

The logo for HAS 2026 is located in the top left corner. It features the text 'HAS' in a large, white, serif font above the year '2026' in a smaller, white, sans-serif font. The background of the logo is a colorful, abstract painting with shades of red, orange, green, and blue.

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# Minimally Invasive Surgery versus Median Sternotomy for Mitral Valve Endocarditis: A Systematic Review and Patient-Level Meta-Analysis

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## Introduction:

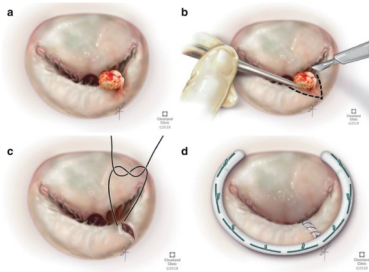
### Mitral Valve (MV) Infective Endocarditis (IE):

- Most frequently involved
- In-hospital mortality: 8-23%

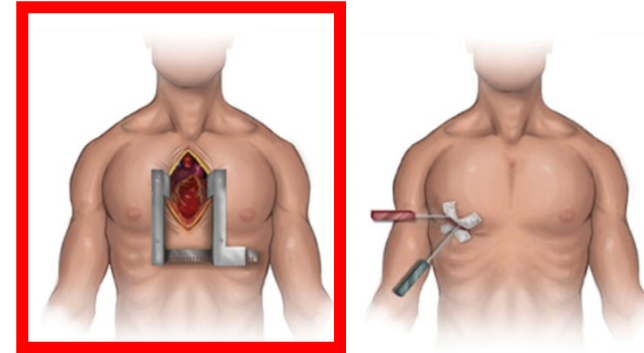
Approximately 50% of patients with MV IE



Surgical  
management



What is the recommended approach? (AATS 2016)



#### 2. Operative approach

Medium sternotomy is the recommended approach, with few exceptions

I C

- Only limited observational data support this indication
- Level of evidence: C
- Limited long-term data



