specialists.

In an effort to put this thinking into practice, the RCP, in 2012, established a Future Hospital Committee to deliver a programme and policy context underpinning an agenda for transformation. Following the committee's report in 2013, four development sites were launched to explore future hospital and new care model concepts. Three of the four development sites are focused around improving care of frail older patients, while the fourth aims to streamline the care of patients admitted via acute medical admissions services.

Ian will update the congress on the Future Hospital programme and provide insight on the lessons for evolving and refining the concept of the hospital without walls to deliver holistic and coordinated care for patients, whether they are in hospital or in the community.

Ian Bullock (UK)

Chief executive
Royal College of Physicians

Hamish Dibley (UK)

Independent management consultant
Dibley Consulting

Understanding patient demand: a better way to make the NHS work

The NHS must change the way it operates to effectively meet future challenges. The starting point for improved services at less cost rests on more intelligent use of data to inform future performance improvement through system and service redesign.

The NHS has exhausted other 'misguided' approaches – for example, standardising; over-medicalising; functionalising; and commercialising operations. Today, we need to humanise healthcare and focus as much on care needs as medical treatments.

To this end, Hamish Dibley has pioneered a new and refreshing approach to healthcare analysis: the Consumption Demand Method. This alternative approach to realising better healthcare services and less cost begins with looking at healthcare data not from an activity perspective but from a patient-centred one. Unlike existing practice, this method establishes time-series data to interpret the true nature of person demand for acute services, in order to better understand the root cause(s) of service challenges facing commissioners and providers alike.

Understanding patient demand is the first step in arriving at intelligent system and service redesign solutions around patient cohorts. This informs a more integrated and preventive system that will successfully alter the nature and consumption curve for care, and reduce costs across the system.

This approach outlines the true nature and type of patient demand facing acute trusts and clinical commissioning groups (CCGs). It provides for innovative thinking as to how to propose future improvement schemes, not only to reduce patient demand but also to better respond to, and therefore manage, such demand. This latter aim requires proof of concepts to test new approaches and processes with a small cohort of patients.

This work serves to inform and constructively challenge current cost improvement plans and quality improvement programme planning, as well as provide the basis for broader schemes, such as vanguard projects or joint improvement work with CCGs. Moreover, this approach helps provide a different approach to addressing the principal performance challenges facing all healthcare economies – eg A&E breaches, delayed transfers of care, and waiting time lists for planned care.

The 2030 Plan: processes and tools for system-wide health service, infrastructure and masterplanning

In an unprecedented Canadian study, Alberta Health Services (AHS) commissioned the 2030 Plan, with the objective of creating an evidence-informed, sustainable, high-performing healthcare system to the year 2030.

The 2030 Plan addresses health services and infrastructure requirements for quaternary, tertiary, secondary and community-based services for a projected population of approximately 2 million people. Key drivers for the project were 'status quo' projections that were deemed financially unsustainable, as well as the imperative to reduce the operational and capacity pressures on the facilities due to population growth and existing patterns of health service delivery.

The project included three phases: current state assessment of services and facilities; development of zone-wide clinical service plans, supported by multi-year infrastructure strategies; and site-specific masterplans, of which two of three reflect campuses of multiple healthcare providers.

Clinical service plans and multi-year infrastructure strategies were developed for all health services, including: primary care; emergency medical services; acute care programmes; quaternary regional services; mental health/addictions; public health; rehabilitation; and selected long-term care services.

The planning phases required the engagement of thousands of staff and physicians. A broad range of planning processes, approaches and tools were developed, including an interactive built-space database linked to digital drawings; questionnaires that used lean-informed criteria to assess the quality and functionality of built spaces; and the application of data, best practices and other evidence to models of care and service delivery, as inputs into clinical service planning.

A tool was created to age physical infrastructure over time to predict the availability and quality of healthcare spaces to the year 2030. As each of the three sites' masterplans were developed, additional tools were created, including: methodologies to convert high-level service plans to space requirements; a model to allocate services between sites/providers; and an online tool to assess the high-level quality/functionality of 200-plus existing buildings.

This presentation will describe how the 2030 Plan was conducted, present examples from the project's range of tools, and summarise key lessons learned from this complex undertaking.

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Humber River Hospital
Toronto, Ontario, Canada

Schwarzwald-Baar Hospital
Villingen-Schwenningen, Germany

The P3 hospital as cultural centre: the architecture and public spaces of the new Centre Hospitalier de l'Université de Montréal

Hospitals are for the public: users that inhabit these spaces are the community whose wellbeing is paramount. The fostering of social cohesion and inclusion informs the integrated and compassionate design of space for the individual.

Occupying two full blocks in downtown Montréal, the Centre Hospitalier de l'Université de Montréal (CHUM) is one of North America's largest academic medical centres, and the most important public-private partnership (P3) hospital venture in Canada's history. The 334,170 sqm hospital will serve 345,000 ambulatory patients, 22,000 inpatients, and 65,000 emergency patients each year. It will encompass 35 disciplines and provide 772 single-patient rooms, as well as ambulatory and diagnostic centres, surgery, intensive care, clinical laboratories, and a research centre.

The CHUM was envisioned to act as a place to heal with dignity and as a place of gathering. It would aspire to function as a generous public space that performs several cultural roles – as a gallery (with the highest concentration of public art in Montréal), educational centre (with more than 5000 students, and libraries), and public sanctuary (with intuitive wayfinding and gardens woven into its 20 storeys). The purpose of the CHUM is to unify three outdated healthcare facilities into one massive patient-led facility, while preserving the community needs and promoting a singular identity of a culture of care and wellbeing for all.

Radical phasing and reorganisation of the hospital provided 85% of the hospital's clinical functionality during the first phase of construction, including all beds, operating theatres and diagnostics services. The design features standardised rooms and processes to promote quality of care and reduce error, through use of leading-edge communication and logistics technology. The process of integrating the CHUM team involved the use of BIM, which also helped in tracking and quantifying all equipment, allowing for efficiencies and avoiding waste.

The CHUM's ambition is to become an architectural pillar within its community and a symbol of excellence in healing, while committing to providing public art and cultural space for the region. Acting as a spark for the re-development of an under-utilised area and providing world-class community care, the CHUM creates a space for all to heal.

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A world-class university hospital for a new health system in Stockholm

The New Karolinska University hospital (NKS) is a point of departure for a new healthcare system in Stockholm County Council. The project is focused on quality improvement and patient safety, designed to meet future demands for new treatment models. The design aims to support medical staff work in an interdisciplinary way. It is a flexible building prepared for rapid changes in treatment methods, and it will facilitate collaboration between clinic, research and education.

Objectives

In 2016, the first patients will arrive at the NKS, a new 330,000 sqm facility in Stockholm with 650 single-patient rooms. The hospital is integrated with a new urban development connecting to other knowledge hubs and universities. Healthcare will be provided thematically with close links between buildings and departments.

Methodology

The proposal for the NKS resulted from an architectural competition in 2006, during which a study was conducted to understand the trends in university hospital development, focusing on healing environments, R&D integration, flexibility, urban integration and sustainability. The research, which analysed successful university hospitals in the USA, Netherlands and UK, informed the proposal.

Results

The project has set new standards in technical requirements and patient-centric care. It also considers the environment's impact on patients and staff. The research led to the application of four key attributes: a public space in an urban context; a hub for innovation; a dynamic, flexible workplace; and a safe place for healing.

Conclusions

The goal is to achieve the Gold level in Environmentally Classified Building standard and, at least, Gold level in LEED. There are lessons, however, around the clinical design process. The final programme was decided in 2013, after final 'sign-off'. This caused issues regarding flexibility around healthcare delivery, and limits for expansion. There should have been more focus and transparency on costs for remodelling. Scale and timetables also proved challenging.

Implications

The NKS project is a model for a new generation of hospitals in Sweden, including Linköping and Uppsala University Hospital, Danderyd Acute Hospital, and a new operation and intervention centre at Huddinge Karolinska. To achieve a successful outcome, future hospitals must be designed to be attractive, safe and flexible.

Humber River Hospital: digitalisation drives a new standard for healthcare facility design and operation

The first fully digital hospital in North America, Humber River Hospital serves a diverse, multi-cultural, urban community of more than 850,000 in north-west Toronto. Humber's 'lean, green, digital' project vision underpins the redevelopment. The new 656-bed, 1.8m sqft, acute-care facility is planned to treat 97,400 emergency department patients, deliver 5300 newborns, perform 19,900 inpatient and 20,670 outpatient surgeries, and support 192,700 on-site clinic visits annually.

As a greenfield redevelopment project, Humber provided an opportunity to reimagine hospital design and the way patient care is delivered. The project allowed Humber's planning team to utilise lean process improvement analysis and redesign, employ clinical planning best practices, optimise sustainable design methodologies and apply digital technology to allow staff to spend more time with their patients as well as to provide faster, more accurate diagnosis and treatment.

Humber's design is at the cutting edge of health care delivery. The project vision is articulated through six guiding principles:

- Lean, green and digital: deploy a fully interoperable digital platform to sustainably drive optimal operational efficiency and improve patient outcomes;
- Strategic planning imperatives: align key clinical adjacencies to strategically consolidate services, optimise clinical functionality and improve flow ;
- Patient-centered and outcome driven: employ evidence-based design to drive improved patient outcomes and to focus on the patient and their family's needs;
- Workplace of distinction: leverage the capabilities of Humber's greatest asset, their staff
- Community and civic importance: embrace the institutional importance of Humber as a source of community/civic pride; and
- Partnerships: foster beneficial partnerships with each of Humber's constituents.

Humber's vision resulted in the first fully digital hospital in North America; however, the new Humber River Hospital focuses on patient care, not technology. Technology is an enabler, a resource and a tool. By integrating the latest digital technologies across all systems of a large, urban academic hospital, care providers are better able to accomplish their primary task: patient care.

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Designing our way out of emergency

What is it that distinguishes the design of a poor, acceptable or excellent emergency care centre, and can design play a significant role in alleviating these service pressures?

In 2004, the UK Government introduced the four-hour stay target. This required 98% of patients attending A&E to be seen and discharged within four hours. The target was later lowered to 95%, recognising that some patients with complex conditions take longer to diagnose.

Methodology

The new target initiated a wave of A&E upgrades, embracing a root-and-branch redesign of both process and environment. Exemplar emergency centres around the world were identified and scrutinised. Innovations emerging from this work were: rapid streaming and registration on entry; separating off minor illnesses and injuries into a distinct centre; separate children's areas; flexible see-and-treat zones; central staff bases; and close-by observation and assessment wards.

Results

The priority to transform emergency services was picked up in the 'Five Year Forward View', published by NHS England and others in 2014, leading to the publication of 'Safer, faster, better: good practice in delivering urgent and emergency care' in August 2015.

This latter document offers best practice principles pointing to more integrated environments that promote cross-discipline/multi-speciality assessment with accelerated access to speciality care if needed. Also addressed is the need to improve patient and staff experience.

In parallel, a programme of emergency department reconfigurations has been rolled out in England, with some innovative but contrasting approaches: the Queen Elizabeth Emergency Care Centre (Gateshead), the Worthing Hospital Emergency Floor, and the Northumbria Specialist Emergency Care Hospital (Cramlington). In the US and Canada, innovative projects have focused on streamlining processes and repositioning the emergency department as a key portal to secondary and other forms of care. Examples are the Nanaimo Emergency Department on Vancouver Island and the Universal Care Centre at University Wisconsin Health.

Conclusions

What are the lessons from this latest period of innovation and how can design of the physical environment help prevent systemic collapse? At the same time, how can design ensure that patients and staff are reassured and supported? This presentation will answer these questions and draw on examples from the UK, US and Canada.

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Critical care design of tomorrow: how technology fits in

Advances in networking and remote monitoring capabilities have already begun to redefine the physical and organisational boundaries of the intensive-care unit (ICU). Although commonly thought of as a self-contained unit, the ICU draws on informatics resources located outside the physical space of the unit.

Purpose

The main objective of deploying advanced informatics in the modern ICU is to electronically integrate the patient and all aspects of patient care with hospital and ICU informatics systems. The second goal is to transform all patient-related data into actionable information using smart technologies. This session will explore both the operational and design requirements needed to ensure this connectivity.

Methods

New technologies are changing the interface of care collaboration and patient monitoring, requiring ICU design strategies that can incorporate them. These issues will be explored through the perspectives and experiences of an intensivist in critical-care medicine and a healthcare architect trained in internal medicine. Accounts of advanced informatics in the critical-care environment will be discussed via case studies, design guidelines and project examples.

Results

Smart ICU infrastructure necessitates a connectivity envelope that encompasses the patient, medical devices, healthcare staff, and pharmacologic and other care elements. This requires integration of bedside wired and wireless infrastructure, connectivity hardware in the patient room, medical devices to transmit their data, and placement of middleware (software that connects medical devices with the hospital's operating systems) on hospital and ICU networks.

Real-time locating solutions can improve management and workflow by tracking tagged assets, monitoring device usage, and controlling product inventory. Devices can be monitored by middleware, thereby supporting web-based device viewing, alarm transmission and remote troubleshooting. New informatics systems can transform data into actionable information, highlight the most important patient alarms, and enhance infection control and patient room management.

Conclusions and implications

The future ICU will require a robust life-support system capable of organising information and creating a connectivity envelope around the patient, which interfaces with the ICU and hospital networks. A deep understanding of advanced informatics and use of new technologies in the practice of critical care are vital to the future of ICU design.

Designing technology: mapping professional healthcare figures with personas for P4 medicine

The concept of P4 medicine, representing a predictive, preventive, personalised and participatory medicine, is rapidly emerging as a new proactive discipline aiming not only to treat patients' diseases but also, and more importantly, to improve the overall wellbeing of people. Better use of data and technology has the power to address some of the P4 challenges, transforming the quality of the healthcare system while reducing the cost of services. The design of e-health services therefore plays a key role in supporting P4 objectives.

In this paper we contribute a functional redefinition, as well as an extension, of a well-known design tool: personas. While the different perspectives and aims on the personas tool have been extensively explored, we concluded that a more articulated tool specifically crafted for the e-health domain is needed. Indeed, supporting P4 goals implies being able to design services that match the end users' expectations of trust, and customise them according to users' technology proficiency and professional behaviour.

The new definitions adopted for classifying users come from recent literature. Trust is of paramount importance in effectively supporting P4 goals, which exploit highly sensitive data. In this case, we found it interesting to consider the following class: information controllers, security concerned, benefit seekers, crowd followers, and organisational assurance seekers. Technology proficiency is another relevant dimension in supporting P4, eg to enable means for the identification of optimal therapy while reducing trial-and-error prescribing.

We segment users according to the following standard marketing-related classes: innovators, early adopters, early majority, late adopters, and laggards. Finally, the professional behaviour of the end-users of our services is classified by exploiting the CIPD HR profession map behaviours: curious; decisive thinker; skilled influencer; personally credible; collaborative; driven to deliver; courage to challenge; and role model. Importantly, the CIPD HR professional map defines not only the classes but also a list of "contra indicators" to help the service design activity.

Notably, our functional redefinition of the personas tool enables the mapping of numerous and heterogeneous stakeholders into play in health-related environments, delivering a practical and effective tool in real-life R&D departments, as well as hospitals and care delivery organisations.

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Healing gardens in healthcare – the necessity of nature

Mounting evidence supports the notion that exposure to nature reduces stress and has a positive healing effect. Healthcare organisations are increasingly embracing the importance of providing on-site outdoor space. However, there is often a disconnect between what research and best practice recommends, and the design of outdoor spaces provided.

This presentation will: summarise the basic research and two overlapping theories; present examples of successful and less successful healthcare outdoor space; suggest reasons for the disconnect between design recommendations and what is actually created; and, finally, propose policy recommendations that may offset the apparent disconnect.

In 1984, Roger Ulrich's seminal paper, 'The view from the window', documented the fact that patients recovering from surgery who had a view to trees recovered faster than those facing a brick wall. The medical world began to acknowledge that trees and greenery were not just cosmetic niceties but may actually lessen the time that some patients are in hospital, and thus positively impact the bottom line. Two overlapping theories sought to explain the healing effects of nature.

Supporting stress-reduction theory were physiological measures documenting stress reduction after as little as 5-10 minutes' exposure to nature; while attention restoration theory documented that exposure to nature restores a person's ability to focus after too long a period of mental fatigue. It could be argued that the first of these theories applies more to patients in healthcare, while the second applies more to staff. Research will be presented documenting the very positive reactions of both patients and staff when provided with access to, or views of, nature.

Around the world, many examples of therapeutic outdoor spaces in healthcare have appeared – sometimes called "healing gardens". Many are successful – perhaps on account of the use of evidence-based design or a participatory design process, or because the designers appreciated what was needed. Unfortunately, others are less successful, either because they comprise mostly hardscape with little greenery, lack physical access, or provide minimal basic requirements such as shade, seating, smooth pathways, etc.

Policy recommendations will be suggested, such as those of the US Green Building Council and JCAHO (Joint Commission for the Accreditation of Hospital Organizations), which go some way to ensuring that accessible outdoor space is provided. Future recommendations, however, would also need to set out those basic elements that are necessary without curbing designers' creativity.

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Designing greenspace for health, the future of cities and hospitals: a case study of Tlemcen University Hospital, Algeria

Global urbanisation is occurring at an unprecedented pace, with more than half of the world's population living in cities – a statistic set to rise to 70% by 2050. Understanding the effects of the built environment on health is therefore critical. While city living confers many benefits, the negative influences of the urban environment and nature deprivation on human health are becoming better understood: both lifestyle and mental health issues are on the rise at a potential cost of billions to governments.

As healthcare turns towards preventive health, the upstream benefits of an intelligent built environment with access to nature, social, recreation and environmental support become evermore apparent. Growing evidence is suggesting, more clearly than ever, that natural environments are essential to human health. There is also a growing evidence base for placing the provision of natural environments firmly within both health and planning policy.

This paper is based on a research paper presented at Milan Expo for Great Weeks/Healthcare UK and UKTI. The paper sought to evaluate the latest international research on four key areas: the global effect of urbanisation on human health; the effect of natural environments versus urban environments on health; the theoretical underpinnings of this link (eg biophilia, savannah view theory, etc); and the relationship between therapeutic environments in hospitals and therapeutic environments in cities.

The paper examined both historic and innovative ways in which these natural environments and biophilic elements can be cleverly and sustainably incorporated into hospitals and the built environment to improve health and mental wellbeing. This includes a flagship hospital project designed in Tlemcen, Algeria, in which the hospital is placed within a 32 hectare site with expansive parkland – contributing not only to patients' wellbeing and care but the public need for parklands in a growing city. With examples provided, the presentation makes the case for far greater links and awareness between researchers, designers, and health and planning policymakers, as well as firm legislation and planning policy.

Healing gardens in Italian architectures for health: a current national panorama's quali-quantitative evaluation

The importance of therapeutic green spaces in healthcare facilities has been scientifically demonstrated through international experiences. In Italy, there are many cases studies of green areas within built social and health structures, but only some of these follow the principles of healing gardens.

A healing garden offers wellbeing benefits of a social, physical and psychological character, as it: creates opportunities for active movement and physical activity; offers the chance to make choices, seek out privacy, and experience a sense of control; and provides access to nature and other positive distractions, such as situations that encourage people to come together.

Objectives

The research aims to emphasise the green characters of five existing hospitals in Lombardy, in order to understand the perception of the healing spaces inside and outside the building and the related qualifying characters. The study analyses the relationship between indoor and outdoor spaces in visual and spatial realisation, according to the healing gardens' characteristics. The outdoor spaces are qualitatively observed and quantitatively compared, in order to determine the effectiveness of the planning and assume any improvements for suitable and successful use of gardens.

Methodology

The outdoor areas characterised as a "healing garden" are evaluated using a tool for environmental audit, covering the basics of design from previous research and practical experiences (Marcus and Sachs, General Design Guidelines for Healthcare Facilities). In particular, they are evaluated for: safety, security and privacy; accessibility; physical and emotional comfort; positive distraction; engagement with nature; maintenance and aesthetics; and sustainability.

The relationship between the (indoor) built environment and (outdoor) green areas has been designed according to the accessibility and visibility of the sample. In order to understand which relationships between the built environment and open spaces induce people to look and venture out, the areas were verified according to: the views of green space from the hospital's rooms; the openings and accessibility of facilities; materials; and signage.

Discussion

The study shows that in Italian healthcare architecture today, access to nature and outdoors spaces needs to be better understood through specific design guidelines, which should aim to have a significant impact on users' behaviour and, ultimately, the health of patients.

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Innovation, health and social change

A common theme in science fiction is a world in which extraordinary technological advances have advantaged a few, while political instability, incompetence or greed have created a dystopian existence for the majority. Are health systems, in perception or reality, beginning to create such situations?

This presentation examines: the advances taking place in healthcare in smartphone telemedicine, miniaturisation, nanosensors, robotics, and pharmaceutical/genomics; their co-existence with system failure and a polarising society; their ability to extend medicine's reach to the developing world; the changes that they will catalyse in health professions and buildings types; and the likelihood of their narrowing or widening the health gap between rich and poor.

Futurology can be hit and miss, but we can predict the following:

1. Rapid, cheap and remote diagnosis will widen medicine's reach to the developing world, shaping policy and planning.
2. These changes will take place in the short to medium term.
3. It is believed that we're around five years away from the 'Tricorder' complete diagnosis of a person's health. Nanosensors will become available that can measure tiny changes in body chemistry, coupling diagnosis with prevention. These will have several consequences: extending the personalisation of healthcare through mass distribution of handheld diagnostics; providing very early diagnosis of cancer; changing the relationship between patient and physician; and mirroring the changes in office computing and communication from mainframe to desktop in diagnostic pathology. The cost and availability of these tools will determine whether the health gap widens or narrows.
4. The explosion of smartphone health apps and the increasing availability of remote monitoring could have many social and economic consequences – for example: creating hospitals that become acute medicine centres attached to 'roomless data surveillance centres for remote monitoring'; the significant cost differences between remote and face-to-face consultation may create a two-tier system for both physicians and patients; and the personalisation of healthcare may shift responsibility to the individual with consequences on insurance-based healthcare systems in terms of proactive engagement and penalties.

