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Audiology in the Classroom

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Pam Millett, PhD, Reg CASLPO



February is the month when registration for kindergarten opens for families, so it's not too early to start thinking about what our students need to navigate this important transition. The first day of kindergarten is a big step, usually consisting of equal parts excitement, uncertainty, nervousness, and anticipation. Teachers work hard to prepare classrooms that are colourful, fun, and engaging but it's still a brand-new environment with new places to be, new adults, new friends, new routines, and new expectations. In many provinces and territories in Canada, we have the advantage of universal newborn hearing screening and early intervention programs to support children in developing the language, communication, social, and cognitive skills that provide a firm foundation for school readiness. However, even for students who enter kindergarten with age-appropriate skills, there are considerations that we should keep in mind as professionals, educators, and family members to support this transition.

An Overview of Full-Day Kindergarten In Ontario

In Ontario, the kindergarten program is a two-year (junior and senior kindergarten), full-day program based on play-based and inquiry-based learning.[1] Children are eligible to enroll in full-day

kindergarten in the calendar year when they turn 4. There are two educators in classroom with more than sixteen students – an Ontario College of Teacher certified teacher and an Early Children Educator, with a hard cap of 29 students. There may be an educational assistant in the classroom who is available to support the classroom but is very rarely assigned to a single student.

What Does This Mean For Deaf Or Hard Of Hearing Students?

Kindergarten students demonstrate a huge range of speech, language, cognitive, social, and communication skills.Because the criteria for enrollment is turning 4 in the calendar year of kindergarten entry, in any junior kindergarten class in September, there will be children who will soon be 5 years old (i.e., those born in early January) and children who are 3 years of age (those born later in the year between September and December). This is a huge range in all aspects of child development, from receptive and expressive language to social skills, to articulation. For example, many kindergarten students exhibit developmental articulation errors[2] which could make it difficult for students with hearing loss to understand peers, particularly under difficult listening conditions. While outcomes for speech, language, cognitive, social, and communication skills have improved significantly with universal newborn hearing screening, early intervention, and hearing technology advancements, our students are still at risk for difficulties in these areas if care and attention are not taken.[3]

In addition, the population of students entering junior and senior kindergarten this September were born at the beginning of the pandemic. There is an emerging body of research on the effects of the COVID-19 pandemic on children's kindergarten readiness, particularly on the development of social skills,[4] potentially adding another risk factor for our students.



There Is A Lot of Noise

Classrooms of close to 29 students are very typical in my experience. These rooms must be big enough to hold 29 students, 2-3 adults, tables, chairs, and all of the items needed for play-based learning (e.g. sand tables, dress-up areas, play kitchens, listening centres, etc.). One can imagine the noise levels in a classroom of this physical size full of 29 three-, four- and five-year-olds (in fact, one need not imagine it, there is a huge body of literature documenting poor classroom acoustics, including kindergarten classrooms).

It Is Full-Day Kindergarten

This means an entire day spent under often difficult listening conditions with various communication partners, with challenging language and cognitive content. Some students may not have previously spent full days outside of the home, they may be getting used to taking a bus to school; even eating lunch and snacks at school might be something new. Our focus in audiology on the problem of listening fatigue for individuals with hearing loss is relevant for every minute of full day kindergarten. School staff and families need to be aware of the likelihood of fatigue, even exhaustion, by the end of the day or by Friday, and that there may be behaviours such as meltdowns or tantrums that might not be recognized as being related to hearing loss.

Classrooms Are Very Busy, Requiring Teachers' Attention To Be Everywhere At Once

There is a lot going on at any given moment in kindergarten. When teaching a lesson on sound-symbol relationships, for example, they are tasked with keeping everyone attentive and engaged, managing students more interested in chatting with friends and those who are upset with where they are seated on the carpet. During play-based activities, teachers are moving from centre to centre to facilitate learning, to intervene in disagreements arising from immature social skills, to deal with requests for help and to manage those who are thirsty, upset or need to go to the bathroom. With this level of multitasking, it may not be evident that a deaf or hard of hearing student's hearing devices are not working. While we would not expect a kindergarten student to manage all aspects of their hearing devices (such as putting in earmolds), it is important to work on the ability to at least identify and report basic hearing device issues (e.g. on/off), and to include advocacy and technology management goals on Individual Education Plans. The role of itinerant teachers and educational audiologists is to help students learn these skills, but also to help teachers identify potential problems and do basic troubleshooting. Something as simple as purchasing a hearing aid recharger for school means that hearing aids can be recharged over lunch, preventing an afternoon of lost instruction. One of the things I like to say to my own students is that on any given day, so many of our deaf and hard-of-hearing students are one dead hearing aid battery away from learning nothing that day at school.

