

# Design for health: Improving care quality - building evidence into the architecture

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## **Building evidence into the architecture: using Health Facility Guidelines to promote better quality of care through improved design**

- Complexity of healthcare buildings is increasing
- Design of physical spaces has several purposes including:
  - Support clinicians in care delivery roles
  - Provide patient environments to assist rather than hinder healing
  - Deliver environments that promote wellbeing for all facility users
  - Assist care delivery organisations such as hospitals to deliver appropriate care, within capital and operational budgets, and with available workforce.

## **This paper:**

- Examines the interaction of stakeholders and ‘evidence’ during decision-making processes that develop design guidelines for health facilities
- Looks at different types of ‘evidence’ available e.g. academic, practice based, post occupancy evaluation – and how these can impact on the design of health facility projects
- Discusses how guidelines are developed, referencing ‘evidence’ and research, are peer reviewed and implemented in the design of health facility projects in Australia and New Zealand
- Looks at an example of POE used to inform guideline development
- Considers the strengths and weaknesses of this process in terms of the impact on health facility design outcomes

## Introduction

- Health buildings are complex and increasingly expensive
- They must accommodate the needs of many, diverse stakeholders
- Demand for healthcare continues to increase
- Reasons include: ageing population, increasing availability of expensive medical technology, skill shortages in medical workforce, plus increasing consumer expectations for “healing environments”
- Publicly funded health systems face a particular challenge as capital expenditure has a limit – yet equity and access are issues to be addressed in such systems.

## Introduction

- Australian health expenditure in 2005 – 2006 was \$86.9 billion or 9% of GDP (AIHW 2008)
- Capital expenditure was 6% of this or \$5.2 billion.
- Design standards are used to maximise returns on this investment
- There are strengths and weaknesses associated with this
  - e.g. the “standard” becomes the “maximum” or “planning efficiency” is more important than other factors such as good design
- Latest evidence must be used - from a range of sources – must be relevant to the Australian context and health system
- Future and emerging trends must be considered
- Guidelines should encourage innovation rather than stifle it – not always easy to do!
- Should allow for future growth, flexibility and adaptability of health facilities

## Development of Guidelines - Context

- Used by many countries – including US, UK, the Netherlands, Australia and New Zealand
- Interface with the common practices of designers – briefing/programming, design and construction documentation
- Offer the ability not to “start from scratch” on every project
- Can ensure acceptable and consistent quality on all projects
- Can ensure “functionality” or “fitness for purpose”
- Do not replace the services of a good architect or designer.

