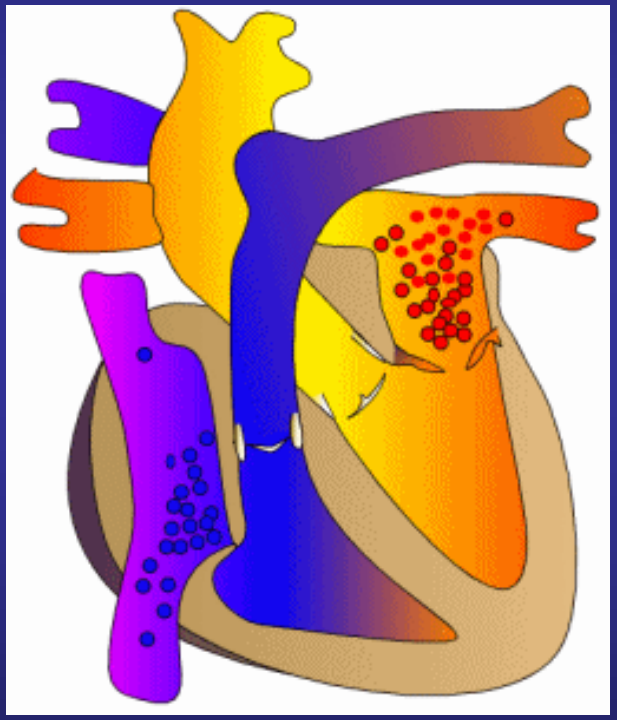
# Valvular heart disease :
## Role of medication
## ( drug and intervention )



Pol.Col.Dr.Kasem Ratanasumawong

# Management of valvular heart disease

- Accurate diagnosis and disease severity
- Prevention and treatment of complication
- Monitor and consider timing of surgery ( wait and watch )
- Assess and treatment of comorbidity and associated condition

# Role of medications

- Prevention of complication
- Treatment of complication
- Symptomatic treatment
- General health care
- Treatment of co-existent disease
- Prevention of disease progression : delayed surgical treatment

# Complication of valvular heart disease

- Infective endocarditis
- Recurrent rheumatic fever
- Thromboembolism
- Disease progression -> heart failure

Case study 1

A 40 year old female patient with severe MS with Dyspnea on exertion.

BP 110/80 mmHg, HR 120/min, irregular pulse

Echo : Thickened and doming of MV

MVA 0.8cm.2by pressure half time

no LA thrombus

What is your management?

# Prevention of endocarditis

Table 1

**Cardiac Conditions Associated with Highest Risk of Adverse Outcome from Endocarditis for Which Prophylaxis Before Dental Procedures Is Recommended**

- Prosthetic cardiac valve
- Previous infective endocarditis (IE)
- Congenital heart disease (CHD)*
  - Unrepaired cyanotic CHD, including palliative shunts and conduits
  - Completely repaired congenital heart defect with prosthetic material or device, whether placed by surgery or by catheter intervention, during the first 6 months after the procedure†
  - Repaired CHD with residual defects at the site or adjacent to the site of a prosthetic patch or prosthetic device (which inhibit endothelialization)
- Cardiac transplantation recipients who develop cardiac valvulopathy

*Except for the conditions listed above, antibiotic prophylaxis is no longer recommended for any other form of CHD.

*2008 focused update ACC/AHA guideline management of valvular heart disease*

# Prevention of endocarditis

Table 2
**Regimens for IE Prophylaxis Before Dental Procedures**

| Situation | Agent | Regimen for adult* | Regimen for children* |
|---|---|---|---|
| Oral | Amoxicillin | 2.0 g | 50 mg/kg |
| Unable to take oral medications | Ampicillin | 2.0 g IM or IV | 50 mg/kg IM or IV |
| Penicillin-allergic | Clindamycin or | 600 mg | 20 mg/kg |
| | Cefalexin or cephadroxil or | 2.0 g | 50 mg/kg |
| | Azithromycin or clarithromycin | 500 mg | 15 mg/kg |
| Penicillin-allergic and unable to take oral medications | Clindamycin or | 600 mg IV | 20 mg/kg IV |
| | Cefazolin | 1.0 g IM or IV | 25 mg/kg IM or IV |

*Administered 30–60 minutes before procedure; IM = intramuscular; IV = intravenous

# Secondary rheumatic prophylaxis

| Category | Duration |
|---|---|
| Rheumatic fever with carditis and residual heart disease (persistent valvular disease) | 10 y or greater since last episode and at least until age 40 y; sometimes lifelong prophylaxis* |
| Rheumatic fever with carditis but no residual heart disease (no valvular disease) | 10 y or well into adulthood, whichever is longer |
| Rheumatic fever without carditis | 5 y or until age 21 y, whichever is longer |

*Statement for health professionals, AHA 1995*

# Prevention of rheumatic fever

Table 4
**Secondary Prevention of Rheumatic Fever**

| Agent | Dose | Mode |
|---|---|---|
| Benzathine penicillin G | 1 200 000 U every 4 week (every 3 week for high-risk* patients such as those with residual carditis) | Intramuscular |
| Or | | |
| Penicillin V | 250 mg twice daily | Oral |
| Or | | |
| Sulfadiazine | 0.5 g once daily for patients 27 g (60 lb) or less; 1.0 g once daily for patients greater than 27 kg (60 lb) | Oral |
| For individuals allergic to penicillin and sulfadiazine Erythromycin | 250 mg twice daily | Oral |

# Risk of thromboembolism in valvular heart disease

- Systemic embolization may occur in 10-20% of patients with MS
- Risk related to age and present of AF
- AF with MS : highest risk among native valve
- AF with MR, aortic valve and tricuspid valve : relatively lower risk

# Thai guideline of oral anticoagulant 2010

*คำแนะนำระดับ ++*

1. กรณี valvular atrial fibrillation (AF) ให้ยาต้านการแข็งตัวของเลือดชนิดรับประทาน (target INR 2.0-3.0)
   *(คุณภาพของหลักฐาน ระดับ 1)*

New oral anticoagulants is not recommended

# Prevention of thromboembolism

- Mitral stenosis

**CLASS I**

1. Anticoagulation is indicated in patients with MS and atrial fibrillation (paroxysmal, persistent, or permanent). *(Level of Evidence: B)*
2. Anticoagulation is indicated in patients with MS and a prior embolic event, even in sinus rhythm. *(Level of Evidence: B)*
3. Anticoagulation is indicated in patients with MS with left atrial thrombus. *(Level of Evidence: B)*

**CLASS IIb**

1. Anticoagulation may be considered for asymptomatic patients with severe MS and left atrial dimension greater than or equal to 55 mm by echocardiography.* *(Level of Evidence: B)*
2. Anticoagulation may be considered for patients with severe MS, an enlarged left atrium, and spontaneous contrast on echocardiography. *(Level of Evidence: C)*

