AMERICAN COLLEGE OF OCCUPATIONAL AND ENVIRONMENTAL MEDICINE

Safely Returning America to Work
Part II: Industry-Specific Guidance

Tanisha K. Taylor, MD, MPH, MBA, Rupali Das, MD, MPH, Kathryn L. Mueller, MD, MPH, Glenn S. Pransky, MD, MOCCH, Philip Harber, MD, MPH, Robert K. McLellan, MD, MPH, Natalie P. Hartenbaum, MD, MPH, Amy J. Behrman, MD, Deborah R. Roy, MPH, RN, CSP, Robert C. Blink, MD, MPH

INTRODUCTION

The world continues to face an unprecedented threat from the COVID-19 pandemic. Physical distancing has been identified as one of the methods of reducing transmission. As a result, businesses, schools, and institutes of education were closed due to such measures as well as restrictions on travel and social gatherings. Working from home, telework, and on-line meetings are now the norm. As businesses have reopened, they will be looking for guidance on how to work safely. Even those sectors that have continued to function will need guidance to ramp up functioning to new levels of normalcy. This document is intended to provide return-to-work guidance for both employers and the OEM physicians who will be supporting businesses to implement safe return-to-work strategies.

TRANSMISSION

While scientists race to develop effective, safe vaccines and treatments to manage COVID-19, non-pharmacologic interventions (NPIs) serve as the bulwarks to reduce transmission of the SARS-CoV-2 virus. With wide social acceptance, NPIs can reduce the effective reproductive number of the virus and suppress the pandemic. NPIs include air ventilation/filtration, surface cleaning and sanitation, hand hygiene, avoiding touching the face, physical distancing, and a variety of other measures in the hierarchy of exposure control, including personal protective equipment (PPE). Respirators and face coverings are generally the least effective means of controlling most exposures. However, the opportunity for SARS-CoV-2 transmission in a wide variety of environments where other controls are challenging to optimize creates a critical role for the use of face coverings and respirators.

The SARS-CoV-2 virus is frequently transmitted by the respiratory route. Viral containing particles in the air are often dispersed as either droplets or aerosol. Droplets are larger and heavier and fall to the ground relatively quickly in still air. Aerosols are smaller particles, remain suspended for longer times, and may be transmitted further. Evidence for droplet transmission is well-established as is that of aerosol transmission. Certain procedures such as intubation, bronchoscopy or suctioning are likely to create many aerosol particles. However, aerosols may also be generated by singing or similar activities. Such activities may create smaller particles and, in addition, propel droplets or aerosols at high velocities so they will travel further. Published examples relate to local outbreaks following a choir practice in New York and an air conditioning system dissemination in China. [1,2]

In the United States (US), the Centers for Disease Control and Prevention (CDC) recommends following a "6-foot perimeter" distancing based upon the concept that droplets should fall to the ground within that distance. This is a somewhat arbitrary rule based upon the typical settling velocity for larger droplets in still air. This is not completely protective for two reasons. First, smaller particles or aerosols may be produced by the source or develop due to desiccation of larger particles. Second, droplets may be carried by convective air movement as well, remaining airborne longer and traveling further. These are affected by the airflow rates, direction, and the presence of turbulence.

OSHA'S OCCUPATIONAL RISK PYRAMID

Classification of worker exposure to SARS-CoV-2 using OSHA's Occupational Risk Pyramid can help employer representatives determine and implement control measures. In the risk pyramid, OSHA classifies worker risk of occupational exposure to SARS-CoV-2. The level of risk depends on industry type, the need for contact within 6 feet of individuals that are suspected of being infected or infected with the virus, or the need for repeated or extended contact with such individuals. [3,4]

Very high exposure risk refers to those with high potential for exposure to known or suspected sources of SARS-CoV-2 due to medical, laboratory or postmortem procedures including health care workers (HCWs), laboratory personnel and morgue workers. High exposure risk refers to jobs with high potential for exposure due to known or suspected sources such as health care delivery and support staff, medical transport workers and mortuary workers. Medium exposure risk refers to those that require frequent or close contact, within 6 feet of those who are suspected to be infected with the virus but not known to be so. This includes workers who have frequent contact with travelers or with consumers in a community with high positivity rates. Lower exposure risk refers to those jobs not requiring contact with those infected with the virus or are suspected to be so, having minimal occupational contact with the public and other coworkers.[3,4] The majority of workers fall into medium to lower exposure risk categories.

ROLE OF OCCUPATIONAL AND ENVIRONMENTAL MEDICINE PHYSICIANS

Occupational and environmental medicine (OEM) physicians have specialized training in epidemiology and public health and expertise in return-to-work practices, including the issues that pertain to testing protocols needed for communicable diseases and contact tracing. OEM physicians further have experience in organizational behavior and can additionally address fitness-for-duty determinations collaborating with other professionals as needed. OEM physicians collaborate with various professionals in diverse organizational settings to facilitate employees returning to work including public health officials, infection control practitioners, safety personnel as well as other occupational health professionals. Employers will need to look to expert professionals, including OEM physicians, for guidance regarding testing, contact tracing and other return to work challenges.[5]

CDC and OSHA have made recommendations for employers regarding workplace considerations.[6] Employers will need to develop and institute policies to facilitate the safety of employees. OEM physicians have various collaborative roles with other health and safety team members including human resources (HR), safety, industrial hygiene, infection control, and management. OEM physicians will have an important role and will advise in various return-to-work considerations.

Policies for return to work after recovering from COVID-19 infection or exposure to an infected person must be established. Employers should put procedures in place and work with OEM professionals on what to do if an employee develops COVID-19 infection or tests positive for the virus, including quarantine and contact tracings. This should include how to handle surrounding privacy issues, stigma, and notifications.

OEM physicians also have expertise in managing work related illness and injuries as well as establishing work related causation. Work-relatedness is established with a diagnosis by a treating physician, documented exposure, and evidence that the disease is related to the exposure. States vary on how this is applied during the COVID-19 pandemic. Some states have passed laws that there is a presumption of causation for certain workers. When the traditional workers' compensation criteria are not met in a case, referral to an OEM physician for discussion of the work-relatedness is recommended.

ROLE OF SAFETY AND INDUSTRIAL HYGIENE

Industrial hygienists (also known as occupational health and safety science professionals) practice the science of anticipating, recognizing, evaluating, confirming, and controlling workplace conditions that may cause injury or illness to workers. The role of safety and occupational health professionals (OSH) professionals include anticipating, identifying, and evaluating hazardous conditions and practices as well as developing hazard control designs, methods, procedures, and programs. Further, both safety and industrial hygiene professionals have a role in implementing, administering, and advising others on hazard controls and subsequently to measure, audit and evaluate the effectiveness of hazard controls and hazard control programs. Additional resources are available from the American Industrial Hygiene Association and the American Society of Safety Professionals.[7,8]

Reopening plans include determination of phases to re-populate facilities, preparing to implement basic infection prevention measures, developing policies and procedures for prompt identification and isolation of sick people as well as development, implementation, and communication about workplace flexibilities and protections including wellbeing and mental health services to be offered. Workplace controls are to be implemented based on short-

term and long-term risk. OSH professionals should contact OEM professionals with questions pertaining to medical screening, contact tracing, workplace accommodations including as it pertains to high-risk vulnerable employees, and return-to-work evaluations.

Hierarchy of Controls
One way to categorize approach to exposures in the workplace is in terms of hierarchy of controls. This includes hazard elimination, substitution, engineering controls, administration, and PPE.

Elimination/Substitution
Hazard elimination in COVID-19 include ways to prevent exposure such as teleworking, postponing certain work, relocating, ensuring that only essential workers are on the job, health screening, and confining infected workers to home. Substitution could be thought of as permitting work alone in a spare room, solo workstation or facilitating workers' use of individual cars rather than collective transportation.

Engineering Controls
Buildings, Facilities, Operations, and Ventilation
Core building infrastructure should be inspected including HVAC, water system, plumbing and new filters installed.[9] Employers should consider designating separate entrances and exits for buildings and rooms, if possible, and provide unidirectional signage for traffic flow to ensure one-way pedestrian traffic flow along with frequent physical distancing reminders.[9] Increments of acceptable physical distance on floors where lines might form (eg, entrance to building, restrooms, etc.) should be designated. Areas of physical bottlenecks should be identified where physical distancing is more difficult and implement plans to alleviate bottlenecks (eg, restrooms, corridors, stairwells). Designating additional break rooms and lunchrooms to limit worker density and allow proper physical distancing should be considered.[9] The workplace should be reconfigured taking physical distancing requirements into account, including occupancy limits, fitting workstations with Plexiglas if strict physical distancing cannot be maintained. Physical barriers can be installed such as plastic sneeze guards between workspaces that cannot conform to physical distancing guidelines. Consider using sensor technologies to monitor and govern physical distancing throughout a physical location.[9]

Plans should be developed for the safe restart of site assets and equipment including restart procedures, equipment maintenance audits, and preparation checks. Protocols should be developed for the use of confined spaces like elevators (eg, limited capacity of 2 or 3 individuals, and guiding workers on proper positioning in the elevators). Furniture should be removed from congregation-prone areas to discourage workers being too close to each other (eg, waiting/reception areas, dining/break rooms). Technology should be employed to monitor and govern physical distancing throughout the workplace. A formal assessment should be performed to determine areas that can be closed off that are not needed to do business, and close access to them, for example, gathering areas, and areas dedicated to certain workers.

Motion-detection sensors should be installed in place of switches where possible to reduce touch points. Hands-free arm-pull or foot-operated door openers in restrooms and for other heavily trafficked doors should be installed. Signage for proper PPE usage, identification (eg, face shield for grinding operations versus plastic barrier for screening), should be prominently displayed.[9] Further, processes for procurement and storage of hazardous materials (eg, hand sanitizer, cleaners, and disinfectants) should be implemented. Protocols should be established for proper disposal of face masks, gloves, and other disposable PPE worn during work shifts. Training programs should be developed, implemented, and monitored to ensure employees wear PPE properly. Procedures should be implemented for proper cleaning and disinfection of PPE if it is able to be reused.[9]

Administrative Controls
Administrative controls include internal operating controls, the strategy for gradual reopening, management and worker education, training, de-densifying the workplace by staggering shifts, signage, communication strategies, the use of EAP services, virtual meetings, and travel restrictions. They also include alternating day schedule, starting with 25% capacity; telework for office workers, change shift start and end times to avoid shift congestion, change break,

and lunch times to avoid lines, takeout food with touchless payment, individual water bottles, single serve coffee and snacks. Also, reducing the number of workers in break or lunchrooms (ie, reducing number of chairs) and planning on minimum 36 square feet per person in spaces. Other options include using outdoor facilities or tents for extra break or lunch space and closing or reducing occupancy of meeting rooms and conducting virtual meetings whenever possible. Physical distancing should be observed when moving through the facility with one-way aisles or staircases and the number of individuals allowed in an elevator at one time should be limited. Visual cues and decals on floor in lines with 6 feet of distance are helpful. Individual tools, workstations, electronics should be sanitized between use by others. The time for tasks where workers need to be within 6 feet should be limited. Workers can be kept together in small teams to reduce exposures to large numbers of people on a site.