## Development of Guidelines - Context

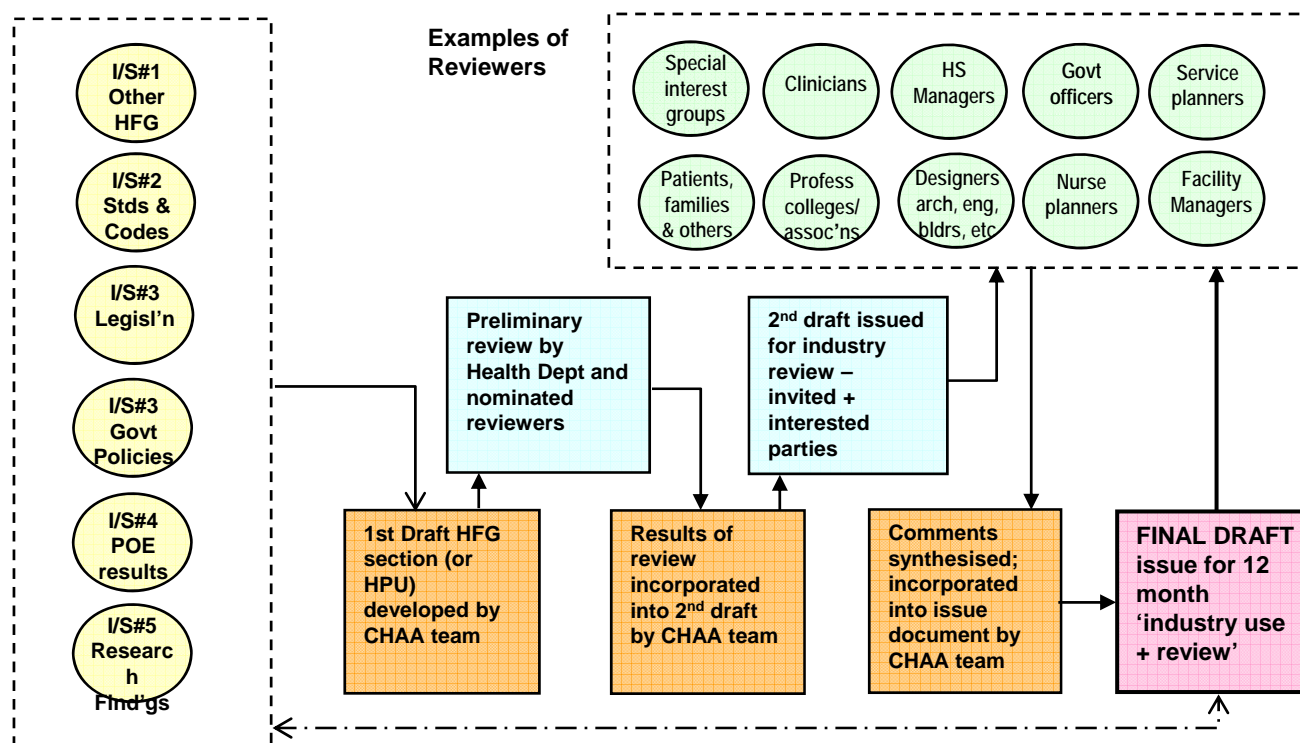
- Use of evidence from research and other sources such as architects' previous projects
- Research can come from many disciplines including health service management, psychology, clinical studies – occasionally from architecture or construction-related fields.
- Architects use many sources of information to guide their projects – demonstrated in NSW-RAIA study of Healthcare Designers' Information Use in 2005.



## Development of Guidelines - Context

- Use of Post Occupancy Evaluation provides valuable input
  - Underutilised learning opportunity
  - Learn from one project to apply to the next
  - Valuable for large clients who undertake many projects of a similar type
  - Understand what did not work but also what went well

# Development of Australasian Health Facility Guidelines



Examples of the 'evidence':  
Information  
Sources (IS)

**Note:**  
All processes managed and developed by the CHAA  
team which includes architects, health planners,  
clinicians, managers, service planners, FM, etc

**Australasian HFG Development Process**

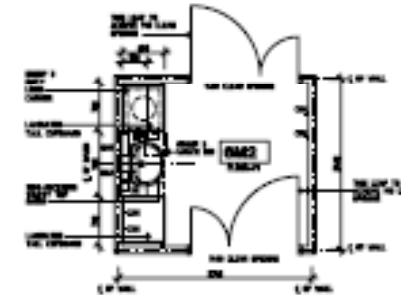
# Governance – AusHFG Development



# Using physical design features to prevent and control the spread of infection within facilities

- AHFG 'Standard Components' = standard rooms/typical application
- Room data and room layout sheets
- Example shown of room layout for 'ante-room' of 6sqm

40	ALUMINUM SHIELD
41	CLAY HOLE
42	DISPOSER - DISPOSABLE GLOVES
43	DISPOSER - HARD TONGS
44	DISPOSER - SOAP
45	DISPOSER - SOAP ANTISEPTIC
46	DISP AND EGG PLATE PROTECTAN
47	FLUO SHIELD
48	LEAK SWITCH
49	FLAM MATE (FLAM RESISTANT)
50	WEL, ALUMIN, COGNATE



