



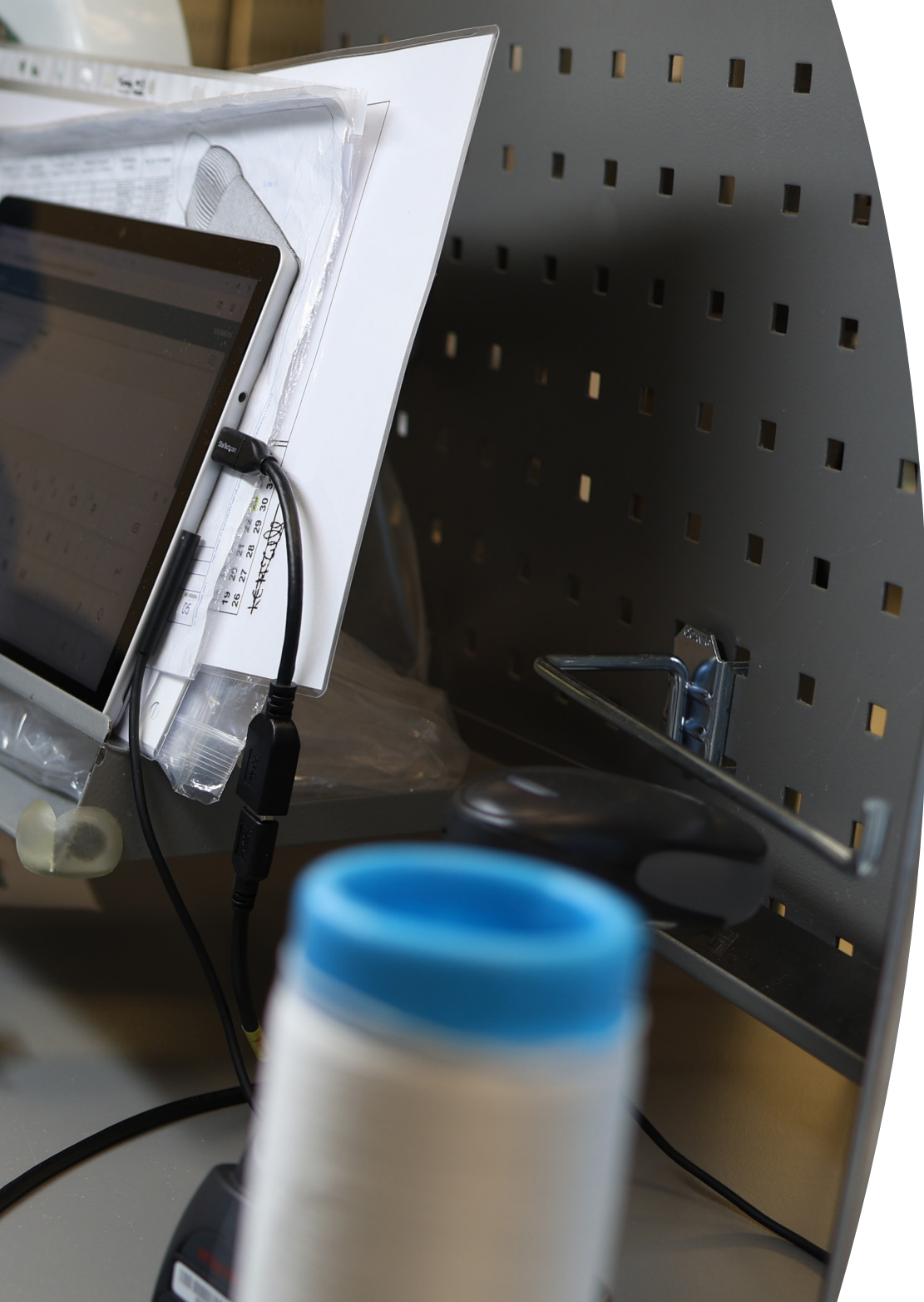
Gelweave™ Valsalva

CELEBRATING TWENTY FIVE YEARS

A Pictorial History of Gelweave™ Valsalva



Gelweave™ Valsalva being hand sewn by Kerry Lochrie in Glasgow.



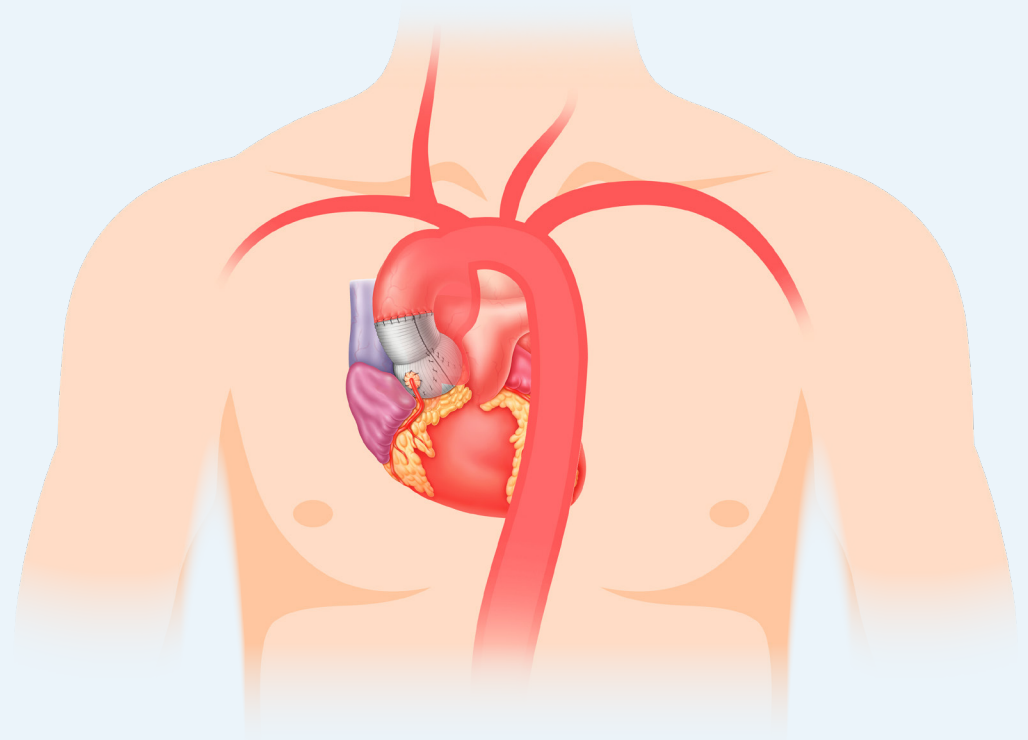
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Introduction

Terumo Aortic is a global medical device company focused on developing and providing solutions for aortic and peripheral vascular disease. We offer a comprehensive portfolio of products for treating thoracic, abdominal, and peripheral aneurysms, as well as dissections and occlusions. The company is a combination of Vascutek Ltd in the UK, who have been manufacturing knitted medical grafts since 1982 prior to undertaking woven grafts, and Bolton Medical Inc; US based leaders in endovascular aortic repair devices for the last 15 years. These two companies were brought together under the ownership of the Terumo Corporation in 2018 to form the subsidiary Terumo Aortic. We now operate in over 100 countries and have manufacturing facilities in Glasgow (Scotland, UK), Sunrise (Florida, USA) and Hanoi (Vietnam).

Since inception, as an organisation we have been committed to delivering innovative solutions that improve patient outcomes, emphasising collaboration with the clinical community. This 25th anniversary pictorial history of the Gelweave™ Valsalva graft is the story of one such successful collaboration between groundbreaking surgeon led research and Scottish artisanal skill and weaving technology, brought to scale globally. The Valsalva graft, perhaps accurately described as 'beautifully simple, without ever being simplistic' has withstood the test of time, delivering hope and reliable clinical outcomes to thousands of patients and surgeons and continues to feature as a key solution in the provision of operative aortic care.



Pictured above: Illustration depicting the position of the Valsalva graft and the heart within the body and in relation to the aorta.

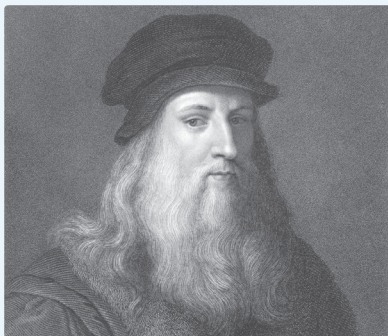
History

During the period of cultural and intellectual revival known as the Renaissance there was a humanistic and a scientific revolution, particularly in the fields of astronomy and anatomy. The first known drawings and thoughts on the mechanisms at work within the aorta's Sinus of Valsalva were made in the 15th and 16th Century in the Papal States that became Italy.

