

Evidence-based design, managing risk and a healing environment

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Workshop

Evidence-Based Design, Managing Risk, and a Healing Environment

Health Facilities Design and Development
Brisbane, Australia

February 21-23, 2008

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Workshop Focus: Using Evidence-Based Design to help:

- Create a healing environment
- Managing risk
- Improve service delivery
- Getting value for money from facility operating costs

Agenda

Part 1: ~9-10am: Introduction

- Introduction of workshop leaders
- Introduction of workshop participants
- Participants' EBD survey; Questions have/what risks are we trying to manage?
- Overview of Evidence-Based Design & Practice-Based Research (Becker & Carthey)

*Part 2: ~ 10-11am (10 minute break before start): **Project Development***

- Introduce Exercise #1: Types and Key Issues
- Participants break into small groups
- Each group identify project scenario and research question
- Develop detailed project proposal responding to issue identified (process)
- Each group report its project proposal to whole group/Discuss

*Part 3: ~11-12noon (10 minute break before start): **Interpretation and Application***

- Introduce Exercise #2: Filters, Findings, and Practice Implications
- New groups formed.
- Each group discuss interpretations and applications: What does this mean for practice?
- Each group report on how it would apply findings to facility decisions
- Discuss issues and questions raised by exercises about EBD and Practice-Based Research

Workshop Goals

- Explore EBD as means of managing risk, creating healing environment, and improving quality of care
- Distinguish between Academic and Practice-Based Research
- Experience developing a practice-based research project
- Practice interpreting and applying research findings
- Address questions and concerns about Evidence-Based Design
- Understand how to use research findings to influence project decisions

Evidence-Based Design: Practitioner Survey

Each person in workshop take 5 minutes:

1) Write down questions, issues, concerns you have about some aspect of Evidence-Based Design.

2) What risks are we trying to manage?

Practice-Based Research: GOAL

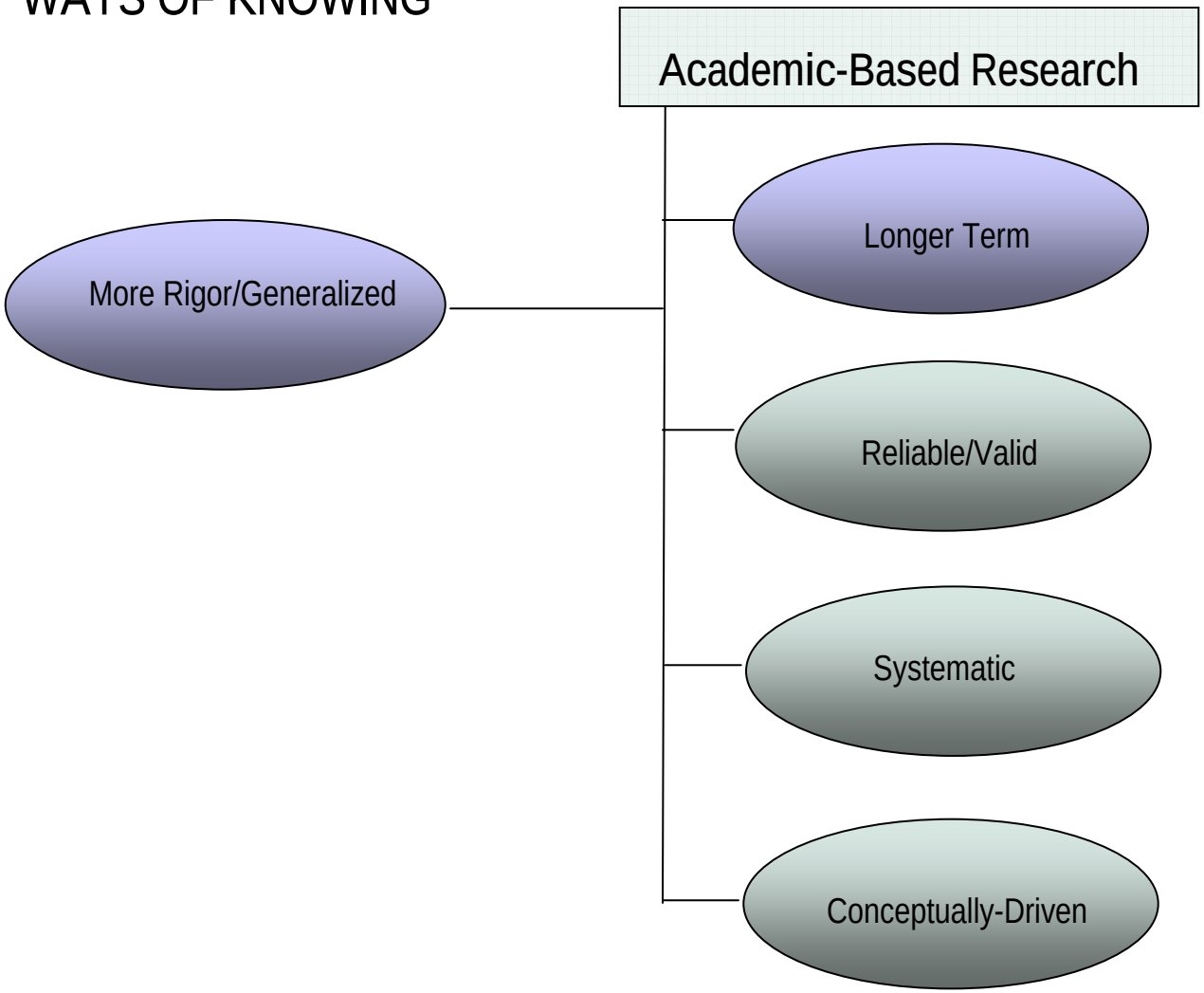
- Make more informed decisions grounded in data not only personal experience
- Test (challenge) working assumptions
- Use/adapt accepted research tools and techniques
- Stimulate debate about research findings
- Make decisions that are likely to achieve desired outcomes

Clichés versus Definable Project Goals

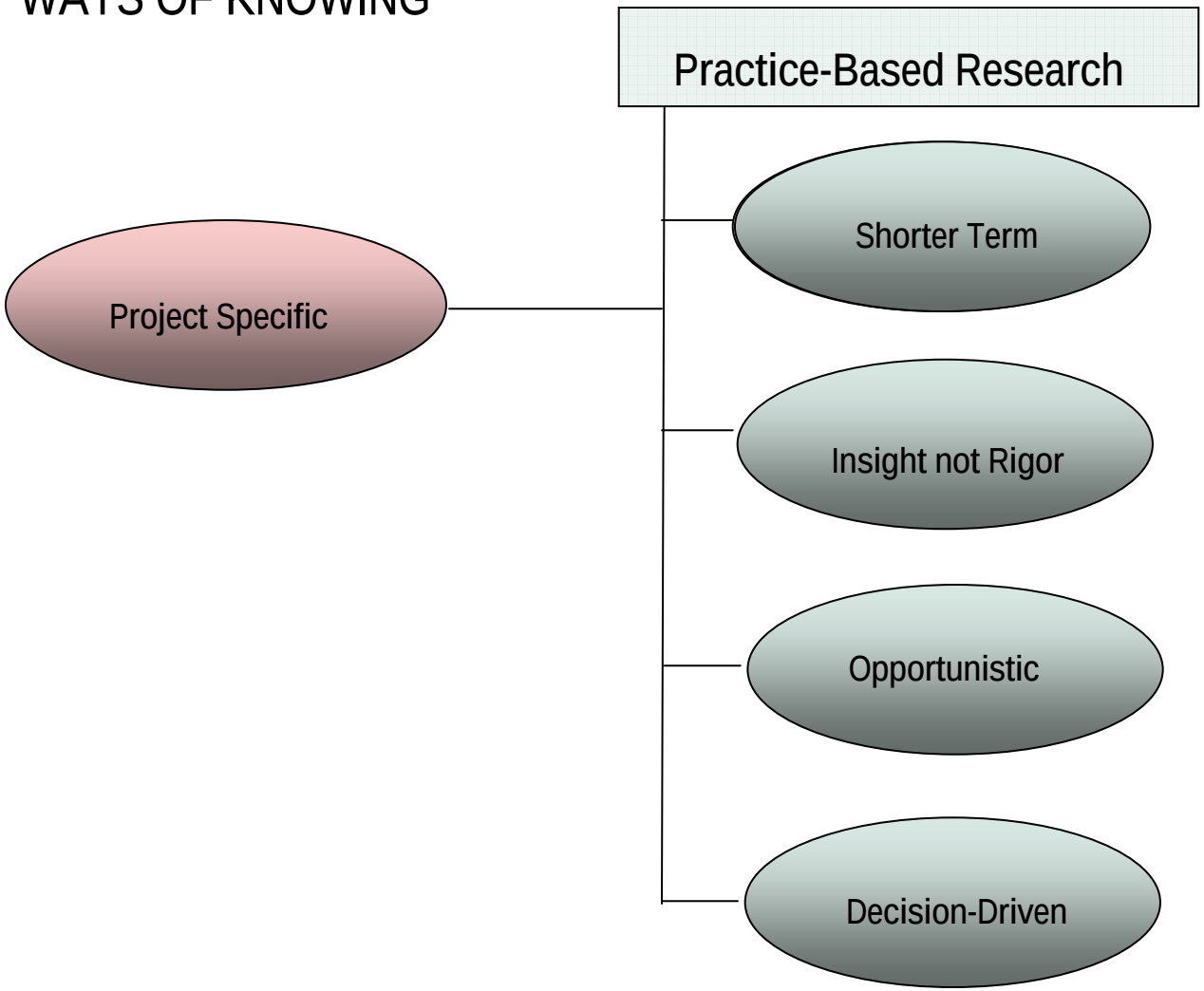
(thanks to Paula Buick, Healthcare Design 01.08, 39-41)

