REFERENCE
Ghoneim A, Proaño D, Kaur H, Singhal S. Aerosol-generating procedures and associated control/mitigation measures: Position paper from the Canadian Dental Hygienists Association and the American Dental Hygienists' Association. *Can J Dent Hyg.* 2024;58(1):48–63.

Supplementary Table S3. Aerosol reduction study characteristics

Author(s), date, country	**Study design**	**Number and type of observations**	**Type and location of aerosol reduction method**	**Comparison(s)**	**Dental setting**	**Size of clinic**	**Type and duration of AGP**	**Summary of findings**
Allison et al. (2022)[51] United Kingdom	Non-randomised experimental study	3 mannequins	LEV: DentalAIR UVC AGP filtration system Location: Extraoral suction system	With suction and without LEV; with suction and LEV; without suction and without LEV; without suction and with LEV	Open plan setting: clinical teaching laboratory Single-surgery setting: enclosed dental surgery	Open-plan clinic: 825.4-m^3 Single-surgery setting: 49.3-m^3	Anterior crown preparation of the upper right central incisor for 10 min using an air-turbine handpiece. In the single-surgery setting, full-mouth ultrasonic scaling using a magnetostrictive scaler at full power for 10 min Duration: 10 min	Local exhaust system reduced aerosols from dental procedures with air-turbine handpiece by at least 90% within 0.5 m, and 99% for ultrasonic scaler. OPC particle counts reduced by 95%.
Barros et al. (2022)[108]	Non-randomised experimental study	120 bovine maxillary incisors	HVE	No HVE	Dental operatory	Not specified	Coronal endodontic opening	No differences were detected when using or not the aspiration. Aerosol dispersion was found in all groups (22.56 cm to 72.30

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Brazil			Location: Intraoral				Duration: 3 min	cm of distance). The longest point was produced without aspiration.
Blackley et al. (2022)[54] United States	Non-randomised experimental study	32 mannequins	3 different types of HVE systems Location: Intraoral	Background concentrations with no dental evacuation system	Dental operatory bay with 5 chairs in semi-separated operatories	3.7 m x 3.7 m	Ultrasonic scaling; anterior crown preparation Duration: 10 min	Respirable and thoracic aeorosols were reduced during ultrasonic scaling and crown preparation using HVE or the other HVE alternatives.
Chavis et al. (2021)[71] United States	Non-randomised experimental study	Mannequins Number: NA	Extraoral suction system (ADS Dental System) Location: Extraoral suction system	Vacuum airflow level off	Dental operatory in dental school	Not specified	The tooth preparation phase of a standardized restorative treatment Duration: 4 min	Use of extraoral suction units for dental clinical procedures can help reduce procedural spatter, surface contamination, and potential transmission of the SARS-CoV-2 virus. However, it did not eradicate spatter.
Chestsuttayangkul et al. (2022)[74] Thailand	Non-randomised experimental study	Mannequins: Number: NA	Metal frame with plastic wrap, plastic shield chamber	No barrier but with HVE and intraoral saliva ejector simultaneously	Single-chair operatory room	Not specified	Scaling procedures	Both types of barriers were able to reduce the surface contamination in most of the areas on dental chair, operator's and assistant's

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			Location: Extraoral suction system				Duration: 5 min	body. No significant difference in surface contamination of splatter reduction was found between the metal frame with plastic wrap and plastic shield chamber.
Choi et al. (2022)[56] New Zealand	Non-randomised experimental study	5 mannequins	HVE; LVE Location: Intraoral	No suction	Enclosed windowless dental surgery	3.9 m x 3.5 m x 2.7 m	Ultrasonic scaling and drilling operative procedures Duration: 8 min	Drilling and scaling with LVE or HVE reduced aerosol generation significantly. HVE was effective in removing all sizes of aerosol particles measured.
Choudhary et al. (2022)[65] United States	Non-randomised experimental study	Patients Number: NA	HVE; saliva ejector; HEPA filter; rubber dam Location: Intraoral and extraoral	Not specified	Operating room (single chair with door closed), 2 types of semi-open bay, and large multioperator space	Not specified	Implant, ultrasonic cleaning, gingival flap with Cavitron, root canal procedures with high-speed handpiece, braces debonding, amalgam removal, post and core CEREC crown, composite filling Duration: 30 min to 74 min	Few viable bacteria and no viruses in dental aerosols when applying common aerosol mitigation techniques.

