Facilitating High Performance Hospital Design

Agenda

• Introduction & definitions
• Drivers of change & impacts on performance
• Evidence based research
• Examples of design innovation & evaluation
• Stakeholder roles & benefits
• Conclusions
Introduction

- Significant ($8Bn+) capital investment in new Hospitals planned & committed by state Govts
- Community expectation of hospital facilities – demonstrate value for money and provide world class health services
- Current policies and procurement practices focus of initial capital (and FM) investment value
- Opportunity to shift focus to long term operational – life cycle outcomes and broader definitions of value
Introduction

Hospital Financial Analysis
(20 year - NPV)

- Staff & Supplies, 84.20%
- Building & Equipment, 10.50%
- Repairs, Maintenance & Replacement, 5.30%
Definitions

• High performance hospital building (HPHB) –

• a building which is planned, designed and developed to meet its functional requirements and perform optimally in financial, social and environmental terms.
Definitions

- Evidence based design (EBD) –
  - a contemporary approach to planning and design which uses empirical research data and analysis to promote HPHD by focussing on design innovations and the resulting stakeholder benefits.
Drivers of change

- Environmental awareness
- Community awareness of “people” issues – individual rights & corp. responsibilities
- Shortage of skilled staff – particularly Health Professionals
- International competition
- Changes in govt procurement of infrastructure
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Holistic Focus

- Environmental Impact
- Social Impact
- Financial Impact
High Performance Hospital Buildings

- Environmental Impact
- Financial Impact
- Social Impact

Optimum Value (Benefit/Cost)

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High Performance Hospital Buildings

• “Well being pays dividends – for both people and profits … investment in better buildings pays off directly and indirectly through enhanced patient care and employee well being”

• **CEO – Fable Hospital - CFHD**
High Performance Hospital Buildings

• “However investors and clients will need to understand the specific quality differences of design alternatives – component by component – if they are to move beyond least-first-cost decision making”

• Loftness, Hartkopf, Gurtekin – CBP&D
Generic Impacts on Hospital Performance

- Management Policies
- Workplace behaviour
- Government Legislation
- Design (Workplace and Wellness environment)
## Comparison of 5% improvement

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
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<tr>
<td>Capital cost (BM)</td>
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<tr>
<td>FM cost</td>
<td>2.50</td>
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<tr>
<td>Staff retention &amp; productivity</td>
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<tr>
<td>Patient wellbeing</td>
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Evidence based design & International research

- Centre for Health Design (USA)
- Centre for Building Performance (USA)
- Focus on linking management outcomes to design innovation & impacts
- Creation of Fable Hospital and Pebble project
- Development of evidence in support of investment in better buildings
Research Findings – Management prime objectives

- Reduction in staff turnover
- Improvement in staff productivity
- Reduction in patient LOS
- Reduction in nosocomial infections
- Reduction in patient transfers
- Reduction in patient falls
- Reduction in drug costs
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Links between Design innovation & Objectives

**DESIGN INNOVATIONS**
- Optimized inter-department lay-outs
- Extra measures to reduce noise
- Provision of acuity-adaptable rooms
- Provision of public art displays
- Provision of health information centre
- Provision of increased hand-hygiene facilities
- Provision of larger one-bed rooms for patients

**PRIME OBJECTIVES**
- Improvement in staff utilization
- Reduction in nursing turnover
- Reduction in patient transfers
- Reduction in hospital stay
- Reduction in drug costs
- Reduction in nosocomial infections
- Reduction in patient falls

**DESIGN INNOVATIONS**
- Provision of extra staff facilities
- Provision of decentralized nursing sub-station
- Provision of additional family space
- Provision of views and natural light
- Provision of meditation rooms
- Provision of additional HEPA filters
- Provision of larger ensuites for patients

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Example of Design Innovation
Objective – Reduction in Nursing turnover

- Provision of Extra Facilities for Staff
- Provision of De-Centralized Nurse Stations
- Optimized Inter-Department Layouts
- Extra Measures to Reduce Noise
- Improved Views and Natural Light
Example of Design Innovation
Objective – Red’n in Nursing turnover

Quantifying the impacts (benefits)

- Provision of extra facilities for staff
- Provision of decentralized nurse stations
- Optimized inter-department lay-outs
- Extra measures to reduce noise
- Improved views and natural light

"Impact" = Overall Improvement Factor \times \text{Total cost per year of recruiting nurses} = \text{Cost benefit from savings in nursing recruitment}
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Example - Royal Melbourne Hospital Main Ward Block
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Example - Royal Melbourne Hospital Main Ward Block

• Client had preconceived “vision” of redevelopment solution
• Involved sequential refurb of six levels of existing wards
• Produced efficient building solution ..but
  – Significant service disruption during building
  – Suboptimal relationships with Clinical depts
  – Suboptimal staffing profiles
  – Suboptimal impact on patient transfers
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Example - Royal Melbourne Hospital Main Ward Block

- Alternative solution developed to shift ward block closer to Clinical services hub
- Involved part new part extg building
- Produced efficient building solution...and
  - Min service disruption during building
  - Optimal relationships with Clinical depts
  - Improved product. and reduced travel dist.
  - Reduced patient transfers and lift depend.
- Produced net benefit of $1.5m pa for additional $6m investment
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Staff movement patterns & costs

- Balance of departments
- All departments-Staff cafateria
- Emerency-Radiology
- Medical Records
- Medical/Surgical Ward-Orthopaedic
- Medical/Surgical Ward-Paediatric Ward
- Medical/Surgical Ward-Rehab Ward
- Allied Health-Admissions
- Medical/Surgical Ward-Radiology
- Pathology-Admissions
- Pathology-Emergency
- ICU/HDU-Emergency
- Day Unit-Op. Theatres
- Paediatric Ward-Emergency
- Medical/Surgical Ward-Emergency
- Orthopaedic-Medical/Surgical Ward
Ward staff vs unit size (ann. cost per bed)
Comparative assessment of costs/benefits

Life Cycle comparison of Development Options

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Stakeholder roles

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Manager’s role

• To set improvement targets in key areas of hospital facilities and operational performance including staff and patient wellbeing, to implement change
Designer’s role

• To explore international trends in hospital facility design, to collaborate with Hospital Manager and Facilitator to help create an environment which optimizes financial outcomes and promotes staff and patient wellbeing
Developer’s role

- Govt - To encourage HPHD innovation via holistic project planning and evaluation policies and guidelines. To allocate due weight to such innovation in investment.

- Private (PPP) – To promote design innovations which support HPHD beyond narrow Capital and FM efficiencies
Facilitator’s role

• To be a catalyst for communication between Hospital manager and Designer in relation to strategies which promote HPHD, to undertake evaluation of costs and benefits and assemble evidence in support of key planning, design and development decisions
Stakeholder roles

- **Hospital Manager**
  - Implementor
  - Set targets

- **Hospital Designer**
  - Innovator

- **HPHB Facilitator**
  - Catalyst
  - Analyst

- **Hospital Developer**
  - Policy Objectives
Stakeholder benefits of EBD

- Enables direct comparison with Exemplar Hospitals, Public sector comparator, Base case
- Demonstrates Value-for-Money: Socio-Economic Outcome
- Demonstrates Value-for-Money: Return on Investment
- Provides Evidence of a transparent selection process
- Proof that a new project is “state-of-the-art” and better than the project it replaces
Conclusions

• Future HDD process will focus on holistic building performance over its useful life
• Need more local Research and development (Evidence) of potential design innovations & benefits – possible ACHSE role?
• Managers and Designers can make better informed planning and investment decisions
• Hospital environments will promote productive workplaces and better patient outcomes
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