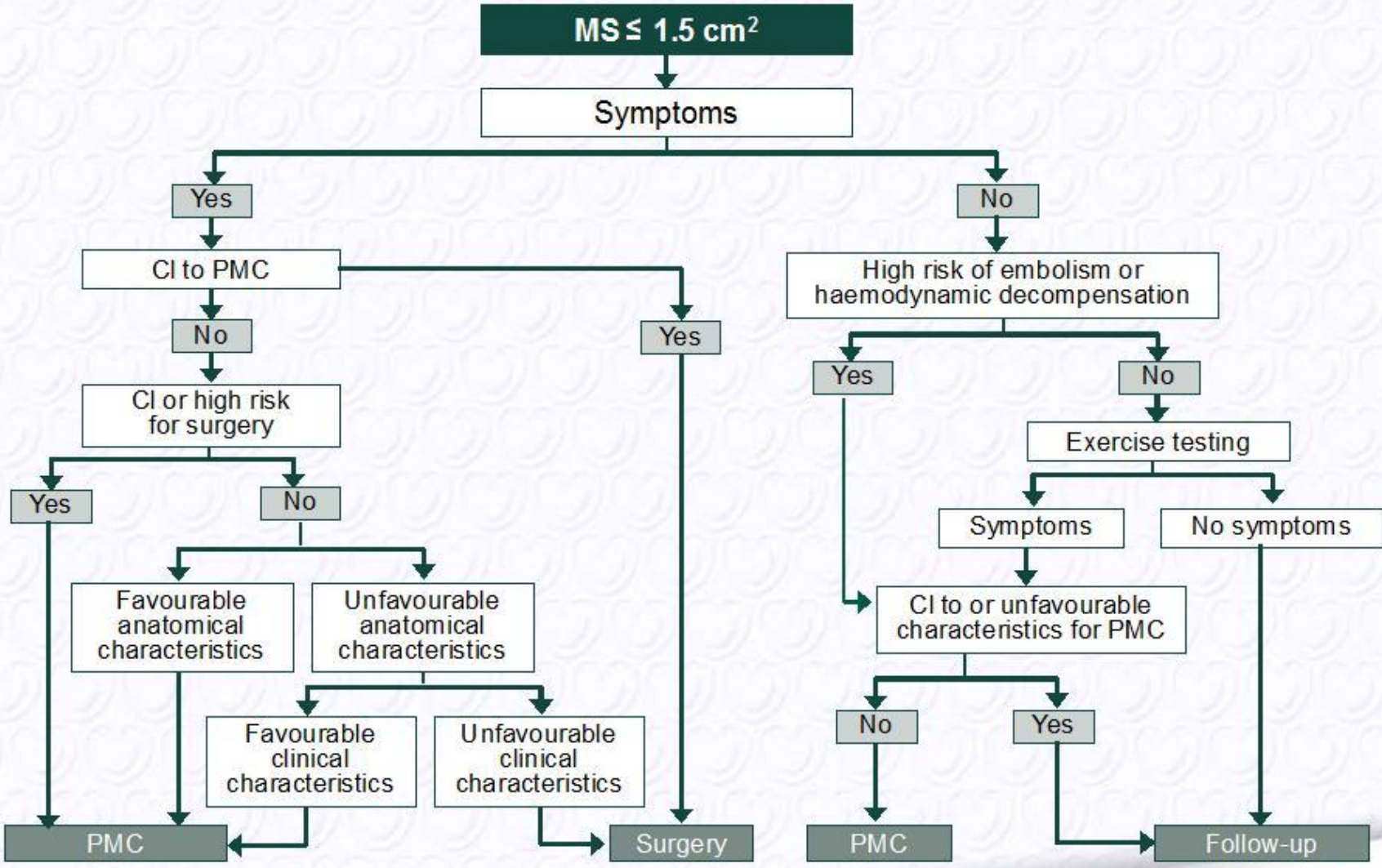
*2008 focused update ACC/AHA guideline management of valvular heart disease*

# Symptomatic MS

- Mitral stenosis
  - Loop diuretics
  - Beta blocker, rate slowing calcium blocker
  - Digoxin

ACE inhibitor or vasodilator : not recommended

# Management of clinically significant mitral stenosis




European Heart Journal 2012 - doi:10.1093/eurheartj/ehs109 & European Journal of Cardio-Thoracic Surgery 2012 - doi:10.1093/ejcts/ezs455).

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# Management of mitral stenosis

Table 2
**Indications for Percutaneous Mitral Balloon Valvotomy (PMBV) for Mitral Stenosis**

**Class I**

1. PMBV is effective for symptomatic patients with moderate or severe MS and valve morphology favorable for PMBV in the absence of left atrial thrombus or moderate to severe MR.
2. PMBV is effective for asymptomatic patients with moderate or severe MS and valve morphology favorable for PMBV who have pulmonary HTN (PASP >50 mm Hg at rest or >60 mm Hg with exercise) in the absence of LA thrombus or moderate to severe MR.

**Class IIA**

1. PMBV is reasonable for patients with moderate to severe MS who have a nonpliable calcified valve, are in NYHA functional class III–IV, and are either not candidates for surgery or are at high risk for surgery.

**Class IIB**

1. PMBV may be considered for asymptomatic patients with moderate or severe MS and valve morphology favorable for PMBV who have new onset atrial fibrillation in the absence of LA thrombus or moderate to severe MR.
2. PMBV may be considered for symptomatic patients with MV area greater than 1.5 $cm^2$ if there is evidence of hemodynamically significant MS based on pulmonary artery systolic pressure greater than 60 mm Hg, PCWP of 25 mm Hg or more, or mean MV gradient greater than 15 mm HG during exercise.
3. PMBV may be considered as alternative to surgery for patients with moderate or severe MS who have a nonpliable calcified valve and are in NYHA class III–IV.

**CLASS III**

1. Not indicated for patients with mild MS.
2. Should not be performed in patients with moderate to severe MR or LA thrombus.

# Essential questions in the evaluation of a patient for valvular intervention

- Is valvular heart disease severe?
- Does the patient have symptoms?
- Are symptoms related to valvular disease?
- What are patient life expectancy and expected quality of life?
- Do the expected benefits of intervention (versus spontaneous outcome) outweigh its risks?
- What are the patient's wishes?
- Are local resources optimal for planned intervention?

European Heart Journal 2012 - doi:10.1093/eurheartj/ehs109 & European Journal of Cardio-Thoracic Surgery 2012 - doi:10.1093/ejcts/ezs455).

# Patient Evaluation

- **Clinical assessment**
  - Symptoms, comorbidities, patient education.
  - Auscultation.
- **Echocardiography**
  - Key examination to confirm diagnosis and assess severity and prognosis.
  - Need to check consistency between the different echocardiographic findings (severity, mechanism, anatomy of valvular disease) and with clinical assessment.



European Heart Journal 2012 - doi:10.1093/eurheartj/ehs109 & European Journal of Cardio-Thoracic Surgery 2012 - doi:10.1093/ejcts/ezs455).

