

July 2020 Issue

# Inspiration

**LUISA**

BREATHEANYWHERE.

**SCALA**

Generation change  
in polygraphy.

**SLEEP IN INTENSIVE  
CARE PATIENTS**

A decisive success factor.



2021

A NEW ERA BEGINS  
IN VENTILATION



## WELCOME

Dear Customers, Business Partners, Employees,

The year 2020 has been extraordinary for the world and for our company with its focus on ventilation. Apart from medical services and hospitals, very few organizations other than ventilator manufacturers have been called on so urgently to help the world's people. It must be said that this group also has profited financially from the situation. Consequently, these manufacturers have a responsibility not only to the general public and governments, but above all to their own employees and their families.

No one can say what long-term effects the pandemic will have on our lives and our industry, but it is already clear that some things will change. There is now a greater awareness that ventilators are critical equipment in a healthcare infrastructure. Our insights into how we handle such crises are surprisingly positive and yet alarming at the same time. Not everything will change and many will revert to old habits. On the one hand, that's good, and on the other, not so good if we miss opportunities here or there. It's widely acknowledged that we are all learning a lot about ourselves. From this valuable and reflective process, we have realized what is important and where we are victims of our comfortable consumer society. Even though such a pandemic may not be seen again soon, we should not forget or neglect our newfound knowledge.

In our family-run business in medical technology, we see that the pandemic has validated our values and our philosophy. We also know that we have to continue to develop and adapt to the changing environmental conditions. That's why we always question our basic premises. Our preliminary balance sheet shows that we have been strengthened by this situation, thanks to our desire to remain down-to-earth and financially independent, our passion to improve patient care, our investment in innovations and our long-term flexibility. Despite, or maybe because of the circumstances, we want to be even more independent, flexible and resilient in the future in order to be a reliable associate for our customers, partners and employees and the best possible provider for our patients.

Let's see what the future brings. In any case, we look forward to discovering opportunities and acting on them. Best of all with you! Stay healthy.

*Benjamin Löwenstein*  
Vice President  
Löwenstein Medical

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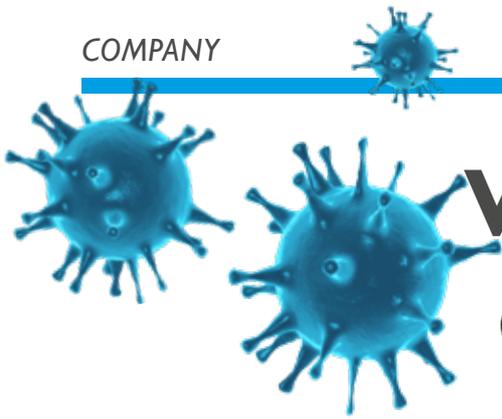
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# WHEN EVERYTHING CHANGES AT ONCE

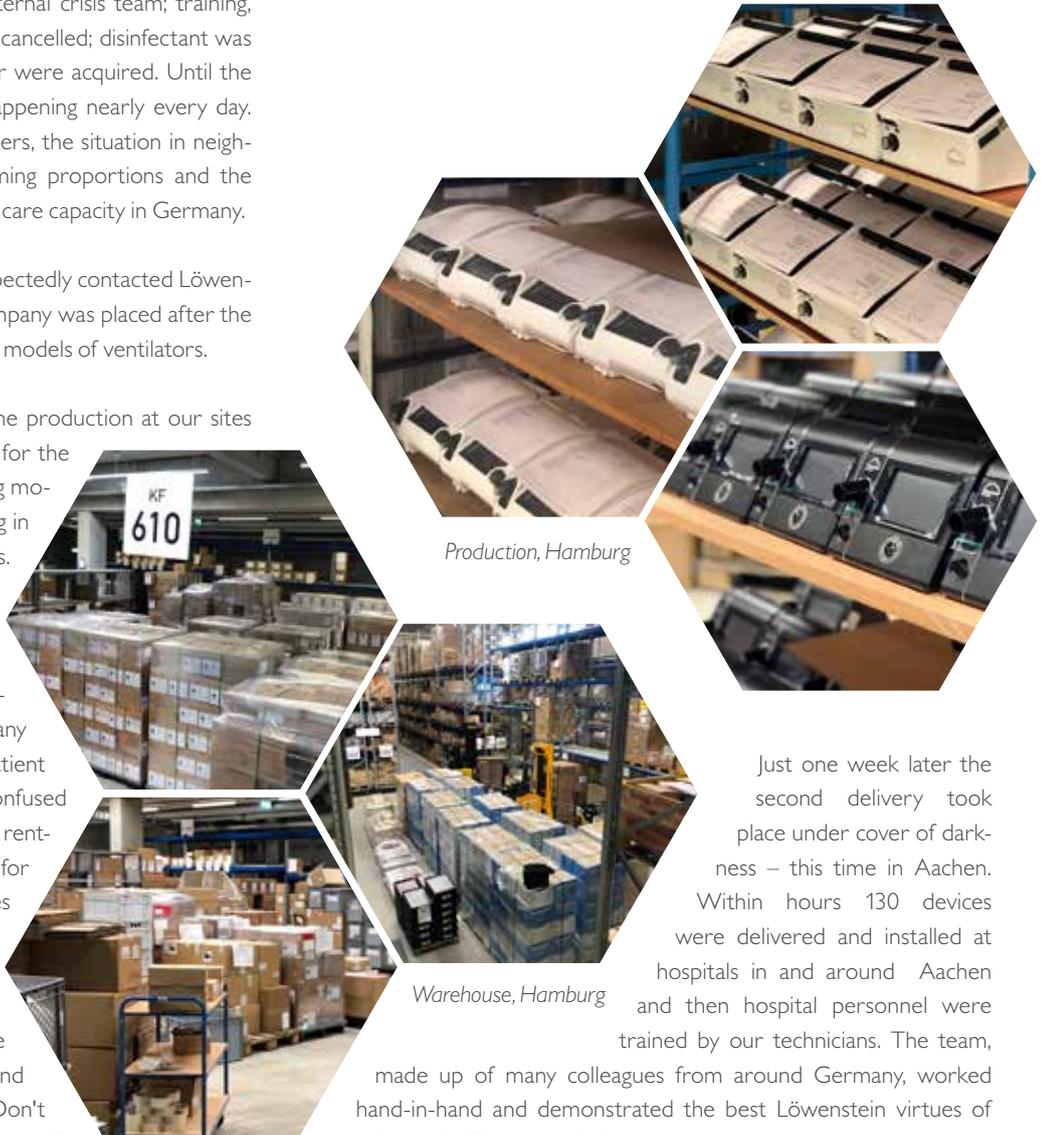
The 12th of March 2020 is a day many Löwensteiners will long remember. At the relatively late hour of 10 p.m., the main office in Bad Ems received an e-mail from the German Ministry of Health. It contained a large order placed by the German government for 6,400 ventilators – to be delivered within three months. What followed is a good example of the engagement, flexibility and dedication of Löwenstein employees. But let's take it from the top.

In the last week of February, life altered by COVID-19 found its way into our day-to-day business lives. The first strict rules of conduct, travel warnings, safety and hygiene practices were worked out and communicated by management and an internal crisis team; training, events, trade fair visits and meetings were cancelled; disinfectant was provided, gloves and other protective gear were acquired. Until the middle of March, there was something happening nearly every day. The media reported increasing case numbers, the situation in neighboring countries, like Italy, assumed alarming proportions and the pressing question arose regarding intensive care capacity in Germany.

Then the Health Minister Jens Spahn unexpectedly contacted Löwenstein Medical. A historic order for our company was placed after the first informative discussions about different models of ventilators.

Within days a master plan was created, the production at our sites was doubled – or in some cases tripled – for the upcoming months. Colleagues in Purchasing mobilized and secured supply chains, remaining in close contact with our partner companies. Several colleagues from different areas and sites throughout Germany said they were willing to help out in Production in Hamburg for the next months. The telephones in Sales did not stop ringing as many hospitals urgently sought direct contact. Patient Support staff members took care of confused patients and offered help. In Bad Ems we rented a warehouse, where an assembly line for ventilation kits was established. What takes days to set up under normal circumstances was done overnight and on weekends. Starting three weeks ago, trainees, technicians, clerks and product managers have packed up 6,500 ventilation starter sets and assembled elisa intensive care ventilators. Don't forget – the normal previously placed orders still had to and have to be filled alongside the rush orders. Flexible planning and creativity were and are required here.

A quickly organized aid transport for Italy gave everybody goosebumps. When the Italian government contacted the German Health Minister on 19 March with its urgent request, Löwenstein Medical was asked to help. Within just one day, 100 ventilators plus accessories and masks of different types were put together. Löwensteiners did not hesitate for a second and drove through the night to Cologne and the airport, where the Italian Air Force received the aid supplies.



*Production, Hamburg*

*Warehouse, Hamburg*

Just one week later the second delivery took place under cover of darkness – this time in Aachen. Within hours 130 devices were delivered and installed at hospitals in and around Aachen and then hospital personnel were trained by our technicians. The team, made up of many colleagues from around Germany, worked hand-in-hand and demonstrated the best Löwenstein virtues of passion and willingness to help.



Production, Neuhäusel



Production, Kronberg

Since then it's been one thing after another: Incredible numbers of masks, hospital, home and intensive care ventilators are produced daily and delivered to a central warehouse specially set up for the German government. From there the distribution to hospitals is arranged.

Löwenstein Medical is on the frontline not just in Germany, but has been and still is taking orders and making deliveries to the Netherlands, England, France and many other countries.

A press release about the government's order boosted the nationwide awareness of Löwenstein Medical. In the quickly set up press center, telephones started ringing off the hook. Dpa, heute, SWR, HR, NDR, Spiegel, SAT 1 and many others wanted to know more about the medium-size company from Bad Ems. The extensive coverage from German press was followed by a second wave of international media all the way from Mexico as word got out.

And today? For several weeks many office sales colleagues have been working in two shifts, a container for Patient Support has taken its place on the parking lot in Bad Ems, employees are sitting apart from each other in offices, colleagues from different areas are helping each other out and cooperating to handle a big task and challenge. Top management regularly informs us of this extraordinary time and situation in weekly video podcasts.

Times like these call for extraordinary action. Once again the Löwensteiners deliver on the promise summed up in their credo: **FOCUS ON THE INDIVIDUAL.**



Protection from infection: Patient Support temporarily relocated, Bad Ems



Production staff, Bad Ems



# OPEN HOUSE IN HAMBURG



During the DGSM congress, Löwenstein Medical invited dealers and medical experts to an Open House at the Löwenstein Medical Technology production and development site in Hamburg on 7 November 2019. Visitors had a chance to see selected highlights from the work done today by a modern medical product manufacturer.

More than 300 customers took up the offer to visit the largest German homecare manufacturer for a look behind the scenes.

At stations served by Product Management, Development and Service, our guests learned about the work and ideas from Löwenstein Medical Technology. In the showroom, employees stood ready to answer questions about the exhibited homecare articles like the tablets equipped with the telemedical solution prismaCLOUD. Visitors later had the chance to take a tour of the site and become acquainted with the Providing area.

During a tour through Assembly and Logistics, visitors saw a live demonstration of the creation of a prisma device. We received lots of positive feedback about the processes, quality and cleanliness at the site. One customer said, "It's great that the devices are actually built by people in Hamburg."

In Production the mobile robot "Giacomo" delivered chocolates to obviously amused guests.

The Rapid Prototyping Center featured demonstrations on the functions and uses of the 3D printer, measuring machine and silicone press. Guests could take still warm silicone parts fresh from the press and convince themselves of the material's versatility.

At other stations our customers had the chance to get actively involved and learn through play at Patient Interface, where the diffuse exhalation system was demonstrated, and in Service where DigiTools were explained. Our colleagues in Service presented the project "Digital Service Instruction" and augmented reality glasses for interactive support. Additional entertainment was provided by the prisma VENTKicker and the 3D video game at the Sleep station.

Crowds flocked to the face scanner where visitors could have their faces scanned and take away a printed image of the scan. Demand was so great that visitors were still heading to the station in groups up to almost midnight. Everyone wanted to join in the fun and get a face scan.

The Customer Inspiration Wall generated spirited discussions. In several instances the appeal came up for simpler diagnostics that could get around bottlenecks in sleep labs.

One highlight of the evening was certainly the exclusive introduction to our new life-support ventilator LUISA by Reinhard and Benjamin Löwenstein.

The keynote speech by Götz Magnussen (Global Product Manager Telehealth) on sleep medicine in the digital era led to a lively exchange that went on until after midnight. All things considered, the evening was a complete success for us.

# TOGETHER INTO THE FUTURE

When you have to make tough decisions, we'll be there to support you in difficult situations. When you want to give someone hope, we'll help you to identify the problem and find a solution. We cannot take away your cares, but we can be there for you when it really matters.

