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Contributors

Stephen Harris

When times get hard, nice to have disappear. Will the global economic downturn put paid to the internationalisation of public private partnerships?



Carlo Ramponi

As patient safety moves up the list of priorities, what role can architecture and design play in improving the safety and quality of global healthcare provision



Dr Eve Edelstein

A greater focus on demonstrating measurable outcomes from design decisions and improvements is needed as the economic crisis deepens



Dr Fionn Stevenson

The findings of a post-occupancy evaluation of Frank Gehry's iconic cancer facility, the Maggie's Centre in Dundee, Scotland, reveal a forgiveness factor



Prof Emeritus Clare Cooper Marcus

Healing gardens are now being designed to support the treatment of different patient groups with specific health conditions



Dr Paul Barach

Governments must stop hiding the pea under another shell, now that the economic crisis is threatening the funding of global health investment



The bottom line

It seems there is no hiding place from the economic storm blowing around the globe. As Dr Barach reminds us, \$200 billion is scheduled to be spent on new hospitals in the US in the next ten years (see p74), whilst in other areas of the developed world, planned funding for healthcare infrastructure renewal has never been greater.

According to Stephen Harris, more than half the nations of the world are looking towards public private partnerships (PPP), arguing that the 'Buy now, pay later' approach of PPP is the only way in a cyclical downturn (p15). Some point out that this fails to recognise that it was this same methodology and flagrant attitude to debt that led to the current crisis. However, there is no greater investment than our own health, and the sustainable future of an interdependent global economy will rely on a creative, educated and healthy workforce. Now that the party is over, however, new economic challenges may help to focus minds and, says Dr Edelstein, will require a better demonstration of measurable outcomes from improvements in design and construction (p22). This may prove to be a boost to research. With more limited resources, commissioners of buildings will, points out Dr Debajyoti Pati, be even more reliant on evidence to inform their design decisions (p23).

As budgets take the strain, the developed world may yet learn some lessons from less advantaged regions of the world. Impeccably maintained, the flexible design of the Sunyani Hospital in Ghana (pp38-41) has withstood huge changes in demand and use, whereas the CBF Women's Health Centre in Burkina Faso (pp42-43) succeeds in sustainably integrating its built space with the harsh local climate to meet a local need.

Our report on Africa is in stark contrast to our feature on the US (pp 24-31), which in the last 15 years, has led the world in the creation of environments that support the healing process. As purse strings tighten, perhaps our interdependency in a global economy will bring us ever closer together in the sharing of knowledge and ideas.

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WORLD HEALTH DESIGN
Volume 2: Number 1
ISSN 1654-9654

Subscriptions:
To receive regular copies of World Health Design
please telephone +44 (0) 1277 634176
to place your order, or email
WHD@designandhealth.com (include postal address
and telephone number). Yearly subscription rates:
1 year £70; 2 years £115; Single Issue £25
World Health Design is published four times a year by
the International Academy for Design and Health UK.

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Health conference makes case for the arts

The economic and social case for the arts as an essential component of patient and staff wellbeing, will be explored by influential speakers in the field of arts in health at The National Patient Environment and the Arts Conference on 12 March in London, UK.

Chaired by the Commission for Architecture and the Built Environment special advisor, Susan Francis, the one-day conference is organised by Building Better Healthcare in association with the International Academy for Design & Health. Other partners include the King's Fund, London Arts for Health Forum, Willis Newson and Arts for Health.

Thought leaders such as Dr Sam Everington, a leading GP from Bromley by Bow, Sarah Waller, programme director at the King's Fund and Professor Jenny Secker from Anglia Ruskin University, will speak about issues such as art and the healing environment, mental health and social exclusion, whilst Jonathan Banks of Ixia and Jane Willis of Willis and Newson will reveal the findings of a recent review of public art in healthcare. In the afternoon, three practical workshops entitled, 'Integrated arts programmes in public health', 'Delivering the arts through LIFT', and 'How to launch and sustain an arts programme' will complete a fully interactive programme.

Event consultant, Marc Sansom said: "Two years on from the publication of the Department of Health Review of the Arts and Health Working Group, the event will explore how much influence it has had in promoting awareness and improving investment in the arts as a critical support tool for patient health and wellbeing. We hope to demonstrate the evidence in the morning and explore practical ways of delivering arts programmes in the afternoon workshops."

For more information on how to register, visit www.bbhealthcare.co.uk



Waterscape (2008) by Karen Lawrence, was commissioned as part of the King's Fund Enhancing the Healing Environment initiative and installed at Guy's and St Thomas' NHS Foundation Trust

Singapore: Consultancy win

China Healthcare has appointed CPG Consultants to provide hospital planning and MEE consultancy services for the redevelopment of the 250-bed West Point hospital in Singapore.

UK: Everyone's single in Scotland

Nightingale Associates in collaboration with the Tribal Group have won the first contract tendered in Scotland under the NHS procurement initiative, Frameworks Scotland, with Principal Supply Chain Partner, BAM Construction. The £120 million redevelopment of Dumfries Royal Infirmary Hospital will feature 100% single bedroom accommodation.

USA: Making change happen

Joseph G Sprague has been presented with The Centre for Health Design 2008 Changemaker award.

UK: For mothers and children

Llewelyn Davies Yeang has completed a new £70m building for The University College London Hospitals NHS Foundation Trust in London for client Building Contractors Joint Venture. The 17,000m² building will house a range of state-of-the-art medical services, including maternity and neonatal facilities.

Canada: Sleep warns of disease

'Acting out' dreams when asleep could be an early warning sign of Dementia or Parkinson's disease. Canadian researchers studied 93 people with "REM sleep behaviour disorder", which can involve punching or kicking out while dreaming. The neurology study found more than a quarter were diagnosed with a degenerative brain condition over the next five years.

Europe: Care collaboration

The Health and Care Infrastructure Research Centre is discussing the creation of a new European research collaboration with Bouwcollege, SINTEF and Helsinki University of Technology.

UK: Vapour trumps bacteria

Health researchers at the University of Northampton have developed a natural microbial vapour that has shown to be effective against a large range of bacteria, including *C.difficile*, *Staphylococcus sp* and vancomycin resistant *Enterococcus sp* (VRE), as well as other fungal pathogens.

UK: The future is green

Llewelyn Davies Yeang has announced its new EcoMasterplanning unit, which will be led by Robert Powell, an architect.

US: Information at risk

A new survey has shown that a third of healthcare professionals are putting personal information at risk by storing patient records, medical images, contact details, corporate data and other sensitive information on mobile devices such as laptops, BlackBerrys and USB sticks. The survey was carried out by Credant Technologies, E-Health Insider and *Outpatient Surgery Magazine*.

US: The only way is up

HDR Architecture has moved to San Francisco's South of Market area, after their design team grew from 4 to over 70 team members in one year. The move follows new projects in Abu Dhabi, including the Cleveland Clinic Hospital and the Arzanah Sports Medical Hospital Center.

Burkina Faso: Win for Africa

The Centre pour le Bien-être des Femmes (CBF) et la prévention des mutilations génitales féminines 'G.Kambou' in Burkina Faso, Africa, designed by Italian practice, FAREstudio, has been named winner in the health category at the World Architecture Festival Awards 2008, held for the first time in Barcelona late last year. For more information on the project, please see our African special report on pp 33-43.

Global awards makes call for entries

The Design & Health International Academy Awards has opened for entries.

The world's leading advocacy programme, recognising professional excellence in the research and practice of designing healthy environments, the biannual Design & Health International Academy Awards programme has opened for entries.

The awards programme, which has a significant influence on the global design of humanistic environments that support health, wellbeing and quality of life, will end in a prestigious final ceremony to be held on 27 June at the The Ritz Carlton Millenia, Singapore during the Design & Health 6th World Congress & Exhibition.

Entrants from all over the world are invited to submit in ten award categories in the following areas:

- Healthcare Project (Over 40,000m²)
- Healthcare Project (Under 40,000m²)
- Mental Healthcare Project
- End-of-life Care Project
- Elderly Care Project
- Research Project
- Sustainability Project
- Low-cost Project in Developing Economies
- Product Design for Healthcare Environment
- Use of Art in the Patient Environment

The Royal Alexandra Children's Hospital in Brighton, winner of the Design & Health Best Healthcare Project in 2007, and subsequent winner in the UK of the Prime Minister's Better Public Building Award



The final awards will reflect important aspects of the exceptional work undertaken by researchers and practitioners at the forefront of the field of design & health. Recipients of the awards will be teams and individuals who through outstanding efforts, have contributed to the progress of knowledge and demonstrated vision and leadership in exemplary initiatives within the field.

The awards are open to international organisations in both the private and public sectors participating in either research or practice, including the planning, procurement, design, construction and management of healthy environments.

The judging panel is constructed from a group of independent experts from Europe, Asia, Africa, Oceania and the Americas. Experts in their field, the judges come from multidisciplinary backgrounds in research and practice, bringing with them a breadth of experience in the field. The awards are co-chaired by John Wells-Thorpe, writer, architect, historian and an international advisor to Design and Health, and Prof Per Gunnar Svensson, president of Design & Health.

The closing date for submissions is 1 April, 2009. To enter, simply download the submission requirements online at www.designandhealth.com, where you will find an entry form to complete and print before sending it to us together with a 500 word statement and a maximum of eight Powerpoint slides.

Lifetime of success

The American College of Healthcare Architects (ACHA) has recognised Derek Parker, a director and former CEO of Anshen + Allen with the Lifetime Achievement Award's Hamilton Medal.

Parker received the award at the ACHA Member Luncheon in Washington DC in November last year in recognition of a significant body of work of lasting influence on the theory and practice of healthcare architecture.



Derek Parker

Since taking on a senior role in the firm following the death of Bob Anshen in 1964, Parker has consistently demonstrated a passion for innovative design, upholding the traditions of Anshen + Allen at the same time as developing the firm's position as a leading healthcare practice. He should perhaps be most celebrated, however, for his wider impact on the industry as a cofounder of the Center for Health Design and the Pebble Project research initiative; creator of the Fable Hospital concept; and his advisory roles with the International Academy for Design and Health, the Institute for Healthcare Improvement, and the Robert Wood Johnson Foundation.

The National Patient Environment and the Arts Conference 2009



Enhancing health and wellbeing through the arts and culture

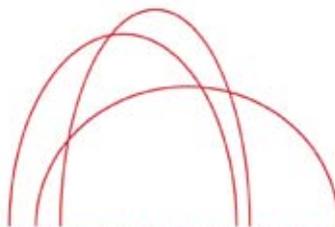
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'Neglect of the surroundings constitute neglect of the patient'

A unique one-day conference analysing the role of art and culture in 21st century healthcare

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BUILDING BETTER HEALTHCARE

The message rang loud and clear to more than 500 delegates at the UK's prestigious Building Better Healthcare Awards held at the end of last year in London.

"Clinical practice in hospitals focuses mainly on treating illness while often neglecting a patient's psychological, social and spiritual needs," said Prof Alan Dilani, keynote speaker and director-general of the International Academy for Design & Health. It was perhaps fitting, then, that leading international architectural practice and advocates for psychosocially supportive design, Anshen + Allen found itself the recipient of two of the major awards on offer – the Award for the Best International Design, for the Intermountain Medical Center (IMC) in the foothills of the Rocky Mountains, USA; and the Best Hospital Design for the Northern Centre for Cancer Care and Renal Services Centre at The Freeman Hospital in Newcastle, UK.

Both projects demonstrate how an evidence-based approach to design can help healthcare environments become places of healing, recovery and wellness, rather than simply functional spaces for treating illness, said Prof Dilani.

A major driver in improving the patient experience at the IMC was the abundant use of natural daylight and connectivity to the landscape, while at the Freeman Hospital, the Northern Centre for Cancer Care and Renal Services Centre was distinguished by the judges for its coherent and harmonious relationship with the existing hospital, a welcoming entrance, two spacious courtyards and careful use of materials and colours to support patient recovery.

Other notable winners included David Morley Architects, which won the Best Mental Health Design for the creation of a non-threatening environment at the Bluestone Unit at Craigavon Area Hospital. Designed on a single storey, materials were chosen for their natural, soft qualities, while strong colours were used to form a soothing and non-clinical environment.

In community care, Kennedy Fitzgerald & Associates in collaboration with Avanti Architects were worthy winners for the innovative design of the Grove Wellbeing Centre in Belfast, which combines health, leisure and library services under a single roof. In primary care, the ability of architects Buschow Henley to balance functionality with humanity, and scale with intimacy ensured the Waldron Centre in Lewisham was successful.

After a decade of success, the Building Better Healthcare Awards is firmly established as the leading advocacy programme for healthcare design in the UK. Chair of the awards panel Susan Francis said: "Good design is important on three levels – impact, functionality and sustainability. This year's exciting competition demonstrated the important role of the awards in raising the bar in the standard of the healthcare environment.

• The Building Better Healthcare Awards 2009 are scheduled to be held on 12 November 2009 in London. The entry period will open in the second quarter of the year. Further details are available by visiting www.bbhealthcare.co.uk/awards

Partners and Award Sponsors
The awards were organised by Building Better Healthcare and Binleys in association with The International Academy for Design & Health, the Commission for Architecture and the Built Environment, Health Estates and Facilities Management Association, the National Patient Safety Agency and Architects for Health. Award sponsors were Euroclad, Gardiner & Theobald, Dyson Airblade and ENER.G.

The winning ticket

From the Rocky Mountains to the suburbs of Belfast, new benchmarks in psychosocially supportive design were set at London's Building Better Healthcare Awards ceremony, held at the end of last year

Award for Best International Design

Anshen + Allen for the Intermountain Medical Center

Award for Best Hospital Design

Anshen + Allen, Northern Centre for Cancer Care and Renal Services Centre, The Freeman Hospital

Award for Best Mental Health Design

David Morley Architects in association with Hall Black Douglas Architects for the Bluestone Unit, Craigavon Area Hospital

Award for Best Community Care Design

Kennedy Fitzgerald & Associates in association with Avanti Architects for the Grove Well Being Centre, Belfast

Award for Best Residential Care Design

Cooper Cromer for the Erskine Care Home, Glasgow

Award for Best Primary Care Design

Buschow Henley for the Waldron Centre, Lewisham

Award for Best Sustainable Design

Househam Henderson Architects for Winthrop Hall

Judge's Special Awards

Roger's Stirk Harbour + Partners for The Maggie's Centre, London; and Devereux Architects, Allies & Morrison and Tangram Architects for the Queen Square, National Hospital for Neurology and Neurosurgery, London

Award for Best Interior Design

Greenhill Jenner Architects, The Urology Centre, Guy's and St Thomas' Hospital, London

Award for Best External Space

Great Ormond Street Hospital, Andy Sturgeon, Garden Design and Spacelab for the Friends Roof Garden, Great Ormond Street Hospital

Award for Best Use of Visual Art

Lime for Integrated Artwork for MAST LIFTCO and the Manchester PCT LIFT schemes

For a full list of winning and highly commended entries, visit www.bbhealthcare.co.uk



Prof Alan Dilani and host Quentin Wilson presenting the Award for Best International Design to Anshen + Allen president Felicia Borkovi



The Intermountain Medical Centre in the Rocky Mountains

The growing interest of multi-disciplinary professions in the relationship between design and health was once again demonstrated at the Healthcare Design conference, held late last year in Washington DC, USA.

More than 3,600 delegates attended to participate in a comprehensive programme of didactic sessions and roundtable discussions. The conference's aim is to gain new knowledge and understanding of how the design of built environments directly impacts the safety, operation, clinical outcomes and financial success of healthcare facilities now and into the future.

As the movement behind an evidence-based design process gains momentum, the highlight of this year's conference was the introduction of the Evidence-Based Design Accreditation and Certification Program (EDAC) from The Center for Health Design (CHD). The scheme is set to appeal to senior administrators and operations executives, architects, interior designers, facility managers, and design/build professionals, as well as researchers, students, and educators, all of whom came together at this year's annual gathering. The goal of EDAC will be to educate and assess individuals on their understanding of how to base design decisions on available, credible evidence. Study Guide 1 was distributed during Healthcare Design 08 and is also available on the CHD's website at no charge, while Study Guides 2 and 3 are now available through purchase. An exam will be launched in April 2009 and will consist of a multiple-choice format, allowing those who pass the use of the EDAC appellation after their names so colleagues, employers and clients recognise the specific expertise. More information on EDAC is available at www.healthdesign.org/EDAC.

Icons

A new accreditation scheme for evidence-based design and a study of iconic healthcare facilities were the highlights of the Healthcare Design conference, reports *Diana Anderson*

Lessons learned

In all walks of life, icons play an important role in setting standards and benchmarks. One of the best attended educational sessions, entitled 'How the icons have fared: Lessons learned from ground-breaking hospitals' was led by D Kirk Hamilton, Francis Pitts and Don McKahan.

A number of well-known US hospital projects, such as Bronson Methodist Hospital and Boulder Community Foothills Hospital, were revisited during the presentation. Through a rigorous process for data collection, which included literature reviews, on-site visits, and interviews with the architect, clients and users, important questions about the success of these projects since opening were answered. Lesson number one was that "no one got it exactly right," indicating the need for flexibility as a critical component of groundbreaking hospital facilities.

A series of roundtable discussions allowed for a multidisciplinary focus on current hot topics, including same-handed patient room design, in addition to the ongoing debate surrounding in-board versus out-board toilet and shower locations and their impact on patients and clinicians.

Trends in intensive care unit design were highlighted in several sessions. They included presentations on two projects which have won the Society for Critical Care Medicine's (SCCM) Annual ICU Design Competition: the 2008 winner, Emory University Neurosciences ICU in Atlanta, Georgia and this year's winner, New York's Memorial Sloan Kettering Intensive Care Unit.

Student highlights

The 2007 recipients of the AIA Arthur N Tuttle Jr Graduate Fellowship in Health Facility Planning and Design had the opportunity to present their work, including one study



Hundreds of exhibitors included specialist healthcare product designers, such as Nurture



Discussions took a multidisciplinary approach



With 3,600 delegates, the conference offers some of the best networking opportunities in the sector



A diversity of events can make choosing between them hard

conducted on walkable environments in and around assisted living facilities, and an overview of design recommendations to create wellness centres for the female baby boomer population. These sessions allow students to present their research methodologies and design studies, while giving practitioners the chance to see examples of student-driven ideas.

Another student feature is the annual Student Design Charrette, hosted by the American Institute of Architects' (AIA) Academy of Architecture for Health (AAH). This year, it posed a 48-hour challenge to design a disaster-response hospital for civil or military use. Four teams from a variety of North American schools participated, including Arizona State University, Clemson University, McGill University and Virginia Tech's Washington Alexandria Architecture Center (WAAC). Deployable modular units and standardised assembly analogous to the first aid kit were among the multiple solutions

developed. The McGill team's solution featured a sophisticated search-and-rescue vehicle for three imagined independent scenarios, anticipating a terrorist attack, a natural disaster, and a humanitarian catastrophe. "It is our belief that every disaster is essentially a personal one and that the key to disaster relief lies in creative approaches to individual rescue relief," stated the team in its brief.

Creating advocates

The Healthcare Design conference is growing in size, requiring attendees to carefully review the conference booklet and make their session selections, often having to compromise and choose one topic of interest over another. However, although this may be a drawback, it is also a reflection of the event's success, which also provided numerous social networking opportunities, a series of facility tours to nearby hospitals, several hundred exhibitors and three excellent keynote speakers.

Healthcare Design continues to succeed as a multidisciplinary learning event by promoting the discussion and sharing of projects and research, creating in the process advocates for its ethos, who can take ideas and concepts learned beyond the conference walls to other professionals and industries, in an ongoing effort to promote innovations and solutions in the collective goal to improve the quality of healthcare spaces.

For more information about Healthcare Design 08, please visit the conference website: www.hcd08.com.

About the conference

Healthcare Design 08 took place from 8-11 November 2008 at The Gaylord National Resort and Convention Center, Washington DC. With more than 3,600 attendees making up a variety of professionals involved in the design, build, and operation of healthcare facilities, the event showcased the most current research and innovative projects related to healthcare design. The annual event is founded and produced by the Vendome Group, publishers of *Healthcare Design* magazine, and The Center for Health Design, a non-profit research and advocacy organisation, in conjunction with the American Institute of Architects' (AIA) Academy of Architecture for Health. Healthcare Design 09 is planned for 31 October-3 November 2009 at the Gaylord Palms Resort & Convention Center in Orlando, Florida (www.hdc09.com).



A sense of wholeness

United Eastern Medical Services (UEM) has selected HKS to provide architectural services for its new state-of-the-art 160-bed women's and children's hospital in Abu Dhabi. Scheduled for completion in 2011, the US\$205m Danat Al-Emarat ('Pearl of Emirates'), is a tribute to Her Highness Sheikhha Fatima, the Mother of Emirates.

Set to become UEM's flagship hospital, the building will include medical/surgical services, inpatient and outpatient surgical suites, a 24-hour emergency department and adult and pediatric intensive care units. There

is special focus given to maternity services, including a high-risk pregnancy unit for expectant mothers needing hospitalisation; labour, delivery and recovery rooms; a mother and baby unit; and a special-care nursery. Additional facilities include primary care and specialist clinics, an advanced imaging and diagnostics centre and a wellness institute that integrates medical sciences with fitness and education programmes. Premium, hotel-like services and amenities will also be available, including a spa.

