Maximum safety for your patients, maximum user comfort for you

TwinStream™ CARL REINER®

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Subject to technical modifications.

Please note

TwinStream™ by Carl Reiner®

Delivers what it promises

Optimal user-friendliness. Best performance.
Greatest possible exclusion of risk. Absolutely no complications.

Basically it's very easy to describe TwinStream™ in just a few words. Because we at Carl Reiner® have invested several decades of research and development in this apparatus, meticulously and repeatedly evolved it further and improved upon it, and have nurtured very close cooperation with our users in order to integrate their wishes as best as possible into the product. We are now proud to present TwinStream™ from 2006 onward, as unique equipment for jet ventilation.

We have put our lifeblood into TwinStream™. Our ambition is not only to develop, construct and offer medical apparatuses of best quality in keeping with Carl Reiner® long-standing tradition, but also to provide surgeons and anesthetists with suitable, reliable, and practical equipment for the treatment of their patients. We are especially proud of TwinStream™ – because it can do more than one would possibly expect an apparatus of this type to do. Much more.

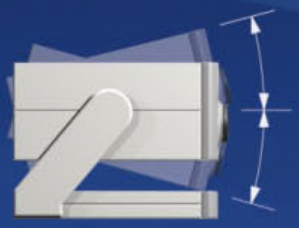
And far more reliably. With TwinStream™ as a global solution consisting of "Apparatus plus accessories" we are able to offer clinics a device that, thanks to its numerous talents and features, guarantees optimal, sufficient and smooth support during jet ventilation for all types of patients.

No more and no less – and all of this for an adequate price.
Because it delivers what it promises.

Multifunctional for patient safety and user comfort

TwinStream™ offers unique features and special advantages

- NEW: Global Connectivity – Integration into Patient Data Management Systems (PDMS)
- Gas exchange can be controlled by *SHFJV*®
- No time limit
- Tubeless *SHFJV*® ventilation with patented Jet-Endoscopes
- *SHFJV*® ventilation can also be performed in newborns and in children weighing between one to ten kilograms
- *SHFJV*® ventilation can also be performed with a jet catheter
- Patented Jet-Converter for continued ventilation through an endotracheal tube or a laryngeal mask
- Uncontested strong performance: 5.5 bar emission pressure
- Sufficient ventilation even in severely obese patients
- Standardized "AUTO START" setting
- Jet ventilation for more than 20 years without any complications
- Compatibility of the adapted surgical instruments is guaranteed
- Can be used as a stand-alone ventilation device for the ICU
- External active warming and humidification of respiratory gas
- Confusion-proof connection ports because of the Easy Connect system
- Fully automatic self-test function
- Its performance potential has been documented in more than 100 publications



TwinStream™ outstanding technical performance is not its only virtue. A mere glance will convince you of its superlative features: the simplicity of TwinStream™ design is very user-friendly. TwinStream™ can be operated via a large touch screen in combination with the jog dial – which makes it extremely comfortable and also very efficient. The Information you need is displayed clearly and legibly. Settings can be adjusted rapidly and precisely. The diverse options of installation - on a table, on the wall, on a trolley or from the ceiling – ensure the best possible ergonomic solution for every type of work environment. TwinStream™ truly makes work a pleasure.

Leader of development and innovations in jet ventilation for more than two decades

1998

- Adapted versions of clients' instruments were used for the first time in superimposed jet ventilation. By means of special manufacturing techniques it was possible to convert laryngoscopes, bronchoscopes and other instruments of nearly every manufacturer into a jet ventilation instrument.

1990

- Bronchotron – the first pneumatic-driven jet ventilation device for superimposed high-frequency ventilation *(SHFJV®)*
- First jet ventilation laryngoscope for tubeless ventilation – for use in microlaryngeal surgery

1989

- Professor Aloy started the development of superimposed high-frequency jet ventilation

1992

- Jet coupling permits the use of superimposed high-frequency jet ventilation *(SHFJV®)* with bronchoscopes of other manufacturers

1993

- First jet ventilation tracheoscope based on the concepts of Professor Friedrich (Graz)

1960

- Development of the first jet laryngoscopes based on the concepts of Professor Kleinsasser

1994

- First application of Bronchotron at the Intensive Care Unit

2006

- TwinStream™ is the first microprocessor-driven jet ventilation device for superimposed high-frequency jet ventilation *(SHFJV®)*
- First basic setting adapted to the patient's weight
- After evaluation of more than 6,000 applications on patients, an algorithm was developed for patient-adapted initial setting of jet ventilation.
- First jet ventilation device with a genuine laser-safe mode - the FIO_2 level of the jet ventilation device is controlled, and simultaneously the patient's oxygen level in the respiratory tract is monitored.
- First jet ventilation device with a maneuver for measurement of CO_2
- Development of the polygonal jet laryngoscope with two nozzles for *SHFJV®* application and two connections for gas monitoring and monitoring respiratory pressure.
- The first device to permit continuous monitoring of respiratory pressure and breath gas.

