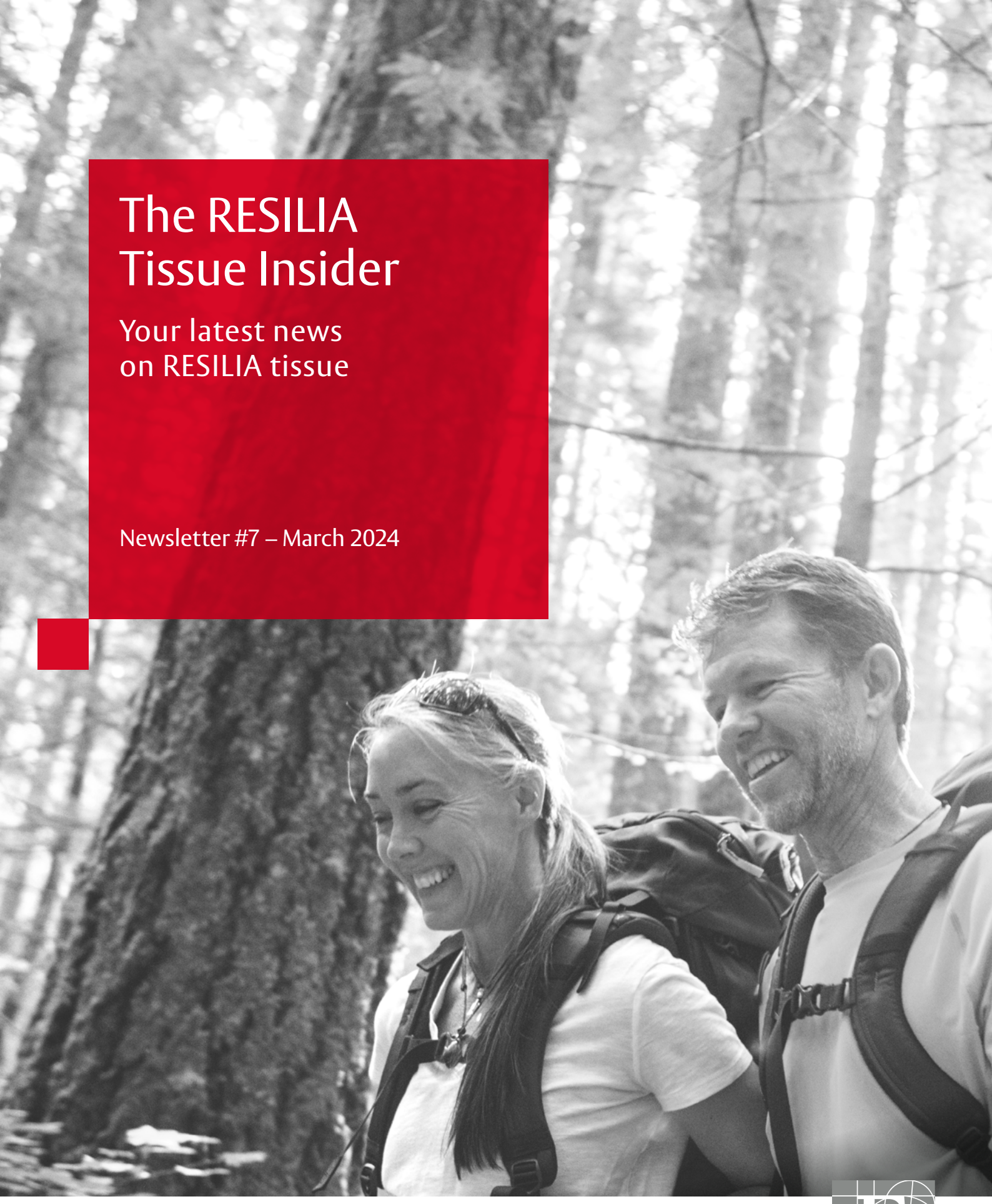


The RESILIA Tissue Insider

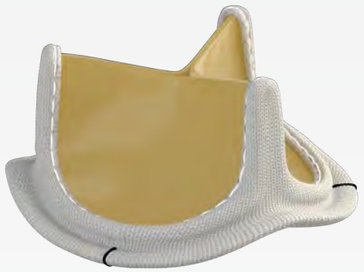
Your latest news on RESILIA tissue

Newsletter #7 – March 2024

Edwards

Edwards Surgical Valves

The RESILIA* tissue portfolio is expanding!



