Diamedica launch new Helix Ventilator
An interview with the Managing Director of Diamedica UK on the launch of a new ventilator incorporated into two new products; the Helix Portable Ventilator and the Glostavent Helix Anaesthetic Machine.

Why introduce a new ventilator model?
We have received many requests over the years from anaesthetists using the Diamedica DPA portable anaesthetic series for a suitable portable ventilator to accompany those machines. So we developed the Helix Portable Ventilator to meet that need. Having carried out extensive development work for the Helix Portable Ventilator, it seemed logical to incorporate a version of the Helix in a further model of the Glostavent.

Is the new machine suitable for adult and paediatric patients?
Yes, the Helix Ventilators are both suitable for adult and paediatric patients and use similar efficient low pressure gas driven systems, minimising the use of any available oxygen. In addition the model makes full use of the Diamedica patient valve system allowing the use of single limb co-axial circuits or standard two limb and ‘Y’ piece circuits, which together enable better application of PEEP. This valve system was the first commercial system of its type and has been well proven with the DPA 02 and DPA 03 anaesthetic machines.

The Helix Portable Ventilator system will run from a cylinder or from an oxygen concentrator, but what is the pressure and flow requirement for the drive gas?
It uses a low flow and low pressure arrangement, anything above 120kPa and 1 litre per minute of oxygen or air will run it. If oxygen is used to run the Helix Ventilator it will reuse the drive gas to provide an increased FiO2 to the patient.

Can the Helix Portable Ventilator operate where there is no electricity to run an oxygen concentrator and there are no compressed gas cylinders?
It can; we offer an optional compressor pack in a small Peli case weighing less than 3kg containing a lithium polymer battery, battery charger and pump. This compressor unit will run the ventilator for over 20 hours continuously on a single charge and includes a 5 LED charge level gauge, mains charger and 12 volt vehicle charger. Battery recharge time to 90% is 4 hours.

So can the Helix Portable Ventilator only be used with the Diamedica portable anaesthetic machines?
No, it is suitable for a whole range of uses, rapid deployment scenarios; transport and outreach work, or for use where TIVA is the anaesthetic method. It can also be used as a stand-alone ventilator for post-operative recovery or in ICU.

Is the new Helix Ventilator going to replace the existing AP Ventilator on the Glostavent?
No, absolutely not. The existing Glostavent anaesthesia system including the AP ventilator is known and respected worldwide as a safe and reliable machine for low resource settings and it has proved itself by many years of service in some of the most difficult locations around the
What are the differences between the Glostavent Standard with the AP Ventilator and the Glostavent with the Helix Ventilator?
The Glostavent Helix moves from the more traditional AP Ventilator with a bellows operated arm and patient pressure controlled by adjustable weights, towards a more contemporary system with a bellows mounted to the side of the machine with patient pressure pneumatically controlled.

Does the new machine use the same oxygen concentrator as the Glostavent?
Yes, we have found it to be the most reliable particularly for very difficult environments such as high temperature and humidity. Despite the requirement in the International Standard that they should operate normally in high humidity many other concentrators have proved to be unreliable in those conditions.

Is the Glostavent Helix capable of providing good pre-oxygenation?
All Diamedica anaesthetic machines incorporate the modified drawover reservoir system highlighted in ‘Anaesthesia’ in 2007. This increases the efficiency of oxygen delivery and as a result pre-oxygenation is easy to achieve. Since we introduced the adaptation a number of other manufacturers have adopted similar systems.

Is the Glostavent Helix suitable for continuous flow anaesthesia as well as drawover anaesthesia?
Yes, the system works in both modes with spontaneous breathing patients or with IPPV. The Diamedica vaporiser output is consistent in either mode, unlike some drawover vaporisers. Data on the output of the Diamedica vaporisers has been the subject of peer reviewed papers for several years and we have been more than happy to provide further details on request.

Will the new machine incorporate the use of Nitrous Oxide?
No, it has become less popular in recent years with various new concerns and all the old adverse factors for its use in low income countries still stand. Nitrous Oxide is still not commonly available in most of the countries Diamedica supplies, where it is available it is prohibitively expensive, and a number of increased risk factors apply with greater requirements for expensive monitoring. In addition in some conflict locations where we work it is banned due to its potential for dual use.

So what gases are provided on the Glostavents?
Both the Glostavent Standard and the Glostavent Helix use oxygen and air, both provided from the oxygen concentrator; this allows for high flow requirements and gives the option of an oxygen/air mix when using continuous flow. There are many manufacturers who provide low income countries with anaesthetic machines that are only fitted for oxygen and nitrous oxide and as many locations only have access to oxygen they have little choice but to use 100% oxygen as a carrier gas. This is then used with all patients including neonates with the associated risks and long-term effects from oxygen toxicity, retinopathy etc.

Why not just produce the new Helix Ventilators?
The current standard Glostavent is a well understood and loved system operating successfully in almost 60 countries around the world. We will continue to manufacture the Glostavent Standard; it is as popular as it has ever been. The new machine provides an additional option for those who would prefer it.

Does the Glostavent Helix have an oxygen flush?
Yes it does, this is a mandatory requirement of the International Standard for an anaesthetic workstation, in addition we have always considered it an important safety aspect.