### PLAN



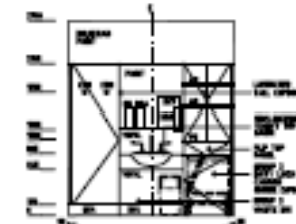
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ELEVATION 2



ELEVATION 3



ELEVATION 4

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2	GENERAL IMPROVEMENT	2000	AL								
3	GENERAL IMPROVEMENT REL. NAME CHANGE	2000	AL								







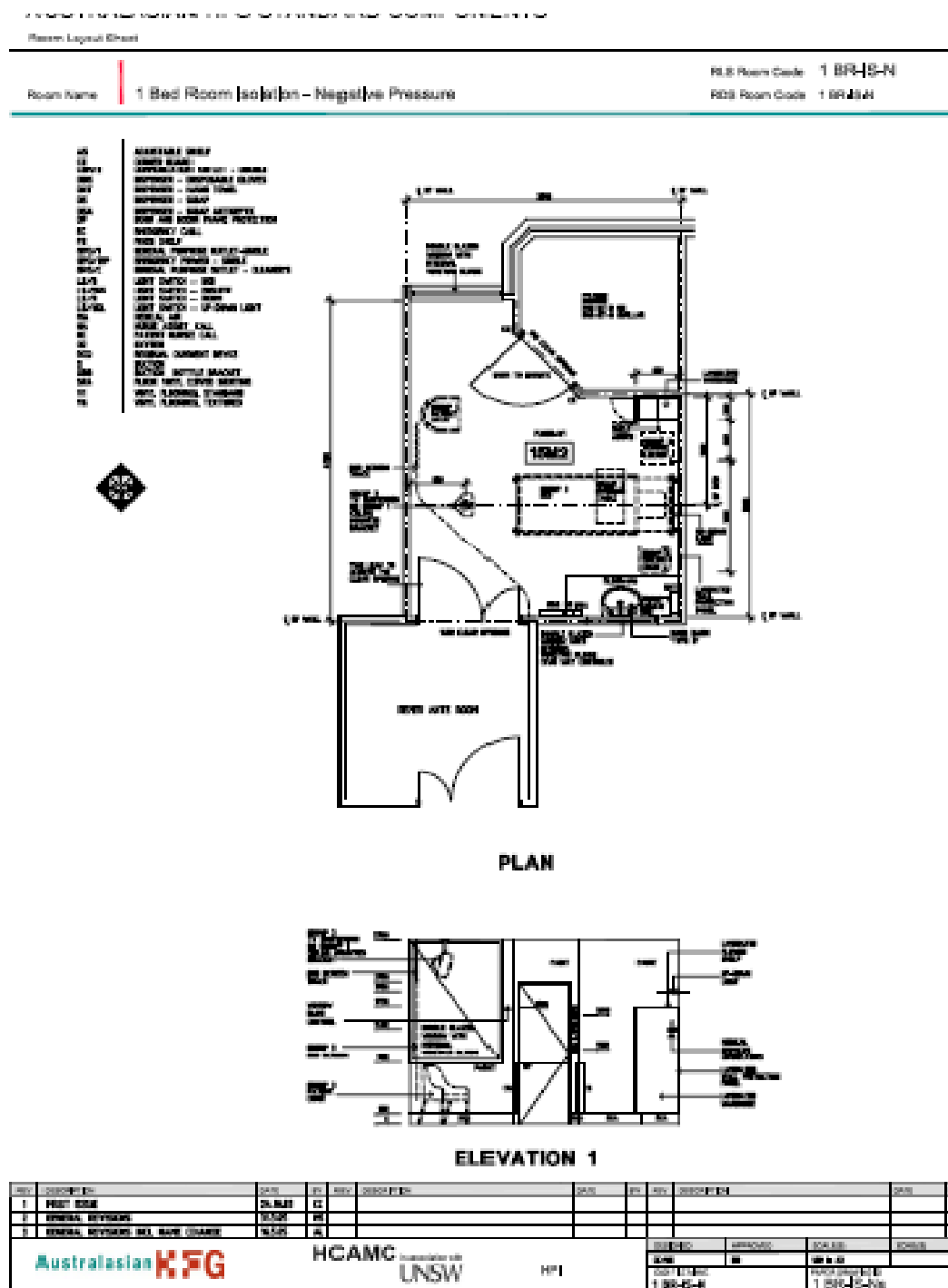
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## Using physical design features to prevent and control the spread of infection within facilities

