Air Filtration Strategies During COVID-19 & Wildfire Smoke for Child Care Programs

How can air filtration help reduce the spread of COVID-19?

COVID-19 can be transmitted through aerosols, which can linger in the air for long periods of time and travel long distances. Air filtration strategies help reduce the concentration of the virus, particularly when people are indoors for long periods of time.

How can air filtration help reduce the negative health impacts of wildfire smoke?

Air filtration strategies decrease the presence of air pollutants, such as smoke. They also help decrease allergies.

While COVID-19 health and safety guidance recommends that child care programs open windows and increase air flow to reduce the spread of COVID-19, exposing children to outside air on days with poor air quality due to wildfire smoke is dangerous (see Alameda County Public Health Department’s Air Quality for Child Care Programs guidance here).

Instead, to counteract both wildfire smoke and COVID-19, child care programs can utilize air filtration strategies.

What air filtration strategies are recommended for child care programs?

Air filters for HVAC systems: If your child care center or family child care home has an HVAC system (also known as a heating & air conditioning system), you may consider installing more powerful air filters into the system. The CDC recommends using a ‘MERV 13’ filter. MERV stands for ‘Minimum Efficiency Reporting Value.’ You can find instructions on how to check and replace your HVAC filter here and additional information on preparing HVAC systems to address wildfire smoke during COVID-19 here.

Portable air cleaners: Portable air cleaners, often referred to as air purifiers, are another option for air filtration. These air cleaners exchange the air in the room with clean air several times per hour, which is referred to as the number of ‘air changes per hour’ or ACH. Ideally, the air should be exchanged 5 times per hour, or an ACH of 5.

What should I look for in a portable air cleaner?

- Choose an air cleaner with a high efficiency filter – preferably a HEPA filter. HEPA filters remove more than 99.9% of pollutants in the air.
- Ensure the air cleaner is the right size for the room where you would like to use it (see instructions below to help determine the right size).
- Avoid air cleaners with additional features, such as ultraviolet lights (UV) or ionizers/ions.
- Avoid any units with ‘ozone generators,’ including those that emit trivalent oxygen, activated oxygen, allotropic oxygen, saturated oxygen, superoxygen, or mountain-fresh air. These can be very dangerous for children.

Find a list of certified air cleaning devices that meet ozone emissions limits HERE.

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1 This resource is shared only as an example of how to replace an HVAC filter and is not intended to recommend or endorse this website’s services.
2 HEPA stands for ‘high efficiency particulate air filter’
How do I determine the right size portable air cleaner for my room?

Most portable air cleaners will include information on the room size for which it is appropriate. The room size is determined by multiplying the length of the room by its width and height. For example:

<table>
<thead>
<tr>
<th>Room length:</th>
<th>Room width:</th>
<th>Room height (from floor to ceiling):</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 feet</td>
<td>20 feet</td>
<td>8 feet</td>
</tr>
</tbody>
</table>

Room size: 25 feet x 20 feet x 8 feet = 4,000 cubic feet

Therefore, you should look for an air cleaner that can filter a room of at least 4,000 cubic feet.

This website provides an easily searchable database of certified portable air cleaners by room size. However, you can also use the following calculation to determine if a portable air cleaner is right for your room:

1. Calculate the room size: length x width x height = room size
2. Identify the Clean Air Delivery Rate (CADR) provided by the portable air cleaner - this is a measurement of the air filter’s performance and how much air passes through the filter.
   a. When identifying the CADR, look for the tobacco smoke CADR.
   b. The CADR will likely be provided in cubic feet per minute (or cfm) instead of cubic feet per hour. If so, convert the number to cubic feet per hour by multiplying the number by 60.
3. Divide the CADR amount by the room size to find the air changes per hour (ACH).
   a. If the ACH is close to 5 or higher, it should be a good fit for your space.
   b. You can also use multiple air portable cleaners to reach an ACH of 5 if necessary.

Example:
1. Calculate room size: 25 feet x 20 feet x 8 feet = 4,000 cubic feet
2. Identify the CADR: 400 cfm
   a. Convert the CADR to cubic feet per hour: 400 cfm x 60 = 24,000 cfh
3. Divide the CADR per hour by the room size to find the ACH: 24,000 ÷ 4,000 = 6

Where should I put the portable air cleaner?

The units are best placed in the middle of the room, raised off of the floor so that they can access as much air as possible. Locate the unit away from doors, windows, and foot traffic, and away from walls or corners. Be sure to safely secure any cords.

How often do I need to replace the filter inside the air cleaner?

The unit will come with instructions on how often to replace the filter – usually every six months to a year for HEPA filters. However, you may want to replace the filter more often if the air quality is particularly bad due to wildfire smoke. When replacing the air filter, wear a mask and gloves and place in a sealed plastic bag in case it has filtered any COVID-19 particles. It is best to change the air filter a few days after it has been used to be safe.

For a more detailed explanation of air filtration and portable air cleaners, please click here.