

Aortic Regurgitation: Do We Follow AR Too Long?

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DISCLOSURE STATEMENT

Speaker: Jeffrey S. Borer, M.D.

has disclosed that he has no actual or potential conflict of interest in regard to this program.

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 - ***BUT NO RANDOMIZED CONTROLLED CLINICAL TRIALS***

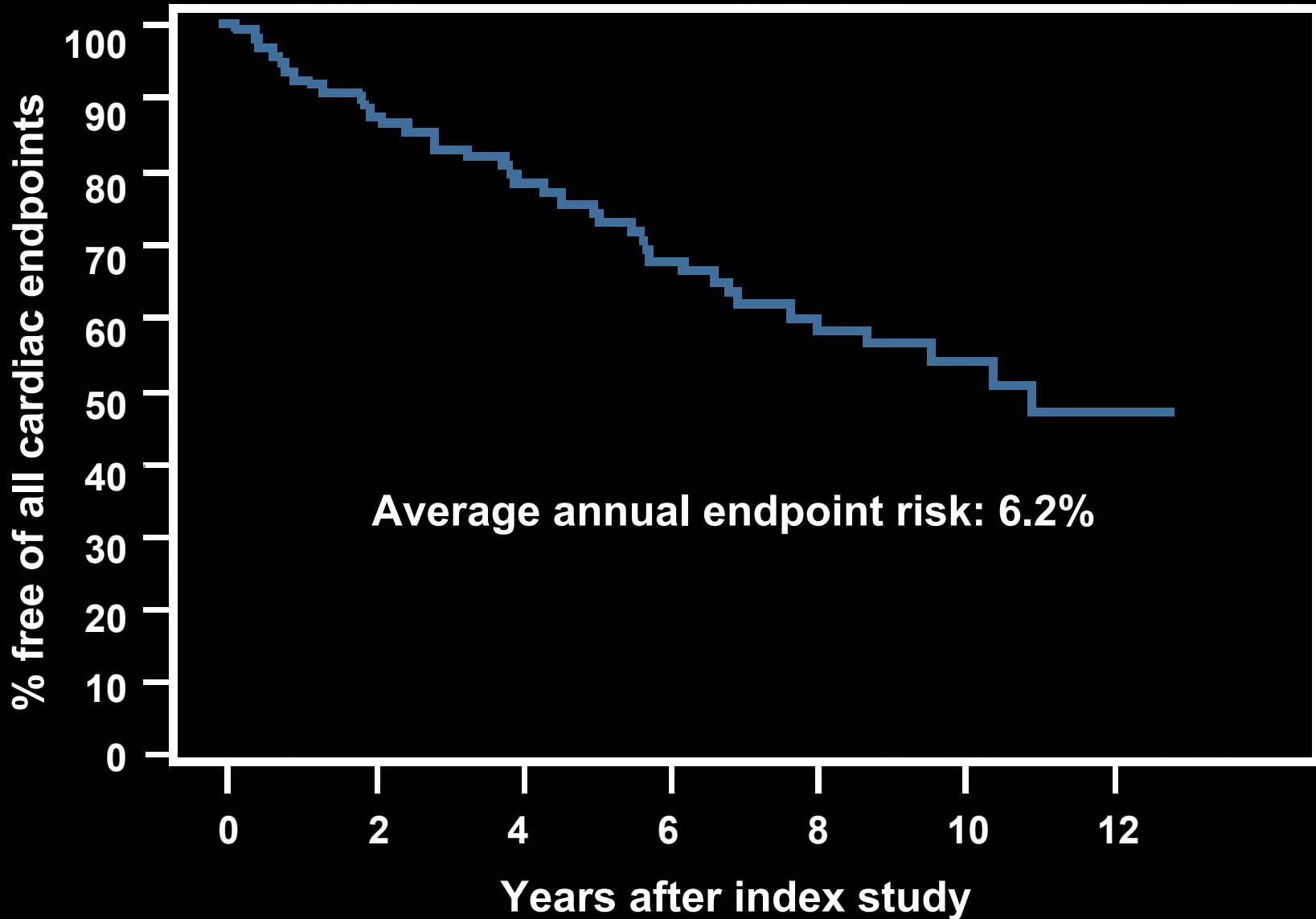
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 - Benefit: symptom relief, ? prolongation of life
- ASYMPTOMATIC
 - Benefit: ? Prolongation of life
 - *BUT NO RANDOMIZED CONTROLLED CLINICAL TRIALS*
 - Risk
 - Periprocedural mortality and MACE
 - Intrinsic
 - Comorbidity-related (diabetes, renal disease, pulmonary dysfunction, cerebrovascular disease, etc.), **other valve or coronary disease**
 - Late post AVR adverse events
 - Prosthesis selection
 - » anticoagulation
 - » durability

