Critical Care Design – The Good, The Bad and The Alternatives
Karen Iverson, MHSc CIC
A Webber Training Teleclass

Overview

• A new dialysis unit- lessons learned
• Challenges of negative pressure isolation rooms
• ICU design considerations, what's your priority?
  – Space for sinks/hoppers/macerators
  – What do you do for dialysis?

Personal Encounters
Hemodialysis

• 4 Chair pods
• 1 sink per 4 chairs
  – Type and size of sink matters
• Plumbing code and drains…
  – New drain design
    • OBC and ventilation
• The outcome…
  – Enterococcus casseliflavus
The OBC

7.4.2.1 Ontario Building Code 1997

(1) Every fixture shall be directly connected to a sanitary drainage system, except that…

(d) the following devices shall be indirectly connected to a drainage system

(i) a device for the display, storage, preparation or processing of food or drink

(ii) a sterilizer

(iii) a device that uses water as a cooling or heating medium

(iv) a water operated device

(v) a water treatment device

(vi) a drain or overflow from a water system or a heating system or

(vii) a drain line from a HVAC system or equipment
Critical Care Design – The Good, The Bad and The Alternatives
Karen Iverson, MHSc CIC
A Webber Training Teleclass

The solution

Personal Encounters
ICU Design

- TWH ICU, last renovated in 1984
  - 23 beds
  - 3 singles, 4 4-bed ward rooms
- Compared new TGH ICU to TWH ICU
  - 0.5 bed moves compared to 4.53
- Inappropriate use of hand washing sinks
- Lack of monitoring for negative pressure
- Mechanical systems inadequate
- Looked at staff and patient infection rates

TGH ICU design

- New construction—36 beds
  - 6 negative pressure
  - 28 single rooms
  - 1 double room
- Natural light
- Staff able to observe patients from outside the room
- Up to date monitoring of ventilation system
The resultant contamination of an assumed safe source negates the benefit of hand washing

J. Bartley and N. Bjerke Critical Care Nursing Quarterly November 2001

• Save money, save water…spread germs
Antimicrobial Fabric?

- Seating areas for family and visitors
- Important for patient care and recovery
- How does the product really perform?
- Water resistance is important – try to meet them half way.

Sinks/hoppers/macerators

- Type of fixtures recommended in areas
  - Cost versus benefit
  - Blackout...
- Location and mounting of sinks
- Location for waste disposal
  - Ratio of waste receptacle to beds
Waste Disposal

AIA 7.3 A15d

“Soiled workroom or soiled holding room….The soiled workroom shall contain a clinical sink(or equivalent flushing –rim fixture)….If the flushing –rim clinical sink is eliminated, facilities for cleaning bedpans shall be provided elsewhere.”
Questions

- Can/should wastes be carried through other areas
  - Central or local?
- Commodes and built in units
- Disinfector or disposable?
- Are isolation rooms different
  - Shared vs. private units

What we’ve learned

- Sinks closer to doors
- Articulating arms
- Sliding doors?
- Method of waste disposal
- Isolation cluster and HVAC design
- Multi-function rooms
- Plan for HVAC in decanting plans for new space

Negative pressure rooms/mechanical

- Design problems
  - Difficulty maintaining pressure
  - Sealed rooms
  - Use of ante rooms
- Location
- General exhaust
- HEPA exhaust
- Maintenance of rooms
- Monitoring of rooms/audio/visual
Critical Care Design – The Good, The Bad and The Alternatives
Karen Iverson, MHSc CIC
A Webber Training Teleclass

Dedicated vs. General exhaust

- Dedicated Exhaust
- General Exhaust

Bubble tight dampers

In the room or in the hall?
Other Major Issues

- Redeveloping space
  - Use existing walls/bed layout to save $
  - “Grandfathered” design, lack sinks, poor bed spacing
  - Cost to upgrade HVAC…not done (high standards)
  - Where to build!
- Adding ducted neg. pressure room too costly
  - Options for HEPA units?
- Need to know when it can be “redeveloped” and when it needs to be REDONE
Patient Spacing issues

• Need to group patients according to nursing ratios
  – “Single rooms are nice but we can’t afford it”
• Lack of clarity surrounding “step down” type care
  – How to group patients
• Departmental moves and changes to functional focus
  – How specialized should a space be as the odds are, it will be used for something else…
Next steps

- Canadian standards?
- Investigate what works for you
- What do clinical staff think?
- Design what will work or what you want to work?