eVent Medical

eVolution 3e Ventilator Ultra

When you're in search of a mechanical ventilator for your hospital, you're not just looking for a list of features; you're seeking a genuine partner who aligns with your goals. You're in need of an ally who provides you with the most up-to-date tools to enhance your patient's outcomes. A partner whom you can trust and rely on with peace of mind. Someone to support you in implementing your clinical protocols, all while managing the costs of care effectively.

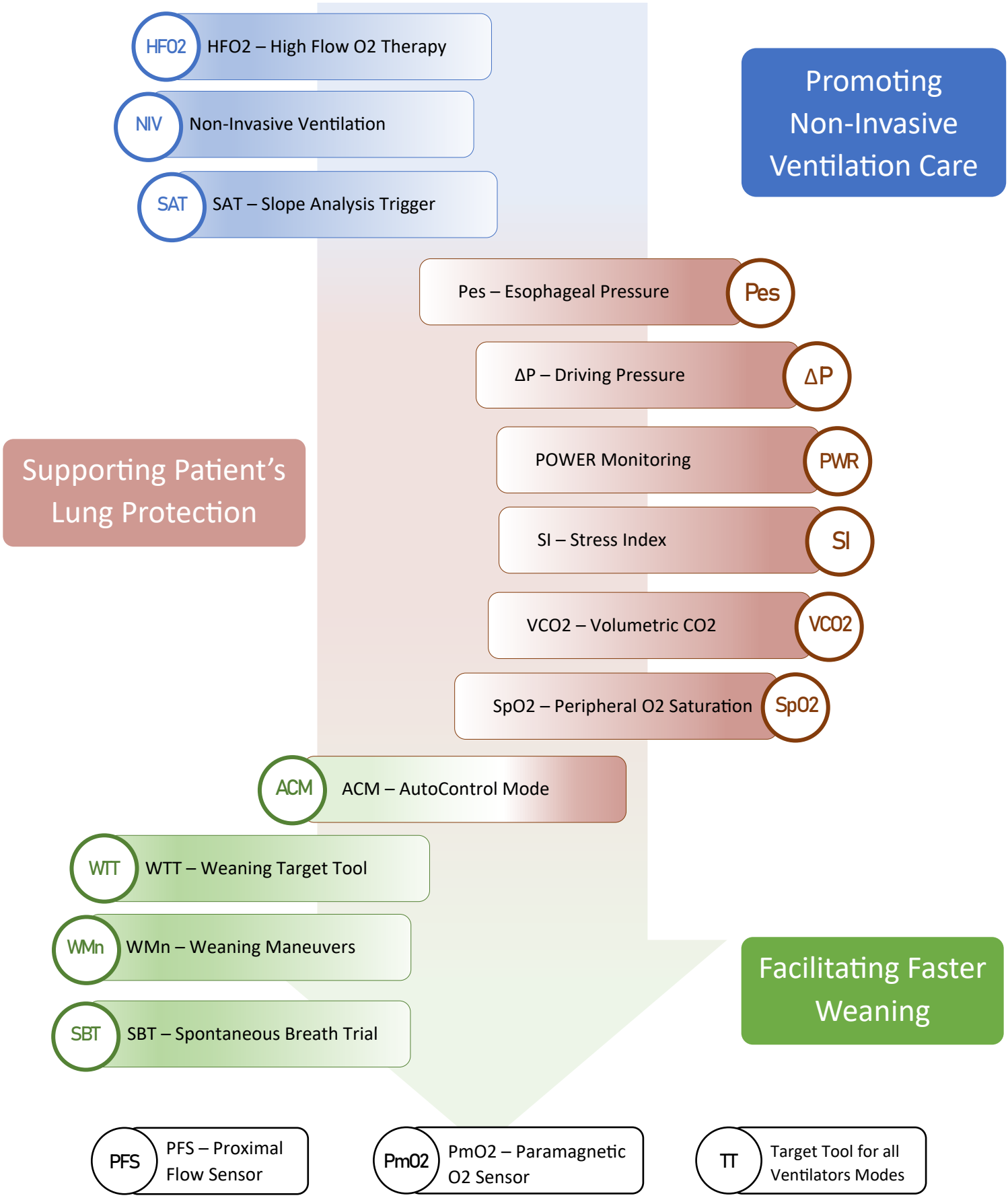
At eVent Medical we understand those needs, and to address these challenges, we introduce to you the **eVolution Ultra.**

To enhance ventilator **usability and user experience**, three distinct user profiles have been established based on the interface utilized for patient care: **Intubated, Mask and Cannula.**

Once a particular interface is selected, the ventilator will automatically configure itself to match the chosen ventilation approach.