Gap in the literature



Patient-Level Meta-Analysis

## Methods:

### PICO:

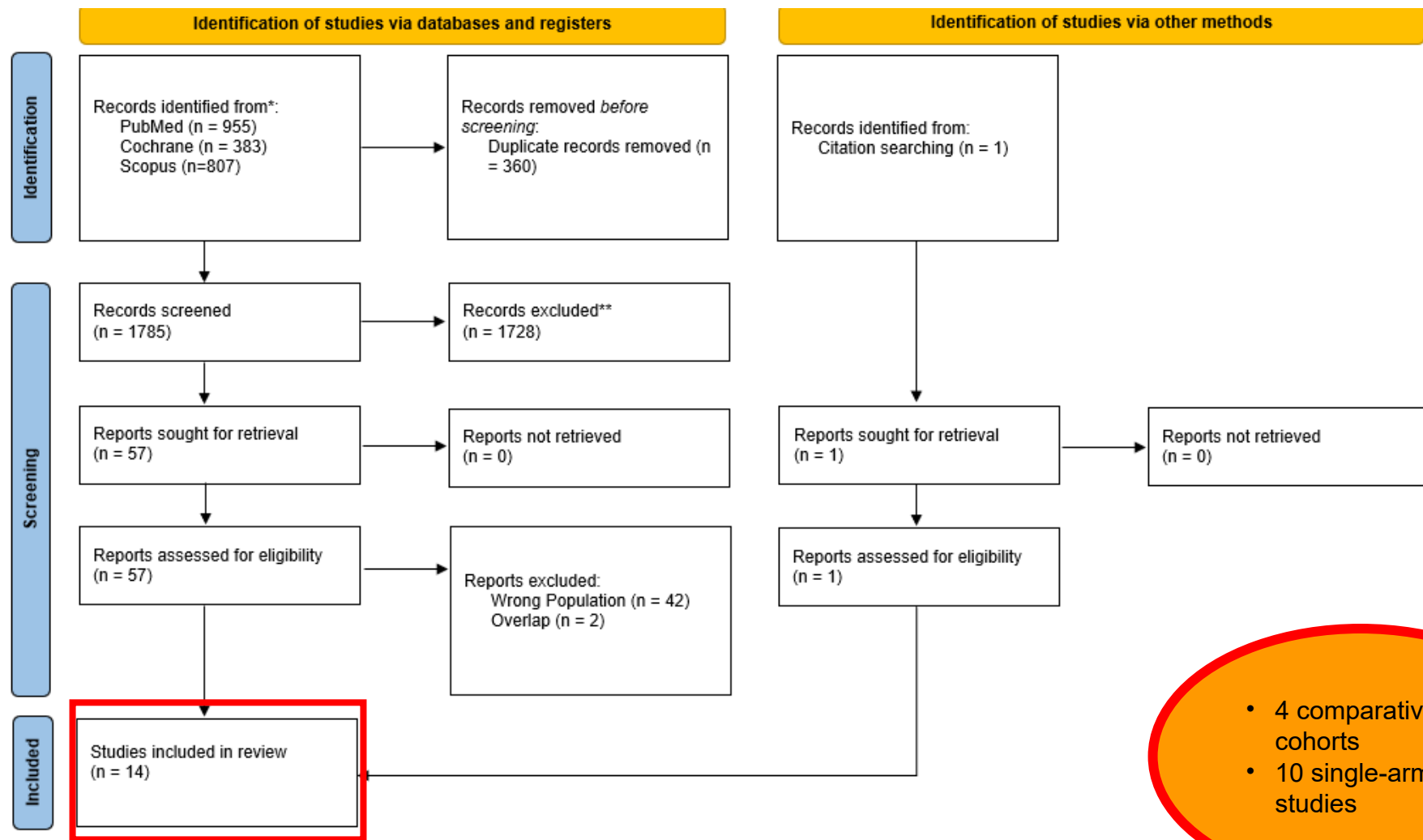
**P:** Patients with MV IE

**I:** Patients who underwent minimally invasive surgery (MICS)

**C:** Patients who underwent median sternotomy (ST)

**O:**Primary: Overall Survival, Freedom from IE-related reoperation

Secondary: Demographics, Intraoperative outcomes, postoperative outcomes



### Statistical analysis:

- Continuous variables were summarized using means and standard deviations
- Categorical variables using frequencies and percentages
- Odds ratios (OR) with 95% confidence intervals (CIs) were used to compare categorical endpoints, while continuous outcomes were compared with standardized mean differences (SMDs)
- Random-effects models (DerSimonian-Laird) were adopted to balance inherent clinical heterogeneity between the included studies.
- We used the methods described by Wei et al. to reconstruct IPD from the Kaplan–Meier curves of all eligible studies for the long-term survival outcomes