Administrative controls further include screening for symptoms, temperature screening or using an attestation app as well as hand washing, use of sanitizer, respiratory hygiene, no contact greetings, and cloth face coverings. When and how should testing be offered and internal contact tracing are crucial considerations. Cleaning should be regular and enhanced after an exposure case. Accommodations should be made for high-risk workers and will require adequate communication with workers and leaders.

Physical Distancing
The CDC has developed guidelines for maintaining safe distancing in public that local health departments can use to help businesses implement and subsequently monitor for compliance.[10] Even when lockdowns are relaxed, large public gatherings will remain on hold.[11] Public areas need to ensure appropriate spacing, for example, limiting the number of customers in a business at any one time or the number of passengers in a subway car.[11] Workplaces must be reorganized to minimize crowding by staggering shifts, limiting in-person meetings, appropriate spacing of seating arrangements, and resorting to telework as much as possible.[11] Restaurants and retail stores need to actively plan and manage the spacing of customers, provide hand sanitizing facilities, and ensure appropriate ventilation to prevent viral particles from lingering in the air.[11]

Hygiene Practices
Frequent handwashing and disinfecting should be adhered to according to local authorities. The correct number of sanitary facilities will be key, for example, hand washing and restroom facilities to facilitate good hygiene practices.[12] Employees should be given sufficient time to wash their hands with soap and water for at least 20 seconds or use alcohol-based hand sanitizers.[13] Good respiratory hygiene includes covering nose and mouth when coughing or sneezing and disposing of tissues.[13] Encourage wearing a face mask whenever there is likely interaction between co-workers or the public. Consider allowing employees, where possible, to wear personal face coverings at work (check with applicable local and state requirements). Equipment, tools, and surfaces that are frequently handled must be cleaned and disinfected with standard products; door handles, mouse devices, keyboards, workbenches, handrails, screens, lockers, and forklifts are included. Site cleaning guidelines and frequency must be established, and cleaning chemical inventories maintained.

The Environmental Protection Agency (EPA) provides a list of household disinfectants to kill the coronavirus SARS-CoV-2,[14] and CDC also provides recommendations on environmental cleaning and disinfection.[15] The frequency and intensity of cleaning and disinfecting should be increased in production areas, warehouses, offices as well as bathrooms, dining areas, and reception areas. Employees will need adequate training as well as supervision. Also, there should be a process in place for employees to report issues surrounding illness, hygiene or physical distancing via telephone or email with prompt and appropriate feedback to the employee.[12,13]

Screening
The Equal Employment Opportunity Commission (EEOC) has provided guidance allowing for employee testing consistent with it being a business necessity.[16] Checking an employee's symptoms, including whether they have a fever, should be permitted during the pandemic, and EEOC should continue to allow this screening tool. While this is not a perfect solution because of the percentage of people who are asymptomatic, it is a helpful tool in determining if a person should not be at work. Guidance from EEOC and US Department of Health and Human Services (HHS) should be clear that temperature taking and symptom checking by a third-party provider retained by the employer,

even if the third-party also is a medical provider, medical professional, or medical clinic, is not medical treatment and is not information protected by the Health Insurance Portability and Accountability Act (HIPPA).

A recent study found that a self-reporting symptom application (app, COVID Symptom Study) was 80% successful in predicting who was likely to have COVID-19, with the loss of taste and smell being the top predictor of illness.[17] The US Chamber developed a sample screening questionnaire that can also be used.[18] In order for employees to return to a workplace, many organizations will institute screening (through self-assessments and temperature checks) to clear employees for entry into a building or site. If employers choose or are required to perform on-site temperature screens, they should be aware of the limitations, cautions and requirements of testing. Temperature screening has not been shown to significantly impact the spread of COVID-19 based on current science. If it is used, it should be part of a larger education and pre-work screening effort which could include symptom screening and reminders of the importance of physical distancing, good hand hygiene and face coverings. Organizations should consider certain actions such as providing written communication or webinars to inform employees how, when and where screenings will be conducted and what will happen should an employee "fail" a temperature screening or provide a positive answer on a screening questionnaire. There should be careful attention to follow up steps for those who are instructed not to proceed to work as well as attention to all the concerns described above including how to keep information confidential; how to take temperature and maintain physical distance; how to proceed if an employee refuses to have their temperature taken and the return-to-work procedures if an employee does have an elevated temperature. Workplaces conducting symptom checking can also help identify areas of potential outbreaks and should share their results with public health officials.

Employers should engage safety committees to help assist with creating guidelines. Employers are to ensure mechanisms are in place to track and understand completion and engagement metrics surrounding screening communications and training. Create guidelines for supervisors and managers in the event of a failed screening and ensure the employee has transportation and a place in which to self-isolate. A process should be established, including speaking points for communicating to employees who have been in contact with a symptomatic employee (eg, what steps occur as a result, self-quarantine, area closed for deep cleaning).

Employers should adopt policies and practices that encourage employees to provide complete and accurate answers to questions concerning symptoms and potential COVID-19 exposures. Employers should be flexible with leave policies to ensure employees feel comfortable proactively sharing their symptoms and making decisions not to come to work at all. Any information maintained is subject to ADA confidentiality requirements.[18] Documentation of this information would represent a medical record and would also be subject to OSHA record keeping requirements (employment plus 30 years).

HIPAA protects most health information from being shared publicly, including with employers. HHS has issued guidance during the pandemic to allow sharing of positive COVID-19 test to law enforcement, paramedics, other first responders, and public health entities. This guidance should be clearly extended to include employers as outlined by EEOC, for sharing of test results that constitute a potential direct threat, but not for sharing serology (blood test) results. Employers are responsible for providing safe workplaces to their employees and giving them access to this information will allow them to assist with contact tracing and containment.

Personal Protective Equipment

If used correctly, PPE such as masks and gloves can help reduce the spread of viruses.[13] Gloves may be used but must be changed frequently and hands must be washed in between glove changes. Wearing gloves may allow bacteria to build up on the hands so handwashing is very important when gloves are removed to prevent subsequent contamination.[13] Workers should avoid touching their eyes, nose and mouth when wearing gloves.[13] Wearing disposable gloves is not a substitute for handwashing, further removal of gloves could lead to contamination of hands.[13] Wearing disposable gloves could give workers a false sense of security, which may result in staff not washing their hands as frequently as required.[13] Hand sanitizers are an additional measure to handwashing but should not replace handwashing.[13] Other PPE include face masks, hair nets, clean overalls, protective clothing, slip reduction work shoes and may be indicated for high-risk areas. Respirators and eye protection are recommended for

two person tasks within 6 feet and face shields should be added if cloth face coverings are worn instead of respirators. An N95 respirator with valve is appropriate if all workers performing similar tasks are wearing one.

Medical Care/Physician-prescribed Interventions

Disease recognition and treatment (including testing) for individuals is a tertiary response/prevention and the hierarchy of controls contain primary and secondary prevention measures. On the other hand, preventing symptomatic people from entering the workplace and basing return to work on tests (if the predictive value improves in the future) could be either an engineering or administrative control.

EXPOSURE CONTROLS

The optimal methods for exposure control are source control and engineering controls as described above. Adequate area ventilation combined with attention to air flow direction and mixing efficiency is a central engineering control. This should be accompanied by adequate high efficiency particulate filtration and increasing the fresh (makeup) air. A filtration efficiency of at least MERV 13 is recommended by experts, and additional protection may be afforded by use of HEPA filters.[19] Furthermore, ultraviolet germicidal irradiation (UVGI) has been suggested. Physical barriers to sneeze, cough, and spread from aerosol generating procedures should also be implemented.

Use of respirators may also protect workers from inhaling and potentially being infected by viruses such as SARS-CoV-2. N95 respirators are commonly used for this purpose, but elastomeric dual cartridge respirators or powered air purifying respirators (PAPRs) may also be employed. N95 respirators are certified by the National Institute for Occupational Safety and Health (NIOSH)/National Personal Protection Laboratory. However, because of the pandemic induced shortage of N95 respirators, several that may be considered alternatives have appeared on the market. Some are inadequate and fraudulently labeled as N95 and approved by the National Personal Protective Technology Laboratory (NPPTL). In addition, the US Food and Drug Administration (FDA) has authorized use of devices called KN95, generally produced in China. The FDA emergency use authorization is for health care settings. Users should be sure that it is not a fraudulently labeled device.

Wearing a facial covering that does not qualify as a respirator reduces the likelihood that an infected individual will emit viral particles in their area and as reviewed below and plays an important role as an NPI to mitigate transmission of COVID-19.

DECISION-MAKING ABOUT USE OF RESPIRATORS AND FACIAL COVERINGS TO SIGNIFICANTLY REDUCE TRANSMISSION OF COVID-19

Although some employers have considerable experience with the choice and deployment of respirators for their workforce, many do not and even those with experience may not understand the use of respirators for management of infectious diseases. Decision-making should consider the following points:
1. Is there a federal regulatory or state order?
2. What are the occupational hazards and risks?
3. Will the employer require or permit the use of a respirator or face covering?
4. What device should be used?