This tailored configuration will then present only the relevant ventilatory modes, screen layouts, monitoring parameters, and associated options linked to that specific interface. This design ensures a streamlined and user-friendly experience, simplifying the management of a wide range of ventilation modes and screen settings in a transparent manner for the user.

All our features and tools have been developed with the intention of supporting you throughout your journey in patient care.



Your Partner in Improving Patient's Outcomes

Promoting Non-Invasive

Intubation carries potential complications such as lung injury, infection, and discomfort for the patient. Minimizing the need for intubation through alternative methods is often the preferred approach, for both scenarios, preventing intubation or avoiding reintubation following weaning.

HFO2 HFO2 – High Flow O2 Therapy

High Flow O2 Therapy – the use of this therapy can help to reduce the rate of intubation, potential risks associated with this procedure, and the median time to clinical recovery [1].

When the Cannula Interface is selected, our ventilator Can provide O2 therapy support up to 80 lpm while maintaining safety, reliability, and stability up to 100% O2 levels.

Alternatively, when the Mask Interface is selected, eVolution can provide **Non-Invasive Ventilation** with leak compensation of up to 60 l/min for all ventilatory modes.

NIV Non-Invasive Ventilation

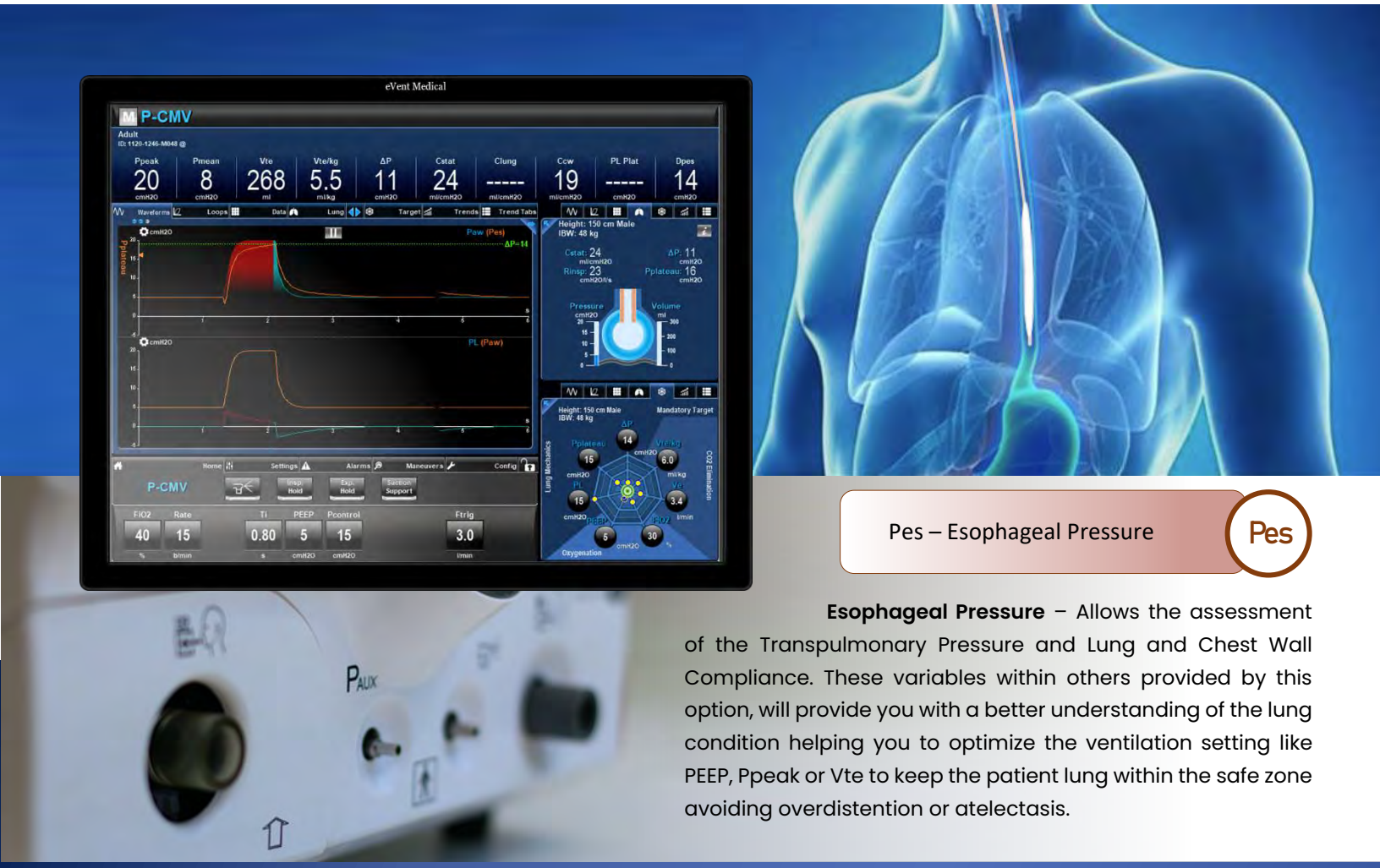
One of the significant challenges in non-invasive ventilation is ventilator-patient asynchrony, where the ventilator fails to synchronize with the patient's effort. This can result in discomfort and a reduced chance of success. Additionally, the presence of leaks can complicate the caregiver's ability to correctly set the trigger settings. To address this issue, the eVolution Ultra, features a proprietary **Slope Analysis Trigger**