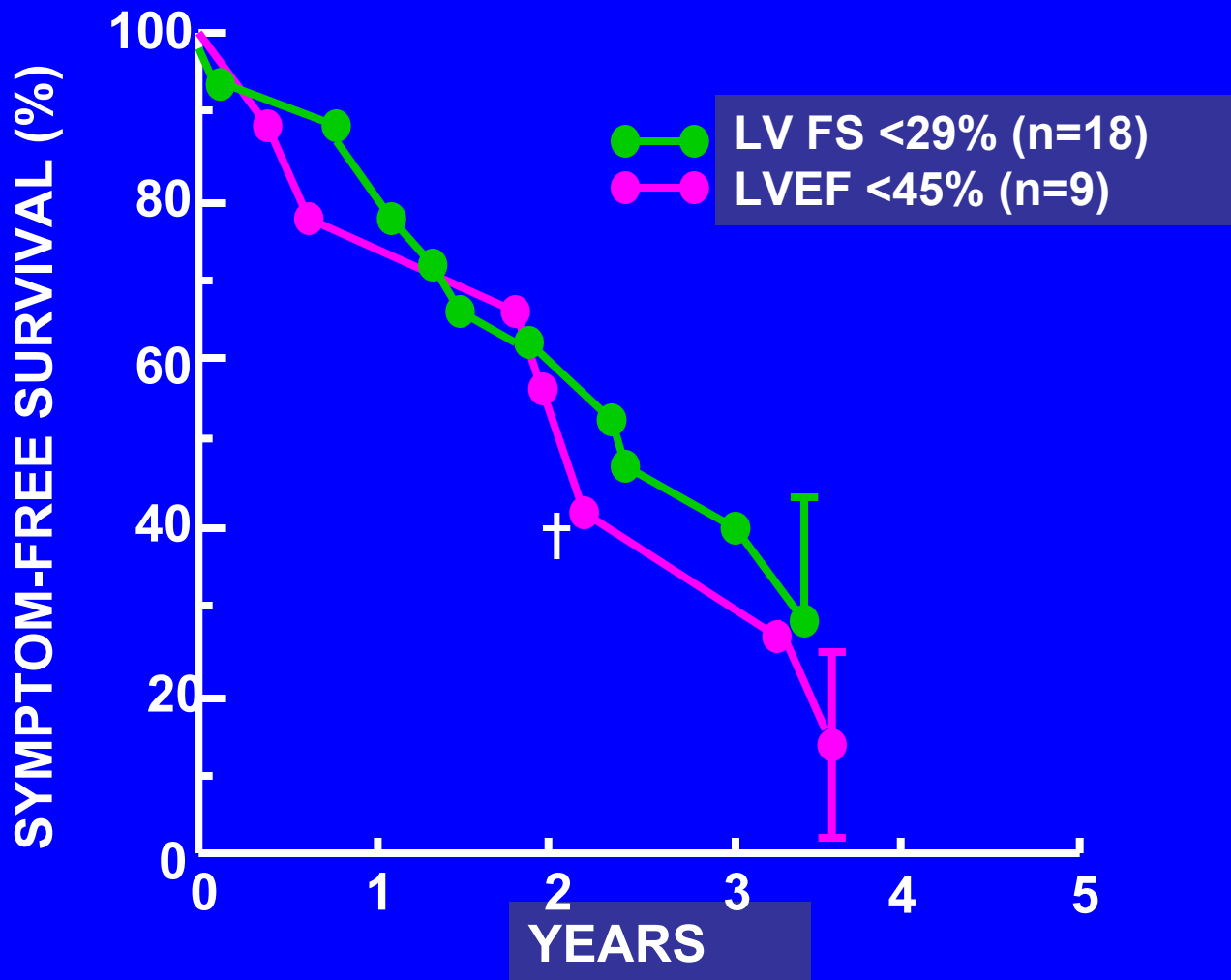
SELECTION FOR SURGERY: HEMODYNAMICALLY SEVERE AR *and*

- **Asymptomatic pts with isolated, pure AR with no major non-cardiac co-morbidity**
 - **Periprocedural mortality: 1-2%**
 - **MACE: 2-5%**
 - **Bioprosthesis: >75% freedom from structural failure at 20 years**

