



# Inspire

Your latest news  
on RESILIA tissue

Newsletter #3 – November 2022  
Special edition for EACTS 2022

Life<sup>R</sup>

Life to the power of RESILIA  
A promise of freedom. That's the power of RESILIA tissue.



Edwards

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## Marking five years of INSPIRIS RESILIA valve implantations

We have a long history of partnering with physicians to develop products designed to help patients live longer, healthier and more productive lives. This year, 5 years post-launch, **150,000** INSPIRIS RESILIA valves have now been implanted in patients **worldwide**.



To mark this milestone, we caught up with Professor Olaf Wendler, the first physician ever to implant an INSPIRIS RESILIA valve.

Turn to page 10 to read about his experience.

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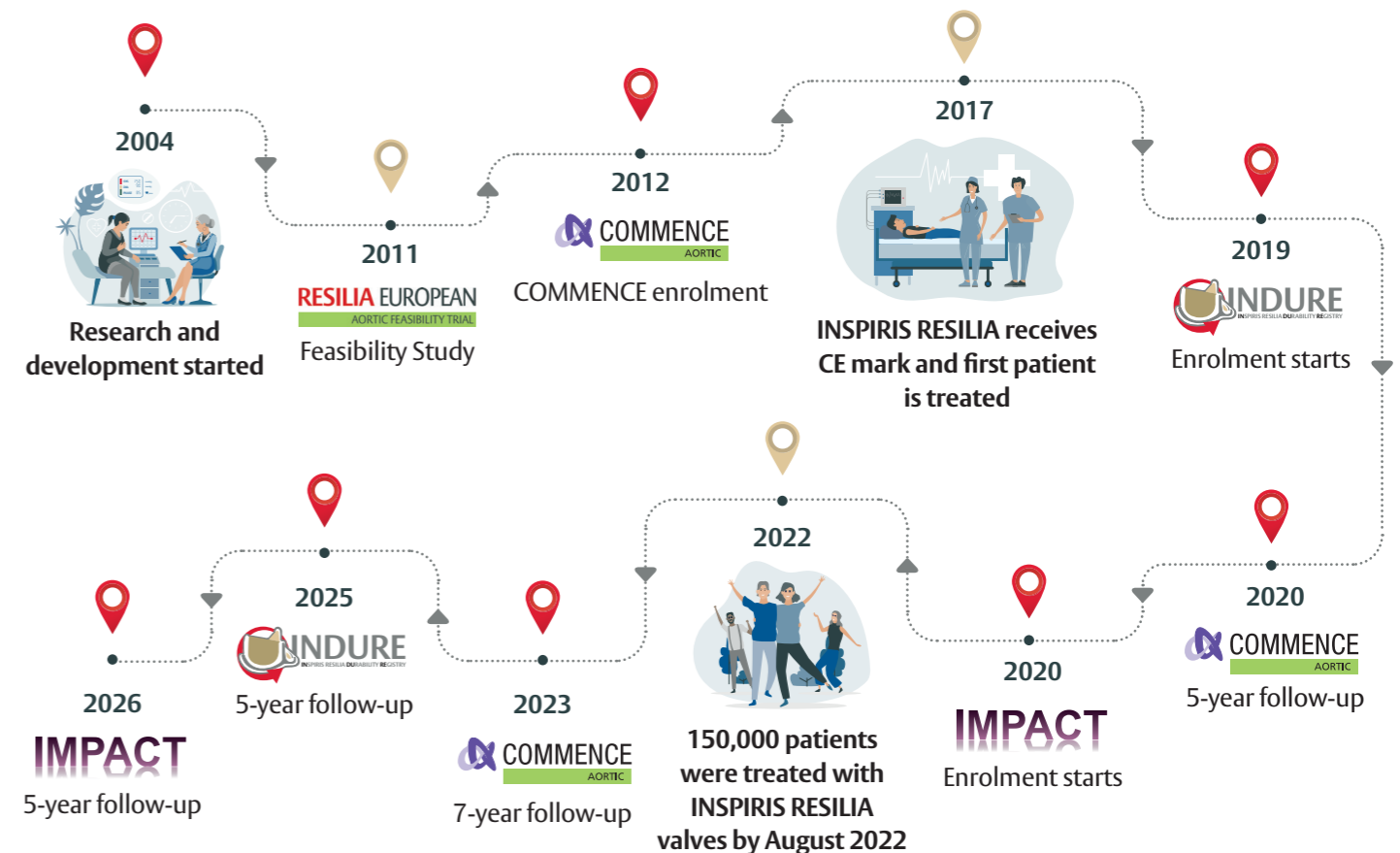
## INSPIRIS RESILIA valve has been successfully implanted in patients worldwide, in over 150,000 patients