SAT SAT – Slope Analysis Trigger

Slope Analysis Trigger (**SAT**) algorithm is a method for triggering in NIV, based on flow waveform pattern recognition. The primary goal of SAT is to prevent auto-triggering and ineffective triggering, particularly when dealing with non-constant leaks (such as when the mask shifts). This results in a more stable PEEP, eliminates false triggering, and enhances the recognition of genuine patient efforts to trigger a breath.

Supporting Patient's Lung Protection

When intubation becomes necessary, maintaining a protective ventilation strategy to mitigate VILI is essential. It serves to reduce mechanical ventilation durations and the inherent risks associated with intubation. To achieve this objective, eVolution Ultra offers a comprehensive array of tools for lung assessment and patient-specific setting.



Pes – Esophageal Pressure

Pes

Esophageal Pressure – Allows the assessment of the Transpulmonary Pressure and Lung and Chest Wall Compliance. These variables within others provided by this option, will provide you with a better understanding of the lung condition helping you to optimize the ventilation setting like PEEP, Ppeak or Vte to keep the patient lung within the safe zone avoiding overdistention or atelectasis.

ΔP – Driving Pressure

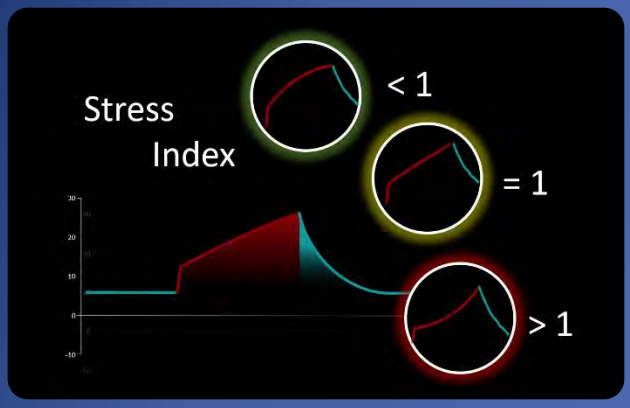
ΔP

Driving Pressure Tools - *"ΔP was the ventilation variable that best stratified risk. Decreases in ΔP owing to changes in ventilator settings were strongly associated with increased survival."*[(2)]. Driving Pressure concept is fully integrated in our device. We implemented a comprehensive set of tools to keep this variable within the safety values: Target Line at the pressure waveform, target value included in the Target Tool and ΔP alarm.

POWER Monitoring PWR

Power – It has been shown that the mechanical forces generated by the interactions between the ventilator and the respiratory system can damage the lungs, that is known as Ventilator-Induced Lung Injury (VILI).

The concept of Mechanical Power was proposed to unify the contribution of factors causing ventilator-related lung injury (volume, pressures, flow, and respiratory rate) based on the equation of motion [3]. The calculation they provided was only valid for volume-controlled ventilations with constant flow. In 2018, it was found that a high value of mechanical power could be associated with higher mortality in ICU patients [4,5].



SI – Stress Index SI

Stress Index (SI) provides a noninvasive approach to detect injurious ventilation patterns and to personalize ventilator settings[6]. Stress index values correlate with tidal recruitment and tidal hyperinflation. Shape of the Paw-t curve detects tidal recruitment and tidal hyperinflation [7].