"HKS is providing programming, planning, and concept design for the new hospital, which will be the first all-digital hospital in Abu Dhabi," says Mohammed Ali Al Shorafa, managing director and CEO of UEM. "It will be designed at the medical forefront, with the latest technology supporting the most advanced surgical and diagnostic procedures. Its design and functionality will work in tandem to optimise day-to-day hospital workflow and operations, while enhancing the patient experience.

"This is a perfect fit with HKS's expertise in medical equipment planning, clinical evidence-based design, and healing environments," he continues. "This hospital will be more than a place of world-class care for the women and children of the UAE – it will be a destination of excellence in the Middle East."

Steve Jacobson, HKS senior vice president, added: "Caring for patients involves more than treating their physical ailments. It also means addressing their emotional and spiritual needs by providing spaces that offer respite and restore a sense of wholeness. We are creating a warm, welcoming healing environment that will focus on the whole person – body, mind, and spirit."





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There are now around forty countries in the world with their own PPP units and another fifty looking seriously at PPP as a preferred funding model. That's nearly half the nations of the world. Many of these countries are fast tracking PPP healthcare schemes – Greece, Egypt and, most recently Sweden, all have PPP hospital tenders out to market.

However, just as PPP takes off globally, the market has been hit by an economic situation that is both making bank debt more expensive, and reducing the size of loans that banks are prepared to make on PPP deals. This is a triple whammy. Developed markets have been hit hard. But in newer markets, such as Pakistan, nascent programmes are grinding to a halt.

I'm writing this piece from California, where I have just attended an infrastructure conference. PPP is on everyone's lips. But in the US, an understanding of what PPP is and what problem it is trying to solve, is far from clear.

In essence, governments around the world look to PPP for three different reasons. Firstly, it is the motivation to improve public services through private sector innovation and aligning the delivery of public services to those best able to undertake them. This is the motivation

of countries like the UK and the Netherlands. It's about best value for money, not lowest cost. This approach can only be managed by countries prepared to spend tax revenues on paying for service delivery by the private sector:

Secondly, there are countries which wish to reduce government debt by shifting spending on infrastructure off their balance sheets and onto those of the private sector. This category includes most of the Central European countries. Progress has been slow here as the lure of EU aid and a refusal to invest in the PPP process has prevented countries such as Poland from developing a programme.

Thirdly, there are those countries that perceive PPP as free infrastructure. The US is in this category at present. This approach eliminates the chances of undertaking social infrastructure projects like hospitals as consideration is only given to projects such as roads, bridges, ports and airports that can generate revenue.

But are these sorts of projects "real" PPP? In the last week I have seen total confusion over its definition in the US; with references to PPP, privatisation and concessions, often in the same sentence. Privatisation is a permanent devolution of a state entity into the private sector with minimal government control over the quality of the private sector delivery. This is fundamentally different from PPP, where quality of delivery is assured by performance based payments and the arrangement is for a limited period.

The term 'privatisation' worries citizens who think that their national assets are being sold off. Politicians must grasp the difference. PPP in the US means concessions. You get the private sector to build something and they make their investment back by charging citizens a user fee for the road, or the water, etc. This is great for governments, which don't have to worry about the provision of infrastructure. It's great for the private sector, as they make money. But it's not always so great for the citizen, as the quality of the service delivered by the private sector often fails to meet minimum standards. If properly scoped and executed, PPP service quality levels are maintained to a standard 'set by government'. To do this, however, a proper performance based payment system, effective monitoring and private capital money at risk are all required.

Successful PPP projects require a proper performance based payment system effective monitoring

Despite the difficult economic situation, the need for new infrastructure internationally remains. In many ways a "buy now, pay later" approach is the only way during a cyclical downturn. There are still infrastructure funds around the world with billions of pounds to invest in the 'right' projects.

This is the key factor. The collapse of the monolines, who could bring a low rated project up to a higher rating, and the more conservative approach to lending by banks means only top-quality projects in stable, developed countries will be able to attract finance. PPP is only applied by countries experiencing problems delivering key infrastructure. When times get hard, 'nice-to-haves' disappear, but healthcare remains near the top of most countries' priority list. My feeling is that healthcare PPP will continue worldwide whilst other categories may struggle.

Stephen Harris is international development director at Tribal

Buy now, pay later

Stephen Harris asks if the global economic downturn will put paid to the internationalisation of public private partnerships (PPP)?

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Carlo Ramponi talks to *Prof Per Gunnar Svensson* about the role that architecture and design can play in improving the safety and quality of international healthcare provision

P*rimum non nocere*. Never before has patient safety been so high on the agenda, fulfilling one of the principal precepts taught to all medical students, that the first consideration of a medical intervention must be 'First, not to harm'.

The Joint Commission International (JCI) has been working with healthcare organisations and Ministries of Health in more than 80 countries since 1994. It focuses on improving the safety of patient care through accreditation, as well as through advisory and educational services aimed at helping providers implement practical and sustainable solutions. More than 200 organisations in 33 countries have been accredited by JCI, including clinical laboratories, hospitals, medical transport organisations, care continuum services, ambulatory care facilities and primary care services.

Through JCI accreditation and certification, healthcare providers have access to a variety of resources and services that connect them with the international community: an international quality measurement system for benchmarking; risk reduction strategies and best practices; tactics to reduce adverse events; and annual executive briefing programmes.

Carlo Ramponi has been working with JCI since 2000 as a project manager in Italy and then as an international consultant, before becoming managing director of its European office. His vision is to provide European hospitals with recognition through international accreditation that can be used as a tool to benchmark standards for safety and quality. He wants to develop an EU-wide network of accredited healthcare facilities, support private and public organisations, including Ministries of Health, regional, cantonal and local authorities and create an environment in Europe where people feel confident that they can rely on a network of safe hospitals.

Here, Ramponi talks to Design & Health president, Prof Per Gunnar Svensson about the value of research, evidence-based design and the healing arts in improving human health and wellbeing.

Standards bearer

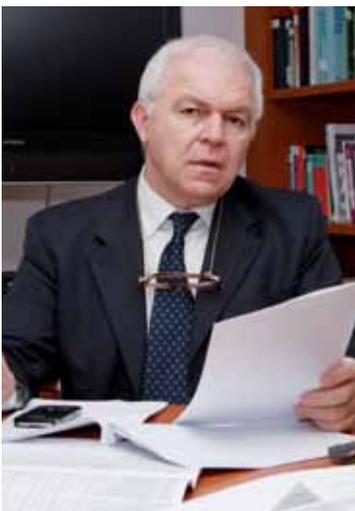
Per Gunnar Svensson: How important is design and architecture to health service provision?

Carlo Ramponi: The Robert Wood Johnson Foundation funded the first ever meta-analysis of over 600 articles that discussed the effect of facility design on the outcome of medical care. The findings from this study demonstrate that many factors of the physical design can impact on the wellbeing of both the patients and the caregivers.

One of the most important findings concerned the use of natural light. It was noted that having access to daylight reduced the length of stay for patients and improved the morale of caregivers.

A second finding demonstrated the importance of design in reducing infections: private rooms, effective air handling and sink placements can all help to reduce the spread of infections in healthcare facilities.

Minimising sound decibels is also important for patients to ensure a calm and restful environment for recovery. By lowering noise levels, caregiver fatigue can also be reduced. Those are just a few of the findings to date, as new knowledge is created from research projects that are using new techniques to study and publish information in this new and fast developing field.



P-GS: How important is flexibility in hospital design to accommodate future changes in technology, work patterns and practices?

CR: Rapid technological advancements and the rising cost of healthcare in every country make flexibility in physical design a mandatory requirement. Healthcare organisations must have the ability to respond to new patterns of care provision and new technologies without having to build expensive new facilities.

Ten years ago, few hospitals were considering a future with a robot at the surgical table while the surgeon worked in another room or from a remote site. Yet, this is now becoming commonplace, particularly as a means of remotely carrying out surgical procedures in under-served areas of the world.

Surgical spaces need to be able to accommodate this intrusion of equipment, which calls for more diverse space requirements to be met. It is hard to know what may be on the horizon, but we can be sure that current and traditional methods of providing care will change or even become obsolete. History has taught us that technology moves on and different space configurations will be needed.



P-GS: In international hospital development, how important is research and the concepts and methodologies of evidence-based design?

CR: To demonstrate our commitment in this area, we launched the Safe Design programme last year. This programme incorporates the environment of care standards for buildings, life safety codes as well as the new evidence-based criteria for health design. We have already begun working in the international community to bring together these concepts for facility design.

Professor George Mann at Texas A&M University has helped to build hospitals around the world for many decades. In a recently published article entitled, 'Toward an international architecture for health practice', Mann reminds us that healthcare facility solutions

must be appropriate for the country they are serving¹. New projects, he says, should be approached only after asking these crucial questions:

- Is the project needed and is it feasible?
- How are resources, staff and facilities going to be successfully aligned to provide the care needed?
- What are the available power and utilities structures?
- What are the health challenges for the country, for example, diseases, age, infrastructure, culture etc?

These represent just a few of the questions to ask in the planning of healthcare facilities, particularly in economically disadvantaged countries.

At the Union of International Architects Public Health Group annual conference held in Florence in June last year, the need to separate patients by ethnicity, culture and social status were identified by speakers in some countries as crucial to the health and wellbeing of those being cared for in healthcare settings. Other topics included

how to embed a culture of innovation and an approach to flexible design that accommodates changes and respects 'humanity' through a design philosophy that reflects patient needs. The 'humanistic' imperative has led some thought leaders to describe evidence-based facility design as a new social movement.

P-GS: At the forthcoming 6th Design & Health World Congress and Exhibition in Singapore in 2009, the majority of presentations are focused on middle- and high-income countries. How do we turn our attention to the developing world?

CR: Developing countries are often neglected on the world stage, but it is crucial that as we research the new methods being used in developing facilities that we explore what can work in countries where there is limited access to basic infrastructure. JCI is committed to working with developing countries to maximise their outputs from limited resources. Its recently developed *International Essentials of Health Care Quality and Patient Safety* initiative takes account of the basic needs for patient safety, and considers the needs of developing countries.

Healthcare organisations must have the ability to rapidly respond to new patterns of care provision and new technologies without having to build expensive new facilities



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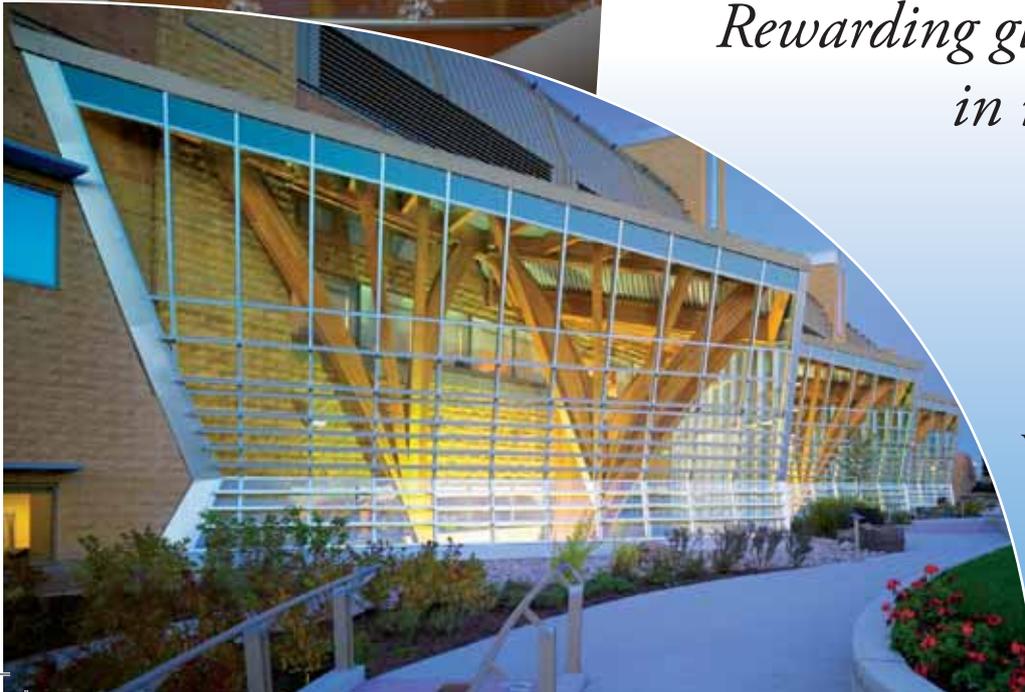
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P-GS:What is the value of the connection between design and culture, in particular the use of art, music and colour to reflect local social context?

Research studies have demonstrated that music when provided to children in emergency rooms reduces stress levels, as well as the pain experienced by the child. Other studies performed on adults demonstrate that the music of the patient's choosing can assist in reducing stress, decrease blood pressure and improve other stress-related ailments.

For example, adult patients in a procedure room reported better pain control when exposed to a nature scene with nature sound in the ceiling². In a 2002 study at the Hong Kong Polytechnic University, researchers found that, with visual stimuli (a soundless nature video) there was a significant increase in pain threshold and pain tolerance³.

According to Ulrich and Gilpin⁴, research suggests that art with views or representations of nature will promote restoration if "it contains the following features: calm or slowly moving water, verdant foliage, flowers, foreground spatial openness, park-like or Savannah-like properties (scattered trees, grassy undershot), and birds or other unthreatening wildlife." Ulrich and Gilpin⁴ also suggest that, in addition to nature art, humans are genetically predisposed to notice, and be positively affected by smiling or sympathetic human faces.

In a landmark study published in 1984, Ulrich⁵ found that postoperative gall bladder surgery patients whose rooms had windows with views of a park enjoyed better outcomes than patients whose rooms had windows with views of a brick wall. Patients also complained less to staff, needed analgesic pain medication of lesser strength and were discharged earlier.



International Academy for Design & Health
President Prof Per Gunnar Svensson

PG-S:What is the focus of JCI's Safe Design programme?

CR: In the Safe Design initiative, assessment and intervention are integrated into the customers planning, design and construction process. The JCI team will maintain a relationship with the customer, ideally as one of the planning members.

As the project progresses and new issues arise, the JCI team members monitor design impacts on safety and quality and advocate for the safety perspective in decision-making. JCI's goal is to design safety into a facility plan from the start of the project in the same way as other functional elements are included, such as plumbing and support beams.

PG-S:Will JCI include architectural and design criteria for healthcare facilities in its future standards development?

CR: JCI has already incorporated some of the more basic evidence-based practices into its standards, such as sinks for hand washing and adequate ventilation to reduce the potential for the spread of healthcare-associated infection (HAIs) from airborne infections.

As the healthcare field develops more evidence-based practice findings, JCI will closely monitor which may be essential to the delivery of safe and high quality care, and should therefore be developed as a minimum standard or promoted as best practice.

Prof Per Gunnar Svensson is president of the International Academy for Design & Health



Carlo Ramponi, MD, MBA

- 2007 Managing Director, Joint Commission International
- 2000 Consultant and Project Director, Joint Commission International
- 1985 Researcher and Lecturer, Bocconi University, Italy
- 1984 MBA received from University Luigi Bocconi, Milan, Italy
- 1965-85 Various senior positions in clinical pathology and general medicine, including Medical Director at Centro Analisi Fleming, Brescia
- 1975 Medical Degree received from Parma University, Italy

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Medicine is a constantly changing field informed by research and measurable outcomes. However, today's ominous economic changes threaten to undermine worldwide progress towards improved healthcare. Restricted funds may jeopardise mandated changes in healthcare facilities, and improvement of clinical staff to patient ratios.

As the global economy struggles so does investment in building improvements, capital projects, research and design. The timing of this economic upheaval may play to our advantage if we clarify our focus on demonstrating measurable outcomes from design improvements.

Now, both design and healthcare communities have the opportunity to reflect on design trends developed in more abundant economic times. Healthcare executives have begun to ask: "How can I justify additional design costs when I am struggling to meet equipment and staff costs? What are the benefits and consequences of 'super-sizing' hospitals? What is the value of an atrium? How will the proposed design function if electricity or technology fails?"

We must advance the means and methods to answer such questions. This economic constraint on healthcare design occurs just as the field of evidence-based design has achieved an important goal. Efforts have attracted the attention of a number of leaders who now understand that the built environment can have a direct and measurable impact on the quality of care. Concurrently,

researchers have begun to apply more rigorous methods that reflect scientific methodologies held in high regard by physicians, nurses and executives.

Emerging and novel technologies may also offer savings in both research and design. Virtual reality and micro technologies now enable us to measure the response to design before the first brick is laid.

Crunch time

As the global economic crisis deepens, three leading experts assess the impact on investment in health and public infrastructures around the world in 2009

Sustainable methods provide the means to lessen costs by reducing energy consumption, and at the same time enhance human health and improve function.

The correlation of design features with economic, health, and market outcomes is now critical if we are to demonstrate a return on investment in better healthcare environments. To assert such claims, we must commit to an architectural process that allocates more time to build a deeper knowledge of the constantly changing world of healthcare. Success could be measured in terms of the reduction in change orders achieved by in-depth planning.

As the constantly changing field of medicine responds to new research, designers must in turn respond to the ever-changing needs of their clients. The achievements of the evidence-based design movement is driving healthcare providers to share their world with the design community. With a solid base in research, we can take advantage of an economic lull in building, by increasing our knowledge of clients' needs and the value of the research-based design solutions we can offer.

Eve A Edelstein, MArch, PhD (Neurosci) is senior vice president of research & design at HMC Architects and a visiting scholar at the University of California, San Diego



The global financial meltdown has raised questions on the sustenance of evidence-based design (EBD) and research. When the healthcare industry was riding on the wave of an unprecedented investment in new and replacement facilities, EBD quickly emerged as the preferred design paradigm for many. With project funds shrinking, can evidence-based design and research be sustained?

A more pertinent question concerns relevance. How will the new investment climate impact on the relevance of the EBD approach? In my opinion, EBD will only increase in value. A key driver will be the increasing concern for patient safety.

In 2008, the Center for Medicare & Medicaid Services (CMS) introduced an unparalleled condition in the reimbursement system for healthcare providers in the US. Costs pertaining to several types of hospital-acquired infections and medical errors (including treatment, legal and other costs) will not be reimbursed in a new pay-for-performance logic. That means that healthcare providers will bear the burden of several harmful outcomes resulting from either unsafe practices or the physical design – or both. Among others, the safety issue will be the fuel that propels research into physical design and cultural factors in healthcare design.

Healthcare systems and other stakeholders recognise the importance of understanding the implications of design on safety to optimise the physical environment. For instance, among the continuing and upcoming HKS research projects, four focus on safety issues. These studies involve major healthcare systems such as Texas Health Resources, INTEGRIS Baptist Medical Center and Trinity Health. Collaborators include leading academic and research entities including The University of Texas' Arlington School of Nursing and Texas Health Resources' Research and Education Institute. Industry players, like Herman Miller, are also actively contributing to these studies.

A shrinking financial climate will only increase the necessity for research focused on the physical design as well as organisational culture. Specifically, since safety is not a binary concept but a function of the degree of risk a particular culture is willing to take, a major impetus to healthcare research will be a matter of necessity. Evidence to help optimise capital investment for the desired degree of risk will constitute one of the most sought-after items of information. Patient safety is a global problem, meaning that the relevance of EBD research will grow worldwide. However, it will be more prominent in the US due to the reimbursement climate.

Evidence-based design has been viewed in different ways by different people, but the fundamental characteristic underlying all definitions is the use of the best available evidence to support a design decision. Developing the best evidence base will increase in importance when project funds are limited – allowing healthcare providers to make the best use of funds in pursuit of a safe and responsive healthcare environment.

Debajyoti Pati, PhD, FIIA
Clinical Solutions & Research Group, HKS



The deepening economic crisis will not necessarily create barriers to the delivery of effective healthcare design and associated research in 2009, but I would predict a distinct refocusing of priorities.

The overarching emphasis will not change dramatically – it has always been an imperative of healthcare design to do more with less, to deliver tangible performance improvements within tight budgets, particularly on public projects.

This emphasis may have intensified, but it need not limit the quality or scope of healthcare design in the coming year. True, the global nature of the recession will eliminate many opportunities for lavish experimentation – in the Gulf, for example – but prudence will breed its own distinct form of innovation.

Health providers will refocus on preserving and improving existing estates. We will learn to extract the very best functionality and performance from existing facilities through intelligent retrofitting, modifying and adapting, not only saving

money, but improving long-term sustainability in the process.

Against a backdrop of volatile energy supply and prices, designers will need to collaborate more closely with engineers to continually improve the energy efficiency of their buildings. These lessons learnt in striving to do more with less will not be forgotten as the economic frosts thaw – indeed, the bar will have been raised for the future.

Finally, I expect a shift in procurement towards processes that encourage health providers and development consortia to work in closely collaborating partnerships. This will hopefully not require the invention of new processes, but will rather entail a shift in favour of those that avoid stifling bureaucracy and put the focus on delivering genuine change – enhanced performance, improved environments and better healthcare outcomes.

Alistair Cory, principal, NBBJ London

Good design is not a luxury. But as North America faces up to its toughest prospects for years, many healthcare infrastructure projects are either being shelved or cut back. *Veronica Simpson* reports on how a strong design ethos can make the difference when times get tough

Survival of the fittest

The North American healthcare sector is reeling from the current financial meltdown – hit harder than most, given the exposure of its massive private healthcare system to stock market crashes.