Clichés	Definable goals
We want to make the patient care space warm and inviting.	Patient satisfaction with the environment of care will increase by 3 to 5 points.
New space to increase volume/admissions.	Increase exam/treatment rooms by 25% to reduce time to appointment delay to two weeks for routine visit.
More support space for patients.	Add 10 parent rooms, doubling existing rooms.
"I want to create a **healing environment** for our patients"	"Your definable goal" (insert here)
"Your cliché" (insert here)	"Your definable goal" (insert here)

WAYS OF KNOWING

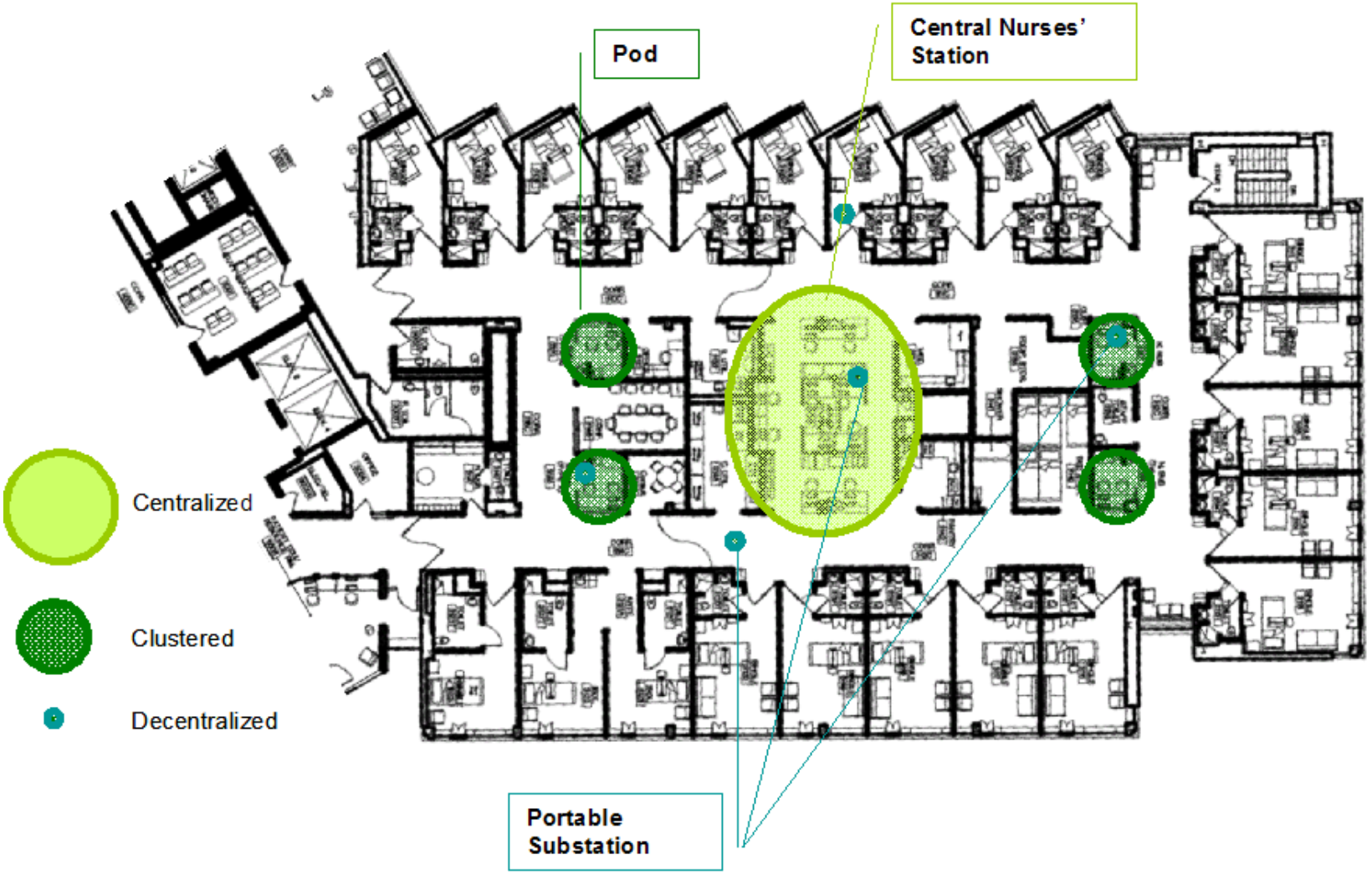


WAYS OF KNOWING







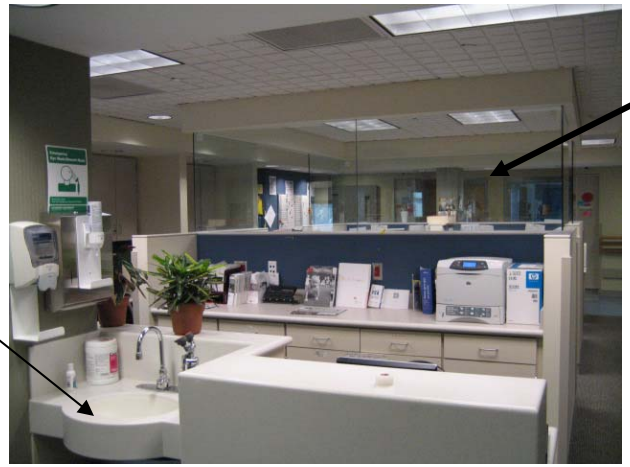


Source: Rosie Adams, 4 wk class project, Dept. Design & Environmental Analysis, College of Human Ecology, Cornell University