Even when the times bring new challenges, we are at your side. Always and everywhere.

We at Löwenstein Medical always strive to be a reliable partner. Devices from our highly varied product portfolio are used in many different situations. We are at your side when you have to make difficult decisions in intensive care. When patients in sleep labs are diagnosed with a disorder and turn

to you for hope, we are at your side. When family members have to be cared for at home, we are there for you. Even when premature babies need help at the beginning of their adventurous lives, we are at your side.

In all these trying situations, you should not have to think about the functionality of the device. We want to provide you with reliable devices featuring innovative design and user friendliness. Our goal is that our patients and customers can forget our devices when they are in use.

In the future too, we will accompany you on the adventurous journey through life with all its highs and lows and unlimited possibilities.



To image film:



# INTERNATIONAL SALES

**I**n brief: We have an export manager, eight sales reps in the office and 13 in the field and from Bad Ems we look after about 200 dealers in more than 130 countries in the business area Hospital.

On to the details: We have had an export department at Löwestein Medical since the company's founding in the 1980s. Back then the scale was much smaller with just one clerk in Bad Ems. Over time as the product palette expanded, the business grew.

At that time we exported only our anesthesia devices Moduvent and Modumat, the first generation of our incubators and our peripheral equipment. The product palette was expanded in the 1990s with modern anesthesia devices Tizian and Sinus, incubators in the Lifetherm series and radiant heaters. These additions increased business in the international area and secured our market position. For Löwenstein Medical the real breakthrough in export came in the early 2000s with the market launch of modern anesthesia workstations Leon, Leon plus and the pediatric ventilators Leoni 2 and Leoni plus. Still in continuous development, both of those product lines are regularly adapted to international and national market requirements.

For 11 years we have exported an intensive care ventilator. Five years ago we launched the new generation, which also has opened up opportunities for us in the market.

As a Private Label Manufacturer (PLM), we brought to market our own humidifier and patient monitors in 2019. Their addition to our portfolio closed the gap, allowing us to offer competitive products in the fields of Anesthesia, Intensive Care Ventilation and Neonatology.

## What do the sales reps in the Bad Ems office do?

The work in the sales office is highly varied. Everything starts with customer acquisition. We look for partners at trade fairs, on specialized Internet platforms, in cooperation with foreign chambers of commerce, via our own contacts and existing networks.

Once a dealer has been selected and contracts drafted, Quality Management and Regulatory Affairs get involved to help determine whether and to what extent registration and import licenses are required.

For the above-mentioned hospital products, we in the sales office are responsible for preparing calls for tenders and writing offers. We also take on order processing, including the generation of all required trade and customs documents with related shipping organization and coordination. It goes without saying that Customer Service, next to administrative work, is our prime concern. We are available to answer questions about our products from our international customers.

## Which tasks do our sales reps in the field take on?

Wherever they are in the world, they provide local support. We have a colleague in each region who personally looks after customers. Many are stationed there so we can provide fast responses to customer inquiries.

**1.2 million**  
Miles flown per year by our  
13 fields sales reps

~ 48 x



**26,000**  
offers / orders per year

## HOSPITAL

With our own branches in Denmark, England, the Netherlands, France, Switzerland, Austria, Israel, Russia, China and 120 authorized dealers in nearly all European and Asian countries, many African, Latin and South American countries, we are well-positioned internationally to offer good, fast service for our products just as we do in Germany.

Our newest office is in the USA, where we are preparing to enter the market there. It is an exciting project, a challenge that we take on eagerly. Now the few remaining light gray areas on the map await our arrival.



You'll find products from Löwenstein Medical from Norway to South Africa, from Peru to Japan. They are even on Mauritius and in Australia. Every year we participate in many trade fairs, symposiums and congresses. We represent ourselves or are represented by our many local dealers. An overview of events is at: [www.en.hul.de](http://www.en.hul.de).

To event calendar:



Despite the size of our company, we have been able to maintain personal relationships, short workflows and straightforward decision-making processes. That is a crucial benefit for Löwenstein Medical in today's fast-moving, international business. You might say that we still have a "people business".

Because the world is spinning faster than ever and the international market is always coming up with new requirements for medical products, there is no time for boredom. We are always excited about what's coming up.



International Sales Team

# EUROPEAN PARTNER MEETING 2020

Löwenstein Medical headquarters in Bad Ems, Rhineland-Palatinate, served as the meeting point for European dealers in the Hospital field this past January.

The European Partner meeting from 14 to 16 January attracted customers from across Europe, from Lithuania to Sweden, Switzerland, Italy, the Czech Republic to Portugal, Greece and Tunisia. Tunisia? Yes, you read correctly. And yes, we know too that Tunisia is not in Europe, but we'll explain that later.

We hosted a total of 54 customers from 23 countries at our headquarters.

Beyond the telephone, e-mail, social media and trade fairs, this type of sales meeting is an important communication and information channel used to convey specialized knowledge to dealers.

The agenda was loaded with updates to devices in our existing product portfolio, introductions to new products, the latest software versions and options, our outlook for the future and lots more.

Once all the dealers had arrived, they were welcomed by Ansgar Bilo (Löwenstein Medical international sales manager and authorized signer) and Werner Seifert (member of management team).

The first two days were dedicated to our intensive care ventilators in the elisa series. Chief Medical Director Dr. Peter Kremeier and Regional Sales Manager Europe Christoph Meurer presented the entire product portfolio and provided details about each device's features and ventilation modes. The new options that await us were discussed and analyzed in lively exchanges with our partners.

The second day began with a fascinating presentation by Dr. Sven Pulletz, senior physician in anesthesia and intensive care medicine at Klinikum Osnabrück. He explained the EIT (Electrical Impedance Tomography) function from the perspective of the user and Dr. Kremeier spoke about the product development. Both were available to answer all the dealers' questions. We give special thanks to Dr. Pulletz for his participation.

*By the way, elisa 800 is the only ventilator with the above-mentioned integrated EIT function. Besides the cost benefit, the device offers a distinct advantage in the intensive care unit where space is limited. The integrated solution eliminates the need for an additional separate device.*



Our product managers and application specialists Jörg Marschinke and Peter Frankenbach and our Regional Sales Manager Christoph Meurer explained the advantages of our ventilators in comparison to the competition and gave our dealers helpful sales arguments. Once again, the dealers had a lively discussion – this time about the market requirements in their respective markets.

In a hands-on session the dealers could try out the options and functions themselves and question our product managers. At the end of the day Regional Sales Manager Middle East Thomas Stucht presented our hospital mask JOYCEclinic FF and Medical Product Consultant Peter Spoljaric introduced the new humidifier LM 2000, which we developed, and its disposable tube system. These products open up new markets and potential in anesthesia and intensive care for us and our partners.

The third and final day was devoted to anesthesia and neonatology. Neonatology Product Manager Marco Meeß started with all the innovations and enhancements to Leoni plus, our ventilator for premature infants. He covered the new option CLAC 2.0, which has been further optimized, and the abdomen sensor, which makes possible even better monitoring of our littlest patients.

Anesthesia Product Manager Markus Stahlhofen spoke about the changes and new features in our anesthesia devices Leon and Leon plus. With an explanation of the Leon mri advantages compared to competitors' products on the market, he gave the dealers arguments for their sales pitches.

Kicking off the afternoon session, Development Manager for Anesthesia and Neonatology Steffen Pattai captured the audience's attention with his outlook for upcoming developments in the anesthesia and neonatology field. All of us look forward excitedly to what the future will bring. Then Ventilation Product Manager Jörg Marschinke followed up with an introduction to the patient monitors LM5 and LM7, which have been in our portfolio for just eight months. He said the new products are valuable additions to the anesthesia line that promise to open up new opportunities for sales.

Beyond the business topics, our Partner Meeting was all about networking! At the end of the busy days, the evenings were given over to relaxation and good conversation. Fortified by a selection of local wines and outstanding foods, our guests were quick to socialize and join in the fun. On Wednesday evening we presented awards for special sales achievements and years of joint work. Our partner Avalon Medical of Norway received an award for an unbelievable 20 years of cooperation. Löwenstein Medical Hospital from Vienna was pleased with its award for generating the highest revenue in Europe and booking the largest order in anesthesia and ventilation.

Finally, Mourad Ben Salah, an employee of Medizin Technik Service in Tunisia, took the award for market development in North Africa and an order for 95 anesthesia workstations. That takes us back to the opening paragraph. Ben Salah had been invited to the meeting by Reinhard Löwenstein in recognition of his outstanding job performance. His inclusion shows that there are exceptions to the rules and at Löwenstein Medical, we don't necessarily pay close attention to where borders end. So Tunisia too is considered part of Europe – in the era of globalization that's not a bad thing.

On behalf of the entire team at Löwenstein Medical, we thank all the dealers, colleagues and speakers for their participation. We look forward to continuing our close cooperation.

Preliminary plans have been made for other regional Partner Meetings. We'll certainly report on them too.



# RESPIRATORY GAS HUMIDIFICATION – more than just hot air!



Under normal physiological conditions, our airways have a temperature of 37° C and relative humidity of 100 percent. During exhalation, the exhaled respiratory gas condenses on the

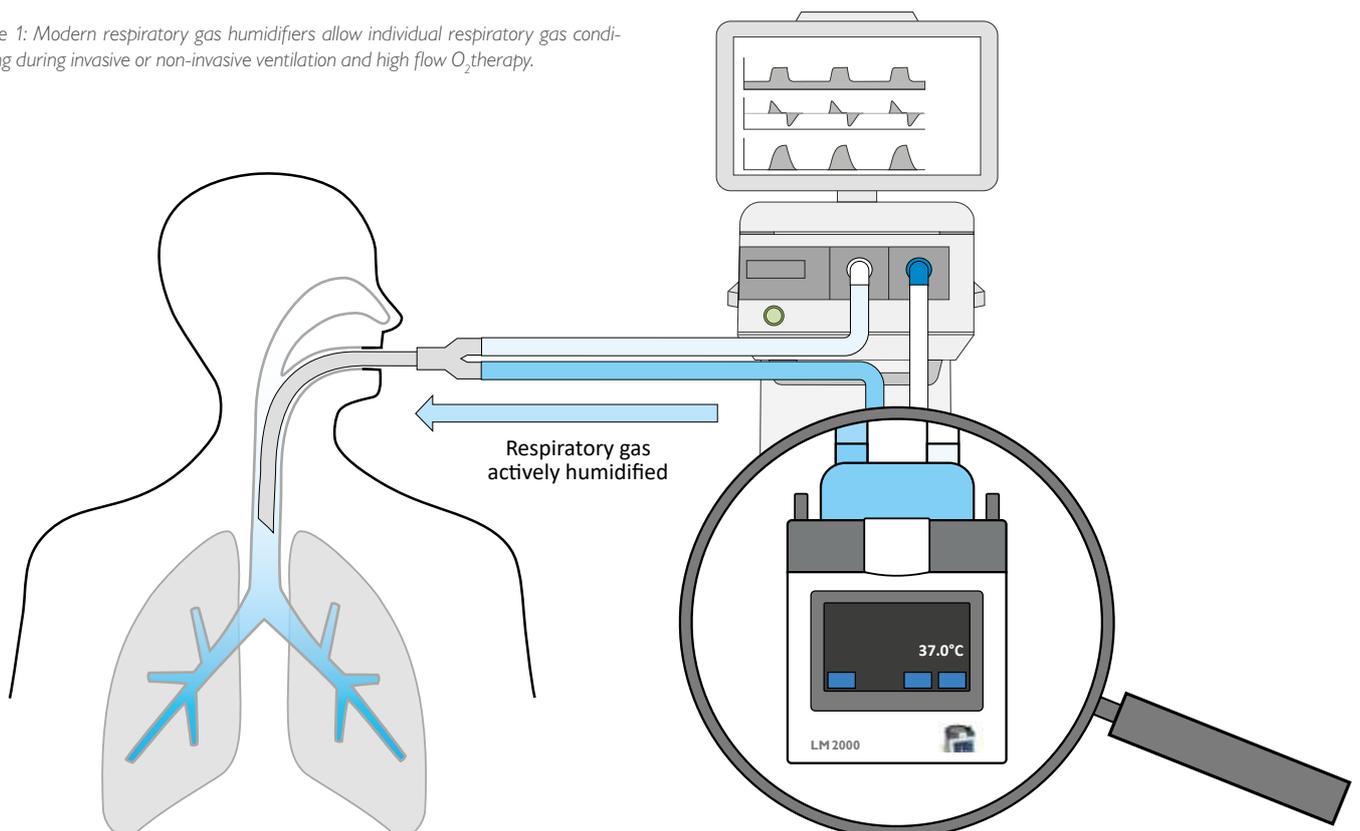
mucous membranes so that the moisture is reheated during inhalation and is thus involved in humidification. If we think back

to our last flu infection, we quickly become aware of the effects of dried mucous membranes. The thermal and humidification equilibrium is disrupted in ventilated patients. A major cause for this is the supply of cold and dry gases from the central gas supply which absorb a high proportion of the heat and humidity present. In addition, endotracheal tubes or tracheal cannulae completely bypass the upper airways. While mask ventilation does not bypass the upper airways, the high gas flows and leakage from mouth and system regularly cause the airways to dry out. In high flow O<sub>2</sub> therapy, continuous flow in particular can at least cause the same effect.

