Green Hospitals and Sustainability

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Why Green Hospitals

• *Patient health, community health, and environmental health are all negatively affected by multiple aspects of hospital construction, design, and maintenance. Increasing numbers of studies have found correlations between the materials used in hospitals and human disease.*
Continued…..

• For instance, volatile organic compounds like formaldehyde, acetaldehyde, naphthalene, and toluene are released into the air from the particle boards and carpets. These toxins, breathed in by patients and hospital staff, have been correlated to longer patient recovery times and more sick days for staff.
The inadequate ventilation found in most hospitals also contributes to the poor indoor air quality and pollution. The production of polyvinyl chloride (PVC), widely used in the production of IV bags, plastic tubing, and other health care supplies, releases the carcinogen dioxin, which has been associated with a number of other health problems, including developmental defects, endometriosis, learning disabilities, and endocrine disorders.
Continued….

• Additional burden is imposed by the green house effect.
• A need for better design and maximum conservation of energy and water was felt.
• The green hospital movement began few years ago (2010).
• Impetus was the U.S. green building council (USGBC).
• Released their leadership in energy and environmental designs (LEED).
Principles of Green Hospitals
Green

• Green
  • Reduction of energy consumption
  • Sustainable and careful use of resources
  • Pollution reduction
Efficiency

• Efficiency
  • Optimized workflows
  • Efficient assignment of time
  • Efficient assignment of costs
Quality

- Quality
  - Optimized medical care
  - Convenient and healthy procedures
  - Health-supporting environmental conditions
Benefits of green buildings

• Tangible benefits:
  • Energy saving - 30 to 40%
  • Water saving - 20 to 30%

• Intangible benefits:
  • Better indoor ambience:
    • Daylighting and views
    • Improved health and productivity
Green Hospitals- The relation

- Research shows much faster recovery of patients
- Connectivity to outside environment
- Better daylighting and views
- Healing benefits to patients
- Better indoor quality of air
- No sick building syndrome
- Regular Co2 monitoring
- Increased fresh air ventilation.
Ventilation trends in green hospitals

• Minimum fresh air ventilation required for all occupied spaces:

• Conventional systems, split air conditioners and window AC’s
do not provide adequate fresh air ventilation
# Outdoor Fresh Air Requirements for Ventilation of Health Care Facilities

<table>
<thead>
<tr>
<th>Application</th>
<th>Estimated maximum Occupancy (persons/100M Sq.)</th>
<th>Outdoor air requirement CFM/person cfm/Ft Square</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients Rooms</td>
<td>10</td>
<td>25</td>
<td>Procedures generating pollutants may require higher rates</td>
</tr>
<tr>
<td>Medical procedures</td>
<td>20</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Operating Rooms</td>
<td>20</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Recovery &amp; ICU</td>
<td>20</td>
<td>15</td>
<td></td>
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<tr>
<td>Autopsy Rooms</td>
<td>20</td>
<td>0.50</td>
<td>Air should not be recirculated into other spaces</td>
</tr>
<tr>
<td>Physiotherapy</td>
<td>20</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>
100% Exhaust for Medical Procedure Rooms and Operation Theatres

• Significant energy savings can be realized even with 100% exhaust
Heat Recovery during Ventilation

- Pre-cools the fresh air resulting in substantial energy savings
Green Hospital
Providence Newberg Medical Centre

• Actual benefits achieved:
  • □ 26% energy savings
  • □ 50% reduction in water consumption for landscaping
  • □ Better indoor air quality
  • □ No sick building syndrome
  • □ Reduction in ducting costs
  • □ 100% outside air; 100% exhaust
  • □ Reduction in floor-to-floor height
  • □ Reduced envelop cost
  • □ Heat reclaim system with VAV
  • □ Higher efficiency than conventional systems
  • □ Day Lighting
  • □ Healing benefits for patients
  • □ Patient recovery faster
  • □ Based on research
Fortis Hospital, New Delhi
Managerial aspect of green hospitals

Today the health system measures performance on both clinical and business indicators of success and improvement, it can deal with patient’s complaints in a more transparent manner, whilst it provides a much wider range of services and is much more transparent in spending government money.

Throughout the world there has been constant calls for health reform. The success of reform internationally, mostly through restructure and the adoption of management techniques has been questioned in terms of effectiveness, cost and negative impacts on health systems.
Continued….

- Integrating sustainability into the core business of a hospital represents a significant reform process.
Traditional Health Management Focus

- Financial
- Patient Activity
- Facility Management
- Hotel Management
- Staff Management
- IT Support
- Process Driven Accreditation
Contemporary Health Management Focus

• Continuous Performance Improvement
• Occupational Health and Safety
• Clinical Governance
• Staff Development
• Community Engagement
• Marketing
Forward Looking Health Management Focus

- Innovation
- Commitment to Employees
- Stakeholder Relations
- Environmental Impact
Integrated business plan

• Optimal Health Outcomes for Patients
• Financial Performance
• Workforce
• Stakeholder Relations
• Environment
Intrinsic to the Business Plan is the integration of sustainability into each of the core identified business activities.
Integrating sustainability into the core business of a hospital
- Significant Reform Process

REQUIREMENTS

• Decisive Leadership
• Education and Training
• Inclusive and Collaborative Approach
• Evidence Based
CURRENT POSITION

Health reform initiatives including the integration of sustainability into the core business of a hospital will fail without Government Commitment to a National Training Scheme and Leadership Development of Health Managers
Continued....

- Change Process
- Cultural Change
- Skills to develop required reporting formats and sustainability performance indicators
- Bringing the Health man power together
Governance

• Business (Including Clinical) Ethics Compliance
• Regulatory Compliance
• Sustainability Compliance
• Corporate and Operational Strategic Plans
• Management Performance Assessment
Financial Performance

- Rs. Actual to Budget
- Patient Activity Actual to Budget
- Variance Analysis with focus on action required to improve favorable trends and reverse unfavorable trends rather than a focus on historical narration of reasons for trends
- Economic payback reports tracking progress
Commitment to Patients

• Executive Summary of Patient Survey Results
• Action Taken in Response to Patient Surveys
• Significant Patient Equipment purchases including sustainability impact reports from suppliers
Commitment to Employees

- Performance Indicators - Loss time Incidents and Hours lost
- Health Indicators – Sick Leave hours and Number of Employee Health Checks
- Education and Training
- Maternity Leave
- Workforce Composition – gender, age range, employees with disabilities
Commitment to Environment

- Water Usage
- Energy Consumption
- Direct and Indirect Greenhouse Gas Emissions
- Liquid Releases
- Conventional Waste tonnages
- Sustainable Product Substitutions
Thank You