Observation & Analysis

CMC Nursing Unit Design

Central Unit



Dictating station with glass barrier

Sink



Doctor dictating station

Bench/ ledge

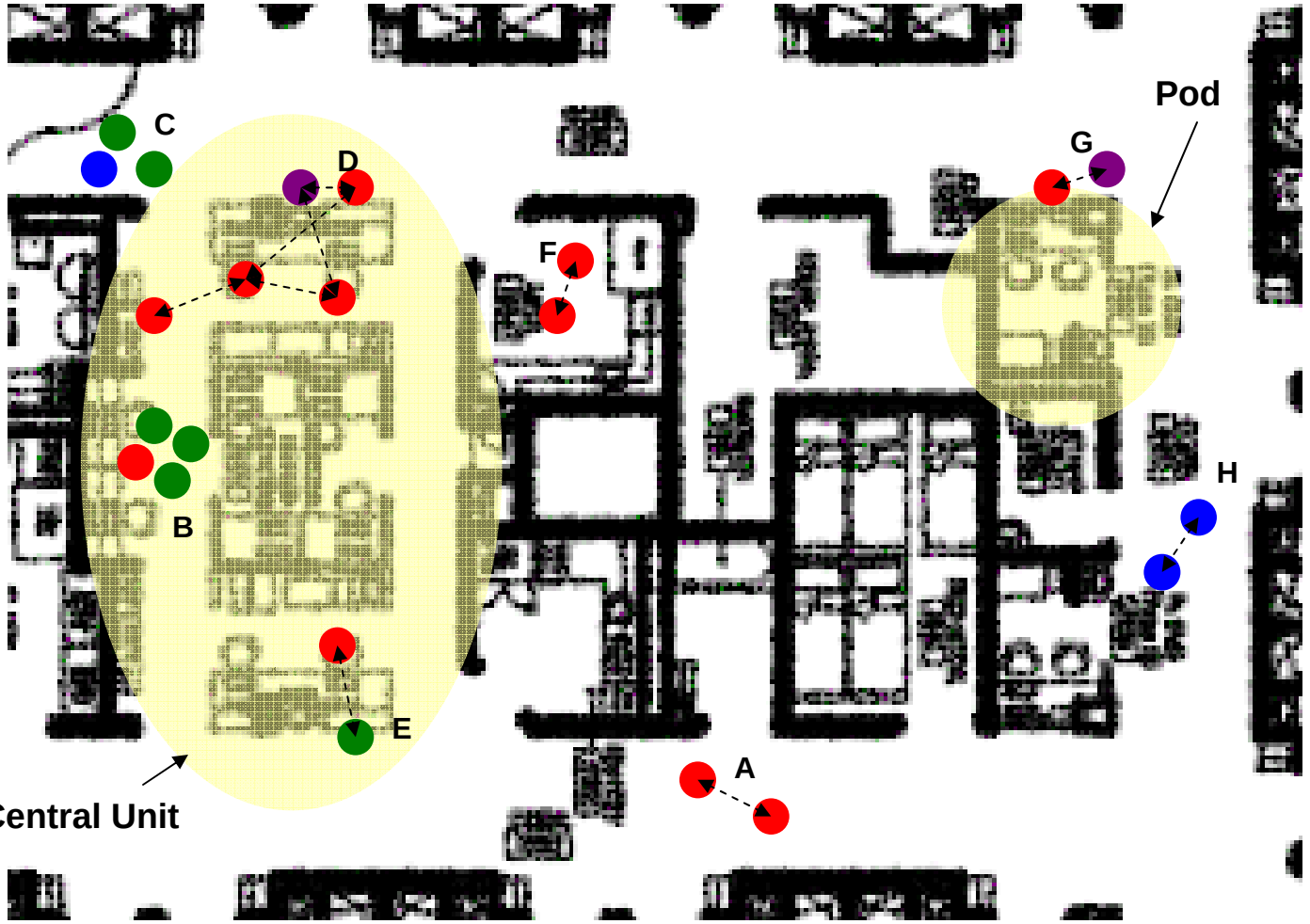


Central Unit

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Observations & Analysis

Behavior Mapping



Nurse

Doctor

Patient/ Family

Other

Nursing Unit Interactions, 7:30am-10:00am

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Observations & Analysis

Space Usage

Key Findings:

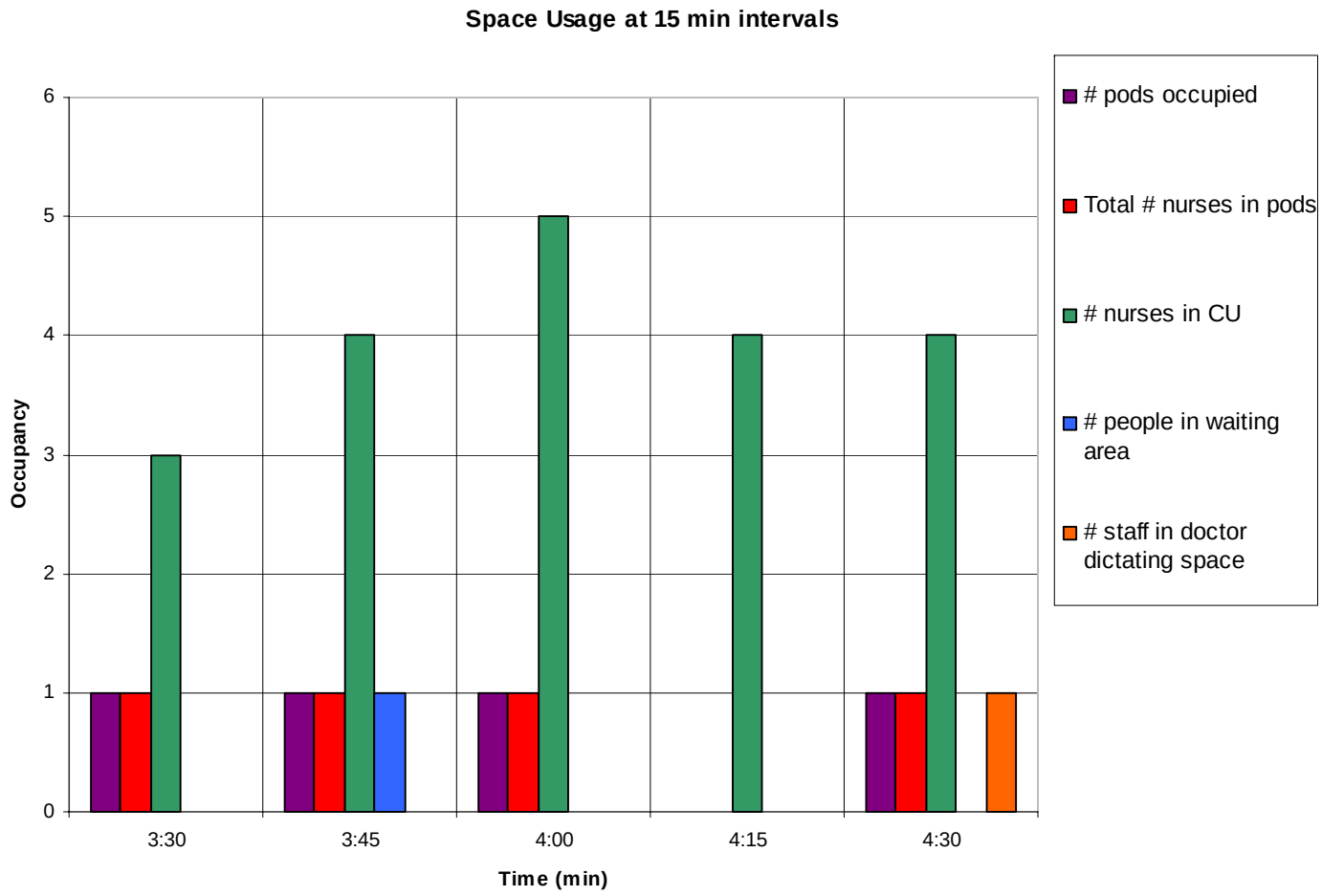
-Rarely is >1/4 pods occupied at any given time

