New Models in ICU Design

Transformation + Tactics

Teamwork + Tradeoffs

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  Health System

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Why Decentralized Care?
Tactics to Achieve Transformation

• “How can we best deliver direct care to patients that requires constant attention?”

• “How can we design an environment that will benefit the patient, the family and the medical providers?”

• “How can we create an environment that merges the medical with the medicinal?”

• “How can we improve the workplace environment in an intensive care unit?”

• “How can we create an environment that takes advantage of the best technology has to offer?”
Criterion for Comparison

• Physical Design
• Quality of Care
• Workplace Effectiveness
  – Operational
  – Cost
• Bottom Line Efficiency
  – Patient Satisfaction
  – Staff Retention
Physical Design: The ICU Primer

- The ICU Unit
- The ICU Room
- Settings of the ICU Room
- Nursing Station
## ICU Unit

<table>
<thead>
<tr>
<th>The ICU Unit</th>
<th>Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room</td>
<td>Patient</td>
</tr>
<tr>
<td>Procedure</td>
<td>Physician</td>
</tr>
<tr>
<td>Nursing Station</td>
<td>Visitor</td>
</tr>
<tr>
<td>RT</td>
<td>Support</td>
</tr>
<tr>
<td>Pharmacy</td>
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<tr>
<td>Soiled</td>
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<tr>
<td>Clean</td>
<td></td>
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<tr>
<td>Equipment</td>
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<tr>
<td>Supplies</td>
<td></td>
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<tr>
<td>Storage</td>
<td></td>
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<tr>
<td>Waiting</td>
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<tr>
<td>Vending</td>
<td></td>
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<tr>
<td>Consult</td>
<td></td>
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<tr>
<td>Quiet Room</td>
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<tr>
<td>Social Work</td>
<td></td>
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<tr>
<td>Lockers</td>
<td></td>
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<tr>
<td>Conference</td>
<td></td>
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<tr>
<td>Toilets</td>
<td></td>
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<tr>
<td>Offices</td>
<td></td>
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<tr>
<td>Light</td>
<td></td>
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<tr>
<td>Orientation</td>
<td></td>
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<tr>
<td>Color</td>
<td></td>
</tr>
<tr>
<td>Ambiance</td>
<td></td>
</tr>
<tr>
<td>Views</td>
<td></td>
</tr>
</tbody>
</table>
# ICU Room

<table>
<thead>
<tr>
<th>What Goes Into the Room?</th>
<th>Users</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Patient</td>
</tr>
<tr>
<td>Bed</td>
<td>☐</td>
</tr>
<tr>
<td>Medical Service</td>
<td>☐</td>
</tr>
<tr>
<td>Headwall</td>
<td>☐</td>
</tr>
<tr>
<td>Power Column</td>
<td>☐</td>
</tr>
<tr>
<td>&quot;Boom&quot; Type</td>
<td>☐</td>
</tr>
<tr>
<td>Medical Equipment</td>
<td>☐</td>
</tr>
<tr>
<td>Patient Unit</td>
<td>☐</td>
</tr>
<tr>
<td>Toilet</td>
<td>☐</td>
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<tr>
<td>Dialysis</td>
<td>☐</td>
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<tr>
<td>Bedpan</td>
<td>☐</td>
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<tr>
<td>Soiled Sink</td>
<td>☐</td>
</tr>
<tr>
<td>Charting</td>
<td>☐</td>
</tr>
<tr>
<td>Personal effects</td>
<td>☐</td>
</tr>
<tr>
<td>Family</td>
<td>☐</td>
</tr>
</tbody>
</table>
## Activities of the Room

<table>
<thead>
<tr>
<th>&quot;Settings&quot; of Room</th>
<th>Users</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Patient</td>
</tr>
<tr>
<td>At Rest</td>
<td></td>
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<tr>
<td>Exam</td>
<td></td>
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<tr>
<td>Nursing</td>
<td></td>
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<tr>
<td>Critical Event</td>
<td></td>
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<tr>
<td>Changeover</td>
<td></td>
</tr>
</tbody>
</table>
### Nursing Station

<table>
<thead>
<tr>
<th>Nursing Station</th>
<th>Users</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Patient</td>
</tr>
<tr>
<td>Charting</td>
<td></td>
</tr>
<tr>
<td>Interaction with Physician</td>
<td></td>
</tr>
<tr>
<td>Orders</td>
<td></td>
</tr>
<tr>
<td>Meds</td>
<td></td>
</tr>
<tr>
<td>Interaction with Visitors</td>
<td></td>
</tr>
</tbody>
</table>
Summary: ICU Primer

Summary

• The ICU Unit
  – Access by all Users

• The ICU Room: Users and Settings
  – Nurse and Patient are predominant
  – Physicians, Service, and Family are periodic

• Nursing Station
  – Nurse is predominant
  – Physician is secondary
Q1. “How can we best deliver direct care to a patient that requires constant attention?”