INSPIRIS RESILIA
aortic valve

MITRIS RESILIA
mitral valve

Now CE marked in Europe

Scan the QR code to find out more!

* No clinical data are available that evaluate the long-term impact of RESILIA tissue in patients. Additional clinical data for up to 10 years of follow-up are being collected to monitor the long-term safety and performance of RESILIA tissue.

In this issue

We hope you enjoy this issue of *The RESILIA Tissue Insider.* Learn more about our growing RESILIA tissue valve portfolio: scan the QR code to visit our website.

Introduction

Welcome to *The RESILIA Tissue Insider*: a new name for the *Inspire* newsletter to put the focus on our growing RESILIA tissue portfolio.

We are delighted that the MITRIS RESILIA mitral valve has already helped more than 100 patients in Europe. In this issue, we bring you the experiences of some of the first surgeons who have fitted the valve in suitable patients. Find out more about the features and benefits of the MITRIS RESILIA valve on page 4.

The longest follow-up of RESILIA tissue from the COMMENCE aortic trial was presented at the American Association for Thoracic Surgery meeting in 2023 and is now published in *JTCVS*.[1,2] Turn to page 5 to read a summary of the 7-year data on valve durability and haemodynamic performance.

The durability of the RESILIA tissue valve has made it an attractive option for younger patients needing surgical aortic valve replacement (AVR). Previously, young patients usually received mechanical valves with longer lifespans than bioprosthetic valves.[2]

A sub-analysis of the COMMENCE aortic trial found no differences in clinical outcomes between patients with a bicuspid aortic valve (BAV), who typically require AVR at a younger age, and patients with the more common tricuspid aortic valve (TAV).[3] Find out more on page 6.

Real-world data on the INSPIRIS RESILIA aortic valve were reported in two presentations at the Deutschen Gesellschaft für Thorax-, Herz- und Gefäßchirurgie e.V. (DGTHG) meeting in February. The IMPACT registry assesses durability and haemodynamics of the INSPIRIS RESILIA valve in a real-world setting. Turn to page 7 to see the 1-year outcomes.[4] Three-year outcomes of the valve in another real-world study showed excellent safety and haemodynamic performance (page 8).

Finally, Professor Farhad Bakhtiary from Bonn University Hospital shares his insights on page 10 into aortic and mitral valve replacement with the INSPIRIS RESILIA and MITRIS RESILIA valves.

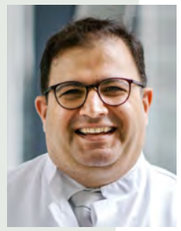
Enjoy reading!

FRONT COVER IMAGE:
ISTOCK.COM/RYANJLANE

First implantation experiences of the MITRIS RESILIA mitral valve

Professor Jan Gummert
Director of the Clinic of Cardiovascular and Thoracic Surgery, Heart and Diabetes Centre North Rhine-Westphalia, Bad Oeynhausen, Germany

Mr Toufan Bahrami
Consultant cardiac surgeon leading the minimally invasive and endoscopic cardiac surgery service at the Royal Brompton and Harefield Hospitals, Guy's and St Thomas' NHS Trust, London, UK



Professor Farhad Bakhtiary
(University Hospital Bonn, Germany) shares his insights on using the INSPIRIS RESILIA and MITRIS RESILIA valves *on page 10*

Professor Alexander Weymann
Deputy Director, and Director of minimally invasive surgery, Hannover Medical School, Germany

To celebrate that the MITRIS RESILIA valve has helped more than 100 patients in need of mitral valve replacement in Europe, we spoke to some prominent cardiac surgeons about their experience of implanting the MITRIS RESILIA valve for the first time. Read on to discover their thoughts.

Q. How did you select a patient to receive the MITRIS RESILIA valve?

A. JG. I chose a young, 59-year-old, patient who underwent mitral valve repair for Barlow's disease many years ago, and now his valve was beyond repair. He wanted a biological valve because warfarin was not an option for him.

FB. The majority of the patients presented with a failed mitral valve repair, or new-onset mitral regurgitation many years after primary surgery.

TB. Our patient wanted a tissue valve, and he had learned about the MITRIS RESILIA valve as it had already been marketed in the USA and Asia.

