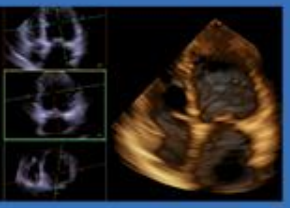


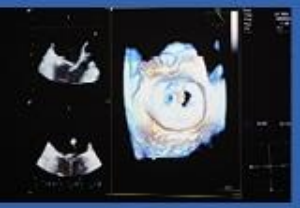
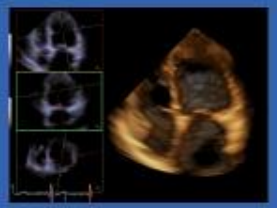
EuroValve
April 26-27, 2018

Spotlight on VHD Guidelines
Mitral Valve Disease

Luc Pierard

University Hospital, Liège

I have no financial relationship to disclose

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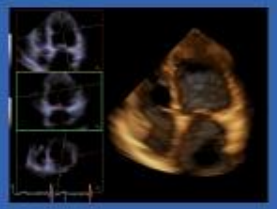
Primary Mitral Regurgitation




Management of severe chronic primary mitral regurgitation

- Symptoms
  - No
    - LVEF ≤60% or LVESD ≥45 mm
      - No
        - New onset of AF or SPAP >50 mmHg
          - No
            - High likelihood of durable repair, low surgical risk, and presence of risk factors[a]
              - No → Follow-up
              - Yes → Surgery (repair whenever possible)
          - Yes → Surgery (repair whenever possible)
      - Yes → Surgery (repair whenever possible)
  - Yes
    - LVEF >30%
      - No
        - Refractory to medical therapy
          - No → Medical therapy
          - Yes
            - Durable valve repair is likely and low comorbidity
              - No → Extended HF treatment/percutaneous edge-to-edge repair
              - Yes → Surgery (repair whenever possible)
      - Yes → Surgery (repair whenever possible)

[a] *LVESD ≥40 mm and one of the following present: flail leaflet or LA volume ≥60 mL/m² BSA at sinus rhythm*

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2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease
(European Heart Journal 2017 - doi:10.1093/eurheartj/ehx391)
)

Indications for intervention in severe primary mitral regurgitation

Recommendations	Class	Level
Mitral valve repair should be the preferred technique when the results are expected to be durable.	I	C
Surgery is indicated in **symptomatic** patients with **LVEF >30%**.	I	B
Surgery is indicated in **asymptomatic** patients with LV dysfunction (**LVESD ≥45 mm* and/or LVEF ≤60%**).	I	B
Surgery should be considered in asymptomatic patients with preserved LV function (LVESD <45 mm and LVEF >60%) and **atrial fibrillation secondary to mitral regurgitation or pulmonary hypertension** (systolic pulmonary pressure at rest >50 mmHg**).	IIa	B

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2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease
(European Heart Journal 2017 - doi:10.1093/eurheartj/ehx391)
)

What is new in the 2017 Valvular Heart Disease Guidelines?

2017 New recommendations

Indications for intervention in asymptomatic severe primary mitral regurgitation

New additional statement:

If pulmonary hypertension (SPAP >50 mmHg at rest) is the only indication for surgery, the value should be confirmed by invasive measurement.

2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease
(European Heart Journal 2017 - doi:10.1093/eurheartj/ehx391)
)

What is new in the 2017 Valvular Heart Disease Guidelines?

Changes in recommendations	
2012	**2017**
Indications for intervention in asymptomatic severe primary mitral regurgitation	
IIb C Surgery may be considered in asymptomatic patients with preserved LV function, high likelihood of durable repair, low surgical risk, and: • Left atrial dilatation (volume index ≥60 mL/m² BSA) and sinus rhythm.	**IIa C (modified!)** Surgery should be considered in asymptomatic patients with preserved LVEF (>60%) and LVESD 40–44 mm when a durable repair is likely, surgical risk is low, the repair is performed in heart valve centres, and the following finding is present: presence of significant LA dilatation (volume index ≥60 mL/m² BSA) in sinus rhythm.

