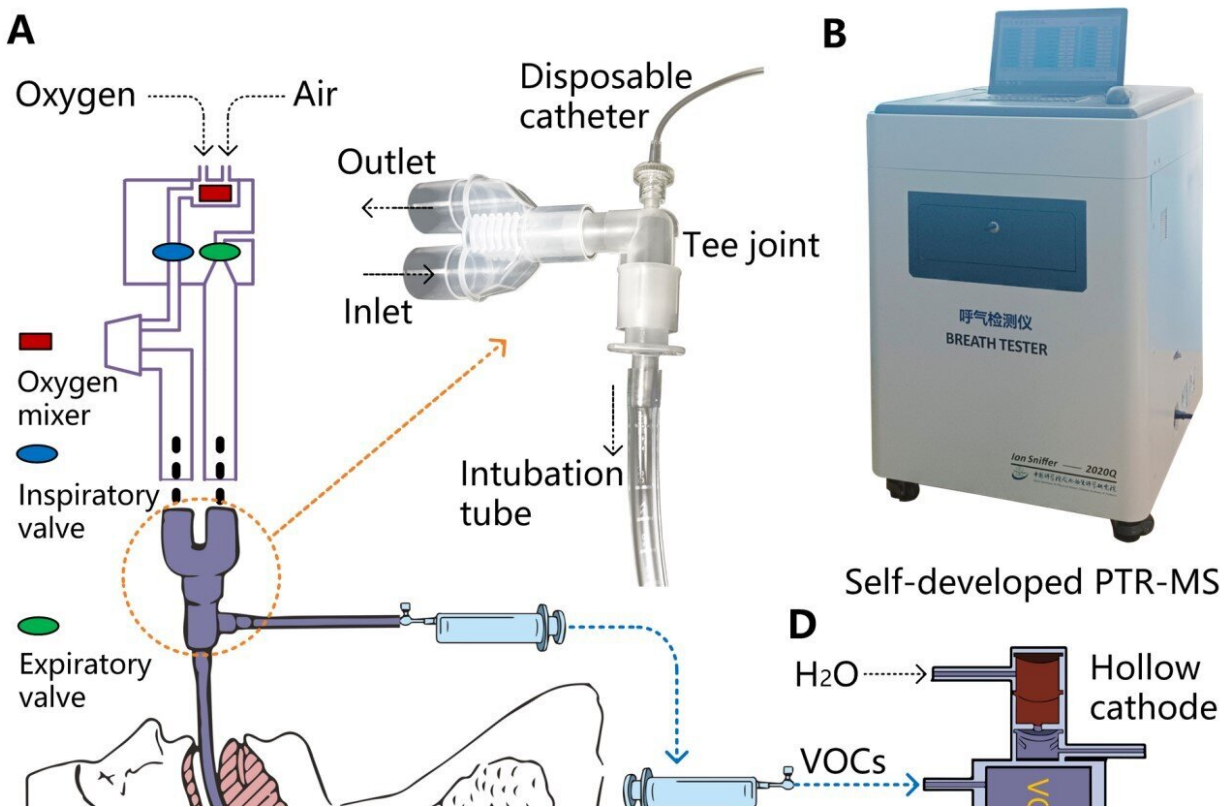


Screening for ventilator-associated pneumonia infection through a breath test

November 17 2022, by Zhang Nannan



Schematic Diagram of Deep Airway Breath Sampling Method. Credit: Xu Wei

Ventilator-associated pneumonia (VAP) is the most common type of nosocomial infection in the intensive care unit. Clinical diagnosis of VAP still depends on the results of microbial culture identification of

lower respiratory tract specimens of suspected patients, which takes about one to three days. At present, there is no way to quickly determine the infection status of patients, and the initial anti-infection regimen can only rely on the experience of doctors, which leads to the abuse of antibiotics and the failure of initial treatment.