Regulatory Environment

OSHA's Respiratory Protection Standard 29 CFR § 1910.134 outlines the requirements for a comprehensive respiratory protection program for when respirator use is appropriate. Description of the rules associated with respirator use is beyond the scope of this document. The key point here is that if employers require the use of a respirator (as opposed to a facial covering), including an N95, they must comply with the entirety of the 29 CFR § 1910.134. (OSHA has temporarily relaxed enforcement of some aspects of the Respiratory Protection Standard.[20]) The reader should note that the regulatory environment is dynamic and requires close attention to the latest information from OSHA and other pertinent regulatory agencies.) The rule also requires that employers who provide respirators to employees for voluntary use or who permit employees to wear their own device must first determine that such use will not create a hazard. OSHA outlines the steps required to assure the safe use of respirators in these settings in its 1910.134 standard. The NIOSH Respirator Selection Logic provides guidance

about the choice of the correct respirator for occupational respiratory hazards.[21] However, this publication does not support the selection for protection from infectious diseases or terrorist agents. Instead, CDC provides guidance for the use of respirators and face masks for blocking transmission of infectious disease.[22]

States and municipalities have added to the regulatory environment with respect to face coverings and other NPIs during the COVID-19 pandemic. These mandates and recommendations have changed frequently. The reader is advised to consult a reliable source for the most up-to-date mandates specific to their site of operations.[23]

What are the hazards and occupational risks?
The decision about respiratory protection should be based on an appropriate hazard and risk assessment. The hazard assessment describes the likelihood of a significant concentration of viral particles in the air. Several factors determine the concentration of particles: presence and number of infected individuals, the infected individual's actions that affect particle emissions (breathing, talking, singing, coughing, sneezing, behavior (use of face covering), and the duration spent in a particular environment. Indoor air is generally more hazardous than outdoor environments given the dilution inherent in outdoor air. Risk assessment should consider the number of people present, their susceptibility, their ventilation rate, their behavior (physical distancing, facial coverings, respirator, hand hygiene), their duration of exposure and surface sanitation. Although the infectious dose of SARS-CoV-2 is not yet known, there is good reason to believe that risk will depend on both concentration and duration of exposure.[3]

Will the employer require or permit the use of a respiratory or face covering?
Some employers may decide to require or permit use of respirators or face coverings when not compelled by local orders or federal regulations. This decision should be based on the emerging science about blocking transmission with these devices. ACOEM's COVID-19 Resource Center is one site to find up-to-date evidence to inform decision-making.[24]

What device should be used?
PPE is designed to protect its user from exposure to hazardous agents. Very high-risk and some high-risk workers need PPE that includes respirators for protection from SARS-CoV-2. The choice of a respirator for this purpose should be guided by device availability, ability to manage use, the outcome of fit testing and in some cases medical evaluation. Facial coverings that do not meet the specifications of a respirator include medical grade and non-medical grade face masks or facial coverings such as cloth masks and face shields. Facial coverings primarily block emission of viral particles from their users rather than prevent exposure to viral particles in the air and as such should not be considered PPE. Increasingly robust evidence documents the value of widespread use of facial coverings as an effective NPI in mitigating the spread of the pandemic.[25-28] Because these types of face coverings do not fit tightly, they cannot protect their user from exposure to fine viral aerosols. However, they may have some role in protecting exposure from droplets.[28]

Studies have evaluated the relative effectiveness of different materials for constructing non-medical grade masks.[29] This evidence can be used to choose facial coverings to optimize their efficacy. Effectiveness, however, depends not just on filtration efficacy but also on factors such as comfort, fit, and breathability to optimize compliance. For this reason, the most efficacious material may not always be the most effective in the field.

Face shields and goggles have been employed in health care settings to provide additional droplet protection for a HCW wearing a respirator. Goggles only protect the eyes, whereas a face shield offers broader protection. As a device to use instead of a respirator or non-medical face covering, the evidence of efficacy in preventing transmission of infectious diseases is mixed.[30,31] At this point, the most appropriate use of a face shield without a respirator is as an accommodation for those who cannot tolerate a face mask. If used, it should be made of non-fogging material that completely covers and wraps around the sides of the face and have a comfortable headband.

Use and Management of Face Coverings
Although face coverings can serve as a key component of a suite of NPIs to reduce transmission of COVID-19, if managed improperly they may increase exposure risk to their users or those around them. Common mistakes while wearing include failing to cover mouth, nose, and chin; touching the front of the mask; and leaving large

gaps along the sides by failing to tighten the straps. These and other details about how to properly don and doff, wear for prolonged periods and reuse are provided in an ACOEM publication designed for employers.[32]

RESPIRATOR USE FOR OTHER PURPOSES
In addition to respirator use for SARS-CoV-2, many worksites already use respirators for protection against other hazards such as silica or solvents. However, because of shortage of certain respirators, methods to reduce reliance on respirators should be considered. For example, reducing the number of workers in an exposed area or use of enclosure may reduce reliance on respiratory protection. In general, respirator use for other purposes should continue as before the pandemic. The current pandemic does, however, imposes several special considerations.
1. Respirators, particularly N95 filtering face piece respirators, have inadequate supplies. Therefore, it may not be possible to obtain them for workers who would otherwise require them. In addition, HCWs with significant potential exposure should be given very high priority for available N95 respirators, further reducing availability for other workers.
2. Respirator users should undergo a fit test to ensure that the device will work effectively. However, due to the pandemic, OSHA has relaxed the requirement for periodic retesting. OSHA has reduced the mandatory requirement for annual fit testing, after an initial fit test as long as the employer demonstrates good faith efforts to comply with this requirement when possible. Workers should also be properly trained to use the respirator. Simply providing a device without training is inadequate.

FIT TESTING
Fit testing procedures may require modification. CDC has suggested reducing the use of quantitative fit testing for filtering face piece respirator users since this leads to destruction of an otherwise needed respirator. (However, the authors suggest that the sampling port might be carefully plugged, allowing continued use of the respirator). Use of respirators other than filtering face piece respirators should be considered. Loose fitting PAPRs do not require fit testing, and they are reusable. Also, elastomeric cartridge respirators, such as dual cartridge half mask respirators, are reusable and may be easily disinfected between uses.

PRACTICAL APPROACHES
The following practical aspects for respiratory protection during the pandemic should be considered:
1. If respirators were used for required exposure control before the pandemic, they should continue to be used.
2. Particularly for N95 devices, which are in short supply, employers and workers should institute measures to reduce reliance on such respirators, eg, reduce the number of workers requiring use or use engineering controls.
3. For workers currently using N95 devices, whether in health care or elsewhere, alternative types should be considered. These include PAPRs and elastomeric respirators.
4. Workers newly assigned to a respirator or a new type of respirators should have fit testing performed. However, routine annual repeat fit testing may be relaxed on a temporary basis per CDC and OSHA guidelines.
5. Careful attention to hand hygiene and doffing and donning is paramount. The hands must be washed or treated with a hand sanitizer before performing the respirator seal check. In addition, hands should be washed/sanitized before and after removing the respirator. Providing hand sanitizer, training, and enforcement can overcome challenges when there is limited access to sinks.
6. Respirators that are meant to be single use respirators (eg, N95) may be reused on a temporary basis. They should be disinfected between uses using one of several accepted approaches (hydrogen peroxide vapor, ultraviolet treatment, or setting them aside for 5 days in a protected location). Reused respirators should be carefully inspected for damage before use. This damage may include deformation of the cup or damage to the elasticity of the straps.
7. A specific individual who understands procedures, regulatory requirements, and disease transmission should be designated for each worksite. This is particularly important in construction sites, where multiple contractors and self-employed workers may be present.

The conditions, availability of respirators, OSHA requirements and guidance, and knowledge are changing rapidly. Therefore, the respirator program should be regularly re-evaluated.

HR EMPLOYMENT, LEGAL AND HUMAN RESOURCES CONSIDERATIONS/COMMUNICATION

The American with Disabilities Act (ADA) prohibits discrimination against people with disabilities in transportation, public accommodations, communications, employment and access to government programs and services. EEOC enforces ADA when it comes to many of the employment provisions.[16] EEOC states, "the ADA and Rehabilitation Act rules continue to apply, but they do not interfere with or prevent employers from following the guidelines and suggestions made by the CDC and other public health authorities about steps employers should take regarding the Coronavirus." Another EEOC website expands this to other public health guidance too, "The ADA and the Rehabilitation Act do not interfere with employers following advice from the CDC and other public health authorities on appropriate steps to take relating to the workplace."[16] During the pandemic, SARS-Cov-2 presents a direct threat to the health and safety of workplaces, and EEOC should acknowledge this for the duration of the pandemic declaration.[16] This means employers can prevent an employee with a clear medical diagnosis of coronavirus from coming to work until they are no longer contagious to others, as outlined in recently released guidance from EEOC. They would not be covered by the nondiscrimination provisions of the ADA.

The community is the most common source of COVID compared to the workplace, for example.[33] Employers should be prepared to address how and where employees can be tested when corporate wide screening not available. Employers should provide resources and information for employees working at home temporarily or possibly permanently. Such resources should include but is not limited to EAP resources, ergonomics, home IT setup, social support and supervision, and performance measures.

Employers should develop a plan to reintegrate employees who have recovered from COVID-19. Concerns for higher risk populations and how to phase in high-risk employee profiles (eg, over 65 years old, known medical conditions that are at higher risk) should be navigated following EEOC guidance on protected classes. Resolve potential liabilities (eg, work from home flexibility versus return-to-work requirements, and access to professional development for work from home employees). Workers should be cross trained to perform essential functions so the workplace can operate even if key workers are absent.[9]

Virtual training should be used to introduce employees to new protocols and patterns of behavior before they return to a physical workplace and ensure a method for acknowledgment that the training has been completed prior to returning to the workplace. Employees in any new organizational roles and responsibilities should be informed and trained as precautionary measures against reinfection. Cross-training plans should also be developed for potential fluctuation in the workforce (eg, employees out for quarantine periods) to ensure business continuity and communicate appropriately to help employees understand why. A webpage should be created and updated regularly for employees dedicated to COVID-19 (eg, internal memos, pay codes, EAP and HR links).[9]

If using a phased approach, employers should describe why certain groups or individuals were chosen to return to work and explain the rationale behind the creation of new roles/positions within the organization for handling the coronavirus. Outline the new responsibilities for existing roles to ensure health and safety in the wake of the pandemic and how employees are expected to engage in the new roles. Convey in detail why certain protocol and design changes were adopted. Explain the benefits of returning to a shared work environment (eg, increased productivity and innovation, access to shared equipment and network).

External Considerations

Monitor the number of confirmed COVID-19 cases in the community to assess potential interactions of employees with confirmed cases to determine exposure risk. Determine organizationally how community infection rates will impact self-assessment of exposure risk (eg, very high, high, medium, low per OSHA guidelines) and put a plan in place for triggering any protocol changes based on local community spread. Communicate any changes to organizational policy as a result of changes in community risk exposure clearly and concisely to affected workers before and after policy change. One paradigm proposed is inclusion of vulnerable family members as part of an at-risk unit instead of only the employed individual. In this paradigm, the community as a public health unit would be factored into the equation for consideration for exposure, return to work, and contact tracings.

WORKERS' COMPENSATION

As with all workers' compensation causation analyses, HCWs should remember that they are providing a medical causation conclusion. Depending on statutes or case law in specific states, the legal result of a medical conclusion may defer from the medical causation analysis. It is helpful if the causation evaluator has knowledge of the state laws and regulations, but final interpretation of specific language is in the purview of the legal system. Thus, the medical facts in the case and the medical reasoning should be clear to non-medical readers. The final analysis must state if it is medically probable, more than 50% likely, that the work-related factors resulted in the disease and the resultant need for treatment.

