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# Risk Factors and Outcomes of *Internal* Fistulous Tract Formation in Infective Aortic Endocarditis: a Prospective ICE Cohort Study

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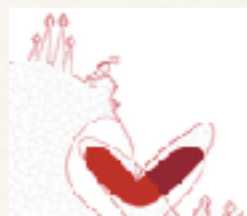
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**on behalf of ICE investigators**



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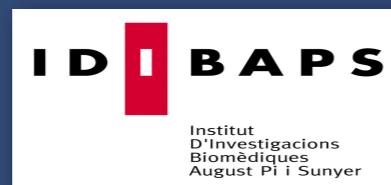
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# Previous studies

Clinical research

**Aorto-cavitary fistulous tract formation in infective endocarditis: clinical and echocardiographic features of 76 cases and risk factors for mortality**

- ❖ Anguera I et al. European Heart Journal (2005) 26, 288–297
- ❖ 1992-2002 ICE. 76 AoCaF
- ❖ All valves were included in that study
- ❖ Only aortic endocarditis developed fistula
- ❖ Mortalidad related to PVE, U/E surgery and CHF



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# Objectives

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- ❖ Incidence, epidemiology and contemporary outcomes
- ❖ Identification of risk factors for development of fistula
- ❖ Determine variables associated with mortality:
  - ❖ In-Hospital
  - ❖ At 1 year Follow-Up



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# Methods

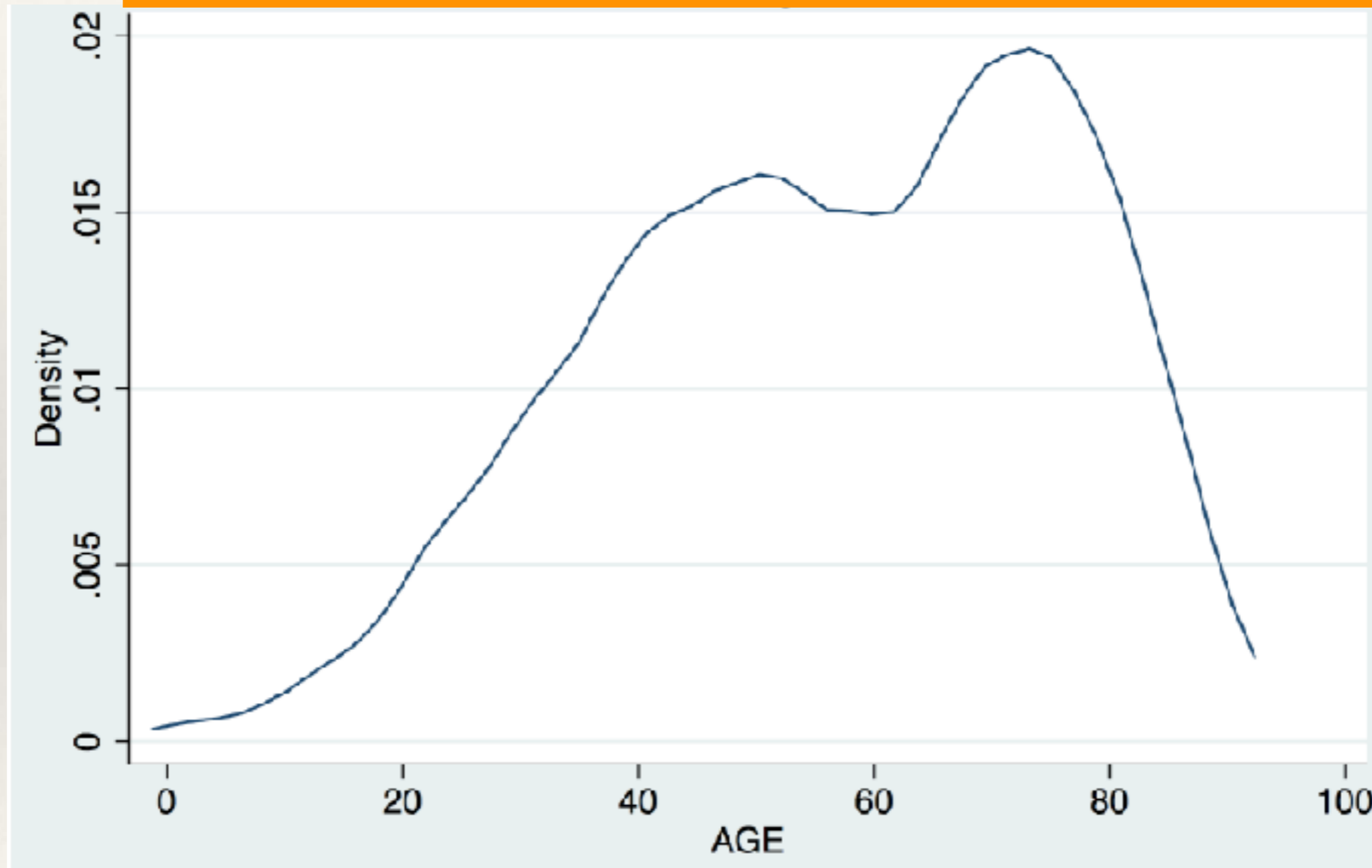
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- ❖ ICE cohort. Prospective. Multi-centric
- ❖ Definite diagnosis of IE, native or prosthetic
- ❖ 61 centers in 28 countries - 2000-06 and 2008-11
- ❖ Focused analysis selecting only aortic endocarditis cases
- ❖ Multivariate analysis