These changes will take place within health systems that have huge staffing and financial challenges, as well as ever-greater political pressures. The result will be that first and third-world health provision will co-exist within the same organisations.

Designing 'smarter hospitals': the impact of data and advanced analytics

As global health systems face up to the dual challenge of rapidly rising demand set against increasingly stretched financial resources, the last few years in healthcare design have focused on creating leaner, more efficient hospital organisations, in an attempt to maximise budgets/resourcing, create efficiencies, and improve productivity that will, hopefully, lead to better patient care.

These trends have made an impact on the way we design, use innovative technologies, and enhance patient experience.

As our world becomes increasingly digital, there are opportunities to apply advanced analytics to better plan and design (accounting for variation and complexity), and also to change the way we operate our healthcare facilities in the future. Using real-time and predictive analytics that traverse traditional boundaries of functional areas and systems, cross-functional teams can take advantage of technology to better control their operations. To do this, it is critical that analytics become simpler, more actionable and more specific to the exact operational nuances and problems of the individual care setting, in the context of the broader patient pathway.

Payment and funding mechanism change is prolific. Real data can assist in aligning monetary and reporting, in order to lessen the administrative burden and assist in forecasting patient pathways to align with new models of reimbursement.

A number of Canadian and UK health providers, at the leading edge of this service transformation, are beginning this journey. We will share examples that demonstrate emerging elements and discuss the implications for the future of smarter hospitals.

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SMART hospital architecture: the development of a data-driven simulation model

Owing to a number of reasons, most hospitals have kept their building information models (BIM) separate from the broader enterprise's administrative patient information. There is also little research on simulations of an enterprise's clinical processes that link simulations more effectively into the BIM. The SMART hospital architecture project connects mapping movement, based on administrative patient data and tracking devices, to clinical process modelling (CPM), BIM and patient-flow modelling (PFM). Based on a blueprint for an activity-based building simulation model, this presentation explores the boundaries of this approach.

Application

The blueprint for an activity-based building simulation model is a theoretical framework that connects a hospital's actual ongoing logistics flows (patients, professionals, equipment) to BIM, CPM and PFM. The first step is mapping the actual flows based on the hospital's administrative patient data and by real-time tracking devices, and visualising these flows in BIM connected to CPM. Besides insight into actual flows as the basis for redesign, the collected data can also be used for simulations of restructured or new architectural layouts, or clinical process re-designs in relation to PFM.

Outcomes

Integration of CPM based on PFM, in relation to actual places in the hospital infrastructure (BIM), has the potential to contribute to a more efficient and effective clinical process. Hospital data is used to design future processes, layouts and flows while the impact of changes on capacity output can be monitored during simulations. The purpose of these simulations is to make the built hospital infrastructure of future facilities more efficient, as well as optimise processes in current facilities. Also, the consequences of architectural layouts on CPM and PFM can be made visible, as well as the impact of changes in the amount of patients, deviations in time, and patient mix.

Implications

This colloquium is the next step in the development of an activity-based building simulation model for hospital infrastructure, which should be able to monitor and test different architectural layouts, clinical processes and patient flows in a virtual environment. This project will be developed further in cooperation with the faculty of information technology of the NTNU, the University of Applied Sciences and Arts Northwestern Switzerland, and the Erasmus University Rotterdam.

Building better healthcare – technologies to facilitate evidence-based design processes

Hospitals face myriad challenges, including long waiting times, under-utilised or over-utilised spaces, confusing layouts, and poor adjacencies leading to increased walking distances.

Objectives

This paper outlines how hospital designs can be optimised for efficiency, and patient and staff experience, with legible layouts for enhanced wayfinding, appropriate-sized waiting areas and number of clinical spaces, and optimised adjacencies.

Methodology

A review will be presented of healthcare design case studies that use various data collection techniques, including: manual collection, RFID, real-time sensing technology, and patient appointment data. Two additional tools to aid automated data collection will be presented.

Results

An appreciation of the interaction between spatial layout, staff and patient behaviours, and operational processes is key. Understanding of the activities and behaviours in a hospital is gained via analysis of real data. Using such data in an evidence-based approach to design and operational processes is being used to optimise efficiency and enhance patient experience, as well as facilitate a more efficient design process.

Conclusions

Obtaining data can be challenging. In some cases, data collection is done using observations of the current workspace (Maiden and Rugg, 1996; Mackenzie and Xiao, 2003). These observations may take time (Greenroyd et al, 2015) and require trained specialists (Mackenzie and Xiao, 2003) to ensure data are not overlooked. Other manual data-collection methods include questionnaires and work diaries (Burgio et al, 1990; Sun et al, 2000; Chang et al, 2006; Ridic et al, 2012; Anderson et al, 2007; Olson and Windish, 2010).

There is also a growing trend for using technological data-gathering techniques to track staff movements (Greenwood et al, 2015; Iedema et al, 2007; Mackenzie and Xiao, 1999; Mackenzie and Xiao, 2003). However, tools for determining occupancy levels, dwell times and arrival profiles automatically in healthcare environments are scarce. Much of these data are collected manually, but patient confidentiality can restrict the effectiveness of manual observations.

Implications

The outcomes of this approach will help ensure healthcare designs are optimal for the community in which they serve, enhancing patient experience and potentially increasing the efficiency of the facility.

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Shrikant Sharma (UK)

Group director
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Allen Kong (Australia)

Director
Allen Kong Architect

Potter Street redevelopment – a paradigm shift in residential care in Australia

The redevelopment of Potter Street in Dandenong, Australia, one of a number of residential care homes owned by Wintringham, a specialist aged-care provider, was greatly influenced by research on management theories and building design.

The architect had previously conducted research into physical and psychological needs for living in Polar regions. Based on the idea that people require basic human needs met before addressing needs relating to old age, intellectual disability, etc, reasonable parallels can be drawn between the confined living conditions of each group.

Starting in 1989, the Wintringham projects gave the architect a platform to implement these ideas. The Wintringham concept was primarily focused on using verandas to provide circulation, an idea similar to one outcome of research by Dr Des Lugg, who concluded that new station buildings weren't to be interconnected for health and wellbeing benefits.

Design was further informed by research on human behaviour and use of spaces between buildings, as well as theories of Feng Shui. The design philosophy also responds to the needs of environmental and social sustainability, cultural appropriateness, and modest construction and architectural responses. Post-occupancy evaluation has resulted in an understanding of how best to support this cohort.

Description

The Potter Street redevelopment is a co-development between disability-support organisation Wallara Australia and aged-care specialist Wintringham. The facility blends aged care for disadvantaged people with a variety of complex behaviours, and specialist high-support services for adults with a disability. This gives ageing parents of disabled children an opportunity to live together, and all have a reliable pathway into residential aged care.

Outcomes

The management and design enable individuals with challenging behaviour to live in comfort together without need for chemical restraint. The open environment has assisted in managing behaviour. External circulation via verandas, with close interconnection with the garden, is vital to health and wellbeing. Fresh air, sunlight and connection to gardens provide improved indoor air quality and other health benefits.

Implications

Even projects with the most modest of means and material can produce high-quality living environments. The solutions provided here are specific to climate, location, residents and staff organisation; the principles of design, however, can be adapted.

One-Stop Multi-Services Centre

Carefirst is a culturally sensitive, community-based health and wellness centre serving the Chinese and South East Asian seniors living in the Greater Toronto Area. Its new 53,000 sqft facility provides a wide range of programmes and services, including: primary care/family health team; social and wellness; adult day programme for seniors with dementia; counselling for seniors with mental health issues; lifestyle coaching; chronic disease management; and accommodation for 30 transition/post-hospitalisation care beds. It also provides vocational training for homecare givers, as well as public health education.

On a greenfield site, a four-storey facility accommodates: public, social and educational programmes, and medical retail spaces on the ground floor; a primary health team, including eye surgery and adult-day programmes on the second floor; a 30-bed Transition Post-Hospitalisation Care unit on the third floor; and administrative offices on the fourth floor.

Infused with natural light throughout, the new facility has a courtyard garden at its heart. Based on the planning principle of the traditional Chinese courtyard house, the outdoor garden provides a contemplative retreat, as well as a space of active use for seniors to enjoy gardening. The roof spaces are utilised for landscaped green roofs, as well as terraces for socialising and recreational use.

Outcomes

With a staff of 350 members and the help of a pool of 1200 active volunteers, we now serve 6500 clients a year, including seniors and physically disabled, of whom 1500 are 'home-bound' and frail. With our holistic approach and focus, our mission is succeeding in ensuring that the seniors and those in need of our services enjoy independent, enriched and quality living in the community through our social, healthcare and supportive services.

Implications

Carefirst has taken a leading role in improving and maintaining the health of Asian Canadians (with a special emphasis on newcomers) through the provision of timely, quality, holistic primary healthcare, offered in a multi-disciplinary, culturally competent environment.

In partnering with local hospitals and university research programmes on maintaining and managing the health and wellness of the elderly, Carefirst has created a transferable model of holistic care, which strongly enhances and supports our existing healthcare system, providing for a more sustainable future in health promotion, disease prevention and treatment of chronic illness.

Alice Liang (Canada)

Principal
Montgomery Sisam Architects

Helen Leung (Canada)

Chief executive
Carefirst Group

architecture enhancing healthcare

Stantec

stantec.com/healthcare

Keynote address: Hopeful ageing: the power of the arts and design to contribute to a life worth living

As we get older, no matter what our physical and cognitive abilities, each of us deserves a life worth living – a life that reflects who we are and engages us in ways we find meaningful.

The arts, including museums, creative arts, and musical and dance performances, are important contributors to a life worth living, as are the environments that support us. These include intimate environments that give us control over our lives and help us remember our accomplishments and families, environments we share with others that provide social support, and the many places in greater urban and rural environments that provide opportunities to be part of vibrant society. To spend the effort and time to achieve these goals requires a belief that arts and environment, as well as our efforts, will pay off – that they *will* make a difference.

Hope is the knowledge that you can make a difference. It takes more than wishful thinking. It takes a careful look at the evidence available. It takes not only a leap of faith but also personal experience. It takes neuroscience knowledge about how the brain employs environments in every mental action – from memory, to wayfinding, to learning. It takes an understanding of how our behaviours affect our genes and, thus, our ability to age well.

This keynote will present examples of how the *I'm Still Here* approach to implementing the arts, culture and design in the lives of those facing cognitive challenges enables them to have a life worth living.

John Zeisel (USA)

President and founder
Hearthstone Alzheimer Care and the I'm Still Here Foundation

Breakfast workshop

Why design matters: a people-centred approach to healthcare

Aims

The aim of this workshop is to illustrate the importance of a user-centred approach to design in healthcare, and to understand how user-centred design methodologies are applied in practice.

Background

Bad design leads to complications in healthcare delivery. User-centred design inquiries have focused on issues such as the patient experience of the treatment pathway, the ways in which medical errors can occur, and lifestyle decisions that can prevent illness. A growing body of evidence shows the merits of this approach in healthcare.

Workshop description

The workshop will begin with presentations from the Design Council, HHCD and HELIX, providing an introduction to design in healthcare. Case studies will be used to illustrate some targeted healthcare problems, methodologies, evidence and solutions. The relevance of design in healthcare will also be discussed and evidenced.

Building on this, delegates will be asked to participate in a few short interactive sessions to introduce design methodologies and their application to healthcare problems. These will include innovation exercises to heighten both personal and organisational creativity. They will provide practical information, tools and methods.

Delegates will acquire an improved understanding of design, and an appreciation of the valuable resources required to embark on and support design-led projects.

The workshop focuses on people-centred design as a means of innovation. It demonstrates the value of the approach from both a creative and corporate perspective. It is relevant to anyone wanting to increase their innovative potential by drawing on the skills of clinicians, educators, marketers and business people. This is not just a course for designers, but is about using 'design thinking' as a catalyst for creativity through involvement of the end user.

Summary

In today's market, it is crucial to understand the context in which we operate. The user perspective is increasingly important, and successful innovators create things that meet customer needs and aspirations. This workshop will enhance your understanding of stakeholders, users and 'lead users'. It will also help you understand the value that design thinking can bring to your organisation, and help you create innovations that are relevant in the real world.

Organisers

Helen Hamlyn Centre for Design (HHCD), Royal College of Art

Design Council

HELIX Centre, Royal College of Art and Imperial College

Presenters

Rama Gheerawo, Ed Matthews and Jonathan West (UK)
Royal College of Art Helen Hamlyn Centre for Design

John Mathers and Clare Devine (UK)
Design Council

Matthew Harrison (UK)
HELIX Centre

PERKINS+WILL

IDEAS+ BUILDINGS

Ghana Ridge Hospital, Accra

Bouygues Construction

Since its founding in 1935, Perkins+Will has been collaborating with internationally recognised clients to set worldwide standards for design innovation and exceptional service for both public and private projects. The firm is highly regarded as thought leaders in the industry and by assembling the most talented teams from more than 1,900 employees worldwide, we consistently help transform clients into market leaders. Our experts in user-experience, operations, evidence-based design, and project delivery engage clients and lead them in highly customised work plans specifically tailored to their unique cultures and institutional missions.

ARCHITECTURE | URBAN DESIGN | INTERIORS | HEALTHCARE PLANNING + STRATEGIES

Keynote address: Can healthcare heal our communities and the planet?

There is a paradoxical relationship between hospitals and the environment: the delivery of care within healthcare facilities results in an ever-increasing environmental footprint – in the form of pollution, waste generation, unsustainable food services, etc – which contributes to damaging the health of the community it seeks to serve.

Gary will use his keynote address at the congress to examine this contradictory connection between healthcare and environmental health, and explore what can be done to realign the relationship in a positive direction.

Indeed, contrary to widely held belief, measures by hospitals to become more environmentally sustainable can yield significant savings rather than incur additional costs. Health and environmental sustainability – the natural, built and social environments – are a necessary condition for human health and wellbeing.

Twenty years ago, hospitals were the largest source of dioxin contamination in the US. Dioxin is linked to cancer, learning disabilities and problems with brain development. In less than a decade, the number of medical waste incinerators in the country fell from about 4500 to just 70.

Gary's organisation Health Care Without Harm is working with hospitals to change their purchasing practices, encouraging them to support and invest in renewable energy, as well as procure products with chemicals that aren't toxic to patients or workers. The organisation is also working with hospitals to change how they buy food, so they can support sustainable farmers in the community.

Gary believes that food is medicine and healthy housing is like a vaccine against illness. He believes that healthcare, through its procurement and community investment strategies, can adopt a broader and more effective healing strategy – one that not only heals individual patients but also heals the communities that hospitals serve, and heals the planet in the process.

Gary Cohen (USA)

Founder and president
Health Care Without Harm

Creating successful places – a vision for sustainable user-centred design

Benedict Zucchi (UK)

Director of architecture
BDP

In the context of hospitals, assessments of sustainability and other design criteria are usually quantitative in nature. Success is rated according to measurable data (energy consumption, walking times, infection or recuperation rates, etc) but, ultimately, a building's long-term success and potential longevity depend on less tangible qualities to do with its sense of place and the community's perception of it as an element in their city.

This paper will introduce this idea through a few historic examples from the UK and abroad, before focusing on case studies of Alder Hey Children's Hospital, Liverpool, and the New Children's Hospital, Dublin, in order to address two of this year's congress themes: designing sustainable health settings and humanising healthcare by design.

At Alder Hey, the trust's vision of the "children's health park" was developed with the local community and with support from the city through extensive consultation. Our concept responded to this vision with a flexible approach that harnessed and capitalised on the input of a broad range of stakeholders while, at the same time, maintaining a strong design direction. This has carried through to the completed building, giving it a distinctive identity ("the hill in the park"), to which children, families and staff can relate instinctively. Views and daylight permeate all parts of the hospital, making connections with nature a tangible part of everybody's day-to-day experience.

In Dublin, the aspiration to create "one of the finest children's hospitals in the world" posed a significant challenge, particularly in terms of stakeholder engagement. In contrast to Alder Hey, the New Children's Hospital in Dublin is an amalgamation of three existing paediatric facilities, so the project is as much about the integration of three groups of clinical users as it is about its architecture.

Given its scale of more than 120,000 sqm, there are also understandable sensitivities about its responsiveness to the site context and, in particular, the adjoining residential neighbourhoods. The concept addresses these challenges by breaking down the scale of the building into a number of elements, which are not only better able to adapt following user feedback but also serve to modulate and mitigate its perceived size.

Again, as at Alder Hey, landscape plays a central role, providing a therapeutic environment for patients and connecting the building to Dublin's strong tradition of squares and civic buildings, with gardens at their heart. This "green thread", it is hoped, will play its part in helping the New Children's Hospital regenerate this part of Dublin and become a cherished and sustainable civic building.

Innovation and the new Alder Hey Children's Hospital

This paper observes that hospital design reflects the personality of both the development team and the client organisation. The team at Alder Hey Children's Hospital has developed a number of new hospitals in the UK, developing a detail-driven approach to hospital design and supporting a vision for buildings to have the balance and personality of Vitruvian Man (striving for excellence in all aspects of form, function and structure).

Working at Alder Hey has revealed to the team two big characteristics of the organisation: there is a sense of informality and innovation that ripples throughout Alder Hey; and there is a very close bond between the teams that provide services and the children, families and communities they serve. Both of these traits appear to have spread to the heart of the design of the new hospital.

Innovation at Alder Hey includes:

- the overall concept, with the Park wrapping itself over and into the building;
- the construction of the building, which pushes the boundaries of off-site construction to reduce, by 20%, the normal construction period;
- the financing of the building, via use of pension funds;
- the development of a top-hung glazed wall with interstitial blind at the front of each patient bedroom (designed by aerospace engineers), which has revolutionised the ward design; and
- the joining-up of the building management system with the trust's clinical systems to create the concept of a living building that can interact with patients and staff.

The snowball effect of innovation has led to the rapid development of the living building concept through the creation of an innovation hub, which is driving a new wave of technology innovation around the hospital.

These innovations include: personalised accounts for children, so that they can create characters online before arriving at hospital – these characters appear in bedrooms and treatment rooms; sensor development, including the concept of placing sensors on the skin to detect the contents of the blood – thereby avoiding the need to jab the patient; application of the latest cognitive computing to help personalise the approach to patients and predict outcomes; and smart theatres with 3D pre-operative planning, 3D printing, and streaming of images during operations.

David Powell (UK)

Development director
Alder Hey Children's NHS Foundation Trust

Iain Hennessey (UK)

Consultant paediatric and neonatal surgeon
Alder Hey Children's NHS Foundation Trust

David Houghton (UK)

Project manager
Alder Hey Children's NHS Foundation Trust

Ged Couser (UK)

Architect director
BDP

Keith Davis (Australia)

Director, health services
Norman Disney & Young

How things have changed: a 10-year comparison of three iconic Australian hospital developments

This presentation explores the multi-faceted shift in hospital design/delivery over 10 years through a benchmark comparison of three contemporary major Australian public hospital developments: the New Royal Children's Hospital (RCH); the New Children's Hospital, Perth (NCH); and the New Bendigo Hospital (NBH).

Using the RCH, NCH and NBH as benchmark examples, the presentation provides fascinating insight into the multi-faceted evolution of design and delivery approaches and techniques that have developed from one major hospital project to the next. The presentation will consider:

- developing trends in client briefing;
- changes to procurement and design methods, and the way they have impacted on project outcomes;
- the ubiquitous and shifting engineering plant space negotiation ("you want how much space?");
- a warts-and-all balanced review of BIM, including its pluses and minuses on cost and quality;
- the evolution and progressive refinement of stakeholder interaction with advanced graphical "visionalisation" techniques;
- the traditional stakeholder reluctance to involve themselves in ICT briefing discussions ("leaving it to the experts");
- trends in ICT initiatives and furniture, fixtures and equipment (FF&E) considerations; and
- changing perspectives and priorities in relation to sustainability.

Designing supportive settings for children and families

Hieronimus Nickl-Weller
(Germany)

Architect
Nickl & Partner Architekten

The quality of the built environment is essential to the perception of space, as well as influencing the behaviour of patients, staff and families in healthcare settings.

Taking into account that positive spatial perception and staff efficiency are key factors of the overall quality management of hospitals, it can be concluded that humane healthcare design is directly linked to the economical and medical success of healthcare facilities.

Purpose

In children's hospitals and mother-child centres, the significance of human-centred environments increases owing to the patients' special needs for security and the staff's role in relation to patients and families. The paper explores measures in corresponding to these special challenges.

Method

Comparisons will be drawn between two newly planned facilities, the New Hauner Children's Hospital at Ludwig Maximilians University of Munich, and the Mother-Child Centre at the Kaiser-Franz-Josef-Spital in Vienna, along with experiences at the Pediatric & Cardiac Centre at the University of Innsbruck.

Results and discussion

Conclusions can be drawn from urban planning, architectural layout and interior design to inform urban and social cohesion, working environment, user satisfaction, efficiency, and corporate identity.

Learning from Ghana

Polly Barker (UK)

Project director
TP Bennett

Ghana's Ministry of Health (GMoH) is radically changing healthcare across the country. But the traditional exchange of skilled staff and western care models is not suited to Ghana, so a new approach has been developed in consultation with the GMoH and local groups. The first element in this new healthcare network is the district hospitals – regional centres from which smaller, local units will be generated.

Objectives

This paper will describe the commissioning, design and delivery of six new district hospitals and the upgrade of a seventh for the GMoH.

