

International Coalition Performing Arts Aerosol Study
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Preliminary Recommendations from International Performing Arts Aerosol Study Based on Initial Testing Results

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 week 3 of a 6-month study; results may change over time.
 - Lab techniques continue to be refined as subjects are in lab, aiming for better accuracy.
 - Wind instruments produce aerosol, which vary by instrument as well as intensity. Trends that the team has measured include:
 - Woodwinds have aerosol coming from keyholes and bells.
 - Brass have aerosols coming from bell.
 - At this time, it appears that if players wear surgical style masks with a slit for mouthpiece AND bell covers, aerosol emission is reduced. Flute players can put the headjoint between their mouth and mask (see <https://www.youtube.com/watch?v=A3T6h1muUic>) and use a "flute sock" attached to the foot (see <https://youtu.be/7if6TMZy5OM>).
 - Bell covers tested so far were made from pantyhose made of 80 denier in 2 layers.
 - Singers produce aerosol, which vary with consonants, vowels, and intensity.
 - At this time, it appears that if singers wear surgical style masks (others will be tested soon), aerosol emission is reduced.
 - Face shields are only effective at close range to stop large droplets; they do not prevent aerosol from being inhaled or released so mask must also be worn.
 - Plexiglass partitions or barriers between musicians are not recommended because the room HVAC system cannot properly change the air as designed. "Dead zones" or areas where aerosol can build-up are a concern.
 - Rehearsal space recommendations in order of preference:
 - Outdoor rehearsals, using individual mitigation techniques described above.
 - Outdoor gazebo style tents with open sides and a high-pitched ceiling with mitigations.
 - Indoors with elevated outdoor air exchange rate from HVAC.-Indoors with typical outdoor air exchange rate from HVAC plus recirculation air through MERV 13 filters or addition of appropriately sized HEPA air purifiers.
 - Indoors with outdoor air exchange rate from open windows supplemented with appropriately sized HEPA air purifiers when airflow 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
 - Masks must be worn at all times.
 - CDC guidelines for social distancing of 6x6 feet, with 9x6 for trombone players.
 - Indoor rehearsals should last for 30 minutes followed by clearing the room for 20-minutes for the HVAC system to change the air indoors with outside air.