The respiratory gases must be heated and humidified in order to maintain mucociliary clearance and avoid damage to the cilia. Two procedures have now become well established in clinical ventilation. Surface vaporisers are often used in active respiratory gas conditioning. The inspiratory gas mixture is passed over a heated water surface so that it is saturated with heat and water vapour. The target respiratory gas temperature at the tube is approximately 37 °C. By using integrated tube heating elements, humidity transport occurs over the entire tube length and the cooling of the gas in the tube system is prevented so that condensate is significantly reduced. The performance data as well as the safety requirements are defined in DIN EN ISO 8185 from 2009. According to these requirements, the moisture content of the inspiratory air must not fall below 33 mg/l and the maximum inspiratory temperature must not exceed 42 °C.

Passive respiratory gas systems are often referred to as Heat and Moisture Exchangers (HME). These so-called "artificial noses" function both as heat and moisture exchangers. HMEs remove heat and moisture from the patient's exhaled air, conserve them in the inner material and deliver them to the dry respiratory gases during the following inspiration. The patient is protected from contamination with exogenous microorganisms by HME filters equipped with a water-repellent filter that works mechanically or electrostatically.

Figure 1: Modern respiratory gas humidifiers allow individual respiratory gas conditioning during invasive or non-invasive ventilation and high flow O<sub>2</sub> therapy.



Such systems eliminate the need for simultaneous use of bedside filters and active humidification.

Because the two methods are so different with regard to mode of action, performance, costs, side effects and the effects on gas exchange and ventilation parameters, they frequently are the subject of lively debate. The hygienic advantages of HME filters over active humidification systems has often been reported and published accordingly. Now that active respiratory gas humidifiers with integrated tube heating are widely available, there is no longer any need to fuss with the system in order to empty the water traps. That too has led to a reduction in the risk of contamination.

Our current scientific knowledge allows no clear recommendation for or against the use of passive or active systems. Instead, assessments of the planned duration of use, the current situation of the lungs and any possible contraindications of HME filters are called for.

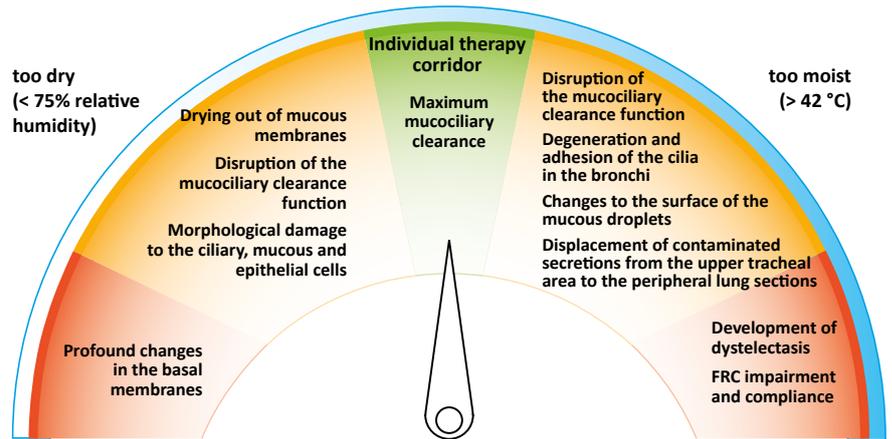


Figure 2: The goal is to achieve a therapy corridor for respiratory gas conditioning that avoids the negative effects of respiratory gases that are too dry and too humid.

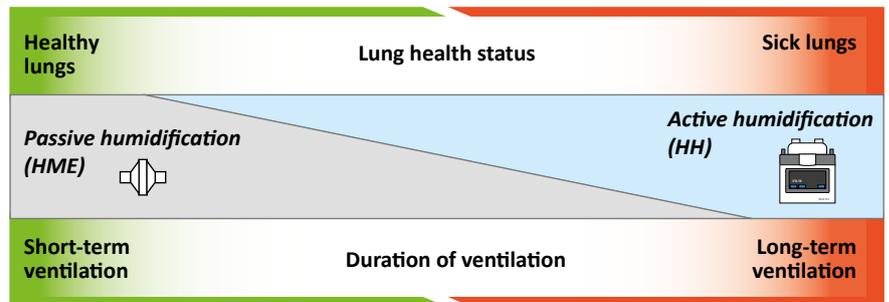
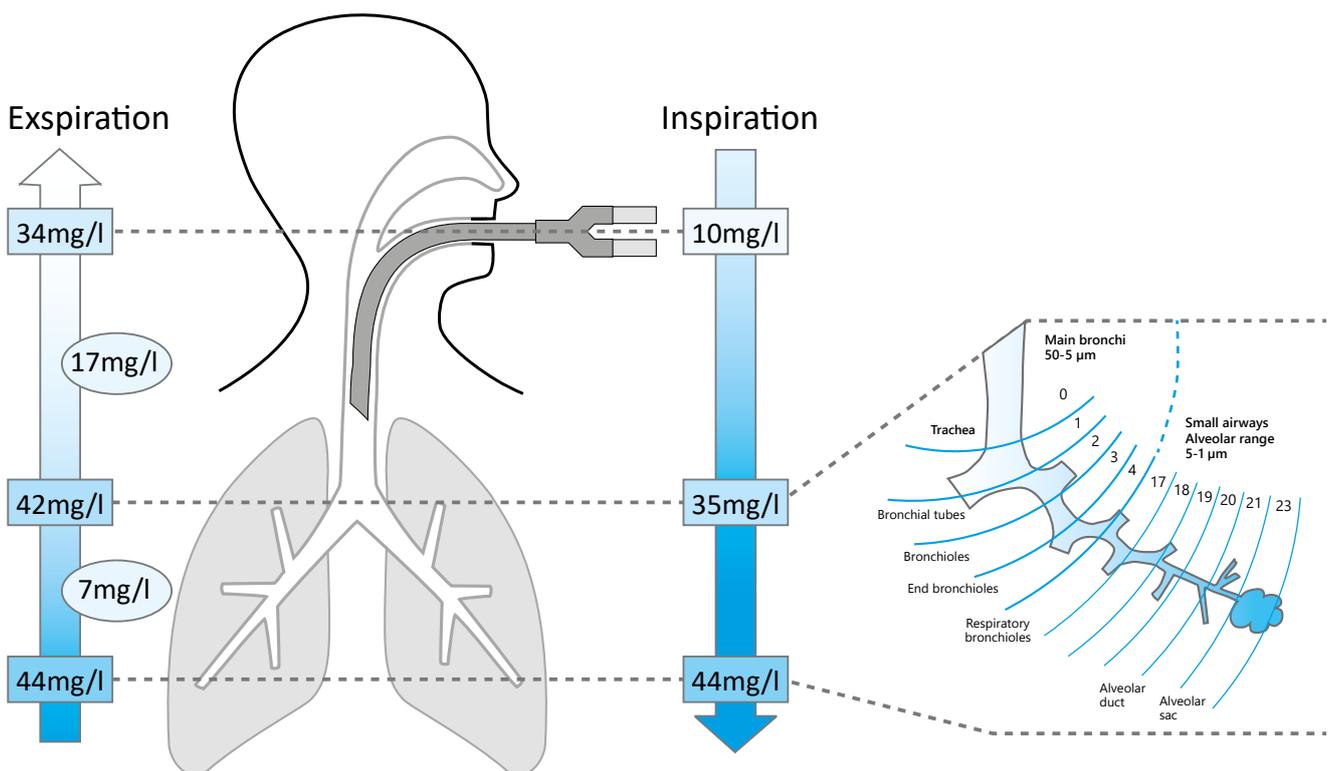


Figure 3: The type of respiratory gas humidification system used depends on the expected duration of use, the "health status" of the lungs and the contraindications for HME systems.



# RESPIRATORY THERAPISTS AND OUTPATIENT CASE MANAGEMENT



Current conditions for the release of respiratory therapy patients from the hospital to their own homes or nursing homes present a complex challenge to everyone involved in the process. Good preparation is indispensable for problem-free case management. That includes professional interplay among all participating groups. The guideline "Non-Invasive and Invasive Home Mechanical Ventilation for Treatment of Chronic Respiratory Failure (Update 2017)" provides help with setting up ideal conditions.

"The releasing hospital is responsible for the complex release management with outpatient ventilation (see § 39 Social Code V (SGB)). Outpatient care of ventilated patients should be organized completely prior to release, ideally by a multi-professional case management team. The team should cooperate with the patient or his legal care provider and caregivers or family members."<sup>1</sup>

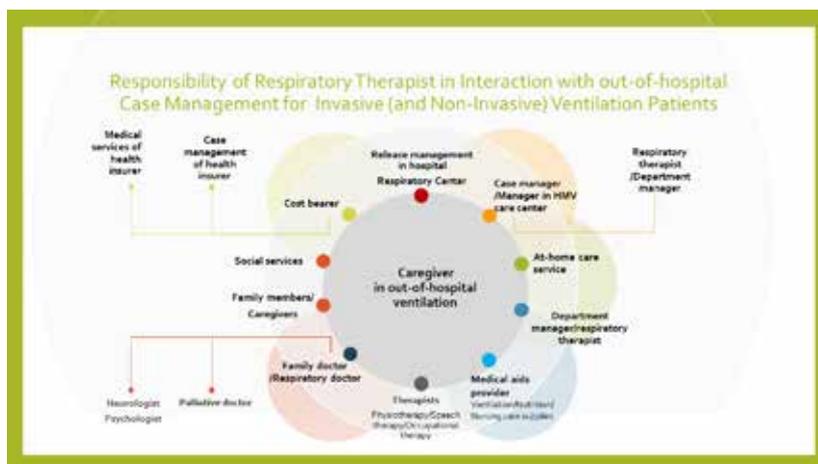
Respiratory therapists, currently well-established in a clinical setting such as respiratory and weaning centers, work in a multi-professional team. Under the supervision of a medical specialist, they perform tasks in the areas of weaning, the initiation of non-invasive ventilation, secrete management and tracheal cannula management. They also assume responsibility in case management and release management. Qualifications for outpatient ventilation include the fulfillment of requirements for nursing services and nursing facilities.

"Internationally, respiratory therapists are involved in the outpatient care of ventilated patients. For the work in outpatient ventilation care of adult patients, a department manager should have, in addition to a degree or certification of a state-approved nursing occupation (healthcare and pediatric nurse or geriatric nurse), one of the following qualifications:

- Respiratory therapist with nursing training
- Specialized health and nursing care for anesthesia and intensive care
- Nursing specialists with at least three years of vocational experience in ventilation (intensive care unit, weaning unit, specialized ventilation unit or outpatient ventilation) within the past five years and successful participation in a certified expert-level course (structured, advanced training of at least 200 hours completed while employed in the field) to become care experts for outpatient ventilation."<sup>2</sup>

Ventilation patients in homecare pose a complex challenge in that their advanced age and comorbidities require a multi-professional team capable of performing specialized tasks. As a department manager, the respiratory therapist takes on an important role here.

Although the graphic below is not complete, it is illustrative of how complex the multi-mode care of these patients is. For example, respiratory therapists outside hospitals perform important tasks in case management. As part of their initial contact with the hospital, they participate in case management conferences, which have become established as important interfaces for professional exchanges between hospital and nursing services. It is imperative that therapists work closely with case management or nursing services that have organizational responsibilities. The respiratory therapist is also the expert interface in this multi-professional team who forwards required medical information to the treating physician and serves as the intermediary for nursing services and family members/caregivers, therapists and, if necessary, talks to equipment providers about further care in a nursing home. Among the responsibilities of the therapist are: briefing/training nurses in the use of devices for ventilation, secrete management, and conditioning of respiratory gas; and instruction in inhalation therapy or patient-specific tracheal cannula management. With increasing frequency nursing services or nursing homes provide for non-invasively ventilated patients within the scope of less-intensive or preventive care, which brings its own challenges. Here too the respiratory therapist assumes responsibility for training nursing staff in the use of non-invasive ventilation and training and introduction on dealing with the interfaces.