2011

- First "hybrid" jet bronchoscope with elective proximal and distal illumination

2008

- First jet catheter for superimposed high-frequency jet ventilation *(SHFJV®)*

2013

- Global Connectivity integration into Patient Data Management Systems (PDMS)

2009

- Jet converter for unilateral lung ventilation and flexible bronchoscopy
- Professor Klemm/Dresden: development of a jet tracheobronchoscope

2010

- Development of jet bronchoscopes for pediatrics and neonatology

2012

- First use of TwinStream™ with the Jet Modifier® at the intensive care unit.
- Jet catheter for children

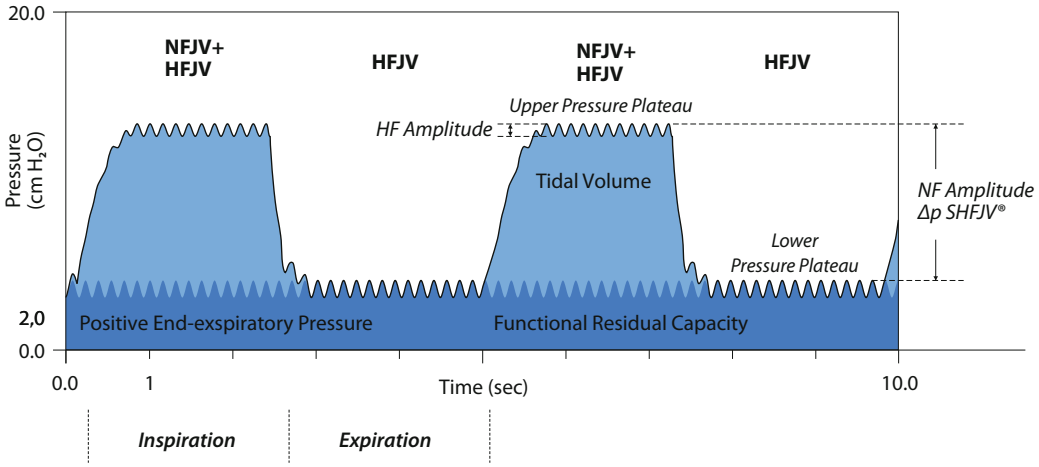
Gold Standard in jet ventilation

TwinStream™ with *SHFJV*® is unique

TwinStream™ consists of two separately or simultaneously functioning ventilation units. In superimposed jet ventilation *(SHFJV®)*, normal-frequency and high frequency jet ventilation are performed synchronously.

Therefore, TwinStream™ always permits ventilation in the open system at two different pressure plateaus. The level of the pressure plateau as well as the duration of inspiration and expiration can be selected as desired.

Thus, both oxygenation and CO_2 elimination can be efficiently regulated (time-regulated and pressure-controlled ventilation with decelerating gas flow).

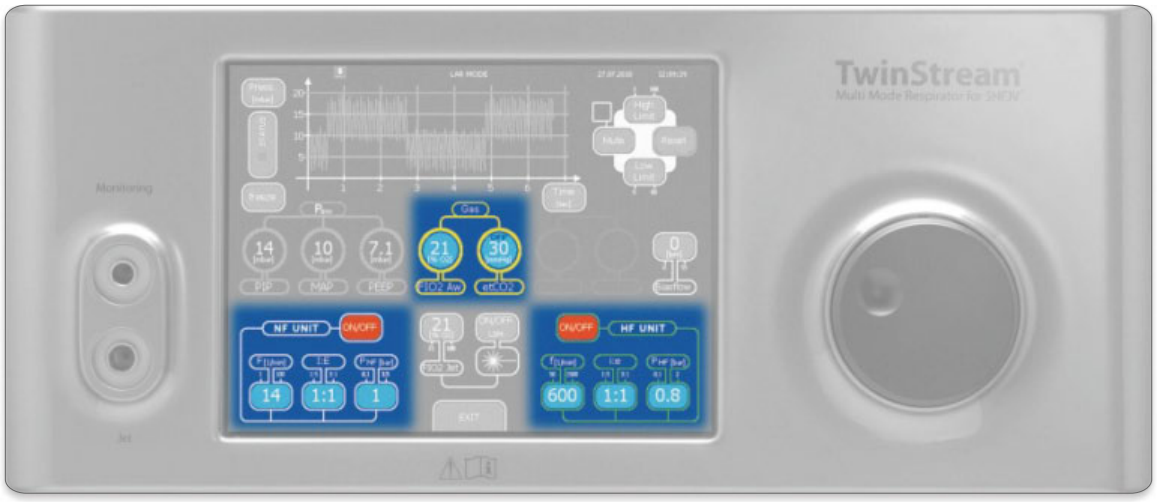


"TwinStream™ has provided us with better options for performing jet ventilation. By the use of TwinStream™, ENT anesthesia has taken an enormous step forward at the Karolinska University Clinic."

Associate Professor Johan Ullman, Department of Anesthesiology, Karolinska University Hospital Stockholm (SWE)

> We have successfully used superimposed high-frequency jet ventilation in more than 3000 patients. The youngest patient was two weeks old and the oldest was 99 years old. We did not encounter a single complication in terms of ventilation technology

Univ.-Prof. Dr. Alexander Aloy, University Department of Anesthesiology at the General Hospital of Vienna (A)



Two separately or simultaneously functioning ventilation units.

