

## Over 95% of intubated patients on ASV

### Interview with Dr. Jean-Michel Arnal, Regional Hospital, Toulon

*At first, Dr. Arnal's team didn't choose the GALILEOs because of ASV. But after using ASV regularly, Dr. Arnal was convinced. He now uses ASV with almost all patients, saying that he would find it hard to work without it.*

**Q:** Dr. Arnal, what was your reason for your choice of ventilator?

**A:** We chose the GALILEO because of its high quality monitoring. I'm very interested in the use of waveform interpretation in optimizing ventilator settings. The GALILEO was the best, thanks to the proximal flow sensor. The nurses liked the very convenient interface with the two different knobs – one for setting, one for monitoring.

We also wanted an automatic low-flow P/V curve. ASV was not an issue at that time, because we had very little experience with it during the testing period.

#### **"ASV completely changed our lives!"**

**Q:** Have you observed any change in your daily routine since using the GALILEOs?

**A:** After three years of use, I realize how much we have improved our ventilator management. This is due to the large implementation of ASV in the unit and to the P/V Tool. ASV completely changed our lives! We now spend less time setting the parameters and have more time to look at the monitored parameters and respiratory mechanics and to think about the lung condition of the patient.

There is also a trend toward reducing ventilation time, even if I don't measure it precisely. I think that using ASV allows for less sedation. Thus, it seems that weaning can be done faster. I can't say if the automatic reduction of ventilatory support per-se reduced weaning time because at the same time we implemented a weaning protocol in the unit.

#### **"It is so easy to set that I sometimes think I am becoming lazy!"**

**Q:** Do you find it easy to set ASV correctly?

**A:** With experience it is so easy to set that I sometimes think I am becoming lazy! Suppose a new patient arrives in the unit and I am busy taking care of another patient during the night. The nurse has to measure the patient and set ideal body weight. The % minute ventilation, PEEP, FiO<sub>2</sub>, and triggers are set by default. Whatever the lung condition and the spontaneous respiratory rate, the patient is safely



ICU of the hospital Font-Pré in Toulon, France.

The hospital Font-Pré in Toulon, France is a 900-bed general hospital for a community of 500,000. The mixed ICU of the hospital has 12 beds. There are 6 senior physicians, 1 resident physician, 25 nurses, 2 head nurses, and 1 respiratory therapist.

Since 2001, the ICU has been using an entire fleet of GALILEO ventilators for all of their patients. The ventilators are mounted to the shelf system of each bed.

Dr. Jean-Michel Arnal is Head Physician.

ventilated and comfortable, without fighting the ventilator. When I arrive, I just have to adapt settings according to lung condition, monitoring, and blood gas analysis.

**Q:** Do you use an ASV protocol?

**A:** We have a very simple procedure for using ASV. It is the same for all patients whatever the lung condition. After the initial settings that are always the same, % minute ventilation is adjusted according to the desired PaCO<sub>2</sub>. PEEP and FiO<sub>2</sub> are set as usual. Triggers and rise time are set according to patient-ventilator synchrony.

# User Report

Even if it's the same procedure for all patients, we showed that the breathing pattern delivered is different according to lung condition. This means that the automatic adaptation according to respiratory mechanics works correctly. Moreover, we just finished a study showing that in ARDS patients, the breathing pattern delivered respects recommendations regarding protective ventilation.

## "I learned a lot using ASV"

Q: How do you use the ASV monitoring?

A: With the time I save by not having to set the breathing pattern, I analyze the breathing pattern that is automatically selected by ASV. This helps me understand the lung condition at the bedside. The most important monitoring parameter for me is the expiratory time constant. It is measured automatically cycle by cycle and is used as an input to the ASV algorithm. The expiratory time constant provides information about respiratory mechanics. In a normal intubated patient, it's around 0.75 s. Below 0.60 s, it's a restrictive (low compliance) respiratory system; above 0.90 s, it's obstructive (high resistance).

When patients arrive in the ICU, I usually don't know their medical history immediately. If I notice an expiratory time constant above 0.90 s, I can suspect COPD – if there is not an excess of sputum. The great thing is that ASV automatically selects a breathing pattern adapted to the patient's lung condition and informs me about the possible diagnosis, if I didn't know it beforehand.

If doctors look at ASV monitored parameters and spend some time pondering the respiratory mechanics data, they can discover how ventilation should be adapted to the patient's needs. Personally, I learned a lot using ASV.

## "At this step, you are an ASV addict!"

Q: What would you recommend other physicians do to become confident using ASV?

A: Firstly, you need several ventilators with ASV

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available in your unit so that you get experience rapidly. Secondly, doctors have to understand the basic principles, because it is hard to trust a machine if you don't know how it works. Thirdly, it is a team effort. Try to learn along with your colleagues; otherwise, someone will change your settings as soon as you leave the ICU.

Then, start with patients with normal lungs, for example those with drug overdose. These patients go from controlled ventilation to spontaneous assisted ventilation and back. ASV automatically adapts. It is safe, and patients are comfortable with it. Later you discover that ASV also works very well when these patients develop aspiration pneumonia and ARDS. So slowly but surely you start to use it for ALI/ARDS.

The last step is COPD patients, especially those with emphysema and flow limitation. In those patients, ASV delivers a breathing pattern with high tidal volume, very low frequency, and short I:E ratio. Intrinsic PEEP is usually reduced and plateau pressure is moderate because compliance is increased. It may disturb the doctor at first, but patients are so comfortable with it that usually we don't have to sedate them. At this step, you are an ASV addict! If you move to an ICU where ASV is not available, you will miss it! We use ASV now in more than 95% of the patients from admission to weaning from invasive ventilation.

## "All the doctors use the P/V Tool twice a day with ARDS patients"

Q: Does the P/V Tool also play a role in the assessment of the lung condition?

Yes, all the doctors in my ICU use the P/V Tool twice a day with ARDS patients. The inflation P/V curve can help to know which pressure provides the best recruitment during inspiration.

The P/V Tool also measures the delta CRF, which is an index of the recruitability of the respiratory system. This information together with blood gas analysis, CT scan, and hemodynamic condition is helpful in setting PEEP in ARDS. Moreover, the P/V Tool is convenient for teaching respiratory mechanics to the residents.

ASV and AVTS are easy-to-use and safe modes of ventilation for the respiratory management of your intubated patients. Employing a lung-protective strategy, both modes determine an optimal breath pattern based on an operator-set minute ventilation plus your patient's changing respiratory mechanics and spontaneous activities. ASV delivers this breath pattern automatically, while AVTS requires the user to manually accept or modify the proposal. ASV is not available in the US. AVTS is only available in the US.

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