<sup>1</sup> Guideline: Non-Invasive and Invasive Home Mechanical Ventilation for the Treatment of Chronic Respiratory Failure – Section 6.4

<sup>2</sup> Guideline: Non-Invasive and Invasive Home Mechanical Ventilation for the Treatment of Chronic Respiratory Failure –Section 7.4

# SLEEP IN INTENSIVE CARE PATIENTS

A critical success factor

**S**leep medicine and intensive care ventilation – two closely connected areas of competence at Löwenstein Medical.

In recent years many scientific papers have examined the sleep quality of intensive care patients. In many cases researchers observed patients with sleep disorders, reduced sleep duration, sleep fragmentation and changed neurobiological processes which can lead to an altered sleep EEG known as "atypical sleep". The causes of poor sleep quality are the environment (activity of personnel, noises, light), psychological influences (angst, agitation, loss of natural sleep rhythm), effects of illness (pain), restrictions on freedom of movement, pharmacological effects and hypercapnia. The high prevalence of poor sleep quality was objectively measured in studies and confirmed by personnel and patients in systematic surveys. In the studies, properly set mechanical ventilation showed a slightly positive effect on sleep quality while in the weaning phases sleep problems frequently arose. Besides "discomfort", which patients named the number one cause of disturbed sleep in a survey, studies showed a correlation between sleep quality and treatment success. A link to the occurrence of delirium was found and disrupted sleep was identified as the cause of reduced weaning success and prolonged weaning, particularly with the occurrence of atypical sleep. The underlying modes of action were examined and even in healthy subjects, for example, a 50 percent reduction in the stamina of inspiratory respiratory muscles was measured after just one night with sleep deprivation. Consideration is also given to the general relevance of sleep for many bodily functions such as the work of the immune system.

Conventional polysomnography remains the gold standard for monitoring sleep during a patient's stay in the intensive care unit. Some papers are concerned with an expanded assessment for the quantification of overall sleep quality and the detection of atypical sleep.

Alternative methods of sleep monitoring such as actigraphy have not yet been validated sufficiently for use with intensive care patients. The activity pattern could be affected by the surroundings, the patient's disease or medication. However, a simple observational report on the sleep and wake phases can provide initial indications of the quality of sleep and make medical personnel more aware of the issue.

Many different approaches for improvement in sleep quality were examined. Positive effects were reported from reduced medication dosages, use of earplugs and eye masks, a decrease in noise and light, and changes to processes, e.g., introducing quiet times, administering melatonin or the sedative dexmedetomidine. Nighttime ventilation or resumption of ventilation at night during prolonged weaning can improve sleep quality – with suitable ventilator settings and a low incidence of asynchrony.

In acknowledgement of the topic's relevance, the Society of Critical Care Medicine issued a practice guideline in 2018 which contained recommendations for the measurement and improvement of sleep quality.

Löwenstein Medical focuses on the needs of its patients and invests in the research and development of medical products for inpatient and outpatient use in order to achieve maximum therapy success and improve the patients' quality of sleep.

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# WHEN A HOTEL IS TURNED INTO A SLEEP LAB

**A**t the end of December 2019 the Hofklinik für Wach- und Schlafmedizin in Lucerne became the 33rd sleep lab in Switzerland to earn accreditation. For the three founding members of the clinic, which first opened its doors about one year ago, it was a milestone on their chosen path for the Hofklinik.

Earlier in the year it had taken just a few days for Prof. Dr. Arto Nirikko, Dr. Heydy Lorena Gonzalez and Karin Blattler to move into the space on Löwenstraße in the center of the old part of Lucerne, right around the corner from the ibis Styles Hotel, Vierwaldstättersee and within sight of the mountains. "When I saw the first patients, I had only a table and two chairs," said sleep specialist Heydy Lorena Gonzalez with a laugh as she gave a tour of the clinic. It was a matter of luck that the three were able to open their clinic at that location. Late one evening a few weeks earlier, Dr. Nirikko had ridden by the hotel on his bike to get an impression at night and to think about whether his concept could work here. The concept which he had presented to the US-based Accor Group, the owner of the ibis chain.

Both the Accor Group and the ibis hotel Lucerne were excited about the idea of using hospitality know-how and the hotel's infrastructure to turn the rooms into a flexible sleep lab. Set up on a mobile trolley, a diagnostic tower containing a polysomnography system, therapy devices and camera could convert any hotel room into a sleep lab. The arrangement offered a few advantages. Instead of equipping some rooms with expensive furniture and permanently installed polysomnography systems, the Hofklinik in the hotel reserves rooms in a defined contingent as needed and takes over responsibility for their

cleaning, laundry and upkeep. "For the patients it is a special experience to sleep in a hotel," said Managing Director Blattler. "While sleep labs tend to have a hospital-like atmosphere, a hotel stay brings to mind relaxation or even vacation. That has an effect on the quality of the diagnosis."

The Hofklinik für Wach- und Schlafmedizin is the first and currently the only sleep clinic in Switzerland that has integrated its sleep lab in a hotel environment. "Such a project demands boldness," said Blattler. "Not just because it is a completely new idea. With the hotel we have an additional partner with whom we have to negotiate." So far, cooperation with the ibis hotel has gone smoothly. "It is astonishing to see everything the hotel organized for us in order to support the project." New mattresses were purchased, a breakfast cart was organized and the reception manager vacated his office to make room for the cockpit, which is located on the same floor as the Hofklinik hotel rooms.

Proximity is a benefit for the nursing staff on the night shift. "In a hotel, you are never alone," said Petra Pivarciova, sleep lab manager at the Hofklinik. "That is different in a typical sleep lab when one of us is alone with three patients." On the other hand, the system has hardly any disadvantages. "The only thing you have to think about is having



everything you need for your nighttime work," she said. "You can't make a quick run to the clinic because you've forgotten something."

When the Hofklinik books overnight stays, the same rooms on the first floor are always available and within the range of the cockpit on the same floor. That wing contains another nine rooms the Hofklinik can use to expand if demand requires. Because very few other guests or loud tourist groups are nearby, patients have peace and quiet throughout the night. The hotel does not know who the patients are. For data protection reasons, their anonymity must be ensured. The names are simply reserved under the name "Hofklinik". In the afternoon a hotel employee delivers the badges for the reserved rooms to the Hofklinik. In the evening the nursing staff greets the patients in the Hofklinik and escorts them to their hotel rooms, where they are then cabled for the night. On the next day a staff member picks up the cart with trays in the kitchen and serves the patients breakfast in their rooms.

The follow-up consultations with patients take place in the Hofklinik, where offices, a room for nursing staff, a conference room and the doctors' examination room are located. In the nurses' room sleep lab technicians fit the masks for patients who have been diagnosed with sleep apnea.

Despite having beds in the hotel, the clinic itself has a room with a bed for examinations that have to take place during the day. They include the Maintenance of Wakefulness Test (MWT) in which patients try to remain awake for 40 minutes in a darkened room and the Multiple Sleep Latency Test which determines how quickly patients can fall asleep in a quiet environment. "We can't conduct daytime examinations in the hotel," Blattler explained. "Hotel operations would not

allow that because the rooms have to be cleaned."

Since it opened in February 2019, the Hofklinik has tripled the number of employees. Besides the three founders, the clinic has two nursing specialists, two administrative clerks, a psychologist and a pneumologist. Together they cover a treatment area that includes treatment of insomnia and Sleep Disordered Breathing to episodes of parasomnia. "In the first year we treated 318 patients, 124 of whom were in the sleep lab," said Blattler. In addition to more growth, Blattler plans to pursue a few projects in the near future. One of them is "Sleepboard," a meeting of specialists at which an interdisciplinary approach is used for complex cases. Another idea is to have patients plagued by snoring and their partners visit the clinic where Ear-Nose-Throat doctors, oral surgeons and sleep specialists can examine and advise patients. The general goal of the Hofklinik, explained Blattler, is to distinguish itself by providing special services. With Löwenstein Medical Schweiz the clinic has a fair and reliable partner that helped to realize the hotel concept. "Löwenstein supports our efforts to offer the unusual."



Mobile PSG functional cart

# INTRODUCING LÖWENSTEIN MEDICAL SCHWEIZ

Löwenstein Medical Schweiz, formerly Weinmann Schweiz, has been around for nearly 30 years. Over the years a lot has changed – more products and business fields were added incrementally to the core business of sleep respiratory therapy, leading to today's small but strong team of 25 persons working in all three areas of Homecare, Diagnostics and Hospital. We are pleased to introduce you to the Swiss site.

G. Weinmann AG was founded in Morges in 1991. Three relocations and four managing directors later, the company, now known as Löwenstein Medical Schweiz AG, celebrated its 25-year anniversary in 2015. It had been an eventful period for current Managing Director Erich Reithaar, who has worked for the company for more than 10 years. "There were some important milestones. Especially exciting was the launch of the prisma series, which took place when we were still part of Weinmann. Thanks to the devices' design, software and user-friendly operation, we quickly became much more competitive."

The core business of the Swiss site – device rental – has been continuously expanded with the sleep apnea devices. It works like this: the physician prescribes a sleep apnea device that the patient obtains as a rental object. The costs of the rental can be settled directly with the responsible health insurer. Löwenstein Medical Schweiz now looks after a considerable number of "rental patients" and works closely with local healthcare providers.



Löwenstein Medical  
Schweiz AG



Managing Director Erich Reithaar



Purchasing and Logistics Manager Manuel Müller

It was an important turning point for the Swiss site when Heinen + Löwenstein acquired Weinmann. "On the one hand it was like a jump into cold water," said Reithaar, "and some processes were difficult." On the other hand, entirely new dynamics came into play under the lively Rhineländers. While Weinmann was more process-oriented, Löwensteiners exhibit more of a just-do-it mentality that is contagious and fun. The motto "Focus on the individual", which became established with the change of owners, also appealed to the managing director, who says customer relationships are particularly important in the Swiss market. "Building a business relationship takes longer here than in other countries," he said. "But once we succeed in winning the customer's trust, the relationship is highly sustainable."

Business processes in Switzerland also differ from those in other countries, says Manuel Müller, manager of Purchasing and Logistics, who worked in export at Weinmann Hamburg and has now been with Löwenstein Medical Schweiz for more than 10 years. "Customers in Switzerland are demanding," he said. "Everything here has to be a little bit better, more precise." But higher prices are also paid. "I believe when a product succeeds in the Swiss market, it succeeds everywhere else." The Swiss differ from their neighbors in other ways too. For example, politeness is so highly valued that correspondence per letter or e-mail can be peppered with polite phrases and participants at meetings can take longer to get to the point. "Some colleagues from Germany become impatient at customer meetings in Switzerland because first they have to get through minutes of small talk," said Reithaar.

Spoken Swiss German can also lead to comical situations. "When, for example, a customer from Berne (known for its strong accent) makes a concerted effort to speak High German, our German colleagues react with delight because they think they can understand Swiss German."

Manuel Müller, who comes from the Black Forest originally, appreciates the idiosyncrasies in Switzerland. "Anyone who loves mountains, fondue and coziness and admires Swiss neutrality will feel right at

home here." Mostly because the team is so small, the Swiss site has a different work culture. "Everyone here automatically has more tasks and greater flexibility. It isn't unusual for someone to take on a job that is outside his or her area of responsibility," he said. The size of the team makes it easier to get a good overview of the individual areas. Of the 25 people in the Swiss team, 20 are in Neuenhof in the canton of Aargau, not far from Zürich. The other five employees are in Preverenges in the canton of Waadt, which is part of the French-speaking part of Switzerland.

Shortly after its 25th anniversary, Löwenstein Medical Schweiz added Diagnostics to the Homecare business and in 2017 the Hospital business. The company now covers all the corporate group's business areas. Expanding the Hospital business is an important goal for Reithaar. In addition to the rental business, the Swiss site wants to sell the entire product portfolio. It has become so large, says Müller, that the warehouse is about to burst its seams. That's why the company is planning to construct its own building in the near future. In the area of sleep respiratory therapy Reithaar has been pursuing a special vision since he joined the company. "Since my earlier work at pharmaceutical companies, I have been aware of how essential sound sleep is for general health and quality of life," he says. "That's why I want to help make sure that in the future Switzerland does not have one single underserved sleep apnea patient."

# RESEARCH NEWS

In this section we present a selection of particularly interesting new literature on the subjects of ventilation, respiratory therapy and related diagnostics. You are invited to give us your feedback on our selections or forward your own personal literature highlights.

## CPAP/APAP Therapy:

The working group directed by Prof. Randerath examined the prisma APAP algorithm with 46 patients. Obstructive respiratory events were almost completely eliminated and sleep quality was significantly improved, irrespective of the therapeutic pressure applied. Five patient showed increased central AHI under PAP attributed to Therapy-Emergent Central Sleep Apnea (TE-CSA). Closed central apnea in particular is a special challenge for APAP pressure regulation. A Löwenstein Medical Technology white paper takes up this subject.