Benefits for the patient

Measurements on a lung model as well as clinical studies [1, 2] clearly show that an adequate tidal volume can only be achieved by this combination of normal-frequency and high-frequency jet ventilation, i.e. *SHFJV*®. Patients with massive respiratory tract obstruction and limited lung compliance benefit more from the *SHFJV*® method than from any other method of jet ventilation [3].

1 A. Leiter, A. Aliverti, R. Priori, P. Staun, A. Lo Mauro, A. Larsson, P. Frykholm; Comparison of Superimposed High Frequency Jet Ventilation with conventional jet ventilation before laryngeal surgery; Posterpräsentation 2010, ESA Helsinki (SWE)
2 G. Koller-Halmer, H. Koller, E. Deusch, S. Watzka, M. R. Mueller, I. Schindler; Superimposed High Frequency Jet Ventilation SHFJV is a feasible methode to achieve adequate oxygenation during lung surgery; Posterpräsentation 2010, ESTS Valladolid
3 G. Ihra, C. Hieber, P. Kraincuk, E. Marker, A. Kashanipour, A. Aloy; Klinische Erfahrung mit der Doppel-Jet Technik: Die superponierte Hochfrequenz-Jet-Ventilation in der Larynxchirurgie; Anästhesiologie Intensivmed Notfallmed Schmerzth 2000:35:509-514
4 Aloy, Schachner, Spiss, Cancura; Tubuslose translarygeale superponierte Jet-Ventilation; Anästhesist 1990, 39:493-498
5 Aloy, Schachner, Cancura; Tubeless translarygeal superimposed jet ventilation; Oto-Rhino-Laryngologie 1991, 248: 475-478

No compromises on your patients' safety

Benefits for clinics as well as for patients – what you can use TwinStream™ for

Laryngeal and phonosurgery

- Microlaryngoscopy
- Tracheoscopy
- Stenting
- Laser surgery
- Percutaneous dilatation tracheotomy (PDT)

Chest surgery

- Separate unilateral single-lung ventilation
- Tracheal processes
- Tracheal resection
- Lobectomy
- Carina resection
- Pneumectomy

Pneumology / Bronchoscopy

- Rigid bronchoscopy
- Interventional bronchoscopy
- Flexible bronchoscopy
- Stenting
- EBUS diagnosis
- Laser surgery

Intensive care

- ARDS
- Bronchopleural fistula
- Intracranial pressure therapy
- Percutaneous dilatation tracheotomy (PDT)
- Respiratory therapy (mucolysis)

"As ventilation can be easily performed by the use of superimposed jet ventilation through a jet laryngoscope even through high-grade stenoses, we have used this ventilation technique - which was originally developed for endoscopic interventions - for the purpose in percutaneous dilatation tracheotomy as well."

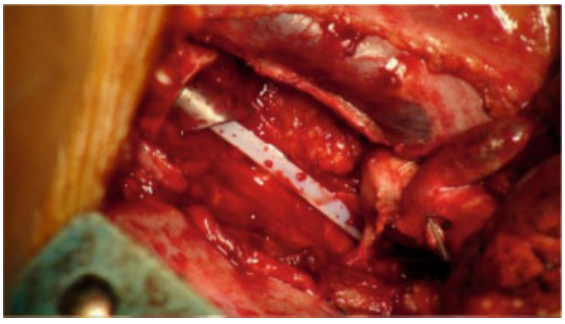
Dr. Andreas Nowak, Head of the Department of Anesthesiology, Teaching Hospital of Dresden Friedrichstadt (D)

> TwinStream™ simple operation makes its handling simply sensational. Only by superimposition and combination of a low-frequency and high-frequency jet gas flow is it possible to achieve satisfactory oxygenation and CO_2-elimination.

Dr. Gabriela Koller-Halmer, Department of Anesthesiology in Otto Wagner Spital, Vienna (A)