As we reach a milestone of 150,000 implanted valves worldwide, INSPIRIS RESILIA now represents the majority of surgical aortic valves implanted in US and Japan.



The INSPIRIS RESILIA valve is in use in over **45 countries** in more than **1,700 hospitals**

## Data on INSPIRIS RESILIA valve continue to be produced and studied in clinical trials



We hope you enjoy this issue of *Inspire*. Want to learn more about RESILIA tissue? Visit [info.edwards.com/inspire](http://info.edwards.com/inspire) or scan the QR code.

**On the circuit**

### INSPIRIS RESILIA aortic valve at EACTS 2022, Milan, Italy

The 2022 annual meeting for the European Association for Cardio-Thoracic Surgery (EACTS) took place in Milan on 4–7 October, with several presentations about the INSPIRIS RESILIA valve. Professor Meuris presented the latest update of clinical outcomes from the INDURE registry, which now includes 421 patients; turn to page 3 to find out more. Dr Francica and Dr Georges also

both presented data comparing the PERIMOUNT Magna Ease valve to INSPIRIS RESILIA valve; find out the results on pages 5–6. We were also delighted to host a symposium which fostered informative discussions on how INSPIRIS RESILIA valve may help treat the ongoing challenges in aortic valve replacements. Turn to pages 8–9 to read a summary of this symposium.

EACTS Scientific Sessions

# INDURE registry: Clinical and quality of life outcomes of surgical aortic valve replacement in patients under 60 years of age<sup>1</sup>

Meuris M et al. Presented at the 36<sup>th</sup> European Association for Cardio-Thoracic Surgery Annual Meeting, 2022.



The treatment of comparatively young patients with implantation of surgical aortic bioprosthetic valves has raised questions about valve durability and longevity.<sup>2</sup> The INSPIRIS RESILIA Durability Registry (INDURE) was designed to assess the performance of the INSPIRIS RESILIA bioprosthetic valve in patients aged younger than 60 years.<sup>1,2</sup> At the EACTS annual meeting in October 2022, **Professor Meuris** presented the latest update of the clinical and quality of life (QoL) outcomes in patients 1 year after surgical aortic valve replacement (SAVR).<sup>1</sup>

**Key patient demographics (N=421)**

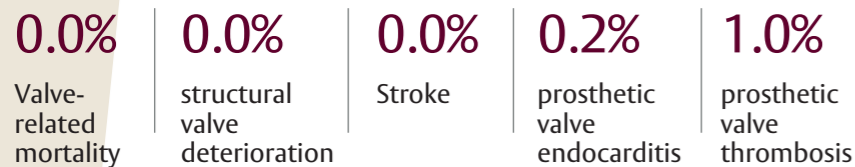
- Mean age: 53.5±6.9 years
- Female: 23.5%
- Mean body surface area: 2.00±0.23 m<sup>2</sup>
- EuroSCORE II: 1.5±1.6%
- NYHA class III–IV: 27.2%

*“The INDURE registry is really unique because we study the INSPIRIS RESILIA aortic valve in a really young patient population...This is the first time ever that we are studying the behaviour and the echocardiographic outcomes of a tissue valve in a patient population this young.”*

Professor Meuris

**Key safety outcomes**

Late clinical outcomes (>30 days to 1 year) were excellent, with a hospital mortality that was better than predicted (0.7% vs 1.5%).



Haemodynamic performance was satisfactory and stable throughout follow-up.

