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Space Technology for Lung Disease

Emissions from motor vehicles, factories, power plants and other sources are amongst the most common causes of air pollution. Unfortunately, the quality of air has a direct impact on population health. For example, chronic obstructive pulmonary disease (COPD), a chronic inflammatory lung disease, can be exacerbated by constant exposure to dirty air.

In the UK, there are an estimated 1.2 million people afflicted with this lung disease. More than 140,000 unscheduled hospital admissions and 30,000 deaths due to COPD are recorded across the country each year, according to Chris Barker, CEO at Spirit Health Group, a leading provider of innovative healthcare solutions promoting patient self-management.

Poor air quality, as Barker points out, contributes to COPD morbidity and mortality, and is estimated to have cost £157 million in health and social care in 2017. He is optimistic this health issue can be addressed through a new collaboration between Spirit Digital, which is a member of Spirit Health Group, and the European Space Agency (ESA).

The ESA recently awarded Spirit Digital a Business Applications and Space Solutions contract and funding to develop a satellite-enabled, digitally connected platform for remote monitoring of patients with long-term conditions. The platform, called "CliniTouch Vie II", is augmented with accurate, location-based satellite air quality data to enhance care provision and patient self-management options.

CliniTouch Vie II's real-time visibility can provide advanced warning of when a patient's condition is likely to deteriorate by vital signs monitoring and alerting both the patient and the healthcare practitioner to make the necessary pre-emptive interventions. By providing real-time data on air quality, the system can empower the patient to make decisions about how they manage their day and have better health outcomes.

By providing an enhanced system that will offer advanced warning of potential condition deterioration alongside pre-emptive intervention data, we can shift the focus from treatment to prevention," Barker explains. "We are delighted that the ESA has recognised the huge potential of CliniTouch Vie II and are thrilled to be working alongside our partners to deliver this ground-breaking project.î

With this new ESA initiative, Spirit Digital will lead a project team comprising air quality expert, EarthSense; not-for-profit innovation and technology network, Satellite Applications Catapult; and NHS support organisation Arden & GEM Commissioning Support Unit, to add Earth Observation data into CliniTouch Vie for improved healthcare decisions. This data includes inputs from the Copernicus Atmosphere Monitoring Service (CAMS) and meteorological data (EUMETSAT via ECMWF) contributing vital wind vector information to enable pollution dispersion to be accurately calculated.

In addition, GNSS data is used for location tracking for both patients and mobile air quality sensors and provides tailored position-based information on pollution concentrations.

CliniTouch Vie II, once completed, will help people with respiratory conditions, initially COPD, although plans are afoot to expand the platform to include asthma and other respiratory conditions.

Spirit Digital is an evidence-based, patient-centric service that delivers technology enabled care solutions through a cloud-based digital connected care platform. By implementing CliniTouch Vie into care pathways to improve healthcare cost efficiencies, Spirit Digital helps to reduce healthcare reliance and distress and discomfort from conditions exacerbations, and has demonstrated a 67% reduction in unplanned respiratory admissions.

Source: Spirit Health Group
Image: iStock

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