*Herkenrath, S. D.; Tremel, M.; Anduleit, N.; Richter, K.; Pietzke-Calcagnile, A.; Schwaibold, M. et al. (2019):* Extended evaluation of the efficacy of a proactive forced oscillation technique-based auto-CPAP algorithm. In: *Sleep & Breathing* DOI: 10.1007/s11325-019-01901-8.

An international meta-analysis of controlled, randomized studies shows significant and clinically meaningful reduction in the risk of major adverse cerebrovascular events in OSA patients when CPAP is used for at least four hours per night. The positive effect is even more pronounced than for cardiovascular events, which have long been pointed to as the main reason for using CPAP.

*Javaheri, S.; Martinez-Garcia, M. A.; Campos-Rodriguez, F.; Muriel, A.; Peker, Y. (2019):* CPAP Adherence for Prevention of Major Adverse Cerebrovascular and Cardiovascular Events in Obstructive Sleep Apnea. In: *Am. J. Respir. Crit. Care Med.* DOI: 10.1164/rccm.201908-1593LE.

## BiLevel Therapy:

An observational study from Italy concerned itself with the use of Auto BiLevel (AutoBi) therapy a treatment option when CPAP titration fails. In a mixed group of patients with OSA, overlap and OHS, the study showed inadequate CPAP titration in 25 percent of the cases as measured by at least one of the criteria AHI, SpO<sub>2</sub> at night and blood gases during the day. Of these CPAP non-responders, 79.5 percent could be treated successfully with AutoBi. Compliance was comparable to that of a group of successfully titrated CPAP users.

*P, Baiamonte; E, Mazzuca; I, Gruttad'Auria C.; A, Castrogiovanni; C, Marino; Lo D, Nardo et al. (2018):* Use of autobilevel ventilation in patients with obstructive sleep apnea. An observational study. In: *J. Sleep Res.* DOI: 10.1111/jsr.12680.

## Adaptive Servo-Ventilation (ASV):

An expert review from France concerned itself with the correct diagnosis of Central Sleep Apnea (CSA) syndrom and the available positive-pressure options for treatment, i.e., CPAP, ASV, NIV. ASV therapy was recommended in cases with a persistent central AHI  $\geq 15/h$  under CPAP with the following exceptions: LVEF  $\leq 45$  percent and predominant CSA (CPAP with symptom improvement or no positive pressure therapy); hypercapnia in cases of opiodes, stroke or neuromuscular diseases (NIV); hypocapnia after stroke or neuromuscular diseases (ASV without prior attempts with CPAP). When measuring central AHI under CPAP therapy, it is necessary to classify hypopnea into obstructive and central types.

*Baillieul, S.; Revol, B.; Jullian-Desayes, I.; Joyeux-Faure, M.; Tamisier, R.; Pépin, J.-L. (2019):* Diagnosis and management of central sleep apnea syndrome. In: *Expert Rev. Respir. Med.*, S. 1–13. DOI: 10.1080/17476348.2019.1604226.

## Ventilation:

A review of long-term ventilation in cases of neuromuscular diseases underscores the clinical advantages of early ventilation for patient prognoses and also covers the challenges posed by providing long-term non-invasive ventilation to patients at home.

*Crimi, C.; Pierucci, P.; Carlucci, A.; Cortegiani, A.; Gregoretti, C. (2019):* Long-term Ventilation in Neuromuscular Patients. Review of Concerns, Beliefs, and Ethical Dilemmas. In: *Respiration* 97 (3), S. 185–196. DOI: 10.1159/000495941.

A European Respiratory Society task force issued evidence-based recommendations for long-term non-invasive ventilation (LTH-NIV) in the management of COPD. The use of LTH-NIV is recommended above all for patients with persistent hypercapnic respiratory failure. Successful ventilation settings are assessed as to whether PaCO<sub>2</sub> can be normalized or at least reduced.

*Ergan, B.; Oczkowski, S.; Rochweg, B.; Carlucci, A.; Chatwin, M.; Clini, E. et al. (2019):* European Respiratory Society Guideline on Long-term Home Non-Invasive Ventilation for Management of Chronic Obstructive Pulmonary Disease. In: *Eur. Respir. J.* DOI: 10.1183/13993003.01003-2019.

The international SOMNOiv working group has proposed a framework for the systematic analysis of Patient-Ventilator Asynchrony (PVA). It should help to find the ideal settings for triggers and inspiration time and assess prevalence and clinical impact of PVA. For our prisma devices we are working continuously on additional improvement and the measurement of synchrony.

*Gonzalez-Bermejo, Jesus; Janssens, Jean-Paul; Rabec, Claudio; Perrin, Christophe; Lofaso, Frédéric; Langevin, Bruno et al. (2019): Framework for patient-ventilator asynchrony during long-term non-invasive ventilation. In: Thorax. DOI: 10.1136/thoraxjnl-2018-213022.*

### High-Flow Therapy:

A review with a meta-analysis was conducted on the use of long-term treatment with nasal high flow for stable patients with chronic COPD. Results: Evidence of improvement in blood gases, quality of life and a reduction in the frequency of exacerbation for this relatively new therapy option. Sufficient proof does not yet exist for other measurements such as exercise capacity, hospitalization rate and mortality.

*Bonnevie, T.; Elkins, M.; Paumier, C.; Medrinal, C.; Combret, Y.; Patout, M. et al. (2019): Nasal High Flow for Stable Patients with Chronic Obstructive Pulmonary Disease. A Systematic Review and Meta-Analysis. In: COPD: Journal of Chronic Obstructive Pulmonary Disease 16 (5-6), S. 368–377. DOI: 10.1080/15412555.2019.1672637.*

### Diagnostics:

A study from Essen validated SOMNOcheck micro for perioperative OSA screening and confirmed the product's suitability for that purpose.

*Faßbender, P.; Haddad, A.; Bürgener, S.; Peters, J. (2019): Validation of a photoplethysmography device for detection of obstructive sleep apnea in the perioperative setting. In: J. Clin. Monit. Comput. 33 (2), S. 341–345. DOI: 10.1007/s10877-018-0151-2.*

### Telemedicine:

Using telemonitoring and telephone support for CPAP patients with stroke, Prof. Nilius and his team Team were able to improve compliance with treatment, daytime sleepiness and blood pressure. That shows the potential of telemedicine with defined intervention schemes used for specific risk groups.

*Nilius, G.; Schroeder, M.; Domanski, U.; Tietze, A.; Schäfer, T.; Franke, K.-J. (2019): Telemedicine Improves Continuous Positive Airway Pressure Adherence in Stroke Patients with Obstructive Sleep Apnea in a Randomized Trial. In: Respiration. DOI: 10.1159/000501656.*

A published report from Belgium summarizes the state of knowledge regarding telemedicine in the diagnosis and treatment of sleep apnea. It provides evidence of the potential to overcome today's challenges in patient care. First, however, specific new difficulties have to be mastered and care and reimbursement systems adapted. Above all, the report calls for more pioneering work in research, the drafting of effective intervention plans and proof of their effectiveness.

*Bruyneel, M. (2019): Telemedicine in the diagnosis and treatment of sleep apnoea. In: European respiratory review : an official journal of the European Respiratory Society 28 (151). DOI: 10.1183/16000617.0093-2018.*

# BREATHE ANYWHERE WITH LUISA



In recent years many new devices for life-support ventilation have come to the market. Some perform convincingly and others less so. We examined those devices very closely, gained experience and listened to the wishes, requirements and ideas of our customers, nurses, patients and our own employees. Some ideas were clearly expressed while others could be read only between the lines. It was a challenge to pull them all together, but we believe that in the end we succeeded to open up a new chapter in life-support ventilation and that chapter is called LUISA!

These days users and our employees have to deal with many different devices that they operate and therefore have to understand. If devices are complicated, their willingness to use the device declines and the danger of incorrect operation increases. Time is tight for device briefings too. It would be ideal to come up with a device that could be understood and used intuitively.

The major objective and biggest challenge was to develop a device that people would want to use because it is easy to operate and configure and it looks good too. The development of LUISA was targeted toward simplicity.

LUISA offers still another advantage in that it can be operated in a vertical or horizontal position. It doesn't matter if the device is set up to the left or right of the bed, if there is plenty of space or barely enough. LUISA can be positioned to satisfy needs and circumstances.



**INSPIRER BIANCA**



**INSPIRER LARS**

We chose a 10-inch touch screen for the display. On the large, modern display all the important ventilation information can be presented clearly along with graphic aids. The operating concept, based on the one used in the prisma VENT series, was simply integrated. All major settings are quickly selected and, where needed, helpfully complemented by additional information. Mobile patients have a view that shows how many hours and minutes the batteries (one internal and two external) can still be used. The entire capacity of all three batteries together is up to 18 hours.

Functionally, everything in LUISA is aimed at simple operation. Unlike all other competitive devices, LUISA requires no adapter for use with all types of tube systems. No modifications are required for a leakage system, single patient valve system or double circuit system, so there's no need to search for the right adapter. The therapy too is simple. An optional FiO<sub>2</sub> sensor is integrated, eliminating the need for an extra cable. We begin ventilating with 30 ml tidal volume. The High-Flow and CPAP modes are now available in both valve systems. The reason is once again simplicity. No matter which therapy is administered, the tube system in use can remain in place. Only the interface has to correspond to the therapy and, if needed, exchanged. That reduces the chance of making a mistake when changing tubes and simplifies the stockpiling of required tube systems. Altogether four storable programs are available, each of which can be given its own name.

Increased safety is provided by the configuration of a second alarm language. The main language is always the one used in the country where LUISA is operated. If desired, a second language can be chosen in which the alarm text will be displayed along with the main language.

LUISA is equipped with state-of-the-art technology for connectivity and data management. Available now or coming soon are: USB-C stick, WiFi, Bluetooth, modem, prisma CLOUD, prismaTS, app, monitor connection, PDMS, Aerogen mesh nebulizer, SpO<sub>2</sub> and CO<sub>2</sub>.

The market launch will be accompanied by a creative, emotional campaign geared toward our patients. It is, after all, about them. LUISA supports ventilated patients as effectively as possible with ventilation that is easy to use for everyone involved. When that is the case, and we Löwenstein Medical employees built a device that's fun to use, then together we have accomplished a lot.



**INSPIRER MIA**

**LUISA ANIMATES  
AND MOBILIZES  
ABOUT PIONEERS AND INSPIRERS**



[breatheanywhere.com](https://breatheanywhere.com)



# 1,000,000 MASKS IN FOUR YEARS

WHO COULD HAVE IMAGINED THAT?

**T**he first million has been reached. We have been assembling masks since 2016 in our Service and Logistics Center. We do a lot of the work ourselves – from the idea and development to assembly and patient care. Almost everything takes place in Germany and has for decades.

**Variety sets us apart**

We are providers who look after sleep apnea patients. We supply them with device, mask and accessories and brief them on therapy. We answer questions about their care. We also are the manufacturer. We pick up ideas in the market and develop new products. We sell the products to providers around the world and thus close the circle. Almost – inbetween is the assembly.

**The mask assembly idea is born**

The idea of assembling the masks ourselves first came up in the summer of 2015. The manufacturer Löwenstein Medical Technology had been in the corporate group for two years and everyone had learned how many steps there were from the idea to the finished mask. Why not integrate the mask assembly in the Löwenstein Group? Right. Why not? The Service and Logistic Center in Neuhäusel offered ideal conditions, including plenty of space for mask assembly. Five new employees were hired and just a few months later in February 2016, the first mask – JOYCEclinicFF – was assembled. A second site at an

external production services provider helps to maintain our flexibility.

**But it's just a mask**

Now you might think, "But it's just a mask." This type of assembly line comes together quickly and runs smoothly. It's true that it is only a mask – but also a medical product that has to comply with norms, guidelines and laws. Over time the team gained experience, changed processes, got more experience and optimized processes. A continuous learning process always with coordination by the experienced manufacturer Löwenstein Medical Technology.

**Increasingly more and more**

As the number of orders increased steadily, the areas for assembly and storage were enlarged and the number of different masks rose too. In addition to JOYCEclinic FF, we now assemble JOYCEone, JOYCEone Full Face, JOYCEeasy, JOYCEeasy Full Face, JOYCEeasy next FF, CARA and CARA Full Face. New employees have been hired to round out the number to more than 20 just for mask assembly.



JOYCEclinic FF



CARA Full Face



JOYCEone



JOYCEeasy

### *CARA is everyone's favorite*

A visit to the assembly line shows the precision and pleasure that goes into a day's work. Innumerable individual parts and components go into the nearly 2,000 masks assembled, tested and stored here daily. A short time later they are sent around the world.

CARA is the chosen favorite. It can be assembled and tested in just 90 seconds. The CARA parts are the simplest for experienced employees to put together. In their words: "It goes fast – bam, bam!" The team leader added: "Sometimes you see the parts flying."