Modern Healthcare magazine recently ran a front cover story detailing the scale of US healthcare projects that have been cancelled or put on hold with the headline: “It’s green. It’s digital. It’s patient-centered. It’s not going to open. Not for a while, anyway.”

Late last year, The American Healthcare Association (AHA) surveyed 736 of its member hospitals nationwide, and 56% of them were reconsidering or postponing capital expenditures, whether investment in

equipment, new building or refurbishment. While budgets are being slashed or projects cancelled, it seems unlikely that the kind of luxurious, spa-oriented facilities that are peppering the US landscape will proliferate further. Though women are generally acknowledged as the decision-makers in choosing family healthcare facilities, the presence or absence of scatter cushions or a flickering fireplace in the lounge is unlikely to count more than access to the top physicians in their field, especially when it comes at a premium.

Positive pressure

The growing transparency of the system will add more pressure on healthcare facilities to focus all their attention on positive surgical outcomes rather than architectural statements. MediCare, the US’s largest health insurer, is apparently now refusing to pay for bungled or mismanaged operations, which means the country’s top surgeons and consultants will be in ever greater demand. Their success rates are published in league tables online and in medical magazines. RTKL president Brad Barker says: “The industry is becoming more transparent, and the physician is the number one driver of where care is chosen.”

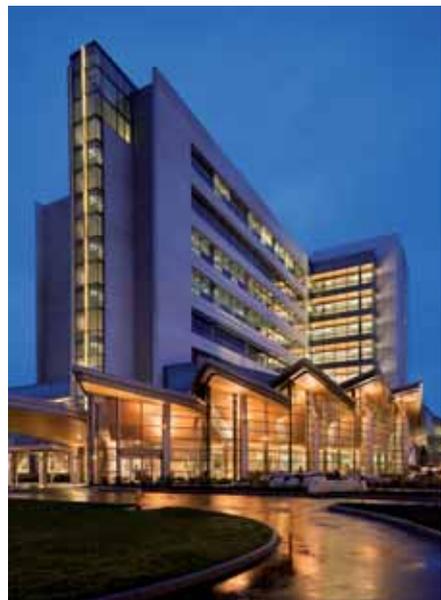
However, the new generation of hospitals which put patient and staff wellbeing, disease-management and operational efficiencies at the centre of their design ethos are reaping rewards in terms of staff performance, patient recovery times and satisfaction.

Good design is not a luxury. It is a vital element that none should aim to jettison in the name of shareholder appeasement, cost savings or belt-tightening. As Rich Dallam, principal at NBBJ, rightly points out: “Great design doesn’t mean more money or a more generous budget. You can get an incredibly responsive environment for the delivery of patient care and staff needs, and you don’t have to spend a dime more than you normally would.”

Natural assets

NBBJ’s work at Southwest Washington Medical Center illustrates this, efficiently creating a new, 307,000 sq ft patient tower that offers state of the art medical care with an uplifting aesthetic. It maximises its natural assets – large patient room windows provide views onto the nearby mountains plus masses of natural light – enhances energy performance and knits the community together by providing diverse social spaces for patients, family and staff to rest, consult and recuperate.

Shortly after the facility opened, in early 2007, Southwest President and CEO Joseph Kortum said: “The idea that a building can foster a culture change or an image change or a community’s reaction to an institution, I think, is valid, and that’s clearly happened with this building.”



NBBJ’s Southwest Washington Medical Centre



Natural light is maximised wherever possible in the Community Hospital North, designed by RTKL

"The way the community talks about the hospital is noticeably different."

This promotion of the social and psychological elements of healing spaces is one of the US's strongest contributions to global healthcare architecture. The in-depth engagement early on in the design process with all healthcare users – including patient families – has been pioneered by charitable foundation Planetree, which was founded in 1978 to demystify and humanise the patient experience.

Many US hospitals are now signed up as members of this not for profit organisation, which means that any building developments don't even get to the drawing board before the architecture and design teams have consulted thoroughly with staff, managers, patients, their families and the local community.

Minimum standards

When Northwest Architectural Company (NAC) completed the 97,000 sq ft Cedar Wing of The Highline Medical Center (HMC) in Burien, Washington, it was the first time it had encountered the Planetree guidelines. Some of the resulting design details – adequate spaces for families outside and inside patient rooms, respite opportunities outside the patient rooms and ample storage space so that equipment doesn't clutter up and institutionalise the spaces – were innovative then, in 1998, but are commonplace now.

Nurse stations were positioned to be closer to patients, though still allowing them privacy, and utilised domestic scale chairs and tables to encourage informal conferences between staff, patients and care partners. And a linking element, between new and existing buildings was transformed into a two-storey gallery, with water

The focus is on positive surgical outcomes, not architectural statements



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Market Report: USA

features, public art works, access to a communal garden, and restaurant and relaxation facilities.

The degree to which the facility's design responded to patient, staff and family needs has clearly paid off long term. Richard Salogga, principal and director of healthcare design at NAC, says: "As measures of the project's success, HCH doubled the number of infant deliveries in three years, has continued to grow its market share for other services, and has very low staff turnover. But most important to me, as I continue to work with HCH, I am often told by the staff who participated in the design process how pleased they are with the product of our mutual efforts."

The consultation process itself is part of the design outcome – engaging the goodwill and understanding of the healthcare community, beyond the considerations of mere planning and aesthetics. And this seems to be proved time and time again. Zimmer Gunsul Frasca has extensive experience with children's hospitals (including the Childrens Hospital of Philadelphia and the award-winning Doernbecher Children's Hospital), but they still went the extra mile recently when working on the Denver Children's Hospital.

Seven members of the ZGF team spent two intense weeks shadowing and interviewing families, patients and more than 250 hospital staff from 27 different departments (for full report, see July 2008 issue of WHD). Says Sharron van der Meulen, the principal interior designer for the project: "This shadowing process not only provided an objective, real-time look at conditions about which users may not have been aware, it also instilled the design team with a sense of empathy that carried forward into the design."

Digital futures

In depth consultations also provide architects with an opportunity to identify key issues for future consideration. One of these is the push towards a digital healthcare environment. As yet, the massive investment in technology and training is deterrent enough for most healthcare systems, but there is a growing community of "paper-lite" facilities, whose advantages are as much social as technical.

With its glowing limestone and glass facade, valet parking and massive patient rooms, RTKL's Heart Hospital Baylor Plano, in Texas, looks every inch the state of the art cardiac facility. This \$106-million, 197,000 sq ft hospital is one of the latest generation of paper-lite hospitals, with information technology, medical equipment and building systems all integrated.

There are systems for digital picture archiving and communications as well as automated medication dispensing systems. Thanks to the use of concierge-type digital technology, monitoring the whereabouts of all patients and staff, patients can be shown straight to their rooms on arrival, and it's here that they are prepared for procedures and to which they return immediately after surgery. This process helps alleviate the stress usually associated with hospital visits, of being bounced around an endless series of waiting rooms, and can save patients up to half a day of in-hospital recovery time.



Sustainability

RTKL achieved LEEDS silver rating for this freestanding outpatient diagnostic, therapy and medical office building surrounded by nature. The environmentally friendly design not only complements the natural beauty of the site, it enhances the facility's healing environment and preserves the natural habitat of the Florida Scrub Jay.

The building faces north and east to protect the main entry's façade, with a glass facade that helps visitors and patients remain connected visually with nature. The remainder of the building also allows for abundant natural light and good views, yet still creates an energy-efficient envelope. Harsh light and heat gain are shielded for energy efficiency.

Existing vegetation was preserved to enhance the landscape while new plants were added to complement the natural ecology. The landscape is irrigated with rainwater collected and held in several retention ponds.

Interior colours and finishes also offer a connection to nature by echoing those of the outdoor environment. In addition, all finishes are high-performance and cause minimal environmental impact.

Preference was given to materials that were manufactured regionally, contain recycled content, improve indoor air quality, and require minimal maintenance. Additional sustainable aspects include water efficient fixtures; motion and timed lighting controls; daylighting, including windows in the MRI room; and bike racks, showers, and lockers to encourage cycling to work.

Client: Parrish Medical Center, Port St John, Florida

Architecture, interior design and medical equipment planning: RTKL

Opened: 2007

Area: 72,235 sq ft

Construction cost: \$30m

Contractor: Skanska

Market Report: USA

Technology is massively expensive, and this issue, plus the difficulty in keeping up with ever changing trends, might push the digitalisation of US hospitals onto the back burner for now. Far more pressing is the need to accommodate greener and more sustainable practices in a world of rapidly dwindling fuel resources.

The future is green

The biggest battle on the green front is correcting the widespread misperception that it's necessarily expensive. NBBJ's Rich Dallam says: "Designing facilities for maximum daylight doesn't cost you any more. It saves money. It's not design. You could look at 100 site plans for hospitals and how many of them would be oriented to the sun? Maybe one? Good site planning doesn't cost you any more money, and it's a simple thing to do.

"There are 100 things you can do to make buildings more sustainable. And the client is interested. They want to understand the costs. And if there are things they can do at a later date, you design them into the plans, and they can defer it. There are ways of phasing things in."

US interest has been stimulated by the rocketing fuel prices last summer, says Roy Gunsolus, senior VP and principal and director of sustainability for healthcare at HKS' Dallas HQ. Some of HKS' clients have seized the green agenda and run with it. St Mary's Clinic First Street Building in Duluth, Minnesota, which opened in 2006, was HKS' first US healthcare project to achieve Gold LEEDS certification – and one of the first nationally to achieve this standard.



Going green: St Mary's Duluth Clinic, designed by HKS

The social element of healing

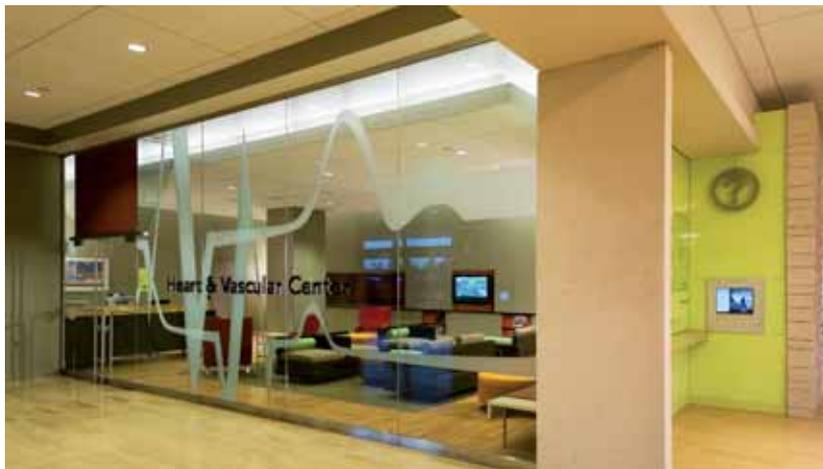
Completed in late 2007, the E W and Mary Furstenburg Tower at Southwest Washington Medical Center pays significant attention to the social, physical and psychological impact of the healing environment. This new, eight-storey building comprises a dedicated Heart and Vascular Center, 15 state-of-the-art surgery suites, six interventional suites and 144 private patient rooms.

All patient rooms are single-occupancy with full-height windows and views of the surrounding mountains. Glazed sliding patient room doors also allow safer manoeuvrability of patients at the same time as helping to bring daylight into the corridors. Hallways are angled, to help reduce direct noise pollution, and sound-absorbing materials deployed throughout.

With the advent of private patient rooms, the social dimension of healing is diminished. To compensate, "perches" were placed outside each patient room, providing families or friends with a space to wait while patients are examined. Employing 3,300 full- and part-time employees, an emphasis on employee wellness is evident: through 60,000 sq ft of glass, the hospital is flooded with natural light. Standardised, same-handed patient, operative and preoperative rooms enable quick-and-easy orientation for staff and patients alike—increasing patient safety through error reduction and increased operational efficiency.

A staff-only "secret garden" provides an outdoor place of respite. As the first piece of this complete campus renewal, the design transformed an asphalt-

covered parking lot into three city blocks of lush healing gardens and landscaped community pathway, with a serene creek and waterfall, walking paths through an open and inviting landscape design, and the addition of 267 new trees and more than 3,000 new shrubs and plants.



Client: Southwest Washington Medical Center
Architecture / interior design: NBBJ
Completion date: December 2007
Area: 307,000 sq ft

Quality of interiors

The Peacehealth Medical Centre is said to offer a welcoming atmosphere. Its NorthWestern Lodge feel helps to sustain a relaxing ambience in both the public areas and the patient rooms. A bell tower and lone Douglas Fir serve as beacons that are immediately recognisable from the road.

Architects Anshen + Allen drew inspiration from resort design, emphasising arrival and reception, patient and family spaces, and connection to the natural environment through views onto the stunning Pacific Northwest scenery offered by the 181-acre site, framed by the McKenzie River, meadows and groves of Douglas Fir.

The heart of the hospital is a two storey atrium with a fireplace at its centre, serving as a congregation and connection point. A grand staircase, intricately constructed iron and brass railings and hardwood floors enhance the resort feel. Trees that were displaced during construction were milled and used in the dramatic atrium ceiling.

An extensive art programme saw local and national artists contribute their work to the healing experience, with hand carved glass panels in the chapel, and bas-relief limestone carvings on the exterior.

The aim, in time, is to knit the facility into a strong local community with health and wellness integrated into the community culture. There are 3.5 miles of walking/running trails that traverse the campus, plus parcels of land reserved for housing, hotels, restaurants, conference centre, assisted living, and medical retail space.

Client: 'Peacehealth' Sacred Heart Medical Center, Riverbend, Springfield, Oregon
Architects: Anshen + Allen
Area: 1.2 million sq ft
Cost: \$350m
Completion date: August 2008



and the community is very interested in preserving the character of the countryside and the community, and they're looking at investing in cutting edge concepts such as geothermal heating and chilled beams."

Resourcefulness

In straitened times, resourcefulness pays. And recent years have seen great advances in materials and techniques that can mimic more luxurious finishes to enhance the feeling of comfort and restfulness without huge furniture, fixtures and equipment budgets.

Pointing to its recent work at Community Hospital North, Indianapolis, RTKL's Brad Barker says: "We used stone effect fireplaces that actually use concrete made to look like stone. It's the same price as brick. For flooring, we are returning to a lot of old materials, like terrazzo. It's very durable. These days there are synthetic wood floors where you can hardly tell the difference from real wood."

There are clearly cost-effective and performance enhancing measures and practices already in place that will serve the architecture and design community well, in justifying the continuing investment in the highest quality facilities – as long as the funding can be found.

As to crystal-ball gazing, some retain a prudent optimism. Dallam concludes: "The whole 'for profit' sector is going to be depressed for a while. That's because they have a different business model.

"The not for profit sector is different. They are strong institutions with strong governments. There will be many who decide to delay projects maybe a couple more years. The ones addressing safety, performance and disease control issues while providing a humane environment for their staff and patients are going to be the winners."

Veronica Simpson is an architectural writer and journalist



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Clockwise from top: Southwest Washington Medical Center; The Sail at Marina Bay, Singapore; Healing Garden, Swedish Cancer Institute; The Wellcome Trust, UK

Market Report: USA

The art of cancer care

The Center of Hope is a new, 11-storey cancer care facility in Oregon, US, which unites into a single building a series of buildings previously constituting all of Providence Cancer Center's (PCC) diagnostic and treatment facilities.

The architects, Zimmer Gunsul Frasca, have translated PCC's philosophy of "a connected experience of care", into a facility where patients can meet with researchers, physicians and specialists in all aspects of cancer treatment and rehabilitation, but also with spiritual advisors, counsellors, social workers, and complementary therapy specialists.

Completed in February 2008, the \$204m facility accommodates 240 beds, 21 operating rooms, a patient spa, personalised chemotherapy suites, as well as the Northwest's first Perfexion Gamma Knife, intensity modulated radiation therapy, High Dose Rate (HDR) brachytherapy and image guided radiation therapy.

The L-shaped tower plan orients the major building facades to the east and north to capture the best views of nearby mountains. It is flooded with natural light, thanks to its glazed envelope. Views onto the outdoors have been provided in lower level diagnostic and treatment areas with clerestory windows, while a skylit atrium connects to the lower level around which radiation therapy waiting and examination spaces are situated.

Glazing around public research and waiting rooms, as well as nurse stations, also help with wayfinding. Calming, neutral tones with extensive use of wood or wood-effect materials enhances the interiors, which are carpeted in natural fibers, on non-clinical treatment/research levels.

A diverse series of meditation rooms, private consultation rooms and various secluded outdoor spaces also offer opportunities for peaceful reflection.



Heart Hospital Baylor Plano

RTKL's new Heart Hospital Baylor Plano in Dallas has a white limestone and glass facade, plus valet parking and interiors which, in their sophisticated colourings, subtle lighting and feature materials, wouldn't be out of place in a Ritz Carlton Hotel Group. But this \$106m, 197,000 sq ft cardiac center in Plano, Texas, achieves, through its 'bow-tie' layout, efficiencies both in infection-control and patient monitoring, with different services (emergency and imaging; surgery; electrophysiology and cardiac catheterization labs) accommodated on their own separate floor; and nurse stations situated close to the central lift shafts, with sweeping views across the patient rooms.



Community Hospital North

When this 400,000 sq ft six-storey patient tower opened at Community Hospital North, Indianapolis, the overall campus almost doubled in size. It is part of a three-phase, \$170m expansion, creating an additional one million-square-foot that will truly transform a community hospital into a full-service urban medical complex. Its core aim is to be a people friendly environment specifically created to reduce stress and confusion. RTKL's six-storey patient tower has been added in front of the existing hospital. RTKL's Women's and Children's Patient tower houses 60 LDRP rooms. Openness, simplicity of orientation, safety and comfort are key.



Improving healthcare delivery

New and upgraded health buildings need to support improved and constantly changing models of healthcare delivery. They also need to be efficient, safe, attractive to patients, visitors and staff alike, environmentally sustainable and, last but by no means least, they must be affordable.

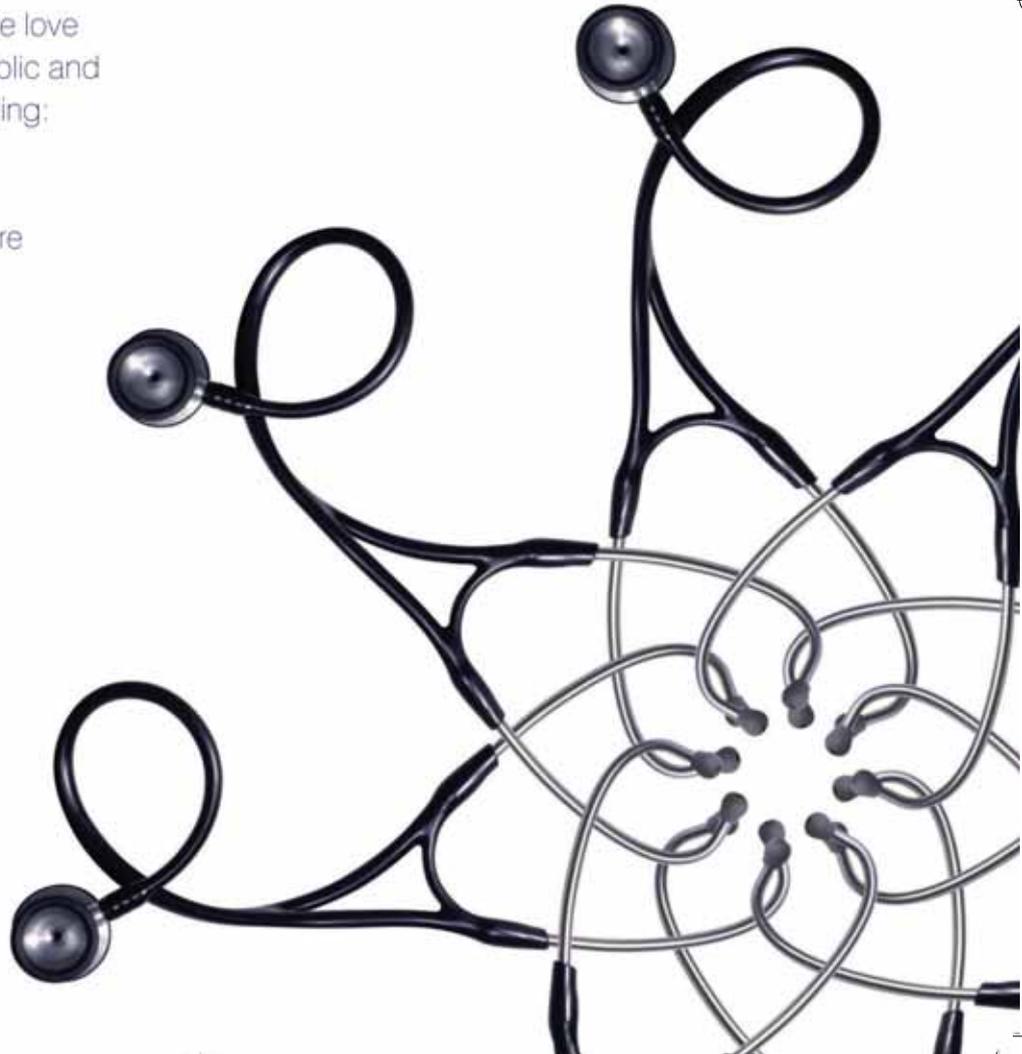
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In many ways, 2009 is set to present a frightening and extremely challenging time for the world. Comfortable economic assumptions in the developed world have been turned on their head, making vital investment in the emerging economies even more challenging than before the current economic crisis.

