

Physician! "First, do no harm!"

It is widely believed that the phrase "Physician, first do no harm" comes from the Hippocratic Oath taken by physicians when they enter medical practice. While the oath (when translated from the original Greek) does not contain this exact phrase, it does state:



"I will prescribe regimens for the good of my patients according to my ability and my judgment and never do harm to anyone".

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Developed in 1954 by Henning Ruben in Copenhagen/Denmark, the original self inflating bag (which he had made by his bicycle mechanic by welding together four spokes from a bicycle wheel and inserting them into a black anaesthesia bag) has changed very little since that time. In 1964, the self-inflating bag was declared by the American Medical Association to be among the most significant medical advances in anaesthesia of the past 25 years.

While there are many different makes of Bag-Valve-Mask devices currently available, they do not differ much in their performance. Certainly, in the early days of CPR the "Ambu Bags" (so named after the first commercial manufacturer) were the only available adjuncts for the rescuer which did not require the use of an exhaled breath, or a source of compressed oxygen to ventilate the patient. As such, they were without a doubt a significant advance in emergency respiratory care. However, considering the major advances in medicine that have taken place over the last 50 years, we are still, in the most part, relying on old Bag-Valve-Mask technology to perform the key task of oxygenating a respiratory/cardiac arrest patient.

In the majority of user's hands, the physiological effects on the patient that these devices can have are significant and can create many problems for the patient and the rescuer. Including:

1. ***Aspiration of stomach contents***
2. ***Reduced venous return to the heart***
3. ***A subsequent decrease in cardiac output***
4. ***Reduced coronary perfusion pressure***

These issues are caused by what has now been termed "**Inadvertent Hyperventilation**" (providing ventilations at too high a minute volume with short inspiratory times, high ventilation rates and massive peak airway pressures). There is significant evidence to show that these devices can be somewhat ineffective in providing good quality ventilation and may possibly be potentially

MARKET NEWS

"Compression Only" CPR Not Designed to Replace Standard CPR

Once again the media has taken a new concept and blown its application out of all proportion!

This is just like they did with defibrillators which, if you are to believe the media hype when they were introduced, will: "Resuscitate anyone having a cardiac arrest". This of course is incorrect as there are many patients that cannot be defibrillated but who still require CPR.

Following a discussion on the topic with an AHA employee at the ECCU Congress in Las Vegas, it appears that the "compression only" issue was introduced by the AHA, "for use by anyone unwilling to do mouth to mouth, or during telephone directed CPR". If they are willing to do mouth to mouth then full , ventilation and compression CPR is still the "recommended" resuscitation method.

Just goes to prove that you can't believe everything you read in the papers!

Calgary, Alberta, Canada goes SMART BAG® MO!

The City of Calgary Emergency Medical Services has converted to SMART BAG® MO from the AMBU Spur. Calgary is the second major city in the province of Alberta, Canada to switch to SMART BAG® MO!

Romanian Government acquires 87 CAREvent® ATVs!

The Romanian Ministry of Health has purchased 87 CAREvent® ATV+ units for its hospitals across Romania. These ventilators are to be used in various departments throughout the hospitals.

dangerous. In fact, as far back as October 1992, The American Heart Association "Guidelines for CPR" published in the Journal of the American Medical Association clearly identified that these devices were generally ineffective in providing adequate ventilations to the patient. A wealth of clinical evidence to support this, and other statements by the American Heart Association, has been accumulated over the past 30 years.

In 1995, The American College of Neurosurgeons in their **Guidelines for the Management of Severe Head Injury - © 1995 Brain Trauma Foundation** stated that:

"Hyperventilation in brain injured patient's increases brain ischaemia".

Aufderheide's paper in 2004 entitled "**Hyperventilation-Induced Hypotension During Cardiopulmonary Resuscitation**" (Circulation 2004;109:1960-1965) stated that:

".... any incidence of hyperventilation is likely to have detrimental hemodynamic and survival consequences during low flow states such as CPR".

This paper clearly showed that even trained paramedics hyperventilate patients when under stress, even immediately post training, and this hyperventilation has serious deleterious effects on the patient.

This led to Pitts and Kellerman statement in The Lancet 2004;364

"Unrecognized and unintentional hyperventilation may be contributing to the currently poor survival rates from cardiac arrest".

