

Introduction & Evidence for Use

Air filtration devices work by removing particles from the air in a room, but do not provide fresh air. Studies on the use of these devices in optometry consulting rooms show that they may be useful in reducing aerosol exposure, but there is limited evidence on their ability to reduce transmission of the COVID-19 virus.

The WHO recommends the use of these devices only in situations where mechanical ventilation systems are deficient, and not as a substitute for a well-ventilated environment. Ideally, natural ventilation through open doors and windows is the simplest way to change the air in a room, but in small rooms with poor ventilation, an air purifier can help remove most small aerosol particles from the air.

However, it is important to continue with usual hygiene practices and clean surfaces to prevent the spread of pathogens.

Terminology & Abbreviations

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Room Size and Air Change Rates

The WHO recommends a minimum of **6 air changes per hour** in modern health care facilities and the use of portable air filtration devices only when 6 air changes per hour cannot be achieved. Room size, air distribution, and ventilation should also be considered

when choosing an air purifier, and it's recommended to choose a model that can handle at least one third more area than the room size. The goal is to achieve 6 air changes per hour or higher for healthy indoor air.

Noise

HEPA filters in optometry consulting rooms should be chosen with noise levels in mind. Noise acceptability is measured in decibels and units may have multiple speed settings. Most air purifiers can be audible at their highest settings, and so it may be worth getting a model rated for a larger room than the one it will be used in for a balance of quiet and effectiveness. Consider noise emissions data in manufacturer manuals and consider using two smaller, quieter air cleaners for good coverage and mixing of air.

Power Consumption

HEPA filters consume relatively low amounts of power and have low running costs, typically less than standard pedestal fans. Power consumption is measured in watts (W) and can be compared to other household appliances. Good quality air purifiers can run 24/7 and will only need to run at high speeds when pollutant levels spike.

Example: 80W Air Purifier Power Consumption

80W air purifier	\$14.5/month (approx.)	\$0.25/kWh
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An example of an 80W air purifier might cost approximately \$14.50 per month to run 24/7 at a cost of electricity of \$0.25/kWh. Although the running costs are very low, it is recommended to turn off the air purifier overnight so as to prolong the life of the filters and the appliance itself.

Buying Guide

When purchasing an air purifier, consider:

- Pricing
- Availability
- Warranty
- Features of the device

Air purifiers typically cost between \$200-\$1000, or sometimes more, and replacement filters can range from \$40-\$100. Look for a device with a good range of fan speeds and an oscillating action for covering more of the room space.

The device should have a HEPA (H13 or H14 only) filter, sufficient Clean Air Delivery Rate for the room volume, and a maximum tolerable noise level of <40dB. Avoid products that advertise "HEPA-like" or "HEPA-style" filters that do not adhere to filter grading systems. Consider cost, expected delivery times, and the availability and cost of replacement filters, and consider locally-made/supplied products.

WH&S

When installing HEPA filters in optometry consulting rooms, safety issues such as **power lead routing**, **trip hazards**, **water hazards**, and **fire escape routes** should be considered. The filter should be placed away from heat sources or flammable objects. Avoid placing the filters in areas with a lot of foot traffic and be careful of trip hazards with power cables.

Units with **ionizers**, **plasma/ozone/photocatalytic oxidation/precipitators** and **UV purification** or **disinfecting add-ons** should be avoided as they can produce respiratory irritants.

Changing Filters and Other Maintenance

HEPA filters in healthcare facilities require careful maintenance to preserve performance. Routine cleaning and filter changes require a "safe change" procedure and should not be carried out in clinical areas. Common maintenance items include frequent checks, bagging and labeling of dirty filters for disposal, PPE for maintenance staff, and testing and tagging of equipment. Ongoing costs include the price of new filters and replacement frequency. HEPA filters are not washable and may need to be replaced. Some models have separate filters that can be replaced separately, while others have an all-in-one filter cartridge. Surfaces of cleaners should be easy-to-clean and impervious.