AW. We also had a young patient who refused to receive a mechanical valve. He had severe aortic stenosis and insufficiency, and degenerative mitral valve disease.

Q. How did you find the implantation experience?

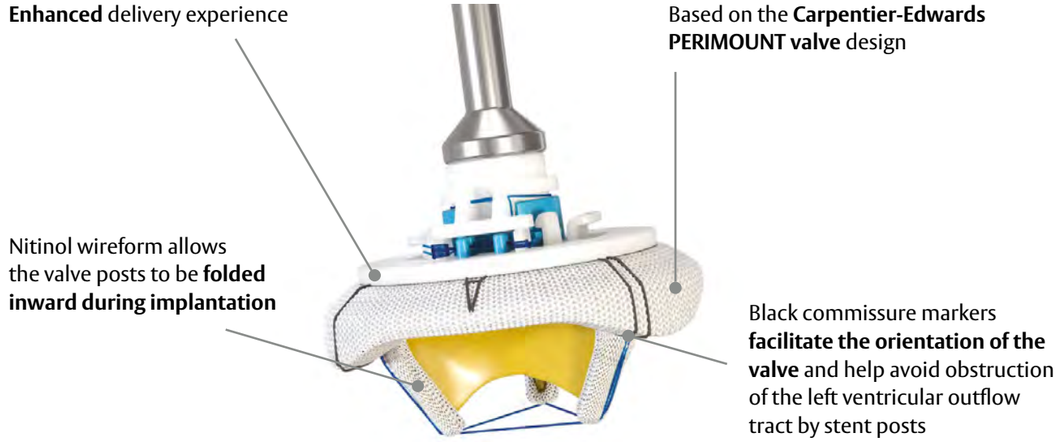
A. JG. Some features are helpful for implantation, especially in a less invasive setting. The ring is soft, and it is easy to stitch. The struts are fixed to the centre during the implant procedure, so it is much easier in cases where the mitral ring is narrow, or chords are in the way.

FB. The implant is very easy to use. The valve is cinched in an anatomic position and the markers are a welcome addition and facilitate implantation in the correct position avoiding obstruction of the LVOT. The cuff of the valve is easy to stitch and compatible with the use of an automated anastomotic device.

TB. It was a pretty straightforward procedure because, technically, replacement is easier than repair, even endoscopically. The advantage with the MITRIS RESILIA valve during this endoscopic operation was when I disconnected the valve from the handle, the posts were still retracted.

AW. It was very straightforward. Some double valve replacements are tricky because of the profile height and the aortic–mitral valve curtain. There was no difficulty here because the MITRIS RESILIA valve has a low profile with markings on the anterior side, so obstructing the left ventricular outflow tract (LVOT) is impossible.

Learn more about these first procedures at the MITRIS RESILIA valve website.



We designed the MITRIS RESILIA mitral valve:

- To be comfortable and seat well on the mitral annulus
- To be a replacement option similar to the native valve
- To handle the pressure of the mitral position

Learn what the MITRIS valve can do for you and your patients.

The MITRIS mitral valve is made with RESILIA tissue for decreased calcification,[a] this is the mitral valve developed with your patient's quality of life in mind.

Here you have a valve choice designed to handle the pressure of the mitral position.

Talk to your rep or visit **edwards.com/gb/MITRIS** to find out more.

[a]No clinical data are available that evaluate the long-term impact of RESILIA tissue in patients. Additional clinical data for up to 10 years of follow-up are being collected to monitor the long-term safety and performance of RESILIA tissue.

The longest follow-up data on RESILIA tissue now appear in *JTCVS*

Beaver T *et al*. *J Thorac Cardiovasc Surg*. 2023; doi:10.1016/j.jtcvs.2023.09.047.[2]

In Issue 5 last year, we reported that 7-year data from the COMMENCE trial had been presented at the AATS Annual Meeting. We are delighted to report that the data have been published in *JCTVS*.

As a reminder, COMMENCE is an FDA investigational device exemption trial exploring clinical and echocardiographic outcomes associated with the RESILIA tissue aortic bioprosthesis. With the increasing trend towards bioprosthetic valve use in younger patients, the durability of the RESILIA tissue valve is of particular interest. Of the 512 patients who completed the 5-year follow-up, 225 reconsented for extended follow-up, with 195 patients completing the 7-year follow-up.

