Nursing Unit Design: Staff Interaction & Communication Patterns
# Table of Contents

## I: Introduction
- Health & Design Focus Issues ........................................ 3
- Trends in Nursing Unit Design ........................................ 7

## II: Observations & Analysis
- CMC Nursing Unit Design ........................................... 8
- Guiding Questions ...................................................... 11
- Behavior Mapping ....................................................... 12
- Space Usage ............................................................. 14
- Nurse Shadowing ....................................................... 15
- Privacy & Visibility ..................................................... 17

## III: Synthesis
- Implications of Observations & Analysis ............................. 19

## IV: Solutions
- Overview ................................................................. 21
- Short-term ............................................................... 22
- Long-term ............................................................... 25

## V: Bibliography
- References ............................................................... 29
Why should we care about Unit Design, Staff Interaction and Communication?

Nursing units are chaotic, complex systems, with myriad behaviors and unpredictable circumstances colliding at a rapid pace (Bromberg, 2006). In the face of these challenging circumstances, hospital staff must insure the safety, comfort and livelihood of patients and family members, without compromising their own well-being. Understanding the relationship between unit design, staff interaction and communication can help hospital staff and management deal effectively with these challenges?

- **Recognizing the “human system”** (Sachs, 1995).
  - Working environments are complex and dynamic
  - Creating an effective working environment requires an activity-orientated approach
  - Activity-orientated approach looks at whole activities, rather than particular tasks
  - Understand how people communicate, learn, and think through problems

- **Informal communication & Learning**
  - Informal communication supports daily work-related tasks, transmission of organizational culture, and team building (Whittaker, 1994).
  - Face-to-face informal communication interactions are particularly important; not only support exchange of task information, but also “emotional information and social support (Zahn, 1991).”
  - “Task and social communication can affect organizational functioning, providing intelligence and integration (Zahn, 1991).”
Creative Problem Solving

- Complex systems require workers to constantly generate creative solutions to unpredictable circumstances.
  “The range of activities that workers must employ to actually get a job done, however, extends beyond the strict limits of a task into the less visible and more complex world of problem-finding, problem-solving, deciphering, decoding, understanding, and collaborating (Sachs, 1995).”

- Informal communication and learning assist the creative problem solving process.
  “It is easier to solve a vexing problem when a worker can bounce ideas off someone else instead of relying only on his or her own experience to arrive at a solution (Sachs, 1995).”

- **Case Study:** Toyota’s problem solving techniques for achieving reliability and performance are being adopted by health care organizations, which has resulted in significant improvements of “medication administration, nursing, delivering better quality of care, relieving workers of non-productive burdens, and saving costs (Spear, 2004).”
  - The University of Pittsburgh Medical Center has developed the Perfecting Patient Care System (PPC), based on the principles of the Toyota Production System (Robinson, 2006).
  - Focus on catching problems as soon as they occur, and immediately developing solutions; constant evolution of “best practice.”
Comparison of organizational versus activity approach to work (Sachs, 1995)

<table>
<thead>
<tr>
<th>Organizational View</th>
<th>Work/Activity View</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analytic Assumption:</td>
<td>Analytic Assumption:</td>
</tr>
<tr>
<td>People produce human error</td>
<td>People discover problems and solve them</td>
</tr>
<tr>
<td>Design Assumptions:</td>
<td>Design Assumptions:</td>
</tr>
<tr>
<td>Deskilling is desirable</td>
<td>Skill development is desirable</td>
</tr>
<tr>
<td>Routine work, rote thinking desirable</td>
<td>Development of knowledge, understanding, deciphering, is central to skill</td>
</tr>
<tr>
<td>Flexibility = interchangeable jobs</td>
<td>Flexibility = skilled people</td>
</tr>
<tr>
<td>Standard Operating Environments are necessary to the business</td>
<td>Collaboration and collaborative learning take place in communities</td>
</tr>
<tr>
<td>Social interaction is nonproductive</td>
<td>Communities are funds of knowledge</td>
</tr>
<tr>
<td>Automation produces reliability</td>
<td>Skill through learning produces reliability</td>
</tr>
<tr>
<td>Consequence:</td>
<td>Consequence:</td>
</tr>
<tr>
<td>Learning is not encouraged</td>
<td>Learning is supported</td>
</tr>
</tbody>
</table>