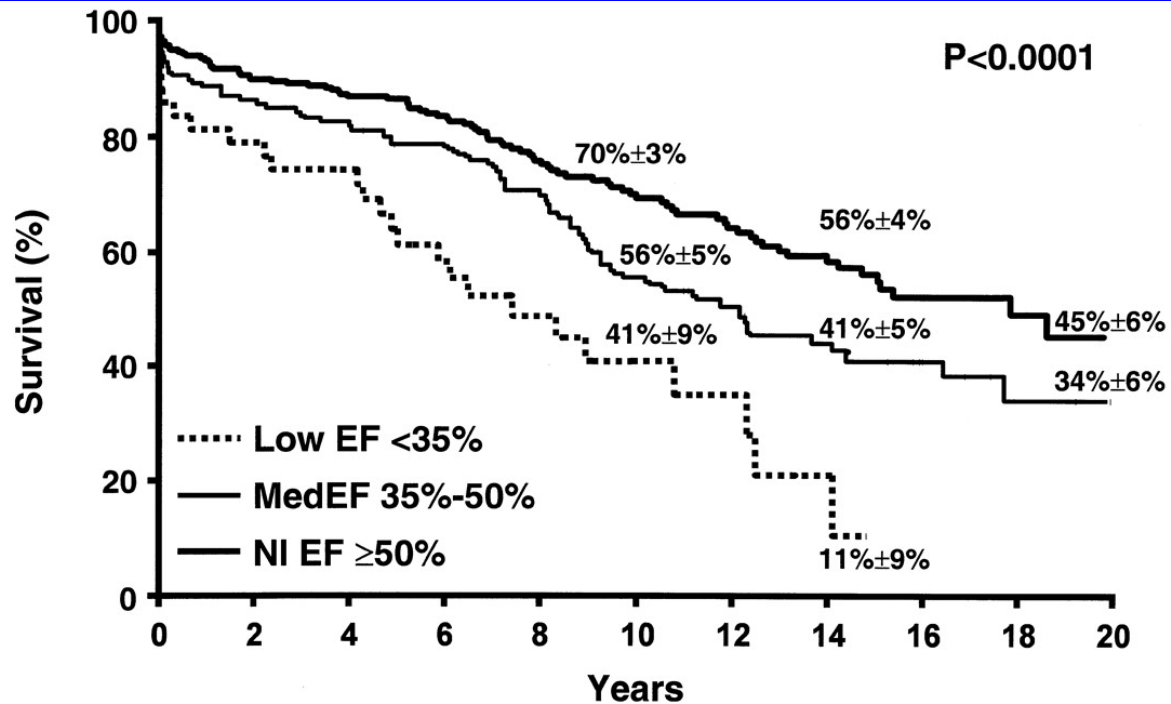
AORTIC REGURGITATION



ASYMPTOMATIC AR: EFFECT OF SUBNL LV FUNCTION ON NATURAL HISTORY

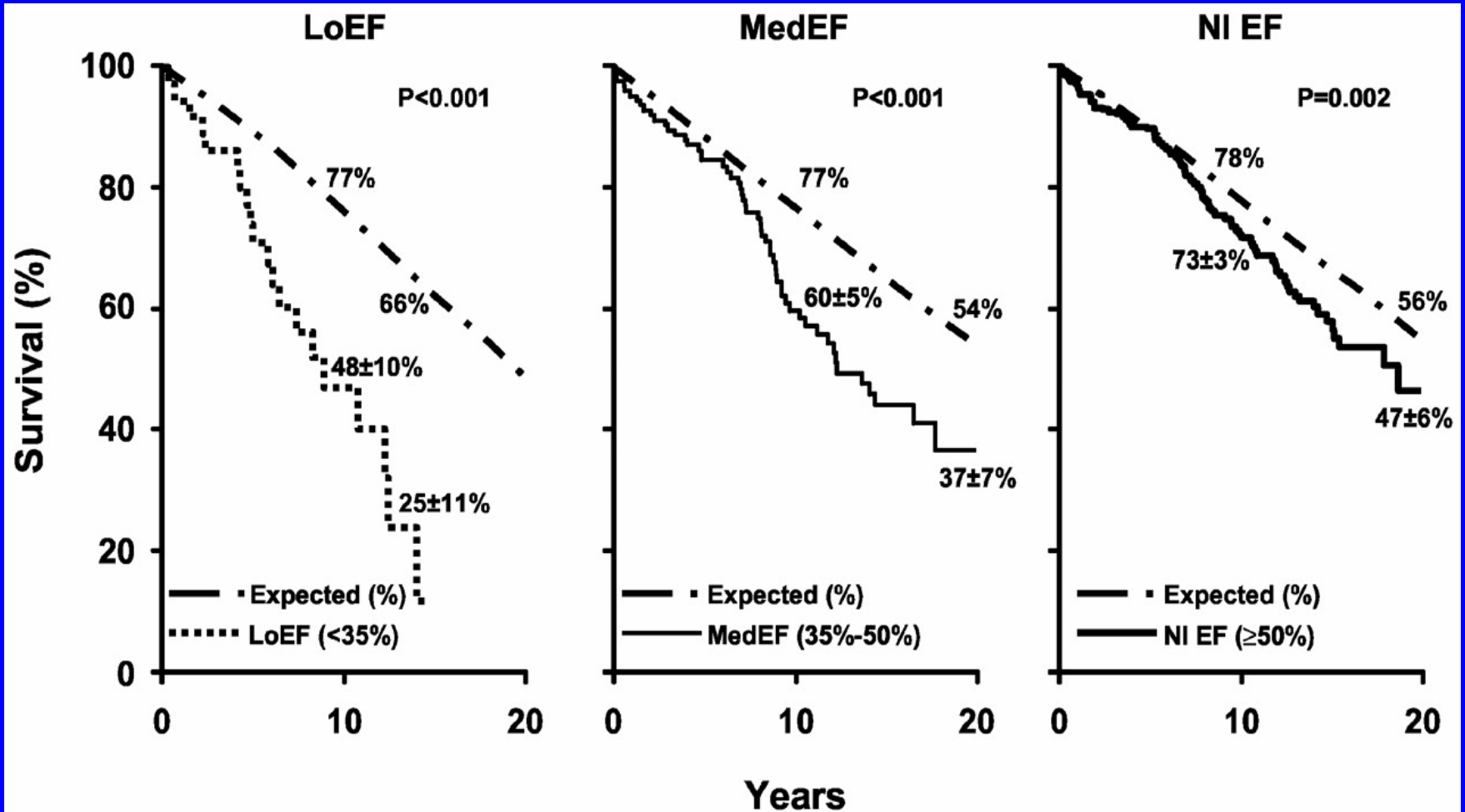


SURVIVAL AFTER AVR AS A FUNCTION OF PRE-OP LVEF



| | | | | | | | | | | | |
|--------------------|-----|-----|-----|-----|-----|-----|----|----|----|----|---|
| LoEF (EF <35%) | 43 | 35 | 31 | 21 | 15 | 8 | 6 | 3 | | | |
| MedEF (EF 35%-50%) | 134 | 115 | 108 | 95 | 78 | 50 | 34 | 30 | 19 | 9 | 2 |
| NI EF (EF ≥50%) | 273 | 245 | 231 | 184 | 141 | 112 | 83 | 60 | 32 | 17 | 1 |

SURVIVAL AFTER AVR FOR AR: RELATION OF PRE-OP LVEF TO EXPECTED (“CONTROL”)



**IN 5/9 STUDIES IN WHICH LVID MEASURED
IN ASYMPTOMATIC PATIENTS WITH AR
AND NORMAL LVEF_{rest}, NATURAL
HISTORY WAS PREDICTED BY**

- **LVIDS**

(cut point= 55mm, 25mm/m²)

– If below cut point, progression to sx, subnl LVEF_{rest} or death = 10-20%/yr

- **LVIDD**

(cut point= 70mm)

– If below cut point, progression to sx, subnl LVEF_{rest} or death = 7-10%/yr

- →.: AVR



IN ASYMPTOMATIC PATIENTS WITH AR AND NL LVEF_{rest} NATURAL HISTORY ALSO IS PREDICTED BY

- CHANGE RATE OF LVEF_{EX} (cut point=.32%/yr)
- CHANGE RATE OF LVEF_R (>-3%/yr)
- CHANGE RATE OF LVIDS (cut point >1mm/yr)

If below cut point, progression to sx, subnl LVEF_{rest} or death are not reliably predicted (few studies, little replication)

∴ not sufficient to support AVR *unless*



- LV dimensions approach “high risk” segregation points (LVIDs 50-55mm and LVIDd 70-75mm)

....especially if