-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



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Observations & Analysis

Nurse Shadowing

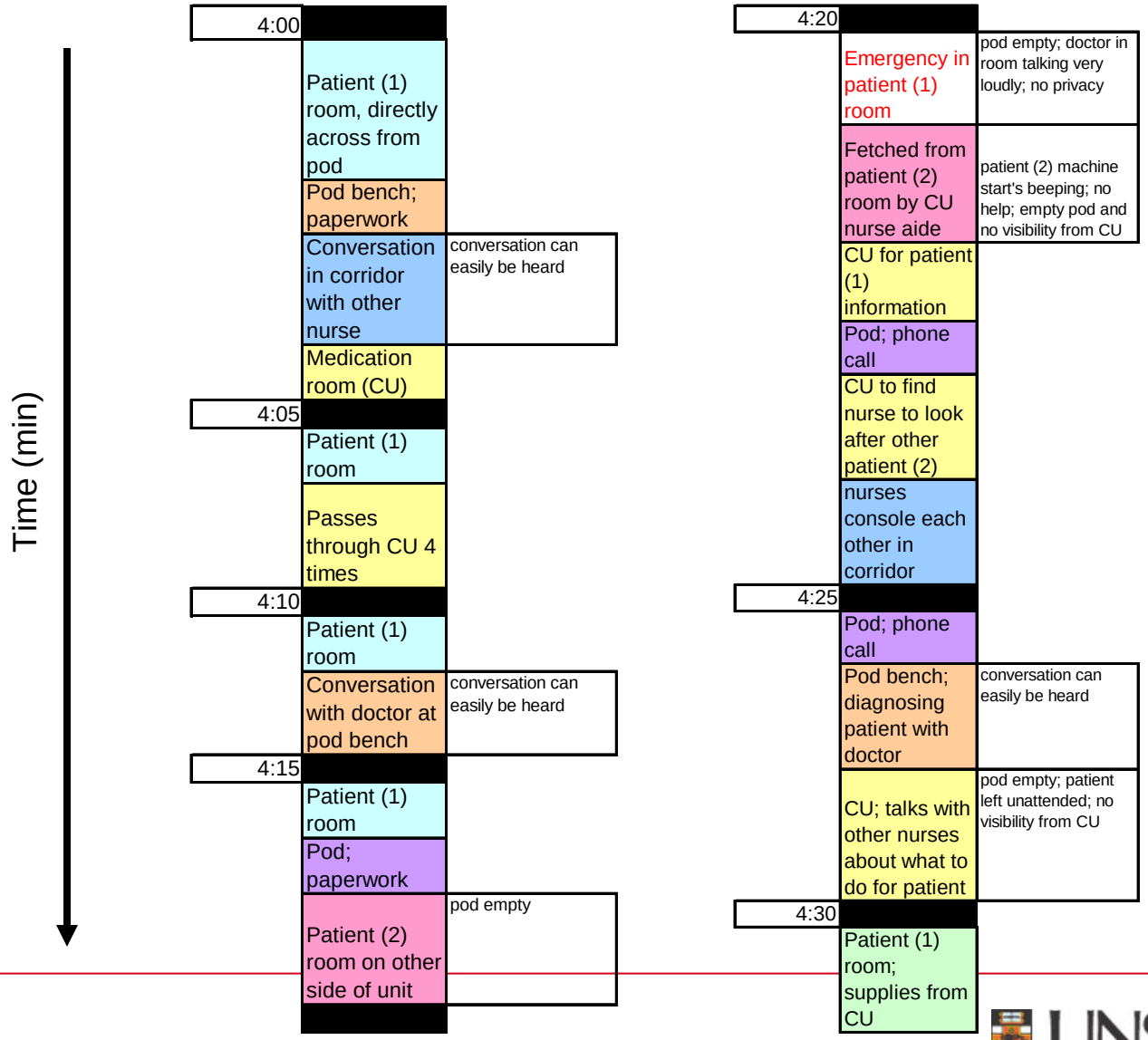
Key Findings:

-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



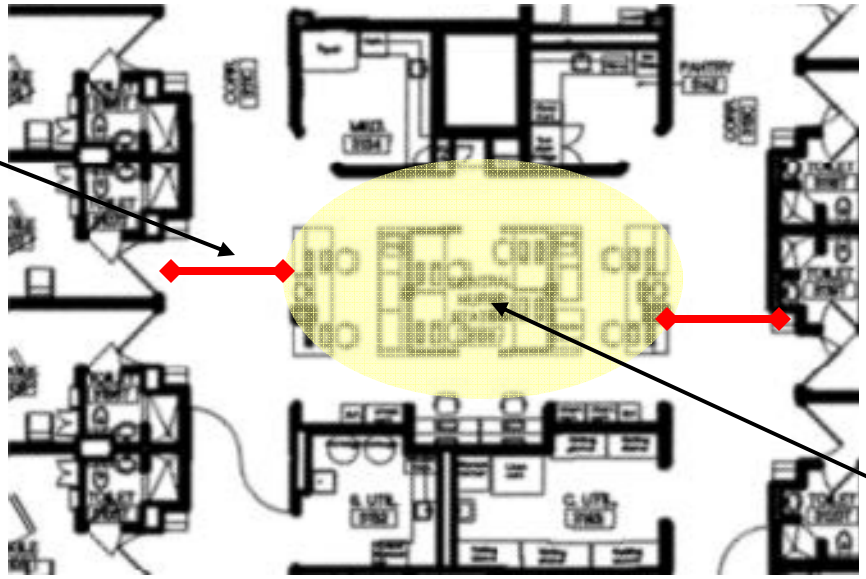
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Observations & Analysis

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.

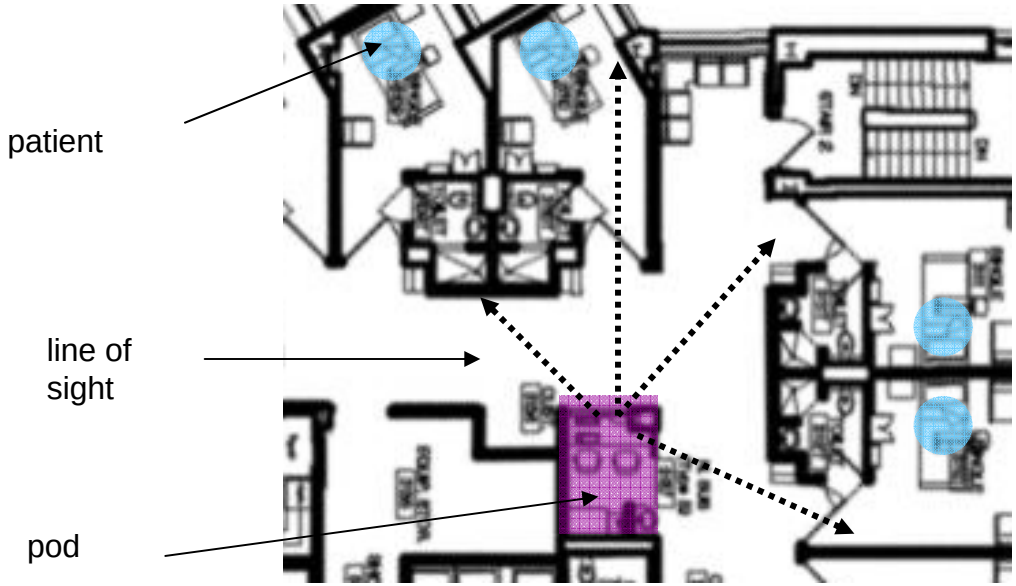
"The lack of a centralized unit means that nurses and physicians are often forced to meet in hallways to discuss patient status, usually within earshot of patients." (Flynn, 2005)



Observations & Analysis

Privacy & Visibility

➢ Pods were designed to increase visibility of patients. However, patient rooms were designed to provide patients with increased visual privacy. As a result, patients cant be seen from pods. Visibility of patients is very low from the CU.



Patients cannot be seen from pod

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.