# Symptomatic MR

- Mitral regurgitation
  - Acute or chronic
- Acute setting
  - Sodium nitroprusside / Dobutamine
- Chronic setting
  - Diuretic, vasodilator, ACE inhibitor , Beta blocker indicate in IHD, LV dysfunction or HT

# Medical treatment in MR

- No indication for vasodilator and ACE inhibitors in asymptomatic patients with MR and preserved LV function
- ACE inhibitor and beta blocker indicate in patient with HT, LV dysfunction from functional or ischemic MR
- If presence of AF : calcium antagonist, beta blocker, digoxin or amiodarone and anticoagulant
- IE prophylaxis : no longer recommend

# Symptomatic AR

**CLASS I**

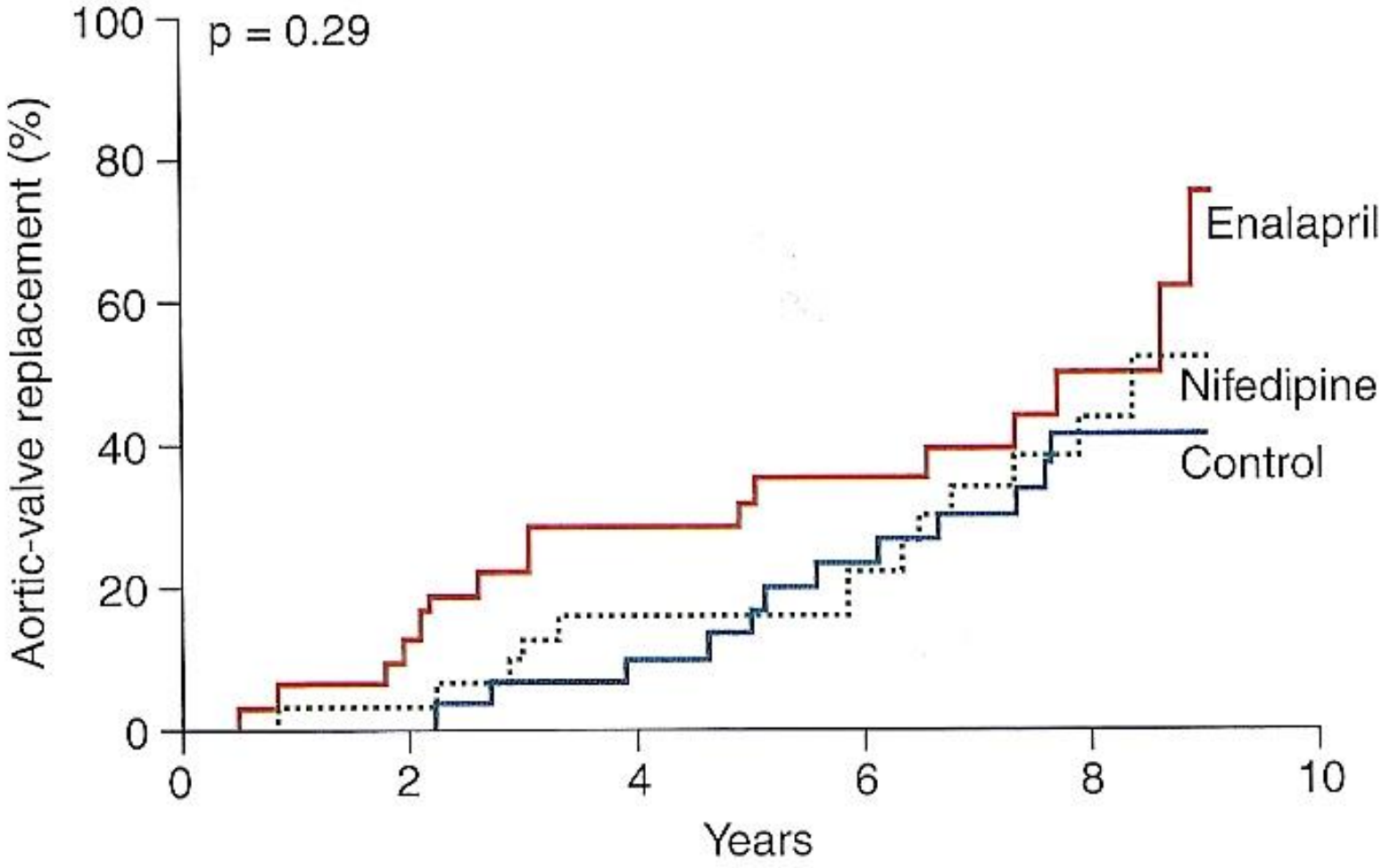
1. Vasodilator therapy is indicated for chronic therapy in patients with severe AR who have symptoms or LV dysfunction when surgery is not recommended because of additional cardiac or noncardiac factors. *(Level of Evidence: B)*

**CLASS IIa**

1. Vasodilator therapy is reasonable for short-term therapy to improve the hemodynamic profile of patients with severe heart failure symptoms and severe LV dysfunction before proceeding with AVR. *(Level of Evidence: C)*

