Welcome

EXPO & CONFERENCE

DISCOVER WHAT'S NEXT

Welcome
Racetrack, X-hall, Wide-hall:
Is There a New Kid on the Inpatient Unit Block?
Twitter Address

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The debate about layout of inpatient units ranges between two main types—racetrack and X-hall. This case study suggests the wide-hall as a worthy third inpatient-unit option. The Orbis Medical Centre in the Netherlands uses space to drastically change the dynamic of patient, companion, and clinician relationships on its inpatient units. Presenters will review research comparing preferences among clinicians for two familiar types and analyze characteristics of North American and European examples against those of the Dutch interloper. Each will be described programmatically, metrically, and spatially, using space syntax analysis.
Session Objectives

• Understand how spatial configuration on three inpatient-unit types influences the complex web of relations between patients, companions, and caregivers.
• Explore the benefits of the unique wide-hall layout.
• Learn how selective (and not overly disruptive) renovations can achieve the same benefits.
• Appreciate how the same care processes are accommodated within much smaller inpatient units in European hospitals, with improved communication and efficiency.
Racetrack, X-hall, Wide-hall: Is There a New Kid on the Inpatient Unit Block?

Our Foci:

1. Patient Observability by the Care Team
2. Visual Cohesion of the Care Team

...and for the wide-hall type:

3. Social Relations amongst the Care Team, Patients and their Visitors

We’ll not be discussing:

1. Distribution of most-used support spaces
2. Care Team Travel
1. As healthcare costs compel and technological advancements in remote patient monitoring allow, care will migrate out of hospitals into the community and the home....

2. Patients in hospital will be increasingly complex...

3. Requiring more clinician specialists who will need to collaborate on diagnoses and treatment...

4. So more collaboration-effective work and care space will be required...

5. The optimal mode of collaboration will remain face-to-face...
6. Face-to-face collaborative space is essentially open to create more opportunities for ‘on-the-fly’ collaboration...

7. Open collaboration space is best ‘off-stage’ in Outpatient Care, and ‘On-stage’ in Inpatient and Critical care

8. The LEAN principle of ‘making work visible’ means more, on an inpatient unit, then tidying up the clean room

9. ‘Work’ on an inpatient unit means (1) caring for patients and (2) collaborating with the rest of the care team

10. In order to be able to do both at the same time, ‘on the fly’, patients have to be visible from collaborative space
Collaborative Space

‘Off-stage’
Best for Outpatient Clinics

‘On-stage’
Best for Inpatient Units
BUT! What if we’re wrong?

Well...
1. **Face-to-face** communication, now that we all have a smart-phone, **who needs it**?

2. Is ‘**on-stage**’ collaborative space **really** best on Inpatient Units? Shouldn’t there be a **mix of both**?

3. Why is ‘**on-stage**’ **better on inpatient units**, but not within outpatient clinics?

.....wrong about **what**?
‘On-stage’ collaboration in outpatient care

Ambulatory Practice of the Future, Mass Gen, Boston
‘Off-stage’ collaboration in outpatient care

Ambulatory Care Centre, St Paul’s, Vancouver
‘Off-stage’ collaboration in Inpatient care


Patient Rooms from Veranda

The Patient Room access Veranda

‘Off-stage’ Staff Work Zone

Creating Flexibility in Acute Inpatient Ward Design:
A new Dialogue to Transform Old Paradigms

Jennifer Hands - Principal, Healthier Spaces
‘On-stage’ collaboration in inpatient care

Orbis Medical Centre, Sittard, the Netherlands, Bonnema Architecten

View of the wide-hall
Wide-hall workstation
On-the-fly collaboration
Corridor renovation (NOT during observations)

Patient Charts

RNs 30% communicating

46% to other RNs (...8 times/hr average 45 seconds)
Peer line of sight: Nurses and healthcare providers prefer to visualize the unit’s activity. If the care unit is configured in isolated pods or is too large, the staff are visually isolated from one another. Peer line of site assists with the mentoring and development of less competent and experienced nurses and facilitates collaboration among care givers.