- Exercise tolerance is falling by formal ETT
- Exercise hemodynamics are abnormal

In these cases, **SURGERY ALSO IS REASONABLE**
though decision is partially subjective and not yet
data-driven

ADHERENCE TO GUIDELINES AMONG ASYMPTOMATIC PATIENTS WITH AR (n=52): EUROSURVEY WITH ACC/AHA GUIDELINES

| | n | n |
|--|---|----|
| Concordant decisions | | 43 |
| Decision to operate and operation recommended according to guidelines | | 16 |
| Mild to moderate LV dysfunction (I) | 4 | |
| Normal systolic function but severe LV dilatation (IIa) | 3 | |
| Normal systolic function and progressive LV dilatation (IIb) | 4 | |
| Normal systolic function but decline in EF at exercise (IIb) | 0 | |
| Severe LV dysfunction (EF <0.25) (IIb) | 0 | |
| Aortic root diameter >50 mm | 5 | |
| Decision not to operate and operation recommended according to guidelines, but comorbidity | | 2 |
| Decision not to operate and operation not recommended according to guidelines | | 25 |
| Discordant decisions | | 9 |
| Decision not to operate and operation recommended according to guidelines, without comorbidity | | 4 |
| Mild to moderate LV dysfunction (I) | 0 | |
| Normal systolic function but severe LV dilatation (IIa) | 1 | |
| Normal systolic function and progressive LV dilatation (IIb) | 2 | |
| Normal systolic function but decline in EF at exercise (IIb) | 0 | |
| Severe LV dysfunction (EF <0.25) (IIb) | 0 | |
| Aortic root diameter >50 mm | 1 | |
| Decision to operate and operation not recommended according to guidelines | | 5 |