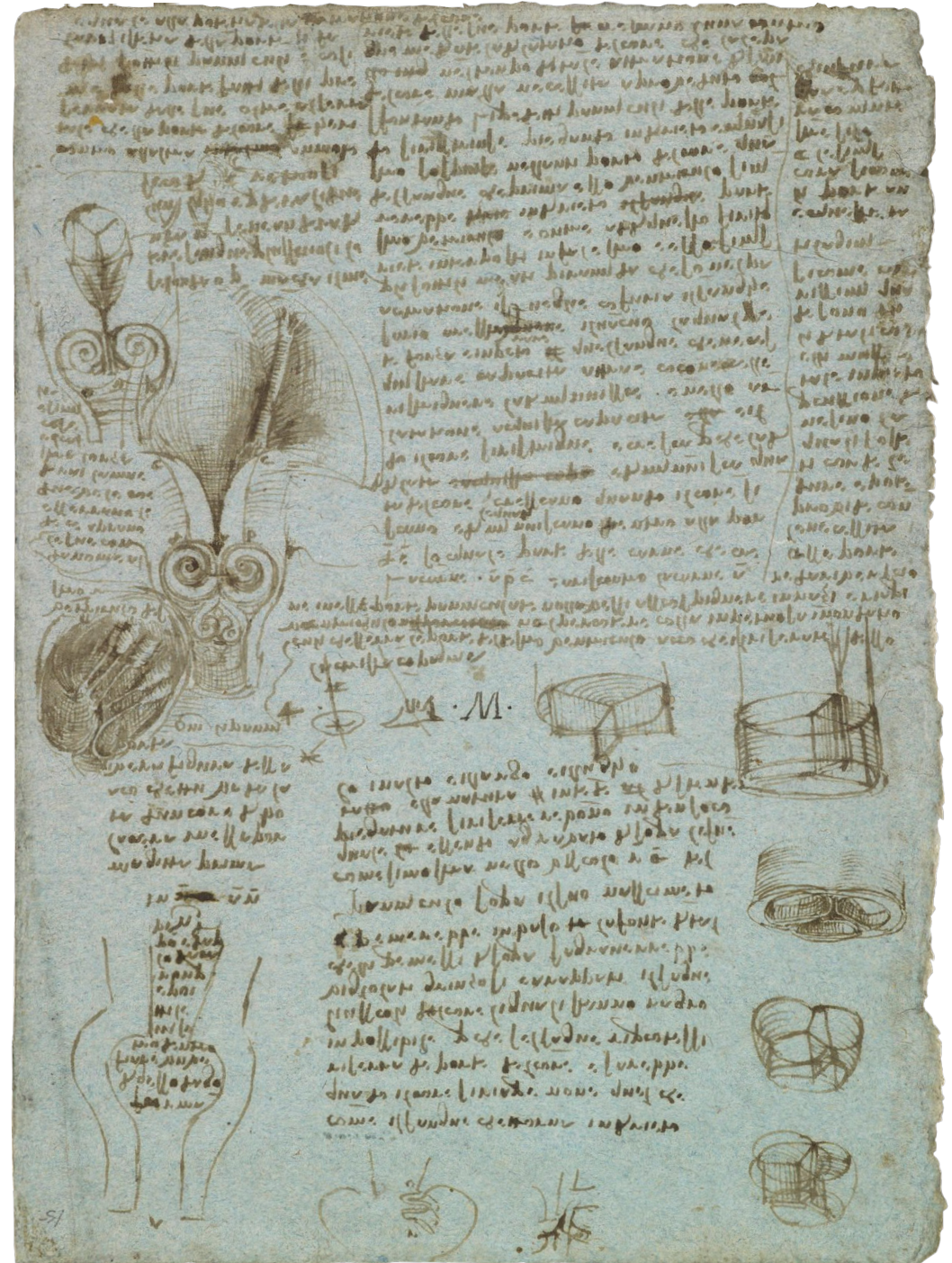
Prominent contemporary polymath Leonardo Da Vinci studied this part of human anatomy, making the notes and sketches pictured adjacently. Da Vinci's drawings and notes illustrate his understanding of how the sinuses of Valsalva contribute to the closure of the aortic valve.¹

However, it was not until the early 18th Century that the Sinuses of Valsalva were named. Antonio Maria Valsalva (1666-1723), Professor of Anatomy at the world's oldest established University in Bologna, gave his name to this aortic landmark.² Given this history of pioneering Italian research made in this part of the anatomy, it would seem very apt that a key component in its modern surgical repair would be conceived within the same lands.

For the last 25 years, the Gelweave™ Valsalva graft, invented by [Prof. Ruggero De Paulis](#) has been used to successfully treat patients suffering from conditions such as aortic dissections and root aneurysms, including those caused by genetic disorders such as Marfan Syndrome and Loeys-Dietz Syndrome. [This is its remarkable story.](#)



Pictured left to right: Leonardo Da Vinci, Antonio Maria Valsalva, Da Vinci's notes regarding hypothetical vascular treatment techniques.





Professor Ruggero De Paulis

Professor Ruggero De Paulis undertook his Cardiac Surgery training at the University of Turin. In 1986 he completed a post-doctoral fellowship at the Artificial Heart Research Laboratory at the University of Utah, Salt Lake City. His research continued at a number of major European institutions while working at University of Rome - Tor Vergata, where he would go on to be appointed Associate Professor of Cardiac surgery in 2002.

Since 2006 he has served as Director of the Cardiac Surgery Operational Unit at the European Hospital in Rome. In 2020 he was appointed **Professor of Cardiac Surgery, at Unicamillus University, Rome**. He has held 6 medical device patents, conducted over 15,000 cardiac surgical procedures and has over 300 scientific publications.

"At the end of 1980s there was a great excitement when stent-less valves first became available for clinical use. In fact, compared to the stented valve, they appeared to offer great advantages in terms of reduced obstruction of the left ventricular outflow tract and especially more physiologic movements during the cardiac cycle. This was due to the possibility that a stentless valve could use the aortic root as a natural stent. It was at this timepoint I was prompted by the chief of my resident program to study the physiology of the aortic root in detail to better understand the potential for this original approach."



"I embarked on reviewing a series of in vitro and in vivo studies focused on the anatomy and physiology of the aortic root. Perhaps the most 'turn-key' piece of information discovered was the realisation that the aortic root, in contrast to the rest of the ascending aorta, expands almost exclusively in the horizontal plane while its longitudinal compliance is almost zero.

*Valve sparing aortic procedures were rarely performed during the early '90s. Apart from few selected cardiac centers, in the majority of cases the clinical reports were reported from the originators of the two techniques; the eminent Egyptian-British **Prof. Sir Magdi Yacoub** who first described the remodeling technique and Canada's **Dr. Tirone David** who first described the reimplantation technique.*

I witnessed their presentations and the ensuing discussions many times during those years at major Annual Meetings. Prof. Yacoub claimed his technique was more physiological because it re-established the sinuses of Valsalva whilst Dr. David claimed his to be more durable because it addressed the annular dilatation. I remember being intrigued by the challenge of finding a solution that could somehow combine the two options.

By 1998, while assisting during a Bentall procedure, my thinking was directed towards the need for a material that would stretch horizontally so to fill the space previously occupied by the root aneurysm. To my knowledge, such a material did not exist, but I was certain a cylindrical conduit was not the best solution for substituting a pear-shaped piece of anatomy."

Prof. Ruggero De Paulis | Open Letter to Terumo Aortic



Pictured: Dr. Tyrone David (Left) | Prof. Sir Magdi Yacoub (Above)



Pictured: Dr. Ruggero De Paulis and his wife Stefania Paciello (Above)
The dress designed by Stefania which inspired Valsalva's construction (Top Right)



Design Inspiration

"My wife, who is a fashion designer, had been working on a peculiar womens dress completely made by pleated tissue material (plissé is the commonly known French word). The upper part had horizontal pleats to smoothly adapt to the shape of a narrow waist, while the lower part (corresponding to the skirt) had vertical pleats that would naturally open and close with the leg movements.

I suddenly visualised the perfect shape for a Bentall procedure and the potential for providing sinuses to a David procedure.

She explained that the pleats were made permanent by heating up the material (I would later discover this is also how corrugated Dacron and ultimately, Gelweave is created) and that the only way to have pleats at a 90-degree angle to each other was to sew two different pieces of the same material together.

On the kitchen table, with the help of my wife, I cut open a corrugated Dacron graft, rotated by 90 degrees and sewed it back on.