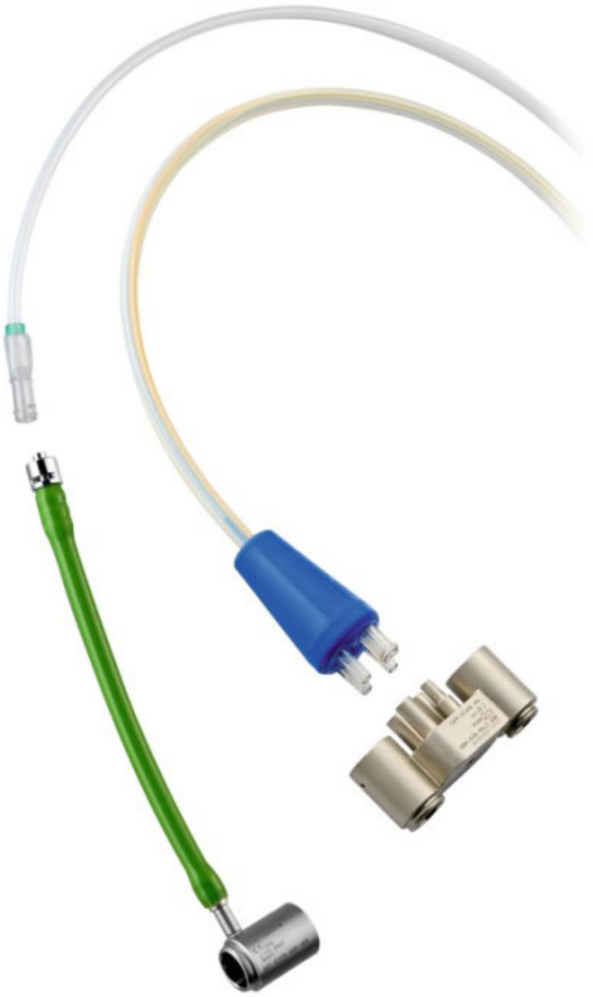
The *SHFJV*® method with a jet catheter

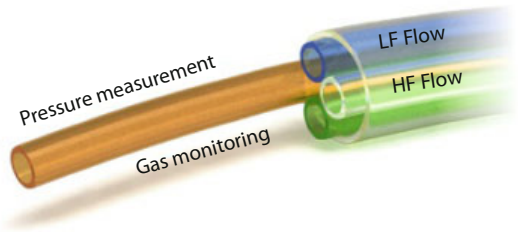
"Tubeless jet ventilation" with Carl Reiner® Jet Endoscopes, which are optimized in terms of flow technology, ensures most adequate and safe jet ventilation.



Of course indications such as open trachea resection, carina resection or lobectomies can only be performed by the use of a jet catheter. Single-, double- and three- or four-lumen catheters were specifically developed for such indications.

Three- and four-lumen catheters now permit, in addition to continued measurement of respiratory pressure, superimposed high-frequency jet ventilation with one catheter.



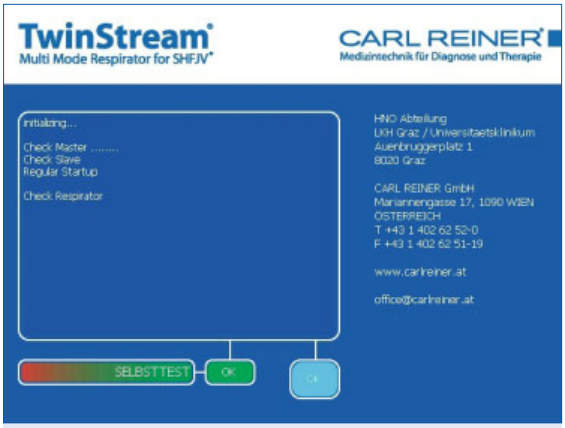


Highest level of performance

TwinStream™ performance spectrum and simple handling are impressive

While conventional jet procedures usually employ very low emission pressures and offer only one ventilation frequency, TwinStream™ is provided with 5.5 bar emission pressure (on the patient's side at the respective applicator) and two separately or simultaneously operating ventilation units.

Its enormous performance spectrum makes it possible to ventilate all types of patients: from preterm infants [1,2] to highly obese adults. Besides, TwinStream™ is the only jet ventilation apparatus in the market that is provided with standardized "AUTO START" settings even for preterm infants and children weighing one to ten kilograms (can be selected in 1-kg gradients).



Fully automatic self-test

Fully automatic self-test

The TwinStream™ autonomously accomplishes all necessary tests of the device internal functions during the start phase. Thus ideal working reliability is ensured and valuable working time is saved.

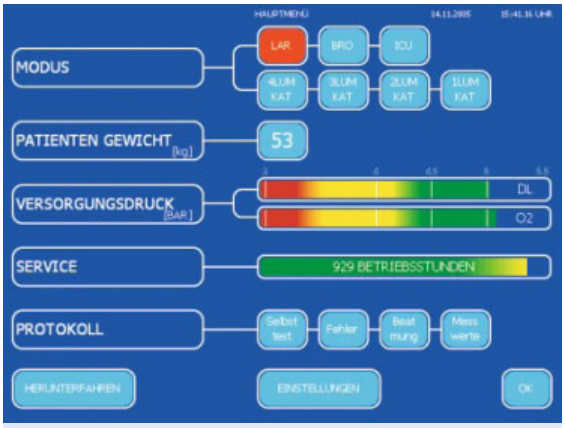
Simple and self-explanatory handling

The special features of TwinStream™ include its self-explanatory regulation, which is provided with a luminous touch screen and the so-called jog-dial system. TwinStream™ works in seven different ventilation modes for all types of jet ventilation - which applies to surgery as well as intensive care medicine.

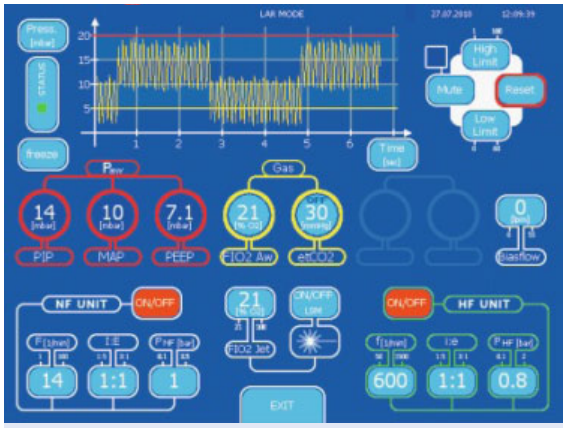
TwinStream™ is easy to operate for the anesthetist and requires no excessive attention that might distract him/her from other tasks in the operating room. The anesthetist simply selects the ventilation mode in the main menu and enters the patient's weight. The resulting initial setting of the respirator takes the respective jet instrument and accessories into account.