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(European Heart Journal 2017 - doi:10.1093/eurheartj/ehx391)
)

Indications for intervention in severe primary mitral regurgitation *(continued)*

Recommendations	Class	Level
Surgery should be considered in asymptomatic patients with preserved LVEF (>60%) and LVESD 40–44 mm* when a durable repair is likely, surgical risk is low, the repair is performed in heart valve centres, and at least one of the following findings is present: - flail leaflet or, - presence of significant LA dilatation (volume index ≥60 mL/m² BSA) in sinus rhythm.	IIa	C New
Mitral valve repair **should be considered** in symptomatic patients with severe LV dysfunction (LVEF <30% and/or LVESD >55 mm) refractory to medical therapy when likelihood of successful repair is high and comorbidity low.	IIa	C

** Cut-offs refer to average-size adults and may require adaptation in patients with unusually small or large stature*

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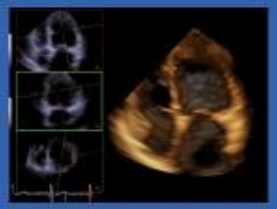

Indications for intervention in severe primary mitral regurgitation *(continued)*

Recommendations	Class	Level
Mitral valve replacement **may be considered** in symptomatic patients with severe LV dysfunction (LVEF <30% and/or LVESD >55 mm) refractory to medical therapy when likelihood of successful repair is low and comorbidity low.	IIb	C
Percutaneous edge-to-edge procedure may be considered in patients with symptomatic severe primary mitral regurgitation who fulfil the echocardiographic criteria of eligibility and are judged inoperable or at high surgical risk by the Heart Team, avoiding futility.	IIb	C

What is new in the 2017 Valvular Heart Disease Guidelines?

Changes in recommendations	
2012	**2017**
Indications for intervention in asymptomatic severe primary mitral regurgitation	
Pulmonary hypertension on exercise (SPAP ≥60 mmHg at exercise).	**Taken out**

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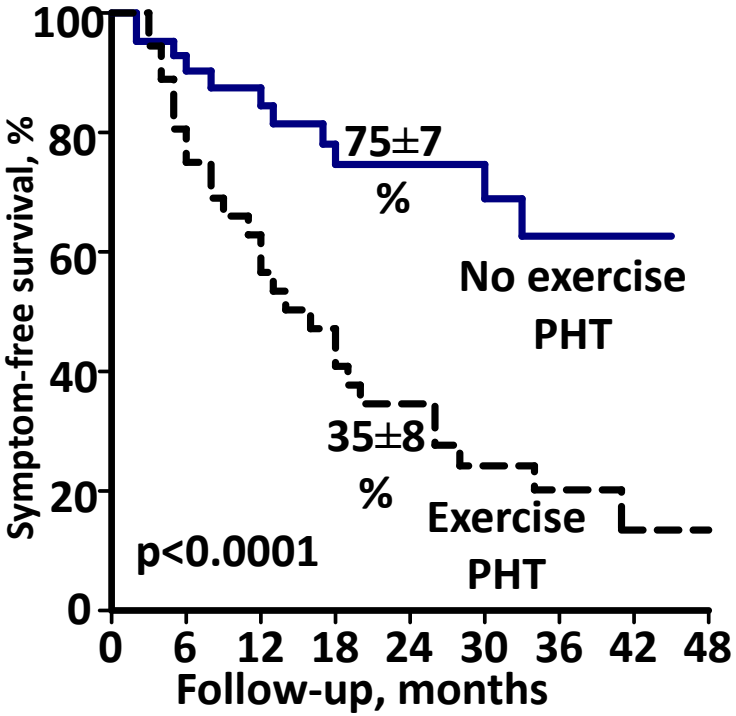
Impact on Symptom-free Survival and Post-op Outcome

Exercise PHT (SPAP >60mmHg)