An independent clinical events committee adjudicated all safety endpoints, which were as defined by Akins *et al*.[5] An independent core laboratory evaluated haemodynamic performance.

Patient demographics of the 7-year cohort

- 65.1 years mean age
- 61.8% New York Heart Association (NYHA) class II/III
- 76.9% male

In Years 5–7, only four patients required reintervention, and the risk of structural valve deterioration (SVD) or reoperation was less than that of death.

Haemodynamic outcomes

Clinically stable gradients throughout 7 years' follow-up:

The mean gradient pressure was stable throughout the follow-up but declined slightly from Year 5 (mean [± SD] 11.6 ± 6.0 mmHg, n= 445) to Year 6 (10.1 ± 4.7 mmHg, n=150), and to Year 7 (9.4 ± 4.5 mmHg, n=157). Effective orifice area (EOA) was also clinically stable throughout the follow up, with an EOA of 1.82 ± 0.57 cm^2 at 7 years. The decrease in mean gradient in Years 6 and 7 is likely influenced by the patient cohort that reconsented to follow-up. These patients were more likely to be men with larger valves.

Conclusions

These 7-year data represent the longest clinical follow-up reported for RESILIA tissue. The RESILIA tissue valve showed remarkable freedom from SVD over 7 years.

Its sustained durability, clinically stable haemodynamic performance and good safety profile make the RESILIA tissue valve an appealing option for younger patients wishing to avoid lifelong anticoagulation therapy.

Safety outcomes at 7 years

85.4%
Freedom from all-cause mortality
(95% CI 82.2–88.7%)

99.3%
Freedom from SVD
(95% CI 98.3–100.0%)

97.2%
Freedom from reoperation
(95% CI 95.5–99.0%)

99.5%
Freedom from major paravalvular regurgitation
(95% CI 99.0–100.0%)

SVD: structural valve deterioration

Important results for patients with BAV: RESILIA tissue offers 7 years of good durability and safety

Takayama H *et al*. Presented at the STS Annual Meeting, 27–29 January 2024, San Antonio, TX, USA.[3]

Patients with a BAV may require AVR at a younger age than patients with a TAV. To avoid anticoagulation therapy, younger patients are increasingly opting for bioprosthetic aortic valves. Understanding the durability offered by a bioprosthetic valve is important when treating patients with BAV.

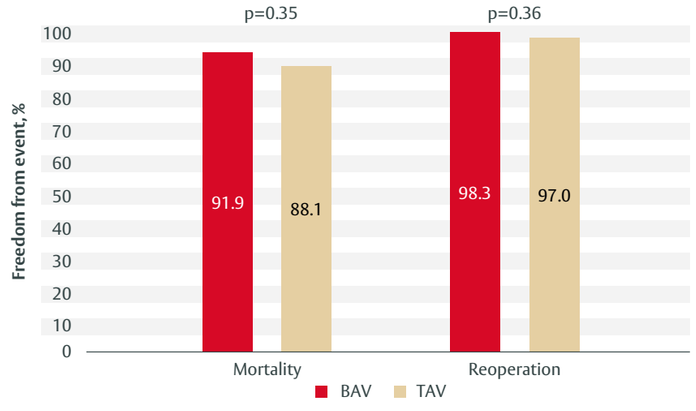
This sub-analysis of COMMENCE trial 7-year data aimed to compare outcomes between patients with BAV (n=214) or TAV (n=458) who received AVR with RESILIA tissue by assessing:

- Mortality over 7 years
- Stroke, valve thrombosis, endocarditis, SVD, reoperation and haemodynamic parameters (pressure gradient and EOA) over 7 years

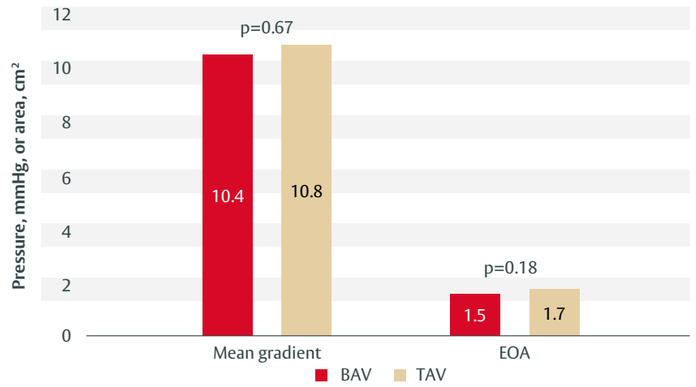
After adjusting for logit of propensity score and age, there were no significant differences between patients with BAV or TAV for:

