



HEALTHIER WORKPLACES | A HEALTHIER WORLD

Use of Real Time Detection Systems to Protect the Public During COVID-19

Guidance Document

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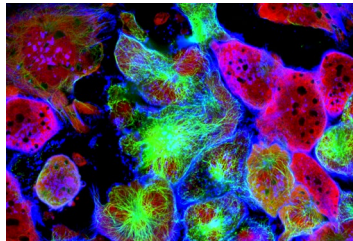
AIHA's Real Time Detection Systems (RTDS) Committee has prepared some considerations where instrumentation and data could support the protection of public and occupational health during this pandemic event. As such, the committee encourages occupational health and safety science professionals to consider the following while working to advance technology and data during the crisis, as well as to prepare businesses for people to return to work.

For those working from home, consider using in-home artificial intelligence devices (such as the Echo, Alexa, Cortana, etc.) so that data can be aggregated to geographic areas and assist in directing medical resources. This can be especially valuable where Artificial Intelligence (AI) can show emerging trends and give hospitals notifications of a particular area or location that may cause a surge in needed services and intervention. The RTDS Committee encourages all companies using personal home assistant devices share their findings to help lower the surge of COVID-19 cases and provide a better focus for medical services for greater impact.

Currently, these RTDS technologies are available for COVID-19 mitigation and control:

Training Personnel

- **Fluorescence.** Powders and/or liquids that fluoresce using a black light (such as Glo Germ) are a simple real-time visual tool that can be used to educate people on how a virus can spread and infect individuals by contacting contaminated surfaces.



Monitoring Workers

- **Temperature Sensors.** In the ear or forehead temperature assessment for workforces



may be an option to help identify trends and contacts for day zero establishment. Note that collecting this data may be considered as medical records by OSHA. It is also important to note that skin temperatures are not as accurate as core body temperatures.

- **Artificial Intelligence (AI).** Emerging algorithms such as facial recognition can possibly be used to identify someone who is sick with disease such as COVID-19.

The concept is similar to infrared imaging technology that is installed at flight arrival platforms to detect passengers with fevers. The facial recognition data could be further analyzed using artificial intelligence to show those with early signs (asymptomatic under current practices). The illnesses could range from subtle facial expressions to irregular walking patterns.



- During the initial outbreak of COVID-19 in Wuhan, China, the Chinese Centers for Disease Control (CDC) may have used their computers to develop algorithms and artificial intelligence platforms to cross-match pictures and videos taken by cameras in public areas of people who appeared to be fine but later had COVID-19. While there could be privacy issues, the outcomes from such research could be lifesaving in terms of screening, early detection, diagnoses, and treatment.

Respirator Fit Testing

- **Optical Particle Counters** are used by some manufacturers to determine respirator fit. All workers who wear respiratory protection must be properly fit tested.



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Deconning Work Areas

- **Ultra-Violet (UVC) Light decontamination.** UVC light has been used extensively in disinfecting surfaces and equipment against a range of environmental pathogens including bacteria and viruses. This includes two closely related corona viruses SARS-CoV1 and MERS-CoV. The effectiveness in practice depends on intensity, exposure time and the ability of the UVC light to reach the viruses on surfaces and crevices of materials. It is important to note that there are hazards with the use of UVC light including skin burns, eye burns/macular degeneration and the possible production of ozone that workers using it must be protected against. If UVC light is used to decontaminate Personal Protective Equipment (PPE), such as respirators, the impact of UVC light on the materials of construction (e.g. degradation of rubber bands on many N-95 respirators) needs to be considered.



Measuring Cleanliness

- **Adenosine Triphosphate (ATP) Bioluminescence.** ATP Bioluminescence assay is a common method for evaluating the environmental cleanliness of healthcare, food preparation, and other workplace surfaces. Light produced from reagents that react with biological material collected by swabbing suspect surfaces can be analyzed immediately using a Luminometer and produces a result expressed in Relative Light Units (RLUs). The ATP Bioluminescence test is not specific for any pathogen. Viruses, including the virus responsible for COVID-19 (SARS-CoV-2) lack ATP, and in the absence of other biological material, would not be detected.



- Conventionally used Optical Particle Counters (OPCs) for particulate detection have been shown to provide data poorly correlating bioaerosols to contagion risk. More about this is being researched by RTDS members and will be reported as information and references are made available.

Cleaning/Deconning Direct Read Instruments

- Real-Time instruments and monitors can be used to detect and measure airborne concentrations of some chemical sanitizers and disinfectants approved by EPA (<https://www.epa.gov/coronavirus/guidance-cleaning-and-disinfecting-public-spaces-workplaces-businesses-schools-and-homes>; <https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2>). Colorimetric tubes and/or single sensor instruments are recommended to avoid degradation of other sensors in multigas monitors. Important information on deconning your direct read instruments. Don't use alcohol even if the instrument is off. Proper deconning should be in the manufacturer's instructions for each instrument but here are some common guidelines.
 - Don CLEAN gloves not used for swabbing of surfaces with alcohol or EPA disinfectant.
 - Turn the instrument OFF.
 - Use ONLY warm water and mild detergent. Give your instrument a sponge bath with the soapy solution followed by sponging the instrument with fresh water.
 - Let the instrument(s) air dry. DO NOT USE an air blower or heated air source.
 - DO NOT FULLY IMMERSE your equipment in water.
 - **DO NOT USE ALCOHOL or OTHER DISINFECTANTS** on your equipment. Many sensors are



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vulnerable to alcohol and cleaners that contain limonene. These products can diffuse into the sensors even when the instrument is off and this will negatively affect future sensor readings.

- ALWAYS perform a bump test or calibration check after cleaning before they are returned to service.

AIHA would like to acknowledge the Real Time Detection Systems Committee for developing this guidance document:

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About Occupational Health and Safety Professionals

Occupational health and safety (OHS) professionals (also known as industrial hygienists) practice the science of anticipating, recognizing, evaluating, and controlling workplace conditions that may cause

workers' injury or illness. Through a continuous improvement cycle of planning, doing, checking and acting, OHS professionals make sure workplaces are healthy and safe.

Get additional resources at AIHA's Coronavirus Outbreak Resource Center.

https://www.aiha.org/public-resources/consumer-resources/coronavirus_outbreak_resources

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