



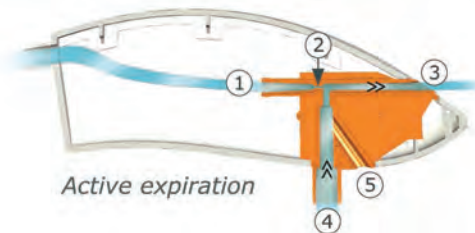
Ventrain® for small lumen ventilation





Ventilation principle

The unique and proprietary Expiratory Ventilation Assistance (EVA®) technology enables active expiration by suction. As such, EVA shortens expiration time, increases the achievable minute volume and reduces the risk of air trapping and the associated risks of barotrauma and circulatory collapse.



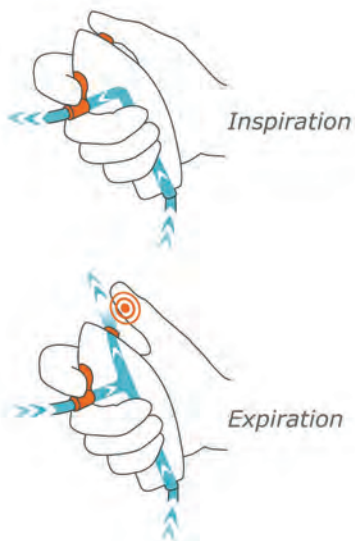
The advantages of Ventrain:

- more therapeutic options in cases involving difficult airways;
- effective, full ventilation of a patient with an obstructed upper airway;
- connection for side-stream capnometry.

The mechanism of EVA is explained by the cross section of Ventrain above. The gas flows via the inlet ① through a very narrow nozzle ② and exhaust pipe ③ to the outside. This flow entrains gas from port ④, which is connected to the catheter, inducing active expiration. Closing exhaust pipe ③ results in inspiration through port ④. The bypass ⑤ functions as an on/off switch. When opened, there is no significant positive or negative pressure at the catheter tip, resulting in equilibration/safety mode. While conventional ventilation depends on relatively high gas flows to obtain an effective gas exchange in the lungs and jet ventilation relies on high inspiration pressures, the EVA technology enables both active inspiration and active expiration, promoting gas exchange by the resulting turbulences in the lungs.



Ventrain



Small
Lumen
Ventilation

Ventrain is a single-use ventilation device based on a fundamentally new ventilation principle: EVA. Dedicated to manage difficult airway situations Ventrain is easy in use as inspiration and expiration are initiated by using just a thumb (see figures on the left). Only requirement is O₂ from a high pressure gas source, with a pressure compensated flow meter. Flow may range from 4 L/Min for pediatric to 15 L/Min for adult patients. The pressure at the catheter's distal end will not be higher than needed to provide the desired inspiration flow.

Effective, full ventilation in case of an obstructed upper airway

Ventrain is the only ventilation device that provides for full ventilation in an obstructed airway situation. Ventrain supplies O₂ during inspiration and actively removes the expiratory gases during expiration. The latter significantly reduces the risk of barotrauma and circulatory collapse and results in proper CO₂ clearance from the lungs. Ventrain in combination with the transtracheal catheter Cricath® re-establishes adequate oxygenation levels quickly as an I/E of 1:1 and a minute volume of 6 L/Min can be obtained.