A comprehensive set of **Maneuvers** including Low flow PV tool and Step Tool provide a noninvasive way to assess optimal PEEP and the compliance patterns of the patient lung providing more information for setting optimization.

Assessing Ventilation Efficiency

VCO2 – Volumetric CO2 (VCO2)

SpO2 – Peripheral O2 Saturation (SpO2)

Adequate oxygenation and efficient carbon dioxide removal are two main goals during mechanical ventilation. SpO2 and exhaled CO2 are important measurements to achieve these goals. These variables can provide insights into lung perfusion by examining the shape and pattern of the waveforms. SpO2 is a useful tool to assess respiratory function and detect early signs of hypoxemia. Volumetric CO2 can be used to calculate dead space inside the lung.

Facilitating Faster Weaning

"Unnecessary delays in this discontinuation process increase the complication rate from mechanical ventilation (eg, pneumonia, airway trauma) as well as the cost. Aggressiveness in removing the ventilator, however, must be balanced against the possibility that premature discontinuation may occur.... It has been estimated that as much as 42% of the time that a medical patient spends on a mechanical ventilator is during the discontinuation process." *(8)*

ACM – Auto Control Mode

The scientific literature has shown that decreasing weaning time and reducing ICU stays for ventilated patients, is an achievable benefit of automated weaning systems. The Wean reference Study[9], among others, demonstrated the benefits of automatic weaning.

Auto Control™ is a ventilation mode that allows the ventilator to recognize and respond to patient breathing activity. It makes the caregiver aware and employs caregiver rules to safely assess and transition the patient from a controlled mode (CMV) of PRVC to a spontaneous breathing mode of PRVC-PS. Once the patient is breathing spontaneously, Auto Control monitors the patient for hypopnea, tachypnea, hypo and hyper ventilation, assuring the patient is able to achieve the intended minute ventilation range.

Facilitating Faster Weaning

During Spontaneous breathing, **Esophageal pressure monitoring** can help detect patient-ventilator asynchrony, which occurs when the patient's spontaneous breathing efforts do not align with the ventilator's settings. Addressing asynchrony improves patient comfort and reduces the risk of complications. High esophageal pressures may indicate increased work of breathing, respiratory distress, or the need for additional ventilatory support.

WTT – Weaning Target Tool

WMn – Weaning Maneuvers

In the **Weaning Target Tool,** caregivers can set target values for a predefined pool of relevant variables for this process, usually used as a success weaning predictor, unifying the goals of the care team responsible for the patient, and allowing monitoring the progress of these variables in comparison to the set target values.

In addition to the weaning tools, the **Weaning maneuvers** like P0.1, PiMax, VC and the Spontaneous Breathing Trail (SBT) provides valuable information to assess the potential success of the weaning process.

SBT – Spontaneous Breath Trial

Spontaneous Breathing Trial (SBT). The SBT is a weaning tool provided for the clinician to evaluate the patient's ability to tolerate spontaneous breathing with minimal support in an effort to determine if the patient is ready for weaning and or extubating, according to the clinician's judgment.

Proximal Flow Sensor

When configuring the ventilator, users can select the proximal sensor option. This feature enables the placement of a sensor closer to the patient, allowing for more accurate measurement of pressure, flow, and delivered volume by reducing the effects of circuit compressibility and potential leaks. This is particularly important in neonatal and pediatric patients, where tidal volumes are small and even minor measurement deviations can be clinically relevant.

Two sensor types are available: adult-pediatric and neonatal. The neonatal sensor features a dead space of just 0.75 ml, placing it among the lowest in the market.

Volume Guarantee

When the proximal sensor is in use, the Volume Guarantee mode becomes available. This ventilation mode is designed to deliver a consistent tidal volume by automatically adjusting inspiratory pressure in response to changes in the patient's lung mechanics. It can be particularly helpful in patients with developing or fragile lungs, such as neonates, where pulmonary compliance may vary rapidly. Clinical scenarios like neonatal respiratory distress or postnatal transition may benefit from this approach. By targeting a predefined exhaled tidal volume, this mode supports more stable and controlled ventilation.

Nasal CPAP and IMV (nCPAP and nIMV)

In today's NICUs and delivery rooms, intubation is associated with increased risks of airway trauma and infection. The eVolution Ultra from eVent Medical, equipped with both nCPAP and nIMV modes modes, provides a comprehensive non-invasive respiratory support solution. Its advanced pneumatic and exhalation systems are engineered to deliver gentle and effective support for neonates with respiratory compromise, offering an alternative to more invasive ventilation strategies.

nIMV enables the delivery of pressure control above PEEP with user-defined settings for rate, inspiratory time, flow, and FiO_2. Alarm thresholds are automatically configured, providing timely alerts for events such as disconnection, occlusion, or abnormal pressure levels.