- AHFG 'Standard Components' = standard rooms/typical application
- Room data and room layout sheets
- Example shown of room layout for 'negative pressure isolation room'



## **Development of Guidelines Using POE Results**

- 3 x NSW Child and Adolescent Mental Health Units undertaken in 2007**
  - Gna Ka Lun at Campbelltown, Sydney, Australia
  - Nexus Unit at John Hunter Hospital, Newcastle, Australia
  - Hall Ward at Westmead Children's Hospital, Sydney, Australia

## PROFILE OF THE UNITS STUDIED

### Gna Ka Lun, Campbelltown

- Officially opened in 2001
- Campbelltown Hospital Campus – outer south western suburbs of Sydney
- Name means '*healing of the mind*' – given to the unit by an Aboriginal elder of the local Tharawal people
- Some socio-economic deprivation
- Rapidly growing population, new housing developments, young population





## PROFILE OF THE UNITS STUDIED

### Gna Ka Lun, Campbelltown

- Adjacent to Waratah House, adult MH unit
- Separate entrance, covered walkways to Waratah House & general hospital
- 10 x inpatient beds plus a day program; aged 12 – 17 years
- Tertiary referral centre
- Referrals accepted from mental health clinicians, psychiatrists, NSW hospitals
- Some patients from rural or remote areas of NSW





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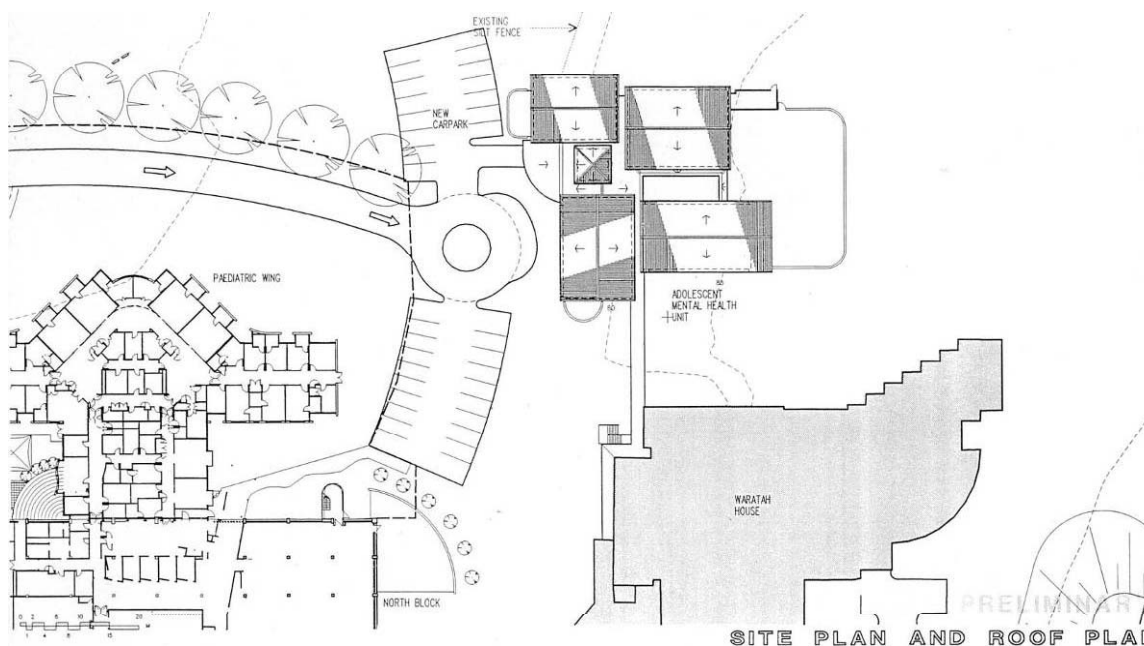
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## PROFILE OF THE UNITS STUDIED

