

TIP No. 98-121-0720

COVID-19 FOCUSED GUIDANCE FOR AUDIOMETRIC BOOTHS

PURPOSE

This document provides information concerning ventilation issues commonly associated with audiometric testing booths. It provides helpful information for the audiology community, installation industrial hygienists, and facilities maintenance staff.

Air Exchange Rates:

- The air changes per hour (ACH) is a measure of the volume of air supplied or exhausted from a room, divided by the volume of the room. The ACH tells how many times the air within a defined space is replaced every hour.
- Calculating the ACH for the audiometric booths or the rooms in which booths are located can help determine how long the booths need to be left empty in-between uses.
- For ventilated booths, the ACH should be calculated based on the supply air volume and return or exhaust air volume inside the booth.
- A minimum of one full air change must occur in between use.

How to Calculate the Air Exchange Rates: *The following information should be collected for every booth or room in which the booth is located*

Room/Space dimensions (room width, length, height)

W _____ ft x L _____ ft x H _____ ft

Determine if the Room or Space has a RETURN or EXHAUST (will not have both)

Room/Space **Supply** Air Total _____ CFM

Room/Space **Return or Exhaust (circle one)** Air Total _____ CFM

Room/Space Air Exchange (ACH) – Calculated value

Use the larger CFM in this equation (either Supply or Exhaust/Return) and verify pressure differential below.

$ACH = CFM \times 60 \text{ minutes/hr} \times \text{Room Volume in FT}^3 = \underline{\hspace{2cm}}$

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*For example: Six ACH for the space is one full exchange of air from the space every 10 minutes (60 minutes divided by 6 ACH = 10 minutes for one full air change). Thus, one would need to wait for at least 10 minutes in between groups or ONE FULL AIR CHANGE.
If there were 15 ACH, you would wait at least 4 minutes (60/15= 4) between users.*

Booths without their Own Ventilation:

- If the audio booth does not have any ventilation, dedicated ventilation should be added. The manufacturer may be able to assist with methods for ventilating the booth.
- Keeping the door open may help bring more air into the booth. It is not recommended, but if it is essential to use an unventilated booth, it is recommended to survey the booth to determine time to achieve a full exchange of air when the door is open to a ventilated space (e.g., tracer gas), or to wait at least 30 minutes between users.
- DO NOT use a fan to bring air into the booth, as this can spread viruses around in the room.
- Use the ACH information above to determine the ACH for the room.

Cleaning and Disinfecting:

- **Cleaning** is removing any dirt or debris from the surfaces; a household cleaner is sufficient.
- All surfaces that are touched in the booths need to be cleaned at a minimum twice per shift (mid-shift and end of shift).
- **Disinfection** is performed to kill any bacteria or viral particles on surfaces.
- Disinfection of all booth surfaces must occur in between each use.
- Select products from the listing of U.S. Environmental Protection Agency (EPA) approved disinfectants (EPA N-list: <https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2-covid-19>).
- One air change should remove all particulates from the booths, but if there is a strong odor from the disinfectant, you may need to wait longer.

Follow label directions on the cleaning and disinfection products.

To determine how long a booth needs to be empty in between uses, determine which is longer:

- **Time for one full air change**
- **Dwell time for the disinfectant used**

Booth must be empty for the longer of the two

Other Measures:

- Do not perform audiometric exams or testing on anyone that feels ill or displays symptoms of COVID-19. Symptoms are listed on the Centers for Disease Control and Prevention website (<https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html>)

- Unless six feet of social distance can be maintained at all times, ALL PERSONS EVALUATED MUST WEAR FACE COVERS.
- Handwashing is also required before testing. If handwashing is not possible, provide hand sanitizer containing at least 60% alcohol.
- Using gloves to handle testing equipment is recommended. If gloves cannot be obtained, require handwashing or sanitizing, AND clean equipment twice per shift, AND disinfect between users.
- Consider limiting the amount of tests being conducted simultaneously to allow for proper social distancing.
- Create a cleaning schedule. All surfaces in the booths should be cleaned at least twice a shift (mid shift and end of shift). All surfaces in the booths should be disinfected between users.

REFERENCES

1. American Academy of Audiology, Booth Safety: COVID-19 and Beyond, May 19, 2020
<https://www.audiology.org/news/booth-safety-covid-19-and-beyond>
2. American Speech-Language-Hearing Association, Audiologists Resuming Services During COVID-19, E3 Tele-Acoustics – Guidelines for Maintaining a Clean Audio Testing Booth
<https://www.asha.org/Practice/Audiologists-Resuming-Services-During-COVID-19/>

For Further Guidance:

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FREQUENTLY ASKED QUESTIONS

The following are examples of questions that APHC has answered regarding the use of audiometric booths during the COVID-19 pandemic. They may provide some clarity.