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Choudhary et al. (2022)[68] United States	Non-randomised experimental study	Patients Number: NA	Conical or Isovac HVE Location: Intraoral	Standard HVE tip	Pediatric and general dental operatories had a single-room layout. Endodontic and periodontic clinics had semiprivate operatories with partial wall barriers between dental chairs.	The orthodontic clinic included a large multi operator clinic space (~35 m × 20 m × 20 m).	High-speed drilling during debonding of orthodontic brackets; enamel and dentin cutting during cavity and crown preparation; slow speed drilling for finishing cavity preparation, polishing, and trimming during crown preparation; removal of dentin and soft tissues during endodontics; and ultrasonic scaling during teeth cleaning. Duration ranges from 2 min to 15 min	Conical HVE is likely more efficient in reducing emissions from high-speed drilling than standard-tip HVE
Dahlke et al. (2012)[61] United States	Non-randomised experimental study	Mannequins Number: NA	Dental isolation combination system; HVE and rubber dam Location: Intraoral	HVE	Dental operatory	Not specified	Simulated tooth preparation procedure. Duration: 10 sec	The dental isolation combination systema and HVE + rubber dam reduced spatter significantly compared with use of an HVE alone.

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D'Antonio et al. (2022)[64] United States	Non-randomised experimental study	48 mannequins	HVE; Isovac; extraoral suction Location: Intraoral and extraoral	No mitigation strategy	Dental operatory	Not specified	High-speed handpiece; air-water syringe; ultrasonic scaler; rubber cup prophy Duration: 10 min	All ventilation options used were equally effective at reducing respirable aerosols. Local control options such as HVE, ISO, and EOS units were equally as effective during short-term tests.
Deana et al. (2021)[80] Chile	Systematic review	34 guidelines or protocols	HVE; rubber dam Location: Intraoral	Not specified	Not specified	Not specified	Not specified Duration: not specified	Procedures such as the use of HVE and the use of a rubber dam were widely recommended to reduce the generation of aerosols during oral health care.
Ehtezazi et al. (2021)[69] United Kingdom	Non-randomised experimental study	3 mannequins	HVE with air filtration system; extraoral HVE	LVE	Dental operatory	4.4 m x 3.1 m x 2.6 m	Air turbine handpiece; electric contra-angle handpiece; ultrasonic scaler	All aerosol-management interventions were relatively effective. Without aerosol-management interventions, particles (0.05 μm to 0.236 μm) remained at elevated concentrations for longer

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			Location: Intraoral and extraoral				Duration: 3 min	than the experimental period.
Gheorghita et al. (2022)[53] United States	Non-randomised experimental study	30 mannequins	EOS A: Dental Aerosol System; EOS B: Eighteenth Vac Station	HVE and a saliva ejector without EOS	Dental operatory	4.15 m x 2.6 m with 1 door and 1 window	Class III cavity preparation in the upper front teeth with palatal access	Total number concentrations were 2 times the baseline with both EOS A and EOS B, while without any EOS, approximately 6 times higher.
			Location: Extraoral suction system				Duration: 5 min	
Graetz et al. (2022)[55] Germany	Experimental pilot study	20 mannequins	Mobile extraoral scavenger device	No EOS but with HVE	University dental clinic	16.94 m^2	High-speed tooth preparation and different procedures of provider tooth cleaning	No relevant differences between AGPs and the control or among the different AGPs when a high-flow suction system was used. The additional use of a mobile EOS device led to a significantly lower concentration of particles between 0.1 µm and 0.3 µm in diameter.
			Location: Extraoral suction system				Duration: 2 min	

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Graetz et al. (2021)[57] Germany	Non-randomised experimental study	8 mannequins	HVE systems with 5 different intraoral suction cannulas: a 6-mm saliva ejector, a 11-mm suction cannula, and 3 types of 16-mm suction cannulas Location: Intraoral Location: NA	No intraoral suction during AGP	Dental operatory	Not specified	High-speed tooth preparations; air-polishing Duration: 6 min	The lowest splatter contamination values resulted when suction cannula of 16 mm of diameter were utilized by a high-flow rate of ≥250 l/min
He et al. (2022)[59] Canada	Non-randomised experimental study	180 mannequins	Plastic and metal HVE Location: Intraoral	Air purifier and no HVE	Dental operatory (single chair)	3.5 m x 3.0 m x 2.85 m	Drilling and scaling procedure Location: 15 min	Aerosol reduction measures can effectively remove the aerosol generated by drilling procedures. Air purifiers and HVE used individually reduced aerosol concentration at a rate of 94.8% to 97.6%. Using both measures simultaneously brought the reduction rate to 99.6%.