A further study by O'Neill and Deakin (Resuscitation 2007;73:82-5) entitled: "**Do we hyperventilate cardiac arrest patients**"? reiterated the points made by Aufderheide et al stating:

"Hyperventilation was common, mostly through high respiratory rates rather than excessive tidal volumes. This is the first study to document tidal volumes and airway pressures during resuscitation. The persistently high airway pressures are likely to have a detrimental effect on blood flow during CPR. Guidelines on respiratory rates are well known, but it would appear that in practice they are not being observed".

For many years it could be stated that these devices were the only, readily available, easy to use products for providing positive pressure ventilation. However, this has not been the case for over 30 years when the first oxygen powered automatic resuscitators came on the market. However the limitations of these devices, in that they required a source of compressed gas (medical air or oxygen) to run them, did limit the accessibility of the products to every area where they may be required.

Mouth-to-mouth barrier devices and "pocket mask" type products, while providing a degree of protection from cross infection for the rescuer, are certainly not seen as a replacement for the BVM by the healthcare profession. Indeed, their overall efficacy, including the low O₂ concentration, high ventilation pressures generated and reluctance of the rescuers to actually use the devices for fear of cross infection make them a "last resort" product for many rescuers.

While the issue of "inadvertent hyperventilation" does seem to be prevalent in the industry, there is salvation in the form of the O-Two Medical Technologies Inc. **SMART BAG[®] MO**. This technologically advanced BVM offers the rescuer the ability to provide controlled ventilations while drastically reducing the risks associated with standard BVM ventilation.

Today and in the future, this device may well assist physicians in their quest to **"DO NO HARM"!**

For more information and a video on the SMART BAG[®] MO check out our website at www.otwo.com

Synergy Consults, the O-Two Distributor in Romania attributes their success in selling these ventilators to the design of the product. The simplicity of the controls and the accuracy of the settings were a great plus for the users. Also, the fact that there is no requirement for battery or electrical power was a big selling feature.

In addition to the ventilators Synergy also equipped the hospitals with 424 silicon SMART BAG[®] MOs!

**Ada County EMS –
Small Service that's Big on
Quality Patient Care!**

Formed on March 25, 1975 The Ada County Ambulance Tax District was served at that time, by two ambulances in Ada and Boise counties in Idaho with a population of 141,000 people.

Now, Ada County Paramedics is comprised of roughly 107 field positions and 13 field supervisors, 20 administrative staff members 12 ambulances and 2 on duty supervisors.

There are six city/county fire departments with approximately 34 fire stations in the county that provide a QRU (quick response units) service. They work in conjunction with Ada County Paramedics and serve a population of some 360,000 covering an area of 1060 square miles of mainly rural Idaho

Field crews are highly skilled pre-hospital care providers with diverse backgrounds and well-respected expertise. The quality of medicine they deliver to their patients is first rate.

Their medical directors, Drs. Murray Sturkie and Matthew Conklin, trust their high standard of care and give them their every support.

When asked why they had standardised on the CAREvent[®] ATV+, Circe Paul of ACP said: *"The simplicity of operation, multiple functions and alarms and the fact that no batteries are required made these ATV's the ideal choice for our service".*

This acquisition brings the total number of ATV+ units in the department to 21!

SMART BAG[®] MO “Controlled Flow” Manual Resuscitator

SMART BAG[®] MO



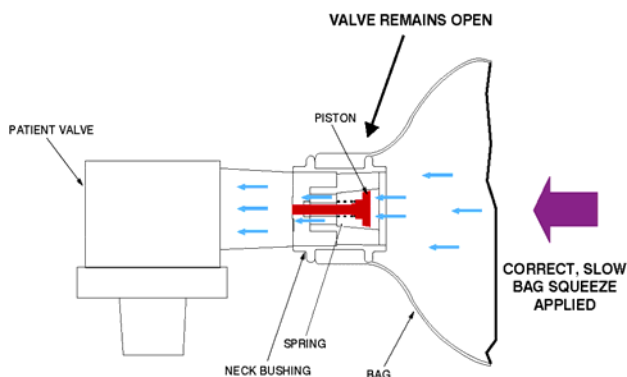
The O-Two Medical Technologies SMART BAG[®] MO Autoclavable Silicone, Cold Chemical Re-usable or Disposable PVC manual resuscitators set new standards for bag-valve-mask resuscitation performance. The SMART BAG[®] MO Bag-Valve-Mask Resuscitators eliminate the uncontrolled and inconstant ventilation frequencies and short inspiratory and expiratory times that are normally delivered using a standard Bag-Valve-Mask Resuscitator. By reminding the operator, with every squeeze of the bag, to deliver controlled ventilation, the SMART BAG[®] MO helps to improve ventilation, improve CO₂ removal, decrease respiratory alkalosis and improve oxygenation.