EF, Ejection fraction.

| | All patients (n = 31) | Normotensive patients (n = 16) |
|------------------|--------------------------|-----------------------------------|
| | n (%) | n (%) |
| Aspirin | 5 (16) | 1 (6) |
| Diuretics | 7 (23) | 1 (6) |
| Digoxin | 0 | 0 |
| Antiarrhythmic | 1 (3) | 0 |
| β-Blockers | 3 (10) | 1 (6) |
| ACE-inhibitors | 14 (45) | 5 (31) |
| Calcium-blockers | 5 (16) | 0 |
| Statins | 4 (13) | 2 (12) |
| Nitrates | 2 (6) | 1 (6) |

NO INFORMATION ABOUT ACTIONS BASED ON SYMPTOMS

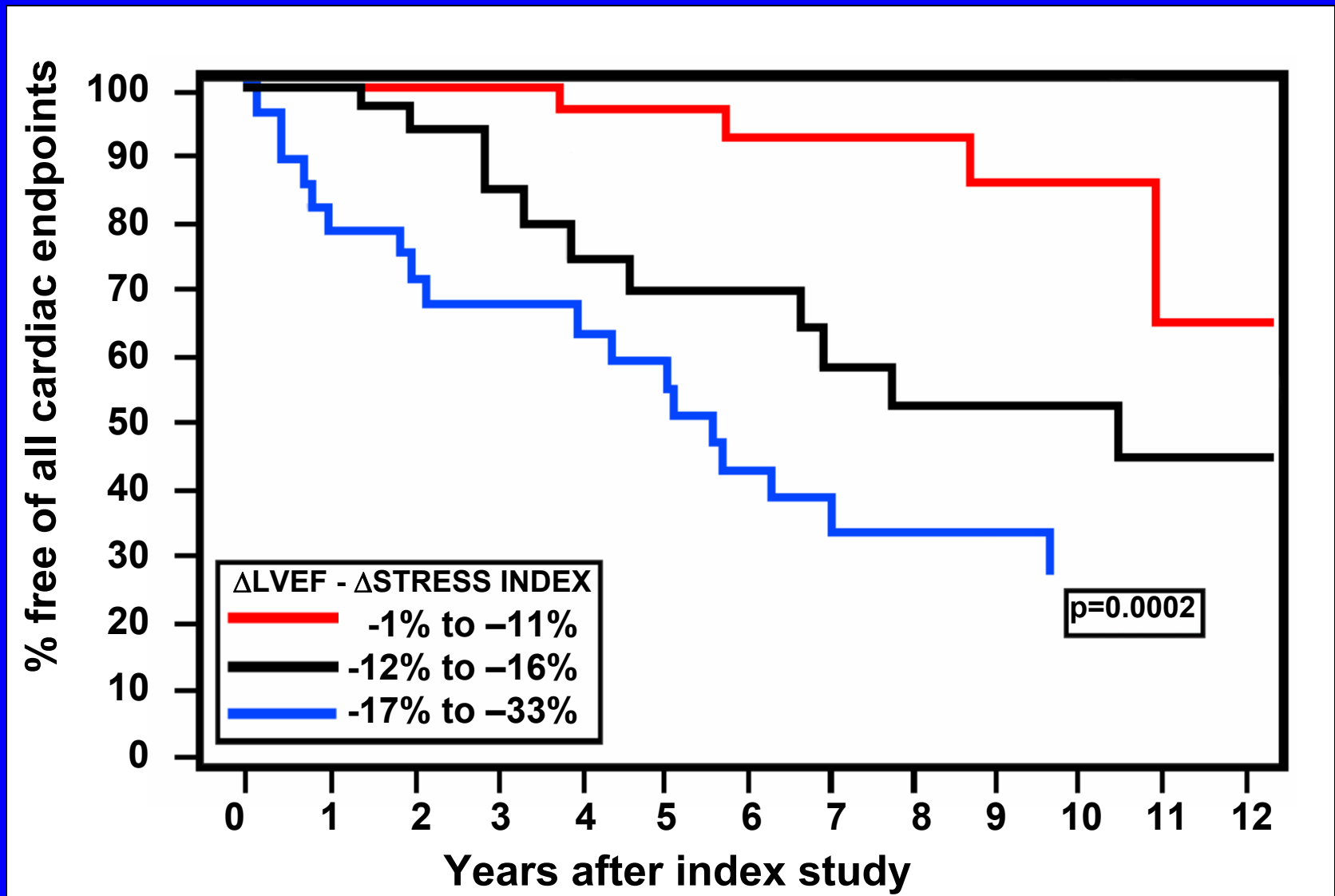
ADHERENCE TO GUIDELINES IN AR: POSSIBLE REASONS FOR DISCORDANCE

- Ignorance of guidelines
- Imprecise criteria (“rapid progression”)
- Inadequate data

