

VAP DIAGNOSIS

Ventilator-associated pneumonia (VAP) is the most frequently acquired infection among patients that receive mechanical ventilation in the ICU. The mortality rate for VAP lies in the 20 to 50% range and could be even higher in some ICUs. A Rapid and accurate diagnosis for VAP is therefore crucial, but still unavailable. It is known that micro-organisms generate complex metabolites during infection. Fast detection is feasible by examining metabolic wastes in proximal end of the respiratory device, demanding a miniaturized battery-powered, gas-sensing device. As a remedy to this problem, a fully integrated low-power nose-on-a-chip with a robust learning kernel is developed for such a vital clinical need. Olfaction today has many applications not only for an individual's life but also for the industries. Applications include food product quality control, safety and security, environmental monitoring, indoor air quality, health care, medical diagnosis, pharmaceutical purposes and military applications. Artificial olfaction system has evolved in these years. It started with the standard operating procedure of conducting chest X-ray. Later on it was an era of gas chromatography methods. Then came the electronic nose or e-nose technology which uses an array of sensors for gas-detection. A modification of e-nose technology is used in nose-on-a-chip for VAP diagnosis. The nose-on-a-chip is a new advancement in the field of artificial olfaction systems. It integrates the sensor array, sensor interface circuitry, an ADC, a learning kernel, memory and a RISC core processor. It is a highly efficient method for diagnosis of VAP.