Results

Each of the district hospitals will possess the following features:

- a healthcare campus, which promotes wellbeing;
- resilience to infrastructure failure – a single-storey structure, with natural ventilation and on-site infrastructure back-up;
- sustainability – economic and practical to operate and maintain;
- good quality accommodation and an attractive working environment, with on-site training facilities;
- local construction and maintenance;
- a kit of parts – adaptable to each local community and terrain;
- training – staff are trained on site and supported both in the construction and the running of the hospital; and
- provision of an integrated IT system.

Conclusions

The district hospitals are the first step in a wider programme that includes community health clinics and smaller community hospitals. Some of the lessons learnt and other key considerations include:

- how a standard western model is not suitable for Ghana;
- how to create a bespoke design that is relevant to Ghana;
- how to work in consultation with local communities;
- how to work with local clinicians and construction specialists;
- the importance of incorporating public health and traditional medicine to form an integrated, sustainable healthcare model;
- rethinking the use and application of modern technology; and
- training staff on site and working with them in the first years of operation – sustainable construction and operation.

Steven Peak (UK)

Director
Vanguard Healthcare

Sarah Lloyd (UK)

Anaesthetist
Lloyd's Healthcare Solutions

Harnessing flexible infrastructure to support the 'Five Year Forward View'

Across Europe, growing demographic pressures combined with advancing technologies are spurring on the development of innovative new models of care. With a decreasing reliance on traditional infrastructure, these new models look to integrate primary, acute and social care – in many cases, away from acute centres.

Objectives

The authors were tasked with reimagining the way in which care could be delivered to integrate primary and acute care. The blending of these services necessitates change, not only how but also where we deliver these services.

Methodology

Taking inspiration from the 'Five Year Forward View', the authors focused on two distinct care models: the multispecialty community provider, which would see a greater degree of services delivered in the community setting; and primary and acute-care systems, which seek to strategically integrate their respective services. We believe that the key to achieving the goals of both models is flexibility.

Results

A system called Healthportability has been developed to allow some 40% of surgical and diagnostic procedures to be safely transferred to the community setting. This system focuses on a modular central hub, which houses everything from consultation rooms to recovery areas. Into this hub is built one or more 'docks', which would allow seamless integration with the growing range of mobile healthcare facilities available to European healthcare providers. At the end of the corridor of one of these facilities may be an endoscopy suite one week, an MRI scanner the next, and a theatre the week after. This would create a flexible community infrastructure, tailored to the prevailing needs of the local health economy.

Conclusions

This model offers benefits to many stakeholders. Patients, especially the elderly and those with chronic disease, will benefit from care being delivered closer to home. The pressure on acute services will be relieved as care is rebalanced across the locality. Under-utilised areas of the NHS estate will benefit because the system makes efficient use of space – one parcel of land could effectively house five or six different clinical and diagnostic facilities. Healthportability can help realise the vision set out in the Five Year Forward View and bring benefits to providers across the healthcare landscape.

Outpatient, outreach: reframing urban design and mental health

Guela Solow-Ruda
(Canada)

Partner
ARK
(Architects+Research+Knowledge)

Decentralisation of mental healthcare – taking clinics outside the hospital environment and integrating them into communities – is a key focus of a recent Government of Ontario Ministry of Health report. The Canadian Mental Health Association also recommends increased contact and connections between the public and people with mental illness, as a means to reduce fears and stigma.

Two recent mental health outreach projects, the Centre of Addiction and Mental Health (CAMH) and Mount Sinai Hospital (MSH), both designed by ARK, seek to reframe mental health issues in the context of urban design. While the first has been operational for three years, the second is completing the approvals phase. A comparative study will reveal operational realities of evidence-based design and the implications of integrating mental health services into the community.

The design response for these hospitals varied significantly, reflecting the psychosocial, cultural, medical and operational concepts, as well as the urban design context.

CAMH: The desire to move some services outside the main hospital facility was based on the idea that patients display significantly reduced hostile behaviour when in normative clinic environments compared with traditional institutional clinic environments. The clinic itself helps de-stigmatise mental healthcare by creating a strong street presence through the conversion of a factory loft storefront, which echoes the central message of 'urban integration'.

MSH: The MSH vision was driven by a socio-cultural agenda to improve access to mental healthcare for those marginalised by cultural, linguistic, economic and ethnic barriers. Urban design plays a significant role in breaking down these barriers by the selection of site context, built form, site circulation, materials and cultural messaging.

Exploration of these case studies solidified the idea that integration of mental health facilities into the urban fabric is an effective means of normalising the condition and reducing stigma. A design process that emphasises stakeholder engagement based on active community consultation and open dialogue is necessary. Addressing healthcare providers' concerns about safety, infection control and communication is also challenging outside the hospital environment. This design methodology is critical in creating mental health facilities that are 'good neighbours' and operate efficiently as hospitals.

Outcomes will include publication of 'Urban design guidelines for the mental health in the community setting', which will serve as both a practical tool for site selection, built-form strategy and design principles, and a vehicle to promote dialogue on de-stigmatisation.

Cliff Harvey (Canada)

Vice-president
North York General Hospital

A new capital investment model for Canada

Health capital investments are often seen as enablers for implementing strategic measures, such as the Healthcare Quality Agenda in Ontario. These investments are complex instruments that have a significant cost attached to them, and in times of economic difficulties, capital investments are often paused while strategy is rethought.

During this phase of reconsideration, the complexity of the investment process and the technical nature of these investments often lead healthcare providers to omit capital from their strategic discussions, only to seek out capital funding at a later date.

In Ontario, where capital investments are a shared governance between the healthcare provider and the Government, many providers do not believe they need capital expertise on their team. These providers believe they only need focus on the healthcare services they deliver, and the Government will provide the capital they require. However, capital investments at the government level is often more about cost containment than strategic investments, so how is this going to assist providers in meeting their community needs?

Why, then, is there a disconnect between health providers and the Ontario Government? Simply, the Government falls within the same capital trap as providers – ie capital is not part of the strategic conversation. In the end, this leads to a gap in the intended strategic health outcomes and the actual operational performance. There must be a shift from regarding capital as a programme decision to be a key part of the overall holistic strategic discussions and decisions. This will require a new investment model supported with strong theoretical underpinnings. Using cognitive science and design thinking, supported by new economic growth theory with its approach to system thinking, a new investment model is proposed that allows organisations to bridge that gap.

North York General Hospital is bridging this gap though the development of a socio-economic model of healthcare system planning. The achievements in improving the hospital's environments of care will be reported on during this session.

University College London Hospitals NHS Foundation Trust (UCLH) – the cancer services journey through transformation and innovation

Over the past 10 years, UCLH has embarked on a journey to transform cancer care. Alongside the national and London strategies, UCLH has aimed to become a centre of excellence, investing in designs and development of services and facilities.

From humble beginnings, UCLH set about redesigning patient care and introducing an ambulatory care pathway by forming the prototype for the UCH Macmillan Cancer Centre (UCH MCC), which opened in April 2012 and won the Prime Minister's Better Public Building Award. It is a key stakeholder in implementing a national strategy to introduce proton beam therapy (PBT) in England, with the development of a phase 4 building currently under construction.

UCLH has used the national PBT strategy, alongside the award of elements of the London Cancer Plan, to plan and redesign its remaining cancer services in both existing and new facilities, and developing new pathways of care with partners beyond UCLH organisational boundaries.

Objectives

Evolution, transformation and innovation have been integral to UCLH's journey towards delivering high-quality patient care. The UCLH case study tells the story of the provider's journey to date and what lies ahead for patients.

Methodology

Resulting from this work, and influencing other service development, flexible design is key to the UCLH methodology and encompasses standardisation, future-proofing, development of portfolio standards, and 'standard' agreed derogations. The approach has been complemented by the Design Quality Indicator process and stakeholder engagement. Multiple UCLH projects have now benefited from this approach, including the UCH MCC, which involved patients in design development, as well as Phases 4 and 5, where complex co-design has been unlocked through stakeholder BIM reviews and approval processes.

Results

The design of these facilities has led to the transformation of patient pathways and services. UCLH, along with the Royal Marsden and the Christie, have become an NHS vanguard project for cancer services, developing a blueprint for patient care.

Kieran McDaid (UK)

Director capital, states and facilities
University College London Hospitals NHS Foundation Trust (UCLH)

Tracey Middleton (UK)

Deputy director, capital planning and strategic estates development
UCLH

Alison Fawthrop (UK)

Head of healthcare planning
UCLH

Jonathan Gardner (UK)

Cancer programme director
UCLH

Stephanie Williamson (UK)

Deputy director
Great Ormond Street Hospital for Children NHS Foundation Trust

Louisa Desborough (UK)

Communications project manager
Great Ormond Street Hospital for Children NHS Foundation Trust

Authoring for advocacy: experiences of writing a design brief on behalf of patients, families and staff at Great Ormond Street Hospital

Great Ormond Street Hospital for Children NHS Foundation Trust (GOSH) is halfway through an ambitious redevelopment programme to rebuild two-thirds of the hospital site over a 20-year period.

Phase 4 of the redevelopment programme will create a new building on Great Ormond Street. Occupying a significant part of the streetscape and incorporating a new front entrance, it will become the hospital's 'signature' building – an architectural expression of a world-renowned brand. It will contain highly specialised inpatient and outpatient wards, diagnostic and treatment areas, facilities for patients and families, research areas, and clinical education space.

The project will involve a plethora of tough, complex design decisions and a meeting of many great minds – from leading healthcare design experts to clinicians and researchers working on some of the most significant scientific discoveries of our time. It will also involve supporting emerging models of care that will improve patient outcomes and enhance the patient experience.

The building must also support and nurture our patients and their families through some of the most challenging circumstances. The guiding principle at GOSH is "the child first and always" and our aspiration is to be the leading children's hospital in the world. This new development must support this world-class aspiration with world-class buildings, which requires a rigorous brief to clearly articulate what our patients, families and staff need.

The emergence of design thinking and a growing weight of research evidence tell us that great design starts with great insight; a process that involves not merely intellectually understanding the problems that need solving but also making an emotional connection with them.

In developing this brief, we've employed the latest creative research techniques for engaging children and young people, in partnership with our professional in-hospital arts programme, Go Create! These included trials of Minecraft and 3D printing to engage patients in imagining their ideal hospital, as well as visualisation and use of metaphor in a technique inspired by the ZMET approach.

Our iterative process has vividly brought to life some of the problems our staff and patients face, and we've now started identifying creative solutions to these problems.

Physical design strategies to reduce patient falls

Debajyoti Pati (USA)

Professor and Rockwell endowment chair
Texas Tech University,
College of Human Sciences

Patient falls are some of the most serious adverse events reported in hospitals. Falls among hospitalised patients are associated with multiple factors. While much literature exists on intrinsic factors, there is relatively little research on extrinsic factors, which include the physical environment – an area lacking in standards to reduce falls.

Objective

This paper sets out to identify specific decisions pertaining to patient room design that may contribute to fall events.

Methodology

A physical mock-up of a patient bathroom and clinician zone was built in a lab space equipped with eight infrared camera systems. The falls committee of a large tertiary care hospital developed a script, and subjects matching the fall-risk patient profile undertook scripted tasks in the mock-up. Activities were captured using motion-capture technology and digital video recording. Data were processed in three stages: marker labelling in Cortex; Center Of Mass (CoM) tracking in Visual3D; and jerk calculation in MATLAB.

After biomechanical data processing, video clips associated with potential fall moments were extracted, and then examined and coded by a group of registered nurses and healthcare designers. Exploratory analyses of the coded data were conducted, followed by a series of multivariate analyses using regression models.

Results

In multivariate models with all personal, environmental and postural variables, only the postural variables showed statistical significance – turning, grabbing, pushing, and pulling in the bathroom, and pushing and pulling in the clinician zone. The physical elements associated with the offending postures include bathroom configuration, IV pole, door, toilet-seat height, flush, grab bars, over-bed table, and patient chair.

Conclusions and implications

Postural changes during interactions with the physical environment are the source of most fall events. Physical design must include simultaneous examination of postural changes in day-to-day activities. Recommendations for specific design standards will be discussed.

The two broader design strategies include: designing bathrooms to reduce turning as much as possible; and designing to avoid motions that involve two or more of the offending postures, such as turning and grabbing or grabbing and pulling, etc.

The biomechanics of patient falls are not influenced by cultural or regional factors, so the findings may be amenable to translation worldwide, thereby contributing to safe and healthy care environments.

Kieren Morgan (UK)

Principal, health sector
HASSELL

Michaela Sheahan (UK)

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HASSELL

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Design matters for nurses: the role of workplace design in nurse attraction and retention

Attraction and retention of nurses are key issues in many healthcare systems and countries. Evidence now suggests that attracting and retaining a happy, healthy and sustainable nursing workforce require a focus on the interactions between nursing and the physical design, organisational culture, technology, and work processes.

This paper reviews the characteristics of hospital workplace design that improve nurse attraction and retention, based on research by a leading Australian university with a grant awarded by the Australian Commonwealth Department of Industry. The four key objectives of the research are to identify: the characteristics of workplace design that can improve attraction and retention; the contextual factors that may influence the interplay between workplace design and staff attraction and retention; the enablers and barriers; and the outcomes that workplace design can achieve in relation to attraction and retention.

Methodology

A realist literature review was undertaken to explore how hospital workplace design can improve nurse attraction and retention. The identified design characteristics informed focus group discussions with hospital nursing managers and ward clinical nurses from hospitals in the UK and Australia. Practice-based evidence was generated about good hospital workplace design principles to improve nursing staff attraction and retention.

Summary

The narrative to emerge from focus group discussions is that current hospital designs can contribute to a culture that devalues nurses. An erosion of the psychological contract between nurses and management is occurring, owing to a perceived increase in throughput of patients without corresponding increases in staffing and space provisions. This leads to burnout, stress and low job satisfaction.

The results suggest that workplace design can help demonstrate the value that hospital administrators place on their nurse workforce, by providing comfortable, safe and effective spaces for work, learning and rest, and easy access to storage for medication and consumables.

In parallel with innovations occurring in the commercial workplace and education sectors, the authors believe that this research supports the inclusion in hospitals of innovative, dedicated spaces for nurses in or near wards that provide opportunities for multi-disciplinary working, knowledge sharing and social interaction.

Expected and unexpected: what we learn about neonatal intensive care unit design through behavioural observations of nurse activities

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The neonatal intensive care unit (NICU) is a life-defining place for premature infants and other newborns with serious health conditions. Demand for newborn intensive care has increased in recent years, and there are several newly built or renovated NICU projects in the United States.

Objectives

Through a literature review of studies of NICU designs, we found limited empirical research focusing on the physical environment of these units. Factors commonly studied are space area, acoustic environment, etc, and many studies are based on the authors' (usually designers or medical managers) own work or personal experiences, which leads to results that are often descriptive or introductive. Nurses, as a user group, spend a long time in NICUs; their behaviours and needs, however, are not fully addressed.

This research aims to clarify the NICU nurse activity patterns by time and space; figure out whether and how the built environment meets or fails their behavioural needs; and provide design suggestions to optimise NICU physical environment design.

Methodology

We collaborated with two hospital NICU departments in the United States to conduct behavioural observations of nurses. This resulted in collected data of more than 60 hours and more than 20 subjects. The data were analysed through both descriptive and inferential statistical methods.

Findings and design suggestions

Work time distributions for nurses by time and location are provided. Their behavioural duration and frequency are also analysed, with behavioural patterns summarised.

This research provides practical examples of NICU designs with insight into the behaviour of nurses. Design suggestions regarding NICU patient room arrangements and department floor plans are provided and include: design the cluster based on the nurse team; consider arrangement of functional rooms; consider centralised and decentralised nurse stations; and organise function zones in the patient room to optimise the nurse work process, etc.

Eve Edelstein (USA)

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Neuro-architecture: how buildings influence the brain, body and behaviour

The term 'neuro-architecture' has long been used to relate to the brain's form and function. Increasingly, architects are adopting this term to describe a new field that explores how the built environment influences the brain, body and behaviour.

The impact of architecture takes on a vital role in clinical settings, where the sensorium adds to the cacophony of care, may hamper critical communication, or impede interaction between providers and patients. In settings where critical thinking and complex action have such great impact, a deeper understanding of the relationship between the physics of built form and physiology takes on great importance.

Methods

Evidence-based medicine has motivated numerous psycho-social studies that demonstrate the impact of built environments. Yet, a large body of neuro-scientific research awaits translation into 'brain-based' principles that may be applied in design. Ongoing research that integrates findings from in-depth literature reviews, clinical insights and original studies now reveals sensory, perceptual, kinetic, emotional, cognitive and behavioural interactions. Smart sensors, and crowd and cloud technologies now map people to places, informing us of a continuum of human needs within clinical care settings.

Results

Examples from original research describe how innovative and mobile technologies simultaneously map EEG brain waves while tracking spatial navigation in full-scale immersive 4D virtual reality simulations of architectural spaces. Changes in heart-rate variability are revealed as subjects perform simple mental tasks in light conditions associated with circadian rhythm disruption. The impact of competing sounds on speech intelligibility and medication error is demonstrated. Initial studies of the impact of architecture on cognition and mental health reveal how the sensorium of design may support creativity, reduce error and enhance outcomes in specialist care groups. Translation of clinical studies of vestibulo-ocular function into design principles will show how architecture may serve our most fragile patients.

Conclusions and implications

This translational design process offers a systematic approach to big-data analysis and decision-making that prioritises the clinical and operational value of design relevant to hospitals, clinics and community health districts. Those trained in both the clinical sciences and design now seek to understand how built settings may change the brain and modify the experience of architecture to yield delight, and enhance the most creative human endeavours.

Culturally responsive design for mental health: case study of the competition-winning design for a new psychiatric hospital at Al Wakra for the Hamad Medical Corporation in Doha, Qatar

Mungo Smith (Australia)

Director
MAAP Architects

The vision for the Al Wakra Recovery and Respite Centre brings together exemplary salutogenic principles, best practice in person-centred mental healthcare, and deep understanding of cultural heritage and appropriateness. The result is a compassionate design-led response based on empirical research and practice, addressing the redesign of health systems and humanising healthcare.

The vision is founded on a genuine appreciation of human needs and Islamic values. The facility is ground-breaking in its concept, respecting privacy and avoiding the western paradigm with emphasis on panopticon planning for security and safety. Instead, it incorporates a flexible structure of indoor and outdoor spaces to support cutting-edge care.

Therapeutic gardens form a significant part of the design response, framing residential and support spaces. A wide range of garden types is incorporated – from private terraces that extend each bedroom, to semi-private courtyards, and common courtyards in residential clusters. Gardens and terraces for therapy, activity and socialisation knit together to make meaningful and comprehensible spaces suitable for recovery from severe mental illness.

These spaces connect and lead to the Aspire garden, a landscaped hill with stables and a falconry. These celebrate the Arabian traditions of animal husbandry to allow patients to develop relationships with domestic animals, as well as to generate a sense of joy and provide rich experiences. Treatment spaces are in a non-institutional, resort-like milieu, with neither visible restrictions nor negative affordances.

The on-stage environment is carefully curated as elegant and simple residential units. The clinical support, services reticulation and facilities management areas are shared, flexible and off-stage. Courtyards and covered walkways create visual buffers between staff and patient spaces while providing both with veiled observation opportunities and liberating views of nature and sky.

The natural environment, which can be harsh for half the year, is tempered using a rhythmic composition of traditional forms: screens, shade cloth and breezeways.

This is a refined and workable proposal devised specifically in response to the competition brief, and embracing up-to-the-minute scientific evidence, an understanding of Qatari sensibilities and culture, and specifics of site and context.

Nolan Rome (USA)

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Dell Children's Hospital: innovation and sustainable design of the world's first LEED Platinum hospital

Opening in 2007, Dell Children's Medical Center in Texas, USA, became the world's first LEED Platinum hospital in 2009, establishing it as a milestone in sustainable healthcare. In 2011, a new 75,000-bed tower for the existing Dell Children's Hospital was also commissioned.

Objectives

The vision was to achieve LEED Platinum status and carry the legacy of the base project through multiple future phased expansion. The challenge was to develop innovative methods to achieve mechanical and electrical efficiencies of greater than 20% in the new bed tower. These systems also had to meet the owner's financial requirements of a 12% rate of return on investment or six-year payback.

Methodology and results

Features included renewable solar power and heating water systems, an integrated lighting and HVAC controls solution, and air-side energy recovery to achieve savings above the baseline requirements of LEED.

A review of the Phase I combined heat and power plant was conducted to determine plant efficiency. The results of the study and the systems innovated for the new bed tower led to combined energy savings that were 46% more efficient than the baseline building.

The renewable solar power and heating water system, an integrated lighting and HVAC controls solution, and air-side energy recovery have reduced the bed tower's environmental impact. The solar system back-feeds the normal power system and collects 35815 kWh AC annually.

Solar heating hot water systems maximise the roof area of the new bed tower and reduce the amount of natural gas used for heating loads. The heating-water return water was run through a closed solar array of 50 panels collecting 302,340,596 BTU/h annually.

Dell Children's Medical Center of Central Texas is part of Austin city's sustainability initiative. The project received a five-star rating from the Austin Energy Green Building Rating System; it is currently the only five-star rated commercial building in the programme.

Conclusions

Ongoing verification: Overall, the building is operating within a typical range of tolerance of about 8.2%. The facility is refining its controls strategies to narrow the gap between the model and actual data.

Lifecycle cost analysis: This was used in all major system decisions. The need for a 12% rate of return or six-year payback was met.

Supporting human + environmental health

This paper will explore approaches to ensuring ongoing commitment to sustainable design through the implementation of a rigorous design process that challenges the status quo to improve human and environmental health.

