# Practical Experience with ATC in Daily Use

Reto Stocker MD, Chief Doctor at University Hospital of Zürich

**Dräger**: Dr. Stocker, on which patients do you use Automatic Tube Compensation (ATC) ?

**RS:** We are of the opinion that ATC can be used on all patients and not only on spontaneous breathing patients, but also during controlled modes of ventilation.

**Dräger**: Which benefits do you expect from use of ATC?

**RS:** In principal ATC compensates what we deliver to the patients via the endotracheal or tracheal tube. These tubes are not physiologic because they have unphysiologic flow characteristics. As a result, the main benefit from ATC is to compensate these unphysiologic characteristics of the tubes. In fact, through the use of ATC we almost return to normal physiology.

**Dräger**: Until recently, it was normal to try to compensate resistance of the tube through CPAP with ASB. Where do you see the difference between the use of ATC as compared to CPAP with ASB?

**RS:** This can be best explained through the physics of flow. ASB, or any similar type of pressure support, gives the patient assistance in the form of a pre-selected pressure level which is independent of the flow generated by the patient respectively independent of the tidal volume required by the patient. Compensation of resistance in the tube cannot however be compensated by a pre-selected pressure level because it is a flow dependent coefficient that is not linear, rather it is based on a different flow function. If we ventilate the patient with a pre-selected pressure level, then in principal there is only a tiny range which can be compensated by this method. If the patient breathes in this tiny range then quite possibly there is optimal support. However, from experience, delivery of breaths to the patient with ASB result in either too much or too little compensation. This problem can be eliminated with ATC.

**Dräger**: In other words you address the problem with conventional pressure support of under- or over-compensation?

**RS:** Yes, with ATC we achieve an individual adaptation for each patient breath. Resistance of the tube is compensated for every individual breath as necessary.

**Dräger**: At the beginning, you mentioned that ATC can be used for all patients, including COPD and ARDS patients?

**RS:** Definitely for ARDS patients. With COPD patients it is not as clear. We have had the experience that also with COPD patients the tube can be compensated for and that it is effective. What can also be done in this case is to provide an external PEEP.

**Dräger**: How do you find handling of the ATC parameter setting and activation?

**RS:** I find that ATC is very easy to set. Above all it is logical because it is dependent on the size of the tube and we do not have to work with coefficients. In addition we use ATC practically always with 100% compensation. Only in a very small number of cases do we reduce the compensation factor.

**Dräger:** Does ATC increase the inspiratory pressure?

**RS:** During use of ATC of course this is not the case. The increase of inspiratory pressure in the inspiratory limb is countered by resistance of the tube. What we have as tracheal pressure at the end does not reflect an increased inspiratory pressure. Also, at least so far we do not have any indications from our measurements which were performed with direct tracheal pressure measurement, that a relevant increase in the inspiratory pressure in regards to the trachea occurs.

**Dräger**: Do you also use ATC during controlled ventilation with BIPAP and AutoFlow?

**RS:** Yes, in fact we almost always have ATC on. The order is as follows: controlled ventilation with ATC, then a change to ASB with ATC whereby those patients we believe require longer support we switch to PPS. Gradually we reduce the ASB level to zero and respectively PPS assist levels to zero, so that the patient in the end only breathes with CPAP w/ ATC. CPAP w/ ATC is always the last step before extubation.

**Dräger**: Have you observed through the use of ATC that weaning is expedited?

**RS:** ATC enables us to optimize the extubation criteria. Relatively quickly we can reduce the level of support with ATC because we know that the patient will not suffer from a too drastic reduction in pressure level as is common in ASB leading to increased WOB. We have been able to prove that if the support is reduced too drastically, the WOB increases so much, that the patient experiences respiratory distress because it is still on the ventilator. Such a patient would be better off being extubated. Certainly such a case can be optimized with ATC. We can reduce the support level very quickly with ATC and must not proceed in slow, short steps trying to titrate to the point of extubation, rather we can proceed quickly. I well believe that weaning from the ventilator can be expedited. Studies from Christoph Haberthür have shown that with ATC not only weaning time is shortened but also the reintubation rate can be reduced.

**Dräger**: Thank you Dr. Stocker for your open and enlightening responses.

Dräger

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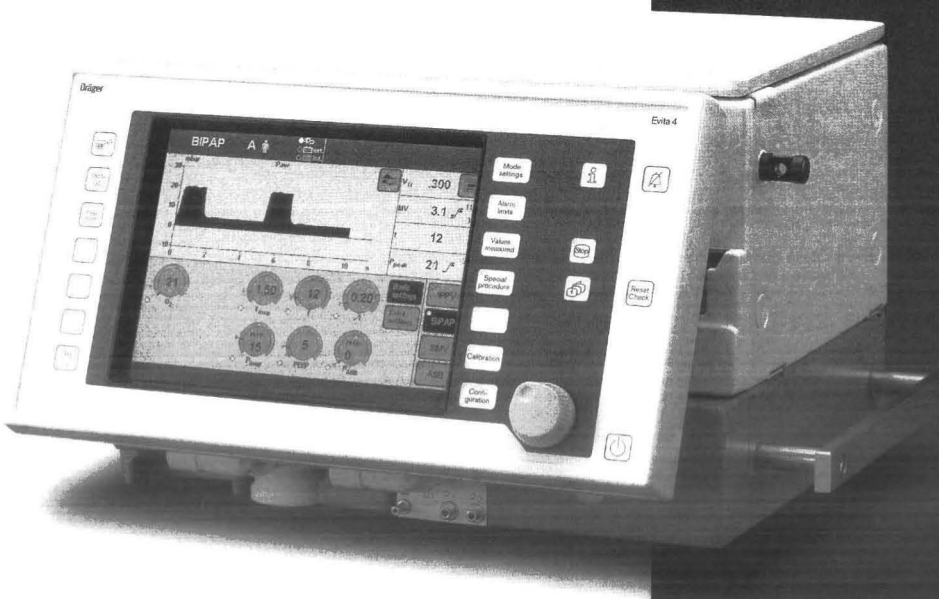


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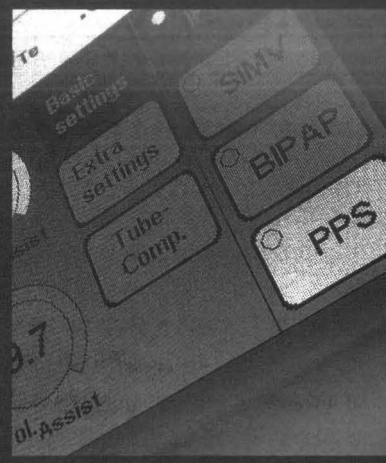



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