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# COUGHING REFLEX INDUCED BY ELECTROSTIMULATION OF THE TRACHEA, A PILOT STUDY

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Critical Care Medicine: December 1999 - Volume 27 - Issue 12 - p A57

Society Of Critical Care Medicine 29Th Educational And Scientific Symposium; Orlando, Florida, Usa;

February 11-15, 2000: Poster Presentations

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**Introduction** Pulmonary infections and atelectases are common complications in Intensive Care, neurological and surgical units. One of the main causes of these complications is insufficient cough activity resulting in sputum retention. In order to treat the problem of insufficient coughing and to reduce the disadvantages of the conventional methods, we developed a new method, which induces a coughing reflex by electric stimulation of the trachea. A literature search on the subject revealed no information. In co-operation with the Department of Bioinformatics of the University of Twente an electrode and electrostimulator were developed and tested in animal study. **Methods** Ten patients in the intensive care unit with reduced ability to remove sputum by coughing were included in the study. The frequency of coughing caused by mechanical stimulation of the trachea (suction) was observed and compared with coughing caused by the electrode in position without any stimulation and coughing caused by electrical stimulation. **Results** During electrostimulation coughing could be induced in all cases with same or better intensity than with mechanical stimulation. A positive effect on sputum evacuation was observed. No side effects were observed on ECG, oxygen saturation and blood pressure; of the six conscious patients one noticed a slight tingling sensation at the location of the electrode. **Conclusions** In this pilot study electrostimulation of the trachea appears to be effective in inducing coughing reflexes in patients with a reduced ability to effectively cough. Also a positive effect on sputum evacuation was observed. The method of electrical stimulation may offer a way to reduce the disadvantages of the conventional method. When the method is applied with assistance of computer or timer, a higher frequency of treatment can be achieved and this may offer a way of improved effectiveness. Because less personnel is needed when using this method, and stay on ICU may be shortened, improved cost-effectiveness can be achieved. Published in: the Lancet Vol 353 March 1999

## Section Description

Poster Hall

Saturday, February 12, 2000; 10:10 AM-3:30 PM

Saturday, February 12, 2000; 5:45 PM-7:00 PM

Sunday, February 13, 2000; 9:15 AM-3:30 PM

Monday, February 14, 2000; 9:15 AM-12:00 PM

Poster Presentations: Airway II

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