Everyone concentrates on the routine movements. But there's always time for a little chitchat "over the masks". That's not a simple matter though because the employees speak 15 different languages. However, they do share one word: mask.

Many surprises and innovations are in store for us in the future. One thing that's certain is that mask assembly is an important element for us. We're betting on it and looking forward to chalking up the next million.



CARA



*The millionth mask produced at Löwenstein Medical in Neuhäusel*

# ESRS COURSE DÜSSELDORF



European Sleep Research Society  
Sleep Research and Sleep Medicine Europe

Many of our international customers in Sleep Therapy and Diagnostics asked us to offer a certified training course for sleep medicine experts. In Germany Löwenstein Medical has done so for many years with the "BUB" course (assessment of medical examination and treatment methods). The objective behind the inquiry was the acquisition of an internationally recognized certificate. Given the need to conduct such a course in English, the only certificate offered in Europe was for "European Somnologist". That certificate is awarded by ESRS (European Sleep Research Society) upon successful completion of an exam. Löwenstein Medical worked with Dr. Neddermann to create a highly qualified preparatory seminar for the exam.

Demand was so high that 24 participants from nine countries took part in the seminar from 2 to 7 February 2020. The biggest group of 11 came from South Korea. Under the moderation and organization by Jörg Lessau (Regional Sales Manager Asia-Pacific), participants worked in a focused but relaxed atmosphere on all the topics relevant for the exam with speakers from Germany. We were able to engage some German sleep medicine opinion leaders to make presentations (see agenda for their names).

After they had worked through all the areas such as physiological fundamentals of sleep, insomnia, circadian disruptions, Sleep-Disordered Breathing and pediatric sleep disorders, the high point came on the last day with the simulation of the ESRS text. We put together an appealing program to support the intense exchange of expertise among the international sleep medicine specialists. Participants' feedback at the end of the event was extremely positive.

Löwenstein Medical will continue to support participants on the way to exams. The next time the exam will be offered is at the ESRS congress in Seville. We'll cross our fingers for the participants!

In the future we would like to offer such a course to our customers again.

## Preparation training for ESRS Examination in Sleep Medicine: 2 - 7 February 2020

<b>Monday:</b>		
09:15 - 12:15	scoring PSG	(Mr. Hubert)
13:45 - 16:15	tour sleep lab, presentation, cabling, procedure PSG	(Dr. Neddermann)
16:15 - 16:45	physiological basis of sleep	(Mrs. Machleit-Ebner)
<b>Tuesday:</b>		
09:00 - 10:30	sleep-related movement- disorders and parasomnia	(Dr. Kallweit)
10:30 - 12:00	Circadian rhythm sleep disorders and hypersomnia	(Dr. Kallweit)
13:45 - 15:15	insomnia	(Dr. Frohn)
15:15 - 16:45	COPD	(Prof. Dr. Krüger)
<b>Wednesday:</b>		
09:00 - 10:30	sleep-related breathing disorders	(Prof. Dr. Randerath)
10:30 - 12:00	therapy forms	(Dr. Minuth)
13:15 - 14:15	childhood sleep disorders	(Dr. Pecnic)
14:15 - 15:45	sleep disordered breathing and cardiovascular diseases	(Prof. Schöbel)
15:45 - 16:30	presentation breathing centres	(Mr. Schöffler)

*Excerpt from the agenda*



*ESRS course participants*

# Participant feedback on the ESRS course in Düsseldorf

“

*First of all, I would like to thank the Lowenstein company for providing me with a first time seminar, not a conference.*

*On the eve of the seminar, I arrived at Frankfurt Airport and drove to Düsseldorf.*

*The staff welcomed us very late at night, and we had a good night.*

*The seminar started the next day and invited experts from each part.*

*On the first day, starting with the attachment sensors, the PSG scoring method was also impressive, with detailed demonstrations.*

*Under the lead of Dr. Neddermann, a PSG sleep laboratory tour was held in the afternoon, where a new type of system was encountered.*

*The breakfast, lunch and dinner at the hotel were great.*

*On the second day there were lectures on Insomnia, Sleep related movement disorders & parasomnia in the morning, followed by Circadian rhythm, hypersomnia, and COPD, all of which were interesting topics. At the end of the schedule, we were always back in the room to held a meeting on the lecture that day, and we were able to find more advanced ways.*

*On the third day there was a lecture on SRBD and cardiovascular disease, and I was impressed by visiting the Lowenstein Medical center and seeing the details of the actual positive pressure renting process locally. And of course all the other professors' lectures were good, I think Dr.Randerath is really the best class. We then visited the bottled Brewery in Dusseldorf for a tour and dinner. It was my first time seeing how beer was made and it was a very impressive tour. The meal was excellent, too. I was happy to have a conversation with Mr. Löwenstein.*

*Last day Prof. Penzel organized the whole process of sleep. I am grateful for your kindness and for telling me important things one by one and for making me a place for questions.*

*In spite of being the first seminar, we would like to thank the company representatives and employees for the smooth operation of the overall and also thank Lowenstein Korea. The afterglow of the seminar hasn't gone yet. It will be a pleasant memory.*

“

*Dear Löwenstein Medical team*

*Thank you for all your hospitality during 2020 ESRS Exam in sleep medicine preparatory course. It was a great honor and privilege for me to learn from many international renowned professors and specialists in this field. I was everytime impressed by the well prepared and wonderful lectures during the course. It was a good opportunity to learn about Löwenstein Medical which has been a leading manufacturer for medical devices and products in sleep and respiratory medicine. The 4 days of this course was like a dream for me. I was fully satisfied with the historical, gorgeous hotel and delicious food, especially the dinner at Rheinturm Dusseldorf. I mostly thank Dr. Neddermann and Mr. Lessau for their warm welcome and hospitality.*

“

*I had attended the ESRS pretest-course program in February 2020.*

*Definitely, it was a great time for me.*

*First of all, I could meet many famous and authorized professors and was very impressed by their extensive knowledge and relatively easy lectures. It must be a great honor for me to hear their professional and highly intellectual lectures. And I also had a chance to meet other many passionate European doctors (including neurologists, pulmonologists, etc). We had discussed about some topics related to sleep medicine, and I could feel their passions about sleep medicine.*

*Nowadays, sleep medicine is keep evolving quickly. The paradime of treatment of sleep disorders is shifting little by little in some concern in Korea, so many doctors have a big interest in sleep disorders and CPAP treatment, and government is also trying to give a help to diagnose and treat sleep apnea patients. So, this was a big chance for me to understand sleep disorders and to prepare the ESRS exam.*

*I have a special thanks to Mr. Lessau and the company of Lowenstein Medical for giving a chance to join in this program. They took an interest in a small part for us while staying at the hotel, attending lectures, and even also enjoying a night tour programs. I really enjoyed all the time in Dusseldorf.*

*Thank you very much~~!!!*



# GENERATION CHANGE IN POLYGRAPHY WITH SCALA

After the almost 20-year success story of the MiniScreen product series, Löwenstein Medical is ringing in a new era in polygraphy. At the end of 2019 the new Sonata polysomnography line was launched. Now is the time to make a general change in polygraphy with Scala. It is the most extensive polygraphy device in the history of Löwenstein Medical.

## What distinguishes Scala from the rest?

Scala, a standard polygraphy device for the detection of Sleep-Disordered Breathing, fulfills the requirements of the German EBM 30900. Furthermore, its standard delivery includes a variety of possibilities for different user groups.

## *Thermistor*

Besides a nasal cannula, a thermistor can be used to measure the patient's respiratory airflow. This function follows the recommendations of the American Academy of Sleep Medicine to record apnea via the thermistor signal and hypopnea and flow limitations via the nasal cannula.

## *Snore microphone*

A sensor to record snoring, which is applied to the larynx, is included in the Scala delivery. It is possible to detect snoring by means of the pressure signal via the nasal cannula at the same time.

### **Differential pressure measurement**

Differential pressure measurement is integrated in Scala in order to generate a precise airflow curve when monitoring PAP therapy or patients ventilated outside a hospital setting. Especially at high, quickly changing pressures, the measurement method offers high-quality signal recording.

### **Capture of respiratory effort movements**

The successful pressure pad technology used in the MiniScreen product line for the recording of thoracic and abdominal movements has been taken over for Scala. It is possible to use an induction belt (RIP) along with or instead of the pads to capture respiratory effort movements.

### **Configurable electrode ports**

The device is equipped with four electrode connection ports which can be configured and used for different electrophysiological derivations, e.g., EMG, ECG and EEG. This function allows the device's use in a number of different medical specialities.

### **Removable rechargeable battery**

The removable battery permits a quick re-assignment of the device to the next patient without having to check the charging time. In that case the user can work with a second rechargeable battery and make a seamless transfer to the next patient. If anything goes wrong with the battery, the user can easily replace it.

### **Online and offline**

In most cases, polygraphy is conducted as an offline recording on patients at home. That means the device has to be programmed in advance and taken home by the patient who starts the recording before going to sleep. The recording, which is stored in the device's memory, automatically ends at a pre-programmed time. Scala also can be used to make online recordings. They generally take place in a professional medical environment in which the recorded data are visualized time-synchronized on a monitor. It is possible to wirelessly transmit the data via a WiFi connection or via cable connection from the patient recorder to the computer. A time-synchronized recording of video and audio signals is conceivable, as is the time-synchronized feed of external analog signals, e.g., from therapy devices or transcutaneous CO<sub>2</sub> devices.

### **No maintenance or service**

No compulsory maintenance or service schedule is planned for Scala because the device requires neither maintenance nor service. Nevertheless, the user can send the device to Löwenstein Medical for regular checks in order to ensure trouble-free, uninterrupted operation.

To sum up: Scala offers many options and features in just one device. Because it is equipped with versatile options, Scala can be used in many different medical specialities such as pneumology, cardiology, ENT, sleep medicine and neurology.



# WEARABLES IN DIAGNOSTICS

Almost every one of us has heard of it, held it or purchased it. We're referring to a fitness tracker, smartwatch or digital glasses – all in the category of wearables, or wearable technology.

## Wearables – what are they actually?

By definition wearables are small computer systems you wear on your body. Today the processors are built into fitness wristbands, smartwatches and even into clothing. Wearable technology is used mostly in the areas of healthcare, lifestyle, fitness and medicine. Depending on the function, the sensors capture data on physical activity, heart rate or pulse, calories burned, steps and sleep quality. Wearables can also be used to listen to music or to communicate (e.g., phoning, messaging). The functions are often integrated in other primary devices such as a smartphone or watch. The information collected by wearables is transmitted to an app that presents the results simply and clearly and manages the functionality of the wearables.

With all the different wearable technology functions, areas of use and findings, users are becoming more aware of their health, fitness and daily activities.

Introducing the four most exciting products:

### 1. Somnibel Sleep Position Trainer\*



Many people are familiar with the nuisance of having a snorer in the same bed. It's hard to settle into sleep with all that noise. The problem is often caused by the sleeping position; most people snore only when lying on their back. It is referred to as "positional snoring". The Somnibel sleep position trainer offers a solution. The Somnibel is attached to the chest with hypoallergenic adhesives. It recognizes the sleeping position and, as soon as wearer turns onto his/her back, it emits a vibration that induces the sleeping wearer to change positions. If the first vibration does not prompt a change, it is repeated with greater intensity after 30 seconds. The idea is to prevent a supine position and snoring. Some patients indicate Obstructive Sleep Apnea syndrome only when sleeping on the back. One way to counteract this problem is position therapy in which attempts are made to keep the patient from sleeping on his/her back. If successful, obstructive apnea during sleep is prevented. Up till now, patients wore a vest with a hard cushion

of styrofoam inserted into the back that was intended to stop the patient from turning onto the back.

Patients who use such vests have reported that the vests are particularly uncomfortable in the summer months when nighttime temperatures are high. Older patients have trouble putting the vest on every day. Furthermore, some patients report that despite wearing a vest, they still snore when in a supine position.

In those cases Somnibel is a good alternative that can be used in position therapy for positional sleep apnea syndrome.

### 2. Steel HR Hybrid Smartwatch\*



Today it's hard to imagine life without smartwatches. Many people already own one and appreciate the extensive range of functions.

The Steel HR is a high-quality stainless steel hybrid smartwatch with seamless around-the-clock pulse measurement. It also tracks activity and sleep. Special features include its extremely long battery run time of up to 25 days on one charge and water resistance to 50 meters. The battery can be charged wirelessly with an inductance charger. The Steel HR records pulse rate, steps, distance and calories burned, among other things, and can be synchronized with the free Health Mate app on a smartphone. The app lets the user monitor and clearly document a personal activity profile, calories burned and sleep quality over a long period. When the smartphone receives telephone calls, SMS, WhatsApp, calendar reminders or e-mails, the app forwards them to the Steel HR.

