Choosing Wisely: ICU Design

Speaker: Neil A. Halpern, MD, MCCM, FCCP, FACP
Director, Critical Care Center; Chief, Critical Care Medicine Service; Medical Director, Respiratory Therapy

- Can see award winning videos on SCCM website information on cost, sqft per room, renovation vs new build. His ICU won the 2009 design award and has chaired the committee and been involved for many years
- Facility Guideline Institute (FGI) releases 3 books every four years, one which applies to hospitals. There is a section that deals with ICUs and this is also a good reference as a starting point on ICU design.
- SCCM has guidelines on ICU design – last published in 2012 and will hopefully see an update published in the next few years
- Series of publications in CHEST in the winter/spring 2014 that deal with politics of putting committee together, design, post-occupancy evaluation, 4-5 different ways to achieve privacy, informatics
- Intensive Care Medicine published articles trying to imagine what an ICU would look like over the next 20-30 years.
- Informatics:
  - The core elements of ICU room have not changed in 50 years, bed, physiologic monitor, ventilator, infusion pumps, feeding pumps, SCDs, computer, etc.
  - One main thing that changed – instead of walking into a room with 20 beds, we now have full wall privacy around each patient. Good: privacy, infection control. Bad: visualizing the whole environment and people reacting quickly. Only way around that is fancy informatics. Must get info from all devices in room to get out of room.
  - Occasionally organizations have really good ideas. NPSG alarm fatigue. O2 sat seconds to reduce alarms
  - Integration is key. Using middleware to get alarms to the right people
  - Many opportunities by putting webcams in the room. Physicians can review patient, ventilator, monitors, etc. directly rather than logging into the systems to view.
  - They changed defibrillators with an emphasis on advanced monitoring and information transfer capability. Automatically transfers information on the code to the Code Committee. Also transmits device status information at regular intervals.
  - Integration is expensive and it is hard to achieve interoperability.
- Takeaways from COVID
  - They polled 16 pandemic hospitals and asked them what they were doing. Compiled responses and published article dealing with things from FDA, how to remotely care for the patient, what to do with that info going forward in both ICU design and surge capacity.
  - SCCM has a book from 2012 on preparing your ICU for disaster. It is time for this reference to be updated
  - His facility can turn on 40-50 beds within 48 hours. They worked to make permanent some of the changes they implemented during the pandemic.
  - If building an ICU (or renovating) place emphasis on remote monitoring (webcams, power, air/O2 outside of the room)

- Staffing and healthcare cost
  - Two places to find number of hospital beds in the country
    - Healthcare Cost Report Information System – classifies beds in categories that haven't been updated since the 1980s and doesn't have specialized bed or stepdown bed categories. Not easy to get information out of this. They have published papers on data from this regularly over the years, last 2010. Currently trying to automate the mining of HCRIS data – this will give ICU beds, ICU capacity, ICU bed days available
    - American Hospital Association survey includes stepdown beds as well as ICU beds.
    - None of these reports converts beds to units. They have calculated this in the past.
    - They use the Russel formula, data from AHA and HCRIS to determine ICU cost per year.
- Final thoughts: Need to figure out how to bring imaging in the rooms. Must get information out of the rooms (takes us back to connectivity)