**Questions Log – AAH1701 webinar “Patient Safety Fundamentals for Healthcare Architects–Part 2”**

1. Q: Can you please summarize current trends in Ebola containment and recent lessons learned?

A: The Ebola outbreak caused many hospitals to examine their ability to deal with infection isolation resulting in closer attention to “AII” facility readiness as well as PPE availability and staff training.

1. Q: Is it appropriate to ask designers to show the entries to the surgical suite with real doors that restrict entries to non-appropriate staff?  Many hospitals still choose to draw a Red Line on the floor to show this limits

A: “Red Line” or door placement is a clinical issue that needs be determined by the hospital – typically the OR department manager.

1. Q: Will be interested in the use of UV light based systems and other hydrogen peroxide or similar aerosol systems in patient rooms and/or equipment rooms – do you have any thoughts or insights on this?

*I was actually talking about roving equipment that has the UV light and spray as he mentioned. C-diff is the best use we have heard for those*

A: There are several total-room disinfectant systems in various stages of development. I am not aware of one that is universally accepted today.

1. Q: What is the expected impact of Displacement Ventilation for airborne infection control or ICRA. (over more typical ventilation arrangements)

A: Use of Displacement Ventilation for airborne infection control can conflict with certain US-based code air change requirements. There is a Displacement Ventilation trial underway by Kaiser. Here is a link to a 2010 HCD article on the subject:

[https://shar.es/19IceZ](https://shar.es/19IceZ%20)

*Many hospitals in the Nordic regions use displacement ventilation systems in all inpatient rooms and treatment areas. A typical U.S. system introduces cold air in the ceiling, forces it down through a diffuser and removes it from the ceiling through an exhaust grille. The diffuser mixes the cold air to raise the average temperature and this has the unintentional effect of entraining contaminants and can result in increased germ and contaminant levels. The high air exchange rates in healthcare facilities also contribute to a “cold” feeling in patient rooms.*

1. Q: Do you have recommendations for environmental procedures for during renovations or construction at or near continuing operations?

A: There is extensive information available on this subject from APIC <http://www.apic.org/APICStore/Products/Product?id=SLS9808> and the Carpenter’s Union <http://www.icraforbuilders.com/Contact.xml> and <https://vimeo.com/49840188>. Fundamental to all procedures is the need to maintain air pressure in the construction area negative to occupied space. Airflow always must be clean to dirty. Simply put, contaminated particles travel with – not against – the air current.

1. Is it too much asking for surgical suite staff to be ONLY use their lounge from the surgical suite?  In other word, we are asking them not to access the lounge from the outside of the surgical suite.  This is very annoying for them since it prevents them from taking their break outside.  Our main purpose is to limit them to enter the suite through the lockers where they will be properly gowned for infection control. (See answer to question 7)
2. Can you talk about infection control in the OR suite where staff and surgeons enter their locker spaces from the non-sterile zone, change and then enter into the semi-sterile and sterile zones...and then move back into the reverse sequence back to non-sterile?   (this includes sequence through the OR Surgeon's lounge and showers.

A: The days of OR staff taking smoking breaks at the fire-stair door exit in their scrubs are long gone. If the procedures are excessively long, there needs be sufficient staff to cycle out through the locker room into street clothing, returning through the gown and scrub process.

1. If the A/E team prescribe the phasing, then are we not prescribing the contractors means & methods? Then is this a shift in liability back to the A/E firms by us prescribing the means & methods?

A: ICRA phasing is not simply a matter of construction means and methods. ICRA Phasing often involves temporary air pressure relationships critical to patient health, safety and welfare. The US Veteran’s Administration has long required design professionals to incorporate clinical input on matters of patient safety into the contract documents.

1. Do you have procedures for sanitizing water systems at commissioning for legionella?

A: Water management plans are required in ASHRAE Standard 188, “Legionellosis: Risk Management for Building Water Systems.”

With hot water systems, maintain the entire domestic hot water system above the temperature that Legionella will grow and multiply. ASHRAE Guideline 12 recommends 124°F requiring limit stops on showers and other mixing valves to reduce point-of-use temperatures.

The American Society of Sanitary Engineering International (ASSE) has a new professional Qualification Standard.

The American Water Works Association publishes standards for sterilization of domestic water requirements under AWWA C651 for piping and AWWAC652 for storage.

The following graphic illustrates temperature range considerations in dealing with legionella.



1. What is the current thinking on gels vs. handwashing?

A: Although alcohol-based hand sanitizers can inactivate many types of microbes very effectively when used correctly, people may not use a large enough volume of sanitizer or may wipe it off before it has dried. Furthermore, soap and water are more effective than hand sanitizers at removing or inactivating certain kinds of germs, like Cryptosporidium, norovirus, and Clostridium difficile.

While alcohol-based hand sanitizers do less harm to hands than handwashing without use of hand lotion, handwashing at a sink with hand lotion available is preferable in limiting user risk of hand dermatitis. Hand dermatitis can not only lead to increased risk of infection for the sufferer, but to reduced compliance with hand washing guidelines, increasing the spread of pathogens.

