Orem student's invention protects premature babies' ears

Braley Dodson Daily Herald | Apr 23, 2019

Oliva Washburn tests materials for sound attenuation value during the engineering phase of developing the Noisy NICU Cap.

Courtesy of Melissa Washburn

A ninth grader from Orem is hoping to make a premature baby's stay in a neonatal intensive care unit less stressful on developing ears.

"When they are in the womb, they are used to a more muffled sound, so when you are exposed to those really sharp, shrill sounds, it can damage their hearing," said Olivia Washburn, a ninth grade student at American Heritage School in American Fork.

Washburn is the teen entrepreneur behind the Noisy NICU Cap, a small hat designed to help lower sound levels for premature babies.

The cap started out as a science fair project last year, when Washburn was named the Junior Division Grand Champion at the Central Utah STEM Fair. She's since also won the $7,000 grand prize at the 2019 High School Utah Entrepreneur Challenge from the Lassonde Entrepreneur Institute at the University of Utah.

Washburn herself had a 10-day stay in the NICU as a baby. While doing research for her project, she found that loud noises in the NICU can have damaging effects on infants and contribute to conditions such as audio processing disorder and learning disabilities. The solutions, she found, hinted at making machines quieter.

"I decided it would be a much cheaper and easier solution to create a cap," she said.

Washburn found that the loudest noises in a NICU can be between 60 and 120 decibels, which can range from a conversation to an ambulance siren. She created a sound box to test the sound attenuation of 25 materials to find which combination worked the best together.

She met with a professional seamstress to work on the design, and made adult-sized versions to get additional feedback.

The current version of the Noisy NICU Cap uses silicon, an elastic foam, cardstock and a wool cotton blend to create ear pieces that can be removed and adjusted inside the cap. The cap goes above a baby's forehead, down their neck and includes a chin strap. The cap is meant to be worn tight to keep sound out, but not too tight, and is designed not to obstruct any respiratory equipment.

Washburn said the cap lowers sound by 50 decibels, just quieter than a normal conversation.

There's not a current standard for headgear in NICUs to lower sound levels, but there is one for wearing it for warmth. Washburn said the cap would do both.

She has two provisional patents on the cap. Her next step is to give it to 50 to 100 mothers to receive feedback, and then she plans to start social media pages, a website to collect addresses of followers and form a Kickstarter campaign to raise money for operating capital.

She's seen a steady stream of people inquiring about the product.

"To actually see that people were interested in it kept me going," Washburn said. "When I was at Lassonde, there was so many people who would come up to me and ask about it and give me names and phone numbers of people who would be interested in helping me pursue it."

After high school, Washburn aspires to become a neonatologist or an obstetrician. If the Noisy NICU Cap continues to take off, she said she'd like to become an entrepreneur, as well.