> The spectrum of indications has been significantly extended by the fact that jet laryngoscopes are offered for preterm infants and children. Supraglottic high-frequency ventilation can be performed optimally even in complex situations.

Assoc. Prof. Dr. Assen Koitschev, Department of Pediatric ENT and Otology, Clinic of Stuttgart – Olga Hospital (D)



Main menu: Mode selection and input of the current patient's weight



AUTO START setting: automatic preconfigured ventilation parameters accounting for patient's weight and the currently used endoscope

Smooth monitoring

The simple and clear design of the displays permits smooth monitoring. Due to the color differentiation of the displays, values can be identified at a glance from a distance. The data shown on the screen include the following:

- peak inspiratory pressure (PIP)
- positive end-expiratory pressure (PEEP)
- mean respiratory pressure (MAP)

- inspiratory oxygen concentration (FIO_2 jet),
- the ventilated patient's oxygen concentration (FIO_2 AW)
- end-tidal CO_2 ($etCO_2$) (no expendables are required)

- bias flow for entry or exit and for operating an active humidification unit
- ventilation unit of normal frequency, with F; I:E, EP (emission pressure)
- high-frequency ventilation unit, with F; I:E, EP

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1 G. Mausser, MD; G. Friedrich, MD; G. Schwarz, MD; Airway management and anesthesia in neonates, infants and children during endolaryngotracheal surgery; Pediatric Anesthesia 2007, 17:942-947

2 M. C. Grasl, MD; A. Donner, MD; E. Schragl, MD; A. Aloy, MD; Tubeless Laryngotracheal Surgery in infants and children via Jet Ventilation Laryngoscope; The Laryngoscope 1997, 107:277-281

Unique apparatus to avoid the risk of burn

TwinStream™ laser safe mode

During microlaryngoscopic laser surgery of the respiratory tract under jet ventilation, even when using so-called laser-resistant materials [3] there is a residual risk of complications due to inflammation and burns. This is because particles are released from the patient's operated tissue ("laser smog") which, under certain circumstances, may catch fire in an atmosphere that is rich in oxygen [2]. A prerequisite for reliable exclusion of the risk of fire is knowledge of the oxygen concentration within patient's respiratory tract.

Unique functional principle

Down-regulation of FIO_2 in the apparatus to below 40 percent does not immediately ensure the appropriate O_2 concentration in the patient's respiratory tract. "Washing out" oxygen is massively dependent on the respective flow and pressure settings and may take anything from a few seconds to several minutes.

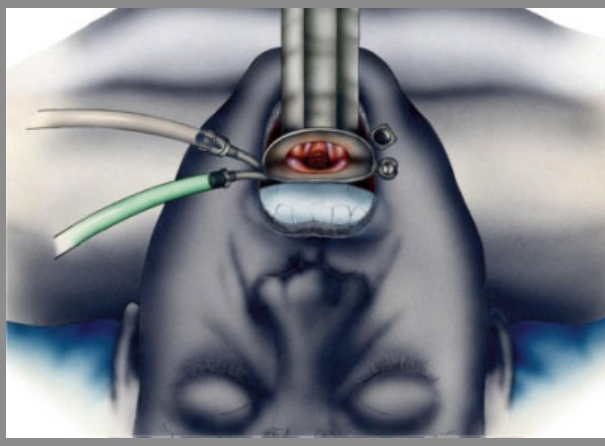
TwinStream™ is the only jet ventilation system in the market today that is provided with two oxygen measurement cells: the first is for monitoring inspiratory O_2 and the second is for measurement of the O_2 level within patient's respiratory tract. Thus, the oxygen level in the patient's respiratory tract can be determined and measured reliably and permanently – this is a special safety feature of the Laser Safe Mode [1]. TwinStream™, by its laser safe mode, is completely free of the risk of explosive deflagrations or burns in the respiratory tract due to protracted inflammable material.

When the target value level is achieved, TwinStream™ emits a green flashing signal which indicates that laser can be used.

"TwinStream™ allows safe ventilation of the patient without intubation. Several interventions, especially laryngeal stenoses, could not be performed without superimposed jet ventilation because the patient cannot be intubated when the larynx is constricted."

