



AMERICAN COCHLEAR IMPLANT ALLIANCE

*Research. Advocacy. Awareness.*

## Consideration of Face Shields as a Return to School Option

### ABOUT US

The American Cochlear Implant Alliance (ACI Alliance) is a non-profit, 501(c)3 organization whose mission is to advance the gift of hearing provided by cochlear implants and other hearing technology through research, advocacy, and awareness. Members include those who provide the intervention (e.g., ENT surgeons, audiologists, speech-language pathologists); other professionals on implant teams and in other settings supporting children and adults with hearing loss (e.g., educators, therapists, psychologists, social workers); researchers in clinical and academic settings; parents of children using cochlear implants and other hearing assistive technologies such as hearing aids; adult recipients, and other advocates. For more information: [www.acialliance.org](http://www.acialliance.org)

**American Cochlear Implant Alliance suggests that face shields offer an alternative to face masks in school settings, an option that responds to the Centers for Disease Control (CDC) considerations to slow the spread of COVID-19 while providing better communication access for children and staff.**

- Schools are adopting considerations from the CDC to help protect students, teachers, and other staff, and to slow the spread of COVID-19.
- Two important health and safety recommendations—cloth face coverings and physical distancing of 6 feet or more—present significant auditory learning barriers to all students and school personnel, but especially those with diverse learning needs such as students with hearing loss.
- All students will miss learning opportunities with the degraded speech signal from face masks, the elimination of lipreading and speaker expressions, and social distancing.<sup>1</sup>
- Face shields are an option that allows access to speech reading and facial clues while providing a reduction in inhaled virus of 92% at 6 feet.<sup>2</sup>

### EDUCATIONAL AND AUDITORY LEARNING FACTS

- School districts must provide a free and appropriate public education (FAPE) consistent with the need to protect the health and safety of students with disabilities and those individuals providing education, specialized instruction, and related services to these students.<sup>3</sup>
- School officials must avoid discrimination on the basis of disability under Title II and Section 504, while cooperating with public health authorities, to ensure that students with disabilities have access to the education program.<sup>4</sup>
- Speaking and listening are the primary communication modes in auditory learning environments, where children are involved in listening activities for approximately 75% of their school day.<sup>5</sup>
- Five acoustic factors affect speech perception in the dynamic classroom:<sup>6</sup>
  - (1) Background noise, (2) signal to noise ratio, (3) reverberation time, (4) speaker-listening distance and directionality, (5) Interaction of these variables.
- Listening and learning are affected for all students when they cannot hear clearly, and subsequently, skills involved in auditory processing and learning to read are impacted.<sup>7</sup>
- Children in specific populations (including those younger than age 15 due to immature auditory brain development) are known to be at additional risk for learning consequences in poor acoustical environments. These children with additional risks include those who:<sup>8</sup>
  - Have conductive or sensorineural hearing loss (both bilateral and unilateral)
  - Have speech-language disorders, learning disabilities, dyslexia, developmental delays, attention deficits
  - Utilize English as a second language

- Sound diminishes as a function of distance (inverse square law) decreasing at approximately 6 dB for each doubling of distance. Social distancing in the classroom will result in less audibility of teacher/peers voices.
- Using remote microphone technology significantly improves speech recognition in noise and reverberation, as well as when the target signal originates at a distance from the primary talker.<sup>9</sup> Remote microphone technology is recommended for all children in the aforementioned populations regardless of face covering.

### FACE COVERING OPTIONS



### BARRIERS OF FACE MASKS AND SOCIAL DISTANCING

- Face masks degrade speech, hide facial cues, such as lipreading which facilitates speech comprehension<sup>10</sup>, and are difficult to disinfect.
- Individuals frequently pull face masks down to make communication easier, resulting in touching their face and eliminating the safety barrier.
- Face masks are uncomfortable to wear especially when using all day to teach.
- Social distancing decreases the decibel level of the speech signal reaching the listener resulting in reduced access to critical speech cues.

### CONSIDERATION OF WINDOW MASKS AS AN OPTION FOR FACE COVERINGS IN THE SCHOOL SETTING

Window masks may be considered as an alternative to solid masks but access to a person's mouth area for speechreading may be limited by the size of the window in the mask, fogging of the window, glaring off of the window, movement of the mask, and the style of the mask itself. Like other masks, the speech signal is degraded by the mask. In addition, little is currently known about the viral protection provided by window masks, especially those that are homemade.

