



## Nose Can Play Music on New Instrument

Tracy Staedter, Discovery News

**May 29, 2007** — A computerized instrument that allows people to play music with the tip of their nose could give those who suffer from physical disabilities, such as cerebral palsy, the chance to experience music's positive effects.

Not only could the interface allow for musical communication, it could also be adapted for speech, giving physically challenged patients the ability to form full sentences, rather than just providing yes or no responses.

"This instrument will give a voice to those who are all too often ignored, due to their physical disability," said Zane Van Dusen, a recent graduate of computer science and electronic media arts and communications at Rensselaer Polytechnic Institute in Troy, NY.

Van Dusen developed the interface with Pauline Oliveros, a musician and distinguished professor of the arts at Rensselaer.

Cerebral Palsy is a neurological disorder that permanently reduces muscle coordination. As a result, sufferers often feel mentally imprisoned by their inability to speak or move.

Music offers a way to break out of the bonds of a physical disability because it gives patients a means to express themselves. Unfortunately, current music tools are limiting.

Most tools restrict input to a joystick on a wheelchair, which can be expensive to add or modify; they may require wires or cables that impede or even distract a person, and lastly, not all music therapy allows for a broad range of creativity.

Van Dusen's "adaptive-use musical instrument" overcomes these challenges with an inexpensive Web camera and specialized computer software that he wrote.

The patient is placed in front of the computer, where they see live video of their face through a Web camera. Motion-tracking software places a red box on the tip of the person's nose and tracks the user's movement across an onscreen keyboard.

The lowest notes are located to the left and the highest notes are located to the right. The outline of a rectangle around the person's face can be widened or narrowed in order to accommodate the patient's range of motion.

In "keyboard mode," the person stays within the rectangle, touching on keys to illicit notes. In "percussive mode," the person can move outside the rectangle to set off a snare drum or cymbal sound.

In a pilot study at Rehabs Program in Poughkeepsie, NY, children who used the instrument paid more attention to their movements because they were motivated by the sounds they were creating. One nine-year-old child spent an hour creating a song, even though it required a lot of effort.

"The added benefit of all of this is that the children are working on their head control," said Leaf Miller, a professional musician and an occupational therapist at Rehab Programs in Poughkeepsie, NY.

Affordability is also an issue, she added.

"The cost of the hardware and software is not going to be expensive and that makes it accessible," said Miller. "It can also be adapted for speech language pathologists to use for communication."

The team will be working this summer to perfect the prototype and create additional interfaces for an organization that fosters a unique approach to music, literature, art and meditation.

They hope the interface might offer a way for otherwise frustrated patients to express the song they have on the tip of their nose.

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