Determining the Optimal Number of Patient Rooms for an Acute Care Unit, T. Ritchey, J. Stichler, 2008

IPU Size Sweet Spot: 24 -30 beds

Journal of Nursing Administration, Vol 38
Early IPU type

Modern IPU types

- Racetrack
- X-hall
- Wide-hall

Nightingale Unit
Stantec’s Initial Concern:

As we move to the all-single room IPU...

...too much patient room access corridor per patient in an all single room ‘racetrack’ IPU reduces clinician density of occupation of the corridor system and therefore care-team ‘on the fly’ communication, probably contributing to medical error.
Anonymous Hospital with Racetrack Inpatient Units

...other concerns

Where is the Family Lounge?
Akershus University Hospital
Lørenskog, Norway, C. F. Moller Architects

X-hall
everything!
Where is the Family Lounge?
X-Hall IPUs with Shared Collaboration Centre

(knowledge centre)
Pradinuk’s Previous Preference

- Better ‘peer line-of-sight’ so more ‘on-the-fly’ communication
- Less corridor with patients both sides so more patients-seen per nurse-step
- Easy to embed most-used support so walking can be managed
- More convivial for patient families, so more mutual support
- All corridors can be seen from the communication centre
- Communication centre can easily control access to the unit
Meander Medisch Centrum
Amersfoort, NL  Atelier Pro Architecten

Red Perimeter / White Interior

Ambulatory / Inpatient / D&T
Meander Medisch Centrum
Amersfoort, NL Atelier Pro Architecten

Entry from parking

Outpatient Clinic Atrium / Cafe
Meander Medisch Centrum
Amersfoort, NL  Atelier Pro Architecten

oranjerie
Meander Medisch Centrum
Amersfoort, NL Atelier Pro Architecten

Limited team base visibility
Cool sleeper/sofa with desk facing patient
Washroom sliding door the full width of the washroom
Corridors dominated by doors
• Great ‘peer line-of-sight’ and ‘on-the-fly’ communication
• All patients, in constant view of nurses, feel less anxious
• Patients can provide mutual support
• No auditory privacy, minimal visual privacy
• Little family accommodation
• Probably high risk of nosocomial infection
Orbis Medical Centre
Sittard, NL Bonnema Architecten

Wide-hall ‘ family room ‘ with care team
Orbis Medical Centre, Sittard, the Netherlands, Bonnema Architecten

- Inpatient Units overlooking atrium
- Wide Hall
- Logistical Centre

5.4 – 6.0M
Long travel path to the Logistical Centre

Very small ‘off-stage’ collaboration space
Motorized blinds and sliding door controlled by the patient from their bed

85% of patients keep their doors open a smidge and their blinds wide open

(Essentially approaching the patient visibility of the Nightingale Ward)
Cozy patient room with overnight accommodation for loved one
Staff ‘small group’ workstation and cart
Orbis Medical Centre, Sittard, the Netherlands, Bonnema Architecten

Staff Collaborating in the wide-hall
Orbis Medical Centre, Sittard, the Netherlands, Bonnema Architecten

Nourishment Centre in the widehall
Orbis Medical Centre, Sittard, the Netherlands, Bonnema Architecten

Lounge seating
Orbis Medical Centre, Sittard, the Netherlands, Bonnema Architecten

All staff uniformed by role

Inventively furnished Team Room
IPU social relations

- Clinician/patient
- Clinician/clinician
- Patient/Visitor
- Clinician/Visitor
- Visitor/Visitor
The Orbis units have several advantages over the standard racetrack unit:

1. Family and companions can retreat to lounge seating in the hall for a break, to allow privacy during an examination or to consult with a caregiver, *all while remaining close to the patient*.

2. Families can support other families of nearby patients *immediately outside of patient rooms*.

3. The patient and the family *see the care team functioning as a team* instead of as unrelated individuals that suddenly appear in the patient’s room.

4. *Clinicians can work and collaborate in the hall*, close to the patients and have a *wide view of activity on the unit* as they leave each patient room.

