BioSpect
the business of Bi
24 years of leveraging the business of Bio
www.biospectrumindia.co

World's first 3D-printed 'Sneezeometer' to help Asthma patients

08 March 2016 | News | By BioSpectrum Bureau

World's first 3D-printed 'Sneezeometer' to help Asthma patients



India has an estimated 15-20 million asthmatics with up to 15% of 5-11 year olds suffering the disease

Research undertaken at the University of Surrey, UK, has led to the development of the world's first 'sneezeometer', an airflow sensor or 'spirometer' that is sensitive enough to measure the speed of a sneeze.
For use in helping to diagnose a variety of respiratory conditions, the sneezeometer is twice as fast, and more sensitive than any other available device.

Spirometers measure lung capacity and are used widely to diagnose a variety of chronic and acute respiratory conditions including asthma, Obstructive Sleep Apnoea and Hypopnoea.

However, current devices are expensive, cumbersome and lack the sensitivity required in difficult diagnostic situations, such as neonatal care.

An ultra-sensitive spirometer, Surrey's sneezeometer measures the flow rate of air through a patient's lungs.

Â

When the patient breathes through the fist-sized instrument, the sneezeometer is fast and sensitive enough to pick up tiny fluctuations in the breath's flow rate, which may be caused by a disease. Because no such instrument has yet been available, researchers are still exploring the diagnostic capabilities.

Dr David Birch, of the University of Surrey's Aerodynamics and Environmental Flow research Group explained, "Breathing disorders are highly prevalent in both the developed and developing world. In India, there has been a 30% rise in respiratory disease since 2010[2], with air pollution being a major factor in this massive rise. The diagnosis and monitoring of respiratory diseases is key to proper treatment and we have now developed a simple, low-cost and non-intrusive diagnostic solution that will make doctors' lives easier across the world.

Dr Paul Nathan, the sneezometer's co-inventor added, "We have created a portable, highly sensitive and accurate spirometer that can catch the speed of a sneeze. What's almost as impressive is that we created this innovative device using simple 3D printing technology, with all of the prototypes 'printed' around the internal electronics."

"Respiratory diseases are especially prevalent in developing cities such as Delhi and Beijing where air quality is a big concern. Air pollution was recently placed in the top ten health risks faced by human beings globally, with the World Health Organization linking air pollution to seven million premature deaths every year," said Dr Prashant Kumar, from the University of Surrey, "The availability of an inexpensive and portable diagnostic device such as this will assist in such diseases being diagnosed, and treated at earlier stages."

The Sneezeometer is currently being trialed at King's College Hospital in London where the device may be used to help diagnose a range of conditions from neonatal settings through to animal diseases.

Dr Manasi Nandi, Senior Lecturer in Integrative Pharmacology at King's College London commented, "The ability to measure the sensitivity of airflow detection and pull out other information from single breath is very interesting from both a research and clinical perspective. This is currently not picked out with conventional tests, and we have already been using it to mimic testing of asthma."

Dr Birch concluded, "From our expertise in wind-tunnel measurement we have translated fundamental research into an incredibly beneficial technology that will have real impact on the lives of patients with chronic illnesses and will make diagnosis faster, cheaper and more accurate."