

SmartCare®/PS knowledge based weaning system: “Relentless”

Philip Thaut, respiratory therapist, explains in this interview why SmartCare®/PS became an essential adjunct to the current ventilator management strategy at Utah Valley Regional Medical Center Provo.



What are the challenges associated with weaning long-term patients from mechanical ventilation?

“I would say that creating enough time for therapists to spend with each of their long-term patients is one of the major challenges in a busy ICU. The demands placed upon them severely limit their ability to make the frequent adjustments that a marginal patient can require. As a result, I have witnessed several scenarios where a therapist would prematurely discontinue a weaning trial based on a written protocol, for example if the patient became tachypneic.”

What do you see as being the main advantages of a closed-loop knowledge based weaning system?

“One of the most important benefit of a closed-loop knowledge based weaning approach is its ability to frequently make the necessary adjustments in ventilatory support without the interruptions, fatigue and the inherent tedium associated with weaning a poorly conditioned, marginal ventilator patient.”

What are the principal advantages of using SmartCare® instead of relying solely on clinical practice?

“I have spent hours at the bedside monitoring patients who were being maintained on the SmartCare®/PS system and have been amazed with some of the results. It is interesting to observe how SmartCare/PS® works in a methodical, consistent, efficient - and in some respects – and relentless manner while carefully titrating pressure support for patients that are either severely de-conditioned or have near end-stage chronic lung disease.”

Relentless is an unusual term, can you elaborate on this?

“When I say that SmartCare®/PS is “relentless”, I am referring to SmartCare®/PS’s ability to titrate the level of pressure support on a continual basis. SmartCare/PS constantly monitors patients’ respiratory frequency, tidal volume, and metabolics (EtCO₂), testing their capability for small decreases in pressure support while maintaining



Phillip Thaut, RRT-NPS, RPFT,

Phillip Thaut has been a practicing respiratory therapist for 34 years.

He did his undergraduate studies in zoology and health administrative services at Brigham Young University and Weber State University.

Phil has been with Intermountain Healthcare since 1973. He has worked in all aspects of critical care including newborn, pediatric and adult critical care services.

He was the technical directory for respiratory care services at Valley View Medical Center in Cedar City, Utah, and has worked as the clinical specialist for adult ICU respiratory care at Utah Valley Regional Medical Center (UVRMC) since 1992. UVRMC is a 450 bed tertiary care hospital in Provo Utah and is member of the ARDSnet community. As part of his duties, he has been involved in/or the facility coordinator for several ARDSnet studies and is currently conducting research and data collection regarding combination therapies that include APRV mechanical ventilation and roto-proning in acute severe ARDS. He is also collecting data regarding ventilator process improvement through technologies that improve ventilator synchronization and enhance patient-ventilator interaction.

them in a 'zone of comfort'. In other words, maintaining their spontaneous workload at the maximum level the patients can tolerate comfortably. "Every few minutes, SmartCare®/PS's knowledge base evaluates the patient's potential for a small decrease or, if necessary, an increase in pressure support, minimizing the risk for overwhelming fatigue and respiratory failure. As I mentioned earlier, such frequent and minor adjustments in pressure support would be unrealistic if attempted by a bedside practitioner due to the time required and the tedium involved."

Can you cite a typical example of this 'relentless' approach to weaning?

"I have personally been involved with several difficult weaning scenarios that have failed our written weaning protocols but were successfully weaned within 48 hours after initiating SmartCare®/PS. I have been very impressed with the consistency and effectiveness of the knowledge based approach in helping us wean very difficult patients. However, rather than being replaced by the automation of this closed-loop protocol, the practitioner is provided with more time to supervise and monitor the process. The most significant realization comes from the fact that the weaning process is continuous and does not necessarily rely on the availability or constant presence of the practitioner at the bed-side throughout the weaning session."

How has the use of SmartCare impacted on your quality indicators?

"Our Dräger EvitaXL ventilators have been in service since June of 2006. Our observed patient-ventilator interaction and patient comfort have both improved, especially with patients who have previously been described as "difficult to wean" from mechanical ventilation. As a result, SmartCare®/PS has become an essential adjunct to our current ventilator management strategy. As our experience with SmartCare®/PS operation increase we see the opportunity to advance care continuing to evolve."

CASE STUDY

- 83 year old female
- Probable Myocarditis
- Possible Aspiration
- Severe Esophagitis
- Severe COPD with chronic CO₂ retention
- Total Invasive Mechanical Ventilation: 8 days

After initial intubation and stabilization; cardiac catheterization demonstrated relatively clean coronary arteries with an ejection fraction of approx. 22 %, probably due to acute myocarditis. After stabilization of hemodynamics and improved ejection fraction with inotropic support, weaning mechanics were obtained and spontaneous CPAP-pressure support trials were initiated via written protocols.

After six days of mechanical ventilation with limited tolerance for spontaneous CPAP–Pressure Support trials the patient was unable to be weaned. Additionally, it was not possible to sustain a Pressure Support levels < 18 cmH₂O without significant tachypnea or weaning trial failure. The overwhelming ventilatory fatigue required an

A/C mode for recovery for more than 24 hours. Concerns regarding the risks for ventilator dependency and continued weaning failures prompted placing the patient on the Dräger EvitaXL equipped with SmartCare®/PS.

Einstellungen:	
Body Weight:	58 kg
Type of Intubation:	Endotracheal
Humidification:	Heated humidifier with heated wire circuit
COPD:	Yes
Neurologic Disorder:	No
Night Rest:	Yes
Pressure Support Goal:	10 cmH ₂ O

With SmartCare®/PS the patient was able to sustain extended spontaneous CPAP-Pressure Support trials with Pressure Support titrated from 18 to 10 cmH₂O and was liberated from invasive mechanical ventilation in less than 48 hours. The patient was thereafter supported with intermittent non-invasive mask ventilation until discharge.



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