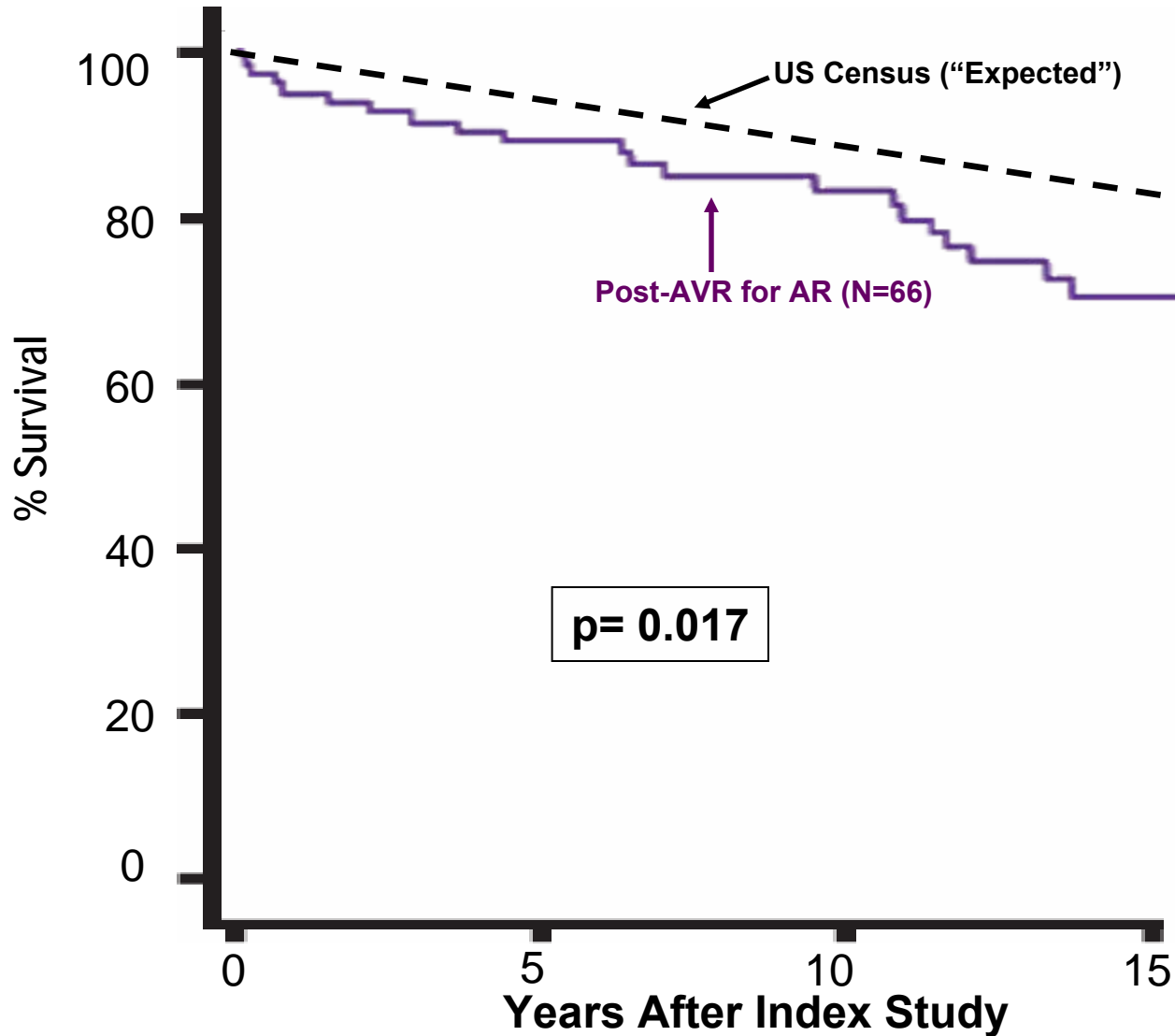
DETERMINANTS OF WHETHER WE WAIT TOO LONG

- Adherence to current guidelines
- Adequacy of current guidelines
 - Limited by available data – so need....
- New data