- Mean gradient
- EOA
- Mortality, reoperation or other safety endpoints

Freedom from mortality and reoperation were similar between patients with BAV and TAV at 7-year follow-up



Haemodynamics were similar between patients younger than 65 years old with BAV and TAV at 7-year follow-up



BAV: bicuspid aortic valve; EOA: effective orifice area; TAV: tricuspid aortic valve

Conclusions

Patients with BAV had similar outcomes to patients with TAV after surgical AVR with the RESILIA tissue valve. Clinically stable haemodynamics were observed in patients, with zero SVD at 7 years and low rates of transvalvular regurgitation.

IMPACT registry: Good 1-year haemodynamic and safety outcomes in 556 patients

Bakhtiary F. Presented at the DGTHG Annual Meeting, 17–19 February 2024, Berlin, Germany.[4]

The IMPACT registry is collecting 1-, 3- and 5-year data on the durability and haemodynamics of the INSPIRIS RESILIA aortic valve in a real-world setting.

A total of 556 patients with mean (± SD) age 63.4 ± 8.5 years were enrolled and valve performance was assessed after 1 year by echocardiography and safety outcomes.

1.4%
at 30 days
All-cause mortality

3.9%
at 1 year
All-cause mortality

11.2 ± 4.9 mmHg
Postprocedural mean pressure gradient

2.0 ± 0.6 cm²
Effective orifice area

The proportion of patients in NYHA class III/IV improved from 41.2% at baseline to just 3.0% at 1 year. No cases of SVD stage 3 and prosthetic valve thrombosis were recorded.

Conclusion

The 1-year follow-up results present good haemodynamic and safety outcomes, confirming the satisfactory performance of the INSPIRIS RESILIA valve.

INSPIRIS RESILIA valve offers excellent safety and haemodynamic performances with minimal regurgitation and no evidence of structural valve deterioration

Schlömicher M. Presented at the DGTHG Annual Meeting, 17–19 February 2024, Berlin, Germany.[6]

From Dec 2018 to Jan 2022, 110 patients (mean [± SD] age 68.3 ± 7.9 years; EuroSCORE II 2.1 ± 1.3%) received an AVR with the Edwards INSPIRIS RESILIA valve.

Parameter	Early occurrence (<30 days)
Mortality	2 (1.8%)
Stroke	1 (0.9%)
Pacemaker implantation	5 (4.5%)

Valve performance was assessed after 1 and 3 years (median follow-up 3.8 years: n=95) by echocardiography and safety outcomes.

Haemodynamics at 3 years

10.4 ± 3.8 mmHg
Postprocedural mean pressure gradient[a]

1.7 ± 0.3 cm²
Effective orifice area[a]

98.1%
Paravalvular regurgitation
None/trivial

97.7%
Transvalvular regurgitation
None/trivial

[a]Data are mean ± SD

Five-year actuarial freedom from

92.1%
All-cause mortality

100%
Structural valve deterioration

97.6%
All-cause reintervention

Conclusion

This latest generation bioprosthesis offers excellent safety and haemodynamic performance with minimal regurgitation and no evidence of SVD.

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INSPIRIS RESILIA valve and MITRIS RESILIA valve: Real-world insights on RESILIA tissue valves[a]

Professor Farhad Bakhtiary is the Director of the Department of Cardiac Surgery at University Hospital Bonn, Germany. He specialises in minimally invasive procedures, and, here, he tells us about his experience of using both the INSPIRIS RESILIA and MITRIS RESILIA valves.

Q. How do you select patients suitable for surgical mitral valve replacement with the MITRIS RESILIA valve?

A. We have so far implanted the MITRIS RESILIA valve in 12 patients, using a fully endoscopic approach. Most of these patients had a failed mitral valve repair or new onset of mitral regurgitation many years after a repair procedure.

