

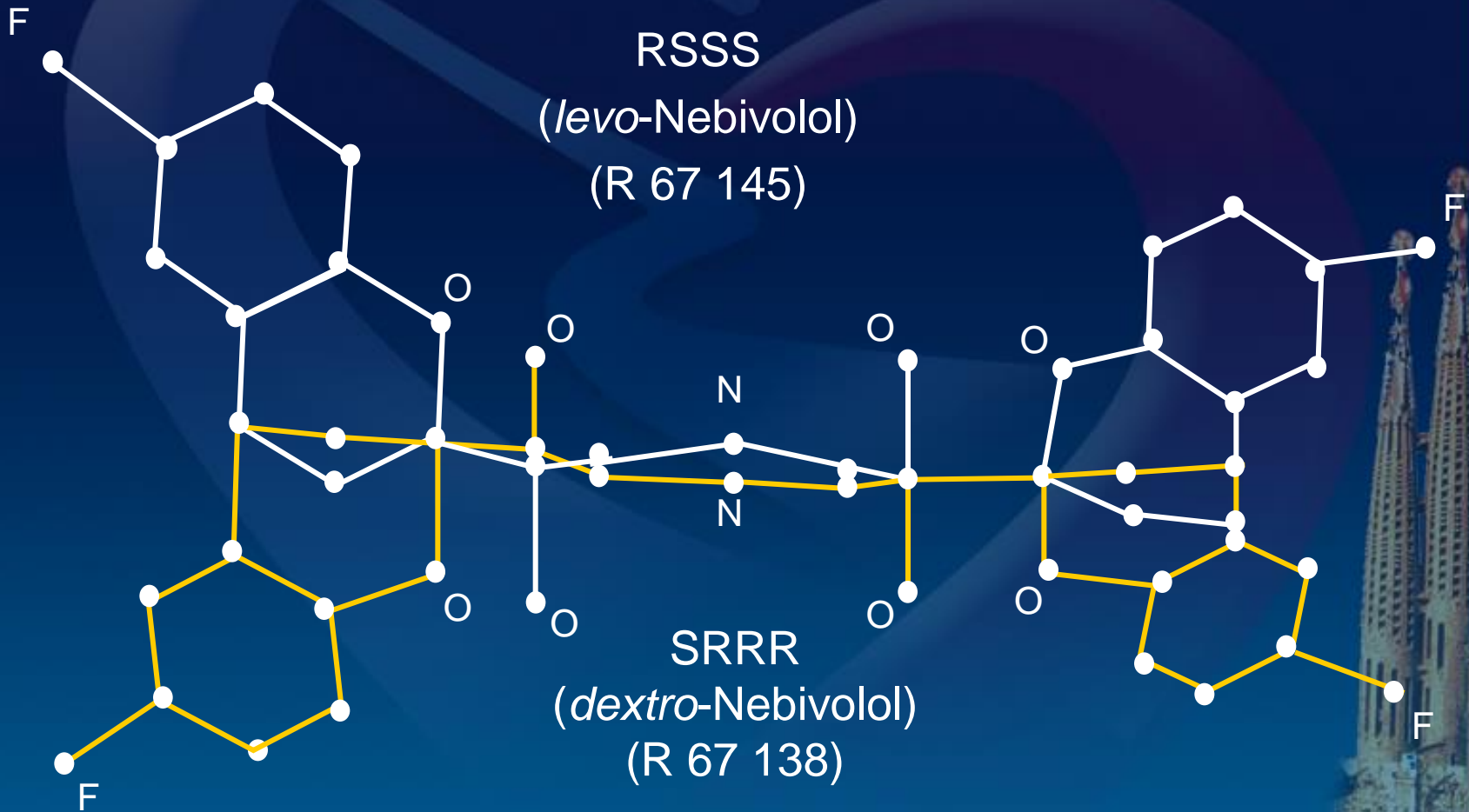
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Role of Echocardiography to Assess Systolic LV Function in Hypertensive Patients