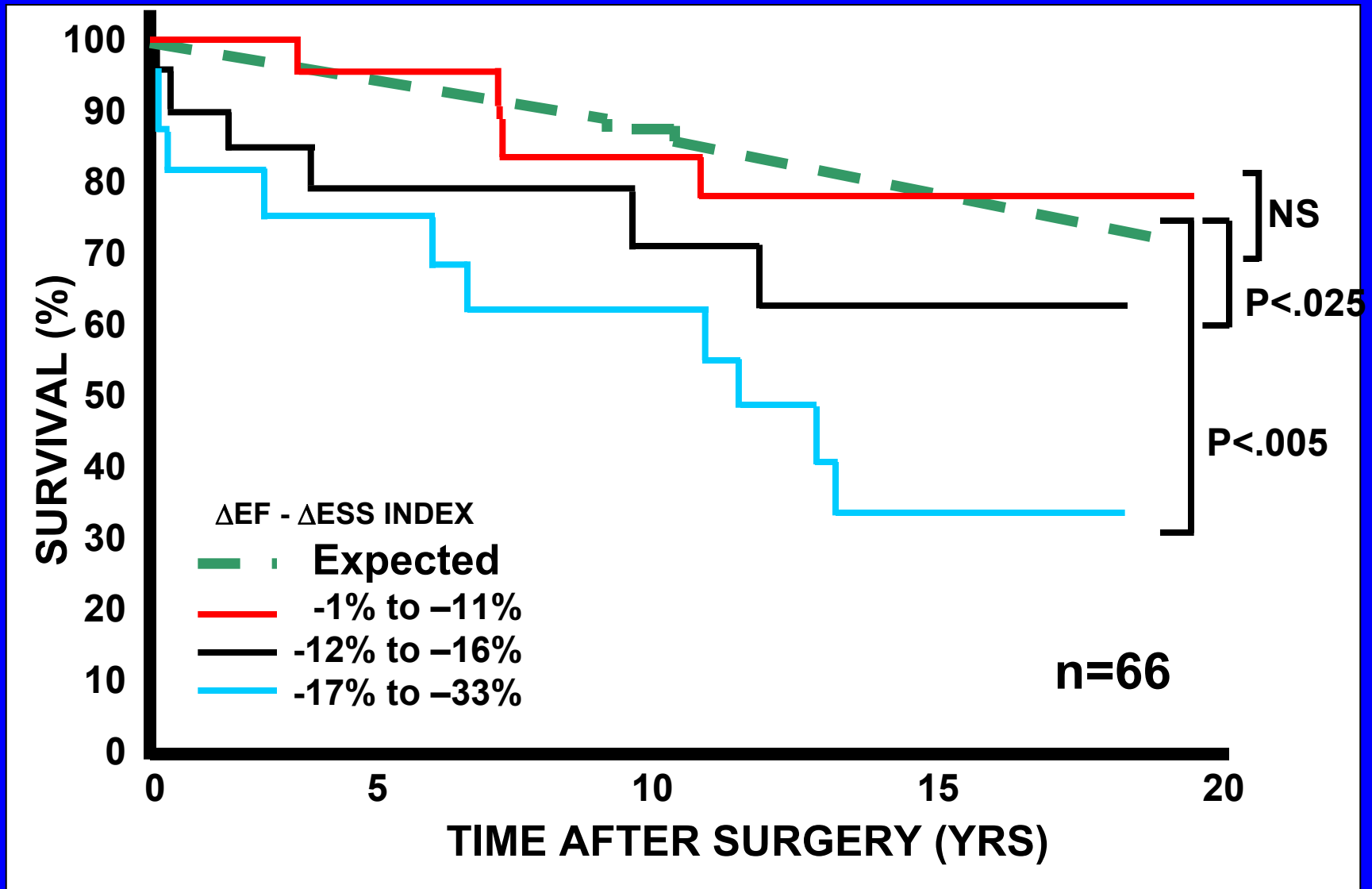
Aortic Regurgitation: All Endpoints



Survival: Post AVR for AR vs U.S. Census (age and sex matched)