5. The atmosphere within the wide-hall is incredibly quiet & calm.
Space Syntax Visibility Analysis of Basic IPU types - SEPARATED

Patient Access Zone Integration

- X-hall with corridor charting
- Race Track with touch down station charting
- Wide-hall with ubiquitous charting

900-1100
Space Syntax Visibility Analysis of Basic IPU types - SEPARATED

Patient Room Integration

X-hall with corridor charting

Race Track with touch down station charting

Wide-hall with ubiquitous charting

140-260

400-600

500-1000
Wide-planning study with distributed logistics and separated public/patient transfer flows
Wide-planning study with distributed logistics and separated public/patient transfer flows

- **Patient Transfer Elevators**
- **Clinician Elevators**
- **Public Elevators**
- **Clean Logistic Elevators**
- **Pneumatic Waste & Linen chutes**
- **Vertical Movement**
The clinical worktable with visibility into all patient rooms. *Drawing courtesy of Earl Swensson Associates*

“When patients wake up feeling disoriented or uncomfortable, you don't want them also to feel isolated. If on opening their eyes, they see another person, their fears are immediately assuaged. And if the person they see happens to be a nurse who may easily enter the room to touch the patients in word or deed, then care becomes synonymous with the innate promise of the hospital that says, "You're in good hands." *With No Hidden Patient design, the hospital says, "You're in good eyes" too!*

[Online article by Jeff Hardy](http://psqh.com/sept06/facility-design.html)
Epilogue:

1. Comments on Orbis and their wide-hall units
2. Visual Management
3. (Over-?) Programing the IPU
4. Research – is the single patient room the only option?
Major planning and design concepts

1. Attempt, not always achieved to *Separate flows* horizontally and vertically. Use of technology for the flow of information, supplies, medication and equipment.

2. Use of *sliding doors* eliminates dead space.

3. *Space standards based on utilization analysis* - eg patient rooms much less than CSA Z8000 but meet all equipment procedure etc. needs.

4. *No private offices* lots of places for small meetings or private thinking.
Major operational concepts

1. First step in problem solving is to **find a process improvement solution**

2. Clinical staff do not move patients (unless there is a clinical reason), supplies, medication, equipment. **Hotel staff do.** (Orbis has supply warehousing and also uses robots for distribution of supplies to units)

3. Clinical and non-clinical **information accessible from any point in the hospital** - access controlled by permission

4. **Planning leadership was driven by business case decisions** - clinicians involved but not the final say unless it could be proven there was patient quality issue

5. Unless a service contributed to improved flow or needed the resources of an acute care hospital it was in the community. Notable exception was a primary care clinic adjacent to the ER but only open when community clinics closed. Clear distinction between roles of hotel staff, housekeeping, portering of patients, equipment and supplies and clinical staff.
Visual Management

- Lean Process Improvement Principle
- Supports both strategy deployment and daily management systems
- Goal is to provide “status at a glance” so staff can take corrective action
- Requires good peer and patient visualization
The Single-Patient Room Is Not the Only Option
Lessons from Rapid Prototyping in Christchurch, New Zealand


Ward plan

View from nurse station

Ward perspective

Otautahi (aka linear multi-bed)
The Single-Patient Room Is Not the Only Option
Lessons from Rapid Prototyping in Christchurch, New Zealand

Lo-fidelity rapid prototype

Lo-fidelity rapid prototype
The Single-Patient Room Is Not the Only Option
Lessons from Rapid Prototyping in Christchurch, New Zealand

Higher fidelity mock-ups with real people
Inpatient Space has Doubled In 30 years

- 1984: 33.9 CGSM
- 2004: 50.0 CGSM
- 2014: 64.0 CGSM

- Rockyview General Hospital
- Peter Lougheed Center
- Grande Prairie Regional Hospital
- Western Memorial Regional Hospital
- North Island Hospitals
### Space Impact of Unit Configuration - Planning Factor

#### Gross Area Planning factor

<table>
<thead>
<tr>
<th></th>
<th>Nwflid - Racetrack</th>
<th>Nwflid - X-hall</th>
<th>BC-Racetrack</th>
<th>Orbis - Wide-hall</th>
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<td>Difference in cost/patient room</td>
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#### Net Area Planning factor