1. Do you have recommendations for monitoring air quality during demolition and construction?

A: There are numerous monitoring systems and devices available. Systems that tie directly to a building automation system (BAS) monitored 24/7 are much preferred. Rapid after-hours response to loss of air pressure relationships from breeched containment, a failed negative air system or failed power supply is vital.

1. Is this why they add upgrades like water circulation systems to avoid dead legs, etc.

A: Circulating systems accumulate biofilm at a slower rate and are better able to maintain water temperature outside the legionella growth range.

1. I believe that the built environment is both directly and indirectly responsible for HAI's. While design is very important to provide engineered solutions to mitigate and monitor environmental conditions. Given the latest Joint Commission addition for ICRA's to include "routine maintenance" should designs now consider the ongoing maintenance requirements and identify components that require access to be located in optimal areas to reduce the impact to patient safety? (i.e., valve's, control boxes for low voltage devices etc.)

A: This can very well fall under Owner Requirements for commissioning, with information for automated facility management maintenance routines built into the BIM model.

1. Can you talk more about why or why not an Ante room may be included for an AII patient room?
   1. Are you saying the bed and patient should go through the ante room? Generally, we design them for staff passage and gowning only.

A: It depends on hospital protocol. If an airborne infectious patient needs be moved for a procedure that cannot be done within the AII, then – to maintain negative pressure in the AII – the ante room would best allow for patient moves without the door to the AII and door to the corridor being open at the same time. Otherwise, the AII wants to be decontaminated before moving the infected patient.

* 1. Due to ever expanding super bugs and the resurgence of TB are hospitals continuing to increase the number of isolation rooms?

A: There is some expansion, but the degree depends on the individual hospital and its assessment of probable increases in AII cases. Expect to see more AIIs in urban and safety-net facilities.

* 1. What is a reasonable number of + and – “iso” rooms per # of inpatient beds?

A: Again, it depends on the individual hospital and its assessment of probable increases in AII cases. One per floor or “Pod” seems to becoming a norm.

* 1. Even when gowned, should family members be allowed into isolation room environments?

A: That for certain is a clinical decision.

* 1. Is the air pressure in an ante room neutral?

A: As shown in slide 32, an AII ante room can be neutral, negative or negative to corridor/positive to the AII room.

1. Can you discuss aspergillus risk in remodel situations?

A: Aspergillus is a significant component of topsoil, a potential issue at rural sites near plowed fields. It is also present in remodel dirt and dust. Aspergillus is a serious – potentially fatal – threat to the immunocompromised. Any room, space or corridor that could be used by an immunocompromised patient needs full isolation from remodel activity.

1. Is it acceptable to dump construction area air through a HEPA filter into a public corridor?

A: Yes, provided the HEPA unit is tested and calibrated at manufacture-prescribed intervals by manufacturer-approved/certified technicians.

1. Why inboard bathrooms preferred in lieu of outboard bathrooms?

A: It depends on what one considers most important. To quote a June 25 2014 Healthcare Design article by Barbara Horwitz-Bennett, “. . .inboard . . . enhances patient privacy, creates a natural vestibule, buffers noise from the corridor, minimizes intrusions from housekeeping, and improves caregiver accessibility to the patient from the nurses’ station. Because this layout results in a smaller staff/caregiver footprint within the room, it also reduces nurses’ footsteps . . .” - See more at: <http://www.healthcaredesignmagazine.com/trends/architecture/patient-bathroom-designs-balance-style-and-safety/#sthash.kKsMInmX.dpuf>. Barbara goes on to speak to the flip side of the discussion.

* 1. Why would inboard patient toilet rooms be better for IC?

A: It is easier to place a hand wash sink in a position that encourages caregiver use. It also minimizes housekeeping traffic in the room. However, none of these considerations are sufficiently compelling to mandate inboard bathrooms.

1. Thoughts on recirculation of air and outside air in in these setting

A: Regardless of whether the source of air is “fresh” outside or recycled it must be filtered. PE Rooms need a final filter at each supply diffuser.

1. Comment (can address or not): auto hand dryers would be loud

A: No one yet makes a hand dryer quite enough to use in a patient room. I am certain it is only a matter of time before one becomes available.

1. Is it permissible to connect multiple isolation rooms to a common HVAC shaft and fan? Or should each isolation room have dedicated duct and fan?

A: No! Each unit needs its own ductwork and fan. Maintenance lock-out / tag-out worker safety precautions should impact one room at a time. There should never be a question as to what unit is on or off.

1. LED color-change hand-wash indicator what is it?

A: It is a light that changes from red to green tied to a timer connected to a hands-free faucet. This is intended to motivate caregivers to scrub hands for 20 seconds – as recommended by the CDC.

1. Is it a FGI code?

A: FGI code doesn’t call for such a light. Scrubbing hands for 20 seconds is recommended by the CDC.

1. How is the isolation room air purified?

A: Supply air to an AII is no different than that supplied to a standard patient room. On the other hand, PE rooms need final HEPA filtration at each supply air diffuser.