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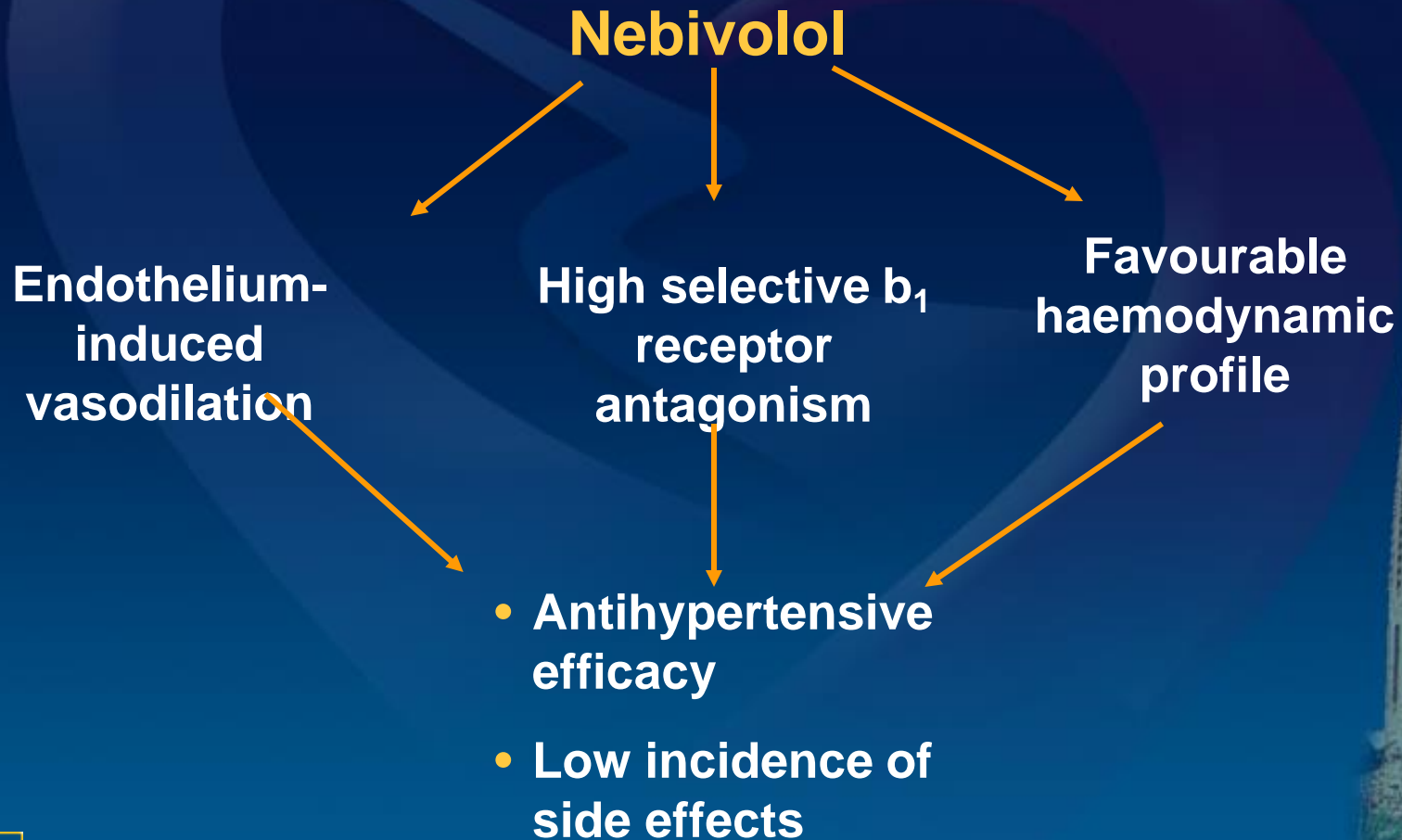


Nebivolol: Chemical Structure

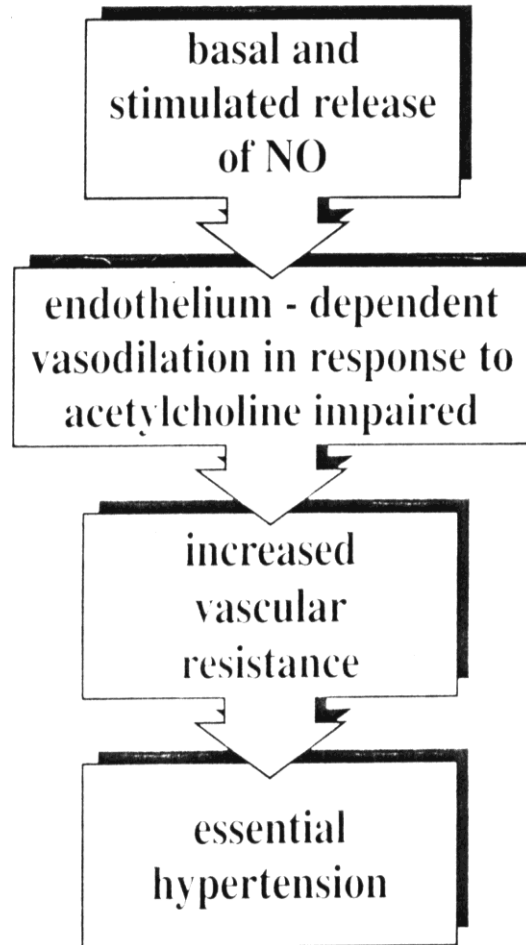


Nebivolol:

