Washington State Department of Health

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Ventilation and Air Quality for Reducing Transmission of COVID-19

Good ventilation and indoor air quality are important in reducing airborne exposure to viruses, including SARS-CoV-2 that causes COVID-19, as well as other disease vectors, chemicals, and odors. However, buildings vary in design, age, Heating Ventilation and Air Conditioning (HVAC) systems, and their ability to provide adequate ventilation and air filtration.

The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) underscores the importance of ventilation and air filtration in reducing the transmission of COVID-19 through the position statement: "Transmission of SARS-CoV-2 through the air is sufficiently likely that airborne exposure to the virus should be controlled. Changes to building operations, including the operation of heating, ventilating, and air-conditioning (HVAC) systems, can reduce airborne exposures. Ventilation and filtration provided by heating, ventilating, and air-conditioning systems can reduce the airborne concentration of SARS-CoV-2 and thus the risk of transmission through the air. Unconditioned spaces can cause thermal stress to people that may be directly life threatening and that may also lower resistance to infection. In general, disabling of heating, ventilating, and air-conditioning systems is not a recommended measure to reduce the transmission of the virus." *(Source: ASHRAE)*

The main goal in reducing airborne transmission of viruses is to decrease the number of viral particles that accumulate in indoor air, by increasing the intake of outdoor air as much as possible and/or through effective air filtration. However, **ventilation and air filtration are not effective alone** – they are tools that must be used along with other measures such as health screenings, physical distancing, reducing building occupancy, frequent hand washing, wearing face coverings, and implementing appropriate cleaning and disinfection protocols. Additionally, when there are high levels of outside air pollution, such as during a wildfire smoke event, outside air intakes will need to be modified as necessary.

Because each building and its existing HVAC systems will be different, **a professional engineer or HVAC specialist should be consulted to determine the best way to maximize the system's ventilation and air filtration capabilities for each specific room in the building**. More detailed guidance can be found in CDC's Interim Guidance for Businesses and Employers Responding to COVID-19 (May 2020), and the ASHRAE Guidance for Re-Opening Buildings. Guidance for schools can be found in CDC's guidance for improving ventilation and increasing filtration in schools, the ASHRAE guidelines for schools and universities, and the ASHRAE guidance for the re-opening of schools.

General Considerations

- Upgrade filters to MERV 13 if the system can handle the air resistance.
- Change filters as needed (clogged filters decrease HVAC operation, stress the fan motors, and decrease ability to improve indoor air quality). Visually inspect monthly.
- Inspect and clean entire systems. Make repairs quickly to prevent more serious issues.
- Reduce recirculation of air, increase/maximize outside air.
- Maintain humidity of 40-60%.
- Bring in outside air prior to occupancy and after, especially while cleaning and disinfection is occurring.
- Inspect and maintain local exhaust ventilation in restrooms, kitchens, cooking areas, labs, etc. Increase exhaust ventilation from restrooms above code minimums.
- Work with building engineer or HVAC specialist to generate air movement that goes from clean-to-less-clean air through positioning of air supply and exhaust air diffusers and/or dampers.
- If there are ceiling fans, reverse the flow direction to draw air upward or turn them off.

Buildings with an Existing HVAC System

- Adjust the HVAC system to allow the maximum amount of outside air to enter the program space. Disable demand-controlled ventilation to bring in more outside air. Reduce recirculation of air.
- Clean unit ventilators, upgrade filters if possible, and adjust for maximum outside air.
- Visually check outside air dampers to make sure they are open.
- Assess units to determine if filters can be upgraded to MERV 13-14, or the highest MERV that will not significantly diminish airflow. Ensure that filters fit tight.
- For existing HVAC systems that cannot be upgraded, optimize as much as possible and consider supplementing with other measures (see below).
- Flush the building's indoor air two hours before and two hours after occupancy and always when cleaning and disinfecting.
- There is no special cleaning or disinfection for (HVAC) systems. Cleaning the system or filters with disinfectants is not recommended and not necessary.
- Clean and service HVAC unit on a regular schedule (check with HVAC specialist).

Buildings that DO NOT have an Existing HVAC System

Opening windows:

- Open windows and doors if it is safe and weather allows, and include more outside time during the day.
- Reduce occupancy in areas where outdoor ventilation cannot be increased to the optimal amount.
- Use fans to increase the effectiveness of open windows. Position fans securely and carefully in or near windows so as not to induce potentially contaminated airflow

directly from one person over another (strategic window fan placement in exhaust mode (e.g., blowing out of the window) can help draw fresh air into room via other open windows and doors without generating strong room air currents).
- Ventilate building or room 2 hours before and after occupancy.
- Use of fans for cooling is acceptable. They should blow away from people.

Portable air filtration:

- Portable HEPA air cleaners can supplement ventilation and are most critical in rooms with poorer ventilation or in isolation areas.
- Unit air ratings are based on the square footage of the room and the Clean Air Delivery Rate (CADR). This guide provides a useful tool to calculate ventilation rates for indoor space(s): Harvard-CU Boulder Portable Air Cleaner Calculator for Schools.
- The equivalent of at least 5-6 air changes per hour is recommended.
- Consider the noise rating as some units can be quite loud. Consult with the manufacturer before purchasing. The Clean Air Delivery Rate is at the highest speed, which will be too loud for some environments. Choose one rated for a larger size room and run it on the low fan speed to reduce the noise, or use two for the room.
- Units should be pointed so they do not blow air across occupants (e.g., from one individual to others).
- Air filtration should be maximized in the space 2 hours before and after occupancy.
- Choose HEPA air cleaners certified by the California Air Resources Board to not emit dangerous levels of ozone.
- Do not use ozone generators, electrostatic precipitators and ionizers, or negative ion air purifiers because they can produce harmful by-products.
- Do not use personal air purifiers.
- HEPA filters should be replaced regularly as recommended by the manufacturer. The unit should be vacuumed and cleaned on a regular schedule – this should be done outside. Filter disinfection is not needed or recommended.

Additional Considerations

Restrooms:

- If toilets have lids, instructions should be given to shut them during flushing.
- Ensure restroom exhaust fans are functional and operate at full capacity 24/7.
- Install paper towels to dry hands, disconnect hand dryers (blowers).
- Ensure that face coverings are worn in the bathroom.
- Ensure that all drain traps are primed (water flow maintained regularly).

More COVID-19 Information and Resources

Stay up-to-date on the current COVID-19 situation in Washington, Governor Inslee's proclamations, symptoms, how it spreads, and how and when people should get tested. See our Frequently Asked Questions for more information.

A person's race/ethnicity or nationality does not, itself, put them at greater risk of COVID-19. However, data are revealing that communities of color are being disproportionately impacted by COVID-19- this is due to the effects of racism, and in particular, structural racism, that leaves some groups with fewer opportunities to protect themselves and their communities. Stigma will not help to fight the illness. Share accurate information with others to keep rumors and misinformation from spreading.

- WA State Department of Health 2019 Novel Coronavirus Outbreak (COVID-19)
- WA State Coronavirus Response (COVID-19)
- Find Your Local Health Department or District
- CDC Coronavirus (COVID-19)
- Stigma Reduction Resources

Have more questions about COVID-19? Call our hotline: **1-800-525-0127,** Monday – Friday, 6 a.m. to 10 p.m., Weekends: 8 a.m. to 6 p.m. For interpretative services, **press #** when they answer and **say your language.** For questions about your own health, COVID-19 testing, or testing results, please contact a health care provider.

To request this document in another format, call 1-800-525-0127. Deaf or hard of hearing customers, please call 711 (Washington Relay) or email civil.rights@doh.wa.gov.