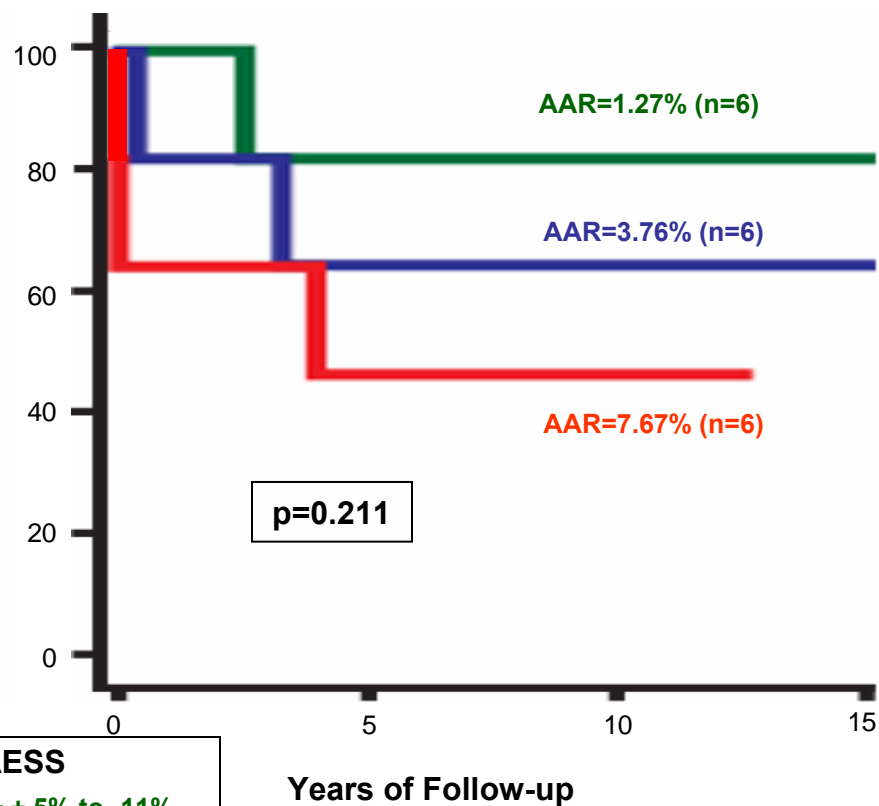
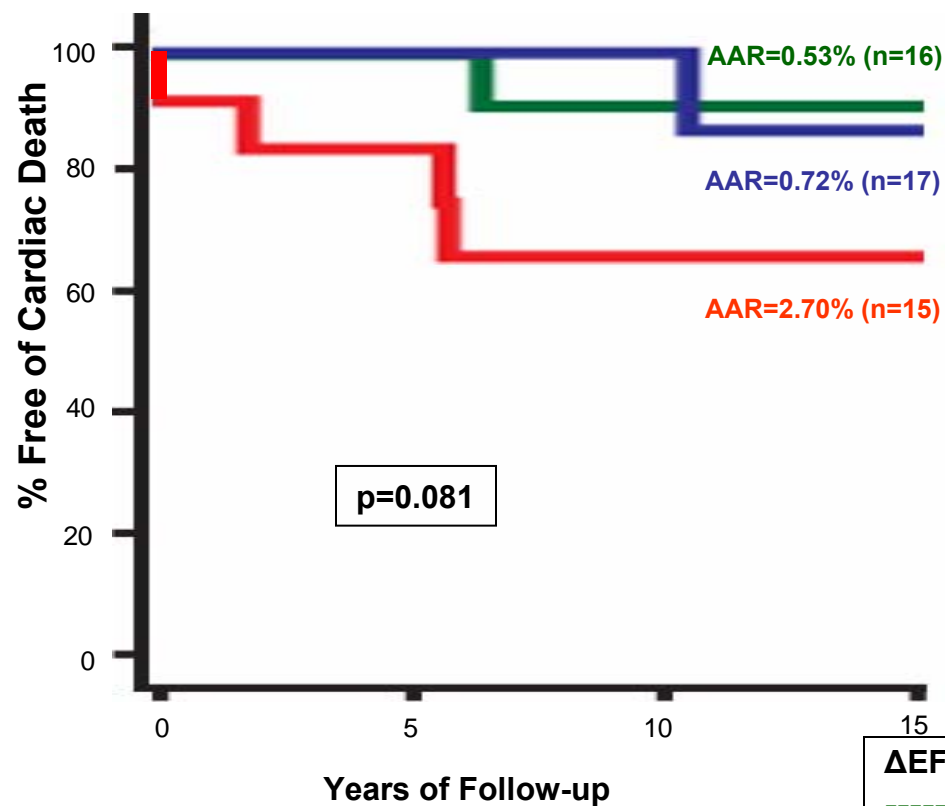
SURVIVAL AFTER AVR AS A FUNCTION OF PRE-OP CONTRACTILITY ($\Delta EF - \Delta ESS$)



Preop Contractility vs Post-AVR Cardiac Death: relation to preop symptoms

FC 1-2 (n=48)

FC 3-4 (n=18)



....AND

- **Late post-op survival prediction by contractility is independent not only of symptoms, but of LVEFrest, LVFS, LVIDs, LVIDd**
- **LVEF rest falls $\cong 1\%/yr$ when LV contractility is markedly subnl, with contractility further deteriorating**

Therefore,

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- To optimize outcome, consider AVR when
 - objective “high risk” descriptors are being approached and
 - rate of change of LVEFrest, LVEFex or LVIDs deteriorating “rapidly”
 - supported by abnormal ex hemodynamics and/or falling ex tolerance

Therefore,

- In patients with isolated, pure AR without major comorbidities, often we wait too long for AVR
- To optimize outcome, consider AVR when
 - objective “high risk” descriptors are being approached and
 - rate of change of LVEFrest, LVEFex or LVIDs deteriorating “rapidly”
 - supported by abnormal ex hemodynamics and/or falling ex tolerance
 - ***contractility falls to >10% below normal even in absence of other findings***