Methodology and results

A core method is the employment of a sustainable return on investment (SROI) process, a broad-based analysis that helps overcome drawbacks by accounting for a project's triple-bottom line – its full range of financial, economic, and social and environmental impacts.

The SROI process builds on best practices in cost-benefit analysis and financial analysis methodologies, complemented by risk analysis and stakeholder elicitation techniques. The SROI tool can identify significant impacts of a given health and wellness investment, and value them in monetary terms.

A key feature of SROI is that it monetises the relevant social and environmental impacts of a project, yet still provides the equivalent of traditional financial metrics, referred to as financial return on investment (FROI).

The SROI process includes traditional financial impacts, such as savings on utility bills or reduced/higher operating and maintenance costs, as well as internal productivity and health effects, plus a range of social and environmental impacts that would result directly from the evaluated project. Examples include: value of enhanced productivity from employees working in a WELL-certified building; quantified and monetised value of reduction in environmental emissions; and value of quality of life improvements, including improvements to households and the broader community.

Another key approach is the advancement of expertise in biophilic design, a methodology that articulates the relationships between nature, human biology, human behaviour and the design of the built environment, so that we may experience the human benefits of nature in our daily world.

There is increasing recognition and research revealing that the human mind and body evolved in a sensory-rich world. Human health evolved in response to natural stimuli such as sunlight, weather, water, plants, animals, landscapes and habitats. These continue to be essential to human behaviour and functional development. Biophilic design is defined as designing to include elements that nurture the innate human attraction to natural systems and processes.

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Creative approaches to engagement ease transition and support a culture of care at Southmead Hospital Bristol

Southmead Hospital Bristol's new Brunel building opened in May 2014. The vision for the new hospital was to create a life-enhancing, salutogenic environment supportive of both patients and staff. To this end, an integrated public art programme was planned from the outset.

Purpose

As well as creating a supportive physical environment, the public art programme addressed some of the cultural and organisational challenges linked to opening a state-of-the-art hospital. This paper focuses on the way in which a series of arts-based staff and community engagement projects were developed in response to the challenges of: merging two existing hospitals and cultures; supporting staff through an immense period of change; including the wider community in the process of change; and creating a new hospital that is part of the wider cultural landscape of the city, and which fosters a strong sense of community, inclusion and social cohesion.

Methods

The presentation will showcase a range of engagement projects developed over a seven-year period. These include oral history and theatre-making, therapeutic knitting on wards and in the community, creative writing, and a staff wellbeing programme – all of which culminated in a series of annual Fresh Arts Festivals.

The Fresh Arts Festival celebrates culture, creativity and care in the hospital trust. It aims to improve the wellbeing of hospital users, link the hospital with its local community, and foster a sense of community.

During the 2014 festival, 24 local artists, writers and musicians and 11 local choirs delivered 277 performances, workshops and bedside activities to more than 3200 patients, visitors, staff, families and local residents. The 2015 festival featured an exchange with the University of Tsukuba in Japan. Local artists and art students from the University of West of England were joined by Japanese artists and students, who ran origami and calligraphy workshops, and created a Japanese 'washi tape' installation that covered the walls of the hospital atrium.

Conclusions

While art integrated into the architecture of the building has helped create an aesthetically pleasing and therapeutic environment, it is perhaps the participatory programme that has had the greatest impact on the organisation's culture. The strongest legacy of the public art programme might, in fact, be the Trust's commitment to develop ongoing creative approaches to patient and staff wellbeing and community engagement in the longer term.

Artists, poets and curators in hospitals: only a distraction

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John Davies (UK)

Poet

This paper discuses three recent hospital arts projects that link the local, the historical and the social through participative practices, generating artworks that aim to humanise their environments. It asks:

- are arts projects in healthcare environments only a distraction, or do they function in a more complex way?
- how can artists and curators enable collaborations with staff and patients to change the hospital environment?
- can the processes and outcomes of arts practices in hospitals ask new questions about patient wellbeing and staff inclusion for hospital administrators and their design teams?

At Eastbourne and Hastings hospitals, the artist collaborated with a poet in response to a brief to examine physical, psychological and emotional responses to navigating hospital sites, with a focus on arrival, waiting and departure. Using mapping practices, and interacting with staff, patients and visitors through the poet's persona, their work addressed the treatment route 'from sperm to worm', ie from birthing pool to morgue.

'Our Storeys', an artwork at North Middlesex University Hospital, was very much a social project. The lead artist was asked to create works that connected with the local population so that they, in turn, connected with their hospital. The response was to develop a number of works in the main atrium. Among these is a large-scale work described as "social wallpaper". Inspired by the history of the hospital and its relationship to poet John Keats, the artist and poet worked with stories they had gathered from staff, patients and visitors – our stories – and transformed them into a four-storey poetry wall, 'Our Storeys', helping the hospital's communities make the new hospital their own.

For the new Bermondsey Centre at Guy's Hospital, the artist was asked to respond to themes of "local" and "historical". She has curated an installation of artworks from the Guy's and St Thomas' Charity collection, integrating this with new site-specific works, including a digital wallpaper created from a working drawing of Guy's colonnade. The Haiku Water Wall included original haikus that staff created in a workshop.

These three arts projects had long timescales, and their realisation often involved complex negotiations with hospital administrators, developers and their design teams. These processes made the artworks, and the issues that they raised regarding staff and patient inclusion, more valued and understandable to those involved.

Royal Hospital for Sick Children, Edinburgh

HLM is a creative and responsive organisation with significant experience in the design and procurement of healthcare buildings in the UK and internationally. We recognise the importance of design quality, sustainability, and innovation in the creation of truly therapeutic environments. We have a proven track record and expertise in the design and procurement of all types of buildings within the healthcare sector, from the masterplanning of large hospital sites to the configuration of individual rooms within acute, primary care, and mental health settings.

The Royal Hospital for Sick Children (RHSC) building will bring together both outpatient and inpatient facilities for paediatric care, specialist neonatal care, neurosciences and adult and children's emergency departments together on one site to create a centre of excellence. There are significant benefits of having children's, maternity and adult services on the same site and the proximity to the University of Edinburgh Medical school and the Bio-Quarter will improve opportunities for partnership working and bring research to the bedside. The project is the first acute hospital facility to be procured under the Scottish Government's Non Profit Distributing model.

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Keynote address: Designing for quality improvement in mental health services: the findings of the Commission on Acute Adult Psychiatric Care

Patients in England with mental health problems currently have no guarantee that they will be treated swiftly or that they will receive care of a high standard. Against this backdrop, the Commission was set up in 2015 to examine the issues surrounding the provision of acute care services for mental health patients in England.

Current estimates suggest that around 500 mentally ill people have to travel more than 50km to be admitted into hospital every month. These long-distance admissions are primarily caused by difficulties in finding acute inpatient beds or suitable alternative services in their local area, and they are a symptom of far more widespread problems in how the whole mental health system operates.

System-wide problems include inconsistencies in the quality of care in inpatient units, insufficient inpatient care or alternatives to inpatient admission, and too many patients remaining in hospital for longer than necessary owing to inadequate residential provision.

The report's findings clearly demonstrate that acute adult inpatient care must be considered as essential mental health services.

Lord Crisp will dissect the Commission's key findings, and outline its recommendations for significant changes to how mental health services are commissioned, organised and monitored across the whole mental health system.

Lord Nigel Crisp (UK)

Independent crossbench member of the House of Lords; senior fellow at the Institute for Healthcare Improvement; former chief executive of the NHS in England; and former permanent secretary of the UK Department of Health, UK

Stephanie Liddicoat
(Australia)

PhD candidate and lecturer
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P01 Beyond the counselling workspace: spaces of significance in treatment of self-harm

Outside of the counselling workspace, what environments are significant in the treatment of self-harm? Why are these significant and what are the implications for clinical practice and architectural design?

This paper explores the significance of environments outside the counselling workspace in the treatment of self-harm. Using literature of therapeutic practice, and feedback from research respondents, this paper discusses the importance of a de-escalation space post counselling to quell dissociative traits; an urge room to keep individuals grounded in the present and help quell urges to self-injure; and a natural mind-space adjacent to the counselling workspace.

These spaces assist in promoting a sense of safety, comfort and containment for individuals who self harm and provide escapism from the intensity of the counselling session. This helps to better foster mental processing and therapeutic efficacy. The research on which this paper is based also found that a metaphor of the journey of counselling is important to have manifest in physical space.

This paper discusses the importance of the physical environment in relation to therapeutic outcomes and implications for clinical practice. A series of design initiatives are proposed to enable integration of spatial concepts into the development of care. Consumer consultation is also emphasised to best understand how these spaces are perceived by individuals who are undergoing treatment for self-harm.

It is recommended that therapists and architects give consideration to the three spaces outlined in this paper. Suggestions are provided for how to design and integrate these spaces, alongside the integration of a user-centred design methodology.

P02 Healthy circulation – an investigation into the design, impact and efficiency of circulation spaces in healthcare environments

Over recent years, the UK Department of Health has undertaken to improve the design quality of healthcare buildings. As well as demonstrating improved quality, new schemes, as part of the NHS approvals process, must also meet standards of efficiency, as set out in the NHS guidance. This is typically stipulated as a maximum percentage of total floor area occupied by circulation spaces that allow user movement around a building.

The subject of this research is to determine whether the aspirations for high-quality environments, specifically in relation to circulation spaces in primary care centres, are achievable without compromising the efficiency standards defined in the guidance.

NHS guidance generally addresses the character of circulation spaces in a purely functional manner. Other research studies, however, have observed that improved quality in corridors has been observed to reduce stress, assist wayfinding and, generally, improve the healthcare experience.

Methodology

A literature review enabled a series of design principles to be identified for improving the design of circulation areas. These principles were used, among other criteria, to select a sample of recently completed primary-care buildings for further analysis in terms of their efficiency. Each selected building represents an exemplar of healthcare building design.

Results

When comparing the results with NHS design guidance, it was found that 13 of the 14 buildings exceeded the recommended figures for circulation space. It was, however, more difficult to link this outcome directly with the concept of improved design quality. This was because a broad range of factors, including the model of clinical care, control of infection policies, construction issues and site constraints, were all found to affect a building's layout.

Conclusion

This apparent difficultly in meeting the NHS design standards can lead to buildings that are non-compliant, larger, and therefore less affordable. Without further guidance on the topic, project teams may face a dilemma whether to pursue design quality as a priority or to comply with efficiency standards.

Marc Levinson (UK)

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University

P03 Interior elements required to relax users of family houses in Japan

In Japan, mothers are often expected to stay with their sick children in hospital all day, but the spaces provided for them in the paediatric ward are normally poorly equipped. As a result, mothers can become exhausted both mentally and physically. A comfortable architectural environment for families should be designed to enable both medical care and familial support for sick children.

Purpose

The purpose of this research is to find the most effective design for providing comfortable spaces for families in hospitals.

Methods

This research clarifies what interior elements can help families relax in family accommodation facilities ('family houses'). It includes: 1) postal questionnaires sent to 91 family houses in Japan and analysis of the 38 responses; and 2) interviews with the house managers of four representative family houses, and a site investigation.

It is estimated that there are 91 active family houses in Japan, and each received a questionnaire. Four representative family houses are economically supported by two different enterprises, which are located in Tokyo, Osaka, and Nagoya. They have gained experience and knowledge of a variety of families and sick children, so house managers should be able to give an account of the feelings of typical users.

Moreover, family houses can satisfy the needs of their users much more flexibly and directly than hospitals, which have many constraints. Therefore, it could be effective to investigate these facilities in order to extract the key elements required to realise a compassionate environment.

Results

Important interior elements required to help families relax are: 1) handmade decorations; 2) good-quality mattresses for better sleep; 3) personal space; 4) a clean facility; 5) interior elements made of wood; 6) colour coordination; and 7) plenty of toys in the playroom.

Conclusions

According to the selected elements, the key idea is to give a sense of 'I feel as if I'm at home' and 'I feel as if I'm valued'. To stay for a long period in a hospital is a difficult experience for all, especially small children. It is important that their mothers stay relaxed and comfortable beside them, and are able to provide good support. We should make the hospital environment more human, and not send out the message that it is merely a repair factory for human beings.

P04 The art of sustainability

Sustainability is one of Great Ormond Street Hospital for Children's (GOSH) five strategic aims. Climate change and poor air quality present a real threat to child health, so we're playing our part by reducing waste, cutting emissions and educating staff, patients and families.

An innovative partnership between the art and energy departments has developed our understanding of how art can improve our sustainability projects, and how sustainability can inspire our arts programme. This has resulted in several award-winning creative projects focusing on sustainability and behaviour change. So far, the partnership has resulted in two major projects and an ongoing change of focus for the arts programme.

Project 1: The sustainability story

Patients created a 62m-long artwork to depict the journey to become a more sustainable hospital. It brings together drawings by more than 100 children and young people, and offered them an opportunity to engage with the sustainability issues most important to them.

Project 2: Clean air – yeah!

This project focused on improving air quality in and around the hospital. Children with respiratory conditions drew landmarks in the local area to create walking maps for hospital visitors. These maps were made available online, with printed copies available in the reception and handed out to encourage walking to hospital. Patients from one ward created an animation, which they narrated, with personal stories explaining the effect air pollution has on their conditions.

Outcomes

The partnership has led to several projects that use creative methods to explore, develop and communicate sustainability themes. This work builds on research that shows people are more likely to change their behaviour if the message appeals to their motivations rather than focusing on environmental or financial benefits. Outcomes include artworks on public hoardings, walking maps, road signs on Great Ormond Street, and an animation.

The impact of the air quality project has been particularly significant. Low-emission travel between stations and hospital increased from 63% to 79%, with around 38,000 annual journeys making the shift. The percentage of taxis booked through the hospital that are now low or zero emission has increased from 70% to 91%, and visitors are reporting that the hospital is quieter and less polluted.

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P05 Repeatable rooms and standardised components achieve clinical and cost efficiencies at Scarborough Hospital

A £4m surgical ward new-build project at Scarborough Hospital has featured two repeatable room designs and several standardised components from the ProCure21+ programme, saving over £90,000 and allowing a further facility to be built as part of the original capital project.

Objectives

In response to the need for another surgical ward, plans were accelerated to build on top of the existing Maple ward. The project brief asked for a minimum of 50% single rooms and a building that would remain efficient and effective for many years.

Methods

The Repeatable Rooms and Standardised Components initiative began in 2013, following a conference at which 95% of NHS trusts present voted to develop a set of evidence-based room designs that could be repeated across a new-build or refurbishment project.

Results

York Teaching Hospitals NHS Foundation Trust had anticipated some operational-phase benefits from standardisation – including improved infection control, footprint savings and resulting clinical efficiencies – but it was surprised at how quickly these were realised. Sixty clinical hours were saved because designs were backed by evidence and available as fully loaded BIM models, so clinicians could walk through a virtual space and understand what it would look like and how it would work. There were also cost savings on components, which allowed the Trust to incorporate another £200,000 project to the redevelopment scheme overall.

Conclusion

The Trust is conducting tests to determine efficiency improvements in the new Lilac ward. While early days, it seems there is a decent reduction in walking distances over the traditional layout. Initial feedback shows estates staff spending less time in the new ward on domestic services and maintenance. Clinical staff scored it 10/10 for quality of product, and patients report feeling as if they're in a private facility. Improvements have also been seen in staff recruitment and retention, lengths of stay, and satisfaction metrics.

The Trust is now looking to incorporate the emergency department repeatable treatment rooms in a forthcoming project.

P06 Biophilic design: the benefits for all of connecting healthcare spaces with nature

Biophilic design is an approach that seeks to connect building occupants more closely with nature, so that people become positively emotionally and intellectually attached to the landscapes and places around them. Using the recently completed Alder Hey Children's Health Park as an example, this poster considers the benefits of this approach in the context of physical and psychological wellbeing for both patients and staff.

Using staff, patient and visitor first-hand accounts, the success of the concept design approach will be measured against the reality of that experience. References will also be made to the evidenced-based research to substantiate conclusions drawn.

The project

The brief called for a paediatric environment that, together with adjacent Springfield Park, would form an integrated children's health park. The brief was ambitious, stipulating broad concepts such as 'greenery' and 'views', 'therapeutic' and 'innovative'. In response, the building's undulating profile makes it instantly recognisable, even from a distance. The three-finger plan form gives almost all rooms a view of the park, and access to outdoor space at the end of each ward connects children with the outdoors even if they have a long inpatient stay.

Internally, the goal was to make wayfinding simple and stress-free, and to get away from the long corridors characteristic of the existing buildings. This open feel begins with the atrium concourse, a five-storey high space that links the building's two main entrances and gives visitors an immediate appreciation of the layout and a sense of the hospital's life and buzz. The sense of openness extends to the clinical areas, where sliding glass doors in all bedrooms to optimise observation and daylight. In the critical-care unit, this approach has produced an innovative layout with patient bays curved around a central staff base and a rooflight that floods the eight-bed cluster with daylight.

Conclusion

This paper concludes with a commentary relating to the specification of natural materials, use of colour, and integration of art and landscape. It will describe how the use of daylight and the generation of views out of the building, as well as the creation of external space at all levels within it, contribute to the biophilic approach, connecting the building and landscape in a sustainable environment.

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P07 National policies for the inclusion of service users back into the neighbourhood

Mental illness affects one in four people in Europe at some point in their life. Moreover, nine in ten countries with the highest suicide rates are European. Yet, society still allocates the risk associated with mental illness to closed institutions, despite limited evidence of their therapeutic effectiveness.

Even in the most advanced countries, institutions can still be segregated from the urban grid; this might be so even if buildings are small in scale and organisationally belong to what is called community care. This contradicts social psychiatry, undermines European principles of health and equality, and ignores the directions of the World Health Organization. Urban planning and architectural research by scholars such as Marcus or Hillier demonstrate the strong connection between social inequalities and the built environment.

The paper investigates how a change in mental health facilities planning legislation could be more supportive for social integration. It explores the case of one European country and examines its national planning and licensing legislation in relation to mental health facilities. It focuses on how alterations to change-of-use legislation for psychiatric facilities affect the national integration outcome.

The research was top down, facilitated by the European Commission and the country's Ministry of Health. In total, 112 out of all 116 community-based facilities in the country participated. The research highlighted those elements in existing planning legislation that favoured segregated (geographically or organisationally) institutions.

The uses-of-land framework prevented facilities from becoming part of an integrated concept and promoted development of mental health accommodation in buildings designed for other purposes or in segregated areas, different from what we would call neighbourhoods.

The research identified the country's planning legislation as a key contributor to exclusion. Alternatives were tested and, in particular, the redefinition of uses. This change generated functional complications, and the condition of altering uses alone proved inadequate.

Yet, the introduction of new national design guidelines could act as a correction mechanism. The final deliverable of the project was a set of fit-for-purpose guidelines. The research findings may be useful to European countries at the start of their process of de-institutionalisation of mental health facilities, but they could also be beneficial for more advanced countries, such as the UK or Belgium.

P08 Application of building information modelling (BIM) to the design, construction and operations management of a complex proton-beam therapy facility in central London

The objective of this work is to describe and review the implementation and application of building information modelling (BIM) to the design of a highly complex proton-beam therapy (PBT) facility currently under development in central London.

Methods

The findings are based on a case study of a PBT project with five storeys below ground and a six-storey hospital above ground, in a congested area of central London. The BIM implementation has been analysed using qualitative and quantitative methods, and is based on a vast volume of data gathered over a three-year period. The methodology is supported by general observation, interviews and surveys.

Results and conclusions

PBT facilities are considered vastly complex estate developments to design, construct and maintain. Such projects require substantial capital investment and usually take longer to complete than typical hospital developments. The intricacies involved are underpinned not only by the regular involvement of design team/building contractor and client but also by a close collaboration with the PBT equipment vendor. Moreover, these challenging undertakings must fulfil elaborate requirements regarding clinical space, patient/clinical pathways, hygiene, safety, specialised equipment, and many others.

By default, these projects comprise a large amount of information to support the cutting-edge technology and construction venture. These data are presented in various ways and often supplied by the equipment vendor in the form of a building information document. However, the buildings are not solely focused on static data but also involve dynamic processes embedded within building design, construction and management, which, in turn, entail iterative phases and intermediate changes. Data management is governed by efficiencies driven by BIM, as well as a lean methodology to the whole lifecycle of the facility.

This paper focuses on development of BIM and its implementation in this PBT project to drive better design integration and fit, decision-making, reduced costs, de-risking, completing ahead of schedule, and, most importantly, robust information for future operations.

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P09 The 10 biggest errors when choosing hospital flooring

The design of safer, healthier hospitals goes far beyond just meeting existing healthcare regulations and building requirements.

Objectives

This paper describes 'The 10 biggest errors when choosing hospital flooring that lead to dissatisfaction with your workers and could become a cost trap for your facility'. It considers how best to avoid them, based on evidence-based design studies.

Results

Supporting the creation of safer spaces both for personnel and patients, flooring plays a crucial role in healthcare facilities. Flooring specification is neither simply a product choice nor is it just about choosing a healthier or less healthier building product. In fact, flooring can have an impact on employee absence rates, maintenance and lifecycle costs, fire safety in the building, the effectiveness of hygiene and infection control, good or bad indoor air quality, good or poor acoustics in the rooms and corridors, and so on. The choice of flooring can be decisive for the success of the hospital in an increasingly competitive environment, where patients tend to compare rankings about hospital-acquired infections (HAIs) and the general quality of design.

Conclusions

This paper illustrates that seeking to attain an environmental building classification is not enough to guarantee a healing environment. It shows how the 10 errors identified could be avoided, if all aspects are considered and if all relevant parties are involved in the planning process.

P10 Health ironies – practising civic stewardship

Dr Bill Snyder describes an approach of 'Active caring for people and places' through the application of three techniques: action learning; connecting; and aligning – all readily and inexpensively integrated into the vision, strategy, values and culture of a health organisation.