In his introduction to our special report on Africa, *Mike Nightingale* calls for the effective use of international expertise in developing local solutions to address this remarkable continent's health issues

Beautiful Africa

Africa, despite its vast natural resources, contains the largest number of poorest nations of any continent. It faces enormous challenges of providing clean water and adequate food supplies; on top of this, HIV/AIDS and drug-resistant TB are just two of the deadliest medical scourges facing young nations often also striving for political stability.

Overarching this is the sceptre of accelerating global warming

threatening dwindling fresh water supplies and pushing up fuel costs. The promise of billions of aid for Africa has not yet been delivered by rich countries, and is now even less likely to develop into a sustainable lifeline following the credit crunch.

However, it is not all doom and gloom. This month will see the inauguration of America's first black president, with direct African roots. Also, focused philanthropy, for example, from the Gates Foundation, is making real progress against malaria, TB, and HIV/AIDS. There are clear signs, all over Africa, that the continent's uniquely resilient and resourceful people are determined to rise above their problems and benefit from raised living standards, better life expectancy and attain security for future generations.

South Africa has demonstrated, since the release of Nelson Mandela from prison in 1994, the huge potential of an African country held back by political dogma for 40 years. It has delivered 5% annual economic growth, year on year, since 1996, and its enormous advantages of ingenious people, rich natural resources and, above all, youthful ambition, can be applied to most parts of Africa.

Now, more than ever before, we are an interdependent global economy; healthcare solutions in Africa are directly relevant to all of us, not just for humanitarian reasons, but to sustain the planet. The case studies in this issue have been selected to demonstrate the importance of long-term social, economic and environmental sustainability and to highlight how international expertise has been effectively used to produce successful local solutions.

A worldwide need is emerging, of community-driven healthcare, fully integrated with education, housing and employment. Local partnerships between public and private enterprises can create sustainable, mixed-use facilities designed to respond flexibly to local needs. The dramatic advantage developing countries have at this point in our technical evolution is that they can make full use of the telecommunications revolution, and its falling costs, to build appropriate low-tech local health facilities linked to specialist facilities anywhere in the world.

Design & Health is keen to stimulate dialogue between all parts of the world health network and harness global expertise to improve healthcare facilities in the developing countries. We implore you to enjoy this African report, learn something new about this remarkable continent and help us in this endeavour.

Mike Nightingale is the founder of Nightingale Associates



Children playing outside the CBF (Centre pour le Bien-être des Femmes) Women's Health Centre in Burkina Faso (Photo - Cariddi Nardulli)

Healthcare solutions in Africa are directly relevant to all of us

Statistics concerning Africa's healthcare problems are breathtaking: eight million lives are lost a year through preventable disease; 18.8% of South Africans are HIV-positive; in order to beat TB, the funding gap is some \$11bn. In 2001, African heads of state pledged to spend 15% of their national budget on healthcare, as a prerequisite to meeting the United Nations' Millennium Development Goals by 2015. At this halfway point, just three countries out of 53 (Botswana, The Gambia and Seychelles) are at or near this figure.

Governments may be failing on the 15% pledge, but there has nonetheless been renewed political commitment to healthcare improvement in recent years, as well as vast increases in aid. Those countries with stable economies and steady growth are introducing measures, such as national insurance schemes, that will secure sustainable long-term funding and minimise economic risk. Furthermore, there is anticipation that public-private partnerships will bring huge opportunities for investors and

a more collaborative approach to funding. This is a swiftly developing market: a recent study by the World Bank estimates that the healthcare sector will more than double in size by 2016, rising to \$35 billion¹.

Time to heal

An injection of design could be the stimulus Africa needs to improve its health condition, reports *Emily Brooks*

Critical issues

Africa's health problems are critical and long-term, and a major barrier to social and economic development; principle causes of death are often from preventable or easily treated diseases, such as malaria. HIV/AIDS,

malaria and tuberculosis account for more than half of the continent's disease burden, and combating them is the cornerstone of the Millennium Development Goals. Reproductive health is a further priority. Aside from these clinical issues, sub-Saharan Africa suffers from an acute shortage of healthcare workers, a problem that, according to the World Health Organisation, can be directly linked to higher mortality rates. An Oxfam report on the subject² estimates that 2.1 million healthcare workers are urgently needed to break Africa's cycle of poverty.

Access to care and medicines is a further problem. In Mozambique, it is estimated that about 50% of the population have access to basic health services (meaning that they live within 10 km of a facility). The issue is more pressing in rural areas: in Zambia, 99% of urban households are within five kilometres of a health facility, compared to 50% in rural areas. As countries such as Kenya, Botswana and South Africa prosper, typical diseases of the more developed world, including diabetes, heart disease and cancer, are becoming an issue. Positive moves towards long-term nationalised care can also create short-term problems – Ghana, for example, has found its public service overburdened with patients seeking treatment since it introduced its national health insurance scheme in 2004.

Who pays?

The WHO's recommended minimum spend per capita on health is \$34, but many low-income countries' spend is less than \$20 per capita, including sources from aid. Greater political stability in east and south African countries has tended to lead to higher Government spending on healthcare. Arguably need is greater in the west, however, where civil war in countries such as Sierra Leone have destroyed healthcare systems and facilities, all medical care tends to be charged-for, and NGOs and aid tend to play a greater role. In the world's poorest country by GDP, Burundi, Government spend per capita on health is just \$0.70, making outside sources of help utterly vital.

Private healthcare plays a huge role in Africa. Government under-funding means that people often pay out-of-pocket for even basic services – a challenge to the Western idea that private care is the preserve of the affluent. Furthermore, public sector spending tends to favour the rich over the poor because of where it is targeted – for example, at tertiary



Africa Mercy at port in Liberia. Mobile units provide healthcare in a secure environment

level in towns and cities, rather than for primary care in rural areas³. Services provided by NGOs and other foreign aid may have no direct cost to the patient, but are still classed as private care; in Kenya, for example, the private sector delivers 49% of care, half of which comes from NGOs and religious organisations, the other half from small and medium-sized commercial operations⁴.

From a donor's perspective, there is also the concern that aid will not reach its destination. "Corruption is a huge challenge that most governments in Africa are struggling with, this has made them extremely unreliable when it comes to managing donor funds," says Susan Wandera, deputy country director of AMREF Uganda, a country in which the government last year began proceedings to prosecute two former health ministers accused of embezzling Global Fund money. "With decentralisation some funds have managed to find their way to the districts, though they hardly reach the grassroots communities," she adds.



The Ethekewini Hospital and Heart Centre in Durban, South Africa, designed by a3 Architects

Aid by design

Hospital design is beginning to address specific clinical and climatic requirements. Designed by Harvard graduate students in conjunction with Partners in Health, Rwanda's Butaro Hospital features large windows on both sides of the building to improve air circulation, as well as outdoor waiting rooms, to minimise the spread of TB.

Just outside Kampala, Uganda, Symbion's Mildmay Palliative Care and Training Center, which treats patients with AIDS and counsels them and their families, has addressed its users psychosocial needs with a single-storey complex of buildings linked with external walkways, intended to be friendly and welcoming.

Custom-designed mobile units can help to solve problems of accessibility to healthcare. Mercy Ships' *Africa Mercy*, the world's largest non-governmental hospital ship, has six operating theatres, a 78-bed patient ward and accommodation for more than 450 volunteer crew members. "It means we can introduce hi-tech equipment in a controlled environment," says Jim Paterson, senior vice president of international operations. "On land, supplies could end up stolen and you would have to go and buy them back from the market, or the air conditioning wouldn't work. On a ship, people can 'plug in' and immediately feel like they are in a familiar environment."

Formerly a Danish rail ferry, it took two-and-a-half years to fit out the ship, guided by its medical staff's past experience – for example, building higher ceilings in operating theatres to create enough clearance for lights and other overhead equipment. Many of its design considerations – patient flow, minimising infection – are identical to a non-mobile hospital.

Elsewhere, Italian architectural firm FAREstudio have put sustainability at the heart of its work on the Centre pour le Bien-être des Femmes, Burkina Faso (see pp 42-43). The centre was built using sun-dried bricks made on-site, and is temperature-controlled by its favourable orientation, shaded areas and separation of enclosed areas by patios. "Sustainability was not part of the initial agenda: we simply used common sense," says FARE's Riccardo Vanucci. "However, once there, the issue was raised dramatically,



One of AMREF's health projects. Major donors have to be safe in the knowledge that their money will get to grassroots level

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and an investment
no matter where it
takes place**

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Market Report: Africa

particularly taking into account local conditions. In political terms sustainability is not an option, it is an obligation." FARE was conceived to work on humanitarian projects: Vannucci sees his 'bread and butter' commercial work as supporting these more radical activities. "Design excellence should be a right, and an investment, no matter where it takes place," he says.

In South Africa, Nightingale Associates has adopted a similar philanthropic attitude, but it is taking a more focused approach. "You have to balance being profitable with being socially responsible," says managing director Matt Audinwood. "For our work with NGOs, we either do work speculatively or free of charge, to demonstrate our commitment to corporate social responsibility." The company has clear ideas about its future involvement in the development of South Africa's infrastructure: "The government has all the right intent and the budget; the problem is often with delivery," says Audinwood. "There is a great opportunity for a client-focused public service provision, to help fill that gap. We don't want to sit around waiting for a commission to fall into our lap; we want to be approaching government with ideas for different procurement methods – in short, being proactive."

Architectural practices in South Africa, the country with by far the most developed economy in the continent, are in a strong position to take advantage of widespread infrastructure investment elsewhere. "We've found ourselves investigating Africa generally and there are some huge development opportunities," says Kevin Hinde, principal architect at a3 Architects. Most up-and-coming markets have stable economies and plentiful natural resources, including Ghana, Angola, Kenya and Botswana. "Nigeria has a population of 140 million people, and all their infrastructure is depleted. It has vast mineral wealth, and a government that is willing to invest," says Hinde.

There is no doubt that greater spending is needed if Africa is to offer even basic healthcare for all, but it is important that the money is well-targeted, too. All too often, funding is spent on high-profile prestigious projects such as hospitals, and not enough on primary care⁵. Hinde identifies "lack of foresight and capability, and lack of ability to deliver" as part of the problem.

Healthcare systems need to be overhauled. But investment also needs to be steady: the WHO states that "only an increased and predictable flow of donor funding will allow [countries] to meet basic health needs in the short to medium term."

Public-Private Partnerships are a huge opportunity for solving Africa's healthcare problems, both financially and as a way of harnessing foreign innovation and management expertise. South Africa's government is actively encouraging PPP, and where it leads, the rest of the continent will follow. A World Bank report about the opportunities that PPP may offer Africa asserts that "The biggest individual investment opportunities will be in building and improving the sector's physical assets... these opportunities can deliver compelling financial return and have an enormous potential development impact."⁶ The report adds: "Ultimately, however, the vigour of the private health sector in sub-Saharan Africa will rely on the commitment, creativity and integrity of the people of Africa."

Emily Brooks is an architectural writer



Concept design by Nightingale Associates for the Entabeni Hospital, Durban



Symbion's Mildmay Palliative Care and Training Centre in Uganda treats HIV AIDS patients

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Market Report: Africa

Surrounded by the forests of the Southern Ashanti Uplands of Ghana, Sunyani Hospital is grandly laid out in a beautifully manicured landscape garden, in a neatly walled precinct separating it from the surrounding city. Some 400km north-west of Accra, Sunyani is both a district and regional capital: originally founded in the 19th century as an outpost camp for elephant hunters (it takes its name from the Asante word for elephant), it was declared a district headquarters for the British Colonial Government in 1924.

Today, this low-rise, modest city is home to some 90,000 people whose healthcare needs are served by a 400-bed regional hospital. Designed by Nightingale Associates, a UK-based architecture practice specialising in hospital design for the International Hospital Group, it was funded by £14m of EU money and completed in 2003.

Pride of Ghana

Peta de Jager visits Sunyani Hospital in rural Ghana, which, despite struggling with overcapacity, is still impeccably run and maintained six years after its completion

Infrastructure stewardship

Dr Daniel Asare, ENT Surgeon, and medical superintendent of Sunyani Hospital, has been involved in the project since inception, and with his team has been steward to the facility over its whole life. His role includes steering the design, management and finance of the hospital, including its building infrastructure. This culture of ongoing evaluation and support means that this remote urban hospital is still impeccably well-maintained and run six years after it first opened.

The WHO uses the term 'Stewardship' in the context of health systems, but it could logically be adapted to apply to a single facility. Stewardship entails the ability to responsively formulate strategic policy direction, to ensure good regulation and the tools for implementing

them, and to provide the intelligence on system performance to ensure accountability and transparency.

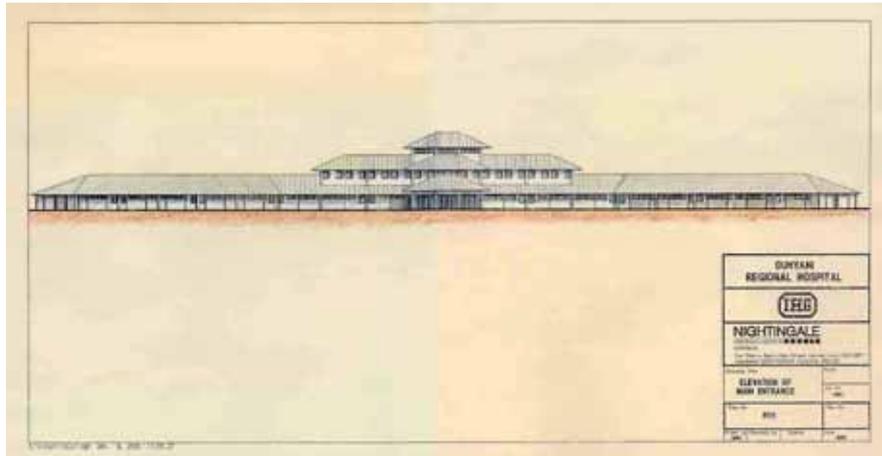
Key challenges include balancing the many competing influences and demands across all aspects of health management: establishing clear policy priorities while maintaining an overview of societal interests; and influencing the behaviour of those involved, in a climate of transparency and accountability, through performance assessment and leadership.

Several aspects of stewardship can be enabled (or conversely frustrated and diminished) by architecture and by the way in which the architect's services are rendered. Stewardship can be enhanced through provision of an infrastructure that is sustainable, context appropriate and adaptable, and

can be entrenched through a prolonged commissioning and hand-over process. A significant feature of Sunyani Hospital was the protracted commissioning and hand-over process of the building. The professional team still provides some maintenance support, and has been involved in managing the outsourcing of specialised services to address routine planned maintenance.

Contextual design drivers

The building typology at Sunyani Hospital is appropriate to the locally available technical and material resources. The complex makes use of local conventional construction methods and materials. Otherwise unassuming brick walls and sheet metal roofing are given accent with a local sandstone plinth detail at the entrance. Design materials and detail specification throughout the facility



The Sunyani Hospital is mainly single storey, making good use of the abundant land available



The hospital's design has coped well to accommodate demand since the introduction of a health insurance scheme in Ghana



The 'shallow' plan of the building is responsive to the climate, using an open corridor system, which provides plenty of fresh air and light, and is separated by large, planted courtyards

– such as the spectacular terrazzo flooring – are hard-wearing to address the robust use patterns of public buildings. This is supplemented by a clear management strategy in raising awareness to reduce impact of wear and tear: A triptych of signs (“Do not touch the wall”; “Don’t spit or litter around”; “No smoking”) clearly communicates this. The hospital also reflects a broader sense of community pride and culture of cleanliness – Sunyani, after all, was recognised as the cleanest city in Ghana for 2007.

The structure, being mainly single-storey, avoids the use of imported technology for mechanical lifts. It is technologically modest, relying mainly on natural ventilation via adjustable louvers rather than mechanical ventilation, except in its operating theatres. Ventilation for comfort and dilution (to reduce airborne infection risk) is supported through ‘shallow’ planning. Rooms are single-loaded onto open corridor systems that are separated by large planted courtyards. Where mechanical ventilation systems have been used, care was taken to specify types that are modular and interchangeable.

Sunyani enjoys a tropical climate; temperatures range from 19 to 35 degrees and rainfall figures vary from 12 to 560mm/month in the wet season. The building is responsive to the climate through its open corridor system, which provides plenty of fresh air and light, and its deep roof overhangs to provide protection from rain and sun. While neither rainwater harvesting nor grey-water systems have been developed in this scheme, the gardens are mostly passively irrigated by rainwater. Storm-water is directed away from the building through a series of hefty drainage channels.

In its sprawling layout, the hospital makes good use of the abundance of available land in the region. The facility hugs the landscape by following the gently undulating contours, and the result is a human-scaled and subtly articulated place. There is some scale differentiation through placement of the administration wing – the only part of the complex to reach two storeys – over the entrance elevation, resulting in a dignified initial impression. This hierarchical aid to legibility and orientation is further formally developed



The human scale and subtle articulation of the Sunyani Hospital provides a pleasant working environment



The Sunyani Hospital has seen a four fold increase in doctors and nurses since opening



The hospital's landmark entrance reflects its status as a source of civic pride

through raising the central portion over the main entrance to accommodate a third-storey water tower.

In Ghana, as elsewhere, continuity and leadership – stewardship – is threatened by high attrition, staff turnover rates and the crisis of overburdened healthcare workers, built environment support staff and other personnel. Some evidence suggests that building infrastructure may have a crucial role in attracting, recruiting and retaining staff. At Sunyani, it seems likely that the building supports a pleasant working environment: here, there is an unusually high level of staff retention for rural Africa, leading to a four-fold increase in doctor and nurse numbers during the hospital's five years of operation.

In particular, the hospital is taking on more and more of a role as a teaching facility, through student attachments. Dr Asare reflects that since opening in 2003, Sunyani Hospital has grown substantially to

meet this need. Its investment in human capital development, and in job creation, has arguably not reached full potential because the staff housing that was part of the original master planning has not yet been delivered.

The Ghana government is introducing an energy management drive with targets and disincentives based on a user-pay principle in the near future. This is apt, because apart from growing global awareness around the need for ecological sustainability, electricity is in short supply in the region. Disappointingly, Sunyani does not exploit any alternative or renewable energy sources, but is supplied by the grid with additional emergency generators. Furthermore the impending energy-saving drive will not easily be supported by the infrastructure, because it lacks sub-metering.

Design for adaption

Although the hospital has a design capacity of 240 beds, it is currently operating at 400 beds. This unforeseen demand is partly the result of the Ghanaian government's successful policy drive

to increase health insurance; this is coupled with Sunyani's reputation, which appears to mean that it has a wider sphere of influence and catchment basin for which it was designed.

As often is the case in resource-constrained environments, the natural response is to disregard the design bed-space allocation and simply squeeze additional beds between conventional cubicles. Using this sleight-of-hand, the 240-bed hospital has been transformed into a 364-bedder. In less resource-constrained parts of the world, this practice would no doubt raise concern because of the increased risk of cross-infection, but in Africa, it is standard practice. Frequently, in developing nations, this awareness of the implications of not using a facility as it was designed is not fully appreciated, and in the face of dire need, hospitals are pushed beyond the capacity for which they were designed.

Dr Asare is aware of this potential risk issue, and asserts that he uses management processes to address this as best he can, by placing non-infectious cases in those overcrowded scenarios. This cannot account for the 400 beds required, and is a reminder that pressure for provision of beds usually trumps patient safety.

That said, the hospital has survived a doubling of patient demand remarkably well. Apart from the robust material and detailing at Sunyani, one reason for this is that its spatial typology is exceedingly versatile. The hospital complex comprises a system of simple, repetitive planning unit blocks, lacking high degrees of functional differentiation. This loose cast of buildings are linked and provide coherence and a sense of place through a web of covered walkways and large courtyard gardens. The system is easily extensible, and can be adapted to address the future growth of the complex. Indeed, additions have been made, and

more are planned, all of which are very much the same as the existing fabric, bearing testimony to the design's continued relevance.

Several areas are under particular pressure given the uneven growth patterns and demand for particular services. The out-patient and obstetrics departments are the most overburdened, and Dr Asare envisages these becoming satellite entities – still within the enclosed precinct of the hospital complex, but functionally independent.

In addition, the accident and emergency (A&E) theatres are used as theatres for day-to-day surgery. Given that the theatre block comprising five full theatres seems to be under-utilised (at two days per week), and there are complaints about the suitability of the A&E suite (which lacks both a recovery area and a separate scrub area), it raises a question as to why this is failing. One possibility is that trends in medical practice, in Ghana as elsewhere, have seen a shift toward day cases, and away from hospitalisation. As the A&E unit is “closer to the front door”, it may well better support this approach to medicine. Though Dr Asare has some plans for expansion, he acknowledges that the facility will reach an optimal functional size, after which future expansion will become unwieldy rather than realise efficiencies.