Univ. Prof. Dr. Gerhard Friedrich, Dept. of Ear, Nose and Throat Diseases, University Clinic and Regional Hospital of Graz (A)

Optimal tubeless ventilation



TwinStream™ is perfectly qualified to support efficient surgery

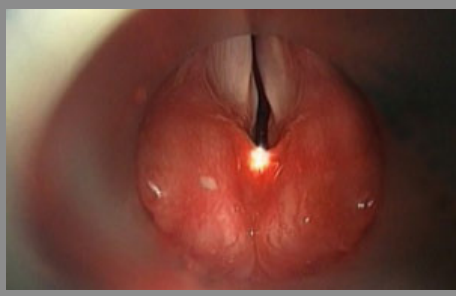
TwinStream™ is as predestined for laryngeal micro- and laser surgery, tracheal stent application and short tracheal stenoses as it is for rigid and interventional bronchoscopy, because tubeless *SHFJV*® with TwinStream™ does not hinder the surgeon's work through a ventilation tube or a jet catheter. In other words, any unnecessary restriction of the surgical field is avoided. Burning or melting of the endotracheal tube is entirely impossible.

Sufficient means of ventilation

Even in the presence of an obstructive respiratory tract with a lumen of just 1.5 millimeters the patient can be sufficiently ventilated by the tubeless *SHFJV*® method of TwinStream™. And what's more – this is achieved with no time limit and without the risk of barotrauma. A tracheotomy is no longer required solely for the purpose of respiration. The optimized flow technology of TwinStream™ Jet-Laryngoscopes, Jet-Tracheoscopes, Jet-Bronchoscopes and their accessories is held in high esteem by its users.

Subglottic stenosis

Tracheal polyp



Laryngeal web

1 A. Rezaie-Majd, W. Bigenzahn, D.-M. Denk, M. Burian, J. Kornfehl, M. C. Grasl, G. Ihra, and A. Aloy; Superimposed high-frequency jet ventilation (SHFJV) for endoscopic laryngotracheal surgery in more than 1500 patients; British Journal of Anaesthesia 96 (5): 650-9 (2006)

2 O. Juri, D. Frochaux, G. P. Rajan, P. Biro; Entflammungs- und Brandverhalten von biologischem Gewebe bei In-vitro-Bestrahlung mit dem CO_2-Laser, Anaesthesist 2006, 55:541-546

3 D. Frochaux, G. P. Rajan, P. Biro; Verhalten des neuen LaserJet®-Katheters bei CO_2-Laser-Anwendung unter simulierten klinischen Bedingungen; Anaesthesist 2004, 53:820-825

Comprehensive, practical and safe

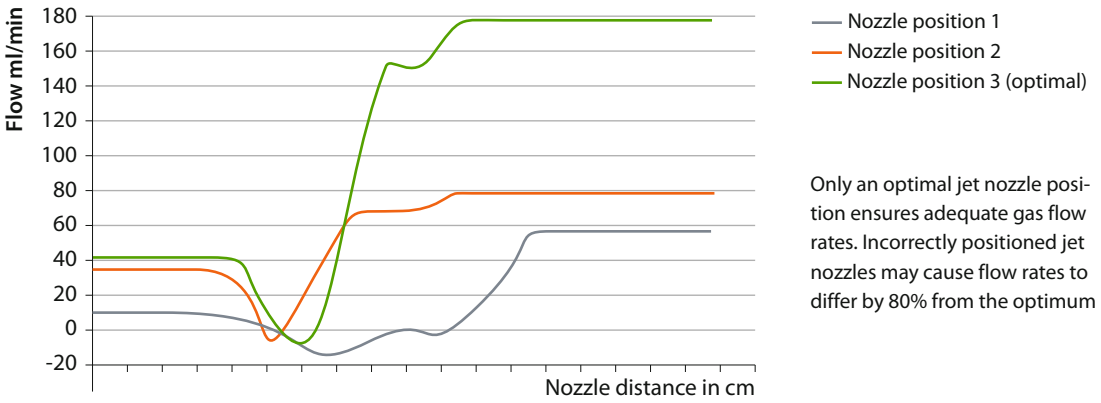
The unique TwinStream™ Jet Endoscopes and accessories

The respective connected jet instruments and accessories play a very important role in ensuring jet ventilation with no time limit. In this context TwinStream™ is exceptional in this regard: it is provided with features and options that are not offered by other apparatuses.

High-frequency jet ventilation performed solely by the use of an attached nozzle or with a jet catheter may not be feasible for a variety of reasons. Usually either normal-frequency or low-frequency ventilation can be performed, because in this situation it is not possible to achieve superimposition of two jet gas flows as that provided by the *SHFJV*® method of TwinStream™ [1,2,3].

Most up-to-date equipment

An essential prerequisite for sufficient jet ventilation is also entrainment or the suctioned ambient air. The volume of entrainment is determined by the emission pressure and input nozzles positioned at the correct site and in the correct emission angle; the placement, length and diameter of the Jet Endoscopes or the application accessories are very important in this setting.



Only an optimal jet nozzle position ensures adequate gas flow rates. Incorrectly positioned jet nozzles may cause flow rates to differ by 80% from the optimum

In the jet ventilation system of TwinStream™, the flow engineering aspects of the individual Jet Endoscopes and all of the accessories are measured by the most modern measuring equipment. Every single tube or nozzle is positioned to achieve optimum flow and has been synchronized with TwinStream™. Thus, the risk of barotrauma [1,3] is ruled out. For the user TwinStream™ guarantees greatest safety as well as reliable and sufficient ventilation in the open system. For practically every type of patient. The surgeon's complete freedom of manipulation remains unhampered by the Jet Endoscope because there is no nozzle to constrict the lumen.