New York's Project for Public Spaces evidenced 80% of the success of places is due to management, and 20% to design. Civic stewardship is "lighter, quicker, cheaper" than physical change and informs design briefing. Stewardship is easily adjustable according to time and circumstances, and can be started by one person with caring skills.

Purpose

The aim of this research is to: demonstrate the strategic concept and value of civic stewardship; experience skills and techniques while encouraging dialogue; and describe concerns of administrators about using places and show how fears have been overcome.

Method

An interactive workshop demonstrates the importance of play and its potential for wider application. Including tables and games encourages conversation and sociability, which is good for people and reduces perceived waiting ennui. The workshop involves:

- a 5-10 minute presentation showing examples;
- a small suitcase containing sweet jars but no sweets – instead they're full of fresh fruits, small games and playthings;
- using everyday objects in different contexts, and asking "what's your story today?";
- the importance of a structure and plan used informally, as people typically watch and wait but soon want to become involved in activities; and
- conversations and listening – the starting points of stewardship.

Results

Temporarily changing the use of places produces amazing responses. Officials join in, they think differently, and they gain confidence in how places can be used. People are engaged and ready to align policies, practices, habits and regulations to create better places and happier, more fulfilled staff and visitors.

Conclusions

The workshop adds to personal experience, allowing participants to try civic stewardship while contributing to continuing government research in Northern Ireland.

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P11 Design-driven co-design of healthcare architecture

Crucial decisions about the design of new healthcare facilities are made in the early phases of the design process. The initial phase can be characterised as a conceptual phase in which stakeholders meet to discuss ideas and requirements concerning spatial solutions and functions. This phase also gives an opportunity to review how existing work is done and how the facilities are used accordingly, enabling a discussion on how work and facilities interact.

Ideas about new care models are integrated with facility design development. User needs, as well as the healthcare organisation's strategic plan, must be identified and articulated to support an efficient design process. Involving healthcare professionals in the design process is essential for integrating knowledge of care processes into the design. Where possible, representatives from patients and families should also participate. The initial phase impacts the healthcare organisation's ability to affect future clinical outcomes.

A design approach is needed where healthcare future visions, needs and spatial solutions can develop in parallel. Using a co-design approach, 'Design dialogues' is a framework that addresses the need for integrating user perspectives to reach innovative solutions in the design process. The framework builds on interactive and participatory dialogue processes involving multi-disciplinary teams. It comprises workshops and tools, and includes active collaboration between clients, users, architects and other stakeholders.

The basic concept is to use design methodology and model-making to handle complex commissions in an iterative work process, with identification and evaluation of needs and development of solutions. While working together in a cross-disciplinary group, participants use design artefacts to explore spatial relationships and new design concepts simultaneously.

Sweco Architects adapted the Design dialogues method for practical and commercial use in 2004. Since then it has been used in more than 100 projects in both the public and private sectors.

Some completed projects have been scientifically evaluated according to both design process and clinical outcomes. Based on a neonatal department at Karolinska University Hospital in Stockholm, the paper will focus on the Design dialogues process, and why and how it was performed. It will also present positive results concerning clinical outcomes and discuss how the design process influenced the development of a new care philosophy and the final architectural design.

P12 The New QEII Hospital – a local hospital for a garden city

The New QEII Hospital is a substantial re-provision of the existing hospital at the QEII site in Welwyn Garden City, bringing together existing and new services in a new purpose-built facility. The New QEII is part of a wider strategic estate and service reorganisation across the NHS in Hertfordshire, and is a major component of this process, as the existing building reaches the end of its useful life.

The strategic changes started with system-wide engagement and consultation in 2007. Patient and public engagement have been significant in helping deliver this £30m facility, as well as the £150m investment at the 'sister' site, the Lister Hospital, Stevenage, where there has been centralisation of specialist acute services. The contractual arrangements enable services to change as health service provision changes. Generic clinical rooms enable greater flexibility of use and provides for a wide range of services to be delivered locally to residents without the need to travel to the acute hospital.

This new building and the reorganisation of the local health system have provided the opportunity to deliver new models of care by integrating primary, acute and social care services. This project exemplifies the current reforms in the NHS and the emphasis in the 'Five Year Forward View' on integration and efficiency.

The New QEII accommodates a 24/7 urgent-care centre and a large diagnostic imaging department. A large outpatients department encompasses many existing clinical services on site. Other services include ambulatory care, medical day treatment, integrated children's services, therapies, a breast clinic, and an endoscopy suite. The voluntary sector has been commissioned to provide support for visitors.

The New QEII is located on the existing hospital site and was built as part of a masterplan to deliver a sustainable development that supports the new hospital and future uses of the site. An exemplar of low-energy, sustainable design, achieving BREEAM Excellent, the New QEII is designed around the wellbeing of patients, integrating the work of several artists to add interest and human scale.

The design of the New QEII reflects the garden city ethos, with accommodation set around a large central courtyard and a series of gardens between the building and a mature hedge. The building is formed in three L-shaped wings defining the courtyard space, around which the main public circulation is arranged, allowing good daylight and legibility for wayfinding.

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P13 Children's hospital experiences

Arguably, there is nowhere more important to get it right in healthcare than in a department that not only provides treatment for the youngest and most vulnerable of society but also where parents and carers are perhaps even more stressed than they would be if it were they who were unwell.

It's important for children to have a strong health education programme at school, raising awareness of their wellbeing and their ability to directly affect health through behaviour and personal choices.

One of the best ways we could help children become less afraid of hospitals would be to teach them how to use the facilities. Field trips, school visits and experiences all contribute to removing the fear of the unknown and de-stressing the experience for when actual enforced visits might be required. If they understood the most appropriate place to get help when it is needed, and knew what to expect when they arrived, not only would children be better equipped to cope with their own hospital visits but they would also be better able to help staff, their parents and carers when we need to use the NHS.

It doesn't take countless studies to evidence the importance of communication in maintaining a stress-free treatment pathway. This is especially true in paediatric care, where parents and carers must be kept sufficiently informed to assist in the calming of the patient.

Adult waiting rooms are generally now far removed from the airport-style rows of chairs, and more closely resemble hotel lobbies in some of the better facilities. But in paediatric units, there exists the opportunity to use technology and allow outpatient clinics the freedom to let patients sit in the café while waiting, pop to the shop, or play under cover in a courtyard, before being summoned by pager or text message – all things that help support positive distraction.

An excellent way to achieve this within high-acuity environments has been used at Great Ormond Street in the journey to theatre. Here, the artist has developed full-size feature walls of silver birch glades, difficult to distinguish with the naked eye and hiding moving digital creatures that can be pointed out by parents and carers – helping take minds away from the anticipation of scary surgical procedures.

P14 Assessing the complexity of a healthcare facility as an evaluation tool for reaching economic, social and environmental sustainability in hospital buildings

Healthcare facilities are supposed to improve and protect public health, but they are highly energy-demanding and socially impactful structures, which determinate negative effects on the health of the population and environment. When speaking about architectures for health, sustainability has to be considered as both a main requirement and a quality issue.

This research work could be significant in the context of hospital facilities because it attempts to analyse not only the performance of the building itself but also all the organisational and managerial processes, and social aspects that characterise a health facility – items that several scholars and professionals are currently studying.

Nowadays there are many rating systems that evaluate different aspects of sustainability and buildings' performance: for healthcare facilities, the most widely recognised and commonly used systems are LEED and BREEAM, while, at a clinical level, there are tools such as the International Joint Commission. Stakeholders' roles have an important impact, too: the analysis highlights the diversity of groups of people who may have an interest in healthcare – from public administration to users such as employees, patients, volunteers, etc.

Starting from these notions, the aim of this research is to provide a new tool that defines an innovative rating system for sustainable existing operative and in-design hospitals, where sustainability applies to the main macro areas of social, economic and environmental sustainability.

The tool features several criteria and indicators organised according to a hierarchic structure, employing a scoring system based on appropriately weighted credits and built through the multi-criteria methods of analytic network process.

The final purpose of the work is practical application to several national and international healthcare facilities. This analysis will allow for the ability to distinguish several deficiencies, to analyse some best practices that can be helpful for improving the sustainability of the structures, and to verify the weighing system obtained through focus groups and interviews with experts, with the goal of increasing the hospitals' quality and performance.

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P15 Out-of-hospital emergency care: developing a model based on evidence from patients, family members and professionals

Emergency care has been broadly studied, but although an increasing number of patients is treated solely on site, there is little research on out-of-hospital emergency care. To ensure patients and families can cope at home, there is a greater importance attached to high-quality care and counselling of patients. This will also help cut down expenditure and make more effective use of resources.

A research project has been launched with the purpose of examining and describing out-of-hospital emergency care from the perspectives of patients, family members and professional care providers. It sets out to develop a model of high-quality out-of-hospital emergency care, with a focus on staff's clinical skills. The project aims to create knowledge that can be applied in the systematic development of quality and effectiveness of emergency care.

This presentation describes patients' and family members' experiences of emergency care and counselling at home. Data were collected in 2014 in a Finnish hospital district, using semi-structured interviews and analysed using inductive content analysis. Participants were adult patients (n=8) and their spouses (n=7).

The couples were mainly satisfied with out-of-hospital emergency care. The spouse was the active partner in the situation. The couples hesitated to call for help. Their experiences of waiting for the ambulance varied. They found the arrival of the care providers and the emergency care professional to be a relief, but their experiences of counselling varied. Spouses had multiple roles in the emergency situation. They described the care as good professional activity but also associated it with uncertainty. Compared with patients, spouses were less satisfied with emergency care provided at home.

Patients and family members need more information about the option of emergency care at home without transport for further treatment. They also require good quality counselling according to their needs to ensure safe coping at home.

A questionnaire was developed to collect further data from patients and family members (n=200) for analysis. Data were also collected from out-of-hospital emergency staff (n=142) and an educational intervention was conducted with staff in autumn 2015. Follow-up data from staff will be collected in 2016. All data concerning staff, patients and family members will be analysed and modelled to describe the elements of high-quality out-of-hospital emergency care.

P16 Evaluation of hospital design strategies for future change

Change over time is a constant feature of architecture, yet the pace of change and its intensity are much greater in hospitals than in any other type of building. Advances in all areas of healthcare – scientific, operational, technical and social – necessitate frequent changes in the typical hospital environment, sometimes in cycles of five or ten years. This is remarkable, given that most hospital structures are typically designed to last between 50 and 100 years.

Since the process of design and construction is both long and expensive, architects and planners are faced with the challenge that many new hospitals are out of date by the time they open. Since the 1960s, architects have developed theories and methods to anticipate, to the greatest degree possible, where changes are most likely to occur, and to design hospitals for maximum flexibility and expansion. Yet, many hospitals that were designed to be 'infinitely' flexible and dynamic did not fulfil their original vision. They did not expand and their interior redevelopment was limited in scope. As a result, many hospitals have become obsolete and face demolition after only 30 years.

Given the high cost and complexity of healthcare, hospital directors and designers can no longer afford to let inadequate prediction of change drive investment and design decisions. They are demanding proof that the design strategy chosen will support hospital performance over time.

This research documents the theories and approaches pertinent to hospital planning for change and explores them in practice. Based on case studies and literary analysis and critique, the research reviews the existing evaluation methods for hospitals' flexibility in design.

The results illustrate the limitation of the evaluation methods and the need to develop a comprehensive evaluation tool that integrates all aspects of hospital performance, in order to enhance knowledgeable decision-making during the design process and through the lifecycle of the hospital.

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P17 Shaping environments for the future – a look at Guernsey's mental health service

Until recently Guernsey's mental health service was delivered from disparate, inadequate estates. A programme of work, which began 13 years ago, identified the need to centralise mental health services on one site. The primary driver was to ensure the service would be efficient and effective, focused on the community, and delivered from new fit-for-purpose facilities.

The Oberlands Centre is a new mental health and wellbeing unit recently completed on the main acute hospital site. This paper looks at the service benefits and efficiencies gained through co-location of complementary departments, and the proposals and anticipated benefits from centralising the community mental health teams within an agile working environment, empowering work in the community. The design interventions that achieve this are:

Flexible inpatient bed configuration: The unit consists of two service-user wards. One includes 'eight plus two' older adult beds and the adjacent ward includes 'ten plus two' adult acute beds. The 'plus two' beds are co-located so they can be used by either service if necessary. Four beds are allocated for extra care and can be locked off. When delivering a healthcare service on an island with a small population it has to flex more than usual to meet varied demand.

Central community hub: The health provider's vision centred on creating a community, not an institution. In realising this, a key space is the main entrance designed as the heart or hub of the building. It is a shared facility for all services and the wider community. The space has informal seating spaces, a service-user run cafe, natural light from clerestory glazing, and a mix of local and service-user art.

Complementary departmental adjacency: The development includes re-use of an existing Georgian villa refurbished for CAMHS outpatient facilities. This is co-located with adult outpatient facilities.

Interior design and service user artwork: Service-user art at entrances eases anxiety on entering a new unit owing to the sense of familiarity. There is sculpted robust seating in the courtyards and kinetic glass installations suspended from the ceilings. Supagraphics and blocks of colour are used to enhance wayfinding.

Therapeutic landscapes: Each ward opens on to secure courtyards with views to the rural landscape beyond. Bedroom windows are screened by raised planters with planted lavender. The scent entering the bedrooms encourages a calm environment.

P18 The P21+ Repeatable Rooms and Standard Components programme: the service-user perspective

The P21+ Repeatable Rooms and Standard Components programme has been developed in response to the Government Construction Strategy, with the aim of driving 20% cost efficiencies by standardising design and identifying opportunities for bulk-buying in the NHS. The P21+ team has succeeded in developing a 'repeatable mental health bedroom', which has delivered cost efficiencies while improving the patient environment.

Methods

The P21+ team followed a robust 12-step design process that tested and re-evaluated assumptions. This included a literature review, evaluation of existing designs, peer reviews, and mock-up tests. The team also visited NHS trusts across the country and mental health support groups, including the Mental Fight Club in Southwark, Innovate Dementia in Merseyside, and South Essex Carer's Group, in order to understand current issues and identify ways to improve the design of mental health facilities.

Results

The site visits enabled the team to understand both estates and operational challenges. The most heated debates centred on the extent to which the design should maintain patient safety; estates managers often argued that the design should accommodate no risk, while nurses generally felt that risk should be managed operationally when possible.

Site visits enabled the team to see examples of innovation, including the use of different flooring at the entrance, with a coat and shelf unit to create a threshold that acted as a lobby. Service-user support groups indicated that rooms are often stripped of identity, with no stimulation to help users connect to the outside world. Participants at the Mental Fight Club felt that furniture often dominated bedrooms.

The team was encouraged to consider what the bedroom feels like when items aren't used, when large shelving units are left empty, or when a noticeboard has no pictures. Service-user and staff feedback have significantly contributed to the design of the 'repeatable mental health bedroom' and helped the design team develop innovative design solutions to key issues.

Conclusion

The programme has developed standardised components that can be used with the repeatable room designs; both designs and components can be used to suit different patient experience outcomes.

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P19 User instructions: a way to optimise wellbeing benefits of gardens in healthcare facilities

Human beings have long been proven to possess an innate attachment and preference towards nature and natural elements. Being in such environments and simply seeing such elements leads to positive wellbeing outcomes for people. This is especially important for those who are sick or ageing.

Considerate design of gardens is just one precondition to achieve positive wellbeing outcomes. How far such outcomes can be achieved depends on how the gardens are seen and used.

Methodology and results

Group interviews (n=19 residents; n=28 staff) conducted in an elderly-care facility in Hong Kong found that an appreciation of nature is rather limited, even false, when residents and staff know little about the potential wellbeing benefits from using a garden. Typically, elderly residents are only aware of fresh air and plants, and merely focus on the red and green colours of plants among different sensory stimulations. While staff share a similar appreciation of nature as residents, they seldom visit the garden, mainly because of their busy routines, dislike of too much sunlight, and presence of mosquitos in the garden. But their reluctance to engage with the garden also limits the chances for residents, who cannot visit the garden without assistance.

Noting this, the author delivered a seminar to staff at the facility, introducing the potential wellbeing benefits that could be gained from the garden, as well as insight on how to appreciate it. Three months later, the author revisited the garden to conduct some observations. This time, many staff were recorded in the garden, relaxing or organising gardening activities for residents. The management also told the author that staff had become more active in visiting the garden and guiding residents to enjoy gardening activities.

Conclusion

Many gardens in healthcare facilities are underused in Hong Kong. Based on the experience of this facility for the elderly, it would be helpful if potential users are provided with some ideas about how gardens can be used and appreciated, together with basic knowledge on the potential wellbeing benefits to be gained. These could be in the form of user instructions, which help optimise wellbeing benefits of gardens in healthcare facilities.

P20 Five-star service as standard: service design strategies for improving cancer care

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This case study reports on a service improvement project for the specialist oncology centre, Leaders in Oncology Care (LOC).

The project builds on knowledge and practice in service design techniques (especially framing and reframing, and process improvement techniques), design ethnography (drawing on human-centric insight and 'thick' descriptions to generate opportunities for innovation and prompt ideas), and different ways of using design within the organisation (as set out in the Danish Design Ladder: styling, process, experience, strategy).

The brief from LOC was to further enhance patient and staff experience at the cancer treatment clinic. The approach was to follow a six-step process based on the principle of 'Rapid Results':

1. Listening, shadowing, learning – talking to people, observing practice, and reviewing information.
2. A 'behind-the-scenes' workshop at a five-star hotel – looking for service similarities and translatable ideas.
3. Designing prototype improvements – three 'task force' teams looking for quick wins in different areas.
4. Rapid testing of prototypes in situ – to quickly see which ideas would or wouldn't work.
5. Selecting prototypes – planning implementation for the long term.
6. Monitoring what's working – regular impact and evaluation reports.

The workshop had a particularly powerful reframing impact. It introduced new solution possibilities by asking what a cancer treatment clinic might learn from service teams at a five-star hotel – a place that excels at delivering a great user experience.

Three areas were identified to trial rapid improvement approaches at the clinic – scheduling appointments, reception, and pharmacy services. Three corresponding task teams developed ideas for improvements in each area. Several ideas underwent rapid testing in subsequent weeks and have now been adopted. Some of these improvements have resulted in significant efficiencies – in treatments delivered each week, and in freeing up staff time.

This project is a powerful demonstration of the ways in which, through the strategic use of design, improving patient experience and creating service efficiencies can go hand in hand.

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P21 Meeting the terror challenge – improved health services planning for a large-scale terrorist attack

On 13 November 2015 in Paris, terrorists delivered the deadliest attacks on French soil since World War II. How would our healthcare systems respond and manage the potential stresses to the system if, for example, London were hit by a Paris-style multi-target terrorist attack?

Methods

Modelling vulnerabilities: Analysis of the layouts of our cities allows modellers to anticipate where people will congregate, where business will locate and, more pertinently, where cities are most vulnerable to a terrorist attack. The models can also provide an understanding of how populations will react to an attack immediately following the event and in the longer term. This understanding has already been used to improve the resilience of the highest priority targets across Europe, but many cities continue to lack this understanding, therefore making them more vulnerable and increasing the likelihood of an attack as a result.

This understanding can also be used when planning emergency responses. It allows the likely locations of terrorist events to be anticipated, so that hospitals and response resources can be pre-positioned while targeted plans can be developed and exercised.

Adaptive capacity: The second key step to improving the response to an attack is to improve the ability to share situational awareness and risk understanding across all emergency responders. An example of this is public space CCTV, which is generally owned by municipal authorities but cannot be shared easily by other organisations, such as health, ambulance, fire and police services. The inability to cohesively create and share situational awareness slows down the response and inhibits coordination.

Results

A city's response to a large-scale terrorist attack will be directly impacted by the ability of all responders to understand the situation as it develops, and the ability to plan, locate and prepare people and resource accordingly.

Conclusions

We propose to deliver a split workshop, with the first group working to develop an understanding of the power of modelling in planning for terrorist events, and the second developing the concept of shared situational awareness and the tools through which situational awareness can be supported.

P22 The choreography of care

Healthcare is not easy to contain; a whole village of activity needs collected under one roof. A reasonable aim for those charged with funding the 'village' is that capital expenditure is minimised and operational efficiency maximised. Equally reasonable aims of healthcare providers should include being friendly and welcoming, taking care of patients, and anticipating needs. The balance is found through the definition of priorities.

Clients may sometimes seem to lack the will to follow through the big concepts (most of which are already embodied in myriad design guides for healthcare). Aspirations are set out in an initial brief but are then abandoned in a return to what was done last time, believing too much effort is required to really change. Compiling a full and intelligent brief takes effort and time, but it pays dividends. A process of interrogation and iteration helps ensure that operational opportunities stay in step with design development and vice versa – as evidenced by two projects we present.

Leaders in oncology care want to spend wisely, ensure the operational flow is correct, and never neglect their manners in offering warm hospitality. A well-considered, some might say, choreographed, sequence of spaces emits a low hum of quiet efficiency. Private matters are dealt with in private, light-filled waiting spaces, where staff are on hand. Chemotherapy pods allow patients to see and hear each other – if desired – during prolonged periods of treatment, so they can forge acquaintances.

Isokinetic follows its patients from the first day after a sports injury to the day of return to the team. The journey to recovery is mapped individually with each patient, and can be seen and understood thanks to a visual link created between all zones of the facility. Spaces flow in a sequence that complements the five phases of the treatment – from pain management through motion and flexibility, strength and endurance, coordination and motor skills, ending with work on a sport-specific movement.

Patients can be young or old, seemingly fit or obviously suffering. We explore, through design, how hospital and hospitality can be best mutually supported so that people are cared for as individuals.