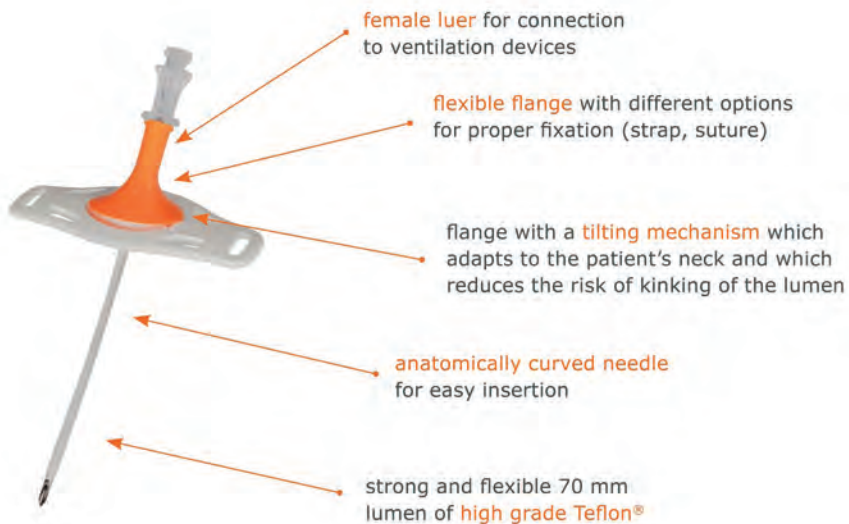
Connection for capnometry

Ventrain has an additional connector for a side-stream capnometer*.

* Not applicable in the USA



Cricath, our cricothyrotomy catheter with an inner diameter of 2 mm, is specially designed to be used with Ventrain. Following the standard procedure, the airway is accessed by inserting the needle through the cricothyroid membrane. The flange of the catheter will then adjust itself to the anatomical characteristics of each patient.



Cricath, the smart choice:

- tilting mechanism: reduced risk of kinking;
- small bore: minimally invasive;
- curved needle: easy insertion.

Ventrain and Cricath are protected by a patent application and a design registration.





Applications

Upper Airway Surgery

To increase working space and view of the surgeon and to prevent an airway emergency, Ventrain can be connected to a small lumen tube, such as an airway exchange catheter, hollow "gum elastic bougie" or the working channel of a bronchoscope. Alternatively, Ventrain can be connected to a transtracheal catheter such as Cricath, bypassing the upper airway obstruction (e.g. a carcinoma).

Ventilation of the non-dependent lung

Ventrain enables full ventilation of the non-dependent lung without notable re-inflation, decreasing the risk of hypoxemia and hemodynamic instability due to shunt, while maintaining working space and view for the surgeon. Also, Ventrain can be applied to enhance collapse initiation, ultimately resulting in a more effective lung collapse, and to re-inflate the lung.

Emergency

Ventrain is the only ventilation device that provides for effective ventilation in "Cannot Intubate, Cannot Ventilate" situations, diminishing the risk of barotrauma. As such, Ventrain is a life saver. A fast tracheal entrance is assured using the minimally invasive, small bore cricothyrotomy catheter Cricath Adult. For pediatric cases the use of a small endotracheal catheter with a firm guide wire is advised, such as a 1.6 mm ID pediatric airway exchange catheter.

*Expiratory
Ventilation
Assistance*



The creators

Prof. Dr. Med. Enk (anesthesiologist) is kindly acknowledged for inventing Ventrain. Prof. Enk, specialized in airway management for 20 years, has committed himself to enable safe and efficient ventilation through a 'straw'. In close collaboration with Prof. Enk and his research group, Ventinova has translated his initial idea into Ventrain. Ventinova has also developed Cricath and Tritube, the 4.4 mm OD small lumen ventilation tube.

Ordering information*

- 1 Ventrain
- 2 Ventrain Emergency Kit containing:
 - Ventrain
 - Cricath
- 3 Cricath (packed with syringe and neck strap)

* All products are
single use and sterile



Distributed in New Zealand by:

WM Bamford & Co Ltd
0800 226 3673
enquiries@bamford.co.nz
www.bamford.co.nz

© 2018 Ventinova, Eindhoven The Netherlands, all rights reserved.

© 2018 Ventinova, EVA, FCV, Evone, Tritube, Ventrain and Cricath are registered trademarks of Ventinova Medical.



Ventinova Medical B.V.

P Meerenakkerplein 7
5652 BJ Eindhoven
The Netherlands

T +31 (0)40 751 60 20
E info@ventinova.nl
I www.ventinovamedical.com