### 3. BPM Connect Blood Pressure Measurement Device\*



The blood pressure measurement device BPM Connect is distinguished by its chic design and high-quality workmanship. The cuff is attached to the left arm at the same height as the heart and activated with the push of a button. The device is operated by an internal battery that can be recharged by cable. Systolic and diastolic blood pressure measurements are displayed and stored in the device. It is recommended that BPM Connect be synchronized with the free Health Mate app. Then the data stored in the device are automatically transmitted to the app. That makes it possible to measure blood pressure several times a day if needed and document the measurements in the app.

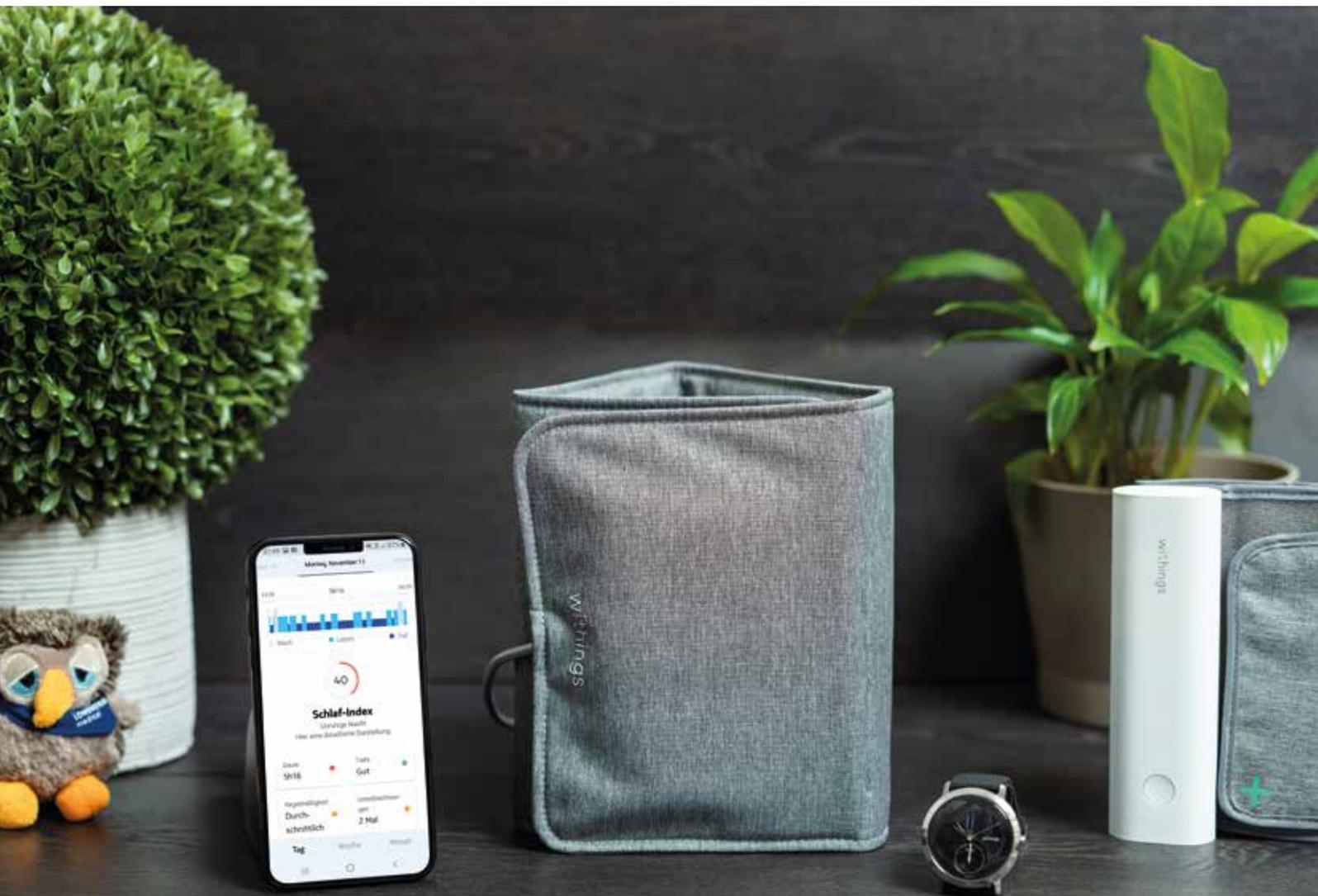
If the customer also owns the Steel HR smartwatch, the data are collected, stored in the shared Health Mate app, displayed and analyzed.

### 4. Sleep Sleep Tracking Mat\*



With the sleep tracking mat called "Sleep", it is possible to monitor sleep habits and characteristics. Like BPM Connect, Sleep is a cut above the rest with chic design and high-quality workmanship. The application is simple enough – the Sleep mat is placed under the mattress (with the exceptions of waterbeds and alternating pressure mattresses) and plugged into an electrical outlet. Right after the mat is switched on, a small air cushion is inflated and is calibrated to the mattress. To obtain a reliable calibration, make sure no one is lying on the mattress during the process. The user's sleep is analyzed into the stages of light, deep and REM sleep based on movement, respiratory rate and pulse. Other information provided is sleep duration, time to fall sleep and sleep quality. The Sleep mat also can detect position, snoring and heart rate. The data, as in the previous two products Steel HR and BPM Connect, are automatically transmitted to the Health Mate app.

Operated via the app, the three products – Steel HR smartwatch, BPM Connect blood pressure measurement device and Sleep tracking mat – can be used in combination.



\* The product is available only in Germany.

# mesana – Health Check

Loewenstein Medical is adding another interesting article to its Webshop ([www.loewenstein.shop](http://www.loewenstein.shop)\*) and convenience products. It is a typical wearable item that makes a personal health check.

mesana is a health check for at home that provides information about your physical and mental well-being. It registers the current condition in the areas of stress, sleep, heart health and fitness.

The wearer receives a total of 17 personal health measurements. mesana reports whether your sleep was good, visualizes your stress level and shows whether you have had sufficient exercise during the day. It gives you an overview of health-related strengths and potential weaknesses. mesana also makes concrete recommendations about the next steps the wearer should take.



## The 17 health measurements at a glance

### Activity and Fitness



- Steps per day
- Daily activity
- Activity variety
- Intensity of exercise
- Lowest heart rate
- Body-Mass Index

### Stress and Relaxation



- Stress symptoms
- Subjective feelings of stress
- Heart Rate Variability HRV age
- Sympathovagale Balance

### Sleep



- Subjective sleep quality index
- Length of sleep
- Recovery during sleep
- Sleep apnea score

### Risk



- Stroke
- Heart attack
- Diabetes

### Exactly how does the mesana application work?

Interested customers can obtain a code for mesana from Löwenstein Medical. The code is entered in the Internet browser at [lm.mesana.com](http://lm.mesana.com)\*

Next, a questionnaire is filled out online that includes personal address data. Two to three days later mesana will be delivered to the customer's home with standard post.

To capture personal information about the subject's health, the customer attaches a plaster-like item equipped with a high-tech sensor, to the skin near the heart and leaves it there for two days. The sensor remains on the skin while the wearer works, exercises, showers and sleeps. After 48 hours, the sensor is removed, placed in a pre-addressed, postage-paid envelope and dropped into a mailbox.

Based on the measurement and answers to the online questionnaire, mesana can deliver a detailed analysis of the current state of health, show interdependencies and gives recommendations for a healthy lifestyle.

Of course the data are handled with absolute confidentiality and protected accordingly. Only the customer, or if it is so desired, a health advisor or physician can obtain the results.



*Plaster with sensor*

\* The product is available only in Germany.

# NO MORE CALLS FOR TENDERS

With the passage of the TSVG (Appointment Service and Care Provision Act) on 11 May 2019, it was resolved that calls for tenders for medical aids would no longer be permitted. For us the news means a foreseeable end of the tender business for CPAP systems, ventilators and oxygen supplies. The affected statutory health insurers had to transfer any current tender business into a negotiated contract within a six-month period. When that period elapsed on 30 November 2019, the bottom line for us was that we could enter into new contracts for our products with health insurers.

We maintain that as of 1 December 2019, newly supplied insured persons benefit from this regulation and from that time on have the right to choose their provider of medical aids.

The provider of any ongoing tendered business must continue to supply medical aids until the end of the paid lease period. This regulation was defined by the supervisory authorities (Federal Office for Social Security, formerly BVA, now BAS) and accepted by the statutory health insurers. For the insured whose lease period is now running, the new law goes into effect when the period ends. Accordingly, the insured will be able to choose their provider when the period elapses. The prerequisite for a free choice, however, is that the affected company or service provider has a valid contract with the respective health insurer.

## What prompted legislators to take such drastic action to regulate the market situation?

The insurance companies' guiding principle is to manage health insurance funds carefully. That economizing principle, combined with the competition reinforcement law to which insurers are subject, encourages health insurers to compete in setting a lower contribution rate and related attempts to enroll the insured. To meet the goal of economic efficiency, health insurers enter into contracts with companies known as "service providers" or with professional associations. In the past they did so in three different ways:

### **Variant 1: Contract as per § 127 Abs. 1 SGB V (old version) = Call for Tenders / Public Contract**

The scope of the service is publicized and companies or service providers which satisfy the prerequisites for contract fulfillment may participate by submitting an offer for the contract with the goal of winning the contract.

The disadvantage is that the contract's content is not negotiable and potential bidders can learn more about it only by posing questions. The processes are outlined by the health insurers and are to be implemented as described. When a company wins the tender or the public contract, it becomes the exclusive provider for patients of the health insurer that issued the call for tenders for the service.

As a rule, the company that offered the lowest price won the tender.

### **Variant 2: Negotiated contract as per § 127 Abs. 2 SGB V**

In the course of this type of negotiation, the health insurer's contractual intentions are made public, usually with a contract draft, the content of which is negotiable. Accordingly, the parties agree to a price structure which represents the result of a round of negotiations regarding criteria required by the contracting parties. Other companies or service providers can accede to this contract under the same conditions. Policy makers currently favor this variant because they want to prevent a loss of quality in service provision.

### **Variant 3: Cost Estimate as per § 127 Abs. 3 SGB V**

In this case a company submits a cost estimate for the service to the health insurer who solicits other cost estimates for the same service for comparison purposes. Because this procedure is time-consuming and costly, it should not become a permanent solution, especially since the objective of the policymakers is to encourage health insurers to enter into contracts.

Because health insurers saw the greatest money-saving potential within the framework of calls for tenders, they used that proven method to gain a better position in competition with the other insurers.

In this context, a respected magazine examined negative aspects of the tender business in an article available to the general public (i.e., policymakers could have read it too). The report disclosed glaring deficiencies in the means of providing medical aids for treatment of incontinence. For tender purposes the patient's co-payment was included in the specification of a service or medical aid which exceeded what was "presumed" medically necessary. It was clear that the "standard" was inadequately defined. Patients with incontinence received thin plastic pads to treat their condition. Most patients had to pay a surcharge so they would not be provided with the "newly defined" standard. This failing in service provision caused far-reaching problems in treatment and prompted patient associations to take up the cause. As a result of their advocacy, legislators saw the need for intervention. With the introduction of the Heil- und Hilfsmittel Versorgungsgesetz, which was passed in 2017, initial modifications were made to the structure. The intention was to establish quality assurance that would not be undermined/subverted by the savings madness of the tender business. Accordingly, it was specified that medical aids involving a high proportion of services would no longer be eligible for tendering. Furthermore, the price was not to be the decisive criterion applied to a tender; instead, more consideration was to be given to qualitative aspects, which were to make up 50 percent of the decision.

Health insurers came up with many ways to get around this regulation. They included the open-house process (a unilateral directive on contract content and prices – without negotiation) and other calls for tenders in which qualitative requirements were circumvented. Resulting tenders then had an allocation formula of 90 percent price and 10 percent quality.