Mean pressure gradient (mean valve size 24.4 ± 2.3mm):



Within 3–6 months, QoL was restored to good-to-excellent on the Kansas City Cardiomyopathy Questionnaire scale, and approximately matching the QoL of the general US population according to the Short Form 12 item (version 2) Health Survey scoring system.

One-year clinical outcomes of patients aged <60 years with INSPIRIS RESILIA valve were excellent, with stable performance, better-than-predicted hospital mortality and no SVD. Patients returned to expected QoL within 3–6 months after surgery. Longer follow-up is underway.

# INDURE and IMPACT

Specifically designed for younger patients (<60 years old) and those with comorbidities, the INDURE (INSPIRIS RESILIA Durability Registry) and IMPACT (IMPACT of Pre-existing

Comorbidities on Patient Outcomes and Prosthetic Valve Performance in a Real-world Setting) registries<sup>1,2</sup> combined will provide data on clinical outcomes, including haemodynamic

and structural outcomes, and mortality data specifically from patients with concomitant disease (chronic kidney disease, diabetes, hypertension, metabolic syndrome or inflammation).



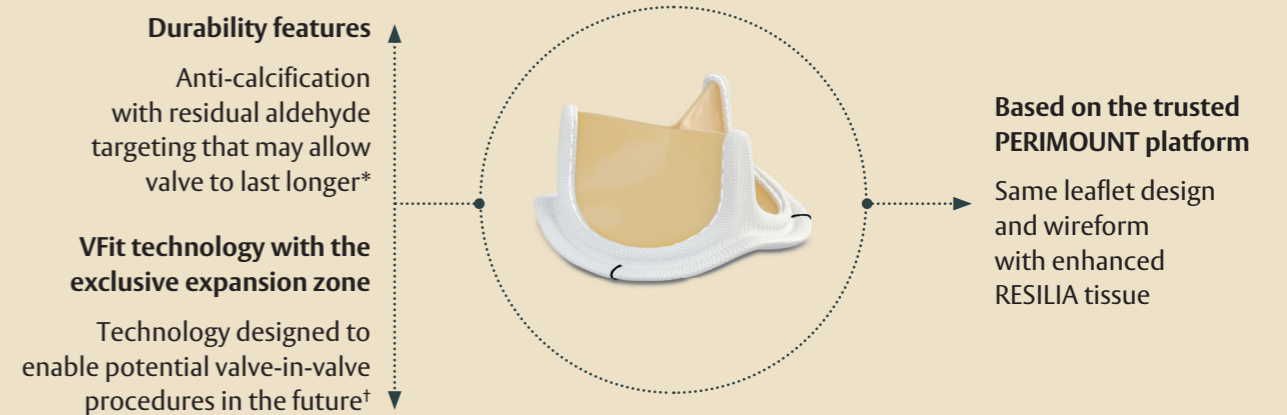
- Multicentre, prospective, single-arm, registry
- Assessing clinical outcomes in patients ≤60 years old
- 21 European and Canadian sites (N≥400)
- Primary outcome: Valve-related safety at 1 year (according to VARC-2) and freedom from SVD at 5 years

- Multicentre, prospective, single-arm, registry
- All-comers registry with focus on comorbidities
- 21 European sites (N≥500)
- Primary outcome: All cause mortality at 1, 3 and 5 years



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## INSPIRIS RESILIA valve is based on the trusted and proven design features on the Carpentier-Edwards PERIMOUNT and PERIMOUNT Magna Ease valves



† 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 ViV procedures. VFit technology is available on sizes 19–25mm

\* No clinical data are available that evaluate the long-term impact of RESILIA tissue in patients

## PERIMOUNT Magna Ease vs INSPIRIS RESILIA valve in patients below 70 years of age: a propensity-matched analysis of the haemodynamic performances<sup>3</sup>

Francica A et al. Presented at the 36<sup>th</sup> European Association for Cardio-Thoracic Surgery Annual Meeting, 2022.