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Space Impact of Unit Configuration - Distribution

Newfoundland

- Reception & Waiting Area
- Inpatient Area

BC

- Patient Support
- Environmental

Orbis

- Staff Support
- Offices & Workstations
## Space Impact of Unit Configuration - Support Space

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<th>Newfoundland</th>
<th>BC</th>
<th>Orbis</th>
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<td>Offices &amp; Workstations</td>
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<td>1.7</td>
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<tr>
<td>Washrooms &amp; Lockers</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>7.1</strong></td>
<td><strong>2.6</strong></td>
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Interesting Recent Research

Patient Safety: Single-bed versus multi-bed hospital rooms
Are multi-bed or single-bed patient rooms safer?

Kate Fairhall, BSc (Hons), MSc; Laura Bache, BSc (Hons), MSc, MPhil; Peter Dodd, MBA, MAPM; Patricia Young

UK’s National Patient Safety Agency June 2105

Evaluating a major innovation in hospital design: workforce implications and impact on patient and staff experiences of all single room hospital accommodation

Jill Maben, Peter Griffiths, Clarissa Penfold, Michael Simon, Elena Pizzo, Janet Anderson, Glenn Robert, Jane Hughes, Trevor Murrells, Sally Brearley and James Barlow
Ward design staff challenges

Limited glazing and in board bathrooms reduced visibility

Visibility of patients more limited than staff had anticipated

Greatest challenge was monitoring patients re risk of falls

Staff could not see / find each other

Social isolation real disadvantage for patients/staff

Implications for patient and staff experiences of all single room hospital accommodation

Professor Jill Maben OBE PhD, RN
Florence Nightingale Faculty of Nursing and Midwifery
How do all-single patient rooms stack up?

Patient view

- **Strong patient preference (66%)**
  - Privacy
  - Confidentiality
  - Personal control
  - Flexibility for visitors

- **Some patient reservations**
  - Staff visibility/interaction
  - Interaction with other patients (social isolation)
How do all-single patient rooms stack up?

Staff view

- Reduced visibility makes patient surveillance difficult
- More challenging keeping patients safe
- Less efficient
- More challenging time management and priority setting
- Increased social isolation
- Less team work
- Less time for care (more travel)
- 50/50 split singles / bays
How do all-single patient rooms stack up?

Research findings-safety reasons not clear cut

- Few changes to patient safety attributed to move to single rooms
  - Infection control
  - Falls
  - Pressure ulcers
  - Medication errors
- Single-bed rooms are at least as favorable as multi-bed rooms for patient safety, and usually more so
- Room size, flexibility, shared social spaces and efficient ward layout also safety factors
How do all-single patient rooms stack up?

Research findings - costs

- Minimal increase in cleaning costs (+0.14%)
- No cost impacts due to safety
- Increase in staff budget could not be attributed to single rooms
- Opportunity cost of increased staff travel
How do all-single patient rooms stack up?

Finding common ground
- Patient privacy
- Location of bathrooms
- View into rooms
- Staff collaboration
- Patient / patient family/family interaction
- Visualization of other staff
- Decreased travel time
Should We Reconsider the All Single Inpatient Unit?

- Staff preference remained for a mix of single rooms and bays.
- All single rooms may have significant implications for the nature of teamwork in the longer term.
- Patients preferred single rooms.
- No evidence that single rooms had any impact on patient safety outcomes.
- Staff in some areas felt that surveillance was more difficult and fall risk increases.
- The evidence has implications for future unit design.
Key Learnings, Process Improvements and Take-aways

- The importance of *patient visualization* and *care team collaboration* is likely to increase.
- Consider some version of a *wide-hall IPU* for new hospitals.
- Consider a *wide-hall* option on a major racetrack renovation.
- Consider *all-single inpatient rooms*, but...
  - Not at the expense of visual management
  - Not at the expense of staff collaboration
  - Not at the expense of patient isolation
  - Not at the expense of decreased time for care
Thank You