A1. Put the people that provide that care as close to the patient as possible.
Tactics of the Physical Design

- Traditional Model: “Centralized” Nurses Station
- “Decentralized” Model: Design that moves the Nurse closer to the patient
Centralized Unit

• The ICU Unit
  – Access by all Users
    • Convenient for Nurses, Physicians, and Service
    • Unpleasant experience for Families and Visitors

• The ICU Room: Users and Settings
  – Nurse and Patient are predominant
    • Lack of Patient Privacy
    • Compromised Family interactions
    • Distant from Patient
  – Physicians, Service, and Family are periodic
    • Convenient for Nurses, Physicians and Service
    • Family has less interactions with Physicians and Staff

• Nursing Station
  – Nurse is predominant
    • All of the Nurses are together: both an advantage and disadvantage
    • Communication is Simpler
  – Physician is secondary
    • Can do multiple charts at one time
Decentralized Unit

• The ICU Unit
  – Access by all Users
    • Convenient for Nurses, Physicians, and Service
    • A “better” experience for Families and Visitors

• The ICU Room: Users and Settings
  – Nurse and Patient are predominant
    • Patient Privacy
    • Private Family interactions with Patient, Nurse and Physician
    • Close to Patient
  – Physicians, Service, and Family are periodic
    • Convenient for Nurses, Physicians and Service

• Nursing Station
  – Nurse is predominant
    • Nurse is “next” to patient
    • Optimal staffing efficiencies
    • Remoteness, Distance and Change are common concerns
  – Physician is secondary
    • Bedside Charting
    • Nurse is available to interact with Physician and Support Staff
Physical Design: A Change of Paradigm
Tactics to Achieve Transformation

- “How can we design a space that will benefit the patient, the family and the medical providers?”
- “How can we create an environment that merges the medical with the medicinal?”
- “How can we improve the workplace environment in an intensive care unit?”
- “How can we create an environment that takes advantage of the best technology has to offer?”
Tactics to Achieve Transformation

- Prepare for Change
- Envision the Future
- Change the Workplace
- Change our Process
Physical Design: Preparing for Change

Identifying What We Wanted:

• **Care Focused Around the Patient**
  – Proximity of Nurse
  – Easy Visibility of the Patient
  – Medications/Supplies within step

• **Increased Cohesion of the Multi-Disciplinary Team**
  – Space for Interaction – large desks
  – Classroom with Satellite Access
  – Offices for Key Staff
  – Satellite Pharmacy
  – Dedicated R.T. & Blood Gas
Physical Design: Envisioning the Future

Challenges to Confront
- Staffing Shortages
- Aging Staff
- Changing Reimbursement
- Demands on/by Physicians
- Informed / Expectant Consumers
- Focus on Patient Safety
- Technological Advancements
Physical Design: Changing the Workplace

**Goals to Accomplish:**

- Plenty of Space
- Sufficient, Accessible Computers, Phones, Nurse Call System
- Large Windows
- Containment of Sound– A “Quiet” Unit
- Communication
- Proximity of Health Team Members and Patient
Physical Design: Changing Our Process

Merging of Two Cultures:

- Involvement of staff from both units in planning process (NUTs)
- Floating Staff
- One Manager
- Targeted Education
- Policy / Procedure Changes
- Benchmarking Trips
- Physical Mockup
Mock Up Site
ICU Room
Mock Up Site
ICU Room
Design Process

Two Bed Module
vs.
Four Bed Module
2 Bed Module
Saint Vincent Health Center
Saint Vincent
4 Bed Module
South Pointe
Does it work?

- Quality of Care
- Workplace Effectiveness
  - Operational
  - Cost
- Bottom Line Efficiency
  - Patient satisfaction
  - Staff Retention
Quality of Care Measures

- Restraint Use decreased by 10%
- Self-Extubations per ventilator days decreased by 100%
Patient Satisfaction Results

- Overall Quality of Intensive Care increased 6.1%
- Overall Quality of ICU Nurse Care increased 7.2%
- ICU Explained Medical Condition to Family increased 8%

*As measured by National Research Corporation*
Patient Satisfaction Results

- Visitation Policy for ICU increased 5%
- Dignity/Respect by ICU increased 2%
- Helpfulness of ICU to Reduce Pain increased 2.7%

*As measured by National Research Corporation*
Impact on Recruitment and Retention

- Vacancy dropped from 25% to less than 5%
- Turnover decreased by 50%
Volume Impact

- ICU Patient Days increased 16%
Lessons Learned

• What we would do again
• What we would change
Credits

The presenters would like to thank all those involved, though too numerous to list, that have had a part in the development, implementation, and evaluation of these concepts.
End/Slide Placeholder

• Deleted slides follow
Quality of Care Measures
Restraint Use

% of utilization

<table>
<thead>
<tr>
<th>Month</th>
<th>Utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>April-September, '03</td>
<td>14.5%</td>
</tr>
<tr>
<td>October '03 - March '04</td>
<td>12.5%</td>
</tr>
</tbody>
</table>
Self-Extubations per ventilator days

April-September, '03

October '03 - March '04
Patient Satisfaction Results

as measured by

National Research Corporation
Overall Quality of Intensive Care (n=99/98)

April-September, '03  October '03 - March '04
Overall Quality of ICU Nurse Care

(n = 95/92)

April-September, '03  October '03 - March '04
ICU Explained Medical Condition to Family (n=99/91)

- April-September, '03
- October '03 - March '04
Visitation Policy for ICU
(n=90/94)

April-September, '03          October '03 - March '04
Dignity/Respect by ICU
(n=101/97)

April-September, '03

October '03 - March '04
Helpfulness of ICU to Reduce Pain
(n=99/98)

April-September, '03

October '03 - March '04
Nursing Sensitive Quality of Care Indicators
Patient Falls

6 mos. Prior to new ICU | 6 mos. after new ICU

Falls
Restraint Use

- 6 mos. Prior to new ICU: 14.5 hours/day
- 6 mos. after new ICU: 13 hours/day

Graph showing a decrease in restraint use from 14.5 hours/day to 13 hours/day.
Self-Extubations

6 mos. Prior to new ICU  6 mos. After new ICU

Self-Extubations
Impact on Recruitment and Retention
Turnover

- Qtrs. 2 + 3, '03:
  - retirements: 1
  - resignations: 3

- Qtr. 4, '03 + Qtr. 1, '04:
  - retirements: 1.5
  - resignations: 2.5
Volume Impact
Admissions
ICU Patient Days

April-September, '03: 2600
October '03 - March '04: 3400