Breathing problem. IV-delivered anesthetics may escape into the air and affect physicians.

da's Impaired Professional programs, Gold has found that anesthesiologists who abuse drugs tend to start much later in life than other addicts, who typically experiment with drugs during their youth. Anesthesiologists also tend to relapse unless they change professions, says Gold.

Having conducted research on whether secondhand smoke sensitizes brain reward pathways—children of smokers are much more likely to smoke—Gold wondered whether secondhand anesthesia might be at work. He teamed up with several UF anesthesiologists to answer that question. As a first step, they used a mass spectrometer to examine the air in operating rooms during cardiac bypass surgeries in which fentanyl, an opiate many times more potent than morphine, and a nonopiate anesthetic, propofol, were administered intravenously to patients. Both compounds were found in the operating room air and at higher concentrations in the space between the anesthesiologist and patient, Matt Warren, a graduate student with the Florida team, reported in San Diego.

In another test, the researchers found that volunteers given fentanyl exhale it. In lengthy operations such as cardiac bypasses, anesthesiologists "could be breathing analgesics and anesthetics for 8 hours," speculates Gold.

The Florida team is now collecting blood samples of anesthesiologists during operations to see if fentanyl is present. They also intend to expose rodents to the same air concentrations of the anesthetics as found in the operating rooms and test whether those animals are more susceptible to drug addiction and develop changes in brain regions involved in the rewarding aspects of drugs.

Those follow-up studies will be needed to convince anesthesiologists and others who are intrigued by Gold's hypothesis. "He's a guy who thinks outside the box," says Robert L. Dupont, president of the Institute for Behavior and Health in Rockville, Maryland, and former director of the National Institute on Drug Abuse. "But it's hard for me to imagine that the doses people are getting this way are having any biological effect. I'm ready to be persuaded, but I'm skeptical."

–JOHN TRAVIS

Listen, Baby

How quickly babies home in on the sounds of their native language during their first year may predict how quickly they learn new words, string together complex sentences, and acquire other language skills as toddlers. The new research, presented in San Diego, helps pin down a milestone in language development and may shed light on why the ability to pick up a new language wanes with age.

When it comes to language, babies are "citizens of the world," Patricia Kuhl of the University of Washington, Seattle, said in a lecture here. In the early 1990s, her team found that 6-month-old infants naturally possess a language skill far beyond the reach of adults: They can distinguish all the sounds of all the world's languages—about 600 consonants and 200 vowels. By the end of their first year, however, babies begin to specialize. As they become better at recognizing the basic elements, or phonemes, of their native language in all their acoustic variations—learning to lump /o/ as pronounced by mom together with /o/ as pronounced by grandpa and Bugs Bunny, they lose the ability to distinguish phonemes in other languages. By about 11 months, for example, certain vowels that sound distinct to Swedes start to sound the same for a baby born to an English-speaking family.

Baby talk. An infant's level of speech discrimination predicts language skills.

Kuhl and others have argued that this change in speech perception is an essential step in language learning. They contend that babies need to be adept at identifying native phonemes, for example, before they can break down a stream of speech into individual words. That skill, in turn, is necessary for assigning words to objects, creating more complex sentences, and so on.

Recent work in Kuhl's lab bears this out. Her team has been using electroencephalogram (EEG) electrodes to monitor the brain activity of 7-month-old infants, who are just at the cusp of the change in phoneme perception. The babies listened to a recorded voice repeat a single phoneme several times before switching to another phoneme. If the baby caught the switch, a blip appeared in the EEG record. This evoked related potential (ERP) is a standard indicator that the brain has picked up something new. The researchers tested the babies' ability to discriminate both native and non-native phonemes and then followed up with a battery of language tests at 14, 18, 24, and 30 months of age.

The ERP recordings revealed that infants who at 7 months of age were good at native phoneme discrimination tended to be bad at non-native phoneme discrimination, and vice versa. This fits with the "neural commitment" theory proposed by Kuhl several years ago, says Mirella Dapretto of the University of California, Los Angeles. Kuhl's work suggests that "the more your brain gets committed to picking up what's relevant in the first language you're exposed to, the more you're tuning out distinctions that are relevant in other languages," Dapretto says.

The follow-up studies suggest that the brain's commitment to native speech sounds provides the foundation for later language learning. Although all the children in Kuhl's study tested in the normal range, the ones who did best at native phoneme discrimination at 7 months scored higher at later times on all language measures, including number of words produced, duration of utterances, and sentence complexity.

"It's extremely interesting [that] you can look at infants and learn something really important about their future learning," says April Benasich, a cognitive neuroscientist at Rutgers University in Newark, New Jersey. Benasich says the findings add to evidence, including work from her own lab, that it may be possible to screen young infants to identify those likely to need extra help with language learning.

–GREG MILLER

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