



INTERNATIONAL COALITION PERFORMING ARTS AEROSOL STUDY

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RECOMMENDATIONS FROM THE INTERNATIONAL PERFORMING ARTS AEROSOL STUDY

The full report is available to download at: <https://www.nfhs.org/media/4294910/third-aerosol-report.pdf>

These results are preliminary and will be further defined as the study continues. We are providing these preliminary results to assist in the safer return to performing arts activities. This study focuses strictly on the distribution of respiratory aerosol that is generated while playing wind instruments, singing, acting, speaking, dancing, and in a simulated aerobic activity, which may potentially contain virus. This study did not use a live virus and therefore cannot be used to determine specific infection rates. However, this study is based on previous research that shows the virus which causes COVID-19 can travel in respiratory aerosol. This study then was designed to identify performing arts activities that generate respiratory aerosol including volume, direction, density, and mitigation strategies. Aerosol is defined as solid or liquid particles suspended in a gas.

- We are entering month 5 of a 6-month study, utilizing two independent labs at the University of Colorado – Boulder and the University of Maryland.
- Wind instruments and singing produce aerosol, which vary by instrument as well as intensity. The produced aerosol amount is, on average, similar across all instrument types and singing with the exception of the oboe. Most aerosol is being expelled from the bell of the instruments and from the mouth of the performers.
- At this time, it appears that if players wear surgical style masks with a slit for mouthpiece AND bell covers, aerosol emission is reduced between 60% and 90%. (See Appendix B of full report.)
- Flutes and recorders create a minimal amount of aerosol and it is recommended to play flute with the headjoint between their mouth and mask (<https://youtu.be/A3T6h1muUic>)
- Recorder should use the slitted mask used with woodwinds. Both the flute and recorder should use a cloth “mask” at the end of the barrel.
- Bell covers for woodwinds and brass should be made with a multi-layer cover with the center layer being made of MERV-13 filter material, or a 3-layer surgical style mask using a standard such as GB/T32310.
- Singers produce aerosol at similar rates as woodwinds and brass. The amount of aerosol varies depending on consonants, vowels, intensity, and pitch. Singers wearing a well fit 3-layer surgical style mask reduce aerosol emission. (See Appendix A of full report.)
- Face shields are only effective at close range to stop large droplets; they do not prevent aerosol from being inhaled or released unless a mask is also worn.

- Plexiglass partitions or barriers between musicians are not recommended due to room HVAC system design limitations. "Dead zones" or areas where aerosol can build-up are a concern of plexiglass partitions are used.
- Rehearsal space recommendations in order of preference:
 - a. Outdoor rehearsals, using individual mitigation techniques described above
 - b. Indoors with elevated outdoor air exchange rate from HVAC
 - c. Indoors with typical outdoor air exchange rate from HVAC plus recirculation air through MERV-13 filters or addition of appropriately sized HEPA air cleaners
 - d. Indoors without door air exchange rate from open windows supplemented with appropriately sized HEPA air cleaners when air flow is reduced under certain outdoor wind conditions

Please refer to the Association for Heating, Ventilating and Air-Conditioning Engineers (ASHRAE) guidance on ventilation during COVID-19: <https://www.ashrae.org/technical-resources/resources>

- General procedures (See Appendix G of full report.)
 - a. Masks must be worn at all times. Multi-layered bell covers must be used by all wind instruments
 - b. CDC guidelines for social distancing of 6x6feet, with 9x6 for trombone players.
 - c. Indoors limited to 30 minutes followed by a minimum of one air exchange rate (ACH), preferably 3 ACH, to change the air indoors with outside air
 - d. Increase ACH to HVAC maximum, add HEPA Filtration designed for the size of the room
 - e. Practice good hygiene by washing hands, using sanitizers, and preventing uncontrolled spit valve release.



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