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P23 The power of patient, staff and community involvement in masterplanning for mental health and addictions: a lean-led approach

Waterford Hospital is a tertiary care facility in Newfoundland and Labrador, Canada. Much of the existing facility was built in the 1850s, with the newest units built in the 1940s. The model of care has been very paternalistic, with caregivers being in charge of determining care plans without the involvement of patients. In recent years, there has been a lot of unfavourable public attention related to the quality of care and the state of the facility, which provoked a review of how services are provided for mental health and addictions patients. As a result, in 2014, Eastern Health shifted to a recovery model of care, in which patients and care providers partner to help patients achieve their recovery goals. At the same time, it undertook a masterplanning process to determine an appropriate service delivery plan, facilities response, and capital budget.

Purpose

This poster aims to share a transformative methodology for co-design in masterplanning that simultaneously addresses cultural change, operational improvement, and facility planning and design. It will present our lean-led process, outcomes achieved and client feedback.

Methods

The methodology promoted intensive collaboration among stakeholders, including patients, family members, caregivers, community stakeholders and leaders, who worked together to re-design the care model, clinical operations and the new facility. These sessions included: current state value-stream mapping; future state value-stream mapping; production preparation process (3P) workshops, in which future state operations were translated into conceptual designs; and selection of the best option through a rigorous 'choosing by advantages' process.

Results and implications

The results of this approach were profound. Patients, families, caregivers, community stakeholders and senior administrators became the authors and owners of design concepts for operations, the site and the facility. Architects functioned as design facilitators and translators of their vision. The results of this collaboration were more robustly developed design options, more detailed capital budgets, and a deep understanding of the operational implications. This process yielded sufficient operational and design information to produce a schematic design during the masterplanning stage.

P24 Best practices for integrated technologies in healthcare facilities

Most healthcare depends on IT and communications (ITC) technology in some form, and new requirements and technology are continually being introduced, for example: sharing of data across multiple locations; cloud storage; mobile technology; support for clinical decision-making; use of data for predictive and personalised healthcare; and remote monitoring. Patient expectations are also growing.

Healthcare facilities also incorporate an increasingly wide range of systems to support operations and improve patient experience, for example: wireless staff communications; automated dispensing; building management systems; wayfinding; security systems; mechanised logistics systems; and real-time materials tracking.

All too often though, ITC systems are fragmented, difficult to interoperate, and not linked beyond the four walls of the facility.

A whole systems approach is required that integrates people, process, environment and technology. Arup has developed a systems model addressing all elements of the total system to inform successful design and operations.

Description

This presentation will introduce a process and a series of tools used in the planning of healthcare facilities in Canada. These include: stakeholder identification and engagement; definition of responsibilities; business process mapping; system integration scoping; development of an integration matrix; and specifying and procuring integrated systems.

Outcomes

The ambition is for open, interoperable and scalable solutions that enable excellence in healthcare and greater operational efficiency. The goal is not only to deliver successful integration but also to enable the digital (real-time) hospital. This involves a centrally planned and executed technology strategy that enables clinical decision-making and operations to respond to real-time data.

Implications

A systems approach is necessary for the planning, specification, procurement and implementation of ITC. This should start at the earliest stages with an ITC masterplan. New roles are required to define and deliver systems integration. ITC requires a different process than that used for buildings design and delivery, however, as the dependencies and points of information exchange between the two processes must be carefully planned for success.

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P25 More than just a broken body

The King's Critical Care Centre is part of the largest intensive-care service in the UK – King's Critical Care. Constructed over an existing theatre block, suspended from 40m trusses, its location at the hub of the hospital's emergency pathway is key to King's College Hospital's status as a major trauma centre.

The concept design phase for the King's Critical Care Centre started in 2011 and, with a projected completion in 2019, the project team is faced with the challenge of defining the ICU workplace of the future using current construction and medical services knowledge.

Our principal vision to humanise critical care focuses beyond survival and on the quality of a patient's recovery. Where conventional medical research may fail, focus on the environment can enhance recovery. This traditionally hostile setting must, in the future, minimise a patient's feeling of social isolation, empower them to seize control of the environment, and underpin the vital relationship between staff, relatives and patients.

Each bed space will be adaptable to meet the highly variable acuity and environmental needs of each patient. Emphasis is put on natural daylight, maximum transparency while maintaining privacy, and services integration – all within a stimulating environment.

Maximum configurability extends to the main clinical informatics device. A floating 32-inch touch screen will serve as an ergonomic clinical tool for staff and a patient entertainment and communication device, while offering a means of patient profiling.

A roof garden, equipped with data points and medical gasses, will give patients on life-support access to fresh air and sunlight, providing what is believed to be the world's first outdoor intensive-care unit and creating the opportunity for pioneering research into the effects of environmental factors on recovery.

Sponsored by NHS England, and in partnership with technology providers, we are developing a pioneering informatics system to enhance personalised care and facilitate human contact between patients and clinicians.

By combining art, architecture, IT, medical technology and more into a single goal and package, we aim to help set a new standard across the global critical care community and beyond.

P26 Design innovation in emergency care

The Queen Elizabeth Hospital's new emergency-care centre (ECC) extends the existing hospital to improve and reform pathways for emergency patients. It ensures early triage, assessment and quick diagnosis to address significant risk to clinical services and planned elective work posed by previous high levels of unplanned admissions.

The 10,000m^2 new-build ECC responds to these challenges. The assessment process directs patients to the right place first time, ensuring early triage, assessment and quick diagnosis, offering improved quality of care, reduced patient anxiety and prevention of duplication.

Through co-location of a range of services, including adult medical, paediatric assessment, medical and surgical short stay, A&E, and walk-in, the shifting needs within the healthcare model towards greater integration and flexibility are addressed.

The new-build is based on a linear design with two separate access routes for patients and public on one side and clinical staff on the other, providing more efficient workflow, higher productivity and shorter patient stays. It incorporates 56 identical assessment rooms in seven flexible pods, supported by diagnostic and resuscitation pods.

The project outcomes were due to be assessed in February this year, using a level 2 post-occupancy evaluation to highlight successes and lessons in relation to building performance and delivery of emergency care services after one full year of operation.

Working directly with patients and staff, the evaluation looked at the outcomes at a strategic level, reviewing relevant objective data and gathering insight from managers in the NHS trust.

The trust's strategic brief was reviewed in the context of the delivered facility to determine if the building is being used as envisaged. The impact of lean design principles was assessed for effectiveness of staff workflow efficiency and contribution to the avoidance of secondary issues during care.

The presentation of this case study focuses on the output of the post-occupancy evaluation and outlines the salient lessons from what is a specific approach to emergency care in the UK.

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P27 Art and design for health: a model for building innovation capacity to promote dignity and support inclusion

This paper presents a partnership that led to the development of an interdisciplinary innovation centre, where assistive technology is designed to promote dignity and enable inclusion. A particular focus is given to supporting wellbeing and inclusion among children with complex medical conditions.

There is little research on models involving interdisciplinary centres. This paper provides an analysis of the fundamentals of a successful approach by connecting the capture of requirements, creative experimentation, design thinking, testing prototyping, manufacturing, marketing, licensing and financing.

Description

The Cerebra Innovation Centre (CIC) was established in 2005 to develop, design and produce products to help in the daily lives of children with neurological conditions. The CIC represents a partnership between a charity (Cerebra), a faculty (Swansea College of Art), carers and patients.

Products start as bespoke items for individuals but are regularly adopted by other patients who share similar medical conditions. A specific case will be presented where a bespoke product led to many thousands being acquired by the three main supermarkets in the UK, to support parents wishing to take their children shopping. The product is now supporting inclusion in other environments.

A process has been adopted to identify new problems and present solutions that have multiple benefits and beneficiaries. This could impact on challenges such as the development of medical devices.

Outcomes

Ten years of activity have seen the refinement of the process of engagement with patients, the introduction of new technology, and a restructuring of the support network. The financial model for mass production has been tested and has provided new insights. The strengths of this model reside in the engagement with parents and patients, combined with the intervention of practitioners from an arts background. The weaknesses relate to measuring the impact of the benefits of products, and limitations in satisfying demand.

Implications

The authors believe the model is transferable and sustainable, if environment, conditions and partnerships are carefully prepared.

P28 Designing for community-specific mental health – the Australian context

In healthcare design, a standardised approach is often seen as the most cost-effective and efficient way of providing a service. As an architect, this approach seems fraught with difficulties – no two sites are the same, existing buildings get in the way, solar access and views need to be taken into account, and we want to create a design solution that responds to the site context and environment.

These issues are compounded by differences in the methods of health service delivery and by the very different nature of the communities for which we are designing. In Australia and, more specifically, the state of New South Wales, design for communities in urban Sydney, for example, varies greatly from the response for a similarly briefed building in a remote area such as Broken Hill.

The O'Brien Centre at St Vincent's Hospital Sydney is a mental health and drug and alcohol facility built in the heart of the city. The hospital caters for areas as diverse as Kings Cross, with its transient backpacker population, and Point Piper, the most affluent suburb in Sydney. The community for this project are city dwellers, people used to high-rise buildings and apartment living. The O'Brien Centre is an eight-storey building on a tight hospital site, prominently positioned to promote its approach to mental healthcare. The Young Adults Private Mental Health unit within the building is a 20-bed facility designed for adolescents, typically first-episode patients. Initial design ideas for the project centred on concepts such as 'embrace', 'nurture' and 'protect'.

The Broken Hill Sub-acute mental health project is a 10-bed facility in the remote town of Broken Hill, a 12-hour drive from Sydney. In designing this facility, we looked at a very different community. This project would cater for adults who view mental health issues negatively and present specific cultural challenges for the design. Initial design ideas for this project centred, quite differently, on concepts such as 'expanse', 're-connection' and 'land'.

The importance of designing specific healing environments for specific communities became apparent. A cookie-cutter design approach for healthcare is not an appropriate response for buildings that must be concerned with the communities in which they exist.

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P29 How do clinical institutions develop flexible clinical care clusters to encourage future disruptive discoveries to improve patient care?

Urban hospital campuses have developed over the last 30 years, often as tightly knit amalgamations of buildings, and have grown and evolved as renovations and additions have provided much needed new clinical space. Initially, clinical office space, inpatient beds, diagnostic, treatment, outpatient functions and, in some institutions, research components were co-located functions based on clinical divisions. As demands for space increased, these areas became increasingly physically separated from each other over time.

Today, technology, discovery and co-morbidities continue to create a convergence of these once considered disparate divisions; does this require a new model for the modern urban hospital campus to adequately maintain the best patient care?

Over the 20th century, buildings began as integrated centres of care. Silos of departments created individual fiefdoms, and primarily grew in these connected ageing buildings. As the 21st century dawned, many institutions searched for ways to decant space on the urban campus, and selectively separated outpatient care into new distributed buildings off-site from the main hub. Clinical office space became “divisional offices”, which were often further separated from the clinical care areas, as well as intensive diagnostic and treatment areas. If research was accommodated, it was often categorised as a separate function and moved entirely off campus.

Additional pressures of cost of construction pushed institutions to search for ways to limit “office” space, and give priority to patient-care areas. Clinicians’ offices and work areas were often subsequently removed from the hospital. Many institutions evaluated providers who were often at different locations, and moved to an allocated touchdown model. While this left more space for patient care, it may have weakened the provider camaraderie and support network. Did this shift, in fact, create more silos in healthcare?

Clinicians continue to search for new ways to collaborate, inform, and develop, to deliver exceptional patient care. Studies show that staff satisfaction contributes not only to staff recruitment and retention but also to improved patient care. Departments are converging around co-morbidities and new discoveries, clinicians are finding new ways to work, and the built environment should provide the best opportunity to encourage the best patient outcomes. How can the campus cluster to support the clinicians?

P30 Patient flow: design to improve patient flow through acute medicine

Patients in need of unplanned urgent care are likely to be admitted to an acute medical unit (AMU), where their care plans are determined. Evidence shows that AMUs – highly resourced environments staffed by multidisciplinary teams (MDTs) – have reduced: length of stay; delays exceeding the four-hour 'post-admission' target; and mortality rates in hospital. But AMUs experience pressures in patients overflowing from emergency departments and difficult-to-discharge cases.

Framework

A 'Double Diamond' design process informed the project. Opportunities for improvement through design intervention were identified. Concepts were tested through a participatory approach, promoting co-design. The methodology prioritises the most problematic areas, encourages adoption through user collaboration, and enables investors and stakeholders to assess their risk.

Description

Nine hospital sites in Scotland and England were studied. Of these, 'Discharge from acute settings' was selected for further investigation. The goal is a strategy for discharging patients from AMUs at the right time, by the right people – developing a culture to improve patient flow, quality of care and the human experience, from the moment of admission. Through iterations of design and validation with hospital teams, GPs and patients, the team developed ideas focused on four opportunity threads: visibility of the pathway across the MDT; information sharing among the MDT and beyond; patient empowerment through information; and the ability to follow-up with patients post-discharge.

Outcomes

The team is designing communication tools to: improve visibility of the care journey; improve communication and information-sharing among the MDT; empower patients; and facilitating follow-up post-discharge. MDTs involved in evaluating these tools to date believe they will improve care integration and patient flow. Owing to technology infrastructure limitations, both digital and analogue outputs will be created. Local variability between AMUs also complicates standardisation of communication practices.

Implications

The aim is to create more integrated systems, linking different levels of care so that hospital, community and social care all contribute to improved discharge and patient flow through the system.

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P31 Future ICU: improving the patient experience of critical care

Intensive care units (ICUs) can be hostile places for patients. Understandably, they prioritise clinical interventions, but they can also be dehumanising. Patients often suffer from sleep deprivation, hallucinations and delirium in a half-conscious state. The psychological effects of the ICU often linger in patients for years after their hospital stay, affecting their lives and those of their carers.

Framework

This study investigates design approaches to improve the patient experience and long-term outcomes. The project employs the 'Double Diamond' design process and will span a two-year period in three phases: research and concept generation; concept development (current phase); and testing and implementation.

Description

Initial ethnographic research took place in ICU departments at three London hospitals and one in Reading. Work included observations and interviews with ICU nurses, junior doctors, consultants, physiotherapists and clinical psychologists. An understanding was developed about levels of clinical patient acuity, treatment pathways, ICU routines, environments, equipment, etc. The research was further informed by literature reviews, in-depth interviews with ex-ICU patients and relatives, workshops, questionnaires, conferences, and consultations with experts. The team identified 10 dimensions that influence the patient experience, validating them through expert consultations and workshops with ex-patients, relatives and ICU staff.

Ranking of the dimensions by stakeholders led to four areas as the focus for developing design interventions: orientation; hallucinations; communication and information; and relatives' involvement. Three design briefs encompassing these four areas have been developed: orientation tool; positive sensations; and information and relatives' involvement.

These were approved by the project steering group and refined with ex-ICU patients, relatives and ICU staff. A creative ideas session helped develop initial concepts. These were presented to the ICU Support Network Group at Reading to obtain feedback.

Outcomes and implications

Following feedback, the team has outlined design principles to guide further co-development work. Delivery of the final design outcomes is expected in October, with testing at multiple sites during the final five months, ending in February 2017.

P32 Fitting a proton-beam therapy facility into your building

Proton-beam therapy (PBT) is a specialist radiotherapy technique that is likely to be included, or at least considered, for any future large cancer therapy centre. The key benefit to patients for this modality is that it allows much better targeting of the cancer and much less radiation exposure to healthy tissue.

Although the planning procedure is similar to traditional radiotherapy, the PBT equipment is very different. In particular, the treatment rooms themselves tend to be large three-storey spaces to fit the huge gantry, which is required to deliver the beam to the patient (equivalent to the treatment head of a linear accelerator). The proton beam itself is generated in an accelerator (of which there are various types) and transported along a beam line to the treatment room.

One of the main challenges for the inclusion of PBT into any building, particularly one with a fixed footprint, is that there is a number of different types of equipment, all with different space and radiation-shielding requirements. In addition, the equipment is still being developed, so any early design must be flexible and able to cater for changes in both spatial and access requirements.

This paper will give the spatial and shielding requirements for a number of different types of proton-beam therapy equipment and show the difference between suppliers of the same type of equipment. It will outline how the uncertainties in the footprint and other requirements were managed during the design and procurement process for the first NHS PBT centre. It will also provide guidance for other PBT centres during the early stages of design, through to final facility planning.

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P33 Inspiring hope through design

The Royal Belfast Hospital for Sick Children (RBHSC), Northern Ireland was the only children's hospital in the UK without MRI scanning facilities, with young patients having to use inappropriate adult facilities at the neighbouring Royal Victoria Hospital. In order to provide a more supportive environment for children's needs, four local children's charities raised £2m to purchase scanning equipment, and the Belfast Health and Social Care Trust provided space at the RBHSC.

Methodology and results

The site for the new MRI scanner unit was located within the children's hospital, a complex warren of buildings deemed far from fit for purpose. The location overlooked a rundown service yard with no opportunity for natural light or exterior views.

Holistic healing and family-centred care were central to the design concept. The unusual funding stream allowed the design team to collaborate closely with the charities, which significantly informed the final design and enabled AECOM to challenge traditional assumptions.

Given the small number of staff in the unit, AECOM negotiated standard infection-control zones, resulting in space being less clinical than might have been the case had standard zoning requirements been enforced.

Art was the medium to promote wellness. The theme had to offset the run-down location and lack of contact with the natural environment. A seaside theme was chosen to provide a familiar and relaxing environment. Nature-themed super graphics are integrated into the architecture and a large aquarium was installed.

Young children are stimulated by brightly coloured fish graphics, creating clear and fun wayfinding. Older children tend to respond better to neutral surroundings provided through pale rubber flooring, off-white walls and oak timber panelling in circulation areas. Three raised clerestory roof lanterns aligned along the main circulation route allow space to flood with natural light, as well as affording skyward views. Large pebble-shaped pendant lights hanging from the lanterns and lagoon-blue carpets reinforce the seaside theme.

Conclusions

The project team went beyond normal specifications to create an oasis of calm. The project, shaped through meaningful engagement, provides a professional paediatric environment and a space infused with natural light, designed to engage, entertain, distract and alleviate distress.

P34 A social sustainability approach to evidence-based birth environment design

Today, 33% of all Danish women giving birth for the first time receive labour-inducing medicine oxytocin (Kjaergaard, Olsen, Ottesen, and Dykes, 2009). Research in Australia, England and the USA shows that the birth environment influences the normal excretion of the birth hormone oxytocin and women's satisfaction with birth (Hodnett et al, 2010; Foureur, MJ et al, 2010; Uvnäs-Moberg, 1998).

Purpose

This paper investigates how to create a socially sustainable environment at Danish birth units.

By combining user processes with an interdisciplinary evidence-based design process, we might increase the possibility for social sustainability at Danish hospital maternity wards (Fonara et al, 2012; Berardi, 2013; Weisz et al, 2011; Birgisdottir, 2013; Frandsen et al, 2011; Overgaard et al, 2012). This will support wellbeing, social health and a normal birth (spontaneous vaginal birth).

Methods

The paper will explore the above theory by discussing healing architecture, evidence-based design, normal birth, and social sustainability understood as a means to wellbeing and social health for humans.

Results

The paper will argue that social sustainability can be created by merging the method of evidence-based design with elements from user involvement in co-creating the design process.

Implications

Through focusing on users, and involving and creating ideas on space, organisation and professionalism, it is possible to create social sustainability at a maternity ward. This thereby promotes normal birth and supports the new family as they embark on parenthood.

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P35 Negotiation in design: the participatory process in designing healthcare facilities of public hospitals in Thailand

Most public hospitals in developing countries such as Thailand face numerous problems in designing and maintaining healthcare facilities. There is a lack of awareness among stakeholders of the importance of the built environment. The hospital physical environment has been neglected, owing to the centralised nature of the Thai health system in both policy and budget. This leads to limits in designing and operating the built environment to support wellbeing, as most public hospital designs have been assigned by the Thai Ministry of Health.

This paper demonstrates a participatory process in design interventions for public hospitals in Thailand. A 90-bed community hospital was used as a case study to illustrate the problem of standardisation in hospital planning.

A group of hospital personnel consisting of an executive director, medical staff, a facility manager, as well as patients, collaborated with the architects through a series of design workshops, which involved mapping, modelling and focus groups aimed at integrating four dimensions of wellbeing – physical, mental, social and spiritual – into tangible form.

This process involved negotiation among stakeholders, and led to the design interventions and two-way learning dialogues in a selected area: the outpatient department. The negotiated designs suggest that the customisation of healthcare facilities design is necessary.

Issues subject to negotiation ranged from financial limitation, conflicted behaviour in medical service provision, different perspectives, familiar patterns in spatial usage, and hierarchical authority in decision-making. It is hoped that this paper will increase environmental awareness and understanding of healthcare facilities design.

P36 Landscapes for health: whose values, whose benefits?

Studies have shown that residents of deprived urban neighbourhoods with larger areas of green space have the lowest levels of health inequality related to income deprivation, and reduced mortality from circulatory disease. Access to parks and green space in the city has been linked to reductions in chronic stress, improved health and longer life expectancy overall in some populations, independent of individual characteristics (Van den Berg et al, 2007; Mitchell and Popham, 2008). There is generally less quality green space in deprived areas than in wealthier areas in the UK (CABE, 2010).

Creating increased access to high-quality green space can, arguably, be an important part of overcoming health inequality, but this paper questions whether green spaces in all configurations are equally valuable for people of different cultural backgrounds. In the UK, people from ethnic minority groups are significantly more likely than white British people to live in areas with high indices of deprivation, and are more likely to suffer poor health and have shorter lifespans than people of British white ethnicity.

At the same time, although all groups have been found to value access to green space in their neighbourhood, ethnic minorities are typically under-represented as users of parks and other green spaces in the UK at a far greater level than is explained by income alone. As a result, they may well not be gaining the health benefits that have been claimed (CABE, 2010; Snaith, 2015).