Dynamic “Human Systems” approach to coping with complex nursing challenges

Informal Communication

Informal Learning

Creative Problem Solving

Learning
Design as a tool for facilitating desired behavior

- The hospital’s physical environment can support desired activities and behavior on multiple levels – both instrumental and symbolic (Becker, 1980).
  - Instrumental: environment as either support or barrier
  - Symbolic: environment as “behavior catalyst,” which “sets in motion a series of linked events or behavioral reactions (Becker, 1980).”

- Environment as “behavior catalyst” can stimulate positive social interactions and communication, which can in turn improve patient care and fuel new behavioral processes (Becker, 1980).

- Proximity of workers has significant affect on communication patterns
  “people who are physically collocated are more likely to communicate frequently and informally (Whittaker, 1994).”

The nursing station should be a dynamic learning environment. The design should support impromptu meetings and informal information exchange between a wide variety of hospital staff (Bromberg, 2006), facilitating intelligent and creative problem solving.
A primary issue of debate for nursing station design is the choice between decentralized vs. centralized unit design. The unit design has a significant affect on staff interaction and communication patterns.

- **Decentralized design** has individual stations by patient rooms and no central hub
  - Pros: Nurses closer to patients; less distractions
  - Cons: Reduced collaborative interaction; increased noise levels by patient rooms; feelings of isolation

- **Centralized design** has a central hub where all workstations are located
  - Pros: Encourages collaborative interaction; all resources in central location
  - Cons: Removed from patients; congestion and distraction

- There is a growing movement towards hybrid nursing units that combine a central, collaborative space with small, decentralized nursing units closer to patients, where the central hub functions as an “information center” (Flynn, 2005).
Observation & Analysis
CMC Nursing Unit Design

The CMC nursing unit is a hybrid design, with a central unit (CU) and four pods.

Does this unit design support informal communication and learning?
Observation & Analysis
CMC Nursing Unit Design

Central Unit

Dictating station with glass barrier

Sink

Bench/ledge

Doctor dictating station
Observation & Analysis
CMC Nursing Unit Design

Corridor

Pod interior

Computer on wheels

Glass barrier

Ledge
Observations & Analysis

Guiding Questions

- Does the unit design support informal communication and learning?

- What type of interactions occur in the med/surg unit? Between who? Where do they occur with the greatest frequency?

- Pods – how, when, why and by who are they being used?

- Central Unit – how, when, why and by who is it being used?
  - What is happening in the congested are of the Central Unit?
  - How are the dictating stations used? By whom?

- How are the small waiting areas used? By whom?

- What communication patterns can be identified?
Observations & Analysis

Behavior Mapping

Nursing Unit Interactions, 7:30am-10:00am
Observations & Analysis
Behavior Mapping

Key Findings:
- Corridors primary location for informal communication
- CU central communication hub for both information exchange and support
- Doctors and nurses communicate most frequently at benches, sinks and corridors i.e. locations where their paths naturally intersect.

A: Nurses have short conversations in corridor as they pass each other. Conversation subjects range from social/personal to information exchange to support/reassurance.

B: Family members cluster around charge nurse in CU corridor to discuss patient; consult room not used.

C: Family members cluster around vicar in corridor to discuss arrangements for patient who has just died; consult room not used; conversation can easily be heard.

D: Central communication hub. Nurses pause at bench or sink and talk with nurses in CU; doctors and nurses communicate at bench, often while doctor washes hands; close proximity of patient files triggers discussion about patients. Conversation subjects range from social/personal to information exchange to support/reassurance.

E: Patients and family members approach nurses in CU when they have concerns, even if there are nurses in pods.

F: Nurses communicate with each other in medication room. Conversation subjects range from social/personal to information exchange to support/reassurance.

G: Nurses and doctors communicate directly outside of pod, utilizing ledge space to place patient information.