Question:

For an eight man booth and two diagnostic booths, where all the booths are not attached to the heating, ventilation, and air-conditioning (HVAC), how often should patients be seen per hour or per day? Furthermore, there is one air exchange every 6 minutes, and it has its own fan pulling air from the room around the booth.

Answer:

Once a Soldier leaves, the booth should be disinfected before testing another Soldier. Determine how long the booth should be empty between uses based on either the time for one full air change or the dwell/contact time of the disinfectant used, whichever is longer.

Question:

Should 6-feet of social distancing continue to be enforced inside audio booths? When is it safe to reduce the social distancing and allow more people in the booth?

Answer:

If there is a need, for example, to put eight people in the booth, everyone would have to wear face coverings if they can't stay 6 feet apart. This will continue until further notice.

Question:

What should be done for situations with one-man booths that don't have a functioning fan?

Answer:

Open the door to introduce some air movement into the booth. However, relying on passive air exchange is not reliable, and cannot replace functioning ventilation. Consult local installation IH and/or facilities maintenance for further guidance.

Question:

If using a personal fan, should the fan face inwards or outwards?

Answer:

DO NOT use personal fans in the COVID environment. This can blow air from one person to another and allow particulates and aerosols in the air to travel further away from a person and into the room.

Question:

Is there ventilation guidance for medical treatment rooms?

Answer:

Yes; The Unified Facilities Criteria 40-510-01 contains a chart in Appendix B that lists each type of room and air exchange rates.

Question:

If there is no IH support and no way of determining how many ACH occur, is 10 minutes a safe amount of time to wait in between group tests? What is a conservative time allotment in between tests?

Answer:

If there is no IH or facilities maintenance support, the ACH can be calculated using information presented in this TIP. If the make and model of the booth is known, contact the manufacturer, or look up the information online. Measure the length, width and height, to get the room's volume. The ACH calculation is explained in this guidance. If these actions cannot be completed, there is evidence that letting the booth sit empty for 30 minutes would be sufficient (<https://emojo.net/post-kudu/did-covid-19-kill-the-sound-booth/>).

Question:

Is APHC familiar with electrolyte water used for cleaning and sanitation? Some dental clinics use a solution containing distilled water, vinegar, and salt in a paint sprayer to disinfect between seeing patients. Is that an acceptable alternative for sanitizing audiology booths?

Answer:

No, water is not a disinfectant. Refer to the EPA's N-List for a qualified product list of disinfectants found to be effective against coronavirus.

Question:

Is there an equivalent set of guidelines for non-Department of Defense facilities?

Answer:

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE®) is a professional association that provides ventilation guidance, including air exchange rates. American National Standards Institute (ANSI®)/ASHRAE/American Society for Health Care Engineering (ASHE) Standard 170-2017 may also provide guidance.

Question:

Should the (booth) door be left open or closed for the air exchange?

Answer:

If the booth fan runs continuously, allowing for the intake and outtake of air, leave the door closed. If the booth does not have ventilation or ventilation that is operating properly, leave the door open.

Question:

Facilities at my installation provided an air balance report from December 2019 as the best available readings for the three rooms in the clinic where the booths are located. Room dimensions and supply air to the three rooms from the report are provided (in table below). Based on these readings, do the booths have adequate ACH?

Answer

Based on the dimensions and measurements provided by the balance report, the calculated air exchange rate for each of the rooms:

Room #	Air Balance (CFM) & Room Dimensions	ACH	How long for 1 ACH
L 17	80 cfm 10'x16'x9'-10"	3	20 minutes
L18	52 cfm 9'x14'x9'-10"	2.5	24 minutes
L19a	52 cfm 10'x12'x9'-10"	2.5	24 minutes

These air exchange rates are less than the required 6 ACH per UFC 4-510-01, Design: Military Medical Facilities. There is not proper ventilation for this space and the building manager should find a solution for this issue.

Question

Is it ok to use the cloth curtains hanging in audiometry booths as a barrier, or should they be removed and replaced with a more easily cleanable material?

Answer

Although cloth curtains act as a barrier, they are not the best option because they are porous and must be removed to be cleaned and disinfected. Surfaces that can be easily cleaned and disinfected should be used in all spaces that multiple people use.

Question

If a multi-station booth is not fitted with curtains, is there a recommended barrier that should be used between individuals taking tests (e.g., framed cloth barriers, make-shift curtains)?

Answer

Any material that does not interfere with audiometric testing and is durable, nonporous, and can be easily cleaned and disinfected can be used as a barrier between testing locations. A rigid material, such as Plexiglas®, is recommended because it is easy to clean (minimum of daily) and disinfect (between each user).

Question

If Soldiers are wearing masks and there is a curtain between them, do they still need to remain 6 feet apart, or will the two levels of barrier be sufficient to allow the Soldiers to sit closer together when testing?

Answer

In this situation, social distancing cannot be maintained. Therefore, face covers are mandated. In addition, a nonporous, easily cleaned and disinfected barrier between those being tested should be in place.