### Gna Ka Lun, Campbelltown



**SOUTH WESTERN SYDNEY AREA HEALTH SERVICE**  
**CAMPBELLTOWN ADOLESCENT MENTAL HEALTH UNIT**

PROJECT NUMBER 2002  
DI CARLO POTTS AND ASSOCIATES PTY LTD ARCHITECTS AND HEALTH PLANNERS Level 4, Henry Lawson Building, Birchwood Road, Rossmore SA 5038  
PH 8752 8888 FAX 8752 8844 SCALE: 1:200 DRAWING NUMBER: SK 001 ISSUE: B



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## Gna Ka Lun, Campbelltown





## PROFILE OF THE UNITS STUDIED

### Nexus Unit, John Hunter Hospital, Newcastle

- Commenced operation in 2003
- Sole CAMH unit servicing northern NSW
- Newcastle is a mixed demographic area, working families – mining and industrial history
- JHH is administered by Hunter New England AHS, also covers North Coast



## PROFILE OF THE UNITS STUDIED

### Nexus Unit, John Hunter Hospital, Newcastle

- After first year of operation, re-classified and re-structured as high dependency unit
- State-wide referrals for high acuity patients
- 12 beds
- Admits children and adolescents from 5 – 18 years
- Patients referred for admission by local CAMHS community team, GPs, DoCS or school counsellors.



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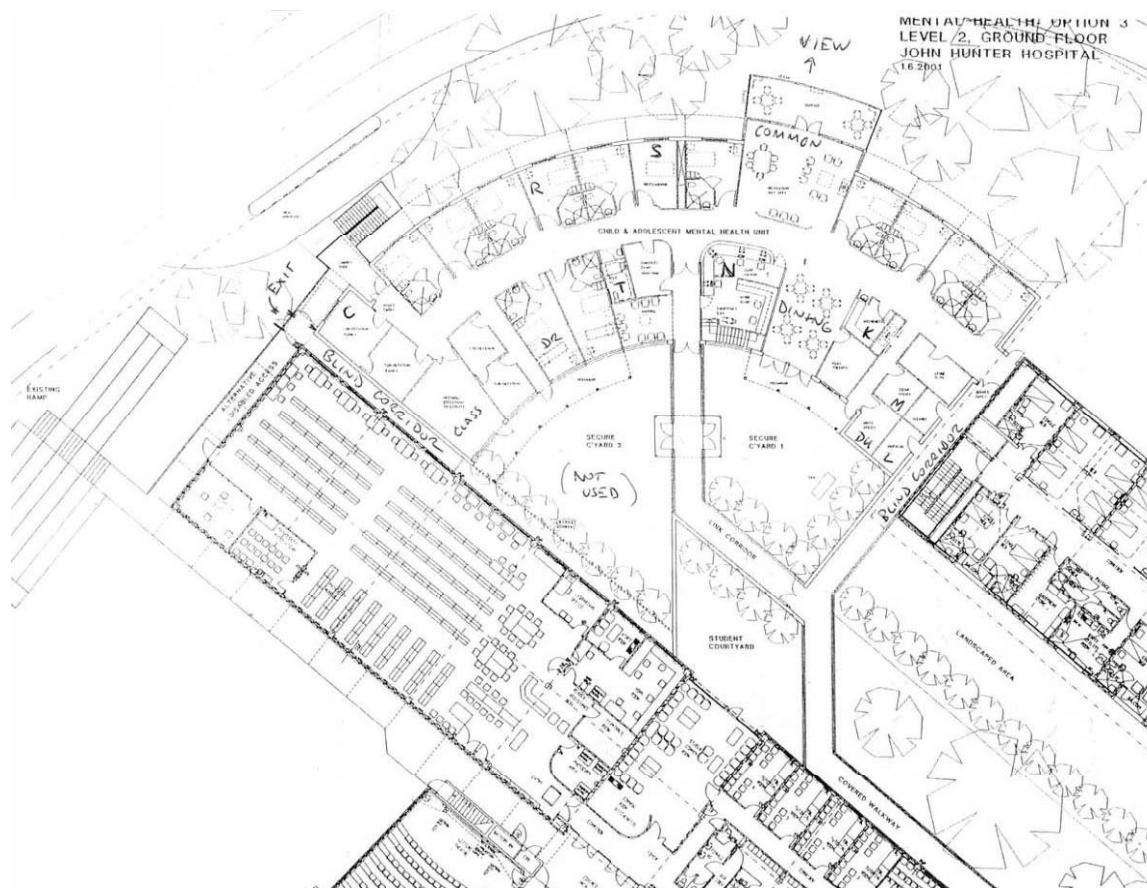
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## PROFILE OF THE UNITS STUDIED

