Mitigating Inherent Risk

Formulating Strategies and Action Plans to Address the Effects of the Coronavirus

Adam Schwalje MD DMA
Disclaimer
Mitigating Inherent Risk

- General principles of risk reduction
- Aerosols
  - Aerosol production
  - Aerosol mitigation
    - Ventilation
    - Distance
    - Time
    - Musician-specific considerations
- Local Variations
  - Experiences at UI
- Decision Making
  - Load the Boat
  - Stacking solutions
General Principles of Risk Reduction

• Ethics and Risk Management
  • Medical Ethics in Decision Making
    • Nonmaleficence
    • Beneficence
    • Autonomy
    • Justice
General Principles of Risk Reduction

- Ethics and Risk Management
  - Risk Management Principles
    - Decision-oriented
    - Begins with Diagnosis
    - Analytic / deliberative risk characterization: Accurate, balanced, informative (shared decision making)
    - Judgement

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Aerosol production

Previous data: Speaking and Vuvuzela


Aerosol Production
Boulder preliminary results - soprano

As measured in clean room, Dr. Shelly Miller, PI

https://www.nfhs.org/media/4029974/preliminary-testing-report-7-13-20.pdf
Aerosol Production

Boulder preliminary results - clarinet

As measured in clean room, Dr. Shelly Miller, PI

https://www.nfhs.org/media/4029974/preliminary-testing-report-7-13-20.pdf
## Summary of Studies on Winds, Brass, and Singing Aerosol Production

<table>
<thead>
<tr>
<th>Group</th>
<th>Space</th>
<th>n winds / n players</th>
<th>n brass / n players</th>
<th>n voices / n singers</th>
<th>Aerosols created?</th>
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<tbody>
<tr>
<td>Boulder</td>
<td>clean room</td>
<td>4/4</td>
<td>4/4</td>
<td>1/1</td>
<td>Y</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>studio</td>
<td>3/3</td>
<td>4/4</td>
<td>1/2</td>
<td>Y</td>
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<tr>
<td>Minneapolis</td>
<td>clean-ish room</td>
<td>6/10</td>
<td>4/6</td>
<td></td>
<td>Y</td>
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<tr>
<td>London</td>
<td>clean room</td>
<td></td>
<td>8/7</td>
<td></td>
<td>Y but &lt; than heavy breathing</td>
</tr>
<tr>
<td>Odense</td>
<td>studio</td>
<td>4/4</td>
<td>4/4</td>
<td></td>
<td>Y but &lt;&lt; than coughing</td>
</tr>
<tr>
<td>Ft Collins</td>
<td>*in progress</td>
<td></td>
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Defining the Problem: Music Making is an Edge Case

- Winds, brass, and singers are at *higher than baseline risk* of disseminating COVID-19 during performance
- *Not specifically addressed* by most federal, state, local, university guidelines
  - CDC K-12 back-to-school guidelines label as “critical” SARS-CoV-2 mitigation strategies such as social distancing, cloth face coverings, hand hygiene, and use of cohorting.
    - If the mitigation strategies cannot be implemented, activities should be limited or cancelled.
  - CDC higher education guidance: “When there is minimal to moderate community transmission”... “**Cancel or modify courses where students are likely to be in very close contact**, such as lecture courses with close seating, or music or physical activity classes where students are likely to be in close proximity.”

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Aerosol mitigation: Ventilation

“These numerical findings need to be compared to actual experimental data as numerical simulations cannot replace experiments when studying new transport phenomena, especially the ones that threaten human life.”

Aerosol Mitigation: Ventilation

“Such inefficient particles [sic] removal through ventilation is largely associated with the presence of many stable circulation regions in the large space..., which increases particle residence time, causes the majority of particles deposited to surfaces..., and forms hot spots of surface contamination...”

Aerosol mitigation: Distance

Aerosol mitigation: Time

Dose = exposure x time

Dose ~ Infection risk
Dose ~ Severity of Infection
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HEPA filtration

Measured in Cincinnati practice room (6 air changes per hour), Dr. Jun Wang, PI

https://www.youtube.com/watch?v=UDtV1x95KEU accessed August 8, 2020
Modified masks

Data from Boulder study

1- did not tolerate
1- increase
2- slight decrease
3- decrease
Masks for singers

Data from Boulder study: **1 Orator and 1 non-operatic singer**

**well-fit mask**

Modified from:
Bell covers

Data from Boulder
2- could not use
3- slight decrease
3- decrease

Data from London
All brass- decrease


Shields

- Can protect against larger droplets
- Largely ineffective against aerosols

Associated Behaviors

• Emptying spit valves
• Blowing out tone holes
• Instrument swabs / feathers
• Sharing instruments (i.e., methods class, contrabassoons)
• On and offstage movement
• Classroom activities (sight singing)
**JULY 2020**

**REED SANITATION FOR SARS-COV-2**

**DR. ADAM T SCHWALJE, MD, DMA**

**BASED ON CORRESPONDENCE WITH VIROLOGIST DR. PETER W KRUG, PH.D.**

**NO REED SHARING**

Short term reed sharing is not a viable practice going forward until after community spread of the virus is over and/or a vaccine is made available. No short-term disinfection procedure that does not damage the reed’s playing ability should be considered at this point.

**REGARDING SHORT TERM SOAK IN ALCOHOL**

All disinfectants registered by EPA are for disinfection (after cleaning) on hard, non-porous surfaces.

[https://www.epa.gov/coronavirus](https://www.epa.gov/coronavirus)

Respiratory secretions are full of proteins, cell debris, etc. and at the microscopic level, this sputum, as it dries, will protect virus from immediate inactivation by drying and disinfection. On a porous surface like wood, these tiny microparticles lodge themselves into the pores of the wood, making them difficult to access and dislodge by mere soaking in liquid.

- **DR. PETER W KRUG, PH.D.**

**RECOMMENDED PROTOCOL FOR REED MAKERS**

**PREPARED FOR OTHERS/DISTRIBUTION**

1. **WASH HANDS OFTEN**

Prepare reed as usual, and disinfect in 75% ethanol (could use Everclear) for 2 minutes completely submerged.

2. **ALLOW REED TO DRY OVERNIGHT**

Mail the reed to the purchaser.

3. **GUARANTEEN THE REED**

Upon receipt, open the vial and let it sit out in ambient air for at least 4 days, preferably a week prior to use. During this time, if the reed maker gets sick, the reed should be disposed of.

Dr. Schwalje co-authored an article entitled “Wind Musicians’ Risk Assessment at the Time of COVID-19” published on the Iowa Protocols, provided by the University of Iowa.


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**Reeds**
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UI Ventilation
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Importance of Analysis, Deliberation, Shared decision-making

These are the kinds of things teachers have been trying to figure out on their own:

“Can I fit [a high number of] woodwind methods students in my room with [a low number of] air changes per hour for hour-long classes?”

“Can I put up a clear shower curtain to protect myself from my student’s aerosols?”

“I’m planning to have all my students put their instruments in a bag to play them.”
Analysis and Deliberation

• Load the Boat
  • Music making is an “edge case”
  • Marshall local resources: Building engineer, facilities management, ventilation designer, aerosol expert, infectious disease physician, local hospital / medical school, testing / research labs
Defining your problem

- Online risk calculators
- Air change rate?
  CO2 monitoring
  (fire extinguishers)
- Smoke (incense)
- Nebulizer
- Particle counter
  (~$2500)
Decision Making

• Stack solutions
  • Unknown risks, unknown benefits
• Maintenance / active surveillance
Decision Making

• Do the hard work to figure out how to make music safely in your spaces, with your people, in your community