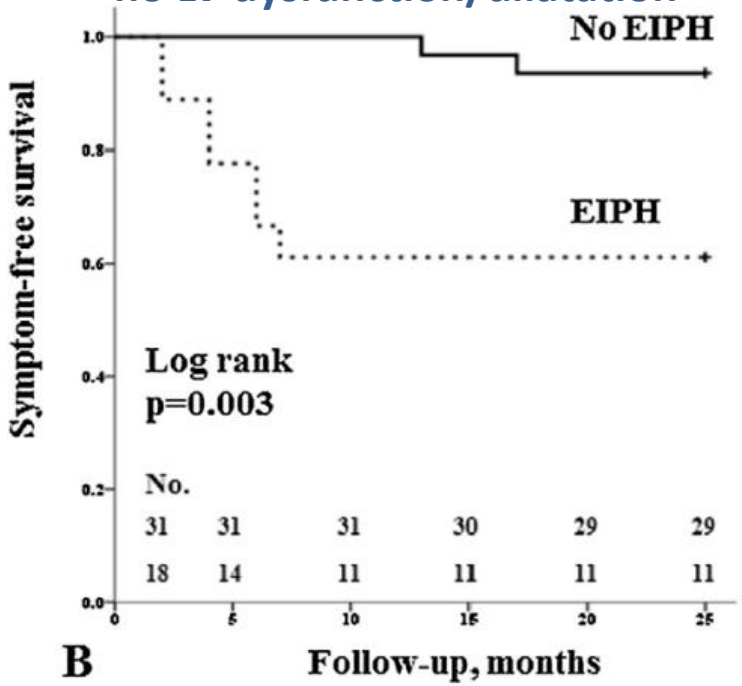
Post-operative Events

Pierard	No Ex. PHT (n=43, 42%)	Ex. PHT (n=59, 58%)	P
All AF, n (%)	4 (9)	15 (25)	0.07
Early AF, n (%)	1 (2)	4 (7)	0.57
Hospitalization, n (%)	1 (2)	11 (19)	**0.027**
Acute pulmonary edema, n (%)	0 (0)	2 (3)	NA
Stroke, n (%)	1 (2)	5 (8)	0.38
Death, n (%)	0 (0)	4 (7)	NA
All events*, n (%)	5 (12)	23 (39)	**0.005**
Events without early AF*, n (%)	4 (9)	19 (32)	**0.013**
Major CV events*, n (%)	2 (5)	9 (15)	0.16

Magne J, Lancellotti P, Piérard LA. Circulation, 2010, 122: 33-41 Magne J, Pierard LA… Lancellotti P. Heart, 2014