### Nexus Unit, John Hunter Hospital, Newcastle





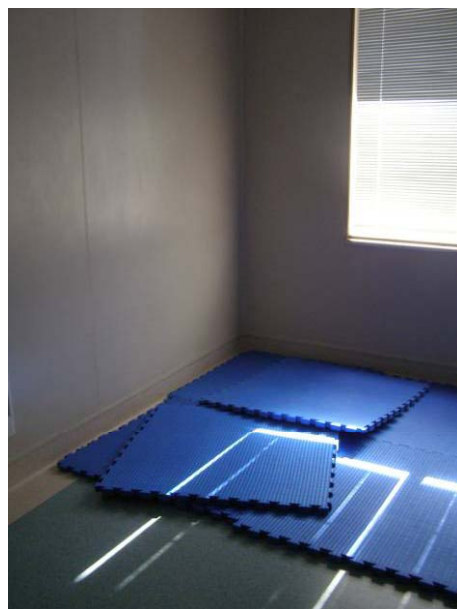
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## PROFILE OF THE UNITS STUDIED

### Nexus Unit, John Hunter Hospital, Newcastle



## PROFILE OF THE UNITS STUDIED

### Hall Ward, Children's Hospital at Westmead

- Officially opened in 2004
- Within Children's Hospital at Westmead
- Administered by Children's Hospital at Westmead (which is a separate Health Service to Western Sydney AHS which manages MH facilities on the adjacent campus)
- Occupies a refurbished ward that previously housed Adolescent Medicine service (now adjacent)



## PROFILE OF THE UNITS STUDIED

### Hall Ward, Children's Hospital at Westmead

- 8 beds including one high dependency
- Shares facilities with medical adolescent ward including a classroom and outdoor space
- Accepts patients from 6 – 16 years
- Patients at either end of acuity scale may be transferred to other facilities
- Agitated or violent patients transferred to Redbank House, a short walk away in WSAHS
- Eating disorder patients managed in the medical ward

