

Development of a Saliva-based Point -Of-Care bioSENSOR for Chronic Obstructive Airways Disease (COPD): ‘COPD-SPOC sensor’

What is COPD and its Clinical Need?

COPD is a common disease with progressive breathlessness. With 44M cases globally, it burdens the whole health economy, primary / secondary care and patients’ lives. COPD is the 4th leading cause of death; Britain has one of the highest EU death rates; over 30,000 people die p.a.. It leads on lost work days, with 20.4M (M) to 3.5M (F) days lost p.a. to acute episodes and poor disease control. A UK district of 250,000 has 14,200 GP consults p.a. for COPD. Flare-ups, a COPD hallmark, are 2nd main cause of emergency hospital admissions. In 2003/4 COPD emergency costs reached £253M, making it a very costly illness for the NHS.

What is the Innovation?

There is an unmet need for practical, near-patient, non-invasive monitoring of COPD status. No current monitor fulfils this clinically. Our solution is to develop a new class of networkable, Saliva-based Point-Of-Care bioSensors specific for practical COPD care. The COPD-SPOC sensor will consist of a miniaturised platform measuring saliva spectral patterns and/or 5 key biomarker candidates, integrated into a smart handheld analyser for patient-driven bio-clinical profiling; whilst having potential compatibility with other current non-COPD systems.

When did the Innovation start?

Work on our innovation started in 2006, and we have made timely progress through the various stages of development, including setup of collaborations with relevant Industrial partners.

What will the Innovation achieve?

Our research is a first step towards timely delivery of a revolutionary, near-patient COPD monitor, driven by a novel concept of interactive saliva-based biometrics and patient-reported events. This feature will give this COPD-SPOC sensor an edge over other portable devices and represents a major leap forward in near-patient COPD care delivery. Bringing the monitor to the patient offers the end-user greater satisfaction and better disease control.

By further exploiting existent telemedicine concepts and developments, the COPD-SPOC sensor will go beyond state of the art, and incorporate systems capability for transferring data from patients’ homes to clinics (GP and hospital) and receiving feedback. This will provide high quality COPD care through safe near-patient monitoring, prompt medication changes and reduction in GP/ path lab / hospital visits, with significant impact on service costs.

What is the Key Innovation message?

The COPD-SPOC sensor is being developed mindful of 2 clinical challenges: (a) early prediction of flare-ups; (b) early recognition of status change over time. To achieve this, our innovation is driven by a patient-focussed systems approach that integrates COPD-relevant biomarkers and spectral patterns in saliva with patient-reported health scores. This sensor will be the first of its kind in COPD care.

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