The Valsalva graft was born..."

Rome, June 8, 2000

Ruggero De Paulis, MD
Divisione di Cardiocirurgia
Università degli Studi "Tor Vergata"
European Hospital
via Portuense, 700
00149 Roma

Dear Doctor De Paulis,

We are pleased to inform you that your revised manuscript entitled "*A new aortic Dacron conduit for surgical treatment of aortic root pathology*" (re.no. 96/00) has been accepted for publication in the Italian Heart Journal. We plan to publish this paper as early as possible.

Thanking you for your collaboration, we send you best regards,

Sincerely yours,


ATTILIO MASERI
Editor

Research methods and new therapies A new aortic Dacron conduit for surgical treatment of aortic root pathology

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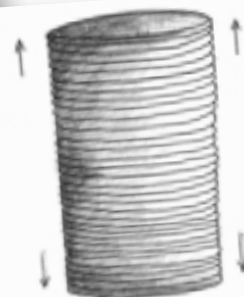
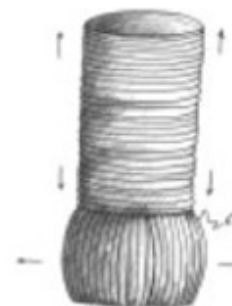


Figure 1. A standard Dacron aortic conduit is horizontally corrugated. It has a significant compliance in the longitudinal direction but none in the horizontal plane.



The modified Dacron aortic conduit has a small portion longitudinally corrugated that allows a certain degree of compliance in the horizontal plane. While the lower part of the graft ("skirt") has compliance in the longitudinal plane, the rest of the conduit has compliance in the horizontal plane. The diameter is equal to the diameter of the aorta.

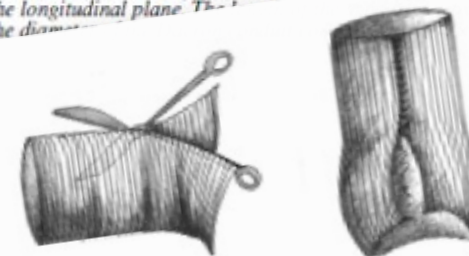


Figure 3. Method of manufacturing: a portion of a standard Dacron aortic conduit with a length approximately equal to its circumference is cut open longitudinally and resutured laterally to obtain a longitudinally corrugated conduit. Next, a portion of the standard Dacron conduit to obtain the modified aortic conduit as in figure 2.



Figure 4. The modified Dacron aortic conduit in its valved version. The valve prosthesis is attached to the end of the "skirt" in a standard fashion.



Pictured: Dr. Ruggero De Paulis and Roshan Maini, OBE. Image is for illustrative purposes only.

Technology Partnership



"In the late 90's very few surgeons were doing valve sparing procedures, most were valve replacement. Therefore, I had to convince Vascutek, now Terumo Aortic, the product would address the Bentall needs first on the basis that the geometry would reduce tension on the coronary sutures. I was very appreciative of the time former Vascutek CEO Roshan Maini afforded me to outline the product and its applications."

Prof. Ruggero De Paulis | Open Letter to Terumo Aortic

- A. Aortic root aneurysm with normally functioning mechanical aortic valve prosthesis.
- B. With the aneurysm resected, and with normal valve function confirmed, the root is mobilised and "buttons" are fashioned containing the coronary ostia.
- C. A graft is sutured to the valve cuff with three 2-0 polypropylene sutures, including the valve sewing cuff and the aortic remnant with each pass of the suture.
- D. With the graft secured in position, the coronary buttons and distal anastomosis are constructed.
- E. Completion Bentall procedure using a Valsalva graft.⁴

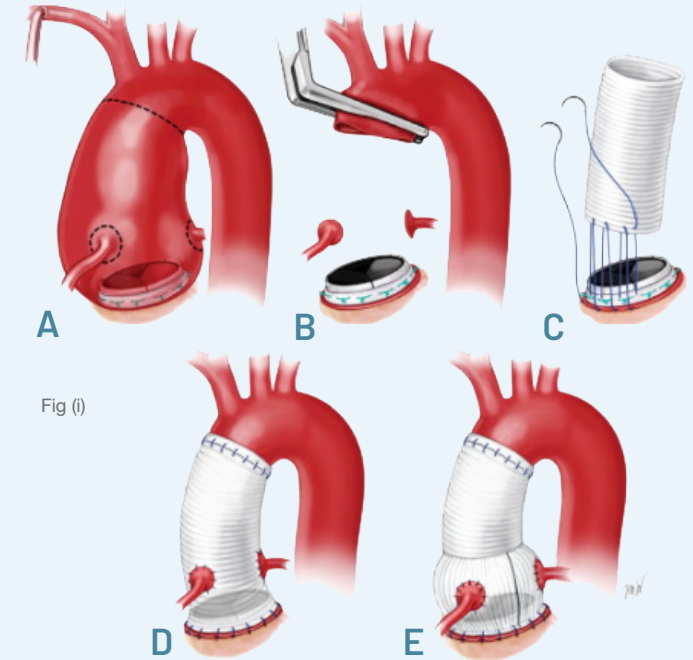
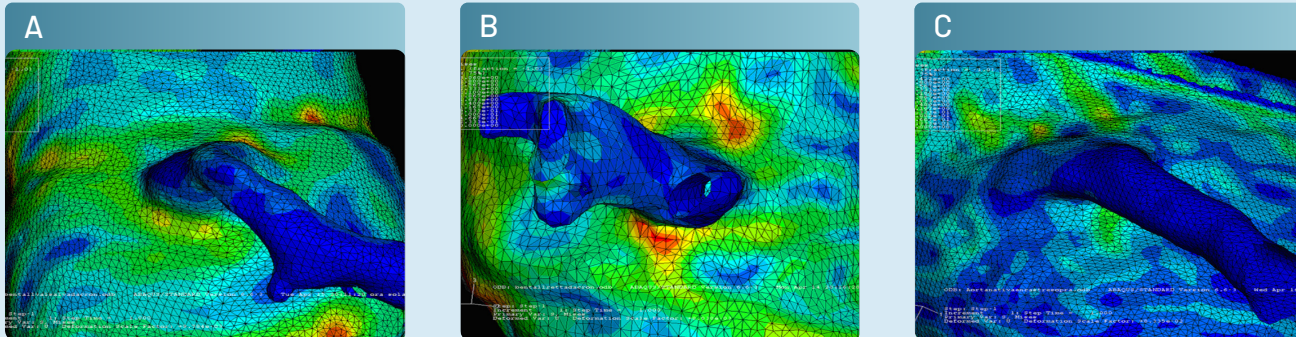


Fig (i)

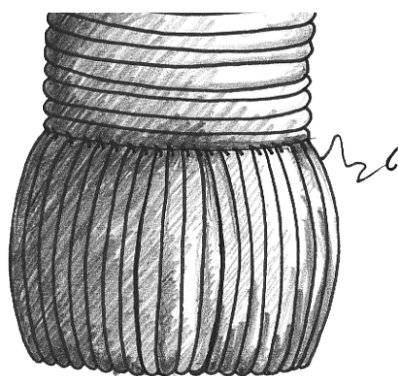


Finite element analysis comparing stresses around the coronary button insertion points in (a.) a healthy aorta, (b.) a cylindrical graft supported aorta and (c.) a Valsalva graft supported aorta. The Valsalva graft shows a 50% reduction in the stresses compared to the cylindrical graft.⁵

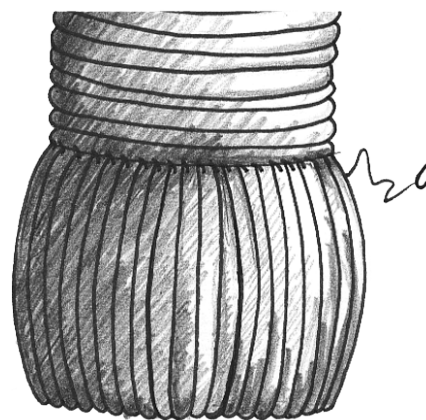
Fig (ii)

Valve Sparing Design Features

Soon after commercialisation, surgeon awareness of the graft grew as they realised the product design was ideally suited for valve sparing procedures (David I & Yacoub). The expansive nature of the device's skirt conferred practical benefits implanting around the anatomy, whilst recreating the natural space to encourage the desired blood flow patterns



The length of the skirt is equal to the diameter of the graft



The compliance/expansion of the skirt is 30% of the diameter of the graft

"In the last 20 years the number of valve sparing operations has increased enormously. The Gelweave™ Valsalva graft is clearly proved to be a factor in this uptick by achieving near normal physiology when doing a valve sparing operation"