*2008 focused update ACC/AHA guideline management of valvular heart disease*

# Progression to AVR in asymptomatic severe AR




*Evangelista A,et al. N Engl J Med 2005; 353: 1342-1349*

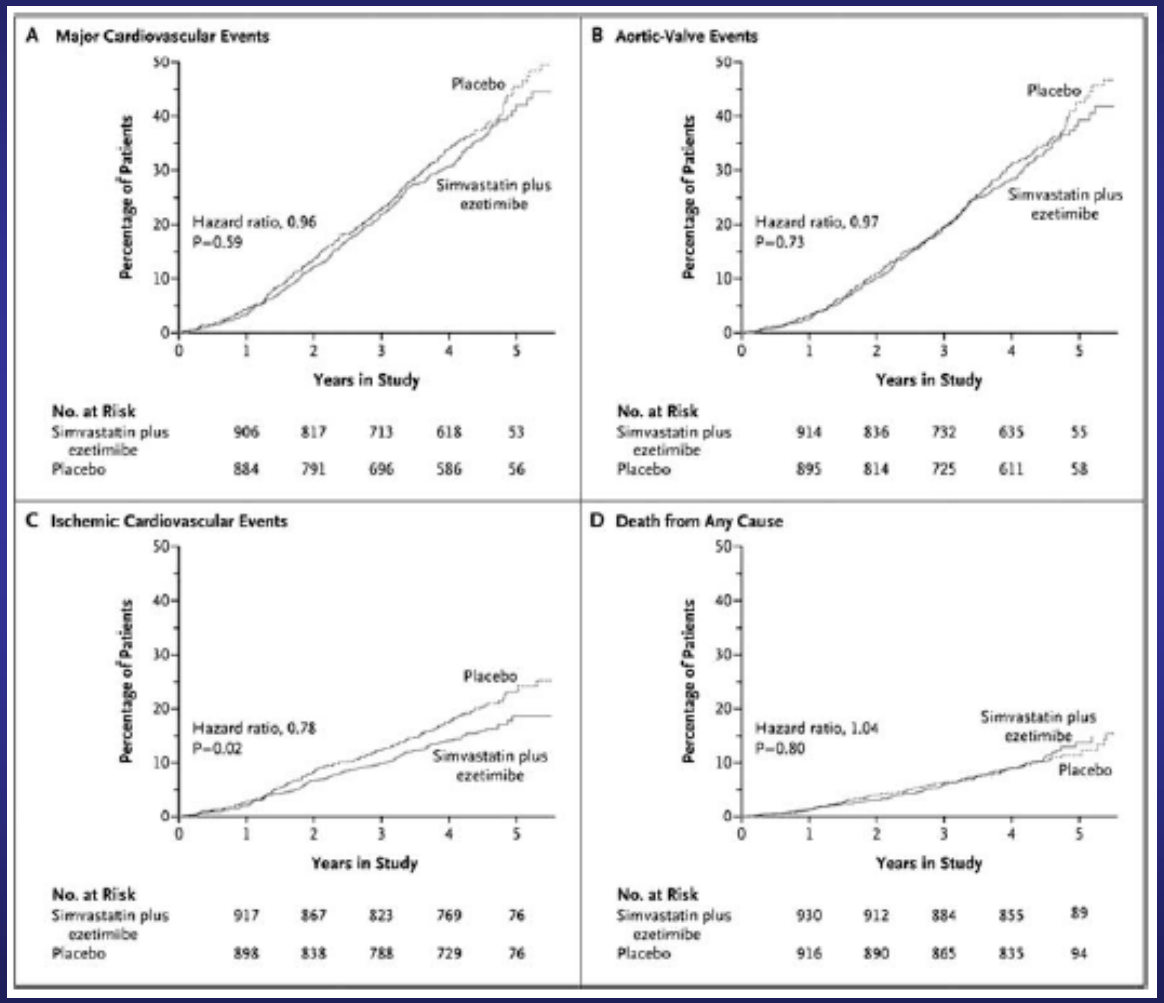
# Symptomatic AS

- Aortic stenosis
  - Diuretic : relieve pulmonary congestion, over diuresis -> hypotension
  - Vasodilator : use carefully
  - Inotropic drug : in cardiogenic shock
  - Treatment should be guided by invasive monitoring in cardiogenic shock with prompt surgery

# Medical treatment in AS

- AS with HT,CAD
  - Low dose diuretic, beta blocker, ACE inhibitor,ARB can be used
  - Precaution when increase dose
  - Nitrates sublingual must be carefully

# Statin in aortic stenosis




*Roseboro AB et al, N Engl J Med 2008; 359: 1343-56*

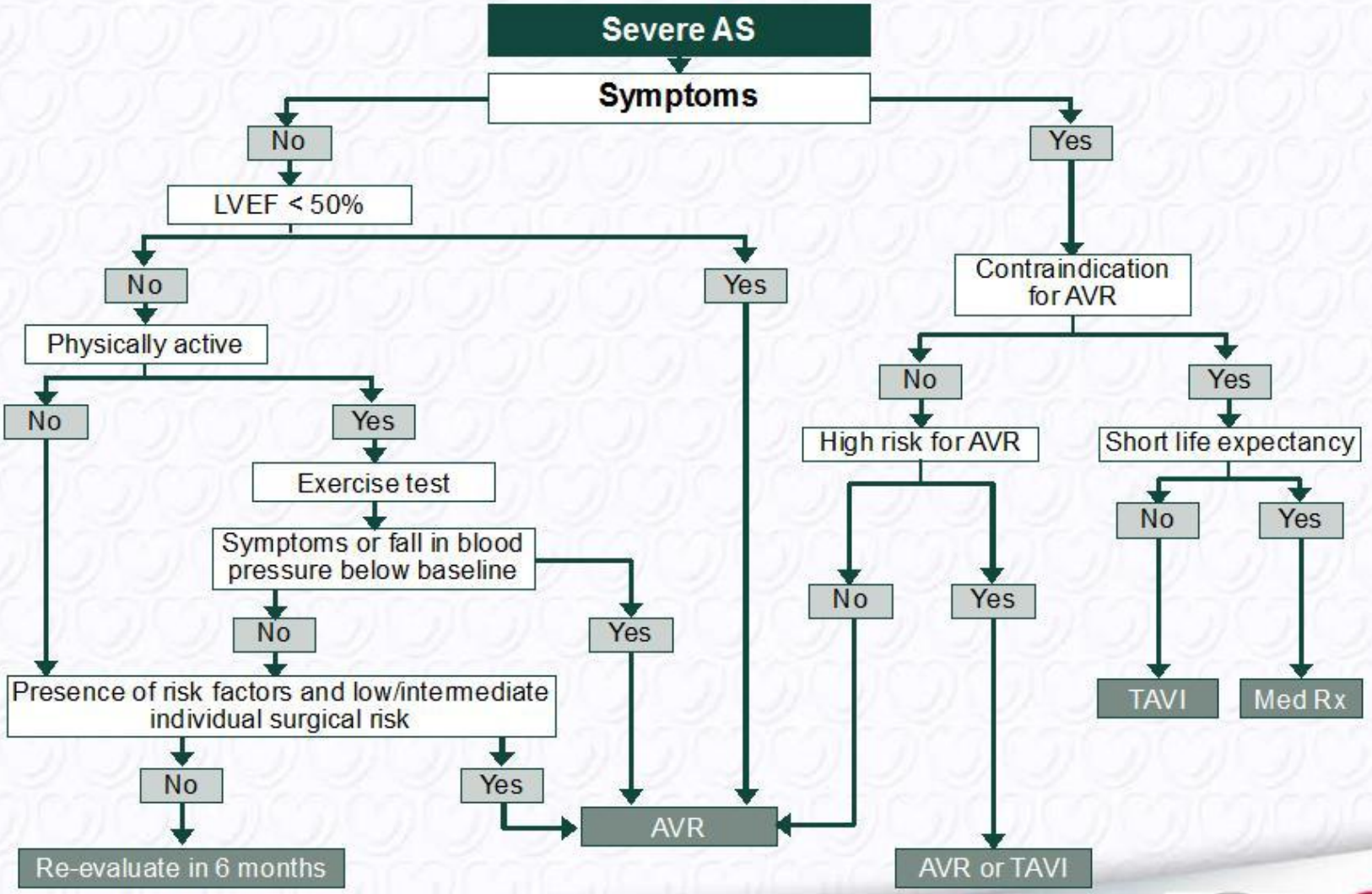
Case study 2

A 80 year old male patient with symptomatic severe AS

BP  110/80 mmHg, HR 90/min with pulsus parvus et tardus

What is your management ?