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Horsophonphong et al. (2021)[60] Thailand	Non-randomised experimental study	Number of mannequins: NA	HVE; extraoral suction system Location: Extraoral suction system	HVE	Dental operatory	Not specified	Ultrasonic scaler Duration: 10 min	The extraoral suction device effectively reduced the dissemination of the aerosols and splatters generated during ultrasonic scaling.
Kumbargere Nagraj et al. (2020)[77] Not specified	Systematic review	16 articles	HVE; dental isolation combination system; rubber dam Location: Intraoral	No HVE, conventional dental suction, no rubber dam, no rubber dam plus HVE	Dental operatory	Not specified	Ultrasonic scaling and polishing and restorative procedures Duration: Not specified	All included studies measured bacterial contamination and not disease transmission via aerosols or viral contamination in aerosols. Some promising results from HVE and HVE + rubber dam. However, evidence was assessed of very low certainty.
Lertsooksawat et al. (2022)[52]	Non-randomised	Mannequins	Negative airflow aerosol chamber	No negative airflow aerosol chamber	Dental clinic	Not specified	Dental scaling using ultrasonic scaler	Negative airflow aerosol chamber reduced *L.*

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Thailand	experimental study	Number: NA	Location: Extraoral suction system				Duration: 10 min	*acidophilus* colonies at all tested locations by 86.63%.
Matys and Grzech-Leśniak (2020)[58] Poland	Non-randomised experimental study	Mannequins Number: NA	Saliva ejector; HVE; saliva ejector with an extraoral vacuum; HVE with an extraoral vacuum; zirc evacuator; customized HVE (white), designed and prepared by the authors; customized HVE (black), designed and prepared by the authors Location: Intraoral	Saliva ejector and HVE	Not specified	Not specified	Treatment of caries class I with the round diamond bur (#014) with a high-speed handpiece, low-speed handpiece, with 1 mm diameter sapphire tip with a handpiece H14 of Er:YAG laser Tooth polishing with silicone rubber dental bur with a low-speed handpiece at 1000 RPM and 10,000 RPM Dental calculus removal using ultrasound scaler Duration: 5 min	HVE allowed removing a significant amount of aerosol. The highest efficiency in aerosol reduction was obtained for wider customized HVE. The Er:YAG laser used for caries removal had a low aerosol generation even when working combined with saliva ejector.
Montalli et al. (2020)[75] Brazil	Non-randomised experimental study	3 screens	Individual dental biosafety barrier	No individual dental biosafety barrier	Postgraduate dental clinic	Not specified	Drilling	This individual dental biosafety barrier was able to reduce contamination by more than 90% over the

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			Location: Extraoral				Duration: 1 min	different distances tested (50 cm, 100 cm, and 150 cm).
Narayana et al. (2016)[109] United Kingdom	Non-randomised experimental study	45 healthy patients	HVE Location: Intraoral	No HVE	Dental operatory (single chair with ventilation)	20 feet × 15 feet	Ultrasonic scaling Duration: 5 min	CFUs were significantly reduced with the use of HVE. Combination with CHX (0.12%) preprocedural rinse was more effective than individual methods during ultrasonic scaling procedure
Noordien et al. (2021)[9] South Africa	Non-randomised experimental study	1 volunteer	Extraoral dental aerosol suction device (DASD) and LVE saliva ejector Location: Extraoral suction system	LVE alone and HVE plus LVE	Dental operatory	16 m^2	High-speed air turbine directed 1 mm away from molar Duration: 5 min	Compared to a LVE, the HVE + LVE showed a 53% and the DASD+ LVE showed a 62% reduction in aerosol, droplet, and splatter contamination

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Nulty et al. (2020)[70] United Kingdom	Non-randomised experimental study	Mannequins Number: NA	External HVE Location: Extraoral suction system	Without external HVE	Dental operatory	Not specified	Intense (full-blast) 3-in-1 air-water syringe; micromotor high-speed handpiece; air turbine high-speed handpiece; low-speed handpiece; ultrasonic scaling Duration: 1 min	Aerosol particulate was recorded at statistically significantly increased levels during dental procedures without an external HVE device versus with the device.
Piela et al. (2022)[63] United Kingdom	Non-randomised experimental study	Mannequins Number: NA	Dynamic suction devices: Standard HVE suction, Purevac HVE system, Purevac HVE Mirror Tip connected directly to the suction port Static suction devices: DryShield Isolation System, standard low-volume suction Location: Intraoral	No suction	Dental operatory	Not specified	Ultrasonic scaling and high-speed turbine/handpiece treatment Duration: 4 min	Effective mitigation of aerosols generated from ultrasonic scaling and high-speed handpiece procedures using high-volume dynamic intraoral suction.