Q. Can you comment on the technical aspects of implanting the INSPIRIS RESILIA and MITRIS RESILIA valves?

A. Since 2018, we have had many opportunities to implant the INSPIRIS RESILIA valve in the aortic position, so it is a very well-practiced procedure for me and my team. The strut is very flexible, allowing for a small incision to avoid injuring the strut. The valve is also pliable and can be used easily with automatic suture devices. In the case of the MITRIS RESILIA valve, all the struts can be folded, which reduces the danger of injuring the left ventricle and allows for a small incision to be used. The markers make it easy to position the valve and avoid obstructing the LVOT. The cuff is also very flexible and easy to stitch, enabling the use of an automated anastomotic device.

Q. How do the patients respond to the procedure?

A. The valve's performance is very good, and the gradients are low. From our standard operating procedures, there is no need for any anticoagulation for the aortic position. We recommend 3 months of anticoagulation with warfarin for the mitral position. The patients respond well to the minimally invasive approach and can be extubated on the operating table.

Q. Are there any surgical aspects that can ensure a successful procedure?

A. The surgeon should be experienced in minimally invasive procedures. To complete a double valve replacement using an endoscopic approach, they should be familiar with the Instructions For Use and recommendations for replacing these valves.

Q. The current age recommendation for mitral bioprostheses is higher than that for aortic bioprostheses, reflecting the faster degeneration seen in the mitral position. How does this influence your choice of valve among bioprostheses?

A. The guidelines respect the choice of the patient. So we see patients present with the wish to receive a biological valve, in which case they should be given the latest generation of the best valve. From our perspective, this means the INSPIRIS RESILIA and MITRIS RESILIA valves, being the next generation of the Magna Ease valve with a better anticalcification system.[b]

Q. Can you describe the benefits of using RESILIA tissue valves for your patients?

A. Valve-in-valve procedures can be very difficult with some biological valves, which is where the INSPIRIS RESILIA valve has many advantages. The VFit technology[c] for small-sized valves is designed to enable potential future transcatheter valve-in-valve procedures. For the mitral valve, we still have problems with valve-in-valve and valve-in-ring procedures, and I believe that the MITRIS RESILIA valve could address these issues.

[a]Expert opinion.
[b]No clinical data are available that evaluate the long-term impact of RESILIA tissue in patients. Additional clinical data for up to 10 years of follow-up are being collected to monitor the long-term safety and performance of RESILIA tissue.
[c]Refer to device 'Instructions for Use' for important warnings related to VFit technology. These features have not been evaluated in clinical studies to establish the safety and effectiveness of the model 11500A for use in valve-in-valve procedures. VFit technology is available on sizes 19–25 mm.

References:

1. Beaver T, Bavaria JE, Griffith B *et al*. Seven-year outcomes following aortic valve replacement with a novel tissue bioprosthesis. AATS Annual Meeting, 6–9 May 2023, Los Angeles, CA, USA.
2. Beaver T, Bavaria JE, Griffith B *et al*. Seven-year outcomes following aortic valve replacement with a novel tissue bioprosthesis. *J Thorac Cardiovasc Surg*. 2023; doi:10.1016/j.jtcvs.2023.09.047.
3. Takayama H, Bavaria JE, Heimansohn DA *et al*. RESILIA tissue in surgical aortic valve replacement for patients with bicuspid aortic valves: Findings from a 7-year IDE study. STS Annual Meeting, 27–29 January 2024, San Antonio, TX, USA.
4. Bakhtiary F. IMPACT registry: Patient outcomes and performance of a novel aortic bioprosthetic valve in 556 patients. *Thorac Cardiovasc Surg*. 2024; **72:** S1–S68.
5. Akins CW, Miller DC, Turina MI *et al*. Guidelines for reporting mortality and morbidity after cardiac valve interventions. *J Thorac Cardiovasc Surg*. 2008; **135:** 732–8.
6. Schlömicher M, Haldenwang P, Berres D, Moustafine V, Strauch J. Outcomes after implantation of a latest generation biological valve with a new anticalcification treatment. *Thorac Cardiovasc Surg*. 2024; **72:** S1–S68.

No clinical data are available that evaluate the long-term impact of RESILIA tissue in patients. Refer to device instructions for use for important warnings related to VFit technology. These features have not been observed in clinical studies to establish the safety and effectiveness of the model 11500A for use in valve-in-valve procedures. VFit technology is available on sizes 19–25 mm.

Medical device for professional use. For a listing of indications, contraindications, precautions, warnings, and potential adverse events, please refer to the Instructions for Use (consult eifu.edwards.com where applicable).

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