When combined with the proximal flow sensor, the eVolution Ultra integrates both invasive and non-invasive ventilation capabilities in a single platform, positioning it as a flexible solution for neonatal ventilation.

Connectivity for a Better Care

All eVolution Ultra model are equipped with the ability to communicate via Ethernet, transmitting a wide range of information.
CliniNet® interface viewing system brings near real-time data and patient management to the entire care team. The intuitive user interface provides access to all your ventilators, allowing clinicians to:

- View centralized and simultaneously the ventilators connected to the CliniNet network.
- View ventilator all settings, monitored data, alarms, trends, graphics, as well as the configuration and location from each.
- Access to Ventilation and Alarms statistics reports.
- Set up a comprehensive notification system that allows any member of the care team to be notified in case any programmed rule is met.

Supporting You in Standardizing Ventilation Protocols

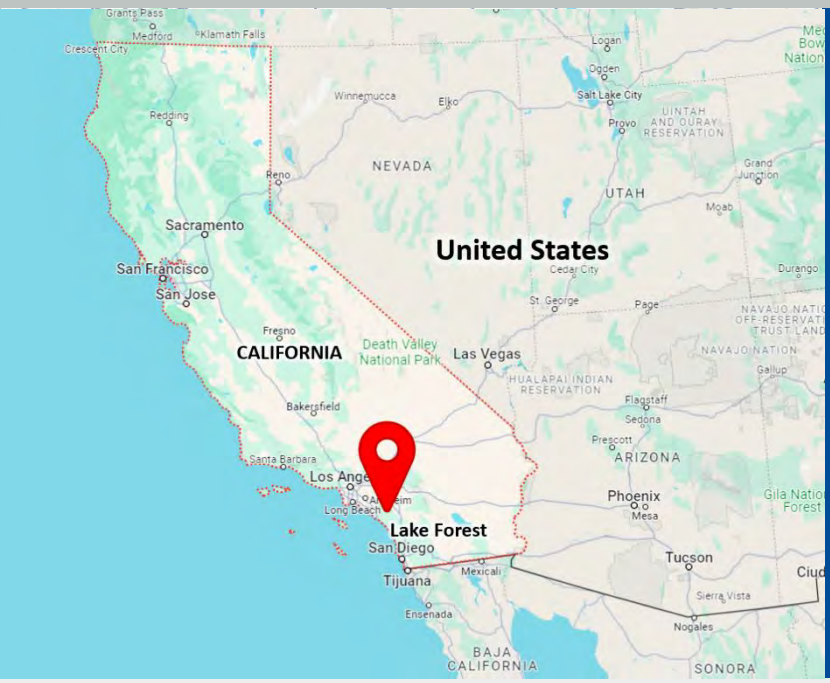
Protocolization in mechanical ventilation is essential for maintaining consistency, ensuring patient safety, optimizing care, and improving outcomes in critical care settings. It provides a structured framework for managing mechanical ventilation that is based on the latest evidence and best practices, ultimately benefiting both patients and healthcare providers.
With the Target Tool, caregivers can set target values for a predefined pool of relevant ventilation variables according to these protocols. They can monitor the progress of these variables in comparison to the set target values and optimize the ventilator settings with a focus on achieving these targets. On the other hand, this tool allows for the unification of the team's objectives.
Through the CliniNet Interface, you can translate your ventilation protocol into a set of rules. These rules can be configured within CliniNet's notification system. This creates an automatic system that continuously monitors all ventilators connected to the network to verify they comply with the established rules. It triggers notifications whenever a ventilator deviates from the programmed protocol.

Quality You Can Trust

Manufactured entirely in the United States, our ventilators embody precision engineering, a commitment to excellence, and reflects the highest standards of quality, safety, and reliability.

At the heart of our ventilator is a robust and efficient pneumatic system, ensuring efficient and precise respiratory support. We've chosen high-quality components to construct a device that healthcare professionals can rely on.

Preventive maintenance is very important to ensure reliability, patient safety, compliance with regulatory requirements, and cost effectiveness. To assist users in staying current with preventive maintenance, we've introduced a notification on the startup screen. This notification displays the next due date for preventive maintenance, helping proactive upkeep.



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