Synthesis

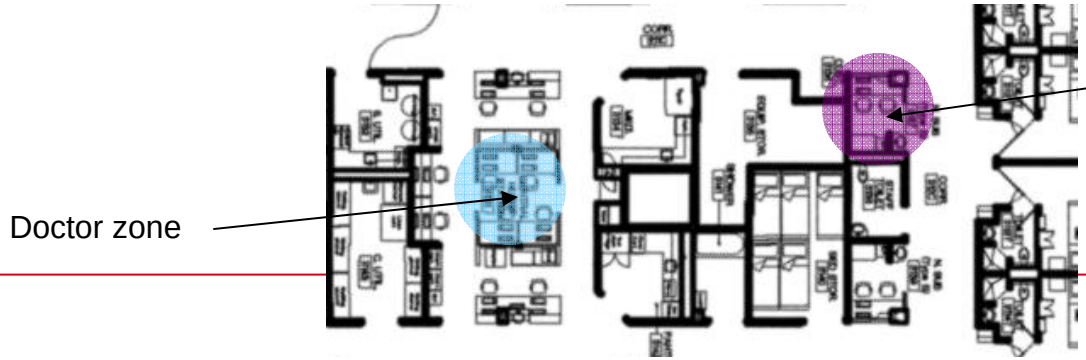
Implications of Observation & Analysis

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 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.



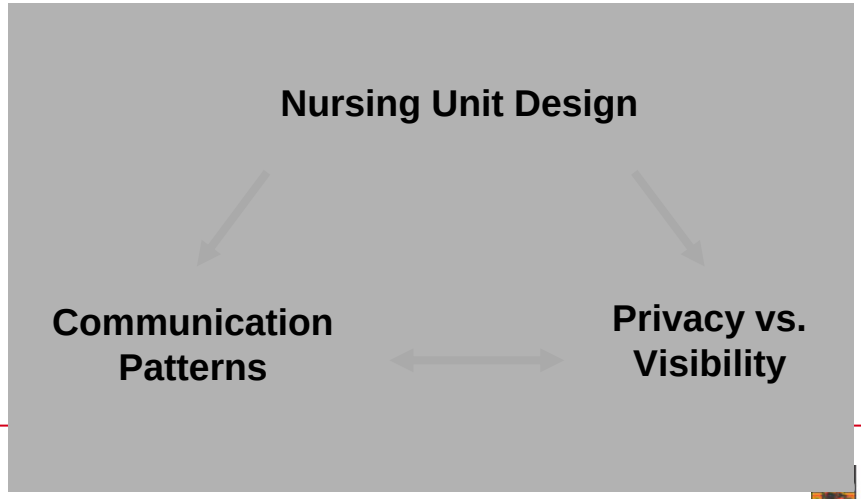
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Synthesis

Implications of Observation & Analysis

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 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.**



Solutions

Overview

- 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.**

Solutions

Short-term

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.



Common zones



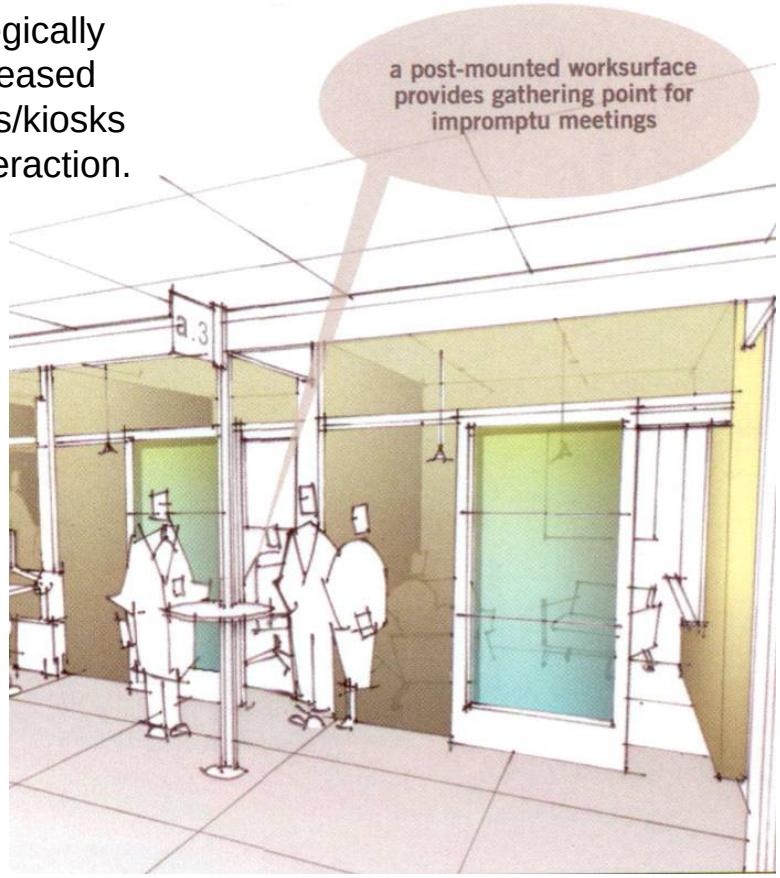
Remove nurse names from pod whiteboard

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.



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

• 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

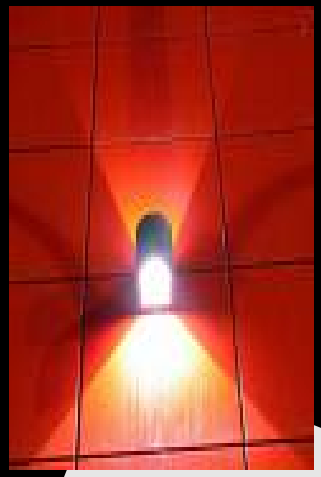


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Ledges

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Post Occupancy Evaluation

"Post-occupancy evaluation (POE) is the process of evaluating buildings in a systematic and rigorous manner after they have been built and occupied for some time"

(Preiser, 1988)

"any and all activities that originate out of an interest in learning how a building performs once it is built, including if and how well it has met expectations"

(Vischer, 2001)

What is Post Occupancy Evaluation? What can it achieve?

Post Occupancy Evaluation (POE) is:

'The systematic evaluation of health service buildings or facilities assumed to occur some time after their occupation and usually after a defined period of use such as 12 months to 2 years'.*

The purpose of the evaluation is to:

- Review project outcomes against planned outcomes
- Disseminate lessons to stakeholders
- Inform future decisions/actions

*Carthey J (2006)

Post Occupancy Evaluation – Key Points

Post Occupancy Evaluation (POE) is described in the CHAA POE handbook *from the perspective of a person/organisation undertaking the POE process.*

- is not intended to test contract compliance
- is a systematic approach
- looks at issues such as functional relationships or quality of finishes from the perspective of how these support the goals of the organisation ie the support of its health service/care activities
- reports in a standardised format

Available from www.chaa.net.au (free download)

Post Occupancy Evaluation (POE)– Key Points

- **quantitative information** needed to assess performance of the building/facility.
- **qualitative information** required to understand the context and nature of the expected and achieved outcomes.
- **complexity and scope can vary** – from whole facility, one part only or one particular issues e.g. door widths
- the process should be **tailored to deliver the required information**

POST OCCUPANCY EVALUATION
POE EVALUATION MATRIX – ISSUES TESTED

	Service Outcomes	Facility Functionality	Facility Procurement Process
Project Profile *Generic project information (minimum data set) collected to enable comparison of projects.*	Data collected includes: Role delineation, catchment size, Service level, occasions of service, operational budget, staffing FTE, project services, catchment area, bed numbers etc.	Data collected includes: Building HPU, HPU cost, HPU Gross Floor Area, HPU Circulation Area, HPU Travel and Engineering.	Data collected includes: Capital budget, program, procurement methods, PFP approval, PDF approval, predicted project length.
Facilities Data *For overall facility issues*	*Data collected to test:* *- Improved health outcomes as per government strategies and Procurement Feasibility Plan eg Facilities supporting desired service models*	Data collected to test the generic section of the HFGs e.g.: performance against the Project Definition Plan, Design, Building Services and ESD, OH & S, Safety and Security, Infection Control Particular HFG requirement eg ensuite sizes.	*Data collected to test:* *- Effectiveness of PDP process in achieving the built project.* *- Scope and budget control* *- User group process* *- Communication strategy* *- Project management processes*
HPU Specific Data *For specific HPU*	*Data collected to test:* *- Estimated service utilisation (PFP) for Health Planning Unit vs actual.*	Data collected to test HPU specific sections of the HFG: Test performance against the Project Definition Plan. - Test HFG requirements - Design and technical issues feedback to HFG and TS11.	*Data collected to test:* *- Test operational commissioning process and feedback to POFP review*