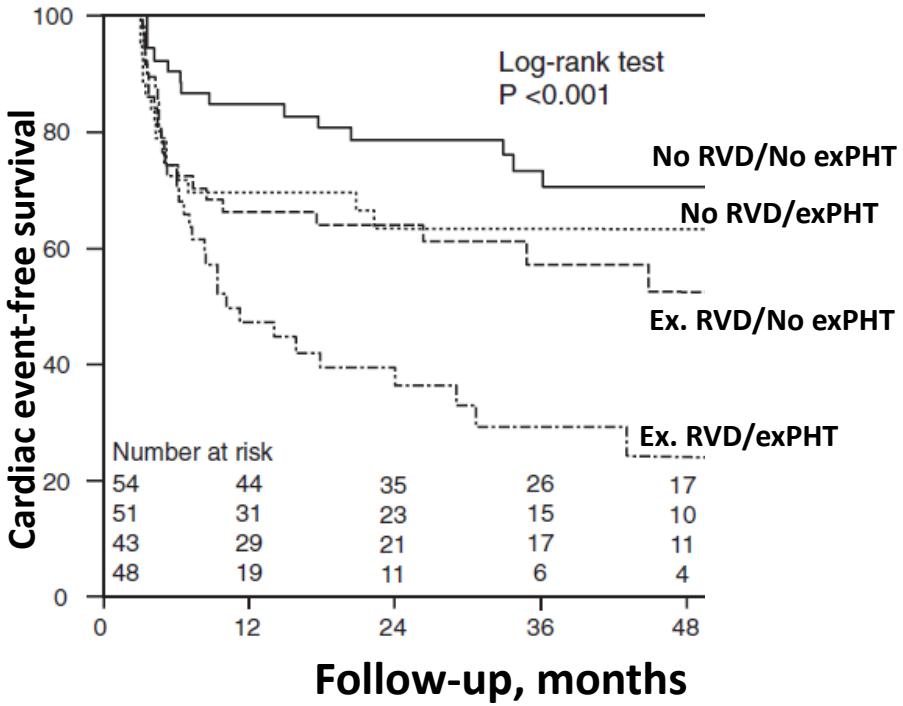
Impact on Symptom-free Survival

n=65 asymptomatic ≥moderate MR, no LV dysfunction/dilatation



Suzuki et aL., J Cardiol, 2014

n=196 asymptomatic moderate to severe MR, no LV dysfunction/dilatation

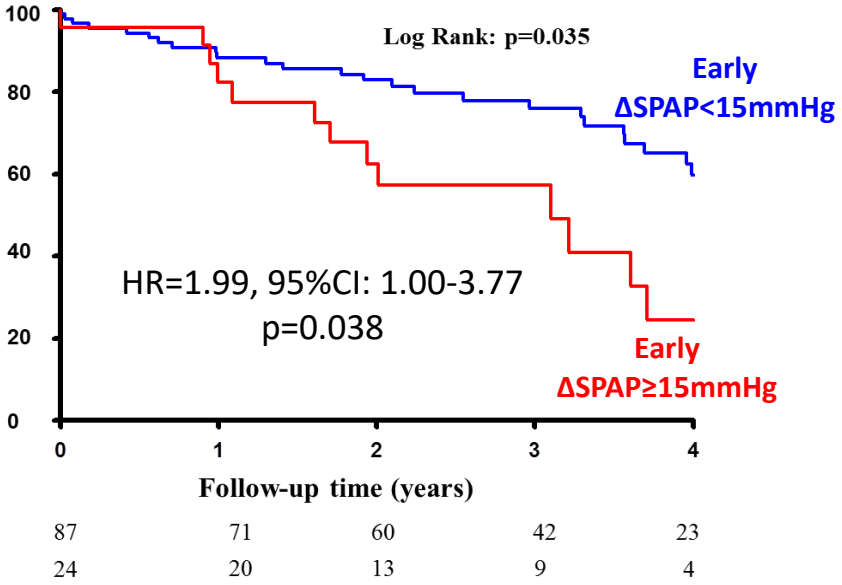


Kusunose et aL., Circ CV Imaging, 2013

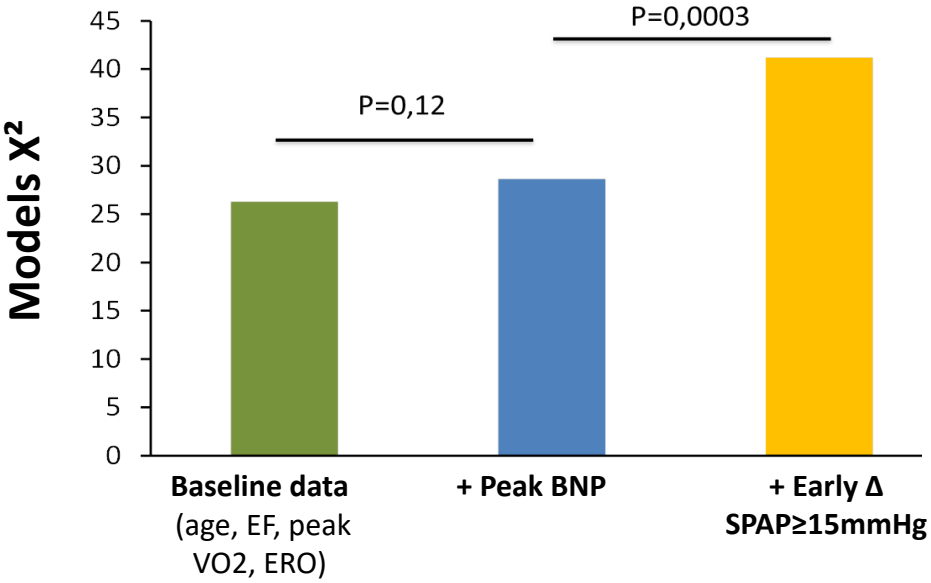
Exercise-induced Early Abrupt increase in SPAP

