

New hand-washing tool prevents germs from spreading

By Smithsonian.com, adapted by Newsela staff on 09.06.18

Word Count **846**

Level **1070L**



A toddler at the Child Development Center gets a “germ inspection” after washing her hands at McConnell Air Force Base, Kansas, April 3, 2018. In honor of National Public Health Week, medical technicians instructed children how to properly wash their hands and prevent spreading germs. Photo by: U.S. Air Force/Amn Michaela R. Slanchik

You have probably seen signs in bathrooms that say "employees must wash their hands before returning to work." Right now, this is as far as illness prevention efforts in restaurants go.

Engineers Christine Schindler and Dutch Waanders had a better idea.

"We thought, that's crazy, there should be something that scans people's hands to see if there's any foodborne illness," says Schindler. "When people were saying that they've been waiting 10 years for a product like this, that's when we left our jobs."

Schindler and Waanders both studied biomedical engineering at Duke University. They started researching foodborne illnesses. They created a device called PathSpot last year, placing test devices in restaurants starting in January.

Beams Of Light Bounce Off Microbes

The Pathspot uses beams of light, says Schindler. The light beams bounce off of microbes on a person's hand. The reflection of the beams is received by the tablet's camera. The light reflects slightly differently based on the shape of whatever it bounces off of, even tiny microbes.

A computer program knows the different ways that light can bounce back for different contaminants. The program can recognize E. coli, salmonella, norovirus, hepatitis A and listeria. The device turns red or green to show the presence or absence of contaminants. The device mounts on the wall next to a sink.

Bad Hand-Washing

We are bad at washing our hands effectively, according to a Food and Drug Administration (FDA) study released this summer.

The study watched 383 people prepare turkey burgers in test kitchens. Fewer than 3 percent of participants washed their hands for the recommended 20 to 30 seconds. Then researchers analyzed microbe samples from refrigerator handles, spice containers and salads. They found up to 41 percent of them had been contaminated. The Centers for Disease Control and Prevention says this sort of behavior contributes to the 48 million sicknesses, 128,000 hospitalizations and 3,000 deaths from food contamination in the United States yearly.

Ben Chapman is an associate professor and food safety professional at North Carolina State University. Chapman says hand-washing failure can be broken into two categories: effectiveness and compliance.

Chapman is one of the researchers on the FDA study. He is quick to point out that the study tested people cooking in home kitchens, not people working in professional kitchens. Professional food handlers are held to hand-washing standards by law.

Furthermore, the study has not yet shown the difference between effectiveness and compliance. Someone who skipped a wash after handling poultry but before handling lettuce (a compliance failure) and someone who did not wash long or well enough (an effectiveness failure) both count as failing to wash appropriately. Only one of those people would be caught by a device like PathSpot.

Routine Inspections Best Way To Measure Compliance

"We don't really have a great understanding of how compliant food handlers are with the law," says Chapman. "The best way we've measured it is through routine inspections."

PathSpot considers effectiveness the bigger issue, but Chapman thinks it is compliance. It is not so much that people fail to wash their hands before food prep or after using the restroom, he says. Rather, they are unaware of the washing that needs to take place in between the steps of food preparation. For example, people should wash when they change from handling raw to ready-to-eat food. People also might skip washes because they feel they do not have time.

In a 2010 study in the *Journal of Food Protection*, Chapman put video cameras in restaurant kitchens. He used them to observe hand-washing practices. He found that workers washed their hands more often and spread germs to food less frequently when food safety info sheets were placed in kitchens. In some places, that washing is unnecessary because people do not always use their hands, he says. Many fast food restaurants, for example, use tongs or other easily cleaned tools to cook and move food.

Pilot Program Shows Success

Still, a clear answer to whether employees washed their hands well enough could be valuable. The information could help improve employee practices. In a pilot program in 20 locations in Detroit, New York City and Durham, North Carolina, PathSpot saw contamination rates decrease by 60 percent over a month, according to Schindler. The company also saw managers use information on when, where and how hand-washing could be improved.

Schindler says the information from PathSpot can tell a restaurant how to better train their employees and tell them what the employees need to change. Schindler hopes PathSpot will inspire people to be excited about cleanliness.

PathSpot just received \$2 million from investors. The company has applied for a patent. It plans to focus on making the devices affordable and placing them in locations that need them. Schindler envisions similar technology that could detect peanut oil in schools, flu in the workplace or staph infections in hospitals.

"The thing that we really care about with this product is the ability for it to grow far beyond detecting foodborne illness on hands to a system for instantaneous detection of illness at large," says Schindler.