The PERIMOUNT Magna Ease valve is the most implanted valve in aortic valve replacement within the last decade, with excellent long-term outcomes. This study, presented by **Dr Francica**

at EACTS 2022, compared the haemodynamic performance of the INSPIRIS RESILIA valve *versus* the Magna Ease valve in aortic position in patients **younger than 70 years**.<sup>3</sup>

Baseline characteristics were similar in both groups (propensity-matched analysis):

Magna Ease N=122		INSPIRIS RESILIA N=122
57.7 years	Age	57.0 years
19.7%	Sex (female)	25.4%
2.7%	EuroSCORE II	2.7%
9.0%	Diabetes	4.1%
55.7%	Hypertension	53.3%
57.1%	Ejection fraction	56.4%
41.0%	Bicuspid valve	48.4%

Peri-procedural data also showed no significant differences between valves:

Magna Ease		INSPIRIS RESILIA
0.0%	Periprocedural mortality	0.0%
0.8%	Stroke	0.8%
3.3%	Definitive pacemaker	1.6%
2.0%	Surgical revision for bleeding	0.8%

Haemodynamics:

At 1 and 3 years, the differences in **mean pressure gradient**,  $v_{max}$  or left ventricular end-diastolic volume with the INSPIRIS RESILIA valve *versus* the PERIMOUNT Magna Ease valve did not reach statistical significance. Mean gradients and peak velocity was also similar between groups across different valve sizes.

At 3 years, there were **no reports of SVD in the INSPIRIS RESILIA valve group**; 4 cases were reported in the PERIMOUNT Magna Ease valve group, with 2 patients experiencing moderate–severe aortic stenosis and 2 patients reporting moderate–severe regurgitation.

The safety and efficacy outcomes of the new-generation INSPIRIS RESILIA valve in patients younger than 70 years were comparable to the excellent outcomes in the established Magna Ease valve in patients aged <70 years.



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## Mid-term echocardiographic results of the INSPIRIS RESILIA aortic valve – a retrospective comparison to the Carpentier-Edwards Magna Ease<sup>4</sup>

Georges G et al. Presented at the 36<sup>th</sup> European Association for Cardio-Thoracic Surgery Annual Meeting, 2022.



At EACTS 2022, **Dr Georges** compared the real-world medium-term efficacy and safety outcomes in patients who underwent SAVR receiving the INSPIRIS RESILIA valve *versus* the established PERIMOUNT Magna Ease valve using a propensity-matched analysis.<sup>4</sup> Following propensity matching, average age was similar for patients receiving PERIMOUNT Magna Ease

(70±7 years) and INSPIRIS RESILIA valve (69±7 years, p=0.26). Postoperative clinical outcomes were similar across groups. For the whole cohort, there was no difference in survival between INSPIRIS RESILIA and PERIMOUNT Magna Ease valves; however **patients with the INSPIRIS RESILIA valve were less likely to be readmitted for a cardiovascular cause or for stroke (p=0.01)**.

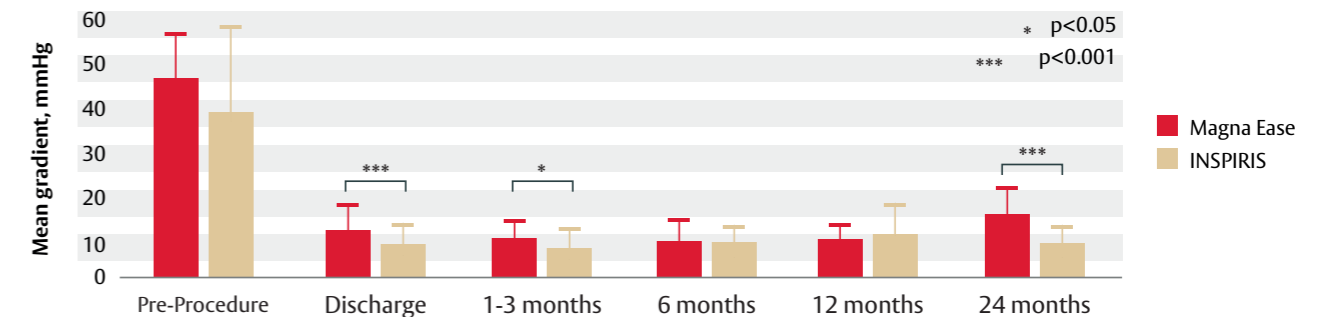
Post-operative adverse events and complications