# Results - Distribution by Age

ALL AORTIC VALVE ENDOCARDITIS WITH FISTULA



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# Results

5786 Left-sided IE



3730 Aortic IE  
(64.5%)



141 Aortocavitary fistula  
(3.78 % of all aortic IE)



Native Aortic IE fistula  
(3.2%)



Prosthetic Aortic IE fistula  
(5.2%)



# Differences Based on Presence of Fistula

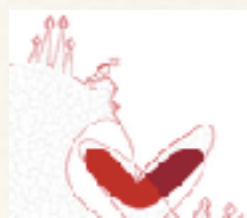
	Aortic IE <b>WITHOUT</b> fistula	Aortic IE <b>WITH</b> fistula	p
Native valve predisposition	32,8%	19%	p=0.008
Prosthetic valve endocarditis	32,9%	43,5%	p=0.014
New moderate/severe regurgitation	58%	73%	< 0.001
Perivalvular abscess	22%	100%	< 0.001
Congenital heart disease	11,7%	21%	< 0.009
Heart failure	39,7%	58,7%	< 0.001
<i>Enterobacteriae spp</i>	1,3%	6,3%	p=0.021
<i>S bovis</i>	7,6%	3,1%	p=0.006
Valve perforation	12%	19%	p=0.023
In-hospital surgery	57%	73,8%	< 0.001

No other differences in demography, medical history, echocardiographic findings, place of acquisition, etiology, current clinical features, treatment, complications of endocarditis



# Results - Risk Factors for Development of Fistula

	OR	p
Congenital Heart Disease	2.03	p=0.002
Prosthetic valve endocarditis	1.67	p=0.007
<i>Enterobacteriae spp</i>	5.01	p<0.001



# Results - Outcome

<b>Outcomes</b>	<b>No Fist</b>	<b>Fist</b>	
<b>n</b>	<b>3581</b>	<b>140</b>	
<b>In-hospital death</b>	<b>681</b>	<b>42</b>	<b>0,005</b>
<b>%</b>	<b>19,0</b>	<b>30,0</b>	
<b>n</b>	<b>2936</b>	<b>125</b>	
<b>1-year mortality</b>	<b>934</b>	<b>54</b>	<b>0,012</b>
<b>%</b>	<b>31,8</b>	<b>43,2</b>	



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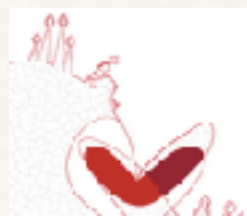
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# Results - Risk Factors for Mortality