n=111 asymptomatic patients with ≥ moderate MR and preserved LVEF

Event-free Survival, %

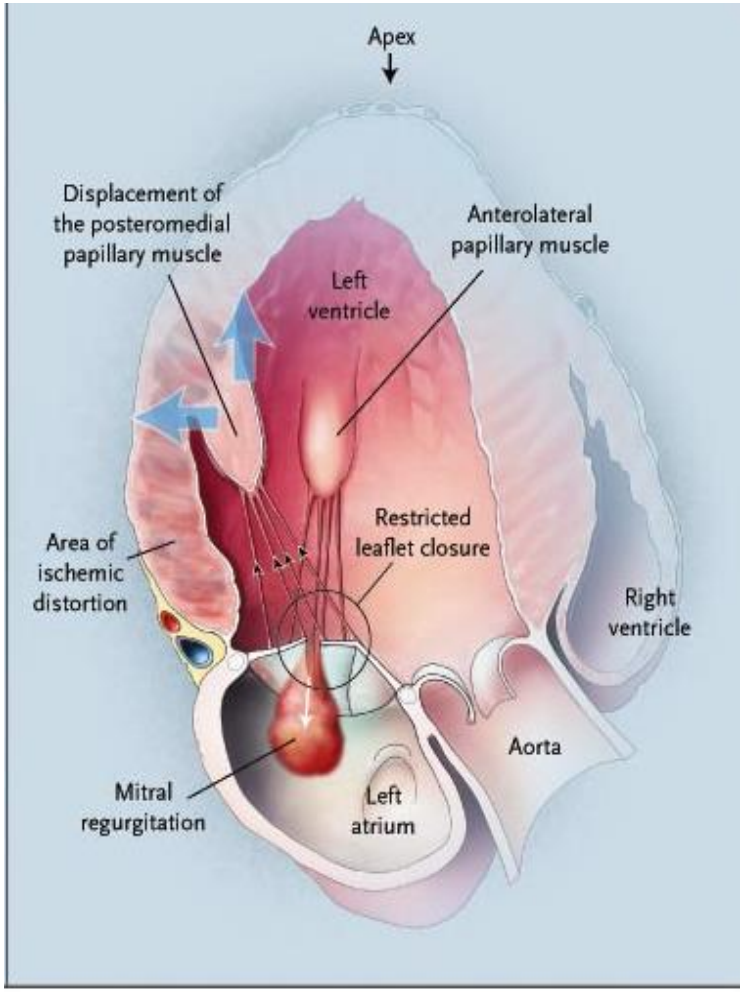


Multivariate Analysis



Toubal et al., JACC, 2018

Secondary MR



Echocardiographic criteria for the definition of severe valve regurgitation: *an integrative approach*

(Adapted from Lancellotti et al.)	Aortic regurgitation	Mitral regurgitation		Tricuspid regurgitation
Semiquantitative				
Vena contracta width (mm)	> 6	≥ 7 (> 8 for biplane)		≥ 7
Upstream vein flow	–	Systolic pulmonary vein flow reversal		Systolic hepatic vein flow reversal
Inflow	–	E-wave dominant ≥ 1.5 m/s		E-wave dominant ≥ 1 m/s
Other	Pressure half-time < 200 ms	TVI mitral/TVI aortic > 1.4		PISA radius > 9 mm
Quantitative		***Primary***	***Secondary***	
EROA (mm²)	≥ 30	≥ 40	≥ 20	≥ 40
R Vol (ml/beat)	≥ 60	≥ 60	≥ 30	≥ 45
+ enlargement of cardiac chambers/ vessels	LV	LV, LA		RV, RA, inferior vena cava

ACC/AHA new EROA≥40 mm²

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2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease
(European Heart Journal 2017 - doi:10.1093/eurheartj/ehx391)
)

Indications for mitral valve intervention in chronic secondary mitral regurgitation

Recommendations	Class	Level
Surgery is indicated in patients with severe secondary mitral regurgitation **undergoing CABG** and LVEF >30%.	I	C
Surgery should be considered in symptomatic patients with severe secondary mitral regurgitation, LVEF <30% but with **an option for revascularization, and evidence of myocardial viability**.	IIa	C
When **revascularization is not indicated**, surgery may be considered in patients with severe secondary mitral regurgitation and LVEF >30%, who remain symptomatic despite optimal medical management (including CRT if indicated) and have a low surgical risk.	IIb	C

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2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease
(European Heart Journal 2017 - doi:10.1093/eurheartj/ehx391)
)

What is new in the 2017 Valvular Heart Disease Guidelines?