H: Cleaning staff pause in corridor and discuss social/personal subject matter, often for +5 minutes; provide support/reassurance to each other. Talking loudly directly outside patient room and blocking corridor.
Observations & Analysis
Space Usage

Key Findings:
- Rarely is >1/4 pods occupied at any given time
- Pods usually occupied by one nurse at a time; very little nurse interaction occurs
- Nurses spend most of time in CU
- Waiting areas rarely used
- Doctor dictating space rarely used

Space Usage at 15 min intervals

- # pods occupied
- Total # nurses in pods
- # nurses in CU
- # people in waiting area
- # staff in doctor dictating space
Observations & Analysis
Nurse Shadowing

Nurse was shadowed from 4:00-4:30 pm.
She moved among the highlighted spaces.
Observations & Analysis
Nurse Shadowing

Key Findings:
- Even when nurse is stationed directly by patient in a pod frequently travels to and from CU
- Little care is taken to keep conversations quiet and private
- Nurse doesn't "hang out" in pod; transitory; pod often empty
- When pods are empty it is difficult to monitor patients; very poor visibility from CU

<table>
<thead>
<tr>
<th>Time (min)</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:00</td>
<td>Patient (1) room, directly across from pod</td>
</tr>
<tr>
<td></td>
<td>Pod bench; paperwork</td>
</tr>
<tr>
<td></td>
<td>Conversation in corridor with other nurse</td>
</tr>
<tr>
<td></td>
<td>Medication room (CU)</td>
</tr>
<tr>
<td>4:05</td>
<td>Patient (1) room</td>
</tr>
<tr>
<td></td>
<td>Passes through CU 4 times</td>
</tr>
<tr>
<td>4:10</td>
<td>Patient (1) room</td>
</tr>
<tr>
<td></td>
<td>Conversation with doctor at pod bench</td>
</tr>
<tr>
<td>4:15</td>
<td>Patient (1) room</td>
</tr>
<tr>
<td></td>
<td>Pod; paperwork</td>
</tr>
<tr>
<td></td>
<td>Patient (2) room on other side of unit</td>
</tr>
<tr>
<td>4:20</td>
<td>Emergency in patient (1) room</td>
</tr>
<tr>
<td></td>
<td>Fetch from patient (2) room by CU nurse aide</td>
</tr>
<tr>
<td></td>
<td>CU for patient (1) information</td>
</tr>
<tr>
<td></td>
<td>Pod; phone call</td>
</tr>
<tr>
<td></td>
<td>CU to find nurse to look after other patient (2)</td>
</tr>
<tr>
<td></td>
<td>Nurses console each other in corridor</td>
</tr>
<tr>
<td>4:25</td>
<td>Pod; phone call</td>
</tr>
<tr>
<td></td>
<td>Pod bench; diagnosing patient with doctor</td>
</tr>
<tr>
<td></td>
<td>CU; talks with other nurses about what to do for patient</td>
</tr>
<tr>
<td></td>
<td>Pod empty; patient left unattended; no visibility from CU</td>
</tr>
<tr>
<td>4:30</td>
<td>Patient (1) room; supplies from CU</td>
</tr>
</tbody>
</table>
Observations & Analysis
Privacy & Visibility

- The high frequency of corridor conversation results in violations of privacy for patients and family.
- Bench/sink area of CU is focal point for conversation. This area has no privacy.
- Conversations in patient rooms can frequently be heard from the corridor. Patients mostly elderly so nurses have to talk particularly loudly.

"The lack of a centralized unit means that nurses and physicians are often forced to meet in hallways to discuss patient status, usually within earshot of patients." (Flynn, 2005)
Pods were designed to increase visibility of patients. However, patient rooms were designed to provide patients with increased visual privacy. As a result, patients cannot be seen from pods. Visibility of patients is very low from the CU.
Does the hybrid nursing unit design support informal communication and learning?

- The culture of the med/surg nursing unit supports informal communication and learning. Information exchange, verbal support and group problem-solving occur constantly and are never frowned upon by my senior nurses or unit managers.