Prof. Ruggero De Paulis | Open Letter to Terumo Aortic

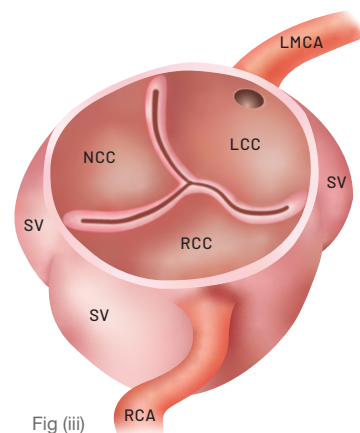
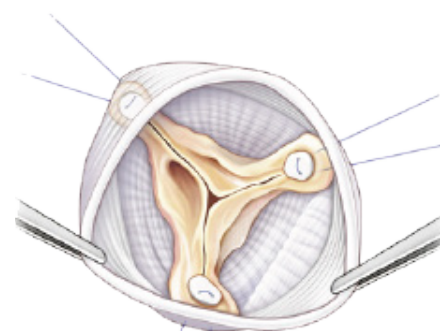


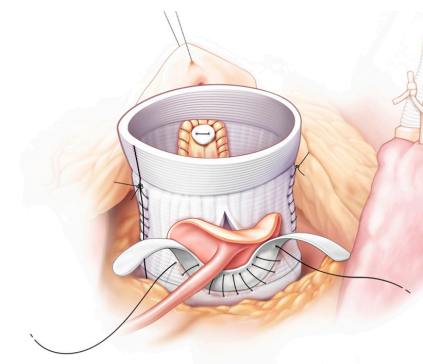
Fig (iii)

The three aortic sinuses of Valsalva (SV), the left coronary cusp (LCC), the right coronary cusp (RCC), and the noncoronary cusp (NCC). The left main coronary artery (LMCA) and the right coronary artery (RCA)



Valve 'leaflets' attached to graft skirt

Fig (iv)



Coronary arteries reattached to graft skirt

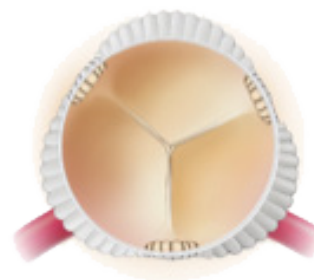
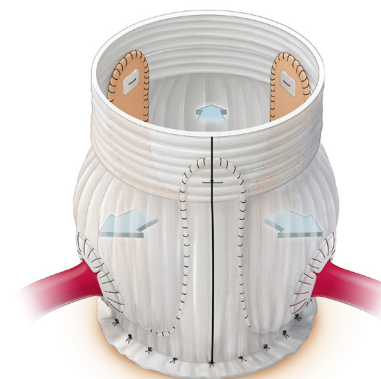
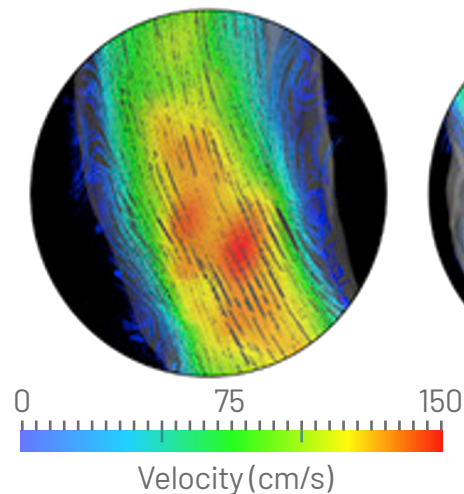
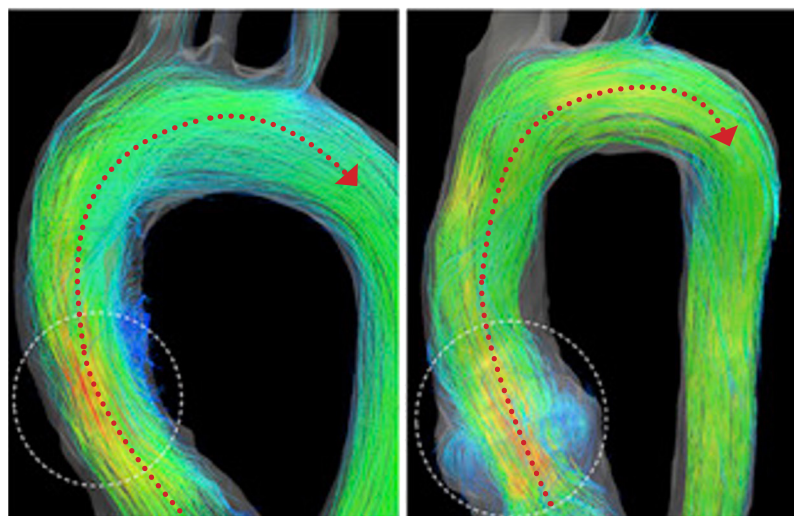


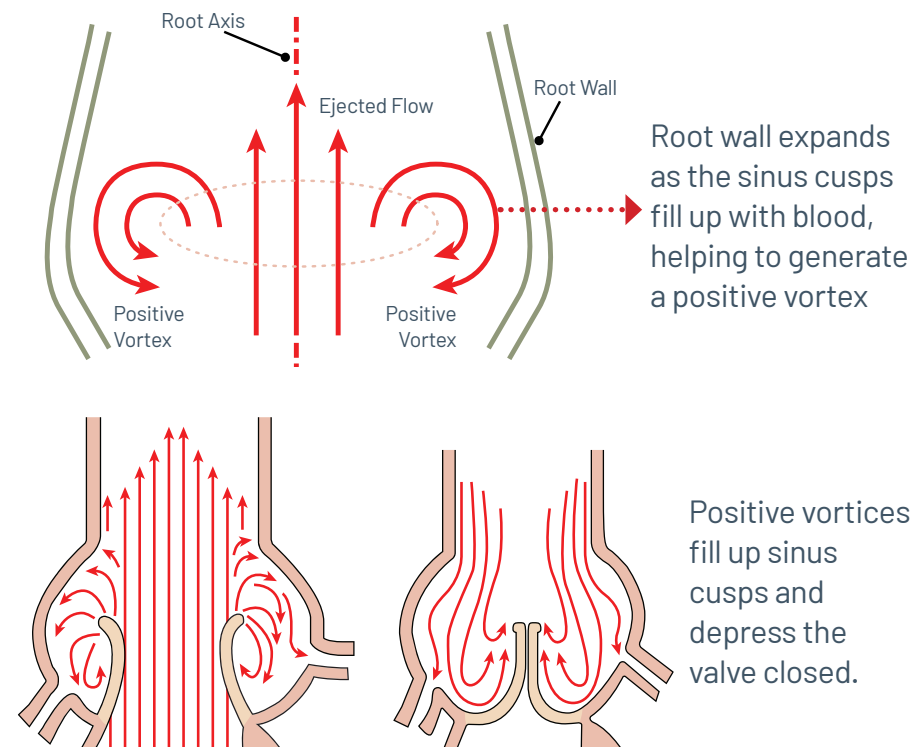
Fig (v)



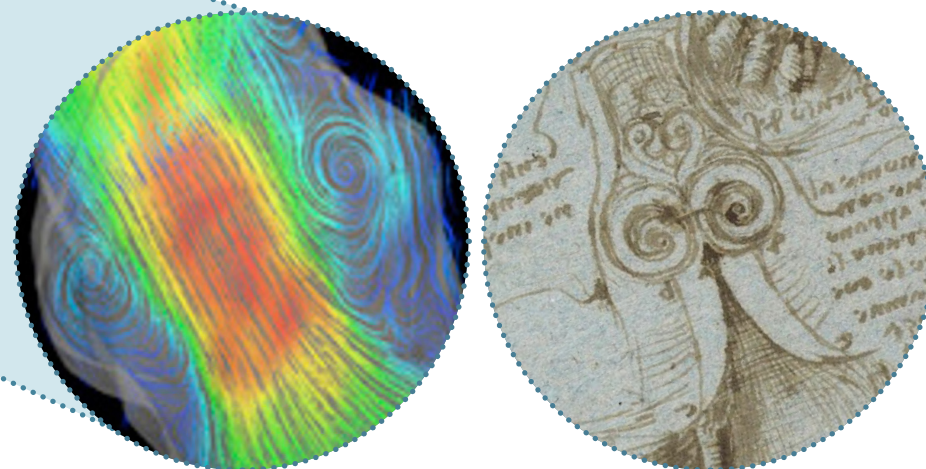
3D MRI image showing velocity of Aortic blood flow⁶**A** Straight Tube**B** Neo-SV

MRI image compares (A.) a Straight Tube with (B.) a Valsalva graft.