Magna Ease N=217		INSPIRIS RESILIA N=217
3.7%	30-day mortality	2.8%
2.8%	Stroke/TIA	1.8%
6.9%	Reoperation for bleeding	4.2%
16.6%	Renal failure	15.3%
4.1%	Atrioventricular block	3.7%
6.0%	Left bundle branch block	2.8%

*“Younger and younger patients are receiving biological valves for aortic valve replacement so there is a need for an improved bioprosthesis with better durability and haemodynamic performance. [...] The clinical outcomes [for INSPIRIS RESILIA valve] are encouraging.”*

Dr G Georges

The INSPIRIS RESILIA valve showed significantly lower mean pressure gradients at discharge, and at 1–3 months and 2 years *versus* the PERIMOUNT Magna Ease valve. SVD was rare in both INSPIRIS RESILIA valve and Magna Ease valve groups; only two cases of moderate SVD occurred, both with the 21-mm INSPIRIS RESILIA valve (difference to PERIMOUNT Magna Ease valve not significant, p=0.87).



The INSPIRIS RESILIA valve showed good haemodynamic performance that remained stable over time. The mean pressure gradient at 2 years significantly lower with the INSPIRIS RESILIA valve than the PERIMOUNT Magna Ease valve

## Multicentre, large scale, propensity-weighted comparison of three aortic bioprostheses: conventional stented, new-generation stented and rapid deployment<sup>5</sup>

D’Onofrio A *et al.* Presented at the 36<sup>th</sup> European Association for Cardio-Thoracic Surgery Annual Meeting, 2022.



Another fascinating talk at EACTS was given by **Professor D’Onofrio**, who compared a rapid deployment valve (EDWARDS INTUITY) with the new-generation stented INSPIRIS RESILIA valve and a conventional stented valve (PERIMOUNT Magna Ease).<sup>5</sup>

The INTUITY valve allowed for **shorter procedural times** than the other bioprostheses. All three study groups had a device success rate of 96%. The incidence of major postoperative complications was similar across all study groups.

**New pacemaker implantations** were less frequent in the INSPIRIS RESILIA valve group than in the other study arms.

Haemodynamic outcomes were better with the INTUITY valve and INSPIRIS RESILIA valve than with the PERIMOUNT Magna Ease valve, with lower post-operative mean aortic gradient.

### Key patient demographics (N=2,589)

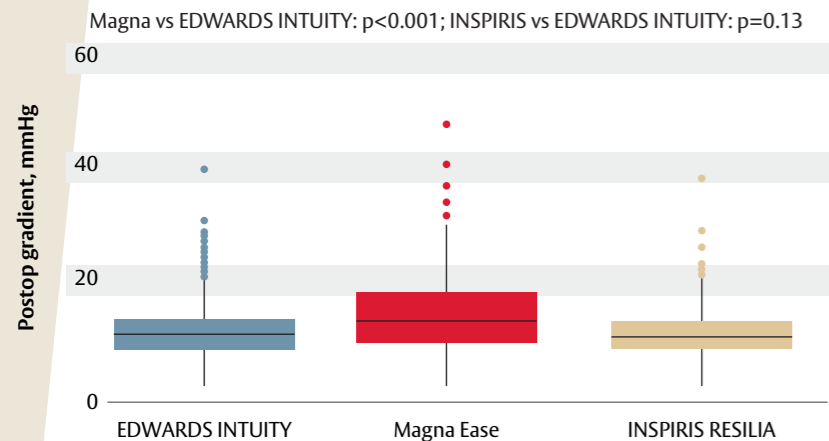
- Mean age: 72 years
- Female: 40%
- Mean STS score: 1.66
- NYHA class >II: 89%