Clarifying the diagnosis can be difficult in many early cases. Nasal swab testing, which is recommended for diagnosis and utilizes RT-PCR, can have a high percentage of false negative results. In a pooled analysis, the probability of a false negative RT-PCR was 38% on the day of symptom onset, decreasing to 20% three days later.[34,35] In addition, diagnostic testing may not be available for many workers, therefore it may be necessary to make a preliminary diagnosis based on clinical criteria. Criteria that will be used as reasonable evidence of a COVID-19 diagnosis should be developed in advance and applied uniformly for all cases where testing is not available within a reasonable time frame. Serology tests alone are currently not recommended for making a diagnosis of COVID-19 and many state workers' compensation systems will not accept serology results as supporting a diagnosis. Because the false positive ratings for all serology testing is currently at least 30%, it cannot be used as evidence of disease, although it might contribute to a finding already established by clinical findings. ACOEM states that "When using an antibody test to confirm the diagnosis, it is critical to know which test was performed and the specificity and sensitivity of the test, as many will have high rates of false positives and/or false negatives. It is also important to look at when the test was performed in the course of illness as positive results are not reliably seen until 2 weeks into the illness. A clinical diagnosis can still be made based on the judgement of the clinician even in the absence of laboratory confirmation."[35,36]

The easiest way to reflect on the conclusion is to consider what would have been the result if the patient had never experienced the work-related exposure. If the patient would have had the same medical condition and needed the same medical treatment without the exposure, then one can safely say that this is not a workers' compensation case. In some cases, it may not be possible to say with 50% probability that the worker sustained their condition from work. For example, a grocery store clerk who wears a mask at work tests positive for COVID-19 and has related symptoms. Her community has seen a large increase in COVID-19 cases and not all her customers wore masks. Her son recently came home from college, was not using any mask protection in the household, and became symptomatic 5 days ago. The patient was avoiding close contact with the son, but he was not completely quarantined. In this case, it would be difficult to say exactly how the patient contracted COVID-19 since both exposures may have logically resulted in infection. Thus, a medical examiner could conclude that it was medically possible the patient contracted the disease from the workplace, but it was not clearly medically probable. On the other hand, if the patient with the college-age son was an emergency physician and had to intubate a COVID-19 patient several days before becoming symptomatic, a clear high-risk exposure, it would be reasonable to conclude that she most likely contracted the disease from work.

The medical provider assessment and discussion of both how the diagnosis is made and the likely possible source, including timing of exposure and resultant symptoms, are the most important facts and an essential portion of the report in establishing work-relatedness. Additionally, many states have introduced legal presumptions specific to COVID-19 that would apply to specific types of workers and exposures.

Workers' compensation laws vary by state and provide compensation for occupational diseases that arise out of and in the course of employment. Many state statutes exclude "ordinary diseases of life," such as the common cold, from workers' compensation. Typically, the worker has the burden of proving that an illness or injury arose out of and in the course of employment. In many cases, uncertainty as to whether the disease is related to the work activity or exposure may lead to disputes, delays in care, and medical-legal expenses. Workers' compensation presumption laws may be introduced with the goal of reducing disputes and reducing delays in medical care. For example, in many states, cancer in firefighters is covered by a workers' compensation presumption.

Presumptions flip the burden of proof and give the benefit of the doubt to the plaintiff (or worker in this case). There are two types of presumptions in workers' compensation. A "rebuttable presumption" accepts that the illness or injury is related to work and removes the injured worker's need to prove work-relatedness. Instead, it requires the defendant (in this case the employer) to *disprove* that the illness or injury is related work from the outset. Conclusive or non-rebuttable presumptions are legal presumptions that are deemed to be automatically conclusive and definitive, regardless of the evidence presented against it. Presumptions in general are rare. Conclusive or non-rebuttable presumptions are extremely rare.

Since SARS-CoV-2 is easily transmitted and can be community-spread, direct attribution to a specific exposure is often difficult, and proving that COVID-19 is work-related can be resource-intensive. Many states and the federal government have either passed laws or issued administrative orders granting the presumptions of work-related causation of COVID-19 for select occupations. All these states include first responders and others specifically list other occupations such as corrections officers, military/national guard, nursing personnel, other HCWs, grocers, postal workers, etc.[37] Most of the presumption laws expire on specific dates. The degree and extent of coverage differs somewhat among these states, with some limiting the extent and duration of coverage.

While the specifics of COVID-19 presumption laws vary by state, typical requirements for coverage include a positive SARS CoV-2 test and a diagnosis of COVID-19 made by a licensed physician within a specified time-period after the last day worked, and the worker's assertion that the illness is work-related. Some state laws only cover workers who are required by their employer to work outside their home.

In the absence of a conclusive presumption and unless work-relatedness is clearly demonstrated from the outset, employers or insurers are most likely going to conduct independent investigations to determine work-relatedness to assess whether to accept a claim as work-related and therefore accept financial responsibility. Cases which clearly meet the requirements of the presumption rules may not require any further evaluation to determine work-relatedness. However, there are many situations which may require formal evaluations to determine work-relatedness. These include: 1) cases occurring in states without presumptive rules; 2) cases claimed outside of the presumptive rules (eg, workers not directly covered); 3) those occurring among individuals who claim to have had COVID-19, but who tested negative for the virus by polymerase chain reaction (PCR); and 4) those occurring in individuals who state they were ill and were not tested, or whose exposure at work is not clearly demonstrated.

Physicians who suspect work-related COVID-19 should do their due diligence to record a detailed occupational history describing timing of exposure relative to symptoms and diagnosis (incubation period), why the exposure is suspected to be work-related, potential non-work-related contacts and exposures, and occupational and personal factors placing them at risk of exposure and adverse outcomes. While physical distancing, use of face masks, and other measures are recommended to prevent transmission of and exposure to SARS CoV-2, they cannot reliably be used as sole measures of whether exposure occurred at work.

Limited data are available to date on occupational COVID-19 claims. The California Workers' Compensation Institute (CWCI), a research organization representing workers' compensation insurers and self-insured organizations such as schools and public institutions analyzed data in California.[38] As of May 1, 2020, 1077 COVID claims had been submitted to 16 insurers and 12 self-insured organizations in California. Less than a third (27.7%) had been accepted as work-related, 36.9% were under investigation at the time, and 35.5% were denied. The most common reasons for denial were negative SARS-CoV-2 PCR test (70%) and lack of work exposure (14.5%). Other reasons for claim denial included working exclusively at home and lack of symptoms or a physician's determination to support a diagnosis of COVID-19. Data from other states are anecdotal.

The California Workers' Compensation Insurance Rating Board (WCIRB) projected the costs of a rebuttable COVID presumption in that state as $0.6-2 billion, with a mid-range estimate of $1.2 billion.[39] The cost drivers were the severe cases which, although projected to be the minority, were estimated to be extremely expensive both for short-term in-hospital treatment as well as long-term health effects and disability. The accurate financial costs of occupational COVID-19 claims are likely to be available a year after the start of the pandemic.

In addition to financial costs, there are unquantifiable and significant social, emotional, and health costs to society. OEM physicians play a critical role by making accurate diagnoses, risk assessments, and risk attributions. Creating medical/legal reports, that clearly outline the facts and basis for the medical opinion of the physician, will assist the efficient adjudication of workers' compensation claims.

Connecting Employees to Mental Health Resources

Employers have a unique ability and responsibility to manage their relationship with benefit providers, such as employee assistance programs (EAPs) and health insurance plans to ensure workers have access to the help and support they need. Employers should encourage EAPs and health insurance plans to be very active in promoting their telephone and online counseling services through various communications, and campaigns. As part of EAP, counseling should be provided for substance misuse, fatigue, family stress and general mental health support; if counseling cannot be provided by the company, ensure policies allow for increased need for off-site counseling. Having employees know their employers are supporting them through these difficult times can make a significant difference for their mental and physical health. Human resources teams and supervisors can help make this difference a reality.[9]

Establish a mental health taskforce with management representation from all functional areas and provide training on how to spot the signs of mental health issues and approaches for handling or starting a conversation with an employee who is exhibiting symptoms and signs of mental illness (consider having an identifier worn or used by every member of the taskforce so employees can easily identify who they can speak with should they want to do so). Employers should communicate frequently to reassure employees from whom they can get help for various problems and promote a culture that normalizes seeking support. Consider using mobile and digital tools to provide resources. Repeatedly share all the resources provided by your benefits providers and local community programs and provide easy links to national support hotlines.[9]

Appropriate HR policies and resources should be adjusted and communicated; a confidential helpline or email address should be provided for employees to get help accessing personal resources and treatment privately. A confidential helpline for employees to raise job-related concerns anonymously should be provided. Employers should be ready to provide assistance or links to local or national resources on common employee concerns, such as applying for unemployment, food insecurity, childcare, etc. Employers must recognize that stress and mental distraction can pose great hazards to worker safety and take extra precautions for workers performing high-risk tasks. Workers should be provided with education and opportunities to practice ways of reducing stress, such as mindfulness training, deep breathing, and exercise (eg, yoga). Support and information should be provided for employees anxious about leaving the relative safety of quarantine. Employers should allow for flexible policies as employees receive elective and routine medical care that may have been postponed due to the pandemic. Allow for flexibility of employees to utilize paid time off to spend time with family and loved ones they were physically separated from during quarantine to help restore their connection with others, reduce stress, and regain a sense of normalcy. Provide training for all leadership, supervisors, and employees on recognizing the signs of stress and how to create a culture of support and trust.

Educate all leadership, supervisors, and employees on understanding the impacts of COVID-19 on stress levels, mental health, and substance use. Recognize the signs of impairment, substance misuse or mental health distress. Employees should be advised on how to engage in mental health first aid and suicide prevention efforts and how to refer employees to other resources and support. Recognize that the stress and mental health effects may be prolonged or delayed and allow for a long period of transition over several months.

Almost half of Americans said that worry or stress related to the COVID pandemic has had a negative impact on their mental health – more so in lower-income families.[40] Contributing factors include job change, loss of income, isolation, and loss of support, altered family dynamics during social isolation, negative stories on social media and in the news, uncertainty and fear, and distrust of those in charge. Consequences include insomnia, anxiety, eating disorders, depression, substance abuse, post-traumatic stress disorder (PTSD) activation and adverse behaviors. Unfortunately, mental health service utilization appears to be decreasing while use of prescription psychotropic medications is increasing.[41]

Employers can begin to address these problems through a multifaceted strategy. They can directly address fears about the safety of return to work through effective communication, using principles honed during past epidemics and crises.[42] Key messages include workers' safety as the number one priority, describing a proactive return to work (RTW) plan that is the result of consensus and expert input, empowering employees to take actions if they feel something is unsafe. Communication by a senior leader who demonstrates empathy, shares challenges, honest and timely answers, and talks about problems as soon as they emerge is most effective. Address the "what ifs" – continually asking employees about their concerns to formulate the message is effective.[43]

The following suggestions can be offered to employees to maintain their mental health during these stressful times:

Stress and mental health symptoms are common during this epidemic – you are not unusual. Surveys show that many otherwise normal people are experiencing insomnia, change in eating habits, anxiety, or perhaps more symptoms or worsening of a mental health condition**.** But that means that more of us need to take positive steps to maintain our mental health.