- HOWEVER, the unit design inhibits optimal communication in 3 ways:
  1. The design delineates nurse zones (pods) and doctor zones (dictating station). Even though the zone barriers are glass, they still send a symbolic message to staff; they act as “behavior catalysts.” As a result, nurses don’t enter the dictating station and doctors don’t enter pods. This limits the impromptu interactions that can occur between doctors and nurses. This in turn limits opportunity for informal learning and creative problem solving. It also results in inefficient use of space.
2. All staff conversations occur primarily in corridors and at benches and sinks. These areas are not appropriately designed to support interaction and communication and, as a result, privacy is compromised. The areas that do provide some degree of visual/acoustical privacy – pods, dictating station, small waiting areas, conference room, and consultation room – are rarely used for conversation as they are not nodes of interaction.

3. Poor visibility between patient rooms, pods and central unit decrease overall unit awareness and knowledge of what is going on. This results in second-hand information, delayed reaction time, propagation of problems, and decreased learning via observation.
Nursing units are complex systems. To effectively cope with the myriad of challenges, solutions must consider the entire system. Therefore, solutions should address both policy and design issues. Furthermore, solutions should include both short-term recommendations and long-term ideals, to support the ongoing evolution of the environment.

For the CMC med/surg nursing unit, solutions should focus on 3 major areas:

1. Removing “barriers” between nurses and doctors to encourage more impromptu interactions.
2. Rethinking corridors so that they support informal communication and interaction without compromising privacy.
3. Increasing visibility to support unit awareness and observational learning.
1. Removing Barriers

- Remove glass panels from doctor dictation space. This will better integrate dictation space into CU and encourage common use. Shoulder-height cubicles will remain so that adequate level of privacy is maintained.

- Stock pods and dictation station with equipment, technology and information required by both nurses and doctors, so that both can function as flexible work space. Remove identifiers, such as nurse names on pod whiteboards.

- Remove nurse names from pod whiteboard
Solutions
Short-term

2. Privacy

• Ledges/kiosks should be strategically placed in areas that provide increased conversational privacy. Benches/kiosks will act as physical nodes for interaction.

• Small waiting areas should be converted into “quiet zones” that act as flex space, accommodating both waiting and private conversation. Half the chairs should be removed and replaced by waist-height bench space.

• “Quiet zones” should be indicated by visual cues such as distinctive paint color and lighting.

Distinctive paint color and lighting

Kiosk as “gathering point for impromptu meetings (Bromberg, 2006).”
3. Visibility

- Strategically place ledges/kiosks so that, when staff are using them, their visibility of the unit is increased.

Ledges with distinctive color; increased privacy for conversation
Open unit design with semi-private stations

“The nursing station worktable layout allows the entire medical and hospital caregiving staff to face each other for the many planned and impromptu care-planning meetings in a barrier-free environment, rather than feeling isolated or having to stand with a high counter between them (Hardy, 2006).”
Re-thinking the corridor: Pull-off “quiet zones”

- Wide corridor
- Pull-off zones allow privacy in open unit design
- Movable glazed glass walls for added privacy
Re-thinking the corridor: Pull-off “quiet” zones

Rectangular vs. round nursing station design doesn’t seem to affect noise level; more an issue of organization of nurse’s activity and use of acoustical materials (Shepley, 2006).

Ledges to encourage informal interaction. Computer equipment so space can be used by doctors and nurses when they need distraction-free space.

“Quiet zones” differentiated by change in material and distinctive lighting

Pull-off zones should have sound masking ceiling and wall tiles. Possible suppliers include:

- Herman Miller for Healthcare
- LogiSon Acoustic Network
- Nurture by Steelcase

HealthcareDesign 2006
Semi-open seating area primarily adjacent to Central Unit

- Attractive, comfortable seating area for waiting; provides positive welcome experience
- Visibility; connection to nursing unit
- Partial walls to facilitate privacy
- Sound masking tiles for added acoustical privacy
- Sound masking tiles for added acoustical privacy
- Primary adjacency to unit makes it a convenient location for unplanned communication
- Partial walls to facilitate privacy


http://www.aia.org/aah_a_jrn_0401_article4 (accessed November 17, 2006)