The expanding skirt 'billows' like the natural sinuses during normal circulation. This allows the blood to swirl into vortices that occur naturally to drive the opening and closing mechanism of the valve.



The normal function of the sinuses of Valsalva do indeed work as described by Leonardo Da Vinci 500 years ago.





Robert Welsh

General Manager Terumo Aortic Glasgow

"Over the last 100 years there have been many revolutionary, iconic designs that have had an impact on their field of use while remaining effectively unaltered over several decades. These designs withstood the test of time proving that the inventors were part of a rare breed of talented individuals that got it right first time. Some examples are, the Volkswagen Beetle first produced in 1938 retaining its revolutionary aerodynamic design for over 6 decades. The Tetra Pak carton first used in 1951 making food safer and more available, still in common use today. In the medical device field the Charnley Hip, designed for use in the first pioneering total hip replacement procedures in the 1960's and still being used virtually unaltered today.

Terumo Aortic also have a design classic that is worthy of being considered a member of this exclusive club, the Valsalva graft. This product has reached the incredible milestone of 25 years in manufacture, with sales around the world still continuing to grow. The graft has also been used by a number of major multi-national Cardio Vascular companies in conjunction with their own products. Again the basic design has remained effectively unaltered and there is no reason to believe that it will not be around for another few decades."



Pictured: Robert Welsh (General Manager, Torum Aortic Glasgow) leading a tour of the Newmains facility in Glasgow (2023)

Gelweave™

At the beginning of the 21st Century, Vascutek's research and innovation in implantable fabrics, coupled with their in-house artisan hand-stitching finishing skills made the company ideal partners for commercialising the Valsalva grafts.

Pictured: Marion and Janice Scott working on Gelweave™ grafts at Terumo Aortic Glasgow (2025)

A person wearing a blue cleanroom suit and hood is seated at a workstation, working on a medical device. The device is a white, flexible, tubular structure. The person is holding the device with both hands. In the foreground, there is a white machine with a black handle and a white tube. The background is a cleanroom environment with white walls and a black chair.

Linda Cunningham

Manufacturing Shift Lead **Terumo Aortic Glasgow**

Linda has been part of the Gelweave™ Valsalva journey from the very first stitches being sewn at our Newmains facility.

"I can't quite believe we have reached the milestone of 25 years making the Valsalva graft. When I reflect on all the changes that have happened at Vascutek/Terumo Aortic in that time but the graft has remained almost completely unchanged since the first designs. I remember being involved with sewing the early prototypes and today I'm part of a team of dozens of sewers who are producing hundreds of the graft every month. I'm privileged to have been part of the journey from day one and hopefully for a wee while longer."



Visit to Terumo Aortic Glasgow

Prof. De Paulis visits the Gelweave sewing team at Terumo Aortic Glasgow along with the first ever Valsalva acute dissection patient, Gianfranco Supino and Terumo Aortic's Eugenio Loreti. February, 2020





Stuart Garvie

"I had an aortic dissection and required immediate and life-saving surgery in Dublin. I had been feeling very physically fit so what happened when I had the dissection was a complete surprise. I just felt something inside me had moved and I felt I needed go to hospital... Later that morning my wife received a call saying, 'if we do not operate now, he will not survive the next hour', so fortunately she gave consent for the operation.

I don't feel the graft or anything inside different...there is not much I can't do. There really isn't... I've got a really good quality of life, I really do. I travel a lot. I don't seem to fall ill with anything, Its good.

I think the technology now and what can be repaired....its technology way beyond what you would have ever thought, that you've got something inside you that's woven in a factory...it's amazing. The whole thing is quite something. At Patients day watching one of the ladies' hand-finishing the graft with the needlework and sewing.. It's almost unbelievable the skill that's there."

Stuart Garvie during visit to Terumo Aortic Glasgow in 2024

Gianfranco Supino

"What I can tell you is that the quality of my life has been fully preserved. After less than 20 days I was able to restart working without any medical difficulty. After 1 month I was able to restart my workout, not so intense of course but I was able to recover that important piece of my life. After 6 months roughly, I was back to my normal life.

Initially the requirement for surgery was an 'earthquake' needless to say, but after that event I can tell you my life has dramatically improved because of the value I give to each single day is higher than the value I used to give prior.

You cannot imagine the complexity, the art, the magic which is behind those artifacts (grafts). In my chest there is now a jewel beating somehow, together with my heart. It was wonderful to visit Terumo Aortic and see the sewing team investing so much of their time making the grafts perfect because they can save lives and allow normal life to continue."

Gianfranco Supino during visit to Terumo Aortic Glasgow in 2020

Mr Supino was the recipient of the the first Valsalva graft for Acute indications.



Eileen Novins

Chief Global Business Development Officer
The Marfan Foundation

*"We congratulate Terumo Aortic on 25 years of the Gelweave™
Valsalva graft and their work to advance science, quality of life, and
longevity for people living with genetic aortic and vascular conditions"*

Eileen Novins during her visit to Terumo Aortic Glasgow in 2025.



Victoria Hilton

Helpline & Communications Manager Marfan Trust

"Since our charity's inception in 1988, revolutions in medicine and healthcare have extended the lives of Marfan syndrome patients across the world. To borrow physician Professor Reed Pyeritz's oft-quoted line: "Thirty years of research into Marfan syndrome has resulted in approximately 30 years of increased life expectancy for individuals with the condition". What was once a bleak prognosis is now filled with hope, as patients today are reaching old age.

As the sole charity in the United Kingdom dedicated to improving and saving the lives of people with Marfan and Loeys-Dietz syndromes, the Marfan Trust strives tirelessly to support patients, educate the public and research improved treatments. Our medical helpline is a lifeline, and we are kept constantly busy. Underpinning the advice and guidance we dispense to patients is optimism and confidence drawn from clinical evidence. Today, every symptom of Marfan can be managed and treated by virtue of the progressively sophisticated medication and increasingly ingenious devices, including the Gelweave Valsalva.

Of the aortic complications in Marfan and Loeys-Dietz syndromes, it is the root that is the most vulnerable and at risk of dilation and dissection. Terumo's Gelweave Valsalva is one of very few devices offering not just protection but life. That it remains widely used today to repair or replace the aortic root, 25 years since inception, is remarkable. The graft mimics mother nature herself and during my tour of Terumo Aortic in Glasgow, I witnessed the dexterity of the employees as they hand-sew these "tubes of life". Very little is automated and virtually everything hand-crafted in the factory's vast cleanrooms where patients' pictures adorn the walls.."

Victoria Hilton during her visit to Terumo Aortic Glasgow in 2025.



CONNECTING THE UNCONNECTED AND STRENGTHENING LIVES



PROFESSOR

Aung Ye Oo, MD, MBBS, FRCSEd (CTh), MD

St Bartholomews Hospital, London,
Cleveland Clinic, London

Professor of Cardiovascular Surgery Clinical Lead for Aortovascular Surgery at The Barts Heart Centre, Barts Health NHS Trust and the NIHR Biomedical Research Centre at Barts, William Harvey Research Institute, Queen Mary University of London, St Bartholomews Hospital.

"Congratulations to Terumo Aortic and Ruggero De Paulis on the 25th Anniversary of the Valsalva graft! This is an example of how forward-thinking industry working in partnership with clinicians has led to an outstanding surgical product which has helped more than 150,000 patients across the world over last 25 years."

The design of this graft with basal ring and sinotubular junction, facilitates annular and STJ stabilisation and transform practice in Valve Sparing Root Replacement (Re-implantation Technique). In addition, this graft with sinus design accommodate space between biological valve struts and the graft allowing generous space for coronary button anastomoses without tension.

This graft has been one of the go-to armamentarium in my clinical practice over last 25 years. I would like to congratulate the medical engineering team and the production team for their achievement in making of such a time-tested outstanding product for the benefit of the patient population in the aortic space."

Prof. Aung Ye Oo | Open Letter to Terumo Aortic

DOCTOR

Joseph E. Bavaria, MD, FACS, FRCS

Thomas Jefferson University,
Philadelphia, Pennsylvania

Anthony E. Narducci Professor & Chair, Department of Cardiac Surgery. Executive Director; Bruce and Robbi Toll Heart & Vascular Institute, Jefferson Health, Thomas Jefferson University, Philadelphia, PA. 52nd President of The Society of Thoracic Surgeons (STS).