Keep your focus on what you can control and what you can do, not on things over which you are powerless. Try to stay in the present, not projecting into the future. Meditation – even a short period of relaxation – is proven to improve calmness and quell anxiety. Several sites have released free meditation apps.

Take care of yourself physically by eating regular meals, exercise, get outdoors, and get the sleep you need. Do things you enjoy, as much as you can. These all contribute to good mental health.

Limit news and social media as much online information is designed to engage more than inform and greatly contributes to anxiety. Obtain information from a trusted site, such as CDC, or state health department. Turn off news alerts; instead, set aside a specific time to read news from credible sources, preferably not at night before bed.

Stay connected with friends and family, co-workers, and get the support you need. Take advantage of video conferencing tools that are temporarily free to do this if you can. Loneliness is one of the most common problems faced by those who work remotely.

Share your feelings with trusted friends and colleagues by phone or video; look for opportunities to help others who may be anxious or isolated. Both strategies can lower anxiety and other symptoms.

Practice effective parenting skills by reassuring your children that they are safe. Answer their questions and set an example by calm and reasonable behavior. Maintain their homework and exercise routines as much as possible; avoid using screen time for babysitting. CDC has good recommendations for maintaining a normal home life.[44]

Separate work from home as much as possible. If you work remotely from home, set aside specific hours and a specific location (if possible) for work, so your family knows when you will turn off work emails and be present. Focus on the positive aspects of working at home – no commute, no dress code, perhaps a nicer office space, you can eat what you want and when you want – this helps maintain a good attitude.

Seek help if your anxiety interferes with your ability to function at home or at work, reach out to your EAP program or other mental health services. There are more telemedicine options readily available now.

Employers seeking to respond to employee mental health issues are considering a continuum model, where the severity of the problems is matched to the right level of services (see https://www.mentalhealthfirstaid.org/). Healthy, functioning adults receive preventive services such as reassurance and supportive communication from peers and managers using the strategies described above, as well as support others (see https://www.mindful.org/). Those who are stressed and mildly affected might receive help from self-management tools, managerial and peer support, and conversations with EAP providers and other professionals. Finally, those who are developing difficulties functioning would ideally receive a more intensive approach, including evaluation and follow-up.

INDUSTRY-SPECIFIC GUIDANCE – SPECIAL CONSIDERATIONS
Food Industry
The food industry is essential, overseeing production and distribution of food, which may not have changed much during the pandemic. Food workers/food handlers cannot work from home and it is essential that measures are

implemented to protect staff from spreading COVID-19 among each other, maintain a healthy workforce and exclude infected food handlers from the workplace.[45] As it is critical to keep workers in the food production and supply chains safe,[45] employers must establish contingency and continuity plans concerning hygiene, cleaning, sanitation, suppliers, distribution, transportation and fitness to work.[12] General guidelines can be applied at the company level.[12] Minimum standards are applied to food businesses during the pandemic, which should be adopted and tailored as needed.[12] Key food hygiene and sanitation practices at each stage of food processing, manufacture and marketing need to be ensured by food safety authorities.[45]

Key prevention practices include physical distancing to the maximum extent possible, use of face coverings by employees and customers/clients, frequent handwashing and regular cleaning and disinfection, training employees on these and other elements of the COVID-19 prevention plan.[46] Policy, training, and signage must be supported with enforcement of physical distancing (such as verbal warning, and corrective action).

In terms of hygiene guidance there is no evidence that food is a vector for transmission of the disease and there is no evidence of fecal-oral transmission even though COVID-19 RNA has been isolated from the stool samples of infected patients.[47] As with other potentially infectious agents, good hygiene practices including appropriate sanitation measures should be implemented to minimize transmission.[12,45] Handwashing after using the bathroom is an essential practice especially in food preparation.[45] Transmission occurs via person-to-person contact with direct contact with respiratory droplets from an infected individual whether from coughing or sneezing.[45] It is possible that someone could become infected from droplets reaching their nose, mouth or eyes; alternatively respiratory droplets too heavy to become airborne may land on objects and surfaces, which are in turn touched.[45] The virus can remain viable up to 72 hours on stainless steel or plastic.[48] Therefore, someone may become infected by touching contaminated surfaces and then touching their face.

It is extremely important to adequately communicate to employees about risks, symptoms, physical distancing, quarantine, and travel to reduce the spread of coronavirus.[12,45] Employees should receive regular reminders of the advice from federal and or public health authorities made available on posters and handouts or that are downloadable.[12] Specific precautions should be available for everyone via bulletin boards.[12,45] Information sessions are recommended to familiarize employees with the new procedures. Retraining on food hygiene principles is recommended to reduce the risk of food surfaces and packaging materials becoming contaminated with viral particles from food workers.[12,45]

It has been established that infected persons may be asymptomatic and can be contagious highlighting the need for all personnel working in the food industry regardless of their health status to practice personal hygiene and use PPE.[45] Gloves may be used by food workers but must be changed frequently and hands must be washed in between glove changes.[45] Food workers should avoid touching their eyes, nose and mouth when wearing gloves.[45] Hand sanitizers are an additional measure to handwashing but should not replace handwashing.[45] Other PPE include face masks, hair nets, clean overalls, protective clothing, slip reduction work shoes and may be indicated for high-risk areas of food premises producing ready-to-eat prepared and cooked foods. Workstations should be spaced out reducing the distance between workers, however, which may require decreasing the speed of production lines and limiting the number of staff in food preparation areas at any given time.[45]

Physical distancing must be implemented at 6 feet between employees where possible, and at least 3 feet always. Physical distancing should also be ensured at entrances and exits.[12] In order to reduce the spread of the virus as much as possible, work hours or shifts should be staggered. Meetings and gatherings among employees should be avoided including during shift changes. Cleaning should be thorough and on a regular basis. Changes to workplace design will be important including use of Plexiglas or other similar material to shield employees from infecting each other or customers.

Access to workspaces and gathering of staff should be limited if possible. Dining services may be continued if physical distancing can be maintained by arranging tables according to requirements. Plexiglas or similar materials must be installed if specified distance cannot be ensured. Breaks and meals should be adequately spaced to ensure physical distancing. Contractors and temporary workers must be made aware of the need to self-report or notify contacts before entering facilities[12] (resources are available for temporary workers[49]). In retail aspects, the number

of customers must be limited and signs placed for customers not to enter if they are ill. Queue control is important with physical distancing advised inside and outside stores. Hand sanitizers, spray disinfectants, and disposable paper towels are to be placed at store entry points. Floor markings should be used to facilitate compliance with physical distancing especially in usually crowded areas such as counters.[45] Regular announcements should be made to remind customers of physical distancing and regular cleaning of hands. Introduce Plexiglas barriers at counters and check out points as an additional level of protection. Use of contactless payment should be encouraged. Further, customers should be encouraged to bring their own shopping bags where possible, and which should be cleaned between use. High-touch points should be cleaned and disinfected regularly, eg, shopping carts, door handles, scales; other items like ladles, tongs and condiment holders should be frequently sanitized. Doors should be kept open where possible.[45] Consumers should be advised to wash fruits and vegetables with potable water before use.

Maintaining good hygiene practices around open food displays is crucial, such as salad bars, fresh produce displays, other open food displays and bakery products. All food contact surfaces and utensils should be washed and sanitized frequently. Unwrapped bakery products should not be openly displayed and should be removed from self-service counter; instead, should be placed in plastic, cellophane, or paper packaging. Any loose baked products should be displayed behind Plexiglas cabinets and placed in bags using tongs when serving customers.[45]

Staff cafeterias may need to remain open where there are no practical alternatives and frequent handwashing, and respiratory etiquette needs to be maintained. Physical distancing between workers should be facilitated with seating arrangements, staggering break, and lunch times to reduce the number of workers in the cafeteria at any given time. Non-essential physical contact should be restricted. Notices and reminders should be visible and strategically placed promoting hand hygiene and physical distancing, cleaning, and disinfecting procedures.[45]

Employees in the food sector should be familiar with the symptoms of COVID-19 so symptoms can be recognized early and minimize the risk of infecting coworkers.[45] This is imperative as an infected worker who handles food could introduce the virus into the food on which they are working, or onto adjacent surfaces.[45] Workers or contractors should notify appropriate personnel immediately if they develop any symptoms such as fever, cough, shortness of breath before starting work or during work.[12] Also, if contractors or workers had recent exposure, they should notify personnel. Temperature monitoring including telethermographic systems such as infrared cameras as well as symptom screening are widely used.[12,50] If a worker develops symptoms suggestive of COVID-19 or is diagnosed with COVID-19 and is onsite, the worker should practice good respiratory hygiene, be moved to an area away from other people and with adequate ventilation then sent home or directed to an appropriate medical facility immediately; calling ahead if need be. The area occupied by the ill individual needs thorough cleaning subsequently. If home, the employee should not come to work and can notify appropriate personnel regarding illness via telephone; recommendations for self-isolation and medical consultation should be followed as well as any close contacts followed. Surfaces touched by the infected worker must be cleaned such as bathroom surfaces, door handles, and telephones.[45] Notification of close contacts may be necessary, who can then take appropriate measures to minimize further spread.[45] Examples of contacts in the food industry include a worker who was face-to-face or had physical contact or who was within 3 feet, working on the same team, cleaned up any body fluids without adequate PPE (eg, gloves, overalls, protective clothing), or in the same household as the confirmed case.[45]

Recommended quarantining based on CDC from the last point of exposure to the confirmed case; workers who had contact with a confirmed case should be asked to stay home for the recommended duration from the last time they had contact with the confirmed case and practice physical distancing.[45] If such individuals become ill within the isolation period and test positive they too will become a confirmed case and should be thus managed.[45] A return-to-work policy for staff who have become infected should be implemented. Confirmed cases can be released from isolation once symptoms resolve.[45]

Food businesses should follow procedures per their local health departments. Additional nondiscriminatory measures aligning with health authorities should be anticipated for pregnant workers, employees over 65 years of age or those who have immunosuppression, chronic health issues such as hypertension, heart disease or pulmonary conditions who are at risk of becoming critically ill.[12] Recommendations apply to all workers including temporary workers and seasonal workers.