The spatial typology of the Sunyani Hospital is exceedingly versatile

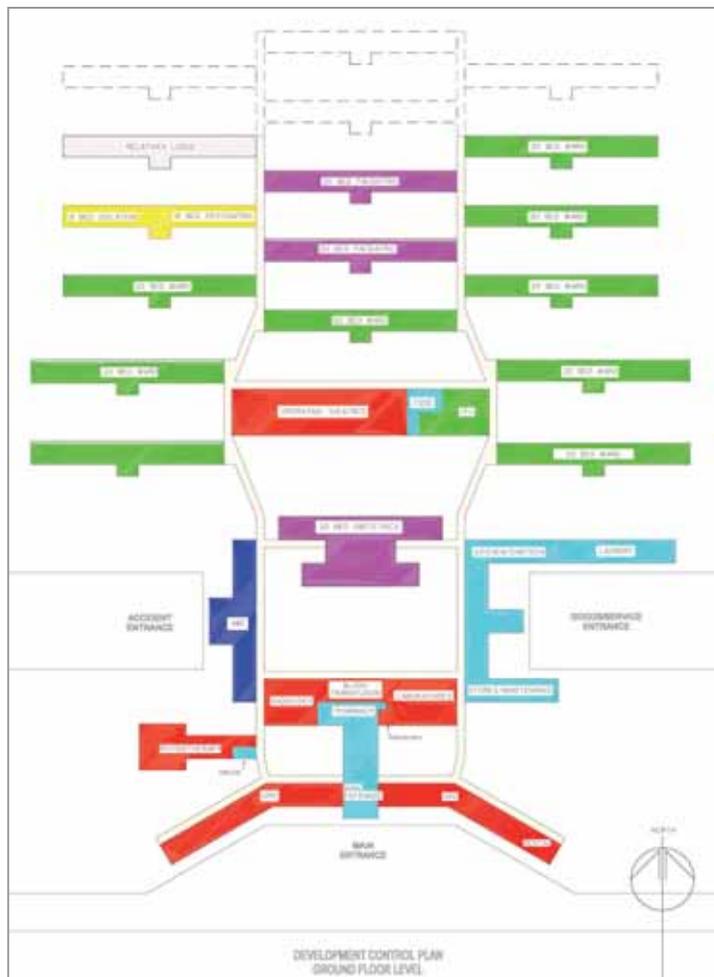
Design for social cohesion

Sunyani Hospital raises questions about life-cycle costing, and whether the model is comparatively cost-effective: at £14m, this project may well lay beyond the budgets of emerging economies. What is the impact of its increased carrying capacity on the healing environment, and on staff morale? When and how would it be appropriate to replicate this model? Should the model be replicated? Where would it work? How can it be improved?

If design in construction is to be sustainable, it must address the triple bottom line: meeting social as well as environmental and economic needs. It must contribute to poverty alleviation, provide community uplift and help to improve social cohesion and job creation. Design must serve its constituency. There is evidence to suggest that the social impact of the Sunyani Hospital has grown incrementally whilst the hospital's built environment has, through its structuralist framework and through the process of implementation, supported the hospital's stewardship.

From its inception, the project involved committed champions – not merely decision-makers, but people who continue to manage the facility today and take an active interest in developments elsewhere in the world. The lesson to learn is that the role of the built environment team may be enhanced if it is engaged prior to and beyond the conventional work-stages. At Sunyani Hospital, the team was involved in the pre-briefing stage, and continues to provide support in the form of technical and maintenance assistance. In large measure, the quality achieved at Sunyani is the result of having experienced consultants, who have imparted some crucial sensitivity to the built environment upon those whom it serves.

Peta de Jager PrArch is an architect and a researcher in health facilities from the CSIR (Council for Scientific and Industrial Research) in South Africa



A World Architecture Festival award winner, the CBF Women's Health Centre in Burkina Faso combines social and environmental responsibility with design innovation in harsh conditions to meet a local need, reports *Erika Trabucco*

Sense of belonging

Created by AIDOS, an Italian NGO fighting for women's rights in developing countries, the CBF [Centre pour le Bien-être des Femmes] project, financed by the Democratici di Sinistra Political Party and with a contribution from the European Commission, is a health centre, training and counselling facility with a particular focus on addressing the widespread health issue of Female Genital Mutilation [FGM]. The social and health services programme

developed by AIDOS is centered on providing educational services, information and awareness about women's sexual and reproductive rights in Sector 27 of Ouagadougou, a peripheral urban area settled by the rural population.

The programme called for a building complex capable of hosting a variety of activities in very harsh circumstances. Completed in 15 months by a local builder, the CBF is a functional and cost-effective response that simultaneously provides a sense of identity for the local community.

Designed by FAREstudio, the project prioritises an integrated approach to interactions between built space and climatic-environmental conditions [building orientation and layout, control of resource consumption, the use of natural vegetation, the selection of building technologies], based on considerations of sustainability and appropriateness.

It is based on the separation of the primary activities performed by the CBF into two distinct buildings: a training centre dedicated to activities of awareness-building and the administration and management of the CBF; and a consultancy centre, used for medical visits, legal assistance and psychological counselling.

The two main buildings are set atop a single structural element: a raised platform that creates a true artificial plane that supports various buildings used for different purposes. The raising of the platform above the ground ensures hygienic/climatic conditions that are extraneous to local culture and practices of building (protection against dust, mud and humidity).

Both buildings are also protected against rainfall and, above all, direct sunlight, by a light, waterproof PVC recyclable velarium, supported by an independent structure of steel 'trees'. This sloping tarpaulin is part of a system that collects and stores rainwater, which is used to irrigate the garden.

The volumes that contain the various rooms are independent of the roof structure and freely placed on the platform. They are articulated around a series of shaded and ventilated patios to ensure privacy. The modular configuration allows for future expansion.

The building walls are constructed using compressed



The centre is set atop a raised platform to ensure hygienic/climatic conditions

dry stacked clay bricks, made on site using a rough mixture of earth, cement and water. The bricks were baked in the hot sun, with no energy consumption, thereby limiting any environmental impact.

The buildings are covered by corrugated aluminum and translucent decking, which allows light to filter into the interior, reducing the need for artificial illumination. The space between the steel roof and the velarium, the open cavity underneath the platform, together with the exterior openings fitted with operable glass fins, help to improve the natural ventilation of interior spaces, reducing the need for mechanical air conditioning.

The exterior space, similar to the interior, is designed as an open area to be used by the entire community. It is a space of sharing and of information, used to present the themes dealt with by the CBF.

The garden is a micro environment that surrounds the buildings taking advantage of the shade provided by the building and trees and the humidity produced by the plants. A layer of grass covers the earth, reducing the effects of erosion, while various species from Western and Sub-Saharan Africa have been planted to create shade and promote the return of autochthonous vegetation.

Temperature control, perhaps the most significant climatic issue, has strongly influenced the overall design. The strategy includes: Carefully studied building orientation, reducing the effect of hot wind and taking advantage of mutual over shading; shading of heavy material against direct exposure to the sun; extensive use of operable windows; and the separation of enclosed areas by transitional spaces, such as verandas or patios.

As water and power are unavailable in the area, the centre is fully independent, integrating the systematic control of consumption and the self-production of resources, possibly renewable. Water is provided by a newly drilled and dedicated well. Photovoltaic cells have also been installed along the perimeter wall, reducing the use of the electrical generator.

The outside walls, with no openings, are finished with a plaster coat, painted with bright colours. The local NGO's slogan, translated in five languages, completes the decoration of the walls.

Erika Trabucco is a project architect at FAREstudio

CBF Women's Health Centre
 Client: AIDOS, Voix des Femmes
 Completion date: November 2007
 Architect: FAREstudio
 Site Area: 1600 sq m
 Cost: €208.500



Exteriors and interiors are designed as spaces of sharing to be used by the entire community (Photo - Sheila McKinnon)



Photovoltaic cells have been installed along the perimeter wall



Site plan of the CBF Women's Health Centre

The future is now

Innovation in the design of medical technology is altering how, where and by whom healthcare is being delivered around the world. *Marc Sansom* reports from the Medica trade fair in Germany

More than 137,000 visitors attended Medica, the 40th World Forum for Medicine to see 4,313 exhibitors presenting the very latest innovations in products, services and facilities across the entire spectrum of healthcare delivery.

Held in Dusseldorf at the end of last year, traditional areas of the exhibition, such as medical device technology and electrical medicine, continued to show their strength, whilst less mature markets such as physiotherapeutic processes and medical IT, enjoyed increasing levels of interest. As medical technology changes the face of healthcare delivery, we offer an insight into some of the latest designs from Medica set to be introduced into healthcare environments around the world.

System integration

Sievekings-Krankenhaus is now home to one of Europe's most modern high-tech operating rooms. Opened this month, the new facility incorporates a striking design with blue glazed walls framing the state-of-the-art operating room, and two large windows providing access to daylight.

Incorporating the latest technology, the unit allows digitalised X-ray images and endoscopy findings to be directly transmitted to the surgeons' screens. Live links to other hospitals, practices or to national and international congresses can also be set up.

Established as a European reference centre for minimally invasive surgery techniques, the new operating room also features the EndoALPHA system from Olympus, allowing operating procedures to be optimally planned.

"With the optimisation of the operating room, we have contributed to the development of system integration and surgery. Ergonomics, efficiency and the flow of information will all be improved", explained Heinz Jacqui, managing director of Olympus Winter & Ibe GmbH.

In the future, video and audio links to other departments in the Ev Amalie Sievekings-Krankenhaus can be created to, for example, the gastroenterology and radiology departments. The high-tech facility also includes the HDTV 1080 standard. Dr Thomas E Langwieler, head of surgery explains: "The use of high-resolution HDTV camera systems together with NBI (Narrow Band Imaging) allows even the smallest of changes in the stomach or breast to be detected when performing tumour operations."

www.olympus-europa.com/endoalpha



The rhythm of light

AmbientLine, from Trumpf, is said to offer the world its first lighting system integrated into ceiling pendants for use in intensive care and operating room environments, easing workloads for the staff, supporting patient recovery and increasing the sense of wellbeing for patients, staff and visitors.

Patients are frequently exposed to extreme lighting conditions, especially in the ICU. Constantly shining bright lights and frequent checks with full room lighting disrupt the patients' circadian rhythms. In addition to other stress factors, lighting is often a hindrance to patients' speedy recovery. More than one third of intensive care patients often suffer from depression, anxiety and confusion after three to five days.

AmbientLine is also claimed



Like clockwork

As cost pressures in healthcare systems increase, solutions, such as the I-Suite from Stryker, which improves efficiencies in the operating room is a key driver for investing in high-tech surgical suites.

More than 3,500 i-Suite operating rooms have been set up at hospitals and clinics, universities and academic institutions across the globe. Its ergonomic arrangement and placement of all machines and medical equipment is said to ensure smooth-running workflows and less stress for the staff.

The ceiling-mounted suspension systems for all devices are just one key feature: suture-incision times can be reduced by six to ten minutes because the floors can be cleaned without obstruction and setup times for equipment like the mobile video trolley are shortened.

Stryker's Switch Point Infinity router control system also allows live operating room images, PACS/DICOM images, digital radiographs and telemedicine to be co-ordinated. The intuitive touch screen interface serves as the connection point for all communications. The i-Suite family includes four operating room solutions, each designed to create the optimal environment for the various surgical specialties: EndoSuite is an integrated multidisciplinary surgical center for general, gastrointestinal, gynecological, ENT or urological surgeries; CV-Suite is an operating room configured for heart surgery; NavSuite offers a functional design for neurological, spinal and ENT surgery; and the OrthoSuite has been designed for orthopedic surgery.

www.stryker.com



Pick and go

Transporting patients between wards while monitoring their vital signs takes time and effort. Clinical staff have to disconnect the bedside monitoring system and connect the patient to a transport monitor.

This process can also be dangerous because the patient is not being monitored while the monitors are being exchanged. Monitoring functionality is also limited during transport, with the risk that the patient's vital data during this period may be lost. Installed at Zurich University Hospital, the Infinity Delta monitor series from Dräger ensures that when a patient is moved, the monitor does not need to be exchanged.

This has been achieved using the patented Pick and Go technology of the Infinity Delta monitors. At the bedside, the monitor is placed on the Infinity Docking Station for connection to power and networking. During transport, the monitor is removed from its station and moves with the patient, seamlessly switching from hard-wired to wireless and retaining all of the bedside settings. At the new ward, the monitor is placed back onto a docking station.

The patient benefits as they can be moved more quickly and are monitored continuously, both locally and at the central monitoring station.

www.draeger.com

to make the work of nursing and surgical staff more ergonomic. Ceiling pendants can be equipped with direct and indirect lighting. These light sources can be simply and flexibly activated at the patient's bedside using an intuitively controlled touch screen. This makes it easier for the caregiver to reach the patient without having to light up the whole room and disturb other patients.

A special LED light designed for platforms and drawers allows for easy and secure access to necessary instruments at the patient's bedside. Additional lighting units are available for patient examination and treatment. These are directed toward different areas on the bed and can be independently operated. But if there is an emergency requiring full lighting, all the lighting units can be switched to maximum brightness by pushing a single button.

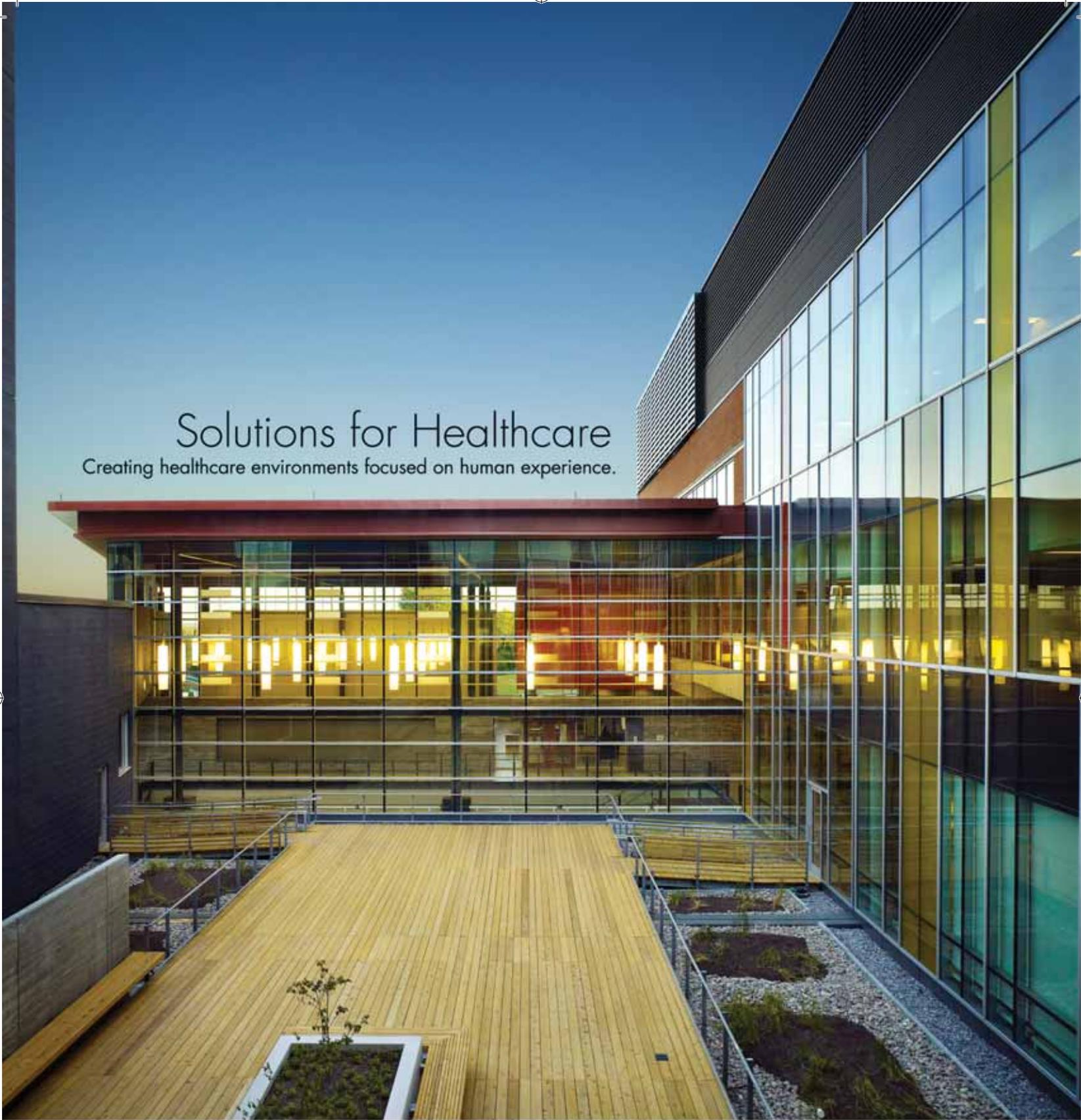
A light, semi-transparent sail also hangs over the patient's bed, offering a surface for individual lighting. Through intelligent and automatic control of the light quality, AmbientLine also supports the patient's circadian rhythm.

www.trumpf-med.com



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Design & Health Scientific Review

The value of critique



Dr John Zeisel is chair of the international advisory board of the International Academy for Design & Health and president of Hearthstone Alzheimer Care



Prof Romano Del Nord is chair of the scientific committee of the International Academy for Design & Health and deputy rector of the University of Florence

Post-occupancy evaluations (POE's) come in many shapes and sizes. This issue features POE's that differ in terms of subject; user groups; impacts on users; ambient conditions; and physical design elements, writes Dr Zeisel.

These differences reflect the backgrounds of the investigators, the intent of the investigations, and the intended audience. They also reflect the fact that, although the term and process has been in currency for some time, the field of environment-behaviour research is still 'an emerging field'.

For this reason we must both celebrate and critique such studies. We must celebrate the fact that POE's are being carried

out, welcomed by professional designers, and enjoying opportunities for widespread dissemination in journals such as *World Health Design*.

We must critique – not criticise – and learn from the unique aspects of such studies and the particular twists the authors put on them. In Clare Cooper's article on healing gardens, she uses several observational POE's of gardens to present readers with thoughtful design guidance – reduce glare, provide choice of pathways, employ furniture to provide semi-private niches.

She makes the point that "the garden has become a potent treatment milieu" and that healing garden design is now in "a third stage" where designers are using sophisticated methods to plan outdoor spaces for the health needs of specific patient and user groups, such as children with autism and elders living with Alzheimer's.

Stevenson, Humphris and Howells's careful multi-method POE of the Frank Gehry designed Maggie's Centre in Dundee, Scotland, compares intent to staff and visitor questionnaire and interview responses. The investigators found major user criticism with "overheating, excessive natural light, excessive dryness of air" layout and use of space in the building, as well as lack of perceived ability to control these ambient conditions.

These user responses were offset by 70% of visitors giving it the highest rating, with 82% rating the views highly, and fully 90% stating the building was "comfortable overall" despite criticising the air and heat. Curiously, the authors conclude with a peculiarly positive assessment of the building – one that might well lead to uncritical design emulation, rather than critical design improvement of future Maggie Centres.

Finally, Kamaree Berry's operating suite study found that fluorescent lighting, lack of views outdoors, and colour can play a role in lower morale among nurses. But the most interesting point this investigator made is that the nurses she studied felt devalued by not only their working environment, but also the way they are treated – not being included in decisions, and excluded from any design input.

Her respondents seem to feel that they are devalued by what Vischer calls their "socio-spatial contract"¹. In this case it is likely that paying the nursing staff more attention would have had a greater effect on morale than an improved environment.

1. Vischer, J. C. *Space Meets Status – Designing Workplace Performance*. Routledge, London 2005

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Working Environments: Operating Room Architecture and Design and the Effects on Staff Morale

Kamaree Berry PhD candidate (Murdoch), MEd Stds (Hons) (UWA), PGDip Nursing (clinical nursing) Perioperative, RN BN, MRCNA, MACORN, RAA

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Post-occupancy Evaluation: Promoting Wellbeing in Palliative Care

Dr Fionn Stevenson; Professor Gerry Humphris; Lesley Howells.

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Landscape design: Patient-specific healing gardens

Professor Emeritus Clare Cooper Marcus



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Working environments: Operating room architecture and design and the effects on staff morale

Surgical suites are costly and complex, with multiple needs. What can nurses' own experience of their workplace do to make their design more conducive to staff wellbeing?

Kamaree Berry PhD candidate (Murdoch), MEd Stds (Hons) (UWA), PGDip Nursing (clinical nursing) Perioperative, RN BN, MRCNA, MACORN, RAA

Healthcare in Australia is in a process of change, a transformation that is occurring at every level and in every profession. Simultaneously, the profile of nursing is diversifying due to the economic reality that always accompanies change¹. Nursing is a multifaceted profession, incorporating both the fundamental nursing skills as practised on the wards as well as the more technical skills found in critical care areas such as perioperative nursing. This specialised environment is a complex system, combining patients, personnel, technology and pharmacodynamics in a physical environment and producing highly specific outcomes².

The purpose of this study is to establish the need for further exploration on how the morale of skilled professionals is affected by the architecture and design of their working environment. The significance of this research will allow further insight into the notion of morale and the working environment of perioperative nurses, which seemed to be absent from the literature reviewed.

Perioperative nursing

In order to grasp the reasoning behind this study, it is important to define both the terms 'morale' and 'perioperative nursing'. Morale is described as "the mental and emotional condition (including enthusiasm, confidence and psychological wellbeing) which provides a sense of common purpose and success with respect to an individual or group"³.