"My congratulations to both Terumo Aortic and Prof. Ruggero De Paulis for designing, manufacturing and continually improving the Valsalva graft. The product has been radical and revolutionary in the field of aortic root surgery and reconstruction, as well as Thoracic Aortic treatment in all domains.

Thousands of patients have benefitted from this invention and its broad applicability is a key feature. It's hard to actually describe the beauty, simplicity and functionality of the device. I've used it in Valve Sparing Aortic Root Reconstruction, both in 3-cusp valves and bi-cuspid valves. I've used it with Bio-Bentall and Mechanical Composite procedures. I've used it in all of the 'Aortic Disease Domains' including Aneurysm, Dissection, and Redo Root Surgery as well as Syndromic and Familial etiologies. Its broad applicability is its genius. Its availability has democratized Aortic Root surgery for Cardiac Surgeons and therefore has had a tremendous impact on the lives of our patients across the world.

I've implanted thousands. I'm looking forward to implanting a thousand more"

Dr. Joseph E. Bavaria | Open Letter to Terumo Aortic



Milestones on the Journey

2000

First implant at the European Hospital, University of Tor Vergata



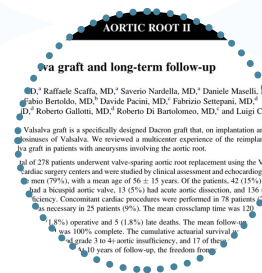
2003

First mechanical valved conduit made with Valsalva



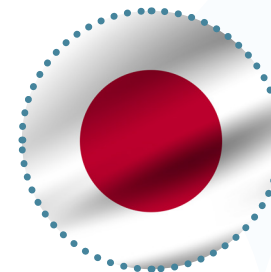
2010

'The Use of Valsalva Graft and Long term follow up' Review⁷



2002

Launched in the USA



2005

Launched in Japan

2019
Over 100,000
implants*



2015
Global distribution in
>70 countries



2020
20 year milestone
reached



Gelweave™ Valsalva
CELEBRATING TWENTY FIVE YEARS

* Implants based on Terumo Aortic sales data

Global Impact

Aortic dissection accounts for 3 out of every 1000 emergency department presentations involving acute chest, back, or abdominal pain.⁸

The condition predominantly affects individuals between 40 and 70, with most cases occurring in patients aged 50 to 65. Approximately 75% of dissections happen in this age range, highlighting age as a key risk factor.⁸

While men are 3 times more likely to develop aortic dissection than women, women often present later in the disease course and have worse outcome.⁸

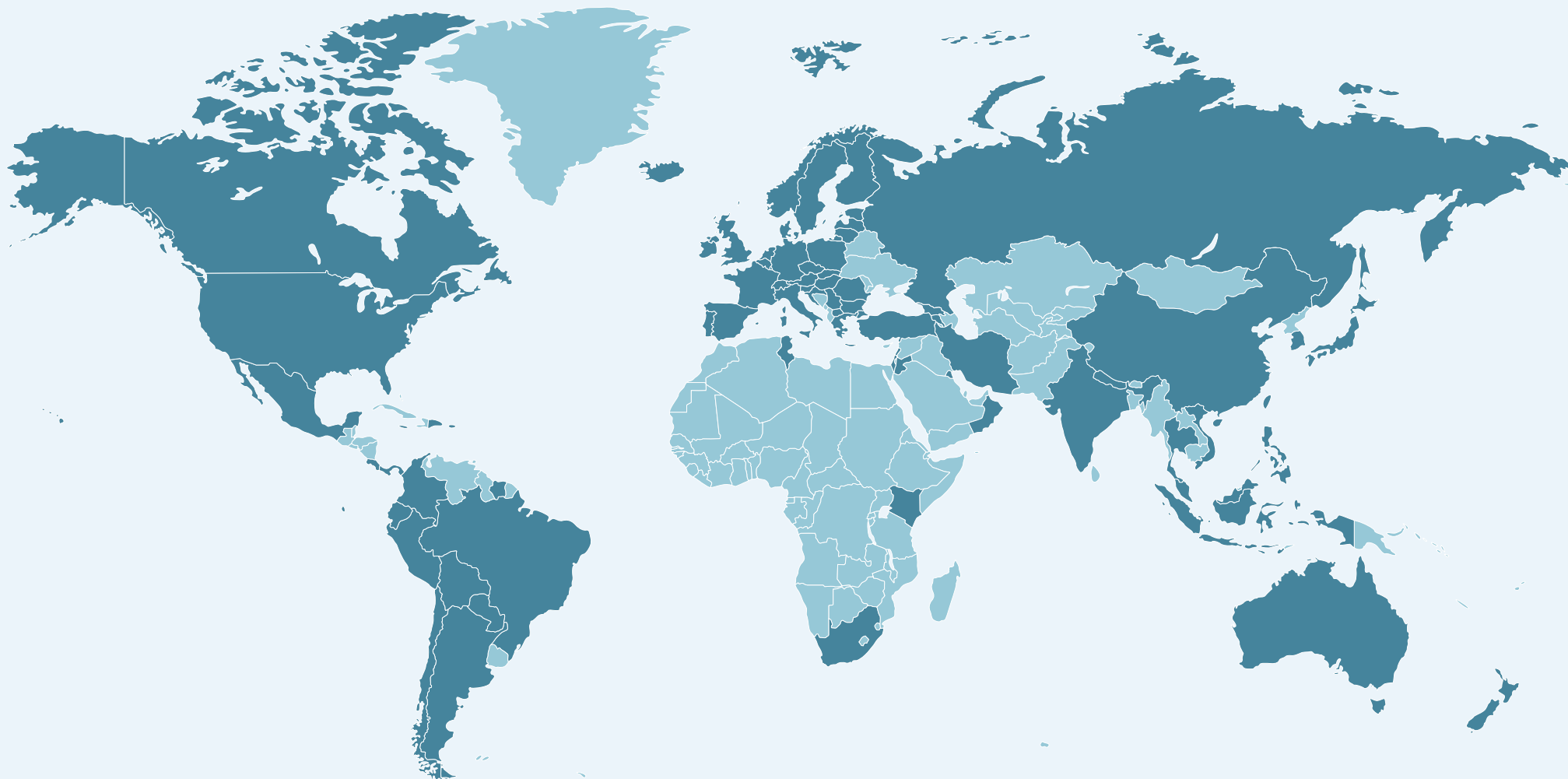
Marfan Syndrome: Marfan syndrome is one of the most common inherited multisystem disorders of connective tissue. This autosomal-dominant condition has a reported incidence of 2-3 per 10,000 individuals.¹⁰

Loeys-Dietz Syndrome: The exact prevalence of LDS is unknown but estimated to be 1:50,000.¹¹

European Registry of Type A Aortic Dissection (ERTAAD). A Bentall procedure was performed in 862 patients, while a David operation was performed in 139 patients. Both operations can feature the Gelweave Valsalva device. After propensity matching to include 115 pairs, the registry found no statistically relevant difference in post-operative outcomes.¹²

GELWEAVE™ GLOBAL AVAILABILITY*

Over 150,000** Gelweave™ Valsalva grafts shipped worldwide



* Global distribution footprint of Gelweave™ product circa 2015 - 2021

** Implants based on Terumo Aortic sales data

Design Variations

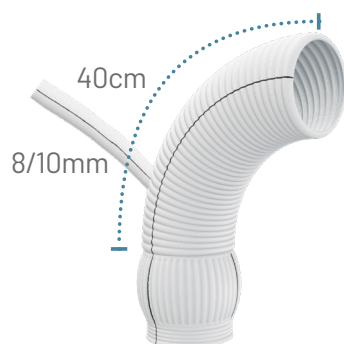
What has proved to be the key design feature for the Valsalva graft over the years is the circumferential expansion and contraction of the skirt. Due to its design and versatility, the Valsalva graft has changed the standard of treatment for the root pathologies. From Bentall to Remodelling, to Reimplantation, to supported Ross, and more, all techniques take advantage of the peculiar Valsalva design.

Following the launch of the original graft and its 510(k) clearance in the USA two years later, there was a flurry of modification requests from the field via the 'specials' program* that was an early pre-cursor to today's Pioneer program. Certain anatomical requirements saw the development of the Narrow and Short Skirt devices, requested by Professor Laufer at the University of Vienna, Austria and Professor Minami at Heart Center North Rhine Westfalia, Germany. The development of the Ante-Flo device was first used by Dr De Pot in Belgium and paved the way for product registration and acceptance in Japan. The Florida Sleeve featuring a cut out ostium was conceived and shipped to Dr Beaver at the University of Florida Health located in Gainesville, Florida, USA in 2007.