Why not just produce the new Helix Ventilators?
The current standard Glostavent is a well understood and loved system operating successfully in almost 60 countries around the world. We will continue to manufacture the Glostavent Standard; it is as popular as it has ever been. The new machine provides an additional option for those who would prefer it.

Does the Glostavent Helix have an oxygen flush?
Yes it does, this is a mandatory requirement of the International Standard for an anaesthetic workstation, in addition we have always considered it an important safety aspect.

Does the new machine use the same oxygen concentrator as the Glostavent?
Yes, we have found it to be the most reliable particularly for very difficult environments such as high temperature and humidity. Despite the requirement in the International Standard that they should operate normally in high humidity many other concentrators have proved to be unreliable in those conditions.

Is the Glostavent Helix capable of providing good pre-oxygenation?
All Diamedica anaesthetic machines incorporate the modified drawover reservoir system highlighted in ‘Anaesthesia’ in 2007. This increases the efficiency of oxygen delivery and as a result pre-oxygenation is easy to achieve. Since we introduced the adaptation a number of other manufacturers have adopted similar systems.

Is the Glostavent Helix suitable for continuous flow anaesthesia as well as drawover anaesthesia?
Yes, the system works in both modes with spontaneous breathing patients or with IPPV. The Diamedica vaporiser output is consistent in either mode, unlike some drawover vaporisers. Data on the output of the Diamedica vaporisers has been the subject of peer reviewed papers for several years and we have been more than happy to provide further details on request.

Will the new machine incorporate the use of Nitrous Oxide?
No, it has become less popular in recent years with various new concerns and all the old adverse factors for its use in low income countries still stand. Nitrous Oxide is still not commonly available in most of the countries Diamedica supplies, where it is available it is prohibitively expensive, and a number of increased risk factors apply with greater requirements for expensive monitoring. In addition in some conflict locations where we work it is banned due to its potential for dual use.

So what gases are provided on the Glostavents?
Both the Glostavent Standard and the Glostavent Helix use oxygen and air, both provided from the oxygen concentrator; this allows for high flow requirements and gives the option of an oxygen/air mix when using continuous flow. There are many manufacturers who provide low income countries with anaesthetic machines that are only fitted for oxygen and nitrous oxide and as many locations only have access to oxygen they have little choice but to use 100% oxygen as a carrier gas. This is then used with all patients including neonates with the associated risks and long-term effects from oxygen toxicity, retinopathy etc.

Why not just produce the new Helix Ventilators?
The current standard Glostavent is a well understood and loved system operating successfully in almost 60 countries around the world. We will continue to manufacture the Glostavent Standard; it is as popular as it has ever been. The new machine provides an additional option for those who would prefer it.

Does the Glostavent Helix have an oxygen flush?
Yes it does, this is a mandatory requirement of the International Standard for an anaesthetic workstation, in addition we have always considered it an important safety aspect.

Does the new machine use the same oxygen concentrator as the Glostavent?
Yes, we have found it to be the most reliable particularly for very difficult environments such as high temperature and humidity. Despite the requirement in the International Standard that they should operate normally in high humidity many other concentrators have proved to be unreliable in those conditions.

Is the Glostavent Helix capable of providing good pre-oxygenation?
All Diamedica anaesthetic machines incorporate the modified drawover reservoir system highlighted in ‘Anaesthesia’ in 2007. This increases the efficiency of oxygen delivery and as a result pre-oxygenation is easy to achieve. Since we introduced the adaptation a number of other manufacturers have adopted similar systems.

Is the Glostavent Helix suitable for continuous flow anaesthesia as well as drawover anaesthesia?
Yes, the system works in both modes with spontaneous breathing patients or with IPPV. The Diamedica vaporiser output is consistent in either mode, unlike some drawover vaporisers. Data on the output of the Diamedica vaporisers has been the subject of peer reviewed papers for several years and we have been more than happy to provide further details on request.

Will the new machine incorporate the use of Nitrous Oxide?
No, it has become less popular in recent years with various new concerns and all the old adverse factors for its use in low income countries still stand. Nitrous Oxide is still not commonly available in most of the countries Diamedica supplies, where it is available it is prohibitively expensive, and a number of increased risk factors apply with greater requirements for expensive monitoring. In addition in some conflict locations where we work it is banned due to its potential for dual use.
References
2. ISO 80601-2-13. Particular Requirements for Basic Safety and Essential Performance of an Anaesthetic Workstation
3. Anaesthesia 2013. Evaluation of oxygen concentrators for use in countries with limited resources. D. Peel, R. Neighbour and R. J. Eltringham
6. British Journal of Anaesthesia. Modification of a draw-over vaporizer for use with sevoflurane. T. Payne, R. Neighbour and R. Eltringham

Robert Neighbour is a chartered engineer and Managing Director of Diamedica (UK) Ltd, a company specialising in the manufacture of anaesthetic equipment for harsh environments and areas of limited logistical support. Trying to catch Robert in the office can be difficult as he spends much of his year travelling to some of the most remote hospitals in the poorest parts of the world.

For full details of our product range please visit our website www.diamedica.co.uk