### Valves received

- EDWARDS INTUITY: 65%
- INSPIRIS RESILIA: 23%
- PERIMOUNT Magna Ease: 12%

*“All these valves provide excellent clinical and haemodynamic outcomes. [...] Surprisingly, we found very low pacemaker implantation in the INSPIRIS RESILIA valve. [...] Probably the most important result of our study is that the INSPIRIS RESILIA and EDWARDS INTUITY valves have similar trans-aortic gradients.”*

Professor D’Onofrio



All three bioprostheses gave excellent early haemodynamic and clinical outcomes, with significantly lower gradients with INTUITY valve and INSPIRIS RESILIA valves *versus* the PERIMOUNT Magna Ease valve. The incidence of pacemaker implantation was lowest among patients with the INSPIRIS RESILIA valve

## EACTS Symposia

### Assessment of a new bioprosthetic valve to treat young patients with bicuspid aortic valve

Presented within a satellite symposia at EACTS: State-of-the-art in the treatment of aortic valve regurgitation in young patients

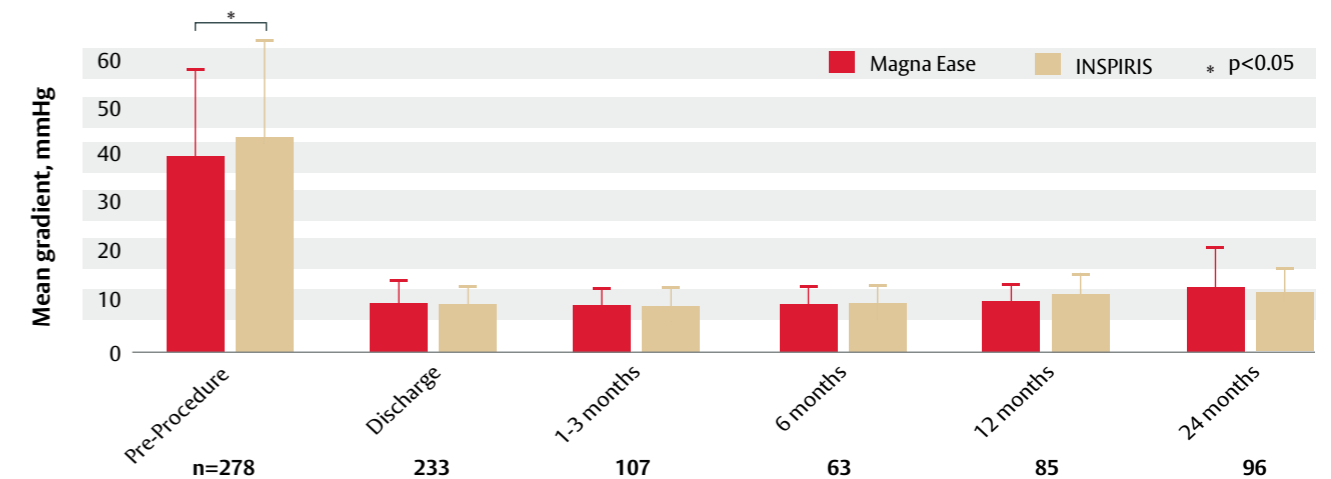
Kalavrouziotis D *et al.* Presented at the 36<sup>th</sup> European Association for Cardio-Thoracic Surgery Annual Meeting, 2022.



We were delighted to engage with so many surgeons at our two satellite symposia at EACTS. Within the first symposium, which focused on treating aortic valve regurgitation in patients under 65, **Dr Kalavrouziotis** presented on patients with **bicuspid aortic valves (BAV)**.<sup>6</sup> BAV disease is the most common inherited aortic valvular defect and increases the risk of valvular dysfunction. Patients with BAV often require a valve replacement at a younger age than patients with tricuspid aortic valve disease; thus valve durability is important in this cohort.<sup>7</sup>

In a sub-study of the data presented by Dr Georges at EACTS<sup>4</sup> (see page 6), early data on the INSPIRIS RESILIA aortic valve in a cohort of young bicuspid aortic valve patients indicate that it has excellent hemodynamics and durability, which compares favourably with the well-established performance of the PERIMOUNT Magna Ease valve.