Whilst the device and its various options continue to go from strength to strength, it is worth noting there are plans to continue the development of the device in line with new technologies and approaches to cardiovascular surgery.



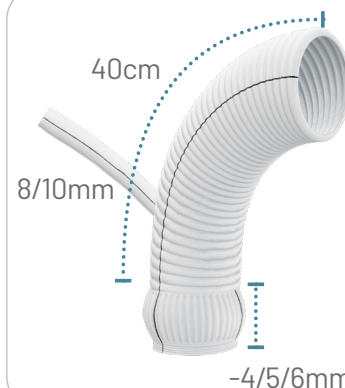
* this is different to Special Access programs which require there to be an unmet clinical need for a specific patient which requires specific authorisation for each case.



Ante-Flo

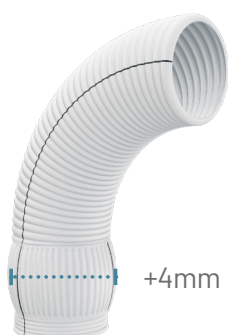
- ▶ **8mm or 10mm** side branch
- ▶ **40cm** body length

The Ante-Flo version of the device facilitates antegrade perfusion through the side branch during the procedure



Ante-Flo – Short Skirt

- ▶ **8mm or 10mm** side branch
 - ▶ **40cm** body length
 - ▶ Skirt **-4mm-6mm** shorter than bore diameter
- As per the standard version, the Ante-Flo version of the device facilitates antegrade perfusion through the side branch in anatomies where a short skirt more accurately replicates the extant sinuses of Valsalva.



Narrow Skirt

- ▶ Skirt **+4mm** wider than bore diameter (standard Valsalva skirt is 5-10mm larger)

Narrow skirt with a smaller (4mm) as opposed to the differential between Skirt diameter and skirt length, often used in small patients.

Linear 4mm differential between skirt diameter and skirt length as the graft body diameter increases.



Short Skirt

- ▶ Skirt **-4mm-6mm** shorter than bore diameter
- Shorter length skirt combined with wider skirt diameter (+6mm relative to standard) to help dial in correct sizing depending on which procedure being conducted. (reimplantation + 5mm, remodelling +3mm)



Florida Sleeve

- ▶ Coronary Ostium cut-out “keyhole”

Designed for use in valve-sparing cases and in valve salvage in cases of offset coronary arteries and bicuspid aortic valve.

The Florida Sleeve allows the skirt to position around the coronary artery and therefore does not require coronary artery reimplantation.

Clinical Data

From a research point of view the Gelweave™ Valsalva graft has been demonstrated to be a formidable tool to study the anatomy and physiology of the root and the effect of suboptimal root reconstruction on the aortic cusp movement, as well as the effect of the sinuses on coronary flow.

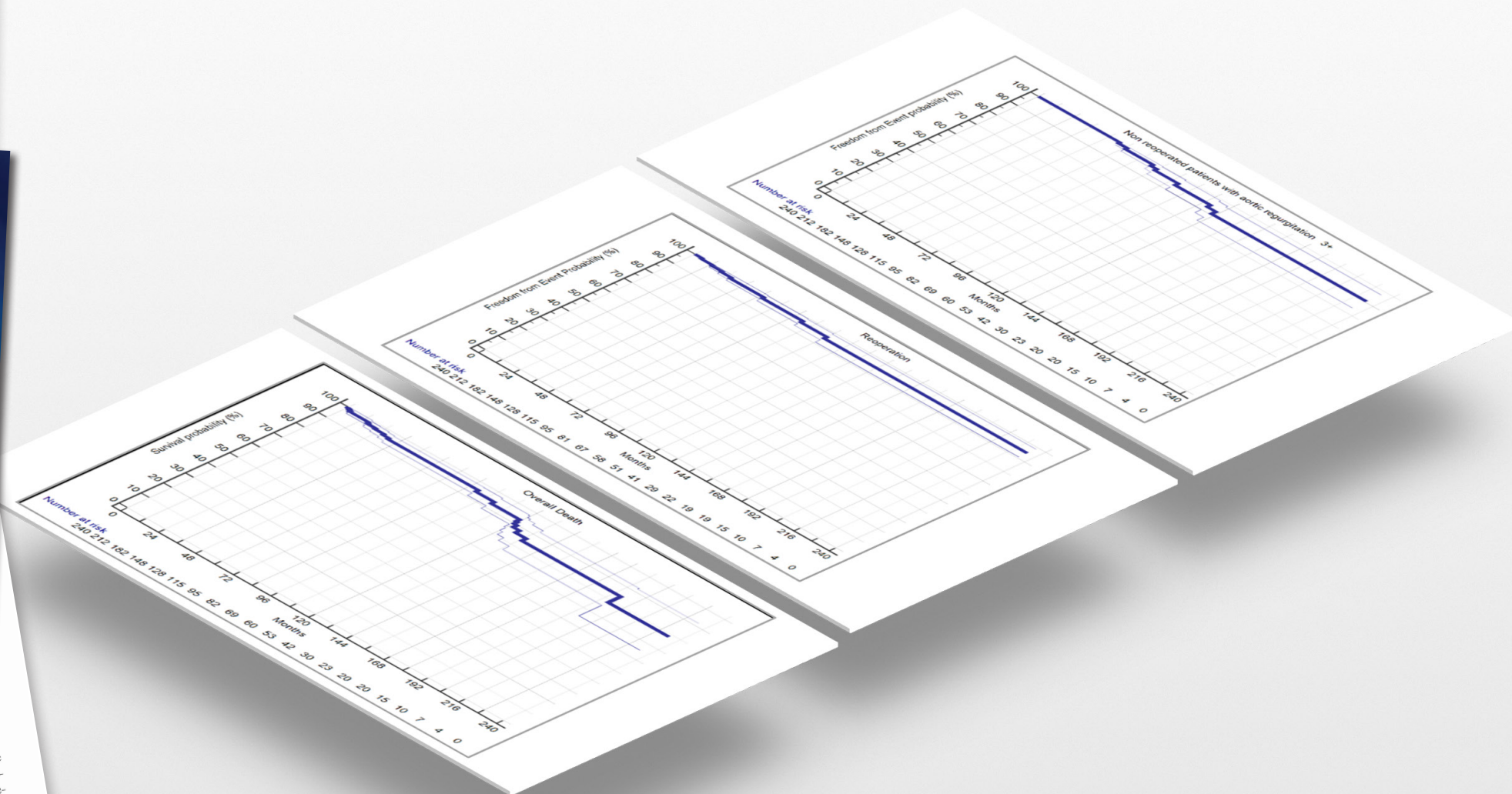
It has also featured in many other experimental studies on flow turbulence or wall stress, appearing in major international peer reviewed journals.

Featured in over 200 Scientific Papers*

* Based on the results of a systematic literature review



Comparing procedure
 Scaffa, Carlo





Pictured: Tarik Paćuka presenting at Terumo Aortic ASCEND 2025

Tarik Paćuka

Chief Commercial Officer Terumo Aortic

When one thought it was the final chapter of the Gelweave Valsalva book, the product family has further elevated its brand and market perception to an altogether different skyline. Moreover, the Gelweave™ Valsalva graft has exemplified innovation, precision, and clinical reliability.

With every product there exists a Product Life Cycle (PLC), however, the Gelweave Valsalva has taken the cycle definition to a completely different level, where the maturity effect has not taken place, which is a remarkable phenomenon after 25 years being available on the market.

As we reflect on this distinction today, the brand continues to break global records with respect to its annual sales growth, new market launches, as well as its growing demand by other companies operating across the cardiovascular segment to incorporate its unique technology to their respective product families.

*Through the implementation of next generation of technological components, the next 25 years of the Gelweave Valsalva will ensure that with more advanced and market leading technology is delivered to our clinicians and our patients, thus further supporting our mission of **Committed to Aortic Care**.*

Here's to the teams, surgeons, and visionaries who made it possible — Here's to the next 25 years of progress, partnership, and patient care.

