The Puritan Bennett™ 980 ICU Ventilator System

Breathe More NATURALLY

COVIDIEN

positive results for life™

The new Puritan Bennett™ 980 ventilator helps enable patients to breathe more naturally† through some of the most innovative breath delivery technology available.

Our simple, safe and smart design provides more natural ventilation that may help clinicians improve patient comfort.[1]

†Compared to conventional mechanical ventilation (VC,VC+,PC,PS)

Simple

Our innovative user interface features a highly customizable display with intuitive screen navigation.

Safe

The newly designed Puritan Bennett™ 980 ventilator provides a unique ventilator assurance feature and an integrated expiratory filtration system.

Smart

Advanced synchrony tools help clinicians set the ventilator to adapt to their patients' unique needs and help provide the appropriate level of support throughout the breath.

The Struggle to Lessen Discomfort in the ICU

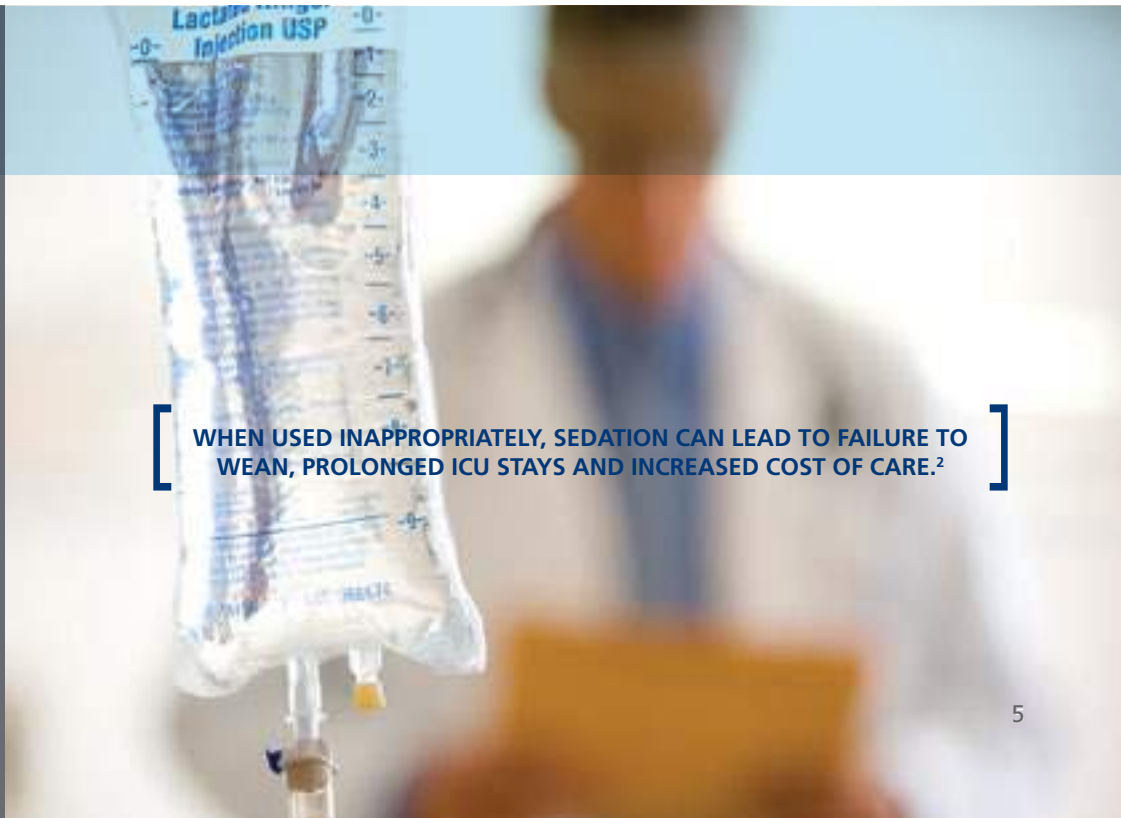
Being in the ICU can be very unsettling and uncomfortable for patients. With limited consciousness and ability to communicate, patients have little control over their own comfort.[2, 3]

DISTINGUISHING HELP FROM HARM

Out of necessity, machines and caregivers assume control over the most instinctive decisions patients have made all their lives, like when to eat, move around, moderate their body temperature, and in the case of mechanically ventilated patients, when and how they breathe.[4]

These factors likely contribute to the overwhelming 71 percent of ICU patients who show signs of agitation at least once during their ICU stay. Out of compassion, clinicians often turn to sedation to relieve their patients' distress.[2]

However, a growing body of research has confirmed a strong link between sedation and poor patient outcomes.[3]