Historically, the term OR or theatre nursing was used to describe patient care in the immediate pre, intra and postoperative period of the surgical experience, thus intimating that nursing care activities were circumscribed to the geographic limits of



Today's operating room, such as RTKL's design at the new Heart Hospital Baylor Plano in Texas, US, must have presence and be functional without compromising the patient's healing process or staff morale

the operating suite⁴.

The idiom perioperative nursing has since replaced the former term and defines the role as the total surgical experience that encompasses, as previously mentioned, the pre, intra and postoperative phases of a surgical patient's care^{5, 6}. The role of the perioperative nurse has always seemed ambiguous to the general public – there is some doubt that the job perioperative nurses do could even be called nursing due to the perception that they are removed from patient care. This view has been fostered by the tendency to hide behind the technology, surgical scrubs and masks⁷.

Yet perioperative nursing is dynamic and reflects the changing nature of healthcare in society today; it consists of flexible boundaries that are responsive to the changing needs. Technological improvements, advancing changes in surgical techniques, specialised educational training and documentation recording have driven the need for functional changes in this specialised environment, yet without compromising standards and

guidelines. Today, the perioperative nurse plans, implements and evaluates patient care, manages sophisticated technology, interacts and effectively communicates with patients, families and other healthcare providers, supervises, educates and advocates for patients and colleagues, and continually responds to changes in healthcare delivery⁸. It is because of this rapid change in technology that many hospitals are forced to upgrade equipment and rethink the design and structure of their facilities, including specialist units, in order to accommodate the experienced growth.

Perioperative architecture

Healthcare architecture, building and design are complex issues involving many key sectors including providers, consumers, employers, employees, the government and a number of professional institutions, guidelines and standards. A cooperation of all sectors is vital in order to ensure effectiveness. Therefore, it is important that each sector understands not only its own

role within the healthcare system, but the roles of others as well^{9,10}.

Over the past 300 years, the design of ORs and ancillary spaces has responded to changes in surgical needs and practice. Architects have been compared to the artists of the Renaissance; however, unlike these patron-guided artists, architects of the time were expected to cope with the rapidly expanding bureaucracy, technological changes and the immense building programme of hospital facilities¹¹. The closing decade of the 20th century in particular revealed amazing transformation in environmental design of healthcare facilities. These changes have been historically compared with the influence of Florence Nightingale, whose observations and facilitation of the nursing profession some 150 years ago left a lasting impression on healthcare settings¹².

A significant history exists regarding hospital architecture that reaches back to the Roman military hospitals in the first century AD. Architecture and the design of hospitals are not the only entities that have undergone extreme change. The discovery of anaesthesia in 1846, the use

of carbolic spray in 1866 during surgery to avoid infection, Von Bergmann's introduction to aseptic technique and the sterilisation of instrumentation in the late 1800s through to the introduction of keyhole surgery in the 20th century has made it necessary to provide designated facilities to encompass these technological changes in a safe environment¹³. Further, a number of standards, guidelines and procedures must be adhered to when viewing architecture and design of a healthcare facility, including specialised units such as the operating suite.

Today, the surgical suite is the most costly area to renovate or construct; moreover, it is the most needs intensive in regards to staff, equipment, material and building systems¹⁴⁻¹⁶. It is no wonder that the design of the perioperative environment offers an immense challenge to the planning and architectural team in order to optimise and accommodate efficiency and, at the same time, allow for flexibility and future expansion^{6,13}. However, when done well, the facility planning and design of the hospital, and in particular the OR, becomes a physical embodiment of operational philosophies and procedures^{11,17,18}.

Literature review

An extensive (1968-2007) and exhaustive search was carried out of various databases (CINAHL, Nursing & Allied Health Collection, Ebsco and Medline), journal articles (including nursing, architectural and healthcare management), and a variety of texts. Key words ranged from architecture, design, OR (and variations thereof), hospital, staff morale, aesthetics and interior design, through to combinations of these words and inclusions of further information such as effective and optimal design.

The search revealed that there has been much literature written regarding architecture and design of healthcare facilities and ORs in general. However, much less has been documented regarding the effects of these designs on staff morale. Furthermore, it included information on healthcare, educational, office and business facilities, with the expectation of revealing insight into the relationship between morale and design in other professions. Only one textbook by Calderhead¹⁹, *Hospitals for People*, provided a significant amount of relevant background information of the effects on staff morale resulting from visual surroundings, noise, smell and the importance of good design. People appreciate good visual surroundings and will travel great distances to be among them. It is therefore vital to encourage good design and aesthetics for healthcare environments as they can have a profound influence on the behaviour and morale of both staff and clients utilising these facilities¹⁹.

Perioperative nurses spend a considerable amount of time caring for the surgical patient and addressing their needs. The workload carried by the staff leaves little or no time to address their own needs, therefore, the issue of staff morale is of low priority within the OR, until a crisis occurs²⁰. When the issue of staff morale was addressed in the literature review, it was related to a specific point, such as significant workload, shift work and management issues. However, no reference was made to the actual structural work environment and if this was a consideration in providing a conducive working arena.

William and County²¹ acknowledge the issues raised in the previous article by Appold²⁰ and have identified a number of factors, such as poor communication, ineffective training and development, which are shown to cause low morale within the perioperative environment.

Table 1. Choose a colour (adapted²⁸)

Red

The colour of energy, it is also the colour of blood and life. Ideal for use first thing in the morning as it is an 'awakening' colour. Can also be used near unconscious patients. Red should be used in small quantities or a short period of time as it can become a sign of frustration and anger.

Pale pink

The colour of roses which most people seem to love – it is a colour which calms aggression.

Pale lavender

A soothing, calming colour known for its healing qualities.

Blue

All shades have calming properties. Blue is about trust, which is particularly evident in the use of dark blue to denote authority. It is good for depression – just being able to see the sky can often lift a person's spirits.

Turquoise

Blue and green are associated with the heart and the combined blend; turquoise is an ideal healing colour due to its soothing properties. Blue and turquoise also relate to communication and may be indicative of someone having difficulty in talking about a problem.

Green

The middle colour of the rainbow, green indicates harmony, growth and rejuvenation. Particularly useful during times of stress, green is associated with the heart and life. Olive green indicates hope. A more potent effect can be gleaned by including live plants in the rooms or outside the windows.

Yellow

The colour of happiness and being cheered up, and the colour of the sun, it radiates warmth and comfort. When combined with black, it is a sign of danger.

Black

Often used as a sign of loss and mourning, black is the denial of colour and life. Should not be used in the healthcare environment.



The creation of a pleasant working environment is crucial to good performance, such as here in the OR at NBBJ's Southwest Washington Medical Centre in Vancouver, US

However, no consideration was given to the architecture and design of the OR or whether it could contribute to the effects on staff morale. In most of the literature, the authors begin addressing discussions with a historical excerpt regarding the foundations of architecture and design of healthcare facilities, followed by their intended topic ranging from the design of the OR to the importance of colour in interior design. Yet there are no simple universal solutions to designing buildings whose aim is the provision of healthcare.

Numerous features of the design of existing hospitals make them profoundly enervating and difficult to work in, including alienating corridors and stark white walls with no decorative or directional variation to break the monotony²². ORs of the past were sometimes hosts to a comedy of errors as they consisted of wooden floors and were created to accommodate hordes of medical students who learned by watching their professors perform surgery in an amphitheatre-style classroom. The surgical suites in the 1960s and 1970s were designed for the functionality and

technology of the era, with commonalities including ceramic tile walls and conductive flooring^{15, 23}. Today, hospital and OR design must have both presence and the ability to assist the functionality of a hospital, yet not work against the patient's healing process.

The creation of a pleasant working ambience is vital when considering all aspects of architecture and design when an upgrade and/or new ORs are being built^{24, 25}. The importance of the physical environment as a rich source of information enables people working in the area to manage experiences. Furthermore, the human senses are like antennae, constantly scanning the environment to receive signals regarding their particular surroundings^{22, 26}.

Thus the assumption that aesthetics of a specific space have a behavioural and psychological impact on staff does carry merit. Colour, furniture, paintings, space, light, furnishings and wall lights are some of the interior design aesthetics that are considered equally as important as good architecture and design and of great importance to staff morale. The correct use of these materials facilitates the creation of a feeling of trust

and calm towards the patient and the staff member²⁷.

Colour choice can prove to be an insight into the emotional wellbeing of both the patient and the staff member alike. Colour plays a significant role in life, particularly in the recovery of patients and the impact and effect on staff morale²⁸. In addition, it has been proven that people actually work better and foster better performance in the presence of certain colours. While effective on their own, greater benefit can be obtained by combining colours and, as colour is produced by different wavelengths of light, people respond to these different energy levels.

The principle behind colour therapy and colour choice is that people choose the colours that they need as it is an indication of what they are feeling (Table 1)²⁸.

Similarly, the emphasis on natural light, space, and the use of windows was also acknowledged on a number of occasions throughout the literature review. In relation to space, the use of curved bricks can provide a visual lift to the corridors, ward and specialist units, providing a sense of flow

from once space to another. Furthermore, exterior windows utilising borrowed light, colourful work stations and bordered OR areas can induce a feeling of comfort and motivation and have proved to be the most effective way to reduce staff stress and ultimately lead to an increase in staff morale^{15,29}.

Emerging themes

Many themes emerged from the literature reviewed. In particular, patients' perceptions of the healthcare facility, ward and/or specialist area are at the forefront of priorities when addressing architecture and design issues. Today's healthcare facility designers endeavour to create a more aesthetically pleasing and therapeutically sound environment in order to facilitate the healing process of patients.

Interior design is categorised as function and aesthetics, both of which are important and must work together. That is why design teams address issues such as the introduction of colour schemes, the integration of Feng Shui principles, waterfalls, natural light through windows and landscaped gardens^{22,27,30}. One article in particular concurred with these comments and went on to note that the role of the environment is an important tool for patient care; however, it was no longer sufficient for the environment to function entirely for the staff. The environment needed to provide an ambience of warmth and comfort within elegant surroundings, reflecting the values and vision of the particular institution. The question is then posed, if patients are provided with an exceptional aesthetically pleasing environment, would this improve the morale and efficiency of staff working in this area?

This question has application and relevance across all areas regardless of their specialism³¹. Hospitals that made the prestigious list of Fortune's 100 best companies to work for found that an inextricable link was identified between patients and staff. Improving customer service to patients resulted in a happier workforce, not only in consumer-friendly innovations and technological expertise but in the architecture and design of healthcare facilities.

Moreover, it prompted a sense of confidence that is reassuring both physically and spiritually for patient and staff wellbeing³¹. A pictorial text by Norio

Ohba³² shows a variety of facilities built in Tokyo from hospitals to mental health and rehabilitation facilities and the importance of aesthetics, natural light, colours and windows by "bringing the outside, in". Calderhead¹⁹ agreed with this concept, albeit that the introduction of external stimuli such as landscaping, air and generally a sense of the 'outside world' would be quite difficult to achieve. It is evident that this concept is not new and that it has completed a full circle. It is vital that the architecture and design of the perioperative, or any working environment, must be conducive to the staff providing the services and functional facilities within this arena, thus alleviating the sense of frustration that develops through ineffective designs¹⁹.

Research method

The purpose of this qualitative study was to examine the architecture and design of OR and its effect on staff morale through a focus group interview with practising perioperative staff members. The purpose of selecting the naturalistic approach of phenomenology was not to extract or explain theoretical terms, but to understand its underlying meanings by allowing the participant to draw a vivid and detailed picture of the effects on morale in relation to architecture and design within this specialised environment³³.

Even though significant interest was evoked by various other specialist departments, only perioperative nurses were invited to participate. The rationale behind this was that the expert in the field can, through explorative questions, articulate their knowledge and understanding of an issue and is willing to give complete and insightful accounts of the topic. The component of personal knowledge is essential in order to appreciate the meaning of any subject addressed in qualitative studies, including issues of morale based on the nurse's background, expertise and knowledge of a particular working environment^{33,34}.

The goal to extract meaningful information from participants regarding their experiences was achieved via means of a videotaped interview and the use of various tools such as photographic evidence, colour specifications and a proposed floor plan.

From this focus group interview, various issues arose that would require further investigation, including a detailed insight into specific areas within the perioperative environment and their individual

requirements. Suggestions and insights offered throughout the interview by both the participants and the researcher paved the way for further research on the topic of architecture and design of ORs and the effects on staff morale.

Data collection

Fifteen expressions of interest were randomly distributed (male and female) to practising perioperative staff members across three major metropolitan hospitals in Western Australia. Prior to the focus group interview, discussions regarding the intention, techniques and aspects of confidentiality were held with each participant. Staff members were asked to complete and return a consent form and an agreed date, time and place were set to address any issues/questions prior to the commencement of the interview. Of the 15 invitations, six members confirmed their participation (minimum); additional participants were unable to attend the scheduled interview due to heavy working commitments and shift work. The option of a taped one-on-one interview was offered if the member was unable to attend the scheduled date or did not wish to participate in the focus group; however, no participant took up this offer.

The six participants were all female, aged between 23-60 years of age. Their backgrounds ranged across various specialisms within the perioperative arena, including anaesthetics, intraoperative, recovery room and endoscopy. Their perioperative experience began at three years since graduation to more than 30 years as a practising registered nurse. The expertise and knowledge scope was extensive, from junior, senior and management staff. The focus group approach was chosen to allow for multiple interactions among colleagues; it was also conducive to the collection of in-depth information and the meticulousness of data.

The recruitment of a neutral associate eliminated the potential bias that may have occurred during the data analysis. Any preconceived ideas or judgments were eliminated prior to the interview as it was vital that the participants' experiences, perceptions and opinions were analysed rather than that of the interviewer.

Permission letters were required to enter agencies to obtain photographic evidence of

each perioperative suite as part of the study. Once access was confirmed, appointments were set with unit managers to further discuss the rationale and outline of the study. A number of meetings were organised with the architectural draftsman who became an integral part in the development and design of a proposed OR suite for perusal, comments and suggestions by the participants during the interview. Various interviewing strategies were used, including but not limited to, pre-selected and open-ended questions.

Colour specifications and samples were obtained through hardware stores and upholstery manufacturers to facilitate discussions on internal design and its effects, if any. Photographic evidence of perioperative suites and a proposed basic floor plan of an OR were used to facilitate data collection. The photographic evidence was vital to the study as it provided the basis of discussion for how architecture and design of ORs can affect staff morale. Furthermore, certain architecture and design pictorial text books were used as reference material^{32, 35}.

One of the most important ethical considerations for this study was that the participants were entitled to privacy, confidentiality and informed consent. The videotaped focus group interview was carried out at one of the participating major hospitals in a designated tutorial room away from the perioperative working environment to allow for privacy, confidentiality and to ensure that no interruptions occurred. The interview lasted approximately 1.5 hours, with the option of a follow-up interview if insufficient data were collected. A neutral associate was employed to videotape the interview and the proceedings, including objectives and questions, were outlined and provided to each participant on arrival.

A 100% response rate was received from the three agencies approached for access to their ORs to obtain necessary photographic evidence required for this study. Six out of the 15 perioperative staff members invited to participate provided a 40% participation rate to the study. The pressure on staff was enormous to be released in time to attend the interview, and shift work proved to be a major factor in the ability for further participation by other members.

Definitions for 'morale' and 'perioperative nursing' were provided at the beginning of the interview to establish the study's



Innovative OR workplace and lighting solutions from specialists such as Trumpf can help to raise staff morale

foundation. Participants were asked to individually identify with the term morale and what it meant to them. Comments such as "working environment, the people you work with the positive effects", "how people talk to you, how you are treated, the area that you've got to work in" and "... a huge effect, because I find that under fluoro lights [pointing to the ceiling] after a while you are like an indoor plant and you sort of die by the end of the day" were put into context by the researcher, confirming with the participants that the phenomenon of 'morale' can be related to and have an effect in relation to the architecture and design of a person's working environment.

Bringing the 'outside, in'

Furthermore, a comment made in regards to windows – "... there are a lot of areas that don't see the daylight; sometimes, somebody will say 'it's raining' – oh really? So you look for the nearest window to see what is happening in the real world" – confirms the findings^{19, 32} that the concept of 'bringing the outside, in' has a profound impact on staff morale as they find themselves aware of their confinement. This particular discussion evoked a continual comparative approach, with members reflecting on other establishments that they had worked in and how they compared to their current environment.

Members of staff are the first to come in contact with their environment, and therefore this space holds great significance. The workplace should provide a welcoming

atmosphere with clear-cut directional emphasis^{19, 26}. As personal senses become offended, people become stressed and lose the effectiveness to accomplish designated tasks within the work setting. Staff energy is therefore focused on reacting to the stress rather than working at the task at hand.

The frustration associated with the architecture and design of a working environment proved to be one of the major themes that emerged from this study.

The participants identified that distance and time associated with moving between various areas within the perioperative suite was a concern that should be addressed when designing the environment. Surgical suites are designed to service patients with advanced medical technology and allow for the incorporation of a universal design to accommodate the conversion from one speciality to another without further changes and/or construction¹⁵. A basic central corridor, hotel-style floor plan was developed to ascertain the perceptions and opinions of the participants. Consisting of operating and recovery rooms, administrative and ancillary facilities, it created an atmosphere of excitement, positive remarks and anticipation in the development of a workspace that would facilitate an increase in staff morale.

The photographic evidence of ORs, recovery rooms and ancillary spaces proved to be a contributing factor in the practical ability and application of participants to address and discuss the research topic. Feelings of aversion with comments such

as “that’s awful”, “that’s terrible” were forthcoming when photographs of these areas were viewed. This reaction also revealed another emerging theme, space. This issue was anticipated to be significant to the participants; therefore the proposed basic floor plan provided ensured that dimensions of the perioperative workspace were addressed with the architectural draftsman during the design process. The floorplan reflected the issues of space and light, with the inclusion of windows surrounding the suite. Furthermore, relevant traffic, movement patterns and dimensions of the particular perioperative space were acknowledged and adhered to according to appropriate standards and guidelines.

The issue of colour specifications and schemes also proved to be important. The focus group was presented with various colour samples ranging from modern bold and bright representations (e.g. burnt orange, shades of purple/lavender and green) to a more contemporary selection of pastel colours (green, blue, pink and beige, for example), which facilitated discussions. Statements made by the participants concur with the literature reviewed, proving that colour has a tremendous effect on staff morale within a working environment. During the interview, comments such as “... the layout also affects your ability to function without feeling frenzied or stressed” and “... colour schemes can play a big part” not only agree with the literature reviewed, but serve

as a testimony to the aim of this study.

The importance of the design team (including management, architects, engineers and actual staff members working in the specialist environment) was highlighted throughout the literature reviewed. During the actual study, the participants critically reviewed the photographs provided as a group. This evoked collaboration between them as they began working together as a team to design their own working environment, utilising sections of one area and placing them into another, thus identifying the ‘ideal’ perioperative setting. However, it was interesting to note that even though only two out of the six focus group participants had spent time on a design team, both revealed that it was a negative experience and had not been aware of the standards and guidelines that exist to govern this issue.

Discussion

Advances in technology, alongside the diversity and growth of hospitals, have led to the need for more specialised healthcare settings and furnishings, thus new and insightful architecture and design of healthcare facilities. Today, healthcare architects are taking into account these needs when developing designs that are conducive to patient-centred care. At the same time, however, the needs of the staff should also be considered, therefore their participation in the architectural design

team, the design evaluation, building and commissioning process is crucial³⁶.

The group dynamics of the interviews were also of interest, as the characteristics of the participants represented personnel currently employed within the perioperative clinical setting. The vast difference between the participants’ backgrounds, experience, knowledge and expertise contributed to the diversity of information, perspectives, opinions and comments offered throughout the focus group interview.

Participant responses revealed a number of emerging themes such as frustration and low morale by the participants due to a working environment that was not conducive to staff. The question is then posed: is the nursing profession (and nurses’) opinions not important or as highly regarded as others in the design process when addressing their own workspace?

The most notable themes that emerged were feelings of frustration regarding the architecture and design of current work settings; identifying and addressing the discontent and disappointment in that participant opinions and recommendations were not being valued when attempting to partake in likely working environment changes; and the excitement at the prospect of being a part of a study where these participants were considered the experts that would ultimately produce an effective, efficient and conducive workspace. From the literature reviewed and previous research conducted in the areas of architecture and design, the results were consistent. Architecture and design, colour specifications, layout, furnishings, aesthetics and interior design in general have the ability to increase staff morale and at the same time produce a beneficial working environment.

Overall, the information was well received by the focus group, with participants identifying/highlighting areas of concern and anticipated issues that would possibly arise during the design process. The willingness to partake as part of the design, evaluation and commissioning team was overwhelming, with participants and management requesting to peruse the research proposal and remain informed on the outcome of this study.

The researcher believes that this study would benefit further from the undertaking of a longitudinal study incorporating facility-specific focus group interviews in order to gain alternative perceptions and insight from



Integrating advances in medical technology with the operating room environment in a way that supports staff is a key design priority of new solutions, such as the i-Suite, from Stryker

external organisations and perioperative staff members.