Drawing on recent case study research findings, this paper evidences how values and beliefs about nature and green space among different ethnic groups can mean landscapes in some spatial configurations will have greater benefits for some groups than for others. Using a mixed methods approach, including survey, interviews, focus groups, spatial analysis and user observation, this research from East London has found that while seeking inclusion, exclusionary values are unintentionally embedded in production and management of UK green space, particularly as sustainability agendas drive a growth in the popularity of an ecological aesthetic.

This paper evidences the impact of cultural values in spatial production, their exclusionary impacts, especially along ethnic dimensions, and reflects on how inclusion can be designed in through greater engagement in design and ongoing management of green space. It also reflects on the importance of cultural consciousness in landscape design and management for health in our increasingly multicultural cities.

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P37 Bringing proton-beam therapy to the UK

The paper sets out to explain the benefits of proton-beam therapy for the treatment of cancer, and why, for certain patients, it is considered a much safer treatment option. This will also shed light on some the reasons why the NHS has chosen to invest in this type of treatment, as the capital costs are substantially greater than traditional radiotherapy. Finally, the Manchester PBT Centre will be considered to illustrate the complexities in design and delivery of such facilities.

Methodology

The use of protons in the treatment of cancer is particularly useful because of their physical properties. Protons can be controlled to a much greater degree, thereby allowing greater precision to treated areas and minimising damage to surrounding tissue. This makes PBT especially suited to treating tumours in sensitive areas, for example, near vital parts of the brain, leading to fewer side-effects.

However, bringing proton therapy to the UK is no easy task, as these facilities are much larger, more complex, and costlier than traditional radiotherapy centres. Considering that the NHS already has a system for sending patients abroad, why invest so much on facilities at home? Firstly, one has to consider the huge disruption that overseas PBT has on a patient and their loved ones. A typical PBT patient is treated over the course of six to eight weeks; for paediatric patients, a parent or guardian also needs to be present during that time. Secondly, patients treated at home in the UK will have access to their entire support network, clinical and non-clinical. Furthermore, the NHS will be able to treat many more patents and at a fraction of the cost of PBT treatment abroad.

Results

NHS England is currently building two PBT centres, one in London at UCLH and one in Manchester at the Christie Hospital. Tender specification details for equipment vendors were issued in 2013, and vendor dialogue began in January 2014. Patient experience was a central consideration in the design of the Manchester PBT, as minimising the fear associated with cancer treatment and such overwhelmingly complex technology was seen as paramount. The architects have worked alongside the end users, equipment vendors and the building contractors to produce the designs put forward for town planning and Department of Health approval. The preferred bidder for the equipment was announced in March 2015, and construction began in August. Equipment will be delivered in June 2017, with the first patient treated in 2018.

P38 Engaging interiors

Interior design is a key aspect of design for health and wellness. In fact, it is arguably more crucial to the experience of all users than any other aspect of physical design.

Over the last 20 years, interior design has moved rapidly in the UK from perfunctory and formulaic spatial decoration to sophisticated shaping of perception and mood, not unlike what can be seen in some of the best contemporary hotel design. Most recently, art and interior design have come together to produce dynamic healthcare interiors that engage users in hitherto unimaginable ways. With this enhanced impact, we argue, comes a responsibility to all building occupants, recognising that novel interventions – visual, non-visual, digital and virtual reality – must be applied with care and sensitivity to patient type and need.

In the late 1990s, the Department of Health invented the somewhat perverse term 'consumerism' to reflect patients' right to quality of experience when in hospital. Consumerism allocated uplifted budgets to additional space – for example, 'social space' in bedrooms – and enhanced interiors. Interior design progressed from the adornment of space to the shaping of experience.

Key to this process has been the embracing of art as a key contributor to design. Art advisors and practitioners have been brought into project teams and work closely (but not exclusively) with interior design teams. Moreover, art specialists from outside the traditional healthcare domain are now being appointed to projects.

This presentation traces the evolving and expanding purview of interior design, drawing on key projects in the UK, the US and the Middle East. We illustrate a progression from basic working with light, colour and texture, to interior design with thematic content, to dynamic interiors that rely on virtual reality and digital technology. This development, we suggest, has brought us to a 'point of no return'.

Those who brief projects can no longer ignore the role that interiors play in shaping experience by influencing emotional states. Designers, on the other hand, must exercise care in the application of new powerful tools. There is a need for evaluation and a new evidence base. We argue that a theoretical underpinning is needed, drawing on the work of Professor Bryan Lawson[2] and others. We explore the potential of this new interior culture and theory to extend to novel settings, such as mental health, rehabilitation and home care.

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P39 Is there a relationship between seasonal changes in daylight hours and clinical measures in patients following deep brain stimulation (DBS) surgery? A feasibility study

There is minimal research into the impact of hospital design on clinical patient outcomes. Research on circadian rhythms and daylight exposure demonstrates a relationship between metabolism and mental health (Ljubicic et al, 2007). Literature on sleep deprivation and daylight exposure shows effects on staff health (Alimoglu and Donmez, 2005). There is, however, little robust research into the effect of daylight on patients and subsequent clinical outcomes, particularly on the effect of allowing ingress of natural light into healthcare environments.

Aims

This study seeks to understand if exposure to daylight in patients following DBS surgery affects outcomes, using seasonal variations in daylight hours as a proxy. It is hoped that the long-term outcome will be to recognise the significance of light on healthcare design.

Methods

A feasibility study was undertaken, retrospectively analysing routinely collected clinical data.

Findings

This feasibility study demonstrates that casenote thematic analysis, using a semantic inductive approach, is an appropriate methodology (Braun and Clarke, 2006). Although the sample size was small and statistical significance cannot be drawn from the findings, clinical significance may be inferred. Post-operative complications were identified, but the potential effect of daylight was not shown, possibly owing to the small sample size. The findings showed a statistically non-significant – but potentially clinically significant difference – in neuropsychiatric complications in winter and summer admissions. Of patients admitted in summer, 41 complications were reported compared with 55 in winter. A difference was found in post-operative complications, particularly in neuropsychiatric complications, where 17 issues were reported in winter compared with 12 in summer, suggesting potential for further investigation.

Conclusion

This study has demonstrated potential areas for improvement or modification in nurse-led clinics to increase early detection of post-operative complications. Areas for the multidisciplinary team to modify practice and improve patient outcomes were also identified.

P40 Promoting the role of green space in healthcare interventions

The Landscape Gardens and Health Network is a UK initiative. It is a multidisciplinary community that wishes to bring all those involved with the healing environment into closer dialogue. It hopes to break down barriers and promote serious debate about the role of green space in healthcare interventions.

The network's aim is to provide a gathering space for those involved and interested in the role of gardens, landscape and horticulture in promoting wellbeing. The term 'landscape' is used in its broadest sense, embracing the natural and designed environment, and highlighting its many relationships to human health.

The founding steering group includes: Gursewak Aulakh, landscape architect (University of Plymouth); Angie Butterfield, garden historian; Daryl Martin, sociologist (University of York); Zoe Millman, landscape researcher (Birmingham University); and Colin Porter, landscape designer.

The network held an initial 'Stepping Stones' meeting at North Devon Hospice, Barnstaple, in 2014. This was followed by a one-day seminar, 'Nature and Wellbeing', which took place in 2015 at the Penny Brohn Cancer Care Centre in Bristol, where a five-acre garden is central to the therapeutic and healing work that takes place.

Attendees at the seminar ranged from landscape architects and garden designers to researchers and healthcare professionals. The event confirmed the need for a central forum for the exchange of ideas and research.

Our recently launched website will, in time, cater for this need. It will provide online resources for the broad base of membership the network attracts. It will not only highlight current research but also projects that demonstrate the therapeutic significance and value of landscape, gardens and green space.

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ARCHITECTS FOR HEALTH

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Architects for Health

Architects for Health (AfH) is the UK forum for healthcare design.

Design of hospital or clinic environments is important for the wellbeing of patients, their friends and families, and people who treat and care. Good design enhances the experience of care and has a positive influence on clinical outcomes. AfH promotes design of better settings for healthcare by providing a forum for the exchange of ideas, promoting best practice, and recognising and rewarding excellent examples of healthcare design.

We work to bring about strategic change to the complex processes of planning and development. Drawing on the practical experience of our expert membership, we aim to make a difference through our work streams on procurement, guidance, strategic planning and design quality. We engage with and influence wider health institutions and communities.

A non-profit organisation with 300 members, we build knowledge networks that inform and support the future design of high-quality healthcare settings. We share ideas, experiences and examples through our growing membership links across the UK and Europe.

Membership

We welcome members from both health and design professions who share our values across healthcare planning, design, and delivery. We bring together ideas from clinical practice and architectural design. Our members benefit from displays of our projects at national conferences, discounts to events, information exchange and collaboration, CPD opportunities, and support for ideas for AfH activities and projects.

Programme of events

The annual programme of activities promotes better understanding of health planning and design issues, and keeps members informed across the whole range of healthcare topics. All events are wide-ranging in scope and include joint events with clinical societies and Royal Colleges, or with representatives of organisations active in health facilities procurement.

Innovation and best practice

New methods of treatment and emerging technologies mean that health environments are constantly facing new challenges. Cultural, workforce and qualitative expectations drive change in design. To understand this evolving health infrastructure and reflect best practice, we arrange study visits to health facilities at home and abroad, which keep our members up to date with the latest ideas and innovations.

Nurture and learning

Designers care for the future. AfH is collaborating with schools of architecture and design to proactively support the inclusion of healthcare-sector buildings in the curriculum. We have a well-established programme of Student Design Awards, which is now in its tenth year.

You can follow AfH on Facebook and LinkedIn. For more information, please visit: www.architectsforhealth.com/join/

ARCHITECTS FOR HEALTH

SALUS GLOBAL KNOWLEDGE EXCHANGE

SALUS Global Knowledge Exchange

SALUS is an entrepreneurial global media, research, publishing, events and training organisation with a vision to improve human and environmental 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 – with a focus on SALUS (Science, Architecture, Lifestyle, Urbanism, Sustainability).

We believe that 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 the earth's finite resources – are inextricably linked.

In today's global knowledge society, with the many opportunities science and technology have presented to share ideas and methods, the solutions to our human and planetary crisis lie within our grasp.

SALUS aims to build interdisciplinary professional communities and networks that will facilitate collaborations through a range of media, publishing, events and training activities that promote the application and interaction of art, science, research, culture and innovation.

Conferences, seminars and workshops

The focus of all SALUS events is on the development of knowledge and sharing of ideas, since we believe that interesting, relevant and inspiring content attracts leaders and innovators. By bringing expert researchers, policy advisors and practitioners together to tackle the key health and climate change issues facing the world, we aim to build bridges across geographic, cultural and socio-economic divides, promote and disseminate the latest scientific and research findings, and inspire the commercial development of innovative products and solutions. We welcome the opportunity to work with government, academic, public-sector and commercial-sector partners who share our values and vision.

Education and training

In addition to the learning environment created through our events, we also organise bespoke training courses and study visits in the design, health and wellbeing sectors. The courses can be combined with study visits to leading UK hospitals and are primarily provided for international delegates from the health infrastructure divisions of Ministries of Health, as well as public-sector and commercial practitioners.

Media and publishing

With more than 50 years of media and publishing experience within its ranks, SALUS is about to embark on its most innovative idea yet: the launch of a dedicated social media network at www.salus.global. This will provide a new online environment featuring conference videos, posters and papers, an online journal, and a fully searchable projects database, alongside a variety of innovative community features.

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Alder Hey Children's NHS Foundation Trust

Contact:
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Alder Hey Hospital,
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Based in Liverpool, Alder Hey is the UK's largest children's NHS trust, and the new Alder Hey in the Park hospital opened in October 2015.

Originally built in 1914, Alder Hey was the first hospital to: test penicillin, saving a child from pneumonia in 1944; establish a neonatal unit in the UK; cure the UK's most commonly encountered congenital heart defect; pioneer a range of splints and appliances; introduce 'liquid glass' to reduce infection; and gain accreditation for public health promotion from the World Health Organization.

On the back of this work, Alder Hey has developed as: a centre of excellence for cancer, and spinal, heart and brain conditions; a Department of Health centre for head and face surgery; a centre of excellence for muscular dystrophy; one of four national centres for childhood epilepsy surgery; a children's major trauma centre; a leading diagnostic centre; and a centre for research, innovation and education.

Brighton and Sussex University Hospitals NHS Trust

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Brighton and Sussex University Hospitals (BSUH) is an acute teaching hospital on two sites: the Royal Sussex County Hospital in Brighton, which is our centre for emergency, specialised and tertiary services, and the Princess Royal Hospital in Haywards Heath, which is our centre for elective surgery. These sites include the Royal Alexandra Children's Hospital, the Sussex Eye Hospital, and the Sussex Orthopaedic Treatment Centre.

BSUH provides district general hospital services for 450,000 people in and around the city of Brighton and Hove, mid Sussex and the western part of East Sussex. Our specialised and tertiary services treat patients from across Sussex and the South East of England. We are the major trauma centre for Sussex and the South East. The trust is planning a £480m redevelopment of the Royal Sussex County Hospital site (the 3Ts Programme), which is the largest publicly funded hospital project in a generation.

Construction Industry Council

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The Construction Industry Council (CIC) is the representative forum for the professional bodies, research organisations and specialist business associations in the construction industry.

Established in 1988 with five founder members, the CIC now occupies a key role in the UK construction industry, providing a single voice for professionals in all sectors of the built environment through its membership of 500,000 individual professionals and more than 25,000 firms.

The breadth and depth of its membership means that the CIC is the only single body able to speak with authority on the diverse issues connected with construction, without being constrained by the self-interest of any particular sector of the industry.

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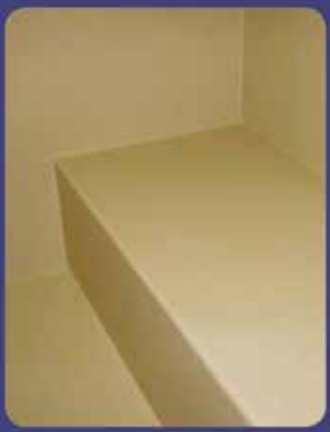

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Design Council

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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.

Essentia at Guy's and St Thomas' NHS Foundation Trust

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Essentia designs, builds and maintains healthcare infrastructure that is vital to the smooth running of healthcare services. We are an essential part of Guy's and St Thomas' NHS Foundation Trust. We combine high standards and public-sector values with commercial focus, innovative thinking and modern technology to create a fantastic patient experience.

We have also developed a commercial arm called Essentia Trading, which helps clients, predominantly in the public sector, become more efficient and effective. We provide consultancy and services in areas ranging from strategy and estates development, to sustainability and IT. We use our experience and expertise gained from many years in the NHS to support other organisations – and all profits are reinvested in Guy's and St Thomas'.

European Health Property Network

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The European Health Property Network (EuHPN) is an association of European governmental and research organisations responsible for the strategic asset planning and management of all forms of health property – from hospitals to health centres. The network was established in 2000, in the Netherlands, as a non-profit trust to promote excellence in health property provision and management.

EuHPN members are interested in learning from each other. To this end, the network holds an annual workshop, which takes place in a different country each year. The network also organises regular regional seminars across Europe.

Our members are able to draw on each other's experience and knowledge to answer some of the challenges they face in their own national health systems. From time to time members come together to take part in collaborative research or to engage in joint European projects. The EuHPN has strategic partnerships and alliances with a variety of other organisations around Europe and overseas, including representatives of private industry and not-for-profit organisations.

Great Ormond Street Hospital for Children NHS Foundation Trust

Great Ormond Street Hospital for Children NHS Foundation Trust

Great Ormond Street Hospital (GOSH) is an international centre of excellence in child healthcare.

Together with our research partner, the UCL Institute of Child Health (ICH), we form the UK's only academic biomedical research centre specialising in paediatrics.

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Health Care Without Harm

Health Care Without Harm

Health Care Without Harm (HCWH) Europe is a non-profit European coalition of hospitals, healthcare systems, healthcare professionals, local authorities, research/academic institutions, and environmental and health organisations.

It currently has 76 members in 26 countries of the WHO European Region, which includes 17 member states of the European Union. Health Care Without Harm has four regional offices: HCWH US (Arlington, United States), HCWH Europe (Brussels, Belgium), HCWH Latin America (Buenos Aires, Argentina), and HCWH Asia (Manila, the Philippines).

The organisation's mission is to transform healthcare worldwide so that it reduces its environmental footprint, and becomes both a community anchor for sustainability and a leader in the global movement for environmental health and justice. HCWH's vision is that healthcare should mobilise its ethical, economic and political influence to create an ecologically sustainable, equitable and healthy world.

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Royal College of Art
THE HELEN HAMLYN CENTRE FOR DESIGN

Helen Hamlyn Centre for Design, Royal College of Art

The Helen Hamlyn Centre for Design in London is the Royal College of Art's largest and longest-running centre for design research. It is 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.

Founded in 1991 and endowed by the Helen Hamlyn Trust, our goal is to conduct design research and projects with industry that will contribute to improving people's lives. Our interdisciplinary approach is based around the activities of three research labs – Age & Ability, Work & City and Healthcare. Each lab has developed its own empathic and innovative research methods, working in partnership with business, industry, government, academic and third-sector partners.

Our healthcare expertise extends from design policy and information, to the development of systems, services and products. Our projects include a total redesign of the interior space of the emergency ambulance.

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Landscape, Gardens & Health Network

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Colin Porter, landscape designer

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We are a multidisciplinary community of gardeners, designers, landscape architects, sociologists, therapists and healthcare professionals. We are practitioners and academics who recognise the need to bring all those involved with the healing environment into closer dialogue.

Our aim is to provide a central forum for this to happen. We want to break down barriers and promote serious debate about the role of green space in healthcare interventions.

Medical Architecture Research Unit

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MARU (Medical Architecture Research Unit) has more than 35 years' experience in research, consultancy and accredited training for professionals working in the planning, design and procurement of buildings for healthcare. MARU is an educational and research centre of excellence for validated, inter-professional training focused on healthcare provision from hospital to home.

Our vision is to explore the interface between health service organisational culture and the built environment response.

North Bristol NHS Trust

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North Bristol NHS Trust provides hospital and community healthcare for the residents of Bristol, South Gloucestershire and North Somerset. The trust is also a regional centre for neurosciences, plastics, burns, orthopaedics and renal.

The new Southmead Hospital PFI was completed in 2014 by Carillion at a cost of £430m. Designed by BDP, the project presents a high-quality public face utilising a semi-randomised façade aesthetic, which gives a non-institutional character to the bedroom wings.

RIBA Architecture

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The Royal Institute of British Architects champions better buildings, communities and the environment through architecture and our members. We provide the standards, training, support and recognition that put our members – in the UK and overseas – at the peak of their profession.

With government, we work to improve the design quality of public buildings, new homes and new communities.

SYKEHUSBYGG

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Sykehusbygg HF (Norwegian Hospital Construction Agency)

Sykehusbygg (Norwegian Hospital Construction Agency) was founded in November 2014 and is in its initial phase.

Sykehusbygg is owned by Norway's four regional health authorities, which, in turn, derive their funding from the Norwegian Ministry of Health.

The aim of the agency is to ensure national know-how for hospital planning, design, engineering and construction 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 taken into account in new hospital development projects. The agency must be used by all major Norwegian hospital development projects (over NOK 500 million).

Sykehusbygg only serves the four regional health authorities and their underlying authorities, as well as parties entering into a joint ownership with these bodies. The organisation's headquarters is in Trondheim, central Norway. This year, it's expected that the agency will have about 40 employees.

University College London Hospitals NHS Foundation Trust

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University College London Hospitals NHS Foundation Trust

University College London Hospitals NHS Foundation Trust (UCLH) is situated in the heart of London. It is one of the most complex NHS trusts, serving a large and diverse population. In July 2004, we were one of the first NHS trusts to achieve Foundation Trust status.

We provide academically led acute and specialist services, both locally and for patients throughout the UK and abroad. We balance the provision of highly rated specialist services – particularly cancer services, neurosciences and women's health – with delivering high-quality acute services to our local population in north London.

Our mission is to deliver high-quality patient care, excellent education and world-class research.

UCLH is made up of the following hospital sites, based in central north London: University College Hospital (Main Campus); University College Hospital (Westmoreland Street); National Hospital for Neurology and Neurosurgery; and Eastman Dental Hospital.

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Healthcare design & management magazine

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Healthcare design & management (*hdm*) is an exciting magazine for professionals involved in the planning, design, construction and management of healthcare buildings. Against a backdrop of new operating frameworks and changing models of care, *hdm* covers government strategy, estates management, cutting-edge interior design, and technical insights into M&E, as well as showcasing innovative new products for the healthcare environment. Regular comment from architects and analysts shows how all this fits together to improve the efficiency, accessibility and quality of the patient experience.

Every issue is packed with topical case studies, showing the best ideas in design and most innovative use of materials and technology across all types of health and social care buildings. Product areas range from components making up the building envelope to specification for patient and public areas.

hdm plays a vital role in healthcare design and construction, making sense of the changing models of care and new frameworks that underpin the latest hospital and healthcare schemes. *hdm* is also the industry's leading product showcase, covering the best design ideas and newest technologies, along with provocative views and in-depth analysis of healthcare funding and strategy.

HealthManagement.org

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Christian Marolt, editor in chief

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Dedicated to promoting management, leadership, best practice and cross-collaboration in healthcare, HealthManagement.org (HM) is a digital powerhouse uniting five specialist platforms – Healthcare IT Management, Cardiology Management, Imaging Management, EXEC, and ICU Management – into one.

Receiving 1 million visits a year, the web portal also serves as a leading healthcare news platform, providing comprehensive information on clinical practice, hospital administration, research, technology, and major challenges faced by practitioners. Valuable management tips are also provided via its dedicated channel e-newsletters.

