Video games may help clear airway of cystic fibrosis patients

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Video games controlled by the player's breath can encourage youths with cystic fibrosis to use techniques that can help keep their airways clearer, according to a study to be presented Saturday, April 30, at the Pediatric Academic Societies (PAS) annual meeting in Denver.

Cystic fibrosis, one of the most common chronic lung diseases in children and young adults, causes mucus to build up in the lungs and digestive tract. To clear mucus from the airways, patients must do breathing exhalation maneuvers called "huffing" several times a day. Many children, however, refuse, preferring to play video games instead, according to Peter M. Bingham, MD, lead author of the study.

"These are kids who are often lonely and frustrated with their medical treatments, and who turn to video games for fun," said Dr. Bingham, associate professor of neurology and pediatrics at the University of Vermont and pediatric neurologist at Fletcher Allen Health Care.

The researchers decided to capitalize on their patients' penchant for video games by designing software that encourages them to use the breathing techniques. Instead of using a handheld controller, the game is controlled by a digital spirometer, a device that measures how fast and how much air the player breathes out.

In one game, created by students at Champlain College in Vermont, the player's breath drives the movement of a race car down a track and allows the player to fill up the gas tank and wash the car. In another

game, the player explores a wilderness, looking for treasure. When the player encounters an animal covered in slime, he or she blows the slime off the animal to earn more treasure.

"The medical goal of the games was to increase breathing maneuvers that respiratory therapists believe can help keep the airways of [cystic fibrosis](link) patients clearer," Dr. Bingham said.

Before the study began, 13 children ages 8-18 years underwent pulmonary function tests. Then they participated in a game phase and a control phase for two to four weeks each. During both phases, they were given a computer and spirometer. During the game phase, they also had access to the games that were controlled by the spirometer.

Results showed that few subjects were carrying out the recommended huffing with any regularity before the study. During the study, subjects were huffing more than they did before the study, although there was no difference in the amount of huffing in the game period compared to the control period.

"Both parts of the study apparently got subjects focused on and involved with using the spirometer to do the recommended forced exhalations," Dr. Bingham said.

A surprising result was that even though subjects used the spirometer during game play and the control period, their ability to take a deep breath (termed vital capacity) improved significantly only after game play.

"We aren't sure why that improvement happened," Dr. Bingham said, "but it could be that the player's ability to carry out the vital capacity test improved simply because they were practicing this skill more often, and not because of an actual improvement in their lungs."

"In sum, we think that these results show that using spirometer games can be a good way to involve children in respiratory therapy," he said. "I think it's ethical and appropriate to meet kids 'where they are' with some engaging, digital games that can help them take charge of their own health."

More information: To view the abstract, go to
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