Changes in recommendations	
2012	**2017**
Indications for mitral valve intervention in secondary mitral regurgitation	
IIa C Surgery should be considered in patients with moderate secondary mitral regurgitation undergoing CABG	**Taken out**

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2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease
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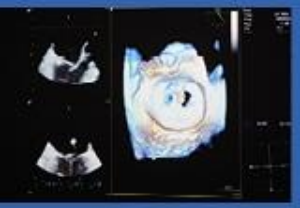
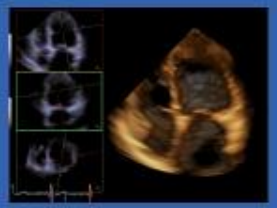



Should SMR be corrected by MV plasty?

RCT, but n =73 pts, CABG alone vs. CABG+MV plasty
FUP at 1 year, MV plasty+CABG associated with reversed LV remodeling, decrease in MR severity, decrease in BNP and improved functional capacity

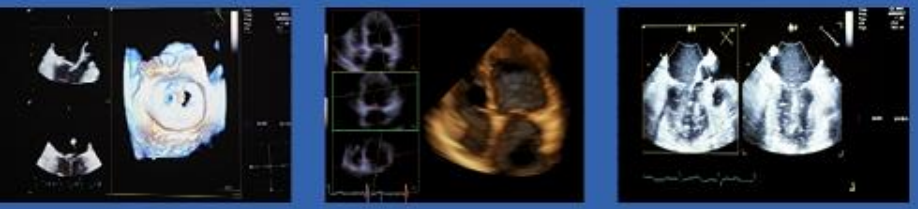
Table 3. Study End Points at 1 Year

	CABG (n=32)			CABG+MVR (n=27)			
End Points	Baseline	1 Year	Δ	Baseline	1 Year	Δ	*P* Value*
Primary end point							
Peak VO_2, ml/kg/min	15.1±3.3	15.9±2.5	0.8±2.9	14.8±3.2	18.1±2.9	3.3±2.3	<0.001
Secondary end points							
LV ESVI, ml/m²†	71.8±16.1	67.4±20.4	−4.4±17.4	78.4±26.5	56.2±14.9	−22.2±25.6	0.002
MR volume, ml/beat†	31.9±14.8	22.7±14.6	−9.2±19.1	35.4±24.0	7.2±3.5	−28.2±24.6	0.001
BNP (pg/ml)	681.4±197.3	286.7±132.0	−394.7±213.6	748.1±158.3	190.7±117.8	−557.4±182.9	0.003

unknown benefit on longer clinical outcomes (long term mortality ?)

#Recurrence of MR after plasty was low in this study

John Chan et al. , Circulation 2012



EuroValve
April 26-27, 2018

The NEW ENGLAND JOURNAL of MEDICINE

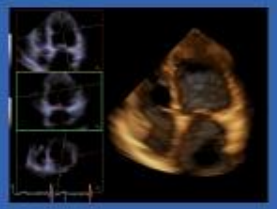
ORIGINAL ARTICLE

Surgical Treatment of Moderat
Mitral Regurgitation

P.K. Smith, J.D. Puskas, D.D. Ascheim, P. Voisine, A.C. Ge
J.W. Hung, M.K. Parides, G. Ailawadi, L.P. Perrault, M.A.
V. Thourani, J.S. Gammie, M.A. Miller, P. Pagé, J.R. Overbey,
E.H. Blackstone, I.L. Kron, D.J., E.A. Rose, E.G. Moquete, N
P.T. O'Gara, J.H. Alexander, and R.E. Michler, for the Car
Trials Network Investigators*

- ❑ No measurements of MV deformation
- ❑ No info on viability
- ❑ High recurrence rate 11% vs. 0-4% in other studies
- ❑ No exercise echo info at follow-up
- ❑ Only ring annuloplasty, no individualized treatment

RCT, n =301 pts, moderate SMR, CABG alone vs. CABG+MV plasty
FUP at 1 year, no difference in LVSVi




Indications for mitral valve intervention in chronic secondary mitral regurgitation

(continued)