Conducting interviews with staff members who have participated in the design, evaluation and commissioning process of an OR would provide further validation to research results. Further research on this topic would clarify the position of the perioperative nurse in the scope of this role and identify the need for educational sessions highlighting specific guidelines and standards governing OR architecture and design. Finally, follow-up interviews with participants would facilitate the verification of research findings and allow for additional input as required.

Conclusion

Technological advancements have brought about profound changes to hospital buildings and the design of the OR. Organisations are now eager to re-examine how they can add to their performance by re-engineering their approach to the use of buildings, space and facilities. Recommended guidelines and standards such as the *Guidelines for construction and equipment of hospitals and medical facilities* from the American Institute of Architects Committee on Architecture for Health & Assistance³⁷ and

the Australian College of Operating Room Nurses ACORN standards and guidelines³⁶ may service organisational demands and increase profits; unfortunately they fail on staff satisfaction and lead to low morale in providing a positive working environment.

Nursing has never been a 9-5 job and most areas operate on a 24 hour basis to accommodate patients' needs³⁸. Additionally, a healthcare facility is a tangible, living testimony of the organisation's beliefs and priorities towards staff and patients. A true-life enhancing environment is, in fact, one that shows respect for human dignity¹². The OR is an interactive environment and can be seen as an autonomous unit due to its terminal location³⁸. Out of all the literature reviewed, only one text was found to acknowledge that architecture and design, in this instance the isolation of the OR location, can begin to affect staff morale, as interaction between other departments/units and other personnel can be non-existent.

Therefore, choosing the correct 'treatment' to create an environment that expresses hospitality and reduces stress – such as a real sense of openness in what is a closed environment – is an integral component for setting the tone of architecture and design³⁸. The surgical suite is the most

costly area to renovate or construct; moreover it is the most needs-intensive in regards to staff, equipment, material and building systems. Functional planning, future operational flexibility and architectural design all contribute to the creation and/or refurbishment of a hospital or a designated department. Good design, sensitive use of materials, contrast of colours, textures and furnishings can turn corridors, ORs and the department in general into a pleasant, reassuring and conducive environment for staff, patients and visitors. The expected results would be a more positive setting, leading to an improvement in quality of staff morale and ultimately patient care. For most people, knowledge on how all the pieces fit together to form a holistic picture is important. Perioperative staff are in a prime position to convey relevant information which will enable them to ultimately produce a structure and/or department that reflects the needs of those personnel who work within the unit¹².

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Figure 1: An external view of the distinctive design of the Maggie's Centre in Dundee

Post-occupancy Evaluation: Promoting Wellbeing in Palliative Care

A post-occupancy evaluation of Maggie's Centre in Dundee provided a valuable insight into the impact of the building's design on user and visitor perceptions of their own wellbeing

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Professor Gerry Humphris, Bute Medical School, University of St Andrews, Scotland
Lesley Howells, Centre Head, Dundee Maggie's Centre, Scotland

The Dundee Maggie's Centre in Scotland, designed by Frank Gehry, opened its doors in 2003 to those diagnosed with cancer and seeking support. The fundamental remit of the Maggie's Centres is to provide information and psychosocial support for carers and people with experience of cancer within a new healing typology¹.

The centres were inspired by Maggie Jencks and pioneered by her husband, Charles Jencks, together with her personal nurse, Laura Lee, who is now chief executive of the Maggie's Centres organisation.

The organisation has four main goals:

- to lower the stress level of a patient;
- to provide psychological support;
- to help patients navigate the information explosion on cancer; and
- to provide peaceful, restful and striking environments with an important place for art and gardens.

There are currently five Maggie's Centres open in Scotland, with ten more projected for completion in the UK. As bespoke and distinctive healing environments, they represent an alternative approach to the traditional cost-driven design of healthcare buildings by deliberately foregrounding design as a key factor in promoting wellbeing.

A post-occupancy evaluation of the Dundee Maggie's Centre building (see figures 1 and 2) was commissioned as a pilot study by The Lighthouse Centre for Architecture and Design in October 2005 and completed in January 2007 by the Ecological Design

Group (EDG) at the University of Dundee's School of Architecture, in association with Bute Medical School, The University of St Andrews and the Maggie's Centres.

Post-occupancy evaluation (POE) provides a more detailed means of examining the performance of building typologies on a building-by-building basis. The highly successful PROBE programme, which carried out POE on a number of different buildings during the 1990s, only examined one healthcare building². To date there has been no systematic evaluation and cross-comparison of healthcare building typologies in the UK, although there have been a number of important individual studies elsewhere³. Seminal POE work by Professor Lawson and colleagues at Sheffield University has, however, proven the link between good design and improved bed-patient recovery times, demonstrating the importance of patients' being able to view nature, good

daylighting, ventilation and patients' ability to control their environmental conditions⁴.

Relatively little POE work has been published to date in the UK on small-scale healthcare buildings which correlates perceived states of wellbeing and health with perceptions of buildings in relation to design quality. This study attempts to identify key design factors that influence perceptions of wellbeing and health in these environments, which are playing an increasingly important role in UK government health policy⁵.

Aims and objectives

The aims of the study were to evaluate:

- visitor and staff responses as users of the building;
- physical performance of the building;
- design and construction process; and
- develop a cross-evaluative methodology for wider use in small-scale healthcare buildings in order to improve the briefing process.

The objectives were to establish:

- a) the effectiveness of the design concept in terms of the original brief and care model;
- b) overall user satisfaction with the building;
- c) the extent to which people perceive the building as contributing to their sense of comfort, wellbeing and health, and the reasons for this;
- d) a comparison of the ease, speed, and cost of construction with a standard domestic-scale palliative care building;
- e) an assessment of the building's physical performance and sustainability, including management and maintenance issues, and the level of energy costs compared to normative measures; and
- f) recommendations for the future Maggie's Centre briefing process and further development of the evaluation methodology for other small-scale healthcare buildings.

This paper focuses primarily on the first three objectives, which contribute to the discourse on health and design. It is recognised that the objectives are interdependent to some extent, and the methods identified for the study reflect this interdependency.

Method

An initial desk top review of existing literature on the evaluation of healthcare



Figure 2: Inside the Maggie's Centre which foregrounds design as a key factor in promoting wellbeing

and other buildings in the UK and elsewhere was undertaken. While existing tools used by the National Health Service (NHS) in the UK provide a valuable means of auditing the design quality of healthcare buildings⁶, the predefined statements approach does not allow for a more open-ended form of inquiry that might reveal hidden factors. The approach developed through the PROBE studies⁷ asks the user to offer up factors which work or do not work well, providing an appraisal of design quality as it is directly experienced by the user.

A 'mixed-mode' approach drawing on Zeisel's environment behaviour methodology⁸ was developed. This initially involved semi-structured interviews with full-time staff, part-time staff and volunteers, and a PROBE-style questionnaire⁹ for visitors. These were carried out in the building over a single day. The aim of the in-depth, semi-structured interviews was to supplement the questionnaire with a collection of more detailed insights from participants. Additionally, user and staff interactions with the building were observed and photographed during the day. Anything unusual that might influence the effectiveness of the design principles involved was noted.

Qualitative questions augmented the PROBE-style questionnaire which previously concentrated on comfort issues and work conditions. These additional questions were drawn from AEDET Evolution and ASPECT¹⁰, but were rephrased to allow for a more open-ended response. Two key questions on visitors' sense of their own health and

quality of life over the past week were drawn from the European Organisation for the Recognition and Treatment of Cancer (EORTC)¹¹ standardised questionnaire for oncology. The interviews with staff and the technical team were used to further establish if there were any significant work issues arising from the innovative design of the project over the two and a half years since its completion.

Copies of the original architectural brief and working drawings were obtained as reference points for user experiences and examined in terms of healthcare design quality. The drawings were also used as a basis for a sensory analysis undertaken on the day of the survey which involved the use of a multi-modal meter to measure temperature, humidity, lighting and noise levels both inside and outside of the building at five strategic points.

All findings from the interviews with the staff team were then compared to those from the visitor questionnaire to establish points of convergence and divergence. This was carried out in recognition of the intersubjectivity involved in the study and the need to understand and analyse all points of view. The resultant findings were then cross-evaluated against the observed environment behaviour, the brief/drawings/specifications and the physical data obtained on the day to determine if the issues raised were reinforced or contradicted. A 'walk-through' tour of the building was conducted with the client representative to help clarify contradictory findings and provide further



Figure 3 and 4: A significant number of visitors were concerned by a lack of environmental control over heating and ventilation, but that this was not critical

information on issues raised.

An important aspect of the method was that the research was co-ordinated by an experienced architect with knowledge of social science research methods. This enabled the research team to draw out subtle interrelationships between the technical and social aspects of the study. POE requires a high degree of skill because of the complexity of the issues involved and because they are often interrelated in a tacit manner. The skill is in identifying and articulating these hidden issues. The interdisciplinary dialogue between

the architect and medical psychologist was highly effective in this regard. The very strength of this method, however, is also potentially its greatest weakness because of the limited number of people with this skill and the degree of training required.

Results

Thirty-four visitors responded to the questionnaire on the day with two full-time members of the Maggie's Cancer Caring Trust, three session workers and one volunteer responding to the interviews.

This paper concentrates on the results which directly relate to the relationship between health and design quality and the main goals of the Maggie's Centre outlined earlier. The questionnaire prompted visitors to comment on the building's layout, use of space, their needs and the views both within and looking out of the building. These were rated in terms of effectiveness using a seven-point scale, with additional comments made where necessary.

The overall building design was given the highest rating by 70% of the visitors. The most positive impression of the building was of the views outside, which received the highest rating level of any aspect of the design (82%). The highest rating levels for the effectiveness of functional aspects such as understanding the layout of the building (52%) and use of space (41%) were curiously lower, although nearly 78% of visitors thought that the building met their needs well or very well.

A major aspect of post-occupancy evaluation is the degree of comfort and personal control which users experience in a building. This is particularly important in healthcare buildings where visitors are likely to be extra sensitive to environmental conditions due to their relatively poor state of health. The overall self-reported rating of global health (over the past week before the survey) was somewhat less than expected for cancer survivors according to the EORTC norm, with 64% scoring between 5 and 7 on the 1-7 scale rating. Likewise the quality of life over the same period was



Thirty-four visitors responded to the questionnaire on the relationship between health and design quality



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Figure 5: Visitors tended to gather near to the kitchen which was the heart of the building

only 57%. All measures of overall comfort satisfaction (temperature, comfort, noise and lighting levels) were correlated with the rating of health.

Although nearly 90% of visitors felt that the building was comfortable overall, nearly half of this group complained about a degree of overheating, excessive natural light and excessive dryness of the air. At the same time, nearly half felt they had no personal control over the heating or noise conditions, with around a third feeling they had no control over cooling, ventilation and lighting (see figures 3 and 4).

Significant correlations were found between the self-reports of 'wellbeing' in the visitors and their perception of control of the 'cooling' and 'ventilation' ($p < 0.05$). Weaker effects were also found for 'heating' and 'lighting' ($p < 0.1$). Interestingly, despite the various comfort issues raised and the apparent correlation of wellbeing with control, the overwhelming majority of users consciously stated that a personal degree of control was actually not important to them. The results for the visitors' survey were almost exactly replicated in the interviews with the staff. These are paradoxical findings which require careful analysis.

Visitor and staff comments and ratings of comfort conditions were corroborated by the physical readings taken on the day.

Indoor temperature readings on the day of the questionnaire were relatively high and reached a peak of 24.4°C by midday indoors on a cold March day, even though the main heating control was set to 22°C. Humidity readings were relatively low inside the building, averaging around 30%, compared to an outside humidity level of 50%. This would account for a significant percentage of visitors experiencing the air as being dry. With it being a sunny day outside, the contrasting low levels of internal light exacerbated the glare from the south-facing windows. Noise levels, on the other hand, were at a normal conversational level in most parts of the building, apart from the upper-level space.

Observation of people using the building over the course of the day also corroborated many of the findings. A very subtle level of interaction was observed between the staff, visitors and the layout of the building, as staff were highly attuned to the arrival of visitors given the open-plan layout of the building, and visitors were quickly welcomed. Visitors tended to gather in the kitchen area, which also offered the best views out of the building (see figure 5). Staff and users attempted to modify the indoor temperature by opening windows and letting out heat rather than attempting to control the heating itself.

Discussion

The study did not aim to prove a direct connection between design and health benefits, but whether or not visitors themselves perceived such a link and if this related to their perceived quality of life and health status at the time of the questionnaire.

The quality of life for visitors was found to significantly and positively relate to the length of visit ($r_s = 0.45$, $p < 0.05$). Although the effect is quite weak, it does suggest that the experience of visiting the building has a dose-response effect. Given the size of study, this needs replication to provide further evidence. The two additional questions on health and wellbeing were 'state' measures asking the visitor to offer their opinion on how they felt about the way the building was influencing either their health or wellbeing at the time of answering the questionnaire. However the interpretation of these associations is not altogether straightforward. It would appear that positive perceptions of the building features are linked with higher ratings of health and wellbeing. It is possible however that the pattern of causality may be the reverse. That is, those visitors who rated their health or wellbeing positively may feel able to rate the building enthusiastically. Specific points worth noting are:

a. Visitors' needs being met within the



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- building were associated with their perceptions of the building influencing their health in a positive manner.
- b. A significant relationship was found between the building setting the person at ease and a perception of a stronger self-reported rating of health.

The consistent positive relationships found across the various comfort features, their control and ratings of wellbeing suggest that if control was considered to be available this had a positive effect on wellbeing. This reinforces the view that making an environment easy to 'read' by offering systems to allow the changing of comfort parameters will enhance wellbeing and possibly self-reported health. This interpretation is speculative but it would be a fascinating area to confirm in a further investigation and could develop our understanding of this person-environment interaction.

The top ratings for comfort were generally lower than those for the building design overall, again suggesting that there may be a kinaesthetic compensatory factor at work with visitors also 'trading off' their appreciation of the views, image and overall quality of design against comfort factors. Although much work has been done on thermal comfort in buildings¹², little work has examined the interaction between different sensory perceptions of comfort. This interactive appreciation of a building can be compared to holistic approaches, such as that adopted by the Maggie's Centres, which recognise the essential interplay of non-medical factors in patient care such as relationships with staff and other users. Such physical 'nursing qualities' in buildings can be identified as views in and out of a building, the overall image afforded by a building and the ability for a building to afford a friendly dynamic between staff and visitors.

This 'trading off' has also been recognised as the ability for people to 'forgive' a building its faults, in terms of the physical comfort levels afforded, because of other design quality factors which are not always easy to identify. This is particularly evident in the Dundee Maggie's Centre, where individual concerns with different specific aspects of comfort such as heat, light, and noise are 'forgiven' in the high overall levels of comfort that visitors reported¹³.

Conclusion

The results of the study indicate that the building has successfully achieved the following objectives of the design brief:

- a highly effective design concept relative to the Maggie's Centre's care model;
- very high user satisfaction overall;
- a high level of overall comfort;
- user perception of increased health and wellbeing due to visiting the building;
- particular appreciation of the views out of the building.

Comfort issues which emerged from the survey included:

- a degree of overheating due to solar gain, lack of cross-ventilation and poor heating system control; and
- a degree of glare due to low-angle solar penetration in the kitchen area.

Given the results and discussion there are several issues that should be considered in relation to the future briefing and design of Maggie's Centres and other similar typologies. It is clear from the study that there is a positive correlation between many design aspects of the building and visitors' sense of health and wellbeing at the time. The findings relating health and wellbeing to visitors' sense of control over ventilation and cooling are important and suggest that attention needs to be paid to the design

and specification of heating, ventilating and cooling controls, if a visitor's sense of health and wellbeing is to be further improved.

What is striking, however, is that while visitors consciously stated that a degree of control in these areas was not important, the degree of control *perceived* to be available did affect their sense of wellbeing. In other words, they may like to feel 'in control' of ventilation and cooling ("I can always open a window if I want to"), but without necessarily having to resort to controlling these themselves – this is an example of the 'placebo' effect at work in buildings and translates a common idea in nursing into design practice. The ability for visitors to perceive themselves as being able to control their environment ties in closely with the Maggie's Centres ethos of empowering people to adapt to their surroundings and take control rather than being controlled as passive recipients in a care system.

The apparent 'kinaesthetic compensation' at work in the building, which gives it a high 'forgiveness' factor is also a valuable design lesson and reaffirms the Maggie's Centre approach to providing an exceptionally high quality of design in their buildings, generating peaceful and striking environments.

The POE methodology used here is an effective means of triangulating different methods and cross-evaluating both qualitative and quantitative factors in the design of healthcare buildings.

The study is only a small one, but points to a direction for further research which can expand the field of POE to embrace aesthetic design qualities as well as physical performance factors.

Principal Author

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Landscape Design: Patient-specific Healing Gardens

In the last two decades, gardens with therapeutic qualities have begun to appear in US and UK healthcare facilities. Now 'healing gardens' are being designed to support the treatment of patients with specific conditions

Clare Cooper Marcus, Professor Emeritus, Departments of Architecture and Landscape Architecture, University of California, Berkeley

The idea that nature has a soothing, restorative effect is nothing new. From medieval monastic infirmary gardens to the landscaped grounds of nineteenth-century mental asylums, enlightened carers have recognised that access to the outdoors has a salutary effect on a person's mental and physical health. With the onset of modern medicine and its emphasis on treatment via surgery and drugs, this knowledge was lost or deemed 'unscientific'. High-rise construction techniques created medical settings where patients were divorced from the outdoors.

From the early 1990s a change began to happen in healthcare design – termed patient-centred care, there were marked changes in the interior design of hospitals. Then, in the late 1990s, three books appeared documenting the therapeutic value of outdoor spaces in healthcare^{1,2,3}. The era of the healing garden had arrived.

Characterising the key qualities of a successful healing garden?

The basics of healing garden design relate to the issue of stress, as the relief of stress helps to bolster the immune system and stimulate the body's natural healing proclivity. There is credible scientific evidence that four elements that can be supported by design help reduce stress: the distraction provided by green nature; exercise; social support; and a sense of control⁴.

The more we are engaged with the environment through all our senses, the lower are our rates of anxiety and the less we are aware of pain. Thus, a healing garden needs to provide a multi-sensory experience with colourful flowers, varying shades and textures of green, the sights and sounds of water, elements that attract birds and butterflies, fragrances, and ornamental



The Sophia Louise Durbridge-Wege Living Garden at the Family Life Centre in Grand Rapids, Michigan, US is an exemplary facility serving the needs of patients with Alzheimer's and other forms of Dementia

grasses which move with the slightest breeze. This outdoor space needs to be a garden, not a paved courtyard – a lush green setting with an optimal ratio of green to hard surfaces of 7:3.

Exercise has many beneficial effects on both physical and mental health. Thus, depending on the size of the garden, there needs to be a variety of longer and shorter pathway loops for strolling and exercise. These must be surfaced to reduce glare, for example with tinted concrete, and there needs to be attention to details such as edging to prevent those using wheelchairs rolling into planting beds, and expansion joints in paving of no more than one-eighth of an inch in width to prevent the wheels of IV poles getting caught and stuck.

There is also evidence that the more social support a patient receives from family and friends, the better they are able to heal. A garden is one place where a patient and visitor can converse in private in an attractive setting. It is essential that sensitive

planting design and site furnishings provide semi-private niches for one or two people or for a family group to be alone. A hospital garden, if sensitively designed, can be a place for a family to visit with an in-patient, perhaps with children and even the family dog in tow; where a person can digest the news of a troubling prognosis; where a family can wait for someone in surgery or an outpatient wait for a prescription to be filled; or where staff members can relax together on their lunch break.

Gaining control

When we enter hospital as an in-patient it is the institution that decides what we wear, when the doctor visits, with whom we share a room and perhaps even what we can eat. In short, we lose control over many issues that were ours to decide at home. The more a patient is able to exert a sense of control, the less they will be stressed. To enhance a sense of control within the garden there should be a choice of different pathways;



The Rehabilitation Garden at the Shepherd Centre in Atlanta, Georgia USA (left) and the garden at Mount Zion Cancer Clinic in San Francisco, USA

a variety of semi-private niches to sit in; some fixed and some moveable outdoor furniture; a variety of views to enjoy when seated – some distant, some near at hand. The material used for seating should not retain heat or cold: wood or hard plastic are preferable, while concrete, aluminium and steel should be avoided.

While these form the basics of a healing

garden, there are a few more requirements that are really just common sense. The garden needs to be sheltered; provide an ambience of comfort and familiarity; include plant materials appropriate to local climate and culture; have a budget for ongoing maintenance; and avoid the inclusion of ambiguous art pieces onto which sick people can project their feelings of fear and

anxiety. The garden needs to be visible from a well-used interior area (waiting room, foyer, cafeteria etc) or, if not, there needs to be adequate signage in the building to alert people to its presence. The garden needs to be accessible, not only with an automatic door and low entry lip to facilitate access by those using a wheelchair but it also needs to be unlocked. This may seem obvious but it is sad to report that many otherwise attractive hospital gardens are kept locked at all times to prevent use. This has specifically been observed at Private Finance Initiative (PFI) hospitals in the UK. One assumes this is so because the owners do not wish to pay for upkeep. This is particularly ironic when increasing evidence points to the stress-reducing qualities of hospital outdoor space, and that this is happening in a country that has a long cultural history based around a love of gardens.