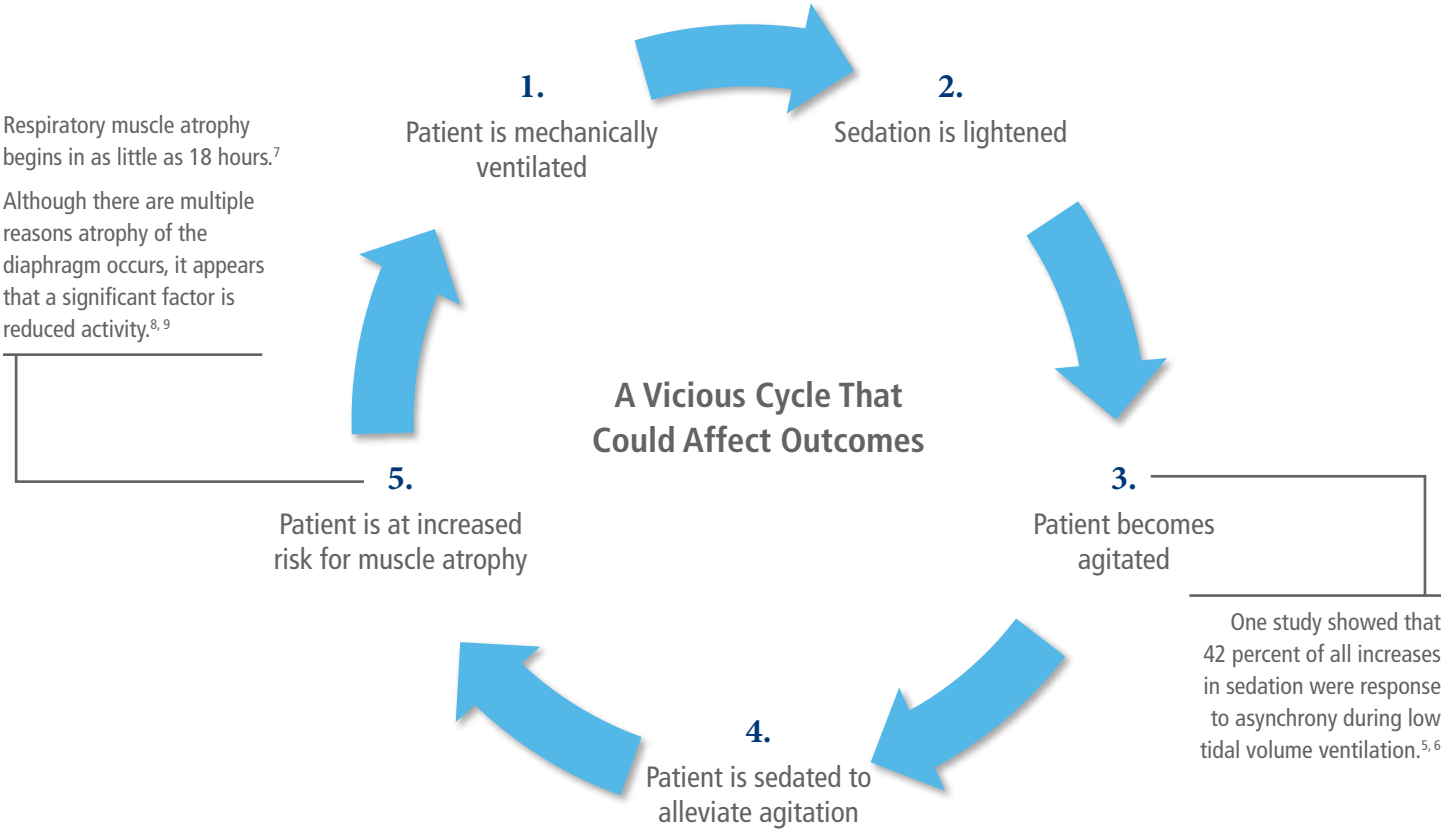


WHEN USED INAPPROPRIATELY, SEDATION CAN LEAD TO FAILURE TO WEAN, PROLONGED ICU STAYS AND INCREASED COST OF CARE.[2]

When Support Stands in the Way of Progress

Although a necessary intervention, the ability of conventional modes of ventilation to match patient breathing patterns and properly manage work of breathing is limited. One study reported that 42 percent of all increases in sedation are in response to patient-ventilator asynchrony.[5, 6]

Without a better way to manage patient agitation, sedation can seem like the only option. Yet this increase in sedation can lead to longer ventilator dependency.[2, 3]



Engineered to Help Patients Breathe More Naturally

The all new Puritan Bennett™ 980 ventilator is designed to advance the Puritan Bennett brand's legacy of providing more natural ventilation† that may enable clinicians to improve patient comfort.[1]

Advanced synchrony tools adapt to the patient's unique needs and provide the appropriate level of support throughout the breath, from initiation to completion.

The ventilator conducts hundreds of calculations every 5 milliseconds to stay in tune with patients' demand; helping to ensure that patients receive the flow and volume they want—when they want it—from breath to breath.

†Compared to conventional mechanical ventilation (VC, VC+, PC, PS and PSV-based modes)

PAV™*+ software

PAV™*+ breath type enables the patient to dictate the breath he or she receives, and helps clinicians more clearly understand the work required by the patient to complete each breath.