Drivers and suppliers must adhere to sanitary rules. If possible, truck drivers should remain in their vehicles and access designated facilities. Drivers should be supplied alcohol-based hand sanitizers, disinfectant and paper towels and should use hand sanitizer before passing delivery documents to staff on food premises. Disposable containers and packaging should be used to avoid the need for cleaning of any returns. Appropriate hygiene and sanitation procedures should be implemented in the case of reusable containers.[45] Surfaces most likely contaminated with the virus include the steering wheel, door handles, mobile devices and adherence to strict hygiene standards is of paramount importance to prevent cross-contamination. Drivers must further be aware of physical distancing when picking up deliveries and passing deliveries on to customers.[45]

Use of individual rather than collective transport should be facilitated where possible to limit exposure. Employers may facilitate safe travel arrangements if the company organizes transport service to minimize infection risk by guaranteeing physical distancing. This may be applicable in settings where employees provide housing, for example, for temporary workers. Stress the importance of practicing physical distancing while taking public transportation to and from work.

General Office Settings/Warehouses
Guidance for General Office Settings
Employers in office settings should be preparing the workplace for operations to occur during the pandemic (eg, enhanced disinfection measures), as well as focus on the indoor environmental quality (IEQ) of the workspace as well as employee readiness and workforce management.[51] For such businesses with indoor workplaces, IEQ is a concern for buildings that have been unoccupied and/or dormant for extended periods. Employers should also consider the comfort of employees as they return to work because they may be in a heightened state of concern.

Employers should also consider developing a team of professionals to monitor, assess, and implement new COVID-19 transmission risk mitigation strategies as they become available and consider how they relate to IEQ. Aspects to reopening an office that should be emphasized during the pandemic include workplace configuration, conference rooms, lobby and common areas, kitchens, ventilation, and enhanced cleaning practices.

Regarding general office space configuration, reception seating areas could be eliminated, or plastic partition installed at reception areas. Review floorplans and reconfigure or remove furniture, seats, and workstations to ensure recommended physical distancing. Temporarily replace amenities frequently accessed such as water coolers, and coffee makers replacing them with alternatives. Vending machines should be wiped down after each use if not turned off. Reduce tasks requiring large number of people to be in one area. Virtual meeting tools should be used in lieu of in-person meetings whenever possible.[51] In-person meetings should be limited to 10 people or less and should be brief. Conference rooms should be disinfected daily as should surfaces and equipment touched in the conference room. Kitchen areas and equipment should be cleaned daily at a minimum. Coffee machines, refrigerator and ice machine handles should be cleaned at the beginning and end of each shift. Water faucets that require workers to operate them should be disinfected three times per day. Disposable silverware is preferred; if not available, silverware should be cleaned in a dishwasher. Congregating in kitchen areas should be discouraged.

Multi-stall restrooms should be able to be opened without touching the handles if possible. Consider a key for single restrooms so disinfection measures can be better controlled. Signage should instruct employees to wash hands before resuming work. Air dryers should be disconnected or taped off.[51]

Adequate airflow into workspaces should be ensured. Restrooms should be under negative pressure and proper filtration should be used to help control SARS-CoV-2 transmission. All HVAC intakes and returns should be cleaned and disinfected daily. HVAC professionals and ASHRAE provide updates are useful.[52] If fans are disabled or removed, attention should be paid to heat hazards.[51] Additional guidance on general office settings is available.[53]

Retail
Special considerations in retail include limiting contact by using flexible working hours and split shift teams to minimize the risk of people gathering. Use every other counter to allow optimal 6 feet spacing. Contactless payment systems are preferred – no cash. Credit card online payments are preferred with collection times booked. Products to be picked up are to be made ready ahead of collection. Collections should be limited to two

at a time, using every other parking space depending on the size of the site. One staff member should be responsible for managing the flow. Customers should remain in their vehicles while preordered goods are retrieved; external customer queue should adhere to physical distancing guidelines. Once goods have been left by their vehicle and the attendant is 6 feet away, the customer may then exit their vehicle and load merchandise themselves. A one-way system should be implemented to prevent people passing each other.[54]

Customer queue locations should have signs or tape demarcating 6 feet intervals. A one-way system marking floor and aisles with arrows should be implemented to prevent people from passing each other. There should be clear signage at point of entry detailing new operating rules and procedures including where to stand while collecting merchandise, and directional signage to hand sanitizer. Plexiglas screens should be installed along the counter and staff should be briefed on what to do if a customer comes to the counter.[54]

Regarding receipt of supplier deliveries during COVID-19, there should be separate material handling equipment for individual users if possible and company sanitation rules for mechanical equipment applied. Forklift should be wiped down regularly with anti-bacterial wipes including the truck, steering wheel, gear stick, operating controls, and access handles. Wipes should be disposed of in a waste bin after being placed in a refuse sack and tied. Supplier drivers should call to confirm arrival and directed to unloading area. Unloading should be done without interaction with team or customers.[54]

Health Care

HCWs and their employers have necessarily led the way in developing successful strategies to mitigate workplace risk and safe return to work because they were forced to do so while caring for COVID-19 patients and simultaneously maintaining other critical functions throughout 2020. Some of these strategies are unique to health care, but many are applicable to other industries. Medical center occupational health (MCOH) physicians play a central role in maintaining workforce readiness and workplace safety for HCWs during this time of unprecedented risk. An unintended consequence of their ongoing efforts has been escalating recognition of MCOH value and improved institutional resource allocation in many cases.

Infectious disease prevention, exposure management, medical clearances and care are core functions for MCOH in all eras. As we grappled with existential challenges to HCWs' well-being in the first half of 2020, comparisons to prior epidemics were unavoidable. Increased risk of illness and death among physicians during epidemics has been recognized since antiquity (Thucydides), and is globally relevant at this time.[55] Public events and compliance (or non-compliance) with non-pharmaceutical interventions massively impacted HCWs' experience during prior outbreaks, with the devastating global influenza pandemic of 1918 providing the most recent parallel.[56] A century later, geography, politics, travel, communications, public actions, social inequities, and supply chain vulnerabilities are impacting HCWs during the COVID-19 pandemic independent of medical advances.

The epidemiology of COVID-19 infection, morbidity, and mortality among HCWs is driven by occupational and non-occupational factors, which can be modified to improve outcomes. An array of studies has shown that direct patient care can be associated with increased rates of HCW infection, hospitalization, and death in acute and ambulatory care settings.[57,58] Fortunately, improved understanding of transmission mechanisms and risk mitigation within the classic hierarchy of controls, as described earlier in this guideline, has greatly reduced workplace transmission. Source control, defined as consistent masking of all HCWs at work *and* all visitors and patients (as clinically possible), can substantially limit workplace infection risk. Eye protection adds additional significant protection. Aerosol generating procedures continue to be associated with elevated transmission risk and require higher levels of administrative control and PPE use for HCW safety.[59,60] Specifically, HCWs who perform these procedures must wear respirators appropriate to airborne isolation pathogens as well as eye protection. Gowns and gloves provide additional protection. Close dynamic collaboration between MCOH physicians, public health authorities, and hospital infection preventionists can optimize staff safety. Indeed, improved cross-disciplinary partnerships may be one of the pandemic's few developments.

In most US hospitals, the initial horrific shortages of PPE in general, and respiratory protection in particular,[61] have partially improved. At the time of writing, improved supply chains, stewardship policies to avoid inappropriate

overuse of respirators in low-risk settings, increased use of reusable respirators and eye protection, and systematic implementation of sterilization and re-use protocols (for masks and N95 respirators previously considered to be single-use items) have alleviated scarcities to some extent. Training and data-driven improvements in administrative controls (such as pre-procedure testing, cohorting infected patients, and isolating persons under investigation) have enhanced staff safety in patient care settings.

Policies requiring HCWs to mask in non-clinical settings, and interventions with distancing and barriers to avoid potential staff-to-staff transmission during meals and meetings, are also crucial to control transmission from asymptomatic co-workers. Thermal and/or symptom screening before all shifts may also decrease the risk of transmission from infected HCWs to co-workers and patients, although data are not robust for this intervention.[62]

Over time, as occupational infection control strategies have improved in the context of essentially uncontrolled community spread in the US, community-acquired infections in HCWs have become proportionally more common. Managing household and community exposure and COVID-19 infections in HCWs are essential to maintaining a stable workforce and preventing secondary workplace transmission to other HCWs and patients. Health care employers must maintain updated evidence-driven policies to guide quarantine and return-to-work protocols, and these policies must address non-occupational as well as occupational risks to be effective.

COVID-19 testing options for HCWs continue to evolve, but the gold standard for diagnosis currently remains nucleic acid testing of nasal or oral secretions with real-time PCR (RT-PCR). At the time of writing, rapid antigen testing still requires confirmatory RT-PCR in many cases, and antibody tests remain of unclear value for managing HCWs' quarantines or treatment. Ideally, HCWs test access should be prompt, convenient, and free with timely results available to HCWs and their MCOH providers. Unfortunately, reagent shortages, restricted access and delayed turn-around times remain common in many parts of the country, although larger medical centers are likely to have in-house capability to guide quarantine management. Symptomatic HCWs should be quarantined pending RT-PCR testing. Asymptomatic exposed HCWs should have access to testing on a voluntary basis following current CDC guidance as it evolves. Surveillance testing of asymptomatic HCWs is likely to become more common and should help control workplace transmission.

MCOH practices must utilize robust data to manage COVID-19 exposures, furloughs, infections, and work restrictions. Rapidly accruing knowledge combined with ongoing uncertainties has led to ever-changing guidance on quarantine length, testing, and clearance criteria. (Readers should consult current CDC, public health, and infectious disease guidance rather than depending on any specific prior reference for these criteria.) Robust and editable information technology (IT) tools are essential to maintaining consistency, managing individual cases, and tracking workforce status. Prior methodologies for managing ordinary nosocomial infections and risks are likely to be inadequate to the pandemic's complexity. Stakeholders from MCOH, infection prevention, human resources, and senior leadership should be included in IT selection and development to succeed in their linked but separate missions. Privacy must be maintained appropriately within the context of contact tracing and public health reporting requirements.

When staffing shortages and pandemic-related workload become critical, health care employers may need to implement contingency or crisis staffing. This implies that usual guidance to keep HCWs with known infections or high-risk exposures out of work may need to be disregarded. If possible, data should be maintained even in these extreme situations to help with future decision-making.