See page 6 for mid-term echocardiographic results from the study on which this sub-analysis is based



Clinical outcomes in BAV patients with INSPIRIS RESILIA, in terms of survival and readmissions, were also comparable to PERIMOUNT Magna Ease.

In patients with bicuspid aortic valves, INSPIRIS RESILIA valve has excellent haemodynamics and durability, comparable to PERIMOUNT Magna Ease

## Management of aortic regurgitation: Gaps, current evidence and future options

Presented within a satellite symposia at EACTS: State-of-the-art in the treatment of aortic valve regurgitation in young patients

Senage T *et al.* Presented at the 36<sup>th</sup> European Association for Cardio-Thoracic Surgery Annual Meeting, 2022.



Within this symposium, **Dr Thomas Senage** also reviewed the management of aortic regurgitation, focusing on current evidence, gaps and future options.<sup>8</sup>

Dr Senage spoke about the potential of the INDURE registry to help guide

future guidelines and treatment options for aortic regurgitation. He focused on comparing patients who present with severe aortic regurgitation (AR) with those with severe aortic stenosis (AS) within the INDURE registry.

Patients with AR presented with significantly different hemodynamic parameters compared with those with AS:\*

Decreased haemodynamic parameters in AR:	Increased haemodynamic parameters in AS:
Aortic valve peak gradient 27 mmHg vs 84 mmHg	EOA 2.1 vs 0.8 cm <sup>2</sup>
Aortic valve mean gradient 16 mmHg vs 53 mmHg	LVEDD 60 vs 48mm
V <sub>max</sub> 2 m/sec vs 5 m/sec	
LVEF 56% vs 60%	

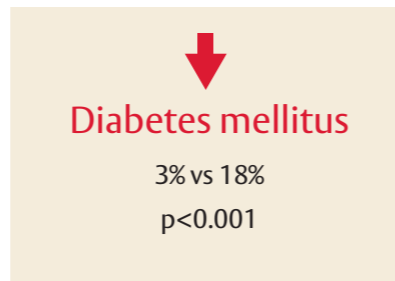
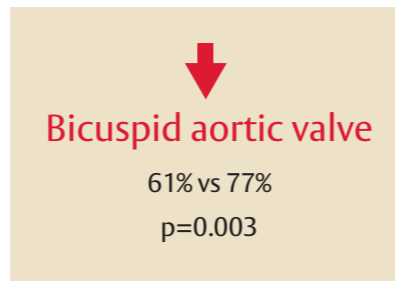
\* All significance values were p<0.001 unless otherwise indicated

In summary, patients with severe AR within the INDURE registry present at a younger age and with different haemodynamic parameters than those with severe AS. The INSPIRIS RESILIA valve may play a vital role in treating patients with AR in the future.



Want to learn more about the data presented at the EACTS Annual Meeting in Milan? **Click here** to access the Edwards professional education platform and find the recordings of our satellite symposia as well as additional insights or scan this QR code with your phone.

Patients with severe AR were younger, and had a lower incidence of bicuspid aortic valves and diabetes mellitus than those with severe AS:



## Aortic valves in practice: Olaf Wendler



Professor Olaf Wendler is a consultant cardiothoracic surgeon based at King's College Hospital, and is Chair of the Heart, Vascular and Thoracic Institute at Cleveland Clinic London. He has extensive experience in complex heart procedures and innovative heart valve disease treatments. Professor Wendler performed the first implantation of the INSPIRIS RESILIA valve in 2017, so we caught up with him to mark the 150,000 implantations milestone.

**Q. As the first surgeon to implant a INSPIRIS RESILIA valve, what was your experience of using this valve for the first time?**

**A.** It was a great opportunity to use the INSPIRIS RESILIA valve in April 2017 in a young woman. As she wished to have children, she preferred a biological valve to avoid anticoagulation treatment, which is a risk in pregnancy. She now has two babies, and she, the children and the valve are doing well.

**Q. Would you recommend the INSPIRIS RESILIA valve to other surgeons?**

**A.** I have often recommended the INSPIRIS RESILIA valve since the first procedure in 2017, and it is very well perceived. It is built on the mechanism and framework of the PERIMOUNT valve, which is a solid device with excellent results and durability. It is easy for surgeons to see the potential of the INSPIRIS RESILIA valve.