Can be adapted as desired

Besides, Carl Reiner® manufacturing unit for surgical instrument can adapt any instrument to TwinStream™. After feasibility testing, all nozzles and tubes are integrated in the same manner as Carl Reiner® own instruments and synchronized to the jet ventilation apparatus. The equipment is delivered together with the measurement protocol and the certificate of compatibility.

Thus, for the user any risk associated with the use of the jet ventilation apparatus when employing the existing instruments at the clinic - which would have otherwise been termed a "manufacturer's risk" – is completely ruled out. Simultaneously, completely safe an sufficient ventilation is guaranteed.

1 Gerald C. Ihra, MD; Andreas Heid, Cand Med; Thomas Pernerstorfer, MD; Airway Stenosis-Related Increase of Pulmonary Pressure during High-Frequency Jet Ventilation Depends on Injector's Position; Anesthesia & Analgesia 2009; 109:461-5

2 P. W. Buczkowski, F. N. Fombon, E. S. Lin, W. C. Russell and J. P. Thompson; Air entrainment during high-frequency jet ventilation in a model of upper tracheal stenosis; British Journal of Anaesthesia 99 (6): 891-897 (2007)

3 T. M. Cook and R. Alexander; Major complications during anaesthesia for elective laryngeal surgery in the UK: a national survey of the use of high-pressure source ventilation; British Journal of Anaesthesia 101(2): 266-272 (2008)

Sufficient ventilation in the open system

The Jet-Converter is multifunctional

The TwinStream™ Jet-Converter is simple to use and can be easily connected to any conventional endotracheal tube, any double-lumen tube or the laryngeal mask.

Thus, the Jet-Converter can be used for the following indications:

- Selective unilateral lung ventilation with a double-lumen tube in chest surgery
- Flexible bronchoscopy through the conventional endotracheal tube or a laryngeal mask
- Mask ventilation for pre-oxygenation and exit of anesthesia
- Respiratory therapy for mucolysis

Ventilation is performed in the open system and permits application of sole, normal-frequency, or high-frequency jet ventilation as well as superimposed high-frequency jet ventilation *(SHFJV®)*.

Thus the Jet-Converter allows safe application and adequate ventilation in patients with highly limited lung compliance. It also helps to improve the quality of surgical and diagnostic interventions.

The Jet-Converter can be combined in many ways. For instance, it can be used together with the TwinStream™ breath gas conditioning device "Humicare 200TS".

"Manipulations in the central endotracheal and endobronchial region in the open system have been rendered possible only by the technique of jet ventilation."

Dr. Hubert Koller, Senior Physician, Department of Bronchology, Otto Wagner Spital Vienna (A)

> With TwinStream™ it has become absolutely safe and simple to use jet ventilation in newborns and children.

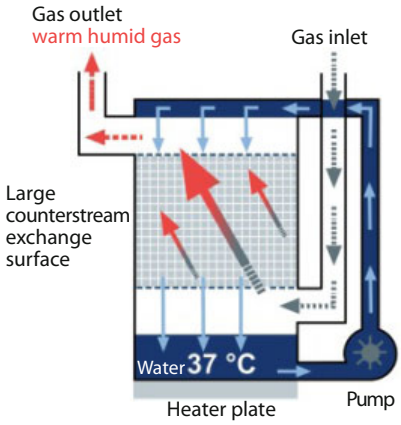
Dr. Wojciech Chrapek, Department of Anaesthesia, University Clinic of Tampere (FIN)

Gas conditioning – as perfect as nature
Optimizing jet ventilation

HumiCare® Delta is an innovative system for more effective heating and humidification of medical gases.

The new technique is superior than other humidifiers in many respects. In contrast to conventional systems its humidification performance is nearly constant and largely independent of gas flow. There is no need to heat the humidification chamber above body temperature.

As in the human nasopharynx, gas humidification and heating result from close contact with a very large and humid surface, heated to body temperature at maximum, allowing for highly effective humidification even at the very high or inconstant gas flow commonly during jet ventilation procedure.



Mix-up-proof connectors

All instruments developed for the TwinStream™ system environment utilize the smoothly functioning and secure Easy Connect plugs and sockets. These prevent the risk of mismatching lines and connectors.

Save lifes –
Save time –
Save costs

TwinStream™ with Jet Modifier – the lung-protective ventilation strategy in Intensive-Care Medicine

TwinStream and the Jet Modifier provide a ventilation procedure that permits effective oxygenation and ventilation in a wide spectrum of patients with acute lung failure, severe chest trauma, and those with ventilation-induced therapy resistance.

Pulsatile high-frequency ventilation with TwinStream™ effectively improves oxygenation with reduced ventilation pressures and the absence of negative effects on hemodynamics (such as hypotension).