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Rexhepi et al. (2021)[67] Italy	Cohort study	Patients 15,574 measurements	Low-volume suction (40 L/min air) Location: intraoral	Measurement of aerosol done at different position	A dental unit located in an open plan clinic	2.8 m × 2.8 m × 3 m	Oral hygiene practices, conservative dental therapy, prosthetic reconstruction, dentoalveolar surgery, implant surgery Duration: 40 min	LVE seemed to reduce PM10 and total particles during dental activities (e.g., ultrasonic scaling), while it showed lower effectiveness in reducing ultrafine PM.
Robertson et al. (2022)[79] United Kingdom	Systematic review	Guidance documents	Rubber dam; HVE Location: intraoral	Not specified	Dental operatory	Not specified	Not specified Duration: not specified	46 documents (73%) recommended use of a rubber dam for patients without COVID-19. The use of HVE was recommended for patients without COVID-19 by 46 (73%) documents.
Samaranayake et al. (2021)[78] Not specified	Systematic review	17 articles	HVE; rubber dam Location: Intraoral	Not specified.	Dental operatory	Not specified	Not specified Duration: not specified	The use of HVE in reducing bio-aerosols in the clinic environment is effective, which is determined by the suction strength of the appliance, the proximity of the HVE to the operating site, and the number of HVE used.
Senpuku et al. (2021)[73]	Non-randomised	3 healthy volunteers	Extraoral suction and intraoral suction	No extraoral or intraoral suction, and no extraoral but	Dental operatory (single chair) in a	Not specified	Simulated scaling	The extraoral suction was effective for reducing

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Japan	experimental study		Location: Extraoral suction system	with intraoral suction	university dental hospital.		Duration: 10 min	droplets and aerosols in the limited area of the left side.
Shahdad et al. (2020)[72] United Kingdom	Non-randomised experimental study	23 mannequins	External scavenger device Location: Extraoral suction system	No extraoral suction	Dental operatory (door closed); some procedures replicated in an open, multichair clinic single bay floor	Dental operatory = 16.8 m^2; open, multichair clinic single bay floor surface = 10.0 m^2	Air turbine procedures were carried out with standard diamond burs and operated at full speed (360,000 rpm). Ultrasonic scaling at a maximum frequency (30KHz) Duration: 5 min	The EOS system reduced the peaks in particle concentration in non-mechanically ventilated and mechanically ventilated environments
Suprono et al. (2021)[66] United States	Non-randomised experimental study	93 students	HVE with intraoral suction device Location: Intraoral	HVE	Clinic area with multiple open bay cubicles	3,118 sq ft, and each cubicle was 78 ft^2	Ultrasonic scalers Duration: 20 min	The combination of HVE and an intraoral suction device significantly reduced the amount of microbial aerosol during treatment periods.

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Vernon et al. (2021)[101] United Kingdom	Non-randomised experimental study	Mannequins Number: NA	Rubber dam; HVE Location: Intraoral	No mitigation strategy	Dental operatory	Not specified	Endodontic access procedures on the upper first molar tooth and anterior crown preparation Duration: 4 min	Use of the high-speed contra-angle handpiece with HVE resulted in no detectable bacteriophage, both on non-splatter settle plates and in air samples taken 6 min to 10 min post-procedure.
Yang et al. (2021)[76] United States	Non-randomised experimental study	Mannequins Number: NA	Extraoral HVE Location: Extraoral suction system	Saliva ejector plus high-speed suction	Dental operatory	Not specified	High-speed handpiece; ultrasonic scaling Duration: 6 min	The increase of aerosol (size smaller than 10 μm) level was minimal during dental procedures when using saliva ejector and high-speed suction. Use of extraoral HVE further reduced aerosol levels to below baseline level.
Rafiee et al. (2022)[21] Canada	Cross-sectional	Patients	51 samples from 7 dental procedures	No HVE (saliva ejector only); no rubber dam	Dental operatory	The area has a volume of L (7.87 m) × W (7.59 m) × H (2.66 m) consisting of 6 dental units.	Ultrasonic scaling (HVE and saliva ejector); ultrasonic scaling (saliva ejector only); orthodontic bonding; orthodontic debonding: denture adjustment; tooth prep with rubber dam; tooth prep without rubber dam	Combining HVE + saliva ejector reduces aerosol escape. From the different procedures and aerosol reducing methods used, ultrasonics with HVE + saliva ejector yielded the lowest particle concentration.

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			Location: extraoral suction system				Duration: 40 min	

CFU: colony forming units; CHX: chlorhexidine; DASD: dental aerosol suction device; EOS: extraoral scavenger; HEPA: high-efficiency particulate air; HVE: high-volume extraction; LEV: local exhaust ventilation; PM: particulate matter; NA: information not available in articles.