**Q. For which patients do you recommend the INSPIRIS RESILIA valve?**

**A.** I usually offer the INSPIRIS RESILIA valve from the age of 55 years. However, younger patients aged 45–50 years often request a bioprosthetic valve. The INSPIRIS RESILIA valve also offers an option for patients with bicuspid aortic valve disease, who often require combined surgeries on the aortic root and aortic valve; the INSPIRIS RESILIA valve can be combined with a graft to replace the entire aortic root.

**Q. What gave you confidence in the INSPIRIS RESILIA valve when you first used it?**

**A.** On first use of a new valve, you are dependent on information from animal testing and the product information. I was confident it would work well as it built on the experience of the PERIMOUNT valve. The only difference is the use of biological tissue, which was shown in animal experiments not to calcify as fast as traditional valves. So far, I have not been disappointed.

**Q. Have you seen any improvement in clinical outcomes since using INSPIRIS RESILIA valve?**

**A.** There are no immediate differences due to the similar surgical technique, but patients will hopefully see benefits in the long-term due to durability. The INSPIRIS RESILIA valve enables surgeons to implant a bioprosthetic valve at an earlier point, offering the patients the chance for a normal lifestyle at a younger age.



## References:

1. Meuris M, Senage T, Borger M *et al.* INDURE registry: clinical and quality of life outcomes of surgical aortic valve replacement in 421 patients under 60 years of age. 36th Annual Meeting of the European Association for Cardio-Thoracic Surgery, 5–8 October 2022, Milan, Italy.
2. Meuris B, Borger MA, Bourguignon T *et al.* Durability of bioprosthetic aortic valves in patients under the age of 60 years –rationale and design of the international INDURE registry. *J Cardiothorac Surg.* 2020; **15**: 119.
3. Francica A, Tonelli F, San Biagio L *et al.* PERIMOUNT MAGNA Ease vs INSPIRIS RESILIA valve in patients below 70 years of age: a propensity-matched analysis of the haemodynamic performances. 36th Annual Meeting of the European Association for Cardio-Thoracic Surgery, 5–8 October 2022, Milan, Italy.
4. Georges G, Bernard J, Pibarot P *et al.* Mid-Term echocardiographic results of the INSPIRIS RESILIA aortic valve – a retrospective comparison to the Carpentier Edwards Magna Ease. 36th Annual Meeting of the European Association for Cardio-Thoracic Surgery, 5–8 October 2022, Milan, Italy.
5. D’Onofrio A, Cibirin G, Lorenzoni G *et al.* Multicentre, large scale, propensity-weighted comparison of three aortic bioprostheses: Conventional stented, new-generation stented and rapid deployment. 36th Annual Meeting of the European Association for Cardio-Thoracic Surgery, 5–8 October 2022, Milan, Italy.
6. Kalavrouziotis D. Assessment of a new bioprosthetic valve to treat young patients with bicuspid aortic valve. 36th Annual Meeting of the European Association for Cardio-Thoracic Surgery, 5–8 October 2022, Milan, Italy.
7. Glaser N, Jackson V, Eriksson P *et al.* Relative survival after aortic valve surgery in patients with bicuspid aortic valves. *Heart.* 2021; **107**: 1167-72.
8. Senage T. Management of aortic regurgitation: gaps, current evidences and future options. 36th Annual Meeting of the European Association for Cardio-Thoracic Surgery 5–8 October 2022, Milan, Italy.

### Important safety information:

No clinical data are available that evaluate the long-term impact of RESILIA tissue in patients.

Use of the EDWARDS INTUITY Elite valve system may be associated with new or worsened conduction disturbances, which may require a permanent cardiac pacemaker implant (PPI). The rate of PPI for the EDWARDS INTUITY Elite valve is within the range reported in the literature for various rapid deployment valves, but higher than that reported for surgical aortic valves. Physicians should assess the benefits and risks of the EDWARDS INTUITY Elite valve prior to implantation. See instructions for use for additional information.

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](http://eifu.edwards.com) where applicable).

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