Post Occupancy Evaluation
Project Information Matrix

	1. Service Outcomes Process	2. Facility Functionality	3. Facility Procurement
a. Project Profile	Generic project information (minimum data set) **collected to enable comparison of similar sized projects**. Data collected includes: -role delineation; -catchment size; -service level; -occasions of service; -operational budget; -staffing FTE; -project services; -catchment area; -bed numbers etc.	Generic project information (minimum data set) **collected to enable comparison of similar sized projects.** Data collected includes: -building HPU; -HPU cost; -HPU Gross Floor Area; -functional relationships; -HPU Circulation Area; -HPU Travel and Engineering.	Generic information **collected to enable comparison of similar sized projects and to test the adherence to the Process of Facility Planning**. Data collected includes (as applicable): -capital budget; -program; -procurement methods; -SPP approval; -PDP approval; -predicted project length.
	Source: Facility Business Case or Service Procurement Plan (SPP).	*Source: Project Definition Plan (PDP)*	*Source: Facility Business Case or Service Procurement Plan (SPP) & Project Definition Plan (PDP)*

Developed from the *NSW Post Occupancy Evaluation Plan - May 2004*, No.7 Post Occupancy Evaluation Information Matrix.

Post Occupancy Evaluation
Project Information Matrix

	1. Service Outcomes Process	2. Facility Functionality	3. Facility Procurement
b. Facility Data	For overall Facility: **Improved health outcomes** as per government strategies and Service procurement Plan (SPP) e.g. facilities supporting desired service models.	For specific Health Planning Unit: Estimated service utilisation (SPP) for Health Planning Unit vs actual. Purpose of data collection **to test the generic section of the Health Facility Guidelines** in terms of assessing: -Performance against the Project Definition Plan including Design, Building Services and ESD, OH&S, Safety and Security, Infection Control; -A particular HFG requirement e.g. ensuites sizes.	For overall Facility **Assess effectiveness of PDP in achieving the built project**. -Assess scope and budget control; -Assess user group process; -Assess communication strategy; -Assess project management.
	Source: Relevant government strategies/policies available from SPP briefing papers list- Models of care etc.	*Source: Actual utilisation for comparison with the SPP will be available from Facility or Health planning unit reports & POE Survey tool.*	*Source: Refer SPP Report, POE survey and interviews (if applicable), Business Case, SPP user group/community consultations & interview process.*

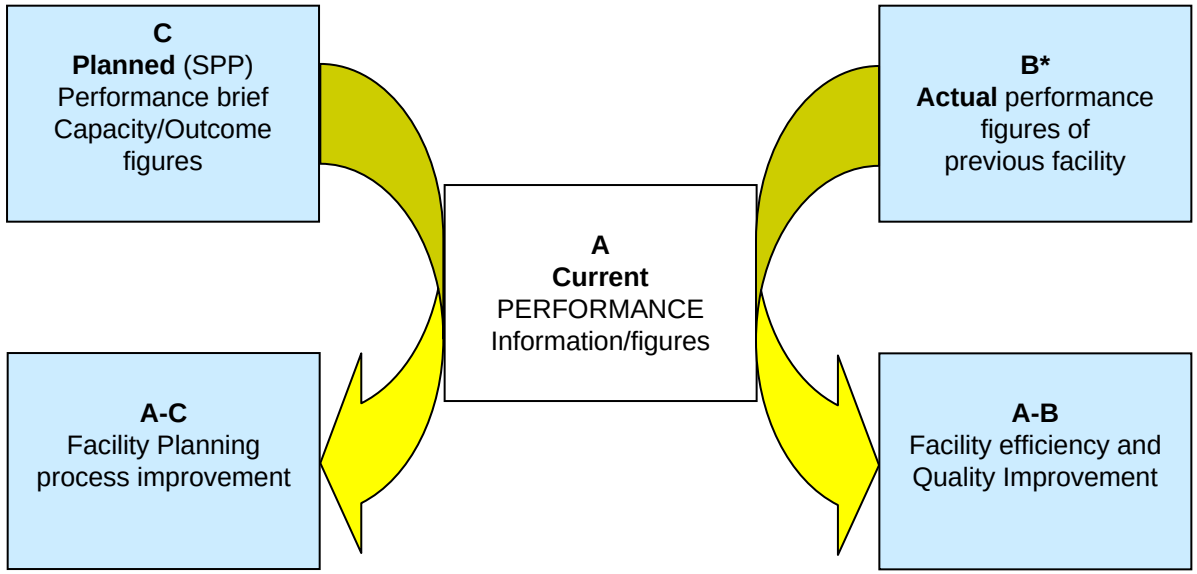
Post Occupancy Evaluation
Project Information Matrix

	1. Service Outcomes Process	2. Facility Functionality	3. Facility Procurement
c. HPU Specific Data	For Specific Health Planning Unit: -Estimated service utilisation (SPP) for health planning unit vs actual performance.	Data is collected to **assess HPU specific sections of the HFGs**: -Assess performance against the Project Definition Plan. -Assess Australasian HFG requirements (CHAA website). -Provide feedback to client and CHAA re design & technical issues to influence future HFG development updates.	For specific Health Planning Unit: -Assess operational commissioning process and provide feedback to POFP review.
	Source: Unit performance data & mandatory requirements such as EAPS management reports.	*Source: Refer SPP Report & POE survey and interviews (if applicable).*	*Source: Refer SPP Report & POE survey and interviews (if applicable).*

Developed from the *NSW Post Occupancy Evaluation Plan - May 2004*, No.7 Post Occupancy Evaluation Information Matrix.

POE - Testing Service Performance

A system that compares achieved outcomes against planned outcomes, and previous performance.



A-B = Efficiency and quality improvement*
A-C = Planning and design process improvement

* On a new 'greenfields' project there may only be planned figures available.

Post Occupancy Evaluation Process
Planning Criteria Table

Step 1
Participants rate the relative importance of each criteria statement to the functioning of the facility.

Step 2
Participants assess the facility's performance in meeting each of the criteria.

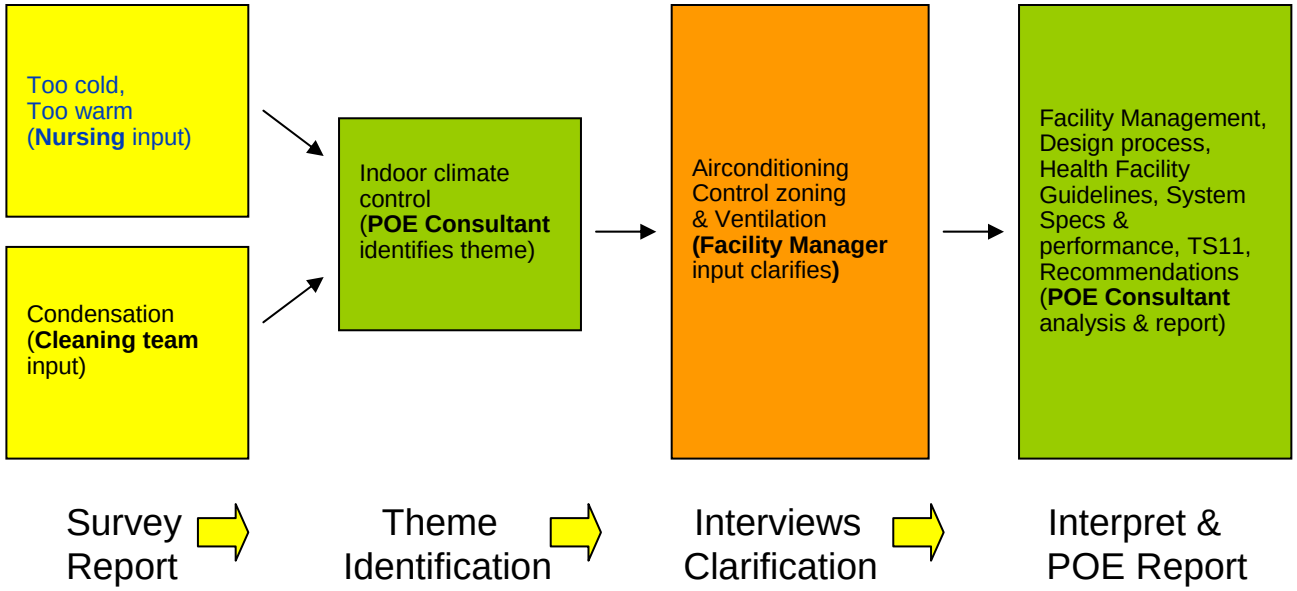
Importance	
H	High
M	Medium
L	Low

Score	Description
5	Exceptional
4	Good
3	Functional
2	Poor
1	Unsatisfactory

Statements may be replaced with project specific criteria

Criteria Statements	Importance (H, M or L)	Assessment (score 1-5)	Comments
a. Development of an integrated health model through collocation to:			
i. Enhance access to services for the community.			
ii Improve effectiveness of services.			
iii Result in cost efficiencies in the delivery of services.			