None of the above is rocket science but a healing garden needs to be a sensitive combination of restorative elements and must be designed by a landscape architect, the only professional trained to design with plant materials. (Some of the worst healing gardens I have seen were designed by artists, architects or interior designers.)

Patient-specific gardens

In the early years of this century, specialised forms of healing gardens began to appear: gardens designed for the special needs of



Garden of the Oregon Burn Center in Portland, Oregon



The Graham Garden at Saanich Peninsula Hospital in Victoria BC, Canada (left) and the children's play garden at Rusk Institute of Rehabilitative Medicine in New York, USA

specific patient groups. Among these are gardens at children's hospitals, cancer clinics, rehabilitation hospitals, facilities for burn patients, for the frail elderly and for those with Alzheimer's disease and other forms of dementia. Gardens at children's hospitals, for example, need to provide for the sometimes conflicting needs of sick children, well siblings and grieving parents. The park-like gardens at Boston and Atlanta Children's Hospitals, for example, provide well for parents but do little to distract children. A new play-garden at Seattle Children's Hospital provides plenty of interest for children but is not a place of solace for worried parents. Legacy Emanuel Hospital Children's Garden in Portland, Oregon is one of the few that does well on all counts⁵.

In the patient-specific gardens described in more detail below, the nurses, doctors, physiotherapists, psychotherapists, speech pathologists, horticultural therapists, and occupational therapists who were to guide their patients in the therapeutic use of the garden worked closely together in creating a programme which was then implemented by a professional landscape architect.

The **Healing Garden at the Good Samaritan Hospital** in Portland, Oregon's Good Samaritan Hospital was created by landscape architect Ron Mah, David Evans and Associates working collaboratively with a team of hospital staff who now use the garden in their therapeutic work with

patients recovering from strokes and brain injuries. These include physiotherapists, speech pathologists, horticultural therapists and spiritual counsellors. The garden includes elements such as different walking surfaces for those learning to walk again after a stroke with the aid of a walker or cane; differing planter edge heights so that patients learning fine motor control can sit or lean while doing simple gardening tasks; and plant labels that speech pathologists use in their work with patients regarding speech after a stroke⁶. Similar outdoor facilities at other hospitals include slopes, steps, bridges, a range of walking surfaces and parallel bars to aid in physiotherapy. The one oversight at the Portland garden was that the team did not realise that many of their patients lived in rural Oregon and would need to learn to walk again on surfaces such as gravel or dirt, rather than the concrete of urban sidewalks.

The Play Garden at the Rusk Institute for Rehabilitative Medicine in New York City represents a similar kind of therapeutic outdoor environment, but here it is for children with brain injuries or mobility problems. While children can be led (reluctantly) through therapeutic exercises in an indoor gym, creating a play garden where they naturally engage in similar exercises has proved highly successful. A team approach to the design ensured that the landscape architects – Johansson

and Walcavage – incorporated elements recommended by the hospital staff and that these elements would be so attractive to children that they would exercise certain skills without realising they were doing so. For example, climbing up a low grassy hill in order to slide down a slide set into the hill or climbing several steps to get into a sandbox – in both cases exercising arm and leg muscles. Turning a frog-shaped knob to start a stream flowing or undoing various bolts and latches in the door of a playhouse encourage fine motor control. In a relatively small urban site a remarkable variety of activities are encouraged while children play in the sunshine and enjoy a relaxed milieu, in contrast to the hospital interior.

Therapeutic spaces

For people with mental or psychological, rather than physical, problems, a series of remarkable therapeutic outdoor spaces are beginning to appear. Unique in this category are two gardens in Sweden for those suffering from depression or what is termed in that country as 'burn-out syndrome'. **The Alnarp Rehabilitation Garden** encompasses a two-hectare site on the campus of the Swedish University of Agricultural Sciences at Alnarp in southwest Sweden. Staff in the department of landscape architecture – namely, Patrik Grahn and Ulrika Stigsdotter – along with a horticultural therapist, physiotherapist, occupational and psychotherapists have

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developed a therapeutic landscape divided into a number of garden rooms.

Participants (they are not referred to as patients) who can no longer work because of depression or burn-out are recommended to the garden programme by their doctors, insurance companies or employers. They start by coming to the garden one morning a week, increasing to four mornings over a three-month period. While at the facility, patients can – if they wish – do nothing but relax in the quiet, hedge-enclosed Welcoming Garden; or they can do light gardening tasks in the greenhouse, vegetable garden or orchard; take a walk along a forest path; or relax in a large meadow. Art therapy, relaxation exercises, snacks, etc are available in a traditional house within the garden; weekly psychotherapy sessions take place in a geodesic greenhouse.

A research project is under way, comparing patient outcomes at the Alnarp garden with a control group of comparable patients who are receiving the normal treatment – resting at home, using an antidepressant such as Prozac, and having a few psychotherapy sessions. Preliminary results indicate very positive results from the non-drug, garden treatment approach.

A similar approach is being applied at Haga Hälsosträdgård (Haga Health Garden) where a green therapeutic environment has been created inside a large commercial

greenhouse in a Stockholm park. The greenhouse has been skillfully redesigned by Ulf Nordfjell and Yvonne Westerberg into five rooms so that a patient can choose to lie in a hammock among olive trees, relax on a chaise-longue under a palm tree, join a group for coffee and conversation at a candle-lit table, engage in gardening tasks, or create art pieces using plant materials. As at Alnarp, patients attend programmes for varying lengths of time and, in addition, courses on the therapeutic value of green nature are offered for human relations staff and employers to encourage them to provide green spaces at work where employees can relax at lunch or in break periods. Thus, Haga Health Garden is taking a proactive approach aimed at educating corporate, institutional and governmental employers on the value of green nature in preventative healthcare⁷.

The increasing incidence of Alzheimer's disease and other forms of dementia is a phenomenon facing the healthcare institutions of many Western nations. For example, in the US it is estimated that 10% of those over 65 are affected by this disease, while the percentage is nearly five times that (47%) for those over 85. The US Alzheimer's Association estimates that 12 to 14 million will be affected by the year 2040.

Facilities serving those with Alzheimer's disease are recognising that a garden can

serve a number of beneficial purposes. Firstly, it can provide a place for exercise, especially important for the general health of older adults. It can provide a setting where people can be in sunlight, especially important for the creation of Vitamin D, the promotion of healthy bones and the establishment of regular circadian rhythms and sleep patterns. A garden can also provide a relaxing locale for staff-led programmes in gardening, crafts, memory recall, etc. In addition, an attractive garden is a pleasant setting for family visits and may encourage such visits.

The **Sophia Louise Durbridge-Wege Living Garden of the Family Life Center** in Grand Rapids, Michigan (Landscape Architect: Martha Tyson) is an exemplary facility serving the needs of patients with Alzheimer's and other forms of dementia who live with their families but spend each weekday at this day centre⁸. One entry door to the garden and a simple looped pathway encourage walking while avoiding the confusion or aggression that can occur when patients have to make a decision to turn left or right, or remember which of several doors to return to. A large gazebo, wired for sound (music is especially soothing) and for fans on hot summer days, is a popular setting for staff-led programmes. A waterfall feature provides the soothing sight and sound of water without the possibility of people getting *into* it (a problem with some Alzheimer's patients). A wide variety



The Haga Health Garden in Sweden advocates the value of green nature in preventative healthcare



of perennial flowers popular during the youth of many of the patients provide opportunities for experiences of memory-recall led by the staff. A small garden and orchard area is the setting for horticultural therapy activities.

A recent study at another Alzheimer's facility with a garden revealed that those who spent as little as five to ten minutes of unprogrammed activity in the garden each day in the summer months showed significant improvements on a number of parameters, including aggressive behaviour; physician-ordered medication, pulse rate, blood pressure and weight gain⁹. This suggests that this kind of patient-specific garden is not only therapeutic in a general sense but also that it has measurable patient benefits that reduce the costs of drug use and staff time.

In Portland, Oregon a unique garden opened in May 2004 for the benefit of burn patients. The Oregon Burn Center Garden was designed by a team including staff treating burn patients, a horticultural therapist and landscape architect Brain Bainnson from Quatrefoil. The resulting 9,000 square foot garden serves patients in a number of ways¹⁰. Firstly, it provides walking paths and differing slopes for those learning to walk again (and for those rebuilding strength and endurance). It also has a number of shade structures that provide outdoor seating for



The Garden of the Oregon Burn Center was designed with staff who use the space for therapeutic work

patients alone or those visiting with family, as those recovering from serious burns have to stay out of the sun. The great variety of plant materials in the garden allow for sensory stimulation (fragrance, touch, vision, hearing). And because the garden is secure and private it provides a protected space for

burn patients to begin taking steps toward community reintegration.

Two patient groups not appearing in the above discussion are those suffering from cancer and HIV/AIDS. What little information exists on the environmental needs of such patients suggests that a garden based on



The Rusk Institute's garden helps children with brain injuries or mobility problems (left), whilst the garden of the Oregon Burn Centre offers plenty of sensory stimulation



Castle Hill Hospital, Hull Oncology & Haematology



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The New Regional Cancer Centre for Humberside and North Lincolnshire providing cancer and haematology services on one site at Castle Hill Hospital.

The site is located in a rural setting on the edge of the main hospital site, set into the Northerly hillside maximising views out to the countryside from all patient areas, the hospital provides state of the art care in an holistic patient focused healing environment. The project is testimony to the close working relationship established between HLM and the Hull & East York Hospital NHS Trust.

For more information please contact:
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the general properties of a healing garden would serve their needs, with an emphasis on adequate shade since both populations are treated with drugs that require they stay out of the sun. In addition, plants with strong fragrances should be avoided in gardens for cancer patients since they can induce nausea for those taking chemotherapy drugs¹¹.

Conclusions

Patient-specific gardens encompass a general understanding of the restorative benefits of nature¹², together with the recognition of the needs of a particular patient population. In each of the cases described above, the garden has become a potent treatment milieu, complementing the provisions located indoors. In this respect, such gardens represent a third stage in the recognition

and acceptance of nature-based therapy in healthcare. The first stage is encompassed by examples of eighteenth- and nineteenth-century hospitals where views and access to nature were intuitively considered therapeutic, but with no understanding of why. The second stage was prompted by the emergence of credible scientific evidence that views to, or even brief visits in, a green, garden setting can have measurable physiological effects such as on blood pressure and the immune system¹³. This, together with a move to more patient-centred care in hospital design, starting in the 1990s, prompted the provision of usable outdoor spaces, sometimes termed healing gardens.

We are now in what might be termed a third stage, in which the needs of very

specific patient populations are being considered in the design of healthcare outdoor space. In future work, healthcare professionals, designers and researchers need to collaborate in discerning the therapeutic benefits of gardens specifically designed for those patient populations whose needs have not yet been widely discussed or explored, including children with autism, cystic fibrosis or cerebral palsy; patients with schizophrenia or Parkinson's disease; and patients recovering from heart surgery.

There are three points to add to this brief discussion. The first point is that healing gardens are on the verge of becoming a 'fad'. Articles on hospitals featured in glossy design magazines often tout the fact that they have a 'healing garden', but when photos of such gardens are examined (or the actual garden is visited), it is sometimes anything but healing in terms of the criteria mentioned above. Perhaps we will soon need to create a certification process, not unlike the Leadership in Energy and Environmental Design (LEED) Green Building Rating System, to ensure that healing gardens meet certain basic criteria.

A second point that cannot be emphasized enough is that a healing garden must be designed by a landscape architect, and preferably one who holds a certificate in Healthcare Garden Design similar to the one offered through an intensive course at the School of the Chicago Botanic Garden (www.chicagobotanic.org/school/certificate). Such a design professional also needs to be well-versed in participatory design. All of the successful patient-specific gardens have come about as the result of a carefully orchestrated participatory process involving the designer, clinical staff, current or former patients and family members. Only through such a process can a garden successfully meet the needs of the patients it is intended to serve.



The garden at Tabor Hills Healthcare Facility, Bohemian Home for the Aged in Naperville, Illinois, USA

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I'm Still Here. A breakthrough approach to understanding someone living with Alzheimer's

John Zeisel PhD
Penguin Group (USA), New York
Price: \$24.95

Alzheimer's. Now there's a diagnosis which gets your attention, whether it's personal or for a loved one. It's usually thought of as a sentence to a decade or more of forgetting. I cannot imagine a more devastating diagnosis, one which will affect millions worldwide this year.

John Zeisel's new book *I'm Still Here*, based on his groundbreaking work at Hearthstone Alzheimer Care, offers hope. No, more than that, it presents a completely different way of perceiving, understanding, coping and caring. It teaches the possibilities of a positive relationship between the afflicted and the caregiver based on memories, learning, stories and visits.

Dr Zeisel has, over the last 15 years, developed and tested non pharmacological approaches to living with the diagnosis that incorporate art, music, environment, love, caring, and touch to stimulate the memories which remain and which do not diminish with time.

The book makes a strong case for a "glass half full" or more approach, for an attitude based on the present, living in the "now" and the recognition that the afflicted partner is still a human being with substantial remaining capabilities. We just need to understand how to find, acknowledge and support their expression.

Three environments are proposed – social, physical and pharmacological – to address what Dr Zeisel calls the four A's – agitation, anxiety, aggression and apathy. The book is critical of the usual treatment of these conditions and is replete with specific suggestions of how to build a new relationship, and how to communicate, which, if followed, allows the caregiving partners to reach the inner self of both the patient and caregiver.

There is a wonderful chapter which describes new relationships that encourage the seeking of the potential of change. Many of these suggestions would improve our normal day to day communication and living, even without Alzheimer's.

Pioneering work

My own design work at Laguna Honda Hospital (LHH) in San Francisco benefitted greatly from Dr Zeisel's pioneering work at Hearthstone. I know from our work at The Center for Health Design (CHD) that the built environment is a legitimate therapeutic modality.

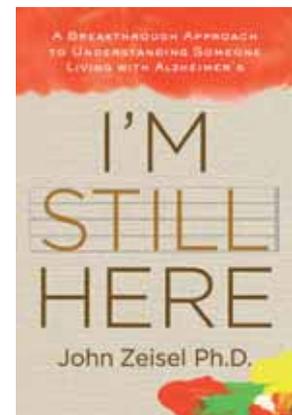
There is a growing body of work which supports the use of evidence-based design for healthcare settings. Design can encourage independence and wellbeing for people with dementia at home or in an institution. The book presents eight major characteristics which support people living with Alzheimer's: exit control; walking paths; privacy; shared spaces; gardens; homelike quality; sensory understanding; and support for independence and empowerment.

All of these were incorporated in the design at LHH and will be the subject of a pre and post research study in the CHD's Pebble Project (visit www.healthdesign.org).

I learned so much from this reading. I learned many things I did not know about the disease. I learned about its symptoms, its progression and its treatment. I learned that although it may not yet be curable, it most certainly is treatable. I finished the book feeling that I could be a much better caregiver if I am ever placed in that position. I felt I had a place to go for advice that is based on caring for the whole person, the person in the "now", as well as a chance for enhanced communication and self-fulfillment.

I hope that should I ever live with this diagnosis, with a mere reduction of 10 out of my 90 billion brain cells, that my caregivers read Dr Zeisel's book. In fact, I am going to change my Durable Power of Attorney to require them to do just that and to keep it handy. If only it had an index!

Derek Parker, FAIA, RIBA, FACHA is a director of Anshen + Allen Architects



An estimated \$200 billion is planned to be spent on new hospital construction in the US in the next decade. The global economic crash, however, has the potential to derail this plan and create barriers to the design of better quality healthcare environments, leading to years of postponement or cancellation of new hospital design and construction.

Widespread bank failures worldwide are threatening to impair the lending capacity of the financial system to healthcare systems for years to come. As US Federal Chairman, Ben Bernanke said recently: "As in all past crises, at the root of the problem is a loss of confidence by investors and the public in the strength of key financial institutions and markets..."

Banks, like healthcare systems are vulnerable to loss of confidence. In fact, healthcare continues to become less trustworthy, costlier, quality is spotty, and the gap between the service we believe possible and the current system is widening. There are several trends that are promising, but they define an opportunity, rather than a policy:

The Great Shell Game

The hospital industry is in the throes of the largest building boom in its history. The funding, however, of global health capital investment is in great peril, writes *Dr Paul Barach*

Escalating costs – Controlling medical costs has become the 'Great Shell Game'. A global recession and reduced funds for hospital construction and service improvement will threaten the efforts to make healthcare safer. In the US, Congress put a cap on Medicare payments for 467 medical procedures, and hospitals just pass the costs off to the states. States put their own caps on Medicaid hospital payments, and hospitals just move the pea to private insurers and Blue Cross and Blue Shield.

Congress caps payments to physicians in hospitals, and doctors move the pea outside the hospital to their offices or clinics where there are no caps. The new caps on hospital costs paid by Medicare and many states allow politicians to boast about cutting deficits. But they do little to reduce costs. In 2009, these costs will continue their inflationary assault on the US economy at double or triple the rate of increase in the Consumer Price Index. And Americans will spend more than \$1 billion a day for healthcare. In Europe, where essentially all care is state subsidised, and 90% of hospital reimbursement is fixed irrespective of patient outcomes, quality improvement is stalled as unions battle to maintain jobs amid cost cutting and reduced working hours.

Role of governance in managing costs – Business alone cannot control healthcare costs but will require transparent cost accounting and better fiscal governance and smart regulatory oversight. We need national policies to restructure financial incentives in the healthcare industry: where possible, to instill some marketplace discipline; and where not, some controls. Costs disappearing from the Federal healthcare budget have a remarkable ability to reappear elsewhere in these noncompetitive systems. The net result is a hidden tax on business and citizens. The Government has simply hidden the pea under another shell.

Health information technology – Developing an effective national HIT plan is a huge undertaking that requires broad, non-ideological thinking. The danger we face now is throwing good money after bad. We don't need merely a readjustment of how health IT dollars are spent. We need to reboot the entire debate about how health IT relates to health, healthcare, and healthcare reform. We don't just need more HIT; we need more evidence to support an array of functions that can deliver better care at lower cost with less waste.

Empowering providers – Engaging doctors and healthcare providers remains the real challenge to reform, requiring a payment policy that they can buy into, and at the same time creating a sustainable cost platform. Making healthcare safer, such as encouraging providers to wash their hands beyond the 30% most research studies show, will require cultural change, and an alignment of incentives to modify their behaviour.

Evidence-based design – Analysis of more than 1200 research studies shows a direct link between quality of care, patient health, and the way a hospital is designed. The new foundation for understanding human errors considers that mistakes are made because the systems, tasks, and processes used by healthcare providers are poorly designed. A reduction in medical errors can be accomplished through better design of the physical environment where numerous microsystems interact every day.

Role of the patient – Patients have emerged as a powerful ally and advocate for change towards greater quality and safety. Patients want care that is coordinated, not fragmented, across the continuum of settings. And they want care that is personal, affordable and convenient.

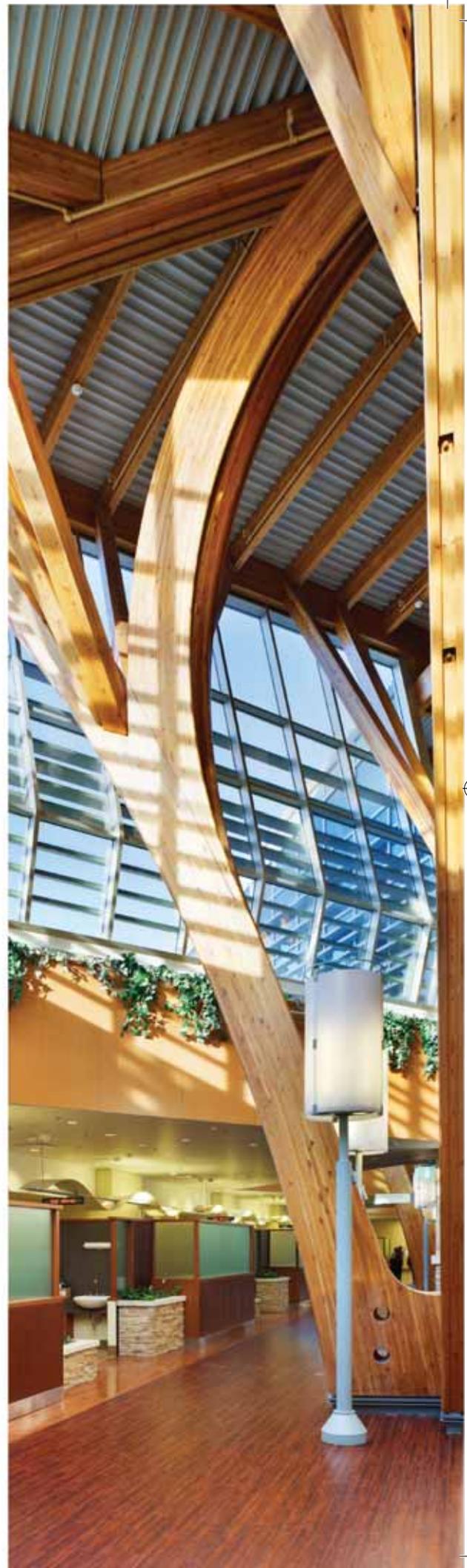


Paul Barach is professor of Safety Science and Anesthesiology, a director of the New South Wales Injury Risk Management Centre, and head of the School of Risk and Safety Sciences, University of New South Wales, Sydney, Australia

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