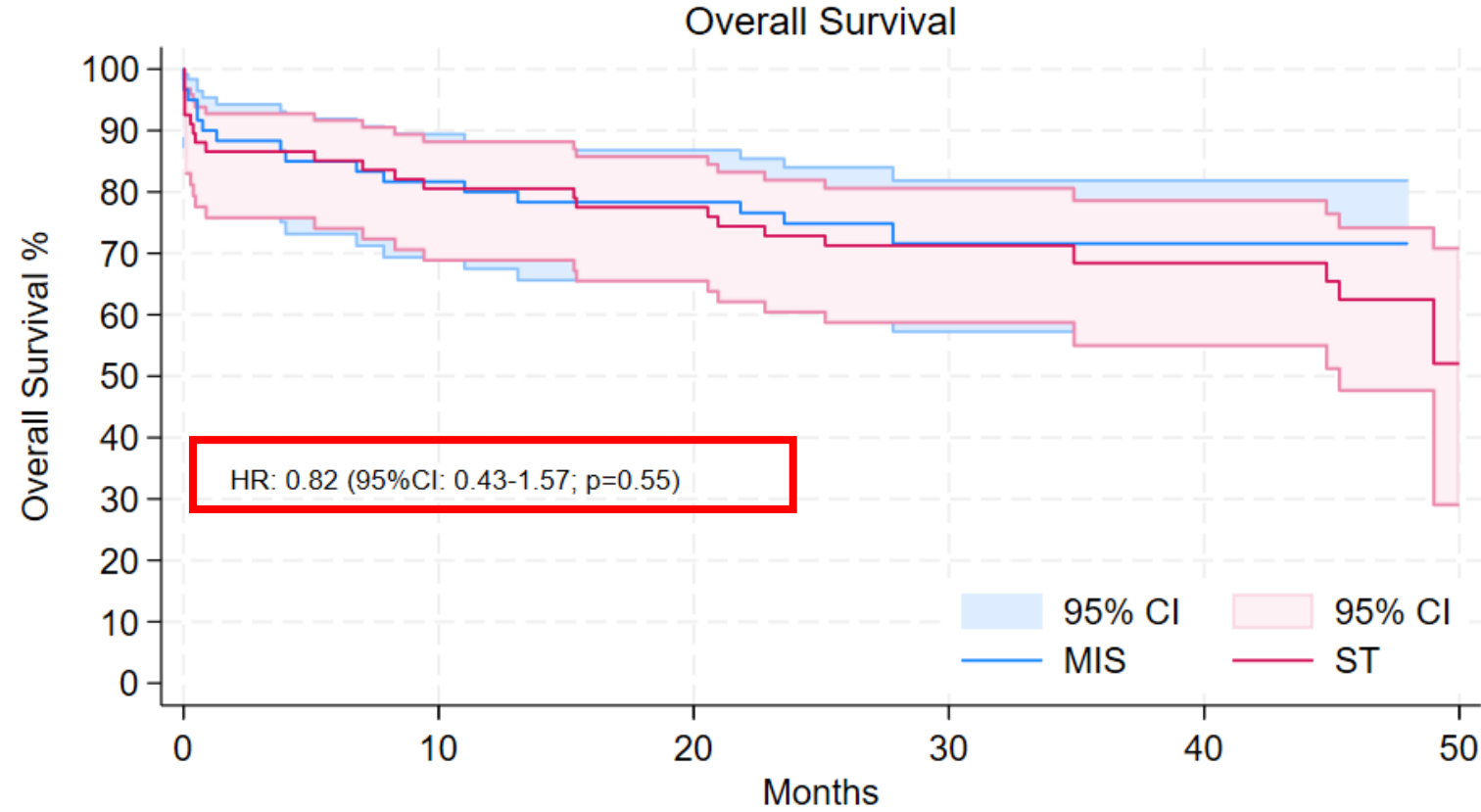
## Results:

	Parameter	MIS vs ST	p-value
<b>Continuous (Preoperative)</b>	Age	58.3 (15.8) vs 53.2 (19.3)	0.89
	LVEF	58.5 (6.5) vs 58.9 (8.0)	0.77
<b>Continuous (Perioperative)</b>	<b>CPB time</b>	<b>127.9 (47.8) vs 112.0 (41.9)</b>	<b>0.04</b>
	Cross-Clamp time	92.6 (37.6) vs 85.0 (33.8)	0.05
	<b>Hospital stay</b>	<b>9.6 (10.0) vs 18.8 (18.1)</b>	<b>&lt;0.01</b>
	<b>ICU stay</b>	<b>2.6 (2.2) vs 4.2 (3.4)</b>	<b>&lt;0.01</b>
<b>Categorical (Preoperative)</b>	Male sex	60.8% vs 52.9%	0.30
	Diabetes Mellitus	23.1% vs 25.7%	0.53
	<b>Hx of CVA</b>	<b>18.0% vs 36.1%</b>	<b>&lt;0.01</b>
	Active IE	60.3% vs 78.5%	0.21
	<b>Native valve IE</b>	<b>97.7% vs 93.8%</b>	<b>0.02</b>
	<b>Prosthetic valve IE</b>	<b>2.3% vs 6.2%</b>	<b>0.03</b>

