INFECTION CONTROL CHECKLIST

For Manufacturing America

PURDUE UNIVERSITY | Dauch Center for the Management of Manufacturing Enterprises

FOCUS AREA	Possible Criticality Low, Med, High	Why act now	Tip #1	Tip #2
Monitoring	**H**	Pre-symptomatic & to a lesser extent, asymptomatic people, shed virus and infect others, especially INDOORS.	Thermal-imaging will miss between 30% and 44% of infected people.	Consider Finger Oximeters; Saturation Level should be above 94%. If below, consider quarantining and seek medical referral.
Clock-in & Out	**M/H**	People in line are an infection-risk to each other, especially INDOORS.	Deploy non-contact clocking and multiple clocking points in the building.	RFID cards, bracelets or facial recognition (use cams and OPEN-cv data-processing).
Cleaning	**L/M**	Low risk IF people do not touch their faces; about 7% of infections come via touching contaminated objects.	Compulsory mask-wearing to reduce people touching their own faces.	Cleaning regimes; soapy water or virucidal disinfectants, or UV-A/ UV-C light (when people are NOT present).
Quarantine stock	**L**	Inward packed goods may be contaminated; if feasible, can be quarantined - subject to the material-surfaces.	Timers on pallets/totes etc., ideally with green/red LED lamps.	
Distancing	**L/M/H**	Outdoors in still air, distancing over six feet reduces viral load, especially if an infected person is wearing a mask. Indoors, risks are higher due to viral load in the air without specialist HEPA filtration (or UV-A/UV-C air-sterilization units) and multiple air-changes every hour.	Wear masks to reduce an infected person contaminating others directly from their virus-laden out-breath and/or from their increasing the viral-loading in the ambient air (for everyone in the building	(Water-droplets in the out-breath contain perhaps thousands of virus in each droplet. Droplets of 0.06 to 10 microns in size stay in the air for hours). If people have to work closely or in a smaller space, wear better respirators, face-shields and consider having the same people work only with one-another, as a 'bubble.'
Space per person	**H**	An infected person's out-breath will infect another person; INDOORS, the viral load in the air continues to be a threat for hours (even when they have left the area). The threat continues for those wearing disposable cloth masks.	If people have to be at work, reduce numbers at any one time and increase distancing. Use respirators, ideally those that do not expel unfiltered air from the out-breadth of the wearer. Industrial N95 as a minimum standard.	Increase the numbers of shifts for all workers, including the office-workers; stagger them to reduce the numbers of incoming and outgoing staff at any moment. Stagger lunches. See 'bubble' comments, above.

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Hearing	L/M	The respiratory contamination threat goes up as soon as an infected person speaks and increases if they shout.	In noisy work-places change from ear-plugs to noise-attentuating ear-defenders.	Ban loud speaking & shouting; reduce speaking to a minimum.
Respirators	M/H	Disposable mask filtraters are between 20 and 100% effective vs particles of 0.1 to 4 microns in size. The leakage allows ingress of a further 33% to 67% more infected droplets.	Replace masks with Standard (industrial) N95 masks or N99, N100, R95, R99, R100, P95, P99, and P100, for example.	Supply petroleum jelly; advise wearers to apply the jelly to the rim before wearing. This can reduce average leakage rates of 10-20% (surgical N-95) to near ZERO.
Disposable Gloves	L	Disposable gloves may be as contaminated as a hand. If gloves help someone touching their face, then consider.	Insist on the use of disinfecting hand-gels and soap-water washing after using the washroom.	Consider hand-washing stations outside bathrooms to reduce virus threats.
Goggles/face-screens	L	Respiratory infections can come via the eyes (from which channels open into the throat).	Vulnerable people, or those who have to be within a few feet of others, should wear goggles and or a face-screen to prevent larger out-breath droplets hitting the eyes.	These measures are additional to mask/respirator wearing to further reduce the higher risk of respiratory route infection.
Canteens	H	Eating cannot be managed while wearing a mask or respirator. These areas are HIGH risk.	Stagger dining. Separate people. Use washable barriers. Improve ventilation with fresh air. Do not use common utensils.	Where possible, close the canteen down; have people eat outside while distancing, or individually in vehicles.
Toilets	H	Infected people have virus in their fecal material. Flushing without a lid can create a droplet plume 15ft. Taps, handles, switches and all surfaces will be contaminated.	Remove doors. Install IR-sensing to put lights on inside and OUTSIDE the facility (that stay after a user has left the room). One-person occupancy only. Install auto-sensing taps and liquid-soap, or elbow-activated levers.	Improve fresh-air ventilation. Consider UV-A/UV-C air-handling units at ceiling level to disinfect the area safely and out-of-sight). Remove air-dryers, especially cool ones and replace with paper-towels.

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Corridors	M/H	Congregation of people, poor-ventilation and surprise contact with people leaving side-rooms: all create high risks for infection.	Make one-way. (Mark out the shop-floor for one-way traffic). Make sure all doors have glass panels and handle-levers that can be activated by an elbow.	Extract air at ceiling level, consider UV-A/UV-C air-units to kill virus out of sight.
Remote Work	M/H	If the whole family is distancing and not going into buildings for more than a few minutes at a time, the whole house-hold is likely to stay safe.	Advise the worker and their family about best practices. Most people do more work at home than at work; be flexible with their (and your own) domestic needs.	
Offices	H	In Washington State, 45 people became COVID-19 infected. Another two died in the main body of a church in March 2020. Nobody sneezed or coughed. The choristors were distancing for just two and a half hours. Consider the risk in crowded offices for 7-8 hours.	Try and have everyone possible work from home. Even casual visitors who arrive can be directed to call someone at home. Wear N95., or better, masks (see above). Decontaminate anything touched. Do not file paper immediately, but quarantine it for later filing.	Digitalize all systems. Have separate shifts with the leaver opening windows, where possible, to ventilate the room. Reduce talking to a minimum unless N95., or better masks/respirators are being used.
Emerging Advisories	M	We have a duty to stay up to date with regulatory advice and the best medical and scientific advice available.	Systematically scan CDC and OSHA guidelines. These are often behind global peer-review research. Nominate someone to keep ahead of likely policy-changes, to prevent poor investments in new measures.	Beware of web-based 'facts'. Always go to starred, peer-review research or official Governmental National Research, or reputable, academic sources.
Emerging Technologies	M	Thermal imaging is a limited means for screening people anywhere. Antibody testing is of no proven use at this time; nobody knows if positive antibodies are COVID-19 specific or a flu-virus with any accuracy; how long the antibodies survive or whether the presence of antibodies reduce the infectivity of the person who has those antibodies.	Oxygen saturation finger 'oxymeters' may be more reliable than thermal imaging. Far-UV lamps are used in operating suites without screens; reportedly, they do NOT cause skin/eye problems, but do kill viruses. The lamps may be available for industrial use: Krypton-Bromine (207 nm frequency) or Krypton-chlorine (222 nm frequency). Consider encouraging track-and-trace for workers.	Remote working including the use of audio-visual and remote actuation of equipment,is now possible. More cost-effective solutions are coming on stream every day. Create time & discipline to research; stay ahead of the timeline and make better-informed decisions about investment strategies.