- With PAV™*+ breath type, the patient defines rate, depth and timing of breathing.
- Flow is an indicator of demand. It tells the ventilator when the patient wants to begin inspiration, how deep the breath should be, when to end the breath and how often the patient needs to breathe.
- PAV™*+ software continuously measures patient demand by measuring flow and pressure every 5 milliseconds.
- As patient demand changes, PAV™*+ software changes ventilatory support to meet the patient demand within the same breath.

WHEN THE %SUPPORT IS SET BY THE CLINICIAN WITHIN THE PAV™*+ SOFTWARE, THE PATIENT AND THE VENTILATOR ARE SHARING THE TOTAL WORK OF BREATHING.

Measures R (resistance) and C (compliance) →

PAV™*+ software measures resistance and compliance every 4 to 10 breaths

Calculates work of breathing with R (resistance) and C (compliance) data →

When R (resistance) and C (compliance) are known, it's possible to calculate patient-generated pressure (P_{MUS}) and work of breathing in real time using the equation of motion

$P_{MUS} + P_{VENT}$ = (flow x resistance) + (volume/compliance)

Provides visual indicator of the patient's WOB

Once %Support is set, clinicians can use the work of breathing (WOB) bar for real-time feedback on how much work the patient is doing

Providing real-time feedback on work of breathing enables the clinician to keep the patient at a sustainable level of work—helping reduce the risk for respiratory muscle atrophy, while potentially off-loading enough work to avoid fatigue.[10]

Leak Sync software

Leak Sync software helps prevent auto-triggering and asynchrony caused by leaks.

- Leaks due to mask interface or uncuffed endotracheal tube are common during mechanical ventilation.[11-13]
- Leak Sync software detects changes in breathing system leak, and compensates for the leak, adjusting effective trigger sensitivity in the presence of a leak helping clinicians better manage the patient's inspiratory work of breathing.[5, 10]

KEY FINDINGS

Puritan Bennett™ Leak Compensation Performance During Both Invasive and Noninvasive Ventilation[14]

Invasive mechanical ventilation[14]	• The Puritan Bennett™ 840 ventilator outperformed all other tested ventilators by requiring fewer breaths to achieve synchronization during increasing and decreasing leaks. • The Puritan Bennett 840 ventilator required fewer breaths to synchronize during increasing and decreasing leaks in both obstructive and restrictive lung models and with PEEP 5 cm H_2O and 10 cm H_2O compared with all other ventilators ($p < 0.0001$) tested.
Noninvasive ventilation[14]	• The Puritan Bennett 840 and Philips Respironics®* V60 ventilators were the only ventilators that adapted well to increasing or decreasing leaks. • The Puritan Bennett 840 ventilator required the fewest number of breaths to synchronize under all test conditions.

Advancing the Legacy

The Puritan Bennett™ 980 ventilator is built on the reliability and sophisticated breath delivery technology clinicians have come to expect from Puritan Bennett™ ventilation.

SOFTWARE YOU DEPEND ON

- **NeoMode 2.0 software** – Helps clinicians provide ventilatory support to neonates weighing as little as 300 grams by delivering tidal volumes as small as 2 mL.
- **Noninvasive software** – Allows versatile options including noninvasive SIMV and CPAP.
- **Bi-Level software** – Permits spontaneous breathing at all times and supports biphasic or airway pressure release ventilation for extra flexibility.
- **Proximal Flow Sensor** – Measures lower flows, pressures, and tidal volumes right at the patient wye in neonate applications.
- **Volume Control Plus** – Enables the patient to take spontaneous breaths to achieve a targeted tidal volume, and pressure is automatically adjusted.
- **Respiratory Mechanics software** – Enables monitoring of key respiratory parameters for easy assessment of patient status.
- **Tube Compensation software** – Acurately overcomes the work of breathing imposed by the artificial airway.

Security for You and Your Patients

Our new ventilator assurance program includes:

VENTILATOR ASSURANCE FEATURE

- In the event of certain system failures, the ventilator will continue to deliver ventilatory support as close to the preset settings as feasible.

STATUS DISPLAY

- There is an additional screen located on the breath delivery unit (BDU) with data display even if the graphic user interface (GUI) is unavailable.

STANDBY MODE

- This feature pauses ventilation while the patient is disconnected and preserves settings, auto-detects patient upon reconnection and resumes ventilation.

Service You Can Trust

THE COVIDIEN SERVICE DIFFERENCE

Quality

The Covidien Service team worked hand-in-hand with design engineers during the development of the Puritan Bennett™ 980 ventilator to ensure they are able to service the ventilator with the high level of quality that our customers have come to expect.

Consistency

The Covidien Service team operates on a solid foundation of experience and expertise, with more than 50 years as a qualified provider of service for Puritan Bennett ventilators.

Responsiveness

Covidien Service has more than 40 Customer Support Engineers across the country. Our fully integrated Sales, Service and Clinical Support team enable us to respond quickly to your service and account needs.

Integrity

Strict compliance with industry standards for Quality Management Systems and with our manufacturer-recommended service maintenance schedule is a priority for our Service team. Satisfying your needs with steadfast integrity enables us to build our relationship with you as a valued customer.

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