Recommendations	Class	Level	
When revascularization is not indicated and **surgical risk is not low**, a **percutaneous edge-to-edge procedure** may be considered in patients with severe secondary mitral regurgitation and LVEF >30% who remain symptomatic despite optimal medical management (including CRT if indicated) and who have a suitable valve morphology by echocardiography, avoiding futility.	IIb	C	New
In patients with severe secondary mitral regurgitation and LVEF <30% who remain symptomatic despite optimal medical management (including CRT if indicated) and who have no option for revascularization**, the Heart Team** may **consider percutaneous edge-to-edge** procedure or valve surgery after careful evaluation for ventricular assist device or heart transplant according to individual patient characteristics.	IIb	C	New

What is new in the 2017 Valvular Heart Disease

Changes in recommendations	
2012	**2017**
Indications for mitral valve intervention in secondary mitral regurgitation	
IIa C Surgery should be considered in patients with moderate secondary mitral regurgitation undergoing CABG	Taken out
IIb C When revascularization is not indicated, surgery may be considered in patients with severe secondary mitral regurgitation and LVEF >30%,who remain symptomatic despite optimal medical management (including CRT if indicated).	**IIb C (modified)** When revascularization is not indicated, surgery may be considered in patients with severe secondary mitral regurgitation and LVEF >30%, who remain symptomatic despite optimal medical management (including CRT if indicated) and have a low surgical risk.

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2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease
(European Heart Journal 2017 - doi:10.1093/eurheartj/ehx391)
)

What is new in the 2017 Valvular Heart Disease Guidelines?

Changes in recommendations	
2012	**2017**
Indications for mitral valve intervention in secondary mitral regurgitation *(continued)*	
	IIb C (modified) *(continued)* When revascularization is not indicated and surgical risk is not low, a percutaneous edge-to-edge procedure may be considered in patients with severe secondary mitral regurgitation and LVEF >30%, who remain symptomatic despite optimal medical management (including CRT if indicated) and who have a suitable valve morphology by echocardiography, avoiding futility.

What is new in the 2017 Valvular Heart Disease

Changes in recommendations	
2012	**2017**
Indications for mitral valve intervention in secondary mitral regurgitation *(continued)*	
	IIb C (modified*) (continued)* In patients with severe secondary mitral regurgitation and LVEF <30% who remain symptomatic despite optimal medical management (including CRT if indicated) and who have no option for revascularization, the Heart Team may consider percutaneous edge-to-edge procedure or valve surgery after careful evaluation for ventricular assist device or heart transplant according to individual patient characteristics.

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What is new in the 2017 Valvular Heart Disease Guidelines?

Changes in recommendations	
2012	**2017**
Indications for mitral valve intervention in secondary mitral regurgitation *(continued)*	
	Additional statement: The lower thresholds defining severe MR compared to primary MR are based on their association with prognosis. However, it is unclear if prognosis is independently affected by MR compared to LV dysfunction. For isolated mitral valve treatment in secondary MR, thresholds of severity of MR for intervention still need to be validated in clinical trials. So far, no survival benefit has been confirmed for reduction of secondary MR.