	Parameter	MIS vs ST	p-value
<b>Categorical (Perioperative)</b>	<b>MV repair</b>	<b>49.9% vs 25.5%</b>	<b>&lt;0.01</b>
	<b>MV replacement</b>	<b>50.1% vs 75.5%</b>	<b>&lt;0.01</b>
	Concomitant TV operation	0.0% vs 4.0%	0.35
	Early mortality	3.6% vs 7.5%	0.46
	Postoperative Afib	18.9% vs 21.7%	0.66
	Postoperative AKI	3.7% vs 8.9%	0.27
	Postoperative PM implantation	4.5% vs 7.8%	0.43
	Postoperative CVA	1.0% vs 2.6%	0.37
	Reoperation for bleeding	5.1% vs 8.5%	0.63



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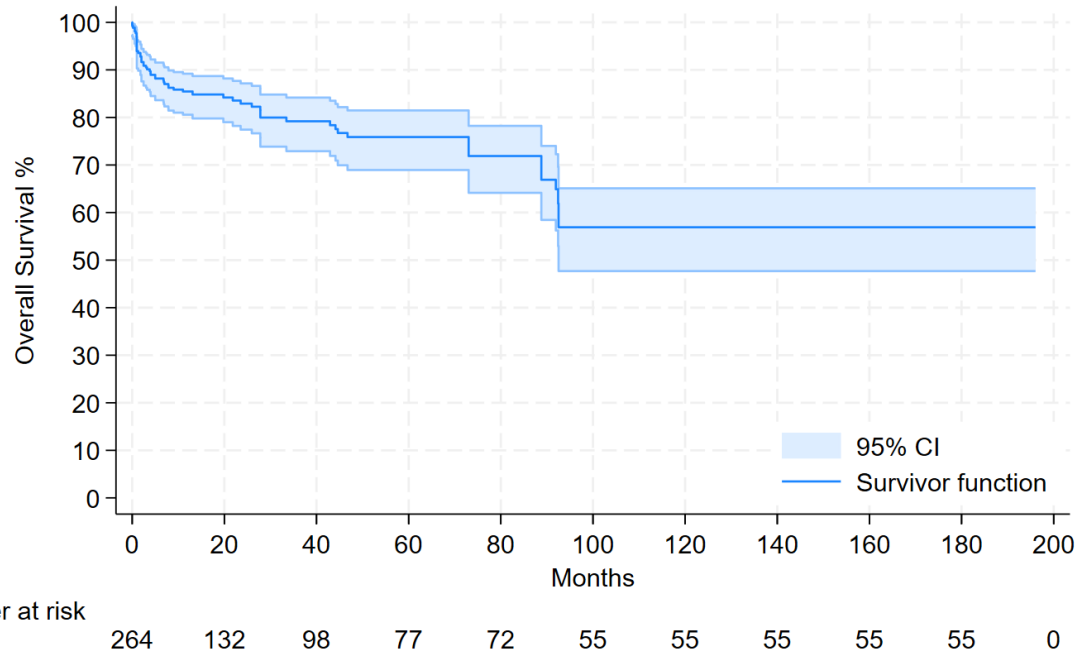


