Assessment of Surfaces

How is *your* skillset when assessing cleaning and disinfection?

By Dr. Gavin Macgregor-Skinner

GBAC STAR™ accreditation means that a facility has:

- Established and maintained a cleaning, disinfection, and infectious disease prevention program to minimize risks associated with infectious agents.
- The proper cleaning protocols, disinfection techniques, and work practices to combat biohazards and infectious disease.
- Highly informed cleaning professionals who are trained for outbreak and infectious disease preparation and response.

The GBAC STAR™ accreditation program is to be used in conjunction with federal, state, and local guidelines and standards, and in conjunction with industry-specific requirements for a particular facility. Determining a facility is safe for human use based on testing and verification requires protocols and procedures to be prepared, equipment and training to be conducted and maintained, and assessment thresholds to be established and agreed upon that are considered to pose an unacceptable risk to human health.

There are currently no such thresholds for infectious disease agent contamination of buildings, including viruses, and even those that currently have no vaccine and no cure like SARS-CoV-2 that causes COVID-19 disease.

Technology is rapidly developing but there is currently no gold standard of assessment of surfaces that are touched often, but testing should be considered a key part of determining that a surface has been deemed "safe" in accordance with cleaning (work practices, equipment, and cleaning agents) and disinfection (appropriate for the purpose) procedures.

Invisible enemies

We live in a world surrounded by microorganisms (also known as germs, microbes, bugs, or pathogens). They live in the soil, on our skin, in our bodies, in our buildings, and on the floor, walls, and surfaces that we touch often. We call these high touch points (HTPs). There are many of them. These

include doorknobs, tabletops, chairs, cell phones, and more.

Not all microorganisms are harmful, but some of them can cause illness or even death, and we need to better understand them to create healthy buildings and decrease the risk of transmission and infection. What you *don't* see can hurt you. As building custodians, we need to use the appropriate tools to identify these invisible enemies.

Controlling the presence and mitigating the risk of harmful microorganisms (bacteria, fungi, viruses) is critical in the prevention of infections, illness, and even death. Our personal risk of being infected and getting sick depends on our own body's defenses and degree of exposure to microorganisms. A single microorganism won't make us sick. It usually takes a team of microorganisms to invade our body, and there is a much higher risk of being infected if these microorganisms can survive in the environment long enough for us to encounter them and offer them opportunities to get into our body.

As building custodians, we need to use the appropriate tools to identify these invisible enemies.

Opportunities for you to be exposed to disease-causing microorganisms can include:

- **Person to person**—droplets from an infected person's breath, cough, or sneeze; touching an infected person and then touching your eyes, nose, or mouth; or by eating food that has been touched by an infected person. This can include the common cold, influenza, measles, and tuberculosis.
- **Object to person**—touching a contaminated object then touching our eyes, nose, or mouth.
- **In the air**—bacteria and viruses can be carried on droplets of mucous or dust particles. This can include measles, mumps, tuberculosis, and whooping cough.
- **From insects or animals**—people can be infected by bites from mosquitoes that may carry West Nile virus, Zika virus, malaria, and other diseases. Flies can contaminate surfaces by spreading infectious disease-causing microorganisms such as anthrax, *Escherichia coli (E. coli)*, *Salmonella*, *Shigella*, and *Staphylococcus aureus*.

In the OSHA (2020) *Guidance on Preparing Workplaces for COVID-19*, it states that a person can get infected by touching a surface or object that has SARS-CoV-2 on it and then touching their own face where the virus can enter the mouth, nose (the primary exposure pathway), and/or possibly their eyes.

What is 'cleaning' and 'disinfecting?'

In 2020, the COVID-19 pandemic has stressed the need for education and for everyone to understand what the words "clean" and "disinfect" actually mean when dealing with infectious disease agents. A surface may look clean but still harbor disease-causing microorganisms and therefore not be safe if it has not been disinfected.

Many facilities have been promoting that they have a safe environment from infectious disease agents by using terms such as "deep cleaning," "enhanced cleaning," "environmental cleaning," "environmental disinfection." What they are trying to say is that they are doing a two-step process—a hard non-porous surface is cleaned first and then an appropriate disinfectant is applied and kept wet allowing for recommended contact time or dwell time, which may take re-application on the surface to attain, for example, a 10-minute wet contact time. That appropriate disinfectant for a facility in the USA should be listed on the Environmental Protection Agency's (EPA) *List N: Disinfectants for Coronavirus (COVID-19)*.

Washing hands with soap and water for at least 20 seconds, with proper friction, rinsing with water, and drying, or if water and soap are not available, using hand sanitizer containing 70% alcohol, are both evidence-based methods of decreasing the risk of infection. Because the need to improve hand hygiene is related to the risk of us touching contaminated surfaces and then touching our eyes, nose, and mouth and transferring microorganisms into our body, cleaning and disinfecting (a two-step process) of surfaces that are touched is also an important method to break the chain of infection and protect people's health.

In any facility that has been GBAC STAR accredited, the role of the cleaning professional is a critical part of a multimodal approach to infection prevention.

In a collaboration between the U.S. Centers for Disease Control and Prevention (CDC) and the Infection Control Africa Network (ICAN), "cleaning" and "disinfecting" are defined separately as:

- **Cleaning** is the physical removal of foreign material (e.g. dust, soil) and organic material (e.g. blood, secretions, excretions, microorganisms). Cleaning physically removes rather than kills microorganisms and decreases their number and

therefore the risk of spreading and causing infection. It can be accomplished with water, detergents, and mechanical action of washing, wiping, or scrubbing the object. This should occur before disinfecting surfaces.