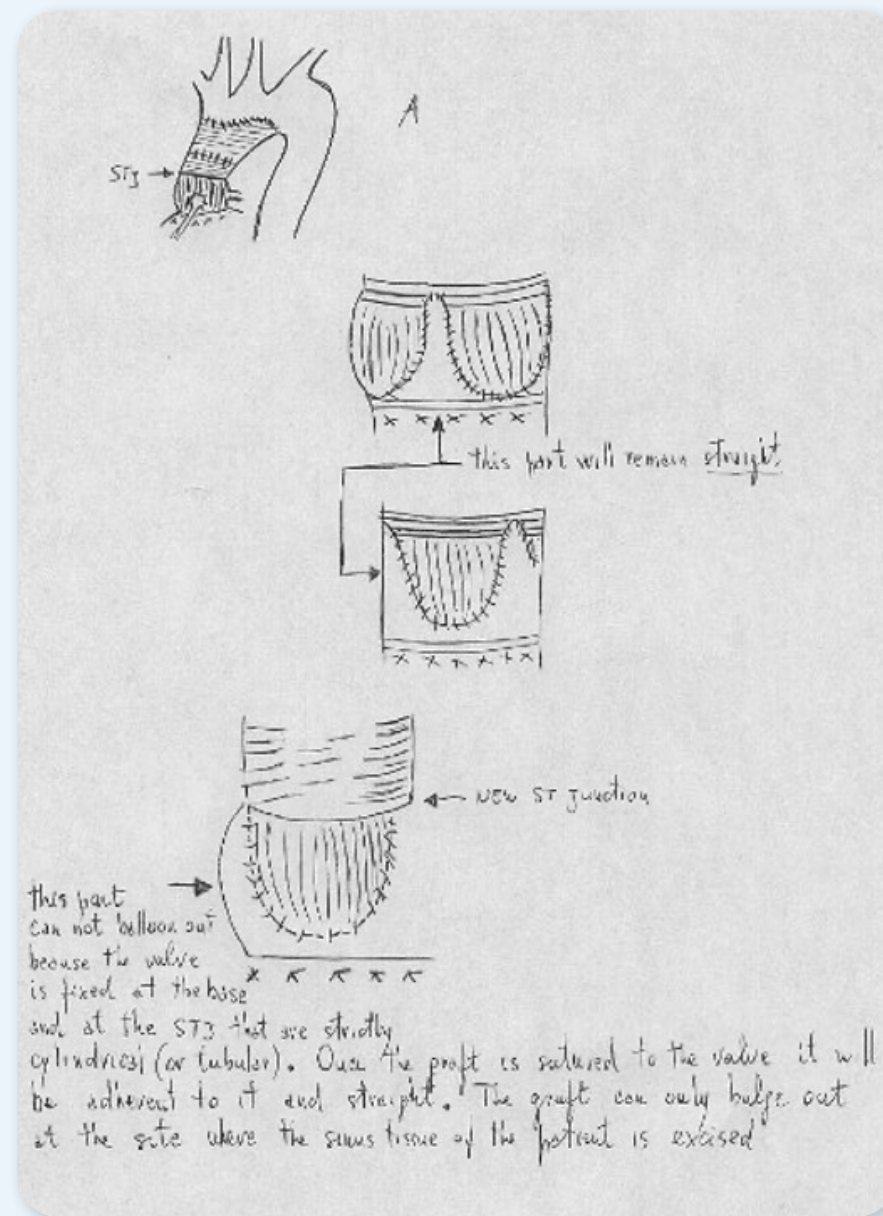




"The creation of the Valsalva graft was a simple intuition and was realised in a few hours on my kitchen table with the help of my wife. Nevertheless, I would like to acknowledge the following colleagues who have helped me in the scientific research and the clinical diffusion of the device."

Prof. Ruggero De Paulis

July 2025 | Open Letter to Terumo Aortic



Pictured Above: An early illustration by Prof. Ruggero De Paulis that was used as an early explanation for a colleague showing how the Valsalva graft would be able to reproduce three independent sinuses as is done in the normal anatomy.

Professor De Paulis would like to thank:

Joe Bavaria	Roberto Di Bartolomeo	Emmanuel Lansac	Sandro Picciurro
Duke Cameron	Gebrine El Khouri	Daniele Maselli	Giuseppe Pisani
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Luigi Chiariello	Lorenzo Galletti	Sergio Moresco	Andrea Salica
Ilaria Chirichilli	Mario Gaudino	Wim Morshuis	Raffaele Scaffa
Enrico Coscioni	Leonard Girardi	Saverio Nardella	Fabrizio Settepani
Salvatore D'Aleo	Francesco G. Irace	Hitoshi Ogino	Fabrizio Tomai
Laurent De Kerkove	Lorenzo Guerrieri	Yutaka Okita	Luca P. Weltert
Giovanni Maria De Matteis	Teruhisa Kazui	Davide Pacini	Kenton Zehr

Terumo Aortic would like to extend their appreciation to each and every surgeon around the world who has adopted this technology to further optimise patient care.

Furthermore, the Valsalva graft would not have been possible without the invaluable dedication of our associates, both past and present.

Thank you all for your contributions.

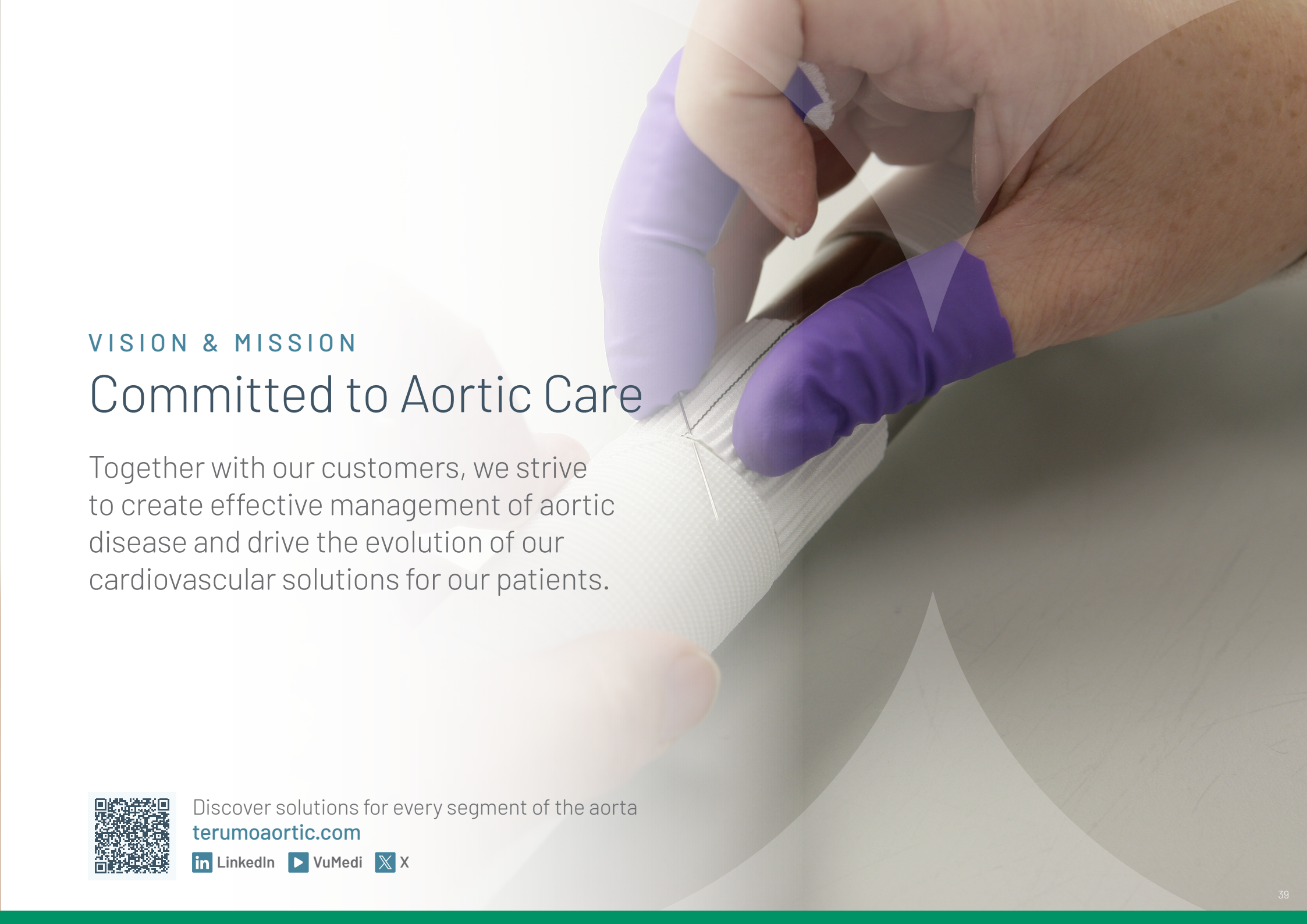
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Images

- i. Malekan R et al. (2011)
- ii. Weltert L et al. (2009)
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- v. Drawings courtesy of Prof. Ruggero De Paulis, European Hospital, Rome, Italy.
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