Differential morbidity and mortality from COVID-19 among racial and ethnic minorities in the US comprise a par-ticularly tragic aspect of the pandemic.[63] This disparity has been well documented in health care workplaces as well as community outbreaks.[57] In addition, chronic medical conditions that worsen COVID-19 outcomes are common among HCWs, including diabetes, obesity, immune-compromise, and cardiovascular conditions. Pregnancy is also common in a health care workforce largely of women in their childbearing years and may be associated with more severe disease from COVID-19.[64,65] In summary, occupational risks, community exposures, underlying medical conditions, and demographic disparities combine to create ongoing hazards for HCWs despite risk mitigation. Employers should provide accommodation for underlying conditions that increase the risk of more severe disease within the context of their legal, ethical, and operational obligations. MCOH providers are central to these evaluations.

Infection and physical hazards are not the only risks for HCWs in this pandemic. Stress, burnout, and psychological distress were critical issues for HCWs before the COVID-19 pandemic.[66] The pandemic, with its associated physical, emotional, and ethical stressors for HCWs accentuates them all. Providing access to confidential psychological support services is crucial to maintain resilience in HCWs,[67,68] and manage crises including suicidality. Every effort should be made to reduce stigma and encourage engagement with a range of behavioral health resources.

Health care employers and their MCOH staff must plan for long-term challenges with the COVID-19 pandemic, including immunizations. At the time of writing, massive advances in medical understanding have not led to meaningful control of community transmission. Case rates and deaths continue to rise across the US, and health care is increasingly stressed in many locations. MCOH providers must anticipate ever-changing guidance and should strive to communicate this effectively and reassuringly to their HCWs. COVID-19 vaccines are arriving now for HCWs. MCOH providers are central to providing safe, efficient, high-volume vaccination resources, building on their extensive experience with other CDC-recommended vaccines for HCWs. Seasonal influenza vaccine campaigns have always been preparation for a pandemic. Now that it rages among us, we must continue working to protect our front-line HCWs and share any useful strategies with our colleagues in other industries.

Influenza in the COVID-19 Era
While COVID-19 and influenza are respiratory illnesses, the viral etiologies are different. With the COVID-19 pandemic, the influenza virus represents a second respiratory virus associated with morbidity and mortality three-fold higher than influenza partially due to its spread among the immunologically naïve.[69] Influenza is associated with tens of thousands of deaths annually. The possibility of simultaneous COVID-19 and influenza epidemics present public health challenges. Interventions such as face coverings mandates and physical distancing are expected to influence both infections; a decreased influenza incidence was associated with the nonpharmacologic interventions.[69] Continued enforcement of nonpharmacologic interventions is expected to decrease influenza transmission. Influenza vaccination has consistently been lower than 50% and it is particularly significant to minimize the viral reservoir. National education campaigns and community-based vaccinations will prove crucial.[69]

There is overlap of symptoms and it may be difficult to tell the difference between them based on only symptoms.[70] Testing will be required to differentiate between the two. Both COVID-19 and influenza have symptoms ranging from asymptomatic to fever, cough, shortness of breath, fatigue, body aches, sore throat, headache, and runny nose; some individuals may have vomiting and diarrhea.[70] Signs of COVID-19 that differ from influenza include anosmia and ageusia. Individuals with COVID-19 may take longer to develop symptoms than if they have the flu.[70] Influenza patients may develop symptoms from 1 to 4 days after being infected while the COVID-19 patient typically has symptoms 5 days following infection. Both can be spread before onset of symptoms – 1 day for influenza and 2 days for COVID-19. Both are spread by respiratory droplets and while spread in similar ways, COVID-19 is more contagious and noted to have super spreaders. Both can cause severe complications including pneumonia and ARDS especially among those at high risk including the elderly, and those with chronic medical conditions. Additional complications associated with COVID-19 include blood clots and multisystem inflammatory syndrome. There are multiple influenza vaccines made available annually to protect against the viruses that circulate annually. Vaccines for COVID-19 are currently in various stages of development and clinical trials and must be authorized for emergency use by the FDA.[70]

There are no specific symptoms that specifically distinguish between early COVID-19 illness and influenza.[69] Distinguishing between the two viruses have implications for return-to-work guidance, quarantine, and COVID-19 contact tracing. Coinfection with both SARS-CoV-2 and influenza has occurred and a positive test result for one does not exclude the other. Diagnostic tests of both viruses may eventually be needed in a particular case.[69]

COVID-19 in Long Term Care Facilities
The COVID-19 pandemic had a major impact on nursing homes. Nursing home deaths account for 40% of US COVID-19 deaths while nursing home residents are less than 1% of the population.[71] Numbers are most likely underestimated, as only about 80% of nursing homes reported, and only federally regulated nursing homes were represented and not assisted-living facilities.[71] Many nursing home worker deaths went unnoticed by federal agency responsible for protecting workers; nursing homes are considered high risk.[72] Many deaths went unreported with nursing home operators claiming they were unable to determine whether someone became ill at work or contracted the disease

elsewhere despite major outbreaks among both residents and employees at the facilities.[72] OSHA issued guidance that gives employers permission to not report deaths to the agency if a "reasonable and good faith inquiry cannot determine whether it is more likely than not" that an employee's COVID-19 infection was linked to exposure at work.[72]

OSHA, as well as state worker safety programs approved by the agency, has only physically investigated a fraction of nursing home employee deaths.[72] All federally funded nursing homes were directed to regularly test all residents and staff, but follow-through has been uneven across the states. Some experts suggest that routine, repeat testing of staff is the key to controlling COVID-19 in nursing homes, as asymptomatic spread from staff to residents likely introduces the virus into facilities. Nursing homes that followed federal guidelines did not have as poor an outcome as those that did not.[71]

The Centers for Medicare & Medicaid Services (CMS) supplied adult care facilities with rapid POC test kits as most nursing homes were ill-equipped to regularly screen employees and residents. There were concerns that employees often worked while symptomatic and were subsequently found to be positive.[73] Without widespread testing, outbreaks often begin with asymptomatic staff who unknowingly introduce the virus from the community.[71]

Transportation and Travel
For employers in the transportation industry, the primary principles for returning to work safely are no different than for other operations, needing to protect both the employees and the customers, in this setting, passengers. Ensuring adequate appropriate supplies and education and communication on issues of physical distancing, hand/respiratory hygiene, use of face covering and other barriers. Screening should be considered for and physical distancing in any conveyances as well as in waiting or ticketing areas, employee breakrooms, restrooms, or maintenance facilities. Appropriate cleaning protocols should be observed for any high contact/high touch areas such as kiosks, turnstiles, benches, railings, handrails, garbage cans, door handles, payphones, restroom surfaces (faucets, toilets, counters), poles, handrails, seats, benches, grab bars, and exit buttons or after identification of an employee of passenger infected with SAR CoV-2. Equipment and supplies should not be shared and if necessary, thoroughly cleaned between users. To the extent possible, ventilation should be optimized, whether through enhanced HVAC systems or opening windows, doors, etc.

For delivery drivers some considerations might include:
- Limiting time spent outside cab,
- Using paperless, electronic invoicing when available,
- Contacting facilities in advance – making an appointment for unloading of cargo,
- Identifying rest areas or hotels which are following proper protocols in advance,
- Packing supplies – food and water to limit stops, and
- Keeping truck well ventilated.

Guidance for different transportation modes can be found through the CDC website or other industry-specific sites.[74-83]

It is important that the risk of fatigue is considered in any transportation operation. For some administrations in Department of Transportation Administrations, such as the Federal Motor Carrier Safety Administration (FMCSA) and Federal Railroad Administration (FRA), relief from hours of duty requirements were available during the early stages of the pandemic through emergency declaration. For FMCSA, relief continues to be an option through the end of the year for certain operations.[84] However, operators are still required to have sufficient rest and if rest is needed, the employer must ensure the employee has rest opportunity. There are several excellent sources of information on addressing fatigue during COVID including through CDC or the National Safety Council (NSC).[85-87]

Discretion of enforcement for several other DOT requirements such as controlled substance and alcohol testing and medical examination requirements were announced.[74-77,88,89] Check appliable transportation modes administration website to confirm status.

Travel
Many employees in the transportation industry will be performing duties away from their home terminal or base. Considerations for these employees and others that may need to travel as part of their job or chose to travel for personal reasons would be similar.[90,91]

The risks from travel should be carefully considered including the situation at both origin and destination as many countries, states and even some cities have specific limitations or requirements for travelers from certain areas.[92-98] Travelers should not only consider the infection rate at their destination but also be certain that they have a plan should they become ill or need to quarantine after an exposure.[99,100] Some areas may be experiencing limitations in hospital or ICU bed capacity which may make travel riskier. Plans should in place should the individual become ill or exposed while away from home. Those at higher risk of more severe illness should consider carefully whether the need to travel outweighs the risk.[101] International travel can present unexpected challenges if borders close, rules change, or if the traveler becomes ill while abroad. Some important questions to consider include:

- Do I need to quarantine before I arrive?
- Do I need to quarantine when I return?
- Do I need a COVID-19 test?
- Do I need to wear a face covering?
- What is opened/closed? Restaurants/bars – indoors or only outdoors?
- Will I need to have my temperature checked?

For all travel, the same core principles to minimize spread of SARS CoV-2 should be followed:
- Physical distancing (proper spacing and avoiding crowds)
- Hand washing or use of alcohol-based hand sanitizers (especially after touching high touch items)
- Wearing a face covering or appropriate (PPE) (and using them properly)
- Symptom monitoring
- Avoiding contact with those who are ill.

For any anyone traveling, whether for business or personal, it is important to be certain that rest stops, overnight accommodations, client locations, restaurants are available and are following appropriate steps. Ensure that there is a plan should employees or customers become ill or are exposed to someone with COVID-19 and those traveling should have a plan if they become ill while away from home. Different modes of travel carry different risk.[102-104] The safest is probably driving a personal vehicle and while studies suggest that certain modes of transportation are safe, there would still be other potential risks. There may be several other potential exposures to the virus such as those associated with the method of the getting to and from the station or airport (taxi/ride share, public transportation),[78-82,102-104] lines for ticketing or boarding, gathering in waiting areas, or indoor eating settings and accommodations.[105] CDC is now specifically recommending the use of face covering during any public mode of transportation conveyance both at the hub and during conveyance,[106] and a face shield might be considered in addition to the face covering in some settings.

For any setting, barriers between individuals, avoidance of shared items, used online reservation/check-in processes, cashless payment or ticketing methods, keyless entries and enhancing ventilation by opening doors or windows should be used when feasible. Avoiding restaurants, travel or other activities during peak hours will limit exposure to crowds. And of course, continued hand washing (or use of alcohol-based hand sanitizer if soap and water not available), physical distancing and wearing a face covering.