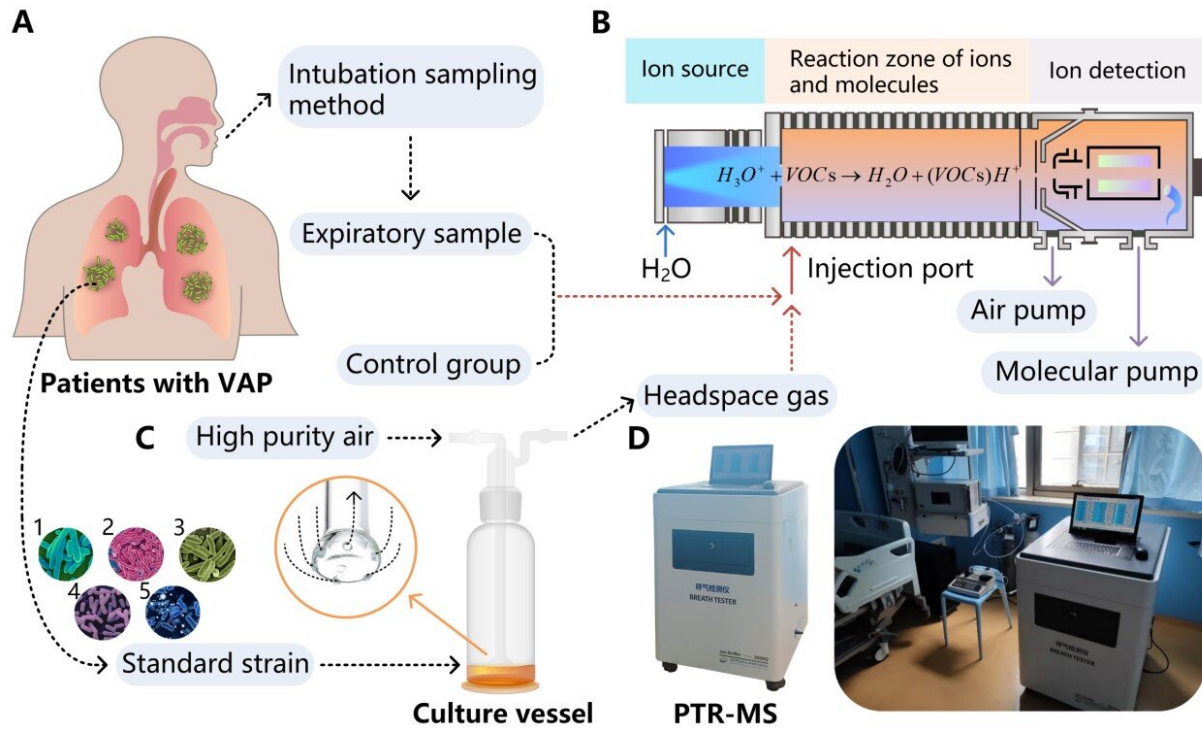
A research team led by Prof. Huang Ying from the Hefei Institutes of Physical Science of the Chinese Academy of Sciences has been conducting research aiming at a new non-invasive screening method for VAP. With a self-developed breath tester proton transfer reaction-mass spectrometry, they detected exhaled [volatile organic compounds](#) (VOCs) from [patients](#) infected with VAP.

Results were published in *Talanta* on Nov. 7.

In this study, the researchers proposed a mode of breath sampling for patients with endotracheal intubation/incision—deep airway breath sampling method.

Combined with the self-developed respiratory tester, breathing sampling and detection of patients with endotracheal intubation/incision only takes a few minutes. Characteristic ions that differentiate VAP were statistically detected in breath tests in infected and uninfected patients.

In addition, the main pathogens of infected patients were cultured in vitro to study the relationship between the iconic VOCs in the breath of VAP patients and the VOCs released by common pathogens.



Experimental scheme of screening VAP by breath test. Credit: Xu Wei

The sensitivity and specificity were 71.4% and 84.4%, respectively. The results showed that exhaled acetaldehyde could be used to screen for VAP.

"The breath test has always been a hot spot in the field of disease diagnosis because it is safe, non-invasive, simple, and convenient," said Xu Wei, first author of the study. "We hope that the rapid screening for VAP through [breath test](#) will assist doctors to develop treatment plans in a timely manner."

More information: Wei Xu et al, Rapid screen for ventilator associated pneumonia using exhaled volatile organic compounds, *Talanta* (2022). [DOI: 10.1016/j.talanta.2022.124069](https://doi.org/10.1016/j.talanta.2022.124069)

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