# Management of severe aortic stenosis

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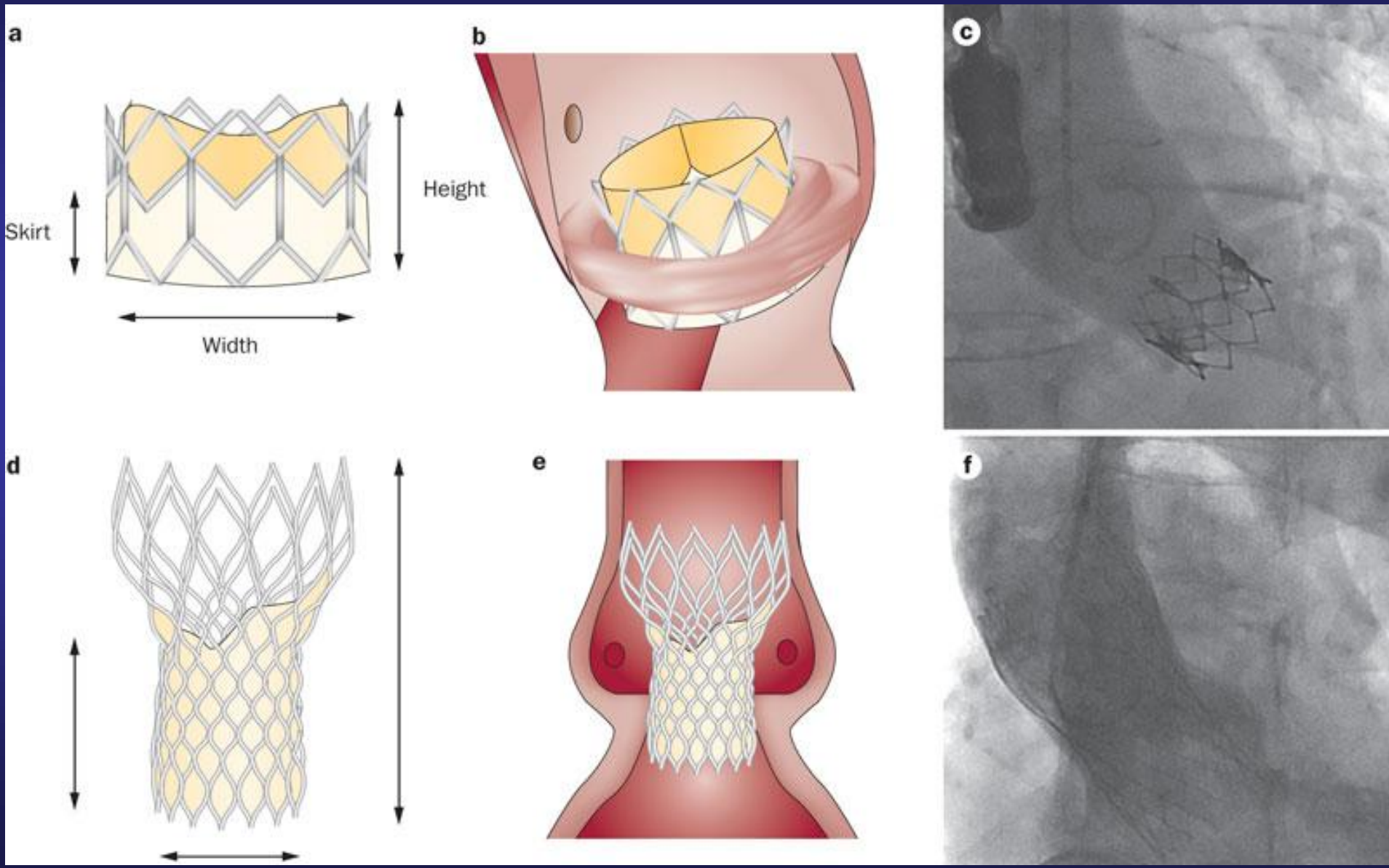
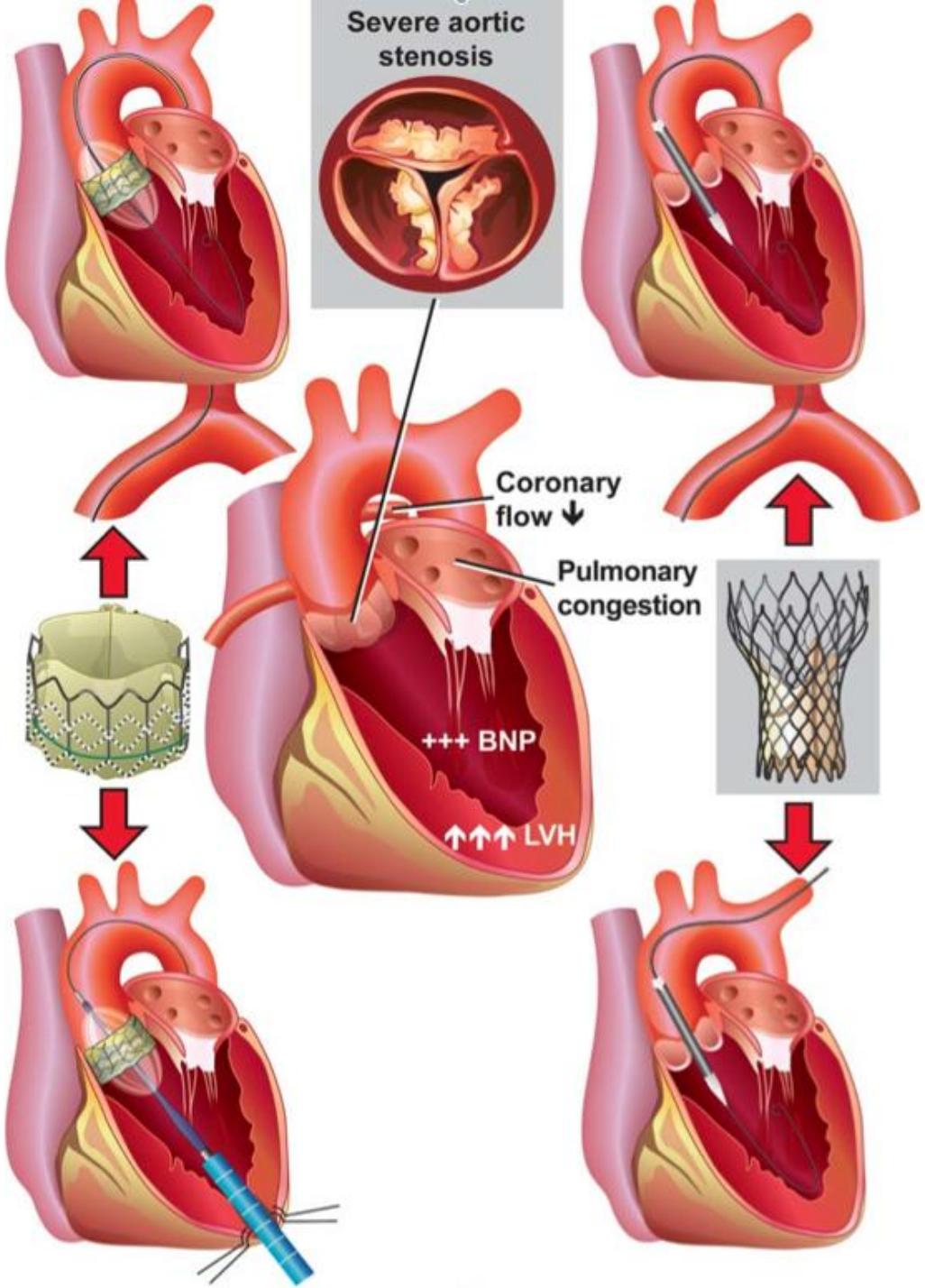
# TAVI