POE Information processing – an example



Indoor climate control example: Too cold, too warm, condensation

Practice-Based Research: WORKSHOP EXERCISE #1

- Develop practice-based research project

Practice-Based Research: Takes Many Forms

- Issue or design oriented (Facility or HPU level POE)
- Observational data
- Survey data
- Archival data
- Interviews and focus groups
- Comparative and case study
- Weeks to months duration

The common thread?

More informed decision-making based on evidence grounded in some form of systematic data collection and analysis

Practice-Based Research: Issues to Consider in Your Project Proposal

- Identifying the right questions
- Who should be involved, doing what?
- Generating internal interest and support
- Clarifying time frame
- Developing research approach (design, collection, analysis, interpretation)
- Who/How collect, analyze, and interpret data
- IRB/Ethics approvals

Practice-Based Research: WORKSHOP EXERCISE #2

- Interpret and apply practice-based research results

How do we make decisions on projects?

Who are stakeholders?

Who makes the decisions?

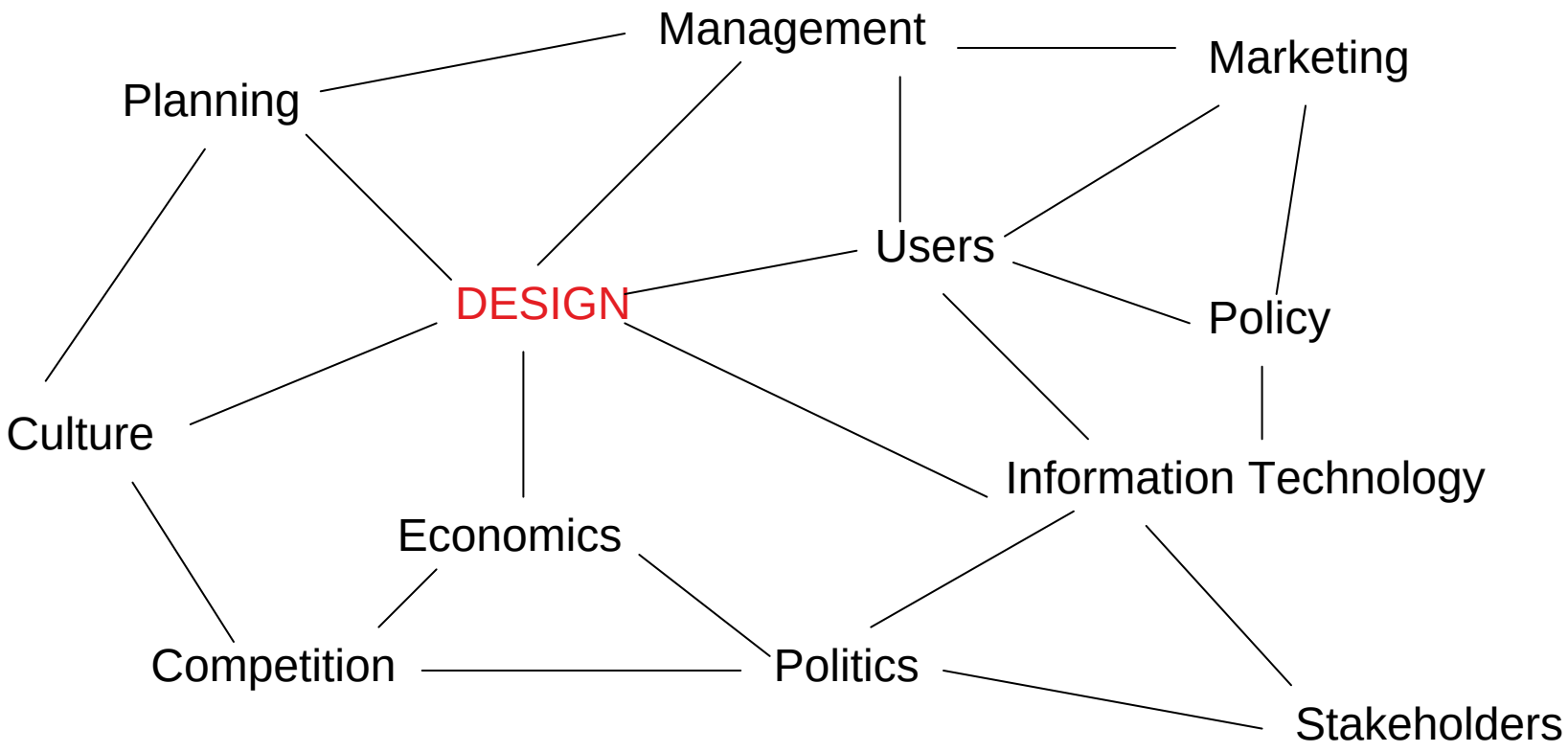
How do we make best use of the ‘facts’ or ‘evidence’ from research or other sources?

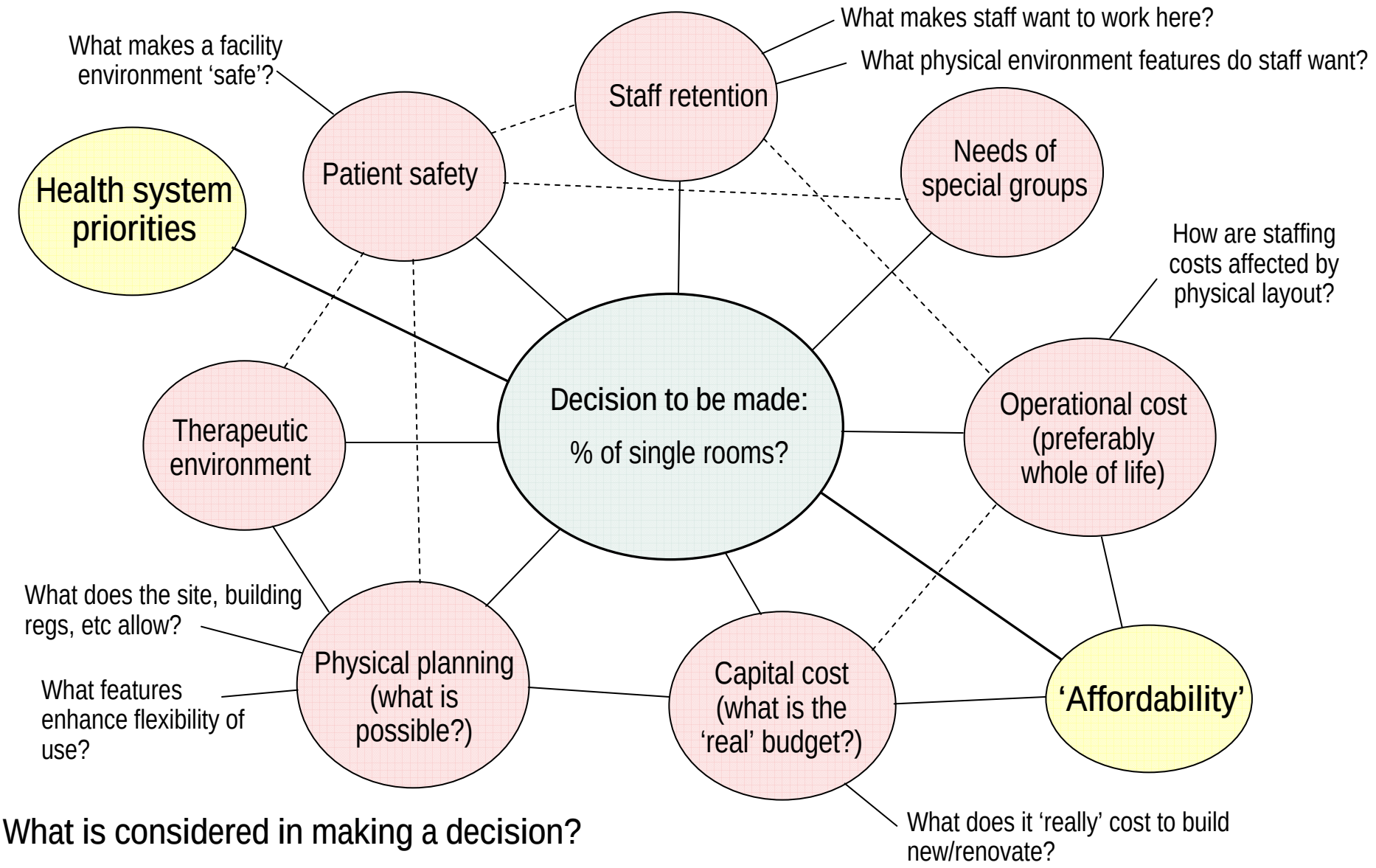
How do we choose between alternatives that appear to be equal? Or when we don’t have the evidence to support a choice?

