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EXPERTS ADDRESS HOW CLEANING AND DISINFECTION STRATEGIES CAN TACKLE EMERGING MICROBIAL THREATS

By Richard Dixon

Call to Action: A Team-Based HAI Response

> ***The bottom line is that the typical healthcare system of silos does not function properly to the benefit of patient care. However, the first clue is that when an outbreak occurs, the entire group of departments gets together to work through the cause, effect, and resolution issues to a successful conclusion, and hopefully put into future processes of the lessons learned."***

A good risk management question to ask in a healthcare facility is: Who is responsible for safety? The most likely response would be "everybody." Great answer! What about: Who is responsible for reducing healthcare-acquired infections (HAIs)? Answers typically are infection prevention and control (IP&C), environmental services (EVS), or nurses and doctors. Let's take a closer look at the clinical and environmental issues and answer this important question properly.

IP&C staff monitor antibiotic use, assist in the policies for EVS and chemical selection, monitor HAI statistics with a watchful eye on outbreaks, provide education on prevention on many typical issues, guide contractors through the difficult process of renovations in the facility, conduct product review and evaluation, manage HAI outbreaks, and more.

EVS is clearly responsible for the cleaning and disinfection in most healthcare facilities, with daily attention to horizonal and vertical surfaces, and special attention to high-touch surfaces plus a variety of waste management and recycling functions, pest management, laundry, and a wide variety of other areas.

Specialized cleaning and disinfection also take place in the food service department (food preparation, storage, serving, waste management), and in facilities management (ducts, cooling towers, HVAC equipment, and more).

Medical device reprocessing plays an important role in the operating and procedure rooms, as cleaning, disinfection, and sterilization of the many pieces of equipment and instruments – some of which are extremely difficult to achieve 100 percent efficacy, such as endoscopes.

Nurses do their best to clean up blood and other fluid spills in medical and surgical inpatient units plus in ambulatory departments such as endoscopy units.

Laboratory personnel, especially microbiology staff, identify bacteria, virus and fungal pathogens with incredible accuracy and speed but seldom are involved in the outcomes and trends of the patients that these tests are concerning.

A healthcare facility is therefore a complex web of different departments within an environment of multi-factorial issues that inevitably causes HAIs.

Let's take the example of a patient in an older-style double room. Patient A is recovering from a respiratory illness and patient B is recovering from an abdominal issue who will test positive two days later for Clostridioides difficile (C. diff) from an endoscopy procedure. In the meantime, Patient A starts off with a mild diarrhea, uses the ensuite bathroom with the door partly open, and to complicate this issue, the bathroom's negative-pressure vent is hardly drawing in any air, so the flushing of the toilet results in a plume of air containing fecal particles with C. diff bacteria to be distributed to Patient A whose bed is adjacent to the bathroom door. In the meantime, EVS staff try to clean and disinfect the room and bathroom, although both patients have personal items on the sink, overbed and bedside tables, so those surfaces don't get any attention – it's the same with the bedside rails because both patients are sleeping or have frequent visitors. As you can see, a perfect circumstance for Patients A and B to both contract as HAI, with further potential transmission beyond that patient room.

So, you can see in this over-simplified example, that HAIs are multi-factorial, and a different approach is required by all the separate departments who reside in their own silos. Here is just a sampling of these multi-factorial issues:

- Patient acuity
- Hand hygiene practices and auditing with consideration of the Hawthorne Effect
- Antibiotic stewardship programs
- Clinical practices
- Fecal waste management
- Environmental cleaning and disinfection practices, plus education
- Patient and visitor education
- Visitor restrictions
- HAI statistics availability and future predictions
- Personal protective equipment (PPE)
- Auditing of routine and specialized practices
- Recognition of transmission routes and challenges
- Facility design
- Facility audit of positive and negative pressures, water temperatures
- Clinical glove use policy
- Training and education
- Budgets to maintain within only a focus on initial control, not long-term prevention, and risk adverse interventions.

The bottom line is that the typical healthcare system of silos does not function properly to the benefit of patient care. However, the first clue is that when an outbreak occurs, the entire group of departments gets together to work through the cause, effect,

and resolution issues to a successful conclusion, and hopefully put into future processes of the lessons learned. Let's then not miss the biggest learning opportunity of all. Teamwork among the silo partners resulted in a positive patient-care solution. Why would or should the silos be maintained as status quo?

A few answers would be "We have always done it that way" or "I don't want to change the process as it would be too hard," or "I don't like change." The best way may be to start with the concept of a patient care multi-disciplinary team (PC-MDT) taking full responsibility for the entire scope of processes on a patient-focused basis. Here are some suggestions on membership of the PC-MDT:

- Infection Prevention & Control
- Environmental Services
- Microbiology and/or Laboratory
- Food Services
- Facilities Management
- Quality & Risk Management
- Nursing (inpatient and outpatient)
- Administration
- Medical Device Reprocessing
- Infectious Disease Physicians/Epidemiologists
- Occupational Health & Safety
- Other stakeholders as required

Let's also look at some of the initial tasks the PC-MDT can address in the short and long term:

- EVS is on the front lines of defense of HAIs and should be recognized for their heroic efforts with addition budget support for training and education
- HAI statistics (facility, community, regional, national, etc.)
- IP&C staff attend clinical rounds
- Policies and procedures blended for an integrated approach
- Key performance indicators of success
- IP&C also focuses on an 'interventional' focus via a learning and problem-solving approach
- Observational auditing (visual, marker, ATP, microbial culture) including when who, how, cost, etc. and use the outcome in trending analysis, celebrating success and learning
- Organizational audits of departments or significant multi-faceted processes
- Specialized audits targeting potential sources of transmission (sinks and drains)
- Chemical products (manufacturer's use requirements, safety, fit for the desired outcome, PPE use, etc.)
- Terminal, shared equipment and specialized cleaning
- Engineered infection prevention solutions such as ultraviolet light, ozonated water hygiene sinks, self-sanitizing surfaces like copper alloys
- Patient, visitor, physician, and staff surveys
- Building trust and success, not fault or punitive measures
- Target typically higher rates of common HAIs (VRE, C. diff, MRSA, CPO), and be on the outlook for fungal infections (Candida auris, Aspergillosis) and more impacts of SARS-CoV-2 variants
- Collaborate with local healthcare facilities on regional learning and cooperation
- Attending professional conferences with a cross representation of attendance
- Seek out local, regional, national, and international standards relevant to the facility's needs.
- Recommendations to administration on operational changes and capital equipment or facility changes that have a positive impact on patient care (Tip: while the upfront costs are very important, the real issue is what a proposed change can do to reduce HAIs, noted as a return on patient-care investment and a strong perspective that HAIs cause illness and death) and financial issues for the facility
- Communication strategy to healthcare stakeholders
- Use science- and evidence-based decision-making
- Randomized clinical trials in environmental assessments do not do well in some multi-factorial HAI-related issues, but rather a practical approach of quantitative risk management assessment (QMRA) which has its roots in food services risk management and safety. This is about assessing the risk of transmission and developing changes to lessen the risk.

Did this whole discussion not start about who is responsible for safety? We are all responsible for HAIs and should dedicate our resources and trust in a PC-MDT to lead the way to safer environment for patients, staff, physicians, and visitors. Remember, the word "team" has four letters that can spelled also as mate; thus, we are all teammates.

Richard Dixon is the co-founder and a board member of the Coalition for Community & Healthcare Acquired Infection Reduction (CHAIR). He has 40 years of experience in senior administration, planning, design, construction, commissioning plus infection prevention and control in healthcare facilities in Canada and across the globe.

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