Severe aortic stenosis
Coronary flow ↓
Pulmonary congestion
+++ BNP
↑↑↑ LVH

# Three-Year Outcomes after Transcatheter or Surgical Aortic Valve Replacement in High-Risk Patients with Severe Aortic Stenosis

**Vinod H. Thourani, MD**
on behalf of The PARTNER Trial Investigators

ACC 2013 | San Francisco | March 11, 2013

THE PARTNER TRIAL

# Publications in NEJM

**1-Year outcomes published on-line June 5, 2011**
**@ NEJM.org and in print June 9, 2011**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ESTABLISHED IN 1812 JUNE 9, 2011

Transcatheter and Surgical Aortic-Val
in High-Risk Patients

Craig R. Smith, M.D., Martin B. Leon, M.D., Michael J. Mack, M.D., D. Craig
Lars G. Svensson, M.D., Ph.D., E. Murat Tuzcu, M.D., John G. Webb, M
Raj R. Makkar, M.D., Mathew Williams, M.D., Todd Dewey, M.D., Samir Kap
Vinod H. Thourani, M.D., Paul Corso, M.D., Augusto D. Pichard, M
Howard C. Herrmann, M.D., Jodi J. Akin, M.S., William N. Anderson
and Stuart J. Pocock, Ph.D., for the PARTNER Trial I

**2-Year outcomes published on-line March 26, 2012**
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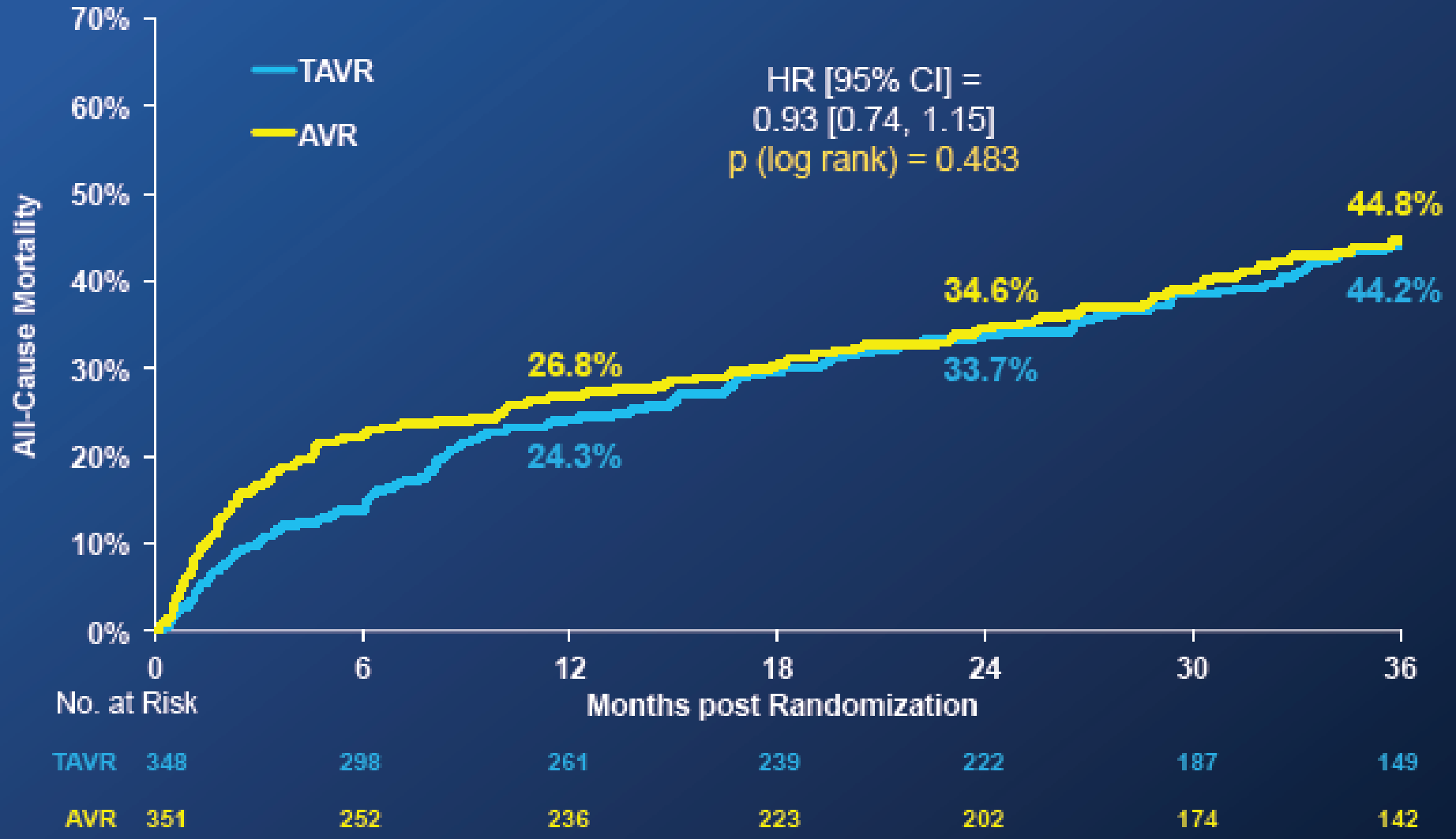
The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Two-Year Outcomes after Transcatheter or Surgical Aortic-Valve Replacement

Susheel K. Kodali, M.D., Mathew R. Williams, M.D., Craig R. Smith, M.D., Lars G. Svensson, M.D., Ph.D., John G. Webb, M.D., Raj R. Makkar, M.D., Gregory P. Fontana, M.D., Todd M. Dewey, M.D., Vinod H. Thourani, M.D., Augusto D. Pichard, M.D., Michael Fischbein, M.D., Wilson Y. Szeto, M.D., Scott Lim, M.D., Kevin L. Greason, M.D., Paul S. Teirstein, M.D., S. Chris Malaisrie, M.D., Pamela S. Douglas, M.D., Rebecca T. Hahn, M.D., Brian Whisenant, M.D., Alan Zajarias, M.D., Duolao Wang, Ph.D., Jodi J. Akin, M.S., William N. Anderson, Ph.D., and Martin B. Leon, M.D., for the PARTNER Trial Investigators*