Number at risk

	0	10	20	30	40	50
MIS	60	49	46	21	16	0
ST	67	53	50	26	23	5



Overall Survival MIS

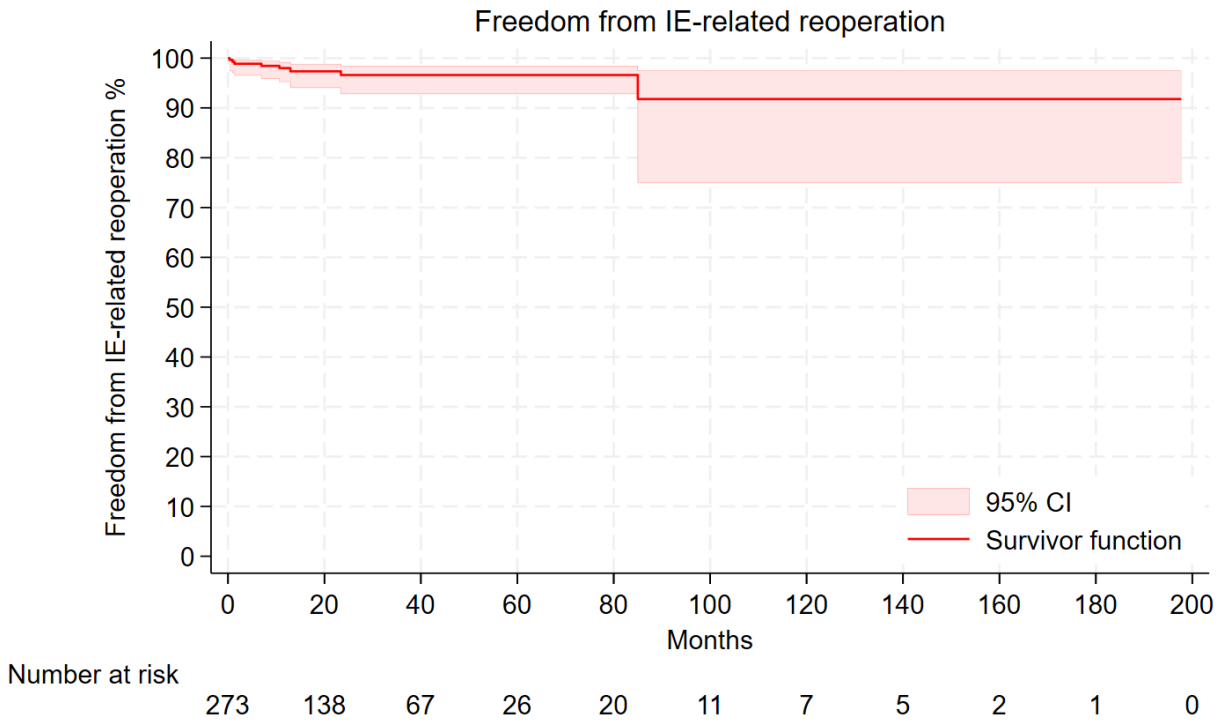


### Overall survival MIS

- 1 year Survival: 85.2%
- 5 years Survival: 75.7%
- 10 years Survival: 56.7%



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### Freedom from IE-related reoperation MIS:

- 1 year: 97.5%
- 5 years: 95.9%
- 10 years: 90.7%

## Conclusions:

- MIS techniques are associated with **reduced hospital and ICU length of stay** compared with conventional surgery in patients undergoing surgical treatment for MV IE
- MIS techniques are associated with **prolonged CPB time**, which may be attributable to the increased procedural complexity of these operations
- **MV repair** is performed more frequently in the MIS group, which may be explained by the higher prevalence of native valve IE among patients undergoing MIS
- **No significant differences** were observed between the MIS and ST groups with respect to **overall survival or complication rates**
- Therefore, **MIS for MV IE appears to be safe and feasible**, with **potential clinical benefits**, particularly when the associated learning curve is appropriately acknowledged and adequately addressed.



## Limitations:

- A meta-analysis restricted to PSM or prospective studies was not feasible due to the limited number of published reports available.
- Comparison of IE-related reoperation rates between the MIS and ST groups was not feasible due to the limited availability of published Kaplan-Meier survival curves.
- MIS MV procedures have been shown to reduce perioperative blood loss and transfusion requirements. However, comparable data for this outcome were not available in the studies included in our analysis.



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**Thank you for your attention!**