ARHAI Scotland
Antimicrobial Resistance and Healthcare Associated Infection

NHS National Services Scotland

Appendix 16: Aerosol Generating Procedures (AGPs) and post AGP Fallow time (PAGPFT)

Aerosol Generating Procedures (AGPs)

An Aerosol Generating Procedure (AGP) is a medical procedure that can result in the release of airborne particles from the respiratory tract and is associated with an increased risk of transmission when treating someone who is suspected or known to be suffering from an infectious agent transmitted wholly or partly by the airborne or droplet route.

Below is the list of medical procedures considered to be aerosol generating following a review of the evidence undertaken in May 2020 by ARHAI Scotland. Based on feedback from stakeholders during consultation for an update to the review, ARHAI Scotland confirmed in September 2021 that the systematic literature review update will no longer take place and instead have recommended a UK level independent group (yet to be determined) take forward this work for consideration with a range of experts relevant to this field of work. As of September 2021, the UK IPC COVID-19 response cell will review this extant list to consider whether any procedures should be removed from the list. Any recommendations from the group will be submitted to the UK AGP panel for consideration. The list of medical procedures below remains extant in the interim.

- tracheal intubation and extubation
- manual ventilation
- tracheotomy or tracheostomy procedures (insertion or removal)
- bronchoscopy
- dental procedures (using high-speed devices, for example, ultrasonic scalers/high-speed drills)

- non-invasive ventilation (NIV): Bi-level Positive Airway Pressure Ventilation (BiPAP) and Continuous Positive Airway Pressure Ventilation (CPAP)
- high flow nasal oxygen (HFNO)
- high frequency oscillatory ventilation (HFOV)
- induction of sputum using nebulised saline
- respiratory tract suctioning (see note 1)
- upper ENT airway procedures that involve respiratory suctioning
- upper gastrointestinal endoscopy where open suction beyond the oro-pharynx occurs
- high speed cutting in surgery/post-mortem procedures (see note 2)

Note 1: The available evidence relating to Respiratory Tract Suctioning is associated with ventilation. In line with a precautionary approach open suctioning of the respiratory tract regardless of association with ventilation has been incorporated into the current AGP list. It is the consensus view of the UK IPC cell that only open suctioning beyond the oro-pharynx is currently considered an AGP i.e. oral/pharyngeal suctioning is not an AGP. This applies to upper gastro-intestinal endoscopy also and as such it should be considered an AGP only where there is suctioning beyond the oro-pharynx.

Note 2: For patients with known or suspected respiratory infection spread wholly or partly by the droplet or airborne route, high speed cutting in surgery/post mortem procedures are considered an AGP if the respiratory tract/paranasal sinuses are involved. An SBAR specific to AGPs during COVID-19 was produced by Health Protection Scotland (HPS) and agreed by NERVTAG and provides more detail relating to this.

Post AGP Fallow time (PAGPFT)

Time is required after an AGP is performed to allow the aerosols still circulating to be removed/diluted. This is referred to as the post AGP fallow time (PAGPFT) and is a function of the room ventilation air change rate.

There is a paucity of evidence in the literature pertaining to AGP fallow times and during the COVID-19 pandemic, a ventilation Short Life Working Group (SLWG) chaired by ARHAI

Scotland and Health Facilities Scotland (HFS) undertook work in conjunction with Leeds University to develop the guidance below using mathematical modelling. A paper '[Ventilation, water and environmental cleaning in dental surgeries relating to COVID-19]' was published.

The PAGPFT calculations are detailed in table 3 and clinical teams will need to undertake a risk assessment in conjunction with estates colleagues and the IPCT for rooms in which AGPs are performed. The duration of AGP is also required to calculate the PAGPFT and clinical staff are therefore reminded to note the start time of an AGP. it is presumed that the longer the AGP, the more aerosols are produced and therefore require a longer dilution time.

As a minimum, regardless of air changes per hour (AC/h), a period of 10 minutes must pass before rooms can be cleaned. This is to allow for the large droplets to settle. Staff must not enter rooms in which AGPs have been performed without airborne precautions for a minimum of 10 minutes from completion of AGP. Airborne precautions may also be required for a further extended period of time based on the duration of the AGP and the number of air changes (see Table 1). Cleaning can be carried out after 10 minutes regardless of the extended time for airborne PPE and should be undertaken using combined detergent/disinfectant solution at a dilution of 1000 ppm av chlorine or general purpose neutral detergent in a solution of warm water followed by a disinfectant solution of 1000ppm av chlorine.

Table 1: Post AGP fallow time calculation

Duration of AGP (minutes)	1 AC/h	2 AC/h	4 AC/h	6 AC/h	8 AC/h	10 AC/h	12 AC/h	15 AC/h	20 AC/h	25 AC/h
3	230	114	56	37	27	22	18	14	10	8 (10)*
5	260	129	63	41	30	24	20	15	11	8 (10)*
7	279	138	67	44	32	25	20	16	11	9 (10)*
10	299	147	71	46	34	26	21	16	11	9 (10)*
15	321	157	75	48	35	27	22	16	12	9 (10)*

* Note that for duration of 25 air changes per hour the minimum fallow time (to allow for droplet settling time) is 10 minutes.

It is often difficult to calculate air changes in areas that have natural ventilation only. Natural ventilation, particularly when reliant on open windows can vary depending on the climate. An arbitrary air change rate in these circumstances has been agreed as one to two air changes per hour.

If the area has zero air changes and no natural ventilation, then AGPs should not be undertaken in this area.

Staff within dental settings may choose to refer to the 'Mitigation of AGPs in dentistry; A Rapid Review' which details fallow times specific to this setting and the mitigations used. The methodology work was undertaken by SDCEP and Cochrane oral Health. Post AGP down time (fallow time) is not considered necessary for successive appointments between members of the same household within dental settings; to minimise aerosol spread dentists should use mitigating measures such as high volume suction/rubber dam.

Treatment rooms in dental practices should be aiming for a minimum of 10 ACH. AGPs

in an Individual's own home and community settings with only natural ventilation.

Wherever possible, staff should avoid visiting patients/individuals with a known or suspected respiratory infection who requires a routine consultation and where AGPs are undertaken in the home. This is because potentially infectious aerosols will still be circulating in the air. The most common AGPs undertaken in the community are Continuous Positive Airway Pressure Ventilation (CPAP) or Bi-level Positive Airway Pressure Ventilation (BiPAP).

Consider phone/digital consultations in the first instance to assess whether the individual requires a home visit. If it is safe to postpone the visit, then do so.

Care at home staff will not be able to postpone visits. In such instances where a home visit cannot be avoided;

- Find out what time the individual is on CPAP/BiPAP and plan to visit at least an hour or more after the CPAP or BiPAP has been switched off.
- On arrival, ask the individual to move to another room in the property and close the door to the room where the CPAP or BiPAP is undertaken.
- If the visit must take place when the patient is on the CPAP/BiPAP or if the above measures cannot be followed, the member of staff must wear airborne PPE.