# All-Cause Mortality (ITT)



# Three-Year Outcomes of Transcatheter Aortic Valve Replacement (TAVR) in "Inoperable" Patients With Severe Aortic Stenosis: The PARTNER Trial

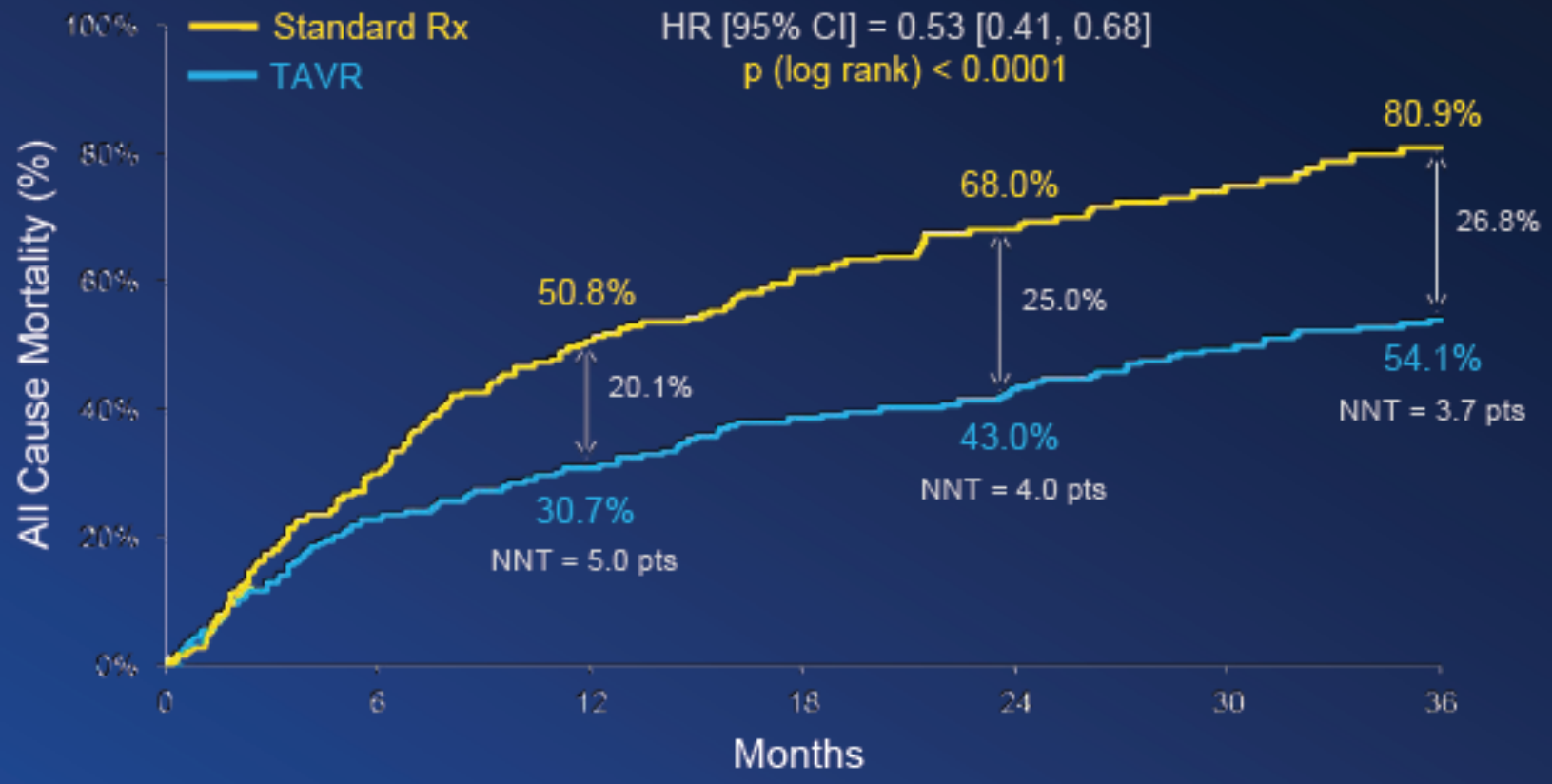
Samir R. Kapadia, MD
On behalf of The PARTNER Trial Investigators

TCT 2012 | Miami, FL | October 24, 2012

THE PARTNER TRIAL

# All Cause Mortality (ITT)

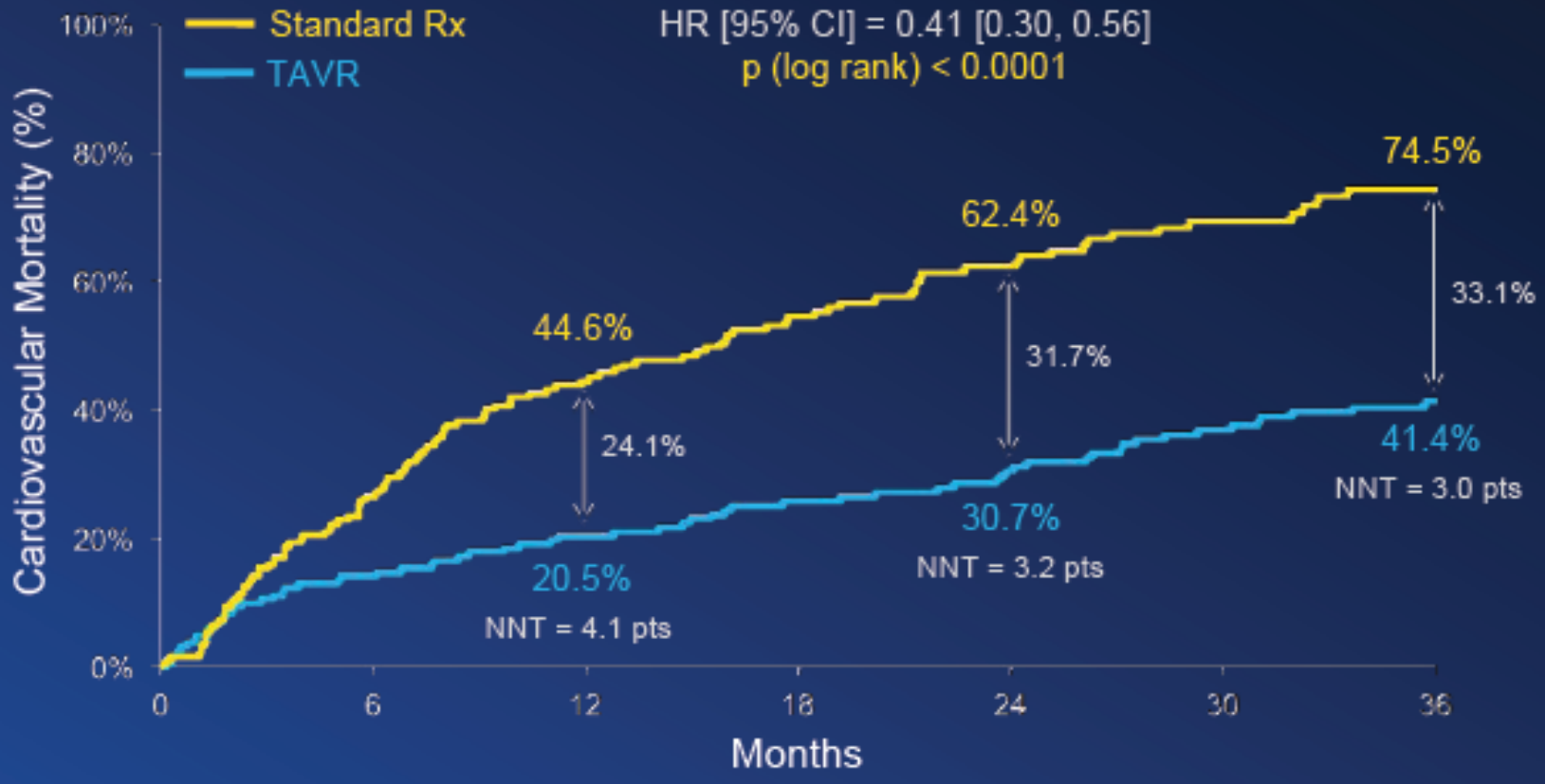
## Crossover Patients Censored at Crossover