Manufactured from translucent, flexible, medical grade silicone or Medical Grade Thermoplastics, the SMART BAG[®] MO provides unsurpassed performance and patient care.

Design Features:

Patented “SMART[®]” Technology:

The built-in “SMART[®]” Technology of the SMART BAG[®] MO provides controlled flow rate, controlled airway pressure, controlled ventilation and virtually eliminates the risk of gastric insufflation. The pressure responsive SMART[®] VALVE responds to both the rescuer and the patient, allowing increased airway pressure to be applied but only when the patient’s airway condition requires it.



If the rescuer attempts to squeeze the bag too hard or too fast the SMART[®] VALVE moves forward and slows down the flow of gas from the bag. This has the effect of making the bag feel stiff, reminding the rescuer to slow down. The red piston of the SMART[®] VALVE also appears in the neck of the bag as a visual reminder of excessive flow generation.

The first rule of “SMART[®] BAGGING” is:

“If it’s hard to squeeze and the piston moves you are squeezing too hard”.

Clinical Snippets now on Website!

The “CLINICAL SNIPPETS” section provides our readers with short overviews and conclusions from the latest clinical research. These studies are gleaned from a variety of the world’s most prestigious clinical sources.

STREET SMARTS

This issue’s question is related to Inadvertent Hyperventilation:

“What are the two main causes of Inadvertent Hyperventilation when using a standard BVM?”

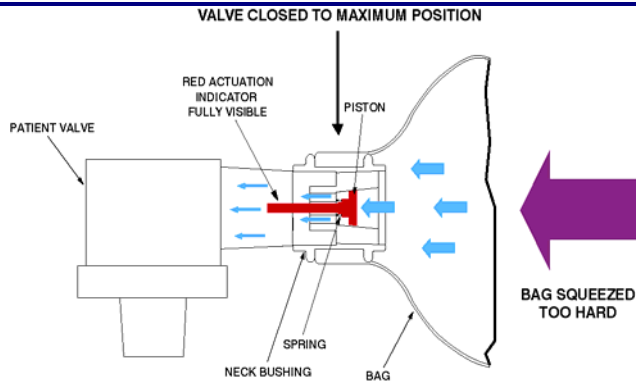
The answer to the last issue’s quiz is:

18 seconds

(60 seconds / 100 compressions X 30 compressions = 18 seconds)



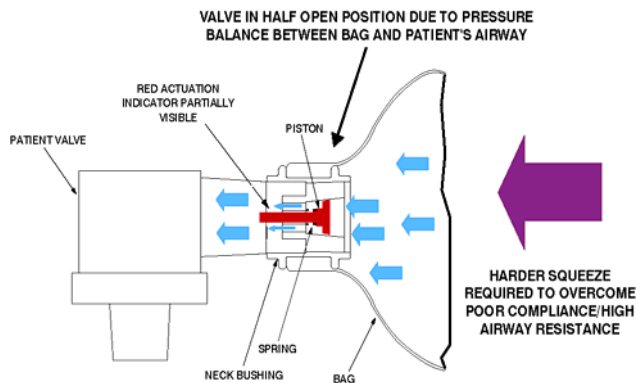
Submit your answer here, but be quick the first 3 correct answers win an O-Two Jacket!



If the bag becomes stiff to squeeze and the red piston does not appear in the neck of the bag this is an indication of a problem with the patient's airway which the rescuer should correct. This problem could be airway obstruction or changing airway compliance or resistance.