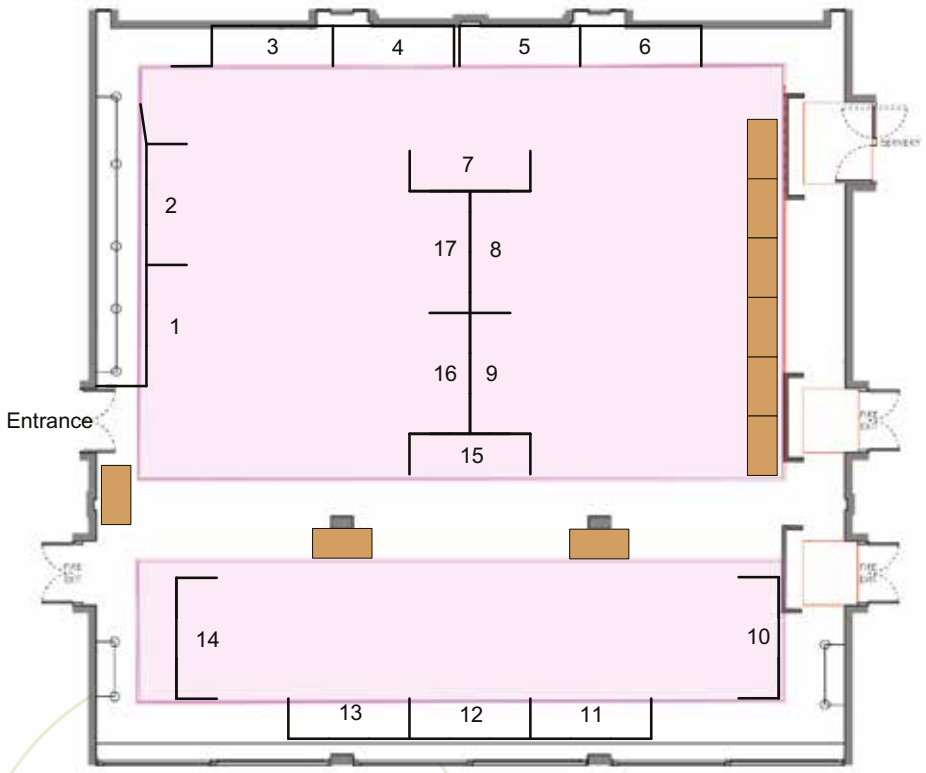
With a circulation of 60,000-plus and free distribution at major healthcare events worldwide, the associated printed publication, HealthManagement.org – The Journal, focuses on topics including management, healthcare governance, quality and safety, patient empowerment, and best practice.

Benefiting from the support of more than 50 professional associations, HealthManagement.org – The Journal is seen as an invaluable source of healthcare management information, with 40,000-plus articles in its online library. HM also serves as Europe's top leadership and best practice forum, boasting a faculty membership comprising about 50 countries.

OPENING TIMES:

Monday 27 June 10.00-17.00
Monday 27 June 18.00-20.30
Tuesday 28 June 10.00-17.00

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 both 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 reception drinks on the evening of Monday 27th June.



CATERING

1. Knightsbridge Furniture
2. Gerflor
3. Art in Site
4. Gold Medal Safety Padding
5. Korpinen
6. Nora Flooring Systems UK
7. Forta Medical
8. Pineapple Contracts
9. Samuel Heath
10. Veritas Medical Solutions
11. Treebox
12. KwickScreen
13. Bioquell
14. Draeger Medical
15. Architects for Health
16. V Guldmann
17. Vanguard Healthcare

AECOM

Contact:
John Hicks, global head of healthcare

W: www.aecom.com

BRONZE PARTNER

Consistently ranked as one of the world's leading healthcare and science designers, AECOM draws on the expertise of professionals in 150 countries. The vision of its healthcare practice is to create smart environments and systems that are people-centred and improve health outcomes.

Its teams are engaged across the health economy, from scientific research to acute hospitals, mental health facilities and aged care. They are able to translate the latest research and practice to generate smart ideas that go beyond conventional disciplines to improve people's health.

Art in Site

Contact:
Louisa Williams, director

W: www.artinsite.co.uk

EXHIBITION PARTNER

Art in Site was founded in 2003 to help change the culture of care. We know that improving the hospital environment improves the outcome for the patient. We make space for the patients to feel included in the building, and embed a feeling of reassurance and being looked after.

We are an expert team of consultants, artists, designers and production managers. Our early involvement with architects and our client's design team in developing effective art and wayfinding strategies helps build strong foundations, on to which our creative designs can be based.

Axis Automatic Entrance Systems

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Rob Brunero

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EXHIBITION PARTNER

Architects BDP inspired Axis Automatic Entrance Systems to design, manufacture and install an innovative child-friendly, manual sliding door for Alder Hey Children's Hospital.

Each door had to be large – up to 1800mm x 2700mm – for ease of access for beds and equipment. Doors had to be glazed for brightness and airiness, with privacy blinds featured. Finally, they had to be easily opened and closed by a child. Axis offered a new design solution called Flo-Motion. Testing of the doors in situ resulted in an average opening force of 10N.

Bioquell

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E: info@bioquell.com

EXHIBITION PARTNER

Studies show that the lack of physical barriers between patients contributes to higher rates of healthcare-associated infections (HAIs). With direct impact on patient recovery, HAIs also affect operations and revenues, owing to bed-blocking and later cancellation of elective surgeries.

With limited space and budgets, more single-occupancy rooms are often not an option. The Bioquell Pod is a 100% bespoke, cost-effective and flexible solution. Thanks to Bioquell's expertise, increasing single-occupancy isolation has never been more effective in preventing costly bed-blocking and enabling greater usage of wards.

Capita

Contact:
Craig Dixon, director, Capita Health Partners

W: www.capita.co.uk

BRONZE PARTNER

Capita is the UK's leading provider of business process outsourcing and professional services. Our multi-disciplinary health consultants can provide services ranging from national policy advice to local problem-solving.

Working together, we can improve healthcare outcomes by: identifying best practice; creating innovative models of care; preparing service strategies; assessing feasibility of proposed changes; drafting design briefs; devising solutions; calculating costs; assessing affordability; writing business cases; evaluating design submissions; and supporting PPP bidding teams.

CRT Health

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KNOWLEDGE PARTNER

CRT Health provides real-time feedback solutions, data analysis capability and quality improvement expertise across the health sector.

As nurses and technologists, we work with NHS bodies to position patient experience at the heart of every solution along the 'Capture, Analyse and Improve' journey: capture feedback effectively – using the best method according to patient profile and accessibility needs; analyse data intelligently – helping staff triangulate data and understand patients better; and improve quality – helping staff achieve change that makes a lasting difference.

Design Quality Indicator

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KNOWLEDGE PARTNER

Design Quality Indicator (DQI) is a process of evaluating and improving the design and construction of new buildings and the renovation of existing buildings. It is designed to set and track design quality at key stages of a building's development.

DQI for Health is a design quality evaluation tool for all healthcare projects. It builds on the DQI and includes the best features of the now obsolete Achieving Excellence Design Evaluation Tool (AEDET). It also includes important topics such as sustainability and patient safety.

Draeger Medical

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Sarah Sanderson, project specialist

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EXHIBITION PARTNER

Dräger has been supporting the design of workplaces in the field of acute medical care for more than 50 years. We know the challenges you face. With our expertise in complex processes, we are able to work with you to develop the most suitable concept. This way, we can produce tailored, flexible and future-proof solutions.

Our extensive range of workstation components enhances the chosen solution to create the optimum workspace for the clinical team and, thus, the optimum environment for the patient.

Forta Medical

Contact:
Aviv Brosilovski, business development

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EXHIBITION PARTNER

Forta Medical manufactures high-standard modular units suitable for the construction of hospitals and clinics, as well as for residential, public and many other applications.

Forta uses advanced off-site building methods, offering fast-track modular and construction solutions with minimal disruption to the surrounding facilities operation. Advanced prefabrication enables Forta to speed up the project timetable for construction projects in a way that is not achievable when using on-site building technology.

Over more than 20 years, our experts have been leading the realisation of hospitals in Israel, Latvia, West Africa, Russia and India. Forta already designs, fabricates and installs modular units in the UK and Scandinavia, and it is looking to expand into European and global markets.

GBS Health

Contact:
Nigel Spawton, partner

W: www.gbshealth.co.uk

VISITOR BADGE PARTNER

Multi-disciplinary healthcare architects, GBS Health has more than 80 years' experience in designing bespoke clinical environments focusing on patients and their carers. Our skilled and highly experienced people put our clients first and our reputation for well-organised projects enhances our shared success.

We are motivated by bringing flair and innovation to the patient experience and allowing these spaces to operate as appropriate backdrops for some of the most important periods in people's lives.

Having completed over 500 NHS projects, in all clinical specialisms, we focus on providing stimulating and healing spaces inside and outside the clinical environment.

Gerflor

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EXHIBITION PARTNER

With more than 70 years' experience of innovation, Gerflor is one of Europe's largest manufacturers of vinyl flooring.

Offering proven solutions for flooring, wall, corner, and door protection, as well as handrails and wall coverings, Gerflor provides a seamless and holistic surface-protection approach for UK healthcare facilities and on a worldwide basis.

Designed to be future-proof, and backed by the highest quality level of innovative research and development, Gerflor products offer excellent long-lasting performance in a wide array of colours and designs. Durable, high-performing, inspiring, environmentally-friendly solutions are reinforced by dedicated customer, technical and service support teams, as well as a quality assured installer partnership network.

Gold Medal Safety Padding

Contact:
Martin Green

W: www.goldmedalsafetypadding.com.au

EXHIBITION PARTNER

Gold Medal Safety Padding

Gold Medal Safety Padding has been used for personal safety rooms in Europe, the United States, Canada and around the world for the past 40 years, and is the preferred product in all new facilities.

It is used extensively throughout police, correctional and medical institutions for the safe keeping of those persons who may, owing to drug or behavioural problems, be assessed as at risk of causing harm to themselves or be destructive to their surroundings.

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KNOWLEDGE PARTNER

HDR

We use the power of design thinking to reimagine 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.

Contact:
Chris Liddle, chair

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SILVER PARTNER

HLM

HLM is a leading design practice headquartered in the UK, offering a rare combination of design skills from the four strong and integrated elements of our business, HLM Architects, HLM Landscape & Urban Design, HLM Interiors and HLM Environment.

HLM has significant experience in the design and procurement of healthcare buildings in the UK and internationally. We recognise the importance of design quality, sustainability, and innovation in the creation of truly therapeutic environments. Many of our projects have involved the creation or transformation of major public spaces internally and externally, the integration of healing arts strategies, and the coordination of complex services installations. We have particular experience in the phased redevelopment of complex existing hospital sites.

Knightsbridge Furniture

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Alan Towns, chief executive

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EXHIBITION PARTNER

Knightsbridge Furniture produces some of the finest British-made furniture available for healthcare, executive and hospitality environments. With a heritage that can be traced back over the last 80 years or so, the company continues to earn plaudits for its balance of traditional skills, manufacturing technology, design innovation and after-sales support.

Knightsbridge Furniture is a market-leading manufacturer and supplier of seating, tables and cabinet furniture to the healthcare sector, and is an 'approved supplier' to both the NHS and the Scottish Healthcare Supplies.

The Knightsbridge Collection embraces the company's portfolio of contemporary furniture for the worldwide hospitality arena, and the team is proud to include names like Rocco Forte Hotels and Windstar Cruises on its current client list.

Korpinen

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Leena Maki, chief executive

W: www.korpinen.com

EXHIBITION PARTNER

Korpinen provides barrier-free, functional Gaius bathrooms for hospitals, care homes and special-needs housing. These bathrooms comprise carefully designed and tested functional elements that support users' independent mobility and allow caregivers to work in ergonomic positions. The ideal Gaius bathroom unit is composed of premium furnishings and equipment, which are configured with care to ensure optimum usability.

All details, from lighting and colouring to materials and design, promote users' independence and reduce care assistants' workloads. The Gaius solutions facilitate the efficient and economic use of space.

Korpinen's bathroom products meet the highest hygiene requirements. Antibacterial surfaces protect against microbes and prevent the spreading of infections via bathroom fixtures and fitting.

Llewelyn Davies

Contact:
Steve Featherstone, director

W: www.ldavies.com

SILVER PARTNER

The original partnership of Llewelyn-Davies Weeks was founded in 1960 by (Lord) Richard Llewelyn-Davies and John Weeks.

Llewelyn Davies has since pioneered new thinking in the planning and design of health and science buildings, delivering more than 250 health projects in 75 countries, by employing an adaptive, intelligent approach to create high-value solutions for complex building types.

Llewelyn Davies is also established as one of the UK's leading masterplanners. From Milton Keynes to the urban renaissance agenda, through policy guidelines and development strategies, the company has influenced the UK's vision for planning and design. The international export of this knowledge has led to commissions for Llewelyn Davies in six continents.

Modulex

Contact:
Paul Fincken, sales manager

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VISITOR BAG PARTNER

Founded in 1963 by the LEGO Group, Modulex is both a provider of architectural signage and a wayfinding consultancy. With its headquarters in Billund, Denmark, it is privately owned with the financial stability and capabilities to handle international projects of any size.

All its signage is manufactured in award-winning facilities in Billund, and complies with the most stringent environmental regulations in the world. Its complete signage and environmental graphics package includes: project management; wayfinding systems; manufacturing; product sourcing; logistics; and installation.

Among the company's clients are: Aarhus University Hospital (DNU), Denmark; Humber River Hospital, Canada; the Royal Alexandra Children's Hospital, UK; and Kirkwood Hospice, UK.

Nora Flooring Systems UK

Contact:
Guy Stanton, managing director

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E: info-uk@nora.com

EXHIBITION PARTNER

As the market leader in rubber floor coverings, Nora Flooring Systems offers a diverse range of environmentally-friendly floor solutions. With strong eco credentials, low maintenance and a long lifecycle, these floorings are widely recognised as the best long-term solution for all types of healthcare project.

The company provides a complete flooring system that is quiet, safe and comfortable underfoot, while being permanently resilient and helping reduce fatigue and bodily strain. The floorings have extremely low VOCs, which aid indoor air quality. Suitable for use in all healthcare environments, nora rubber floorings are high-performance products that are extremely easy and cost-effective to maintain, and require no coatings.

Perkins+Will

Contact:
Bill Nation, principal

W: www.perkinswill.com

BRONZE PARTNER

Perkins+Will is an interdisciplinary, research-based architecture and design firm, established in 1935 and founded on the belief that design has the power to transform lives and enhance communities. Perkins+Will pioneered the development of healthcare design as a specialty focus in the 1950s. Today, the firm is a global leader in healthcare and is ranked among the top healthcare design firms.

Each of the firm's 23 offices focuses on local, regional and global work in a variety of practice areas. With hundreds of award-winning projects annually, the firm's 1,700 professionals are thought leaders developing 21st century solutions to inspire the creation of spaces in which clients and their communities work, heal, live and learn. Every year the company donates 1% of its design services to pro bono initiatives.

Pineapple Contracts

Contact:
Neville Byng, business development consultant

W: www.pineapplecontracts.com

EXHIBITION PARTNER

More than 40 years of experience have given Pineapple a knack for solving problems in care-giving environments.

Our goal is to create innovative products that help staff provide better care, while preserving a modern, stylish aesthetic that helps transform environments.

KwickScreen

Contact:
Michael Korn, inventor

W: www.kwickscreen.com

EXHIBITION PARTNER

We transform buildings by making spaces flexible, enriching their beauty, functionality and efficiency with portable, retractable, printed partitions. KwickScreen was designed by Michael Korn at the Royal College of Art in 2007 and went on to win a number of awards.
It is now the world's most compact hospital partitioning system, used in over 150 NHS Trusts as a solution to mixed-sex accommodation, privacy and dignity, infection control, curtain replacement, and improving the overall patient environment. The new KwickScreenPro has a tiny footprint. It can be wall-mounted or portable with customisable, removable printed inner panels.

Samuel Heath

Contact:
Dr Lloyd Blewett, sales manager

W: www.concealeddoorclosers.com

EXHIBITION PARTNER

Powermatic controlled, concealed door closers deliver safety, hygiene, comfort and wellbeing benefits to all types of healthcare facilities.

Totally concealed when the door is closed, Powermatic assures a clean appearance to doors and interiors, helping create a less institutionalised and more therapeutic environment. Powermatic is also the preferred door closer for many anti-ligature and anti-barricade systems used in psychiatric care and secure accommodation facilities. The door closer's concealed nature also presents little opportunity for would-be vandals to damage its mechanisms.

Stantec

Contact:
Jonathan Wilson, principal, health sector leader

W: www.stantec.com/uk

KNOWLEDGE PARTNER

Stantec is a leading international design firm. Our central London studio specialises in the architecture, planning and interior design of healthcare and academic research buildings. We design places that are at the heart of a community's health – vital healing spaces that are safe, open and honest. The principles of place-making, sustainability and change adaptation are central to our approach. We are passionate about the potential for excellent design to transform healthcare environments and users' lives. We have offices in the UK, US, Canada and MENA (Middle East and North Africa). We work locally while sharing global experience and knowledge, bringing the best and latest ideas to every project.

Treebox

Treebox was launched in 2009 to design, develop, distribute and install urban greening solutions for domestic and commercial applications. We aim to contribute ongoing transformational change to our urban environments, which are under world pressures. Our current areas of research focus on air pollution, health and food production in the urban environment.

Our diverse team is composed of experts in garden design, horticulture, project management and product development. Together, we provide sustainable solutions for environmental problems. We place great emphasis on closed-loop systems, both in our product lifecycles and by continuously feeding our research and knowledge back into the community.

Contact:
Armando Raish, managing director

W: www.treebox.co.uk

EXHIBITION PARTNER

V Guldmann A/S

V. Guldmann A/S was established in 1980 by Viggo Guldmann, with the concept to develop, manufacture and market technical aids for the disabled and working tools for their carers. Today, we supply products and services within two main areas and under two trademarks:

Guldmann – Time to care: We aim to improve the work environment in every part of the social sector where people need to be moved and handled. By supplying beds and lifting equipment, as well as services such as advising, education, service and mounting, we help deliver optimum use of resources.

Stepless – Accessibility for all: We sell accessibility products that offer the walking-impaired, wheelchair users and others access to the surrounding world. Products include ramps, lifting platforms and small lifts.

Contact:
Paul Thompson, UK contracts manager

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E: res@guldmann.com

EXHIBITION PARTNER

Vanguard Healthcare

Vanguard Healthcare is a pioneer of flexible healthcare delivery with 13 years' experience in supporting healthcare providers across Europe, delivering additional clinical capacity when and where demand is greatest.

We operate a fleet of mobile healthcare facilities, ranging from operating rooms, endoscopy suites and day surgeries, to wards and clinics. With an assembly time of a few hours, our facilities can deliver a flexible response to any capacity challenge. Our brand of flexible healthcare delivery has been used in the UK, the Netherlands, Belgium, Sweden and Italy, as well as the Dutch Caribbean island of Bonaire.

Our mobile medical facilities can be supplied with or without moveable equipment. We also offer bespoke transport, mobilisation and familiarisation training packages for host staff.

Contact:
Richard Cluett, marketing manager

W: www.vanguardhs.com

EXHIBITION PARTNER

Veritas Medical Solutions

Veritas Medical Solutions produces pre-engineered radiation shielding systems for fast and efficient modular construction of radiotherapy centres. Equipment-specific shielding designs, which are available for all major machine types, use innovative VeriShield radiation shielding modules and Veritas bi-parting radiation-shielded entry doors.

VeriShield radiation shielding systems feature documented attenuation effectiveness and our proprietary VPAC shielding packs, which speed up construction. Also available are pre-packaged modular radiotherapy facilities designed for temporary or permanent installation. Veritas VROC and Quantum systems are deliverable units that include everything necessary for a fully functioning shielded treatment facility, including structure, shielding and equipment.

Contact:
Arthur Rankin, vice-president of sales and strategic development

W: www.veritas-medicalsolutions.com

KNOWLEDGE PARTNER

VINCI

VINCI is a world leader in concessions and construction. We design, build, finance and manage facilities that improve everyday life. These include the systems that transport us, the buildings in which we live and work, and the water, energy and communication networks that support our communities.

In healthcare, VINCI's credentials are strong: we've delivered more than 500,000m^2 of healthcare facilities over the past five years at a value of circa £1bn; we manage 500,000m^2 of healthcare facilities with circa 500 staff; we deliver and manage a wide range of facilities, from community-based care centres to mental health and treatment facilities, and private hospitals.

In all healthcare projects, we work in close partnership with our health clients, clinical staff and service users. This collaboration enables us to design, construct and manage facilities that improve healthcare outcomes.

Contact:
Alan Kondys, health sector director

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W: www.vinciconstruction.co.uk

LEAD AWARDS PARTNER

WSP | Parsons Brinckerhoff

WSP | Parsons Brinckerhoff is one of the world's leading professional services firms, providing integrated solutions across many disciplines. Our expertise covers environmental remediation, urban planning, engineering iconic buildings, designing sustainable transport networks, developing energy sources, and enabling new ways of extracting essential resources. We employ 34,500 engineers, technicians, scientists, architects, planners, surveyors and environmental experts, in more than 500 offices across 40 countries.

In healthcare, we have built a world-class reputation for innovative solutions in building services engineering, structural engineering, specialist systems, smart technologies, and commissioning. We have delivered two of the three LEED Platinum hospitals that currently exist in the world.

Contact:
Simon Kydd, director, head of healthcare

W: www.wsp-pb.com

BRONZE PARTNER

modulex

Client: University Hospital Aarhus (DNU). Product: Vis Interior

Environmental graphics and wayfinding

Request your Healthcare Sign Guide
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www.modulex.com