ESC Guidelines 2017
Valvular Heart Disease

Mitral Stenosis

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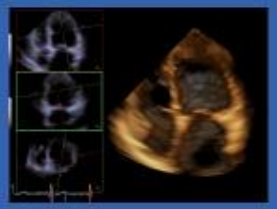
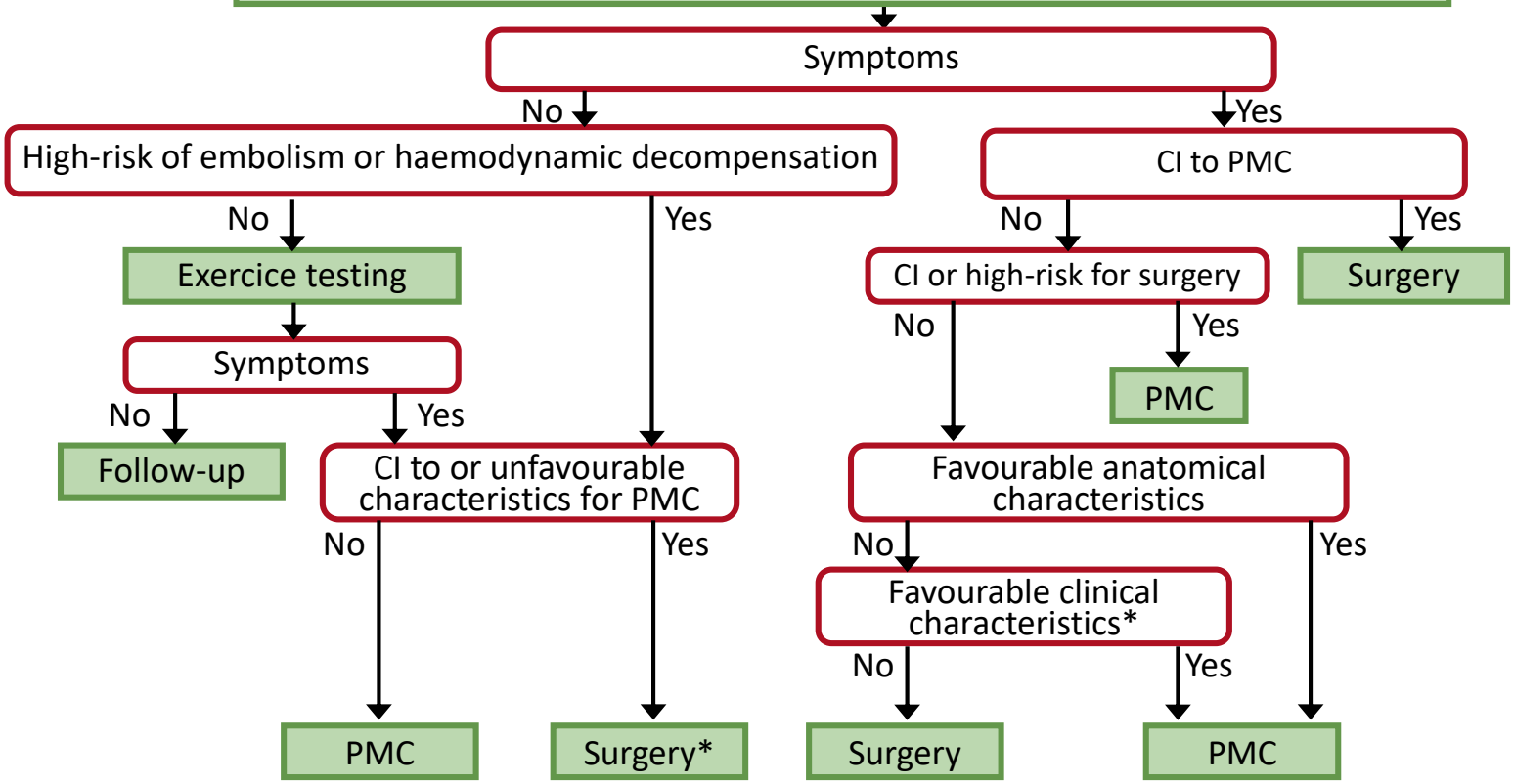
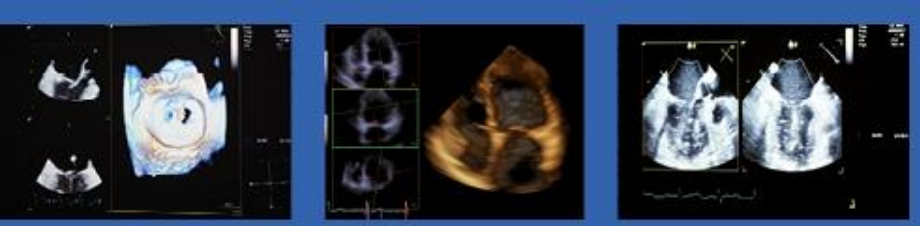



Management of clinically significant mitral stenosis (MVA <1.5 cm²)



See table of recommendations **If symptoms occur for a low level of exercise and operative risk is low*

2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease
(European Heart Journal 2017 - doi:10.1093/eurheartj/ehx391)
)



GAPS in knowledge

- Role of multimodality imaging for prognosis
- Indications of intervention in asymptomatic MR
- Benefit of correction in secondary MR (surgery or percutaneous procedures)
- Controlled studies are necessary