



Resolving “The Problem Inadvertent Hyperventilation” through technology.

Last month’s newsletter reviewed the causes and affects of “Inadvertent Hyperventilation” during CPR when bag-valve-masks (BVM) are squeezed too hard and/or too fast ([click here](#) for June’s article). While improved or increased frequency of training is important, there are technological solutions that provide both patient and rescuer benefits.

The **SMART BAG®** BVM was developed to compensate for rescuers “Inadvertently Hyperventilating” patients causing gas to enter the stomach when ventilating with a face mask. It also addresses a “preference” in the pre-hospital market for using BVMs over other ventilation devices (e.g. automatic ventilators).

It works by controlling the flow of gas from the balloon based both on how the rescuer squeezes and the compliance/resistance of the airway. With a proper slow squeeze, as recommended in the resuscitation guidelines, the SMART BAG® works like any other BVM. If too much pressure is applied on the bag however, a *Smart Valve* or piston incorporated into the BVM will move forward limiting the flow of gas ([click here](#) to view a video on the SMART BAG®). A minimum flow rate of 40 Lpm will always be provided (adult).

A rescuer will know if they are applying too much pressure as the balloon will become stiffer and the *Smart Valve* will become visible in the neck of the BVM. In affect, the SMART BAG® is providing real time training or instant feedback to how well the rescuer is ventilating.

If a patient’s airway is poorly compliant or restrictive, the *Smart Valve* will balance against the increased airway pressure and will not move forward. This indicates that there is a problem in the patient’s airway and under these circumstances the rescuer can apply higher pressures.

In the USA, an override switch allows the rescuer to “lock out” or override the *Smart Valve* should they feel the patient’s condition requires it (in our studies, there is no situation where the override switch is necessary).

The SMART BAG® has undergone a number of clinical studies that have demonstrated its superiority claim over conventional BVMs. One study of 191 EMS physicians demonstrated results of lower mean inspiratory airway pressure, lower mean ventilation rates and a 75% reduction in stomach inflation volumes. [Click here](#) to request further information on the SMART BAG® studies.

With a fairly simple technology, rescuers are provided with the ventilation device they prefer (BVM), with no change to protocols but are able to provide the patient with improved ventilation and reduced gastric insufflation.

One final note. O-Two is the manufacturer of the SMART BAG® but also manufacture regular BVMs, automatic ventilators (next month's newsletter) and mouth-to-mouth devices. This is pointed out to provide a sense of neutrality to our position on the selection of the SMART BAG® for the benefit of patients, rescuers and those managing budgets.