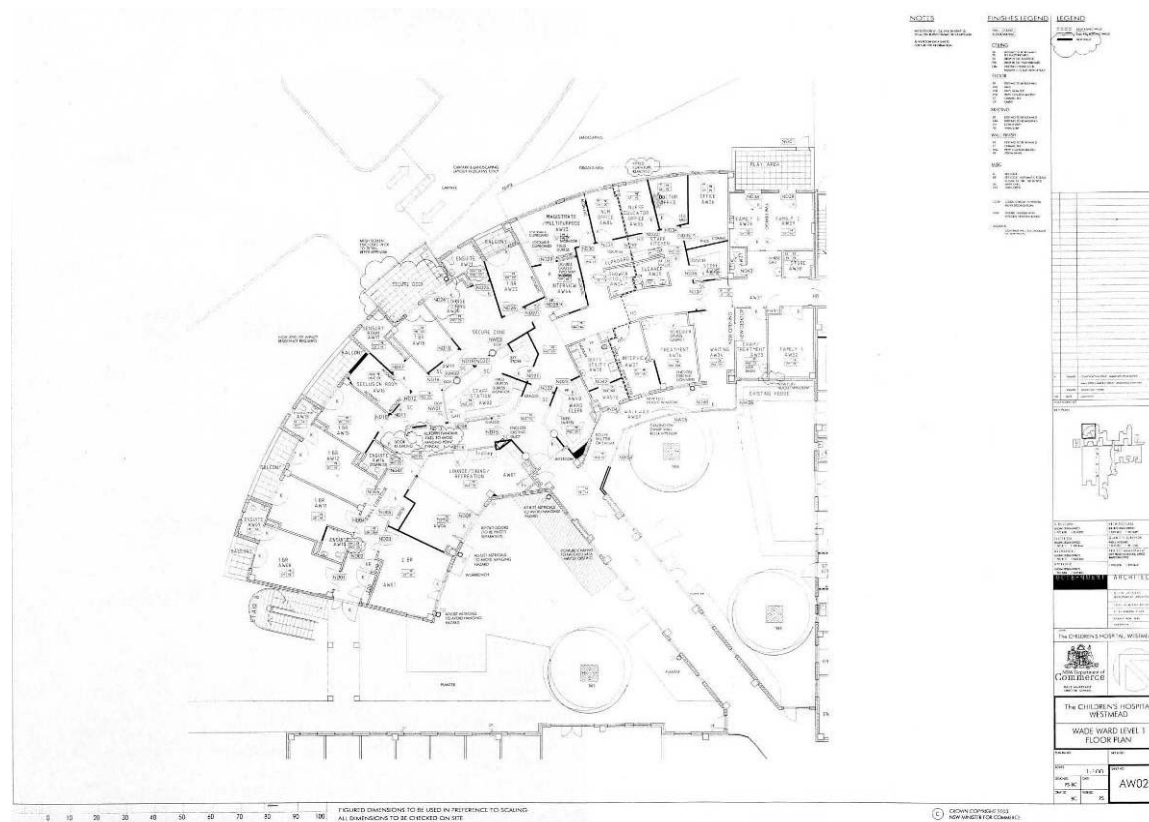




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## PROFILE OF THE UNITS STUDIED

### Hall Ward, Children's Hospital at Westmead



## POE RESULTS: SUMMARY OF RECOMMENDATIONS

### Overall Design/Layout

1. 8 – 12 bed units with a single staff station (as in these units) are appropriate for function, and can be designed to maximise safety.
2. Freestanding or semi-freestanding CAMH units should be considered, if larger capacity and more centralised operation is desired by the health care system in the future.
3. Wherever possible, CAMH unit design should anticipate the need for expansion or modification



## POE RESULTS: SUMMARY OF RECOMMENDATIONS

### Therapeutic Environment

1. Natural light and outlook should be maximised.
2. Indoor ambience should include use of calming, non-institutional colour, plants, and appropriate artwork. Patient art and decoration should be displayed where appropriate
3. Adequate and spacious outdoor areas should be freely accessible to patients. These areas should allow for exercise and outdoor games. They should feature natural landscaping, grass rather than pavement, and allow breeze for cooling in summer. There should be protection from weather
4. Common areas require provision for a safe, quiet retreat space with immediate staff access
5. Small children should have their own play area separate from older adolescents



