Greifswald University Medical Center will continue to rely on a new medical technology development from Canada for respiratory patients in the future. The Department of Internal Medicine B at Greifswald University Medical Center has been participating in an international multicenter study (RESCUE 3*) for two years, in which a special diaphragm stimulation therapy is used to wean patients on artificial respiration (see https://idw-online.de/de/news750754).

Now, the latest generation of the enhanced AeroPace™ neurostimulation system has been introduced in Greifswald and can be used immediately for suitable ventilation patients in Greifswald.

The innovative system, which aims to achieve faster independence from the ventilator, is currently only available in Germany as part of studies. Worldwide, the examination data of 175 ventilator patients have been recorded and evaluated in the RESCUE-3 study so far, 35 of them from Greifswald. Greifswald University Medical Center is thus the leading study center worldwide for the new procedure.

"We have been able to gain extensive experience with electrostimulation of the diaphragm at Unimedicine," emphasized Prof. Dr. Ralf Ewert, head of the Pneumology, Infectious Diseases and Weaning Center at Greifswald University Medical Center. "As a result of the corona pandemic, we have many more men and women who require intensive care and are temporarily dependent on artificial ventilation. In the overall spectrum of efforts to wean patients off long-term ventilation, this method is increasingly taking a firm place. From the perspective of our treatment team, the results to date are promising. It is also very gratifying that the system has been fundamentally refined and made more practical within a short period of time."

Flaccid diaphragm reactivates Diaphragmatic dysfunction is commonly observed when weaning from invasive mechanical ventilation. Ventilators use positive pressure to force air into the lungs so that the main breathing muscle, the diaphragm, is not stressed. Especially with prolonged ventilation, the diaphragm, a plate of muscles and tendons between the chest and abdomen, loses strength and functionality. There is a risk of a so-called ventilation-induced diaphragmatic dysfunction. This is where the procedure from Canada comes in, which has been undergoing intensive testing worldwide for two years. The diaphragm and the phrenic nerves are stimulated via a catheter to restore diaphragm strength and enable natural, independent breathing.

What can the new system do?

Meanwhile, the entire mobile console with the control unit has been optimized, significantly shortening the preparation for therapy. There is now an almost automated process in the treatment with electrostimulation. The catheter can be placed by means of a connected ECG, which can be used during catheter insertion or immediately thereafter. Whereas previously the catheter could "only" stimulate the diaphragm, it is now also suitable for infusing drugs and fluids in intensive care patients. The technically modified electrodes on the catheter provide a better coupling to the phrenic nerves. The AeroPace neurostimulation console sends a signal to the electrodes on the AeroPace catheter to stimulate the phrenic nerve. Like a personal trainer, the exercise intensity can be adjusted to provide repetitive exercises for the
We will certainly continue to bring this method to bear outside of the ongoing clinical trial, as we are convinced of its effectiveness. In our experience, electrostimulation of the diaphragm is a useful addition to the extensive efforts to wean patients off long-term ventilation," the pulmonologist said. "The goal is to significantly reduce artificial ventilation time."

*Background RESCUE-3 Study*
Launched in 2019, the RESCUE-3 study is a randomized, controlled, open-label, multicenter adaptive clinical trial to evaluate the safe and effective performance of the Lungpacer Membrane Stimulation Therapy System in patients who cannot be weaned from mechanical ventilation. Patients have failed two or more weaning attempts and required more than 96 hours (4 days) of mechanical ventilation. The study will enroll up to 400 subjects and will be conducted at up to 80 sites in the U.S. and EU.

Results from an earlier Lungpacer clinical trial published in the February issue of this year’s American Journal of Respiratory Critical Care Medicine (www.atsjournals.org/doi/full/10.1164/rccm.202107-1709OC) showed that Lungpacer therapy strengthened the diaphragm by 246 percent more and improved lung function by 128 percent more than in patients who did not receive the therapy. It also shortened weaning time by 1.4 days and extended survival by 7.9 percent. For more information, visit www.lungpacer.com
Want to significantly shorten artificial ventilation time - respiratory therapist Franco Lemke (from left), Dr. Alexander Heine, Prof. Dr. Ralf Ewert and respiratory therapist Markus Zuschke with the new AeroPace™.

Photo: Alfred Ricer