There are several travel-related activities which are considered higher risk[91]:
- Being in an area that is experiencing high levels of COVID-19, including destinations with a Level 3 Travel Health Notice,
- Going to a large social gathering like a wedding, funeral, or party,
- Attending a mass gathering,
- Being in crowds, and
- Traveling on a cruise ship or river boat.[107,108]

CDC provides examples of risk levels from lowest to highest for transportation, lodgings, food, and camping. For example, outdoor dining is lower risk than indoor dining and a long walk may be preferable to exercise in a gym. In all situations, risks are lower when limiting exposure to those outside the immediate household, whether in vehicles obtaining food or lodging and risk is lower if physical distance is maintained and if everyone is wearing a face covering. While activities may be permitted in some areas, this does not mean that they are without risk. In

some business or even personal travel situations, certain steps might be considered such as pre-travel quarantine and/or testing for groups that will be traveling to remote locations and able to stay within a specific "bubble."

Individuals should also bring adequate supplies such as face covering (possibly a face shield to be used in addition to the face covering or an N95 mask if the individual is high risk.[101] This is also true if the ability to physically distance is difficult, especially if indoors. Similarly, provisions of hand sanitizer, disinfecting wipes which meet EPA criteria, information on how to obtain health care should they become ill (even more important if international), current information on requirements on quarantine, testing, reporting and other local steps to limit COVID-19 spread as well as general information on precautions they can take.

Other items to bring include a thermometer, forms for symptom logging, an adequate supply of usual medications to permit the duration of quarantine if necessary, contact information for the employer's occupational health representative, emergency contact and health care provider information in the event this is required by health care providers. If food or beverage may be limited at the destination, food and water should be packed.

In addition to any local requirement, upon returning from travel passengers, especially if participating in activities considered high risk,[101] or are a high-risk individual or lives or cares for someone who is, should monitor their health and if required or recommended, quarantine. Testing may be considered, but in general should not be used as a replacement for quarantine.[109]

Construction
General recommendations for the construction industry especially where 6 feet physical distancing cannot be adhered to include keeping activity time as short as possible, using back-to-back or side-to-side working rather than face to face whenever possible and reducing the number of people each person has contact with by using fixed teams or partnering. Workers in teams should not be changed if possible. Increasing the frequency of handwashing and surface cleaning remain crucial though not unique to the construction industry.[54]

Staff should be reminded not to touch their faces and not rush or cut corners – safety should be at the forefront of their minds. Managers are to walk the branch to ensure proper physical distancing is being maintained. Desks should be cleared of any items other than keyboard, computer, screen, and phone for ease of cleaning and all other items should be placed in a box under the desk or in a drawer.[54] Staff should also be reminded to stay safe once they have left work. Wherever possible workers should travel to site alone using their own transport. If workers have no option but to share transport, journeys should be shared with the same individuals and with the minimum number of people at any one time. Further, good ventilation should be ensured, for example, keeping the windows open and facing away from each other to help reduce the risk of transmission. The vehicle should be cleaned regularly using gloves and approved cleaning products with particular emphasis on handles and other areas where passengers may touch surfaces. Parking arrangements should be considered for additional vehicles.

Where public transportation is the only option for workers, consideration should be given to changing and staggering site hours to reduce congestion on public transportation as well as avoidance of public transportation during peak times. Workers should be reminded that face coverings are mandatory on all types of public transport.[54] When traveling at work or between site locations, workers should travel alone. If workers have no option but to share a vehicle, then available guidance on *Working Safely during COVID-19* in a vehicle should be followed.[110] Vehicles should be shared with the minimum number of people at a time, good ventilation should be maintained, and vehicles should be regularly cleaned.

Non-essential visitors should be discontinued, the number of access points should be changed to reduce congestion and contact. Where loading and offloading arrangements on site will allow it, drivers should remain in their vehicles. Workers should be reminded not to attend work if they have symptoms of COVID-19. Off-loading areas should be isolated where ideally, the driver is the only person in the area. Steering wheel, gear stick, crane controller, access handles and devices should be wiped with anti-bacterial wipes after each delivery. Where manual off-load is required, either the driver does it on his own or they remain in the cab while the customer completes the off-load. Two-person lifts are only permitted on products where physical distancing can be maintained.[54] Additional guidance on construction is available.[54]

Marine and Offshore Industries

The American Bureau of Shipping (ABS) has created guidance in response to the current pandemic to assist marine and offshore industry in protecting their workforce while continuing crucial operations. Such guidance provide response to exposure cases through isolation, contact tracing, quarantine, cleaning and disembarking. Mitigation of exposure risks by cleaning, disinfecting, screening, and physical distancing. Commercial vessels must comply with guidance from port authorities to help control the spread of SARS-CoV-2 prior to arrival. If there is a suspected case of COVID-19 on board, the port health authority at the next port of call should be notified.[111]

Due to close quarters on vessels and other maritime and offshore assets as well as the nature of transmission of the virus, rapid spread is possible.[111] Given the range of symptoms and disease severity, assets with suspected cases should take immediate measures to limit spread starting with isolation. Isolation on board vessels is critical in preventing potential spread to personnel, adversely impacting onboard medical resources, operations as well as the ability to disembark. Further, ill personnel may not be able to obtain adequate medical attention while on board.[111]

Further, early detection, prevention and control of COVID-19 is important to prevent transmission.[111] All asset managers are to have a plan in place to minimize the risk of exposure. Due to the potential for asymptomatic spread, physical distancing measures that minimize unnecessary exposure are recommended. Prevention management plans include specific cargo-handling procedures, personnel rotation and shift-change procedures, port call and liberty policies based on the prevalence of disease in a specific geographical area, access-control measures for visitors, contractors, and pilots. Areas overlapping with other industries include identification of high-risk areas to focus cleaning and disinfecting efforts including regarding accommodations, physical distances, selection, provision, education and use of PPE as well as hand and respiratory hygiene. Work practices may need to be adjusted to avoid exposure as it pertains to meetings, meal preparation, service, work teams and work shift adjustment.[111]

Special considerations are given to embarkation and disembarkation especially regarding personnel coming on board including crew, passengers, and offshore workers.[111] WHO advises asset owners to implement pre-boarding screening to identify potential contacts; probable and confirmed cases should not be allowed to board the asset. All crew and passengers boarding marine and offshore assets should be provided with general information on COVID-19 and preventive measures. Crew members should not come into direct contact with shore gangways and ladders. Gangway watch should wear appropriate PPE. WHO advises that until the end of the COVID-19 pandemic, all crew and passengers on board marine and offshore assets should complete a passenger/crew locator form (PLF). This form should be kept on board the asset for at least 1 month after the passenger or crew member has disembarked. PLF helps local health authorities with contact tracing if a confirmed COVID-19 is identified following disembarkation.[111]

An outbreak management plan should be developed by all assets if an exposure is suspected.[111] Contacts should be identified and isolated before disembarking. Clinical management of suspected case(s) is important as are procedures to clean and disinfect potentially contaminated areas including isolation cabins. Contact of the suspected case(s) must be managed. Procedures for PLFs, continued service provisions for suspected cases, provision of PPE, and disembarkation policies must be clarified. All staff should have knowledge of the outbreak management plan and understanding of responsibilities.

Energy/Utilities

According to the Department of Energy (DOE), the department has been in Phase 2 since June 29, and there is currently no specific date for the start of Phase 3.[112] Energy sector companies are encouraged to assess the risk within the supply chain including the effects on industry service providers. Protective measures for access to homes and businesses in specific areas should follow CDC and OSHA guidance. Non-essential work orders at businesses or customers' homes that require workers to enter may be deferred wherever possible to conserve PPE for essential emergency work protecting the health and safety of personnel.[113]

The CISA and DHS industry list of essential critical infrastructure workers included electricity, petroleum, natural gas, and propane workers.[114] Important areas for governors to consider include critical infrastructure workers needing priority access to PPE, testing and supplies. Critical energy infrastructure employees should be identified and credentialed in the event of a shelter in place order. Further, waivers may be needed for fuel carrier

standards and commercial driver's licenses needed to move critical utility cleaning supplies. Reliance on energy is a shared area of interdependence among all critical infrastructure sectors, making energy reliability a critical need for national safety and security.[113]

In cases where access is restricted, regional coordinators and state emergency operating centers (SEOCs) have clear protocols on how essential personnel can access restricted areas. DOE performed a thorough review of PPE inventories and other supplies including at labs, plants, and sites. DOE supports the safety and security of the energy sector workforce ensuring the energy system. Energy sectors are monitoring the availability of PPE for essential workers. FEMA released information about information about distribution of cloth masks. FEMA later issued a temporary final rule that extended the PPE allocation.[115]

Guidelines for optimizing PPE including reducing, reusing, or repurposing PPE in accordance with CDC's PPE optimizing strategy for use when PPE supplies are stressed.[116] Usage of PPE should be reduced by modifying normal operations and procedures. Reuse can be accomplished by decontamination procedures. Alternative types or sources of PPE can be repurposed including NIOSH-approved respirators in lieu of N-95 for activities for which respiratory protection is required per CDC.

Decisions about testing remain at the discretion of state and local health departments or individual providers. New guidance includes screening of asymptomatic individuals if prioritized by state or local plans. Energy industry suppliers and infrastructure operators are identifying essential employees for prioritized COVID-19 testing.[113] CISA provided guidance across the critical infrastructure sectors including energy prioritizing testing for asymptomatic personnel performing essential jobs in support of operations centers and control rooms.[117]

CDC provided testing strategies in high-density critical infrastructure workplaces after case identification.[118] Early identification of asymptomatic individuals include initial and regular testing of everyone residing or working in such-settings as well as testing of new entrants or upon re-entering following a prolonged absence.

Some energy companies have implemented sequestration protocols for essential personnel to ensure uninterrupted operation of energy functions. Protocols include assessing the minimum number of essential workers and setting expectations about duration. Also, creating separate living quarters, individually assigned equipment, physical separation between workstations, testing workers prior to sequestration and requiring appropriate PPE use.[113]

Wellness checks are implemented based on CDC guidance throughout work shifts of essential workers including symptom and thermal screen to monitor for symptoms of COVID-19.[119] CDC further issued guidance for critical infrastructure workers who may have had exposure. Workers who were exposed but remain asymptomatic should pre-screen and be monitored regularly. They should also wear a mask, physically distance, and disinfect workspaces.[120] Contact tracing is utilized to help control the spread of disease in accordance with CDC Contact Tracing Training Plan and resources for medical professionals and local health department personnel.

CONCLUSION

As the world continues to deal with the COVID-19 pandemic, many businesses struggle to remain open during surges and face challenges with continuing to work safely. Many of the changes uncovered by the COVID-19 pandemic are here to stay as workplaces continue to evolve. OEM physicians will be a part of this change in the various sectors. There are many useful tools and resources available for employers and OEM physicians to consult.

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