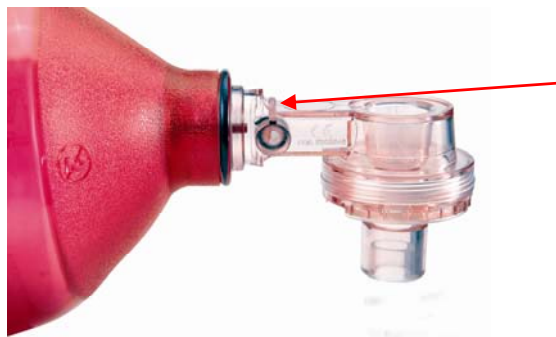
The second rule of "SMART[®] BAGGING" is:

"If it's hard to squeeze and the piston does not move there is a problem in the patient's airway".



Manual Override Control:

The Manual Override ("disable") has been provided to assist the rescuer in overcoming massive facemask leakage due to the inability to effect a positive mask-to-face seal or when confronting uncommon patient conditions. It is recommended that ventilation always be commenced in the "enabled" mode until the patient's condition and ventilation requirements have been clearly identified.



SMART[®] Valve Lever rotated up to the "disabled" position

For the intubated patient, during cardiac arrest, it is recommended that the SMART BAG[®] MO be used in the "disabled" mode with the indicator arm of the manual override switch in the vertical position. This is because of the short inspiratory time available between breaths to deliver an adequate tidal volume. At a compression rate of 100 this means that each compression takes 0.6 seconds. As it is only possible to deliver the breath on the "upstroke" of the compression that gives you only 0.3 seconds to deliver the tidal volume. This requires a high flowrate which is provided by blocking the action of the SMART[®] VALVE.

For the patient in respiratory arrest it is recommended that the SMART[®] Valve remain enabled so as to provide controlled ventilations.

**O-Two
Medical
Technologies
Inc.**
*"Innovation in
Resuscitation"*

Our Pedigree

With over 35 years experience in the design, engineering and manufacturing of medical devices, O-Two Medical Technologies has grown to be the world leader in emergency respiratory care products. Our innovative thinking, leading-edge engineering concepts and high quality manufacturing capabilities combine to make O-Two Medical Technologies a valuable partner for the healthcare professional and the patients they serve.

Our Capabilities

O-Two Medical Technologies provides advanced engineering, state-of-the-art design, prototyping and manufacturing capabilities. These are all encapsulated within a painstaking quality system to meet required International manufacturing standards. Our manufacturing, research and development facilities are registered to the ISO 13485 Quality system as well as European (CE) and US (FDA) medical device requirements.

Our Mission

"Our corporate mission is to apply our expertise in the design, engineering and manufacturing of emergency respiratory care products to assist our dedicated healthcare



SMART[®] Valve Lever rotated down to the "enabled" position

Unique fittings:

The entire unit is designed to prevent misassembly by ensuring that all connectors are of different diameters and design. The Patient Swivel Connector allows connection to all common resuscitation masks, endotracheal tubes, esophageal obturators, tracheotomy tubes and any other airway adjunct with a standard 22/15mm connector.

Pressure Limiting Device:

Preset 40 cmH₂O pressure relief valves (standard on Child Model) that automatically vent the excess volume to the atmosphere. In the instance where higher ventilation pressures are required, the relief valve can be overridden by depressing the pressure relief system cap with a fingertip and rotating the cap to lock it in place.



The adult model can be supplied with an optional preset pressure relief device if required.

The SMART BAG[®] MO series of bag-valve-mask resuscitators have been developed to meet the challenges of manual resuscitation. They are simple to operate, lightweight and effectively allow the provision of consistent ventilations while almost completely eliminating the risks associated with conventional Bag-Valve-Mask ventilation. The unique features of the SMART BAG[®] MO make providing correct ventilation easy.

For more information on SMART BAG[®] MO visit our website at www.otwo.com and watch the new SMART BAG[®] MO product video.

SMART BAG[®] MO

"Improving ventilation, one breath at a time"

providers in giving the very best patient care possible. We constantly monitor market trends to anticipate the changes in the way patients are treated. This proactive approach enables us to develop the products today that will become the Healthcare provider's tools of tomorrow. By applying our imaginative design processes and technologically advanced solutions to new products, O-Two Medical Technologies will continue to meet the challenges of the emergency respiratory care device market".



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