## POE RESULTS: SUMMARY OF RECOMMENDATIONS

### Therapeutic Environment (continued)

6. ADL (activities of daily living) training and therapy needs to be accommodated. This may include cooking, cleaning, laundry, and gardening / yard care. Unit kitchens should be sized and fitted accordingly
7. Indoor exercise facilities should be provided. While exercise provides therapeutic benefit on many levels, the need is even more acute given the anabolic effect of the newer antipsychotic medications being used
8. A separate library / internet area should be provided. This area could also function as additional education space if required
9. Acoustic design should limit noise and maximise privacy
10. Families should be accommodated nearby, if not in, the unit. A family meeting room / lounge should be provided. Units should have adequate visitor / reception areas and visitor parking nearby



## POE RESULTS: SUMMARY OF RECOMMENDATIONS

### Safety and Security

1. Corridor design and unit layout should allow clear sightlines from areas frequented most by staff. The unit should be designed to avoid blind cul-de-sacs or other unobservable spaces. All corridors accessible to patients should be wide enough for staff to safely assist a patient in crisis
2. Observation may be supplemented with corner mirrors, motion detectors, or discreet use of CCTV where necessary.
3. Roof access should be anticipated and prevented
4. All glazing and mirrors should be impact-resistant, including frames. The use of double glazing with internal blinds does not appear to be necessary
5. Safety fittings should be utilised throughout the facility. Appliances including showerheads, faucets, handles and all fittings should be hang proof, and hooks should be breakaway with a 15kg threshold





## POE RESULTS: SUMMARY OF RECOMMENDATIONS

### Safety and Security (continued)

6. Seclusion rooms should have impact-safe material surfaces (such as padded vinyl), allow clear observation by staff while maintaining privacy from other patients, and have two egress doors
7. Medication dispensing areas should be co-located with staff station
8. Treatment rooms containing medical equipment should be located in well-supervised areas, away from patient access
9. Lock and key systems should be selected for reliability and efficiency of use. The number of separate keys required to be carried by staff should be minimized.



## POE RESULTS: SUMMARY OF RECOMMENDATIONS

### Workplace Functionality

1. Office number & layout should anticipate needs of all staff, including planning for future expansion (size + number) and disabled access. Plans may include two workstations per office, and a separate office for the unit Medical Director and Nurse Unit Manager. Space allocation recommendation 6 m<sup>2</sup>/person (Office of Facilities Management Policies and Procedures, Space allocation Guidelines, Draft 3.1)
2. Staff offices should have a dedicated education area, and a dedicated lounge / tearoom separate from conference / magistrates' meeting rooms
3. Adequate numbers of toilets to be provided, recommend one per six on-site staff or per current Building Code of Australia requirements. Staff shower and change facilities should be provided
4. Office and workspaces should provide separation and secure access from patient spaces and from public



## POE RESULTS: SUMMARY OF RECOMMENDATIONS

### Workplace Functionality (continued)

5. Nursing stations should provide adequate workspace for charting, telephone and computer use - ~4m<sup>2</sup> per rostered nurse. Separate doctors charting areas may be desirable. The nursing station should be secure from patient access and should be acoustically private, while allowing visual observation out
6. Adequate proximity to parking for all staff is required





## Conclusions

- Design guidelines are only as good as the process used to develop them and the skill of those who apply them in practice
- A range of different types of evidence are available for guideline development – as referred to in this paper and by my colleagues
- This paper looks at examples of these and this presentation has discussed the potential role that post occupancy evaluation can play in gathering evidence at a small scale.
- Discussed the processes used to develop the Australasian Health Facility Guidelines - review and governance.
- Publicly funded health system find guidelines useful to ensure cost and quality benchmarks are achieved across many projects
- The challenge is to ensure that they are a positive influence on achieving high quality healthcare environments.
- This is an issue of concern to those who fund, design, build and use health facilities around the world today.

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Thank you!



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### ***Major research programs include:***

- Australasian Health Facility Guidelines  
[www.healthfacilityguidelines.com.au](http://www.healthfacilityguidelines.com.au)
- Australasian Post Occupancy Evaluation and Benchmarking projects
- Industry capacity building programs including bi-annual conference, regular seminars and other activities.