***Numbers at Risk***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Standard Rx** | **179** | **121** | **85** | **62** | **46** | **27** | **17** |
| **TAVR** | **179** | **138** | **124** | **110** | **101** | **88** | **70** |

# Cardiovascular Mortality (ITT)
## Crossover Patients Censored at Crossover




***Numbers at Risk***

| | | | | | | | |
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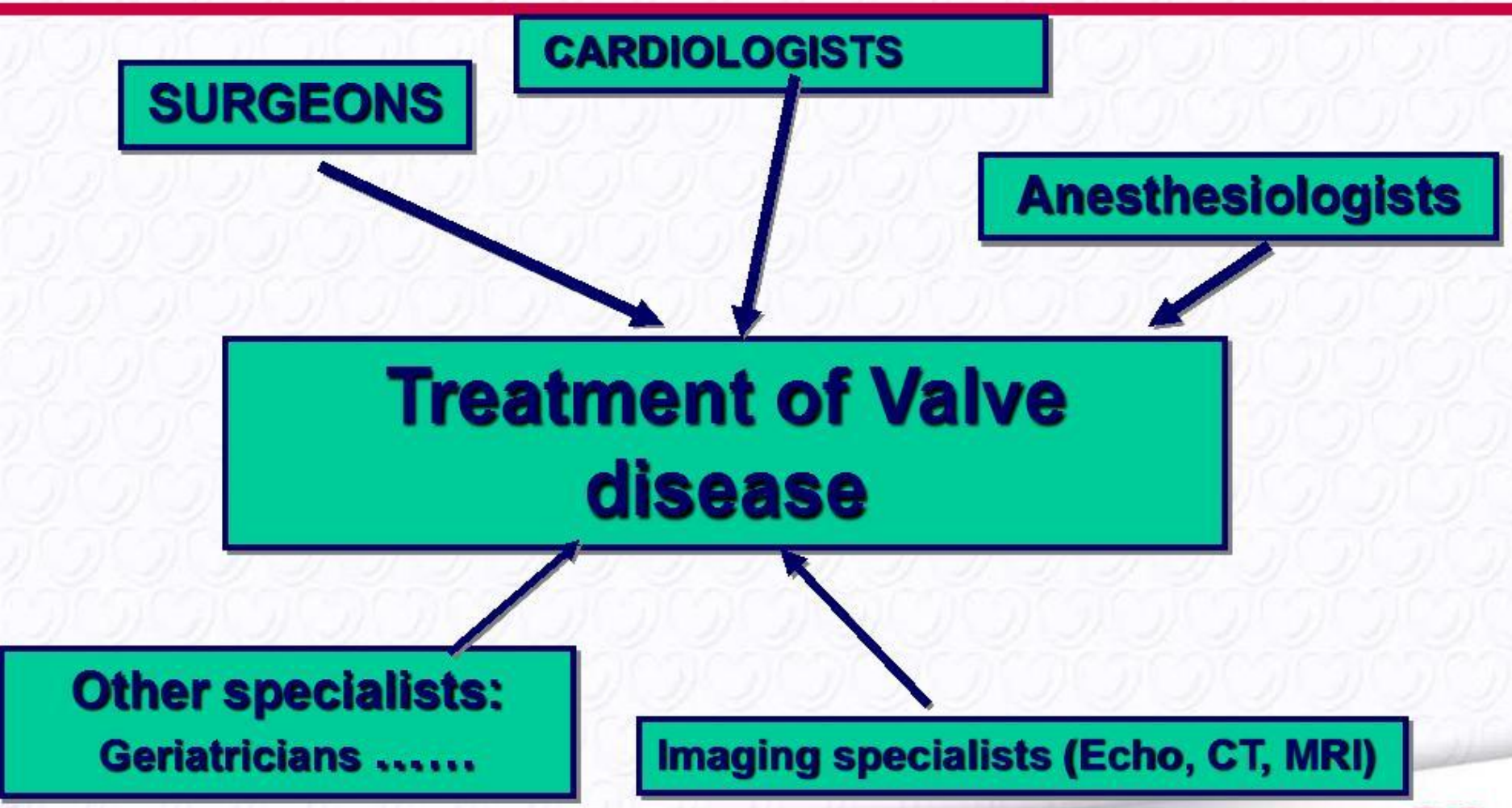
# The « Heart Team »



# Indications for transcatheter aortic valve implantation

| | Class | Level |
|---|---|---|
| TAVI should only be undertaken with a multidisciplinary "heart team" including cardiologists and cardiac surgeons and other specialists if necessary. | I | C |
| TAVI should only be performed in hospitals with cardiac surgery on-site. | I | C |
| TAVI is indicated in patients with severe symptomatic AS who are not suitable for AVR as assessed by a " heart team" and who are likely to gain improvement in their quality of life and to have a life expectancy of more than 1 year after consideration of their comorbidities. | I | B |
| TAVI should be considered in high risk patients with severe symptomatic AS who may still be suitable for surgery, but in whom TAVI is favoured by a "heart team" based on the individual risk profile and anatomic suitability. | IIa | B |

European Heart Journal 2012 - doi:10.1093/eurheartj/ehs109 & European Journal of Cardio-Thoracic Surgery 2012 - doi:10.1093/ejcts/ezs455).

# Take home message (1)

- No specific medical treatment to prevent progression of native valves disease
- Antithrombotic treatment is essential to prevent thromboembolism esp. mitral valve disease
- Rheumatic prophylaxis
- Endocarditis prophylaxis : no longer recommended

# Take home message (2)

- Concomitant medical treatment of co-existent disease
- General health care eg. immunization, daily activity
- Establish schedule of clinical and echo follow up
- Wait and watch : timing of intervention and surgery