• **Disinfecting** uses chemicals to kill or inactivate microorganisms on inanimate objects. It does not necessarily clean dirty surfaces or remove microorganisms. But further reduces their number and risk of infection by killing or inactivating microorganisms remaining on a surface after cleaning. It usually follows cleaning (Cremieux et.al., 1991), but may be required prior to cleaning to ensure worker safety if there is a known recent contamination as bacteria and viruses can remain infectious on a range of surfaces.

Cleaning and disinfecting (a two-step process) of commonly touched surfaces may be one of the critical actions required for any battle against infectious disease-causing agents. The study of cleaning and disinfecting and measuring the effectiveness is critically important for any facility in order to create a safer and healthier building.

Many organizations have issued guidelines for cleaning and disinfection but very few have implemented testing that is easy to use, readily deployable, and that is conducted to provide confidence that the level of cleanliness achieved is sufficient to minimize the presence of infectious disease-causing agents.

Is it clean and is it disinfected?

When working in an environment where there is a risk of being exposed and infected and developing a life-threatening illness, cleaning surfaces is abstract without a verifiable and quantifiable method for detecting how clean a surface actually is.

In our industry, for a very long time, "clean" has been a subjective term. Different people inspecting the same room or the same surface at the same time could have different opinions about whether or not a surface is clean. I know during my years in the military I was subjected to, and actually conducted, the "white glove inspection" myself. But what do we mean, especially during this COVID-19 pandemic, when we state a room or a surface is "clean?" Are we inferring that it is also safe and poses very little risk of getting an infectious disease?

Facility infectious disease prevention is enhanced through cleaning. But how do we know that a surface is actually clean? We need evidence. We need validation. We need to be cleaning for health and not just for appearances and to make things smell better.

Trained cleaning technicians

Appropriately trained staff, given adequate time, equipment designed for the task, appropriate cleaning products and disinfectants, and using them and their active ingredients as recommended by the manufacturer (i.e. read the label), will increase the likelihood of safer surfaces and healthier buildings.

But what is missing in many facilities right now are processes to validate the training, equipment, tools, chemicals, protocols, and procedures to confirm that the risk of infection has been mitigated.

The message has always been clear: measuring something gives you the information you need in order to make sure you actually achieve what you set out to do.

We need to measure what's important. We need to clean to a standard and define the definition of "clean" for areas that are touched often and pose a risk for transmitting infectious disease agents. We need to use technologies and methodologies that move us from "I believe it is clean" to "I have proof it is clean."

The GBAC STAR program promotes evidence-based practices, with established methods of validation, in a process of sustainability and consistency, and if required, continuous process improvement using the Plan-Do-Check-Act (PDCA) principle. The objective during the COVID-19 pandemic, and even after it is over, is to educate, train, organize, and equip staff to focus on results-based cleaning and be able to show what they are doing is effective.

Currently, over 2,500 facilities in the U.S. have applied for GBAC STAR accreditation. We have learned that all are using evidence-based equipment and protocols, but only a small number are collecting measurement data confirming the effectiveness of their methods.

But facilities are requesting assistance with establishing an evidence-based objective measurement of surface cleaning, and as GBAC STAR focuses on continuous improvement, this is a critical area in which the ISSA's GBAC team will provide assistance to all facilities in the program. We have received requests for education and training on currently available, and possible newer methods that combine visual and microscopic inspection and surface testing such as:

1. Visual observations and adherence to standard operating procedures (SOPs)—direct observation of person cleaning; "white-glove" technique; shine a light at an oblique angle across a surface.

2. Adenosine triphosphate (ATP) meters to detect organic material (biologic or microbial)—currently the most requested method for assistance.

3. Tracing agent (chemical markers, fluorescent material) using ultraviolet light or enzymatic detector to determine if any tracing agent is left.

4. Microorganism detection by taking a swab or contact agar plate method or use of RODAC plates (Replicate Organism Detection and Counting).

5. Surface debris samples examined by visual microscopy—these require a correct handling process to prevent cross-contamination. Use a vacuum or adhesive tape.

A key consideration during cleaning, disinfection, inspection, and testing is that not all surfaces in a building will be treated the same, but the level of effort required will be based on identifying the hazards and conducting risk assessments, especially in areas of high occupation density.

All cleaning staff should be certified technicians

During the COVID-19 pandemic, the definition of "essential employees" has expanded to include "janitorial staff," "housekeepers," and "cleaners." Now the industry must acknowledge and recognize the role they are playing in saving lives and livelihoods.

While this is not a new idea, the time has come to use one term with defined skill sets and competencies and to ensure staff are trained and recognized as certified technicians that play a key role in infection prevention.

All technicians should be trained using methodologies that focus on learning by doing, giving sufficient time to complete essential tasks, receiving measurement data in real-time as part of a continuous improvement process, being able to identify hazards and conduct risk assessments, being empowered to mitigate risks to ensure a safer working environment, having the appropriate tools and equipment for each task, and using them in the way that they were designed to be used.

Infection prevention through cleaning and disinfection is required now and will remain a critical element in ensuring our buildings are healthy and our events are safe for all.

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For the GBAC STAR™ accreditation program elements this article relates to (https://gbac.issa.com/issa-gbac-star-facility-accreditation/):

- Element 3 Sustainability and Continuous Improvement
- Element 4 Conformity and Compliance
- Element 5 Goals, objectives, and targets
- Element 6 Programs Controls and Monitoring
- Element 7 Risk Assessment and Risk Mitigation Strategies
- Element 8 Standard Operating Procedures (SOP)
- Element 9 Tools and equipment
- Element 14 Personnel training and competency
- Element 16 Facility infection disease prevention practices
- Element 18 Audits and inspections
- Element 20 Documentation management

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