# Researchers invent real time secondhand smoke sensor

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Making headway against a major public health threat, Dartmouth College researchers have invented the first ever secondhand tobacco smoke sensor that records data in real time, a new study in the journal *Nicotine and Tobacco Research* shows.

The researchers expect to soon convert the prototype, which is smaller and lighter than a cellphone, into a wearable, affordable and reusable device that helps to enforce no smoking regulations and sheds light on the pervasiveness of secondhand smoke. The sensor can also detect thirdhand smoke, or nicotine off-gassing from clothing, furniture, car seats and other material.

The device uses polymer films to reliably measure ambient nicotine vapor molecules and a sensor chip to record the real-time data, pinpointing when and where the exposure occurred and even the number of cigarettes smoked. The prototype proved successful in lab tests. Clinical studies will start this summer.

Such a device could help to enforce smoking bans in rental cars, hotel rooms, apartment buildings, restaurants and other places. It also could help convince smokers that smoking in other rooms, out of windows and using air fresheners still exposes children and other nonsmokers to secondhand smoke. The device would be more accurate and less expensive than current secondhand smoke sensors, which provide only an average exposure in a limited area over several days or weeks.

"This is a leap forward in secondhand smoke exposure detection technology," said Chemistry Professor Joseph BelBruno, whose lab conducted the research.

Federal health officials report there is no safe level of exposure to secondhand smoke, which increases the risks of cancer, cardiovascular disease and childhood illness. An estimated 88 million nonsmoking Americans, including 54 percent of children ages 3 years, are exposed to secondhand smoke.

Provided by Dartmouth College