- recruitment of non-ventilated alveoli for gas exchange
- enhancement of functional residual capacity
- reduced tidal volumes
- lower ventilation pressures
- reduced transpulmonary pressure
- more effective gas exchange compared to conventional ventilation techniques
- avoids all types of atelectasis as well as intraalveolar edema
- improved gas exchange with lower medium ventilation pressure, peak pressure, and positive end-expiratory pressure without a rise in CO_2 and pH values in the normal range.
- balanced volume status without a change in catecholamine dosage
- reduction of shear forces and therefore lesser release of pulmonary and systemic inflammatory mediators (pathomechanisms)
- sufficient mobilization of secretion
- predestined for use in severe chest trauma in polytraumatized patients

”

In patients with severe chest trauma and acute lung failure, superimposed high-frequency jet ventilation effectively improves oxygenation at low ventilation pressures while achieving impressive stabilization of circulation. Further clinically visible positive effects of this type of ventilation include the fact that it improves mobilization of secretion and is associated with a low risk of barotrauma.

“

Prof. Dr. S. Kleinschmidt, Department of Anesthesia, Intensive Medicine and Pain Therapy, Berufsgenossenschaftliche Unfallklinik (Trauma Clinic), Ludwigshafen

> Pulsatile high-frequency ventilation with TwinStream™ is very efficient in severe pediatric lung failure. This new ventilation system is easy to use in clinical routine and well accepted by the entire treatment team.

OA Dr. Christian Scheibenpflug, Head of the Pediatric Intensive Care Unit, SMZ-Ost / Donauspital, Vienna

Lung-protective ventilation strategy for pediatric intensive-care medicine

TwinStream™ with the Jet Modifier or Jet Converter is a successful therapy option in pediatric intensive-care medicine. For primary as well as secondary acute lung failure in various stages of maturity of the lung - from infants to young children and older children.

- Individual respiratory ventilation therapy for every type of thoraco-pulmonary-abdominal system
- Recruitment of the lung and enlargement of lung volume while maintaining a lung-protective ventilation strategy
- Less limitation of hemodynamics compared to other ventilation procedures
- Better CO_2 elimination
- Sufficient mobilization of secretion

VELMAHOS GC, CHAN LS, TATEVOSSIAN R, et al (1999)
High-frequency percussive ventilation improves oxygenation in patients with ARDS. Chest 116: 440-446

SALIM A, MILLER K, DANGLEBEN D, et al (2004)
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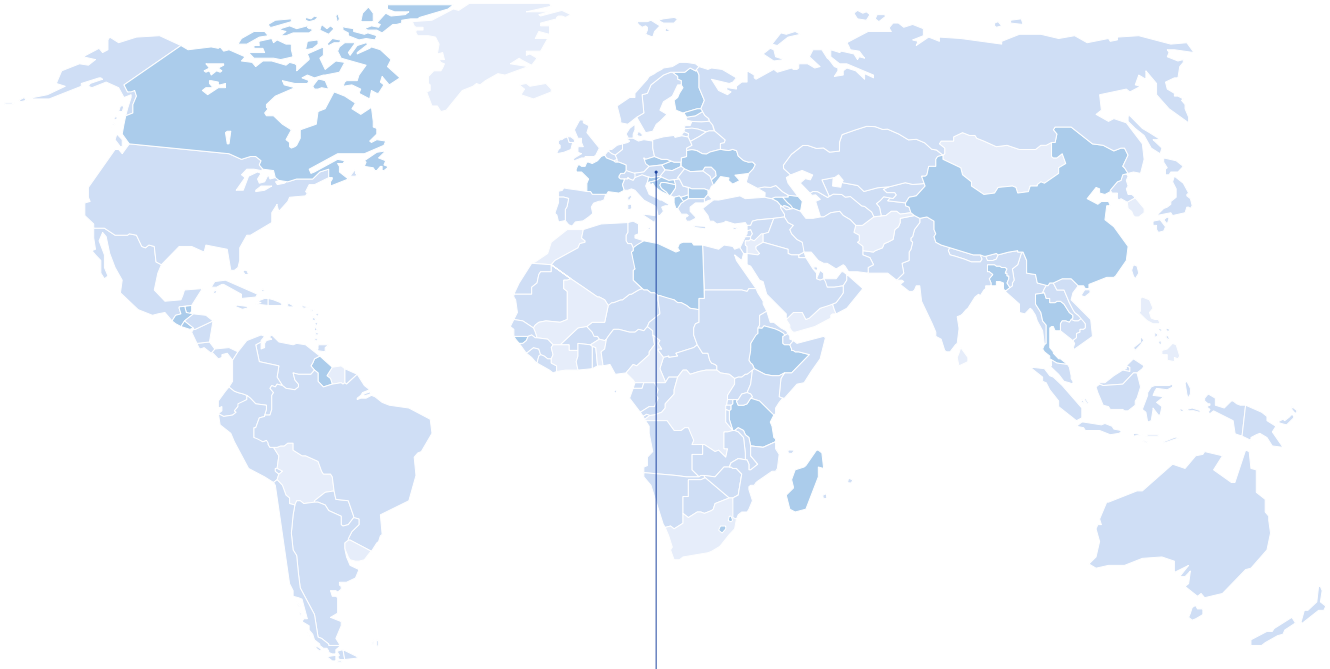

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