Description of proposed exhausted air treatment system

Table 9 describes the proposed exhausted air treatment system.

Table 9. Proposed exhausted air treatment system

	HEPA filter	Portable HEPA filter	UVGI
Image			
Description	Pleated mechanical air filter that can theoretically remove at least 99.97% of dust, pollen, mould, bacteria and airborne particles with a size of 0.3 microns (µm)	A portable HEPA filter unit equipped with the proper fittings and ducting to exhaust air from a selected room to create the required ventilation flow rate and exhausted air treatment	Electromagnetic radiation that can destroy the ability of microorganisms to reproduce by causing photochemical changes in nucleic acids. Wavelengths in the UVC range are especially damaging to cells because they are absorbed by nucleic acids
Application	Air filtration in hospitals, isolation rooms and laboratory facilities	Ventilation and air filtration in hospitals, isolation rooms and laboratory facilities	Air-cleaning measure; UVGI is effective in reducing the transmission of airborne bacterial and viral infections in hospitals, military housing and classrooms
Air extractor needed	Yes	No	Yes
Efficiency	This type of air filter can theoretically remove at least 99.97% of dust, pollen, mould, bacteria and airborne particles with a size of 0.3 microns (µm). The diameter specification of 0.3 microns corresponds to the worst case – the most penetrating particle size; particles that are larger or smaller are trapped with even higher efficiency. Using the worst-case particle size results in the worst-case efficiency rating of 99.97% or better for all particle sizes		UVGI is effective in reducing the transmission of airborne bacterial and viral infections, but it has only a minimal inactivating effect on fungal spores. UVGI is also used in air-handling units to prevent or limit the growth of vegetative bacteria and fungi *(25)*
Suitable for air recirculation	Yes	Yes	No
Risk for health-care workers	No	No	Yes; excessive exposure may result in dermatosis and photokeratitis *(26)*
Electricity requirement	No	Yes	Yes
Initial cost	Moderate	High	Minimal
Ongoing operating costs	Moderate; air extractor power consumption and filter replacement according to manufacturer's specifications	Moderate; power consumption and filter replacement according to manufacturer's specifications	Minimal; air extractor power consumption and filter replacement according to manufacturer's specifications
Maintenance requirement	Moderate maintenance required by trained technicians	Moderate maintenance required by trained technicians *(27)*; these could be in house	Minimal maintenance required; usually consists of keeping bulbs free of dust and replacing old bulbs as necessary
Merits	High efficiency	High efficiency; ventilation system included	Can be cost-effective for large facilities; minimal maintenance needed
Drawbacks	Requires uninterrupted power; requires moderate maintenance	High initial investment; requires uninterrupted power; requires moderate maintenance	Because the clinical effectiveness of UV systems may vary, UVGI is not recommended for air management before air recirculation from airborne isolation rooms; requires uninterrupted power; needs adequate infrastructure