Supports in the Form of Itinerant Teachers and Educational Audiologists Are Necessary

I would argue that support for kindergarten is particularly crucial. Transition meetings for kindergarten need to include teachers of the deaf and educational audiologists to ensure that important information such as student background, use of technology, etiologies related to progressive hearing or vision loss, etc., are discussed. Teachers of the deaf and educational audiologists can interpret this information for school staff, and implement strategies and resources.

For example, there will be a need for support in use of technology for young students using bone-anchored devices on headbands. School staff need to be comfortable tightening or replacing the headband when needed, but these are not likely devices that classroom teachers have ever encountered. Parents and caregivers should not be expected to fill these knowledge gaps for classroom teachers, this needs to be the job of teachers of the deaf and educational audiologists.

Educational Placements

The vast majority of deaf and hard-of-hearing students will attend their local school in the same kindergarten classrooms as their neighbours. There are very few school boards providing self-contained classrooms for deaf and hard-of-hearing students; my own informal count suggests approximately 10% of school boards offer one or more self-contained classes, while the 2023 report from the Consortium for Research in Deaf Education indicated that 78% of students were fully mainstreamed, only 6% were in self-contained classrooms, and the rest in special schools (not always schools for the deaf) (available from https://www.ndcs.org.uk/media/9505/cride-2023-uk-wide-summary-final.pdf)

There Are Lots of Students with Additional Learning Needs

For the same reasons that deaf and hard-of-hearing students typically attend a regular classroom in their neighbourhood school, students who are blind or have low vision, are deaf-blind, have cognitive delays, have physical challenges (students in wheelchairs or with walkers), are on the autism spectrum or are medically fragile (requiring nursing support for feeding, for example) also attend a regular classroom in their neighbourhood school. In some regions of the province, there may be significant numbers of students who have recently come to Canada as immigrants or refugees whose families are coping with new cultural, health care, employment and community contexts and may also be struggling with poverty or insecure housing. Especially in today's context, the number of families who are struggling with food, employment or housing insecurity continues to increase, and schools play a pivotal role in supporting them, as all families with school age children will interact with their local school.

Play-Based and Inquiry-Based Learning

The Kindergarten program in Ontario is centered around play-based learning, which allows children to explore, experiment, and discover naturally and engagingly to develop critical thinking and problem-solving skills.[1] Inquiry-based learning encourages children to ask questions, investigate, and explore topics of interest, rather than having the teacher give them the information. There is some time devoted to activities in which the educators interact with the whole class (for example, during circle time in the morning or during a phonological awareness activity on rhyming). However, much time is spent with students interacting with each other at centres (for example, a kitchen centre, a water table, or a sand table) in this model.

What Does This Mean For Deaf Or Hard-of-Hearing Students?

Challenges in taking advantage of hearing assistance technology Hearing Assistance Technology such as FM systems are our best tool to improve the signal-to-noise ratio and maximize access to spoken language in the classroom (and there are few classrooms noisier than full-day kindergarten). However, taking full advantage of Hearing Assistance Technology can be

difficult. There will usually be a need for two teacher transmitters; both teachers must be trained on how and when to use them. Given the constantly changing activities in kindergarten, figuring out how and when to use both transmitters together or separately can be challenging. Given that many kindergarten-age students cannot independently identify and report problems with hearing technology, teachers need to be particularly careful to use transmitters when appropriate (and to mute them when not). For students with hearing devices that require more complicated FM system interfaces (such as those with on-the-head CIs or BAHAs), teachers require more training, support, and monitoring (on top of the many responsibilities they already have in managing 29 little ones).

Difficulty Communicating with Peers

In kindergarten, students are often engaged in learning activities with classmates, requiring the ability to hear other children's voices as well as the social skills to do so. The Hearing Assistance Technologies available to improve access to peers (such as passaround microphones or conference microphone options) are difficult to implement in kindergarten – there is no place for a conference microphone on a sand table, and a high potential for loss or damage when passaround microphones are used without careful adult supervision.

There Is A Lot To Learn

The kindergarten curriculum covers a wide range of areas, including literacy, numeracy, science, social studies, and the arts, with a strong emphasis on social and emotional development.[1] Most recently, the kindergarten curriculum has been updated to emphasize literacy, particularly the foundational skills of phonological/phonemic awareness, sound-symbol relationships, and decoding.[5] These skills are prerequisites for learning to read for all students – while they may be more difficult for students with hearing loss, there is no alternative path to reading.[6] Kindergarten students at this crucial learning point need the best possible access to spoken language that we can provide, even though kindergarten also represents one of the most challenging contexts in which to do so. We all need to be at the top of our game.

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