How do we know where to find the evidence or how to generate it via research if the evidence doesn’t exist or isn’t applicable to our project?

The Organizational Ecology of Healthcare Environments

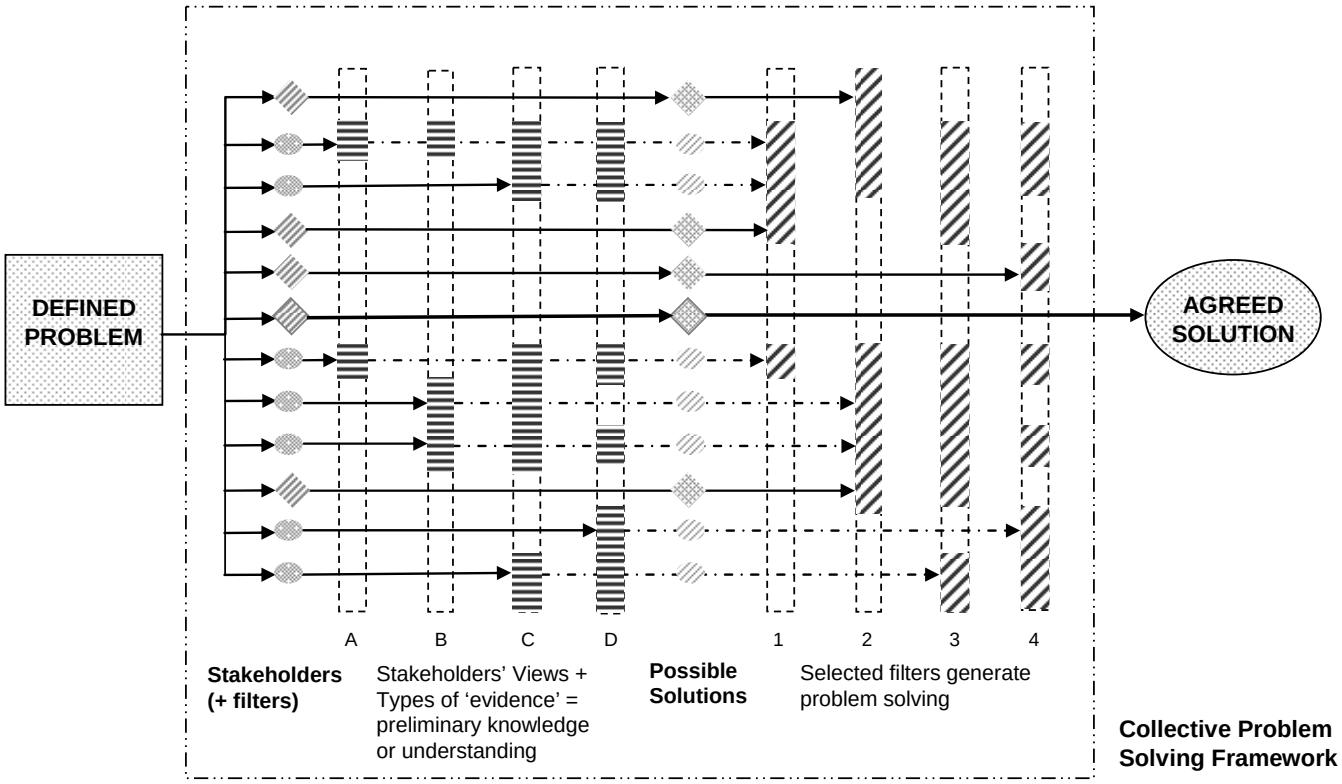
It is a SYSTEM: A tangled web of interdependencies





What is considered in making a decision?

What are the ‘filters’?



Use of Evidence and Filters to Determine Facility Design Solutions

(Becker & Carthey, 2007)

What is the ‘evidence’?

Goal: Nursing Unit Design More Efficient & Effective: Improve Care Quality

Key Findings:

- Rarely are >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
- 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
- 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.

Summary: Practice-Based Research Benefits

- Manage risk by reducing uncertainty through EBD
- Create a healing environment that reflects how people actually behave
- Improve service delivery and patient safety by identifying what works and does not
- Adopt the mindset of continuous improvement
- Achieve value for money

Summary: Sharing the research?

- Pebble Project – US-based
- What could work in Australia/NZ?

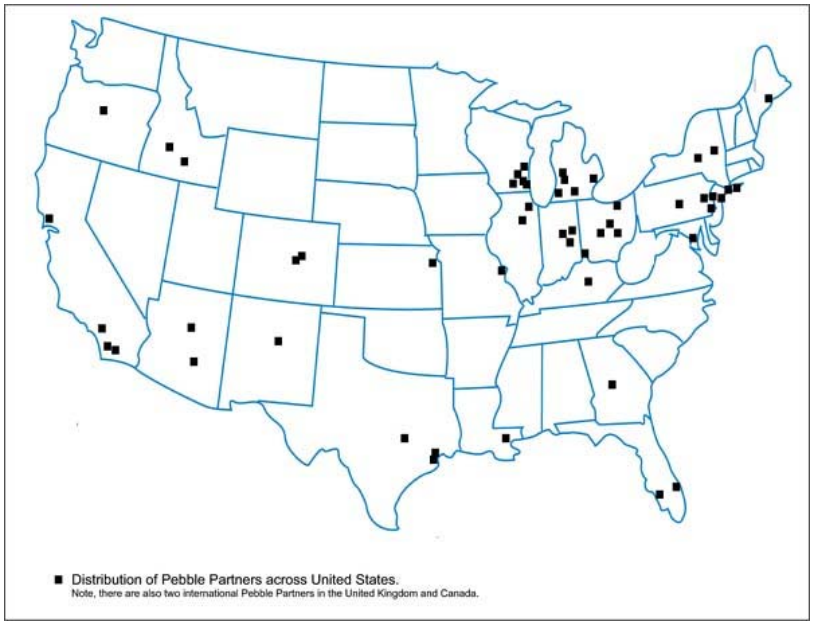
Useful References?

- HERD Journal; www.herdjournal.com
- Center for Health Design; www.healthdesign.org
- Centre for Health Assets Australasia; www.chaa.net.au

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www.healthcaredesignmagazine.com, 12 Feb 2008







http://geography.about.com, 12 Feb 2008







It takes a team!!

Thank you……