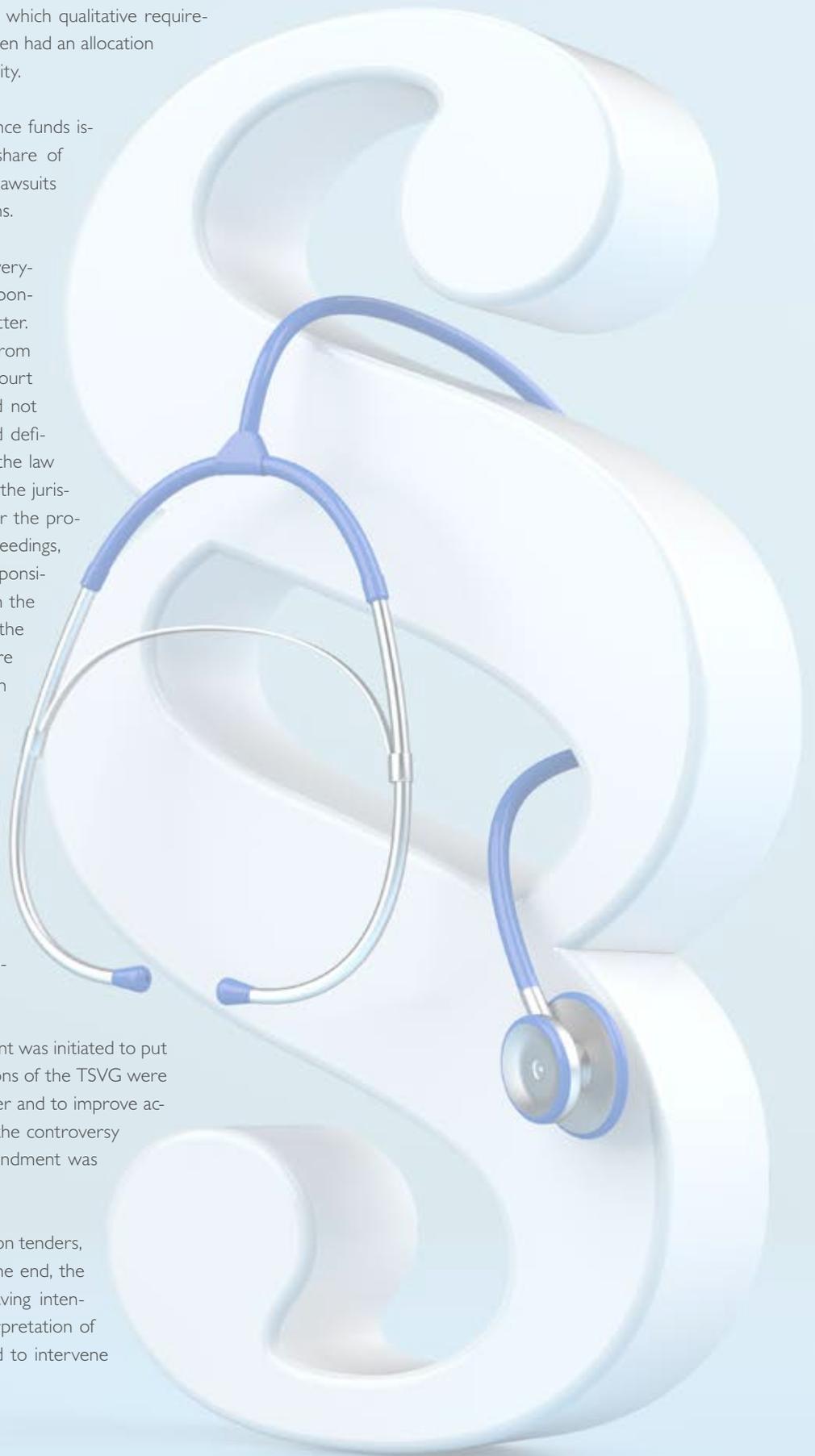
Later on when two other public health insurance funds issued calls for tenders that specified a high share of services, they were legally challenged. Several lawsuits were filed against health insurers for their actions.

In the end, the issue of jurisdiction astonished everyone involved as no one wanted to assume responsibility for making the final decision in the matter. The courts referred the ongoing proceedings from the higher regional court to the social welfare court and vice versa. The hoped-for clarification did not come. It became obvious that a more detailed definition had to be formulated of the passage in the law regarding "high proportion of services" so that the jurisdiction could be unambiguously determined for the proceeding in question. Parallel to the legal proceedings, the courts contacted politicians to say the responsibility for making a final decision was not within the courts' purview. Once again, the victims were the insured who, despite the drafting of a law, were left behind, stuck in the gears of the tender. An advocate from political circles was found in Dr. Roy Kühne, who also is a member of the health committee in the Federal Ministry of Health.

In order to get more clarity, discussions on defining "proportion of services" were held with professional associations. Talks with statutory health insurers went nowhere because the KKH (Kaufmannische Krankenkasse), among others, did not want to deviate from previous practices.

A short time later another legislative amendment was initiated to put an end to calls for tenders. The original intentions of the TSVG were to help patients get medical appointments faster and to improve access to medical care in rural areas. In light of the controversy surrounding the tender business, another amendment was made to the law.

That amendment provides for a complete ban on tenders, a move aimed at clearing up all ambiguity. In the end, the statutory health insurers with their money-saving intentions, related behavior in the market and interpretation of the legislation saw to it that the politicians had to intervene with new regulations.



### What awaits us in the future?

First we have to verify for ourselves that with the elimination of the tender business, the surcharge goes away too. For many insured persons a good supply system gives them a choice among products that is not limited to specific models. However, only certain products deemed economically efficient could be included in calls for tenders.

We are pleased that the frequently heard complaints about a limited portfolio of masks are now history. After all, it is our intention to offer the insured what they need for treatment and what they find acceptable. The level of acceptance rises and falls with the portfolio. If the portfolio is limited, you run the risk of distancing the insured from treatment instead of bringing them closer to it. An untreated insured patient – in the CPAP system segment, for example – could cause greater expense in later phases of an illness through a heart attack, for instance, than the preventative treatment would cost. We therefore welcome politicians' new push in the hope that we will be able to establish long-term thinking in healthcare that recognizes the need for preventive action before it is too late.

What will the future bring? The question remains open as we keep an eye on expenditures in the medical aids sector to see whether health insurers will increase the contribution rate as a result of amendments to the law.

Should that happen, it remains to be seen whether lawmakers turn the wheel back and permit statutory health insurers to make calls for tenders again to control costs.

On top of that, federal elections will be held next year. Right now there is disagreement and unrest even in the major parties on who should be the next party chair or scandals about who supported whom in the state election. The election could have some surprises in store for us as we can see that the parties are preoccupied with themselves.

What would the ancient Romans say? "Let the games begin!" We are curious about what awaits us.



# VENTILATION THERAPY – THE GREATER GOOD

Ventilation means life. For the littlest among us ventilation therapy is very important as they are particularly vulnerable and in need of support. We know the enormous tasks facing parents or legal guardians in such a situation. Therefore in this sensitive subject area LM is taking a stance by supporting rehaKIND in its efforts to increase awareness and understanding of the problems and needs of the youngest members of society.

Given the special requirements associated with physical growth and emotional maturity, the ventilation of children poses a great challenge and demands a high level of technical competence from users.

We speak of two different forms of ventilation – intermittent (pressure-controlled) and life support ventilation. Where pressure-controlled ventilation is used, the patient can breathe spontaneously (to a limited extent). In life support ventilation, the ventilator takes over the complete function of the lungs. Congenital disorders, muscular or metabolic diseases and accidents resulting in paraplegia are among the reasons that make ventilation support necessary. Added to those are extremely premature babies whose numbers have been growing in recent years as a consequence of significant progress made in intensive care. Very often the lungs of premature infants are not yet sufficiently developed, prompting the need for doctors and parents to make far-reaching decisions within the first days of life. If the child is ventilated, the lungs could be damaged further. If ventilation is not administered, the child could suffer oxygen deficiency with consequences such as brain damage. On the other hand, when premature babies receive complete ventilation at an early stage, their lungs mature so that the babies can breathe on their own.

Parents already burdened by this stroke of fate undoubtedly need support. The situation takes an emotional toll and then they have to deal with the insurance company bureaucracy that refuses to cover the required medical services.

The international association rehaKIND is an advocate for children with special needs associated with disabilities. The group is made up of members (manufacturers, dealers, law practices, publishers, hospitals and individuals), committees (research, cost bearers, specialized trade, patients and parents) and cooperating associations (Rett-Elternhilfe, oi-Gesellschaft, DVFR, Kindernetzwerk e.V., QVH / BVMED / BIV, DRS and vocational associations). At all times rehaKIND asserts that children's rehabilitation is not a luxury, but a moral obligation and an investment in the future of our children.

The goal should be to give all children the chance to participate in "normal daily life at school and in society". To achieve that goal, rehaKIND works with expert groups to develop quality standards for everyone involved and attempts to raise awareness in the market for this small fringe group with training measures..

You too can help to become a part of the whole – because together we are strong.

#KinderrehaistkeinLuxus  
#GemeinsamChancensichern  
[www.rehaKIND.com](http://www.rehaKIND.com)



# HAVE YOU HEARD?

In the category "Have You Heard?" you can read interesting facts about the entire Löwenstein Group.

## YouTube



Watch our many new tutorials for the ventilation and respiratory therapy devices on our YouTube Channel.

This will take you straight to the Löwenstein Medical channel:



[youtube.com/c/LöwensteinMedicalInternational](https://youtube.com/c/LöwensteinMedicalInternational)

## Construction Projects 2020



In 2020 we will also make sure we have more capacity for our corporate group. In **Steinbach** (Hessen) a new building is going up for the development and production of our intensive care ventilator series elisa. At our site in **Neuhäusel** (Rhineland-Palatinate) we are expanding our logistics center with a new hall to serve as additional production space for intensive care ventilators. Other expansion projects are taking place in our sites in **Dortmund** (North Rhine-Westphalia), **Ludwigshafen** (Rhineland-Palatinate) and **Wettenberg** (Hessen).



## Löwenstein Medical Anniversaries

Löwenstein Medical congratulates employees who are celebrating job anniversaries and thanks them for their engagement and loyalty through the years:

Herrn Ansgar Bilo, Frau Regina Bilo, Herrn Rüdiger Best, Herrn Kurt Wirges for **30 years** of employment; Herrn Jörg Karlapp, Herrn Michael Eidt, Herrn Olaf Konopka und Frau Sabine Kramny for **25 years** of employment; Herrn Dirk Bröder, Herrn Ingo Böckmann, Herrn Christoph Schmitt, Herrn Hans-Peter Seidel, Herrn Jürgen Endl, Herrn Jens Krüsmann, Herrn Thomas Schöffler, Herrn Michael Klein, Herrn Robert Heinz, Frau Brigitte Barzen, Herrn Boris Held, Herrn Bernhard Striewe, Frau Nicole Woelk, Herrn Marcel Brunner, Herrn Harald Schmitt, Herrn Mike Nitz, Frau Jasmin Zöller, Herrn Dirk Doetkotte, Herrn Jürgen Kefer, Herrn Uwe Ohm und Herrn Jan Malcherczyk for **20 years** of employment.

### LinkedIn + Facebook

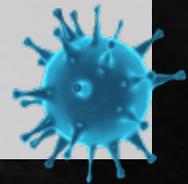
Effective immediately, we are on the social networks LinkedIn and Facebook where we offer interesting information about Löwenstein Medical.



Subscribe to our channel!

### In the fight against COVID-19

Over the past several months we have supported not only the German government in the fight against COVID-19 with ventilators, but also many other countries and governments. We have delivered several thousand ventilators in recent weeks to Israel, Saudi Arabia and the Netherlands. We even received a personal thank you from the Dutch king in a phone call to our management.



### Management Development Program

At the beginning of 2020 we started a company-wide development program for all managers. Within two years almost 200 employees will go through the program. It offers our managers from team leader to department and division managers the chance for personal development. We see this investment in our employees as an investment in our capital.



### Protection Mask



We have nearly wrapped up the development of our brand-new Protection Mask and the full range of tests has begun with our own employees. At the end of 2020 the masks will be offered for sale.

We thank the team for the quick implementation in these extraordinary times!

# WE BID FAREWELL TO MICHAEL WELEDA

We regret to tell you that our long-term, highly regarded colleague

**Mr. Michael Weleda**

died suddenly and unexpectedly on 13 April 2020.

The news of his death filled us with deep sorrow.

We have lost an engaged, helpful and reliable  
employee and colleague.

With profound respect and esteem,  
we bid farewell to a wonderful person.

We will remember him fondly and  
keep him in our thoughts.

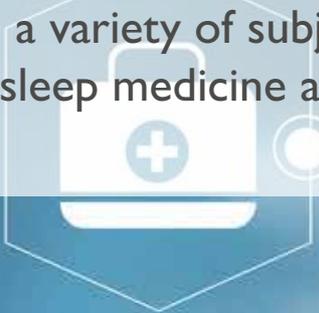
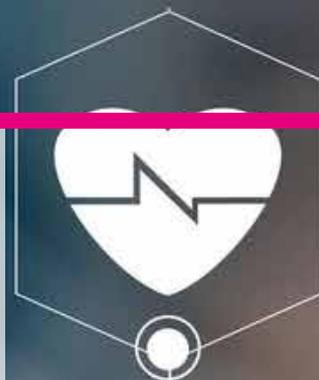
Management and Staff

*» Life is limited,  
but memory is eternal. «*



# WHITE PAPER EDITION

Current studies  
on a variety of subjects  
in sleep medicine and ventilation



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