### CONSIDERATION OF FACE SHIELDS AS AN OPTION FOR FACE COVERINGS IN THE SCHOOL SETTING

Another solution to overcome barriers of face masks while keeping teachers, school personnel, and students safe is the option of wearing a face shield that meets the CDC recommendations to cover the front and sides of the face and provide barrier protection.<sup>11, 12</sup>

#### FACE SHIELDS:

- Provide visual access to a person's face (speechreading, facial expressions)
- Are readily available, economical, reusable, and easily disinfected
- Prevent the wearer from touching his/her face as the shield covers the face area
- Are reasonably comfortable to wear and breathe in

#### DATA SUPPORTING USE OF FACE SHIELDS:

- When face masks are unavailable, a face shield *that covers the entire front (extending to the chin or below) and sides of the face* with no face mask is an option.<sup>13</sup>
- Face shields offer the ability to more effectively communicate because the clear shield allows people to see lips and full facial expressions without the need for face shield removal.<sup>14</sup>
- At the recommended physical distancing of 6 feet, face shields reduced inhaled virus by 92%.<sup>2</sup>
- When used, face shields should be just one part of any infection control effort—along with social distancing, hand-washing, cleaning, and disinfecting. There will be no intervention, even a vaccine, that can guarantee 100% effectiveness against coronavirus, so face shields cannot be held to that standard.<sup>2</sup>

## ENDNOTES

- <sup>1</sup> Crandell, C., Smaldino, J., & Flexer, C. (2005). *Sound-field FM amplification: Theory and practical applications* (2nd Ed). Clifton Park, NY: Thomson Delmar Learning.
- <sup>2</sup> Mundell, E.J. (2020). Face shields a more effective deterrent to COVID? Published online April 30, 2020. Available: <https://www.webmd.com/lung/news/20200430/face-shields-a-more-effective-deterrent-to-covid#1>
- <sup>3</sup> <https://www2.ed.gov/about/offices/list/ocr/frontpage/faq/rt/policyguidance/Supple%20Fact%20Sheet%203.21.20%20FINAL.pdf>
- <sup>4</sup> <https://www2.ed.gov/about/offices/list/ocr/docs/ocr-coronavirus-fact-sheet.pdf>
- <sup>5</sup> Dahlquist, L. (1998). *Classroom amplification: Not just for the hearing impaired anymore*. CSUN 1998 Papers. Retrieved from: <https://files.eric.ed.gov/fulltext/ED420964.pdf>
- <sup>6</sup> Smaldino, J., et al. (2009). Room acoustics and auditory rehabilitation technology. In J.Katz et.al. *Handbook of clinical audiology* (6th Ed. ). Baltimore MD: Lippencott Williams & Wilkens.
- <sup>7</sup> Smaldino, J., & Flexer, C. (2012). *Handbook of acoustic accessibility*. New York, NY: Thieme.
- <sup>8</sup> Crandell, C., Smaldino, J., & Flexer, C. (2005). *Sound-field FM amplification: Theory and practical applications* (2nd Ed). Clifton Park, NY: Thomson Delmar Learning.
- <sup>9</sup> Schafer, E., & Wolfe, J. (2019). Remote Microphone Technologies. In Madell et.al. *Pediatric Audiology: Diagnosis, Technology, and Mandagement (3rd Edition)*. New York, NY: Thieme Medical Publishers.
- <sup>10</sup> Haxby JV et al, Human Neural Systems for Face Recognition and Social Communication, *Soc Biological Psychiatry*, 2002 51:59-67
- <sup>11</sup> <https://www.fda.gov/media/136842/download>
- <sup>12</sup> Perencevich EN et al, Moving Personal Protective Equipment into the Community: Face Shields and Containment of COVID-19, *JAMA*, 2020 7477
- <sup>13</sup> CDC. Strategies for Optimizing the Supply of Facemask. Published online March 17, 2020. Available: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/face-masks.html>
- <sup>14</sup> Bankaitis, A.U. (2020). Infection Control Anxiety: Acceptable Alternatives to Critical Supplies. Updated May 6, 2020. Available: <http://aubankaitis.com/infection-control-anxiety/>

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