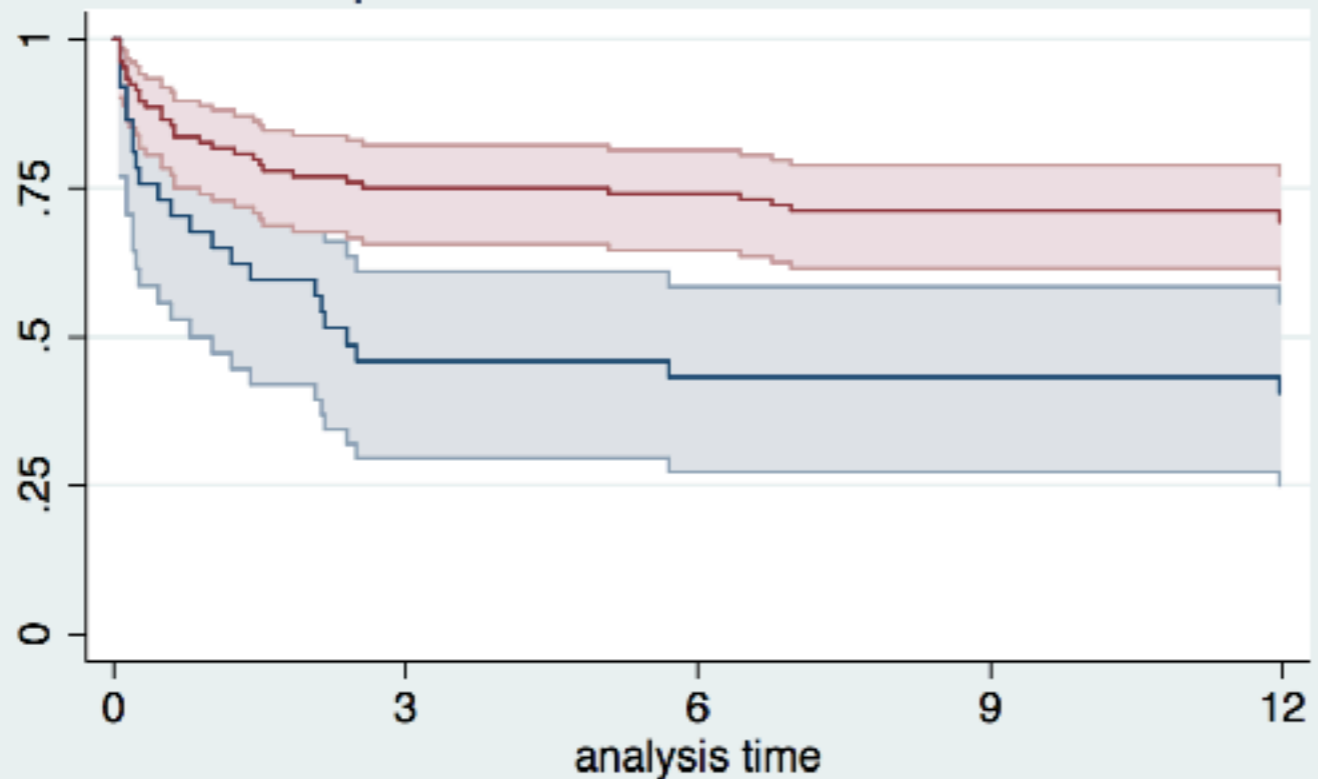
IN HOSPITAL	OR	p
Age >60 y	2.97	p=0.004
Chronic pulmonary disease	4.52	p=0.004
<i>Enterococcus spp</i> IE	7.8	p<0.001
Congestive Heart Failure	3.1	p=0.006
Persistent + blood cultures	6.1	p=0.01
New conduction abnormality	6	p=0.005
Cardiovascular Surgery	0.32	p=0.003

AT 1 YEAR	OR	p
Age >60 y	2.77	p=0.006
Coagulase negative IE	3.9	p=0.002
<i>Enterococcus spp</i> IE	3.9	p=0.002
Congestive Heart Failure	2.8	p=0.04
New conduction abnormality	4.5	p=0.03
Cardiovascular Surgery	0.27	p=0.002

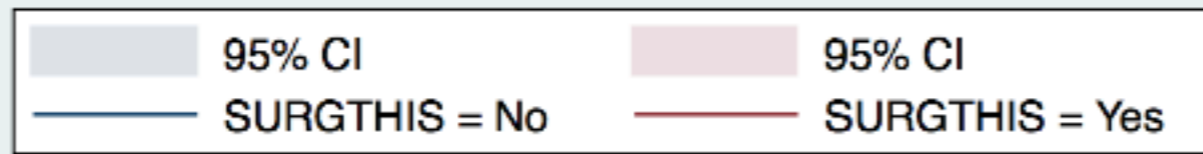


# Results - Operative management

Kaplan-Meier survival estimates



Number at risk		0	3	6	9	12
SURGTHIS = No	37	17	16	16	16	16
SURGTHIS = Yes	104	78	77	74	74	74



	Fistulas undergoing surgery	Fistulas without surgery
Hospital Mortality %	23,3	48,6



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# Conclusions

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- ❖ Up to 3.8% of aortic endocarditis seen in referral centres develop *internal* fistula / s
- ❖ Confers worse outcome to aortic valve endocarditis
- ❖ Risk factors for development of fistula: PVE, CHD and *Enterobacteriae spp*
- ❖ CHF, Age >60 y, *Enterococcus spp* and new conduction abnormality associated with in-hospital and 1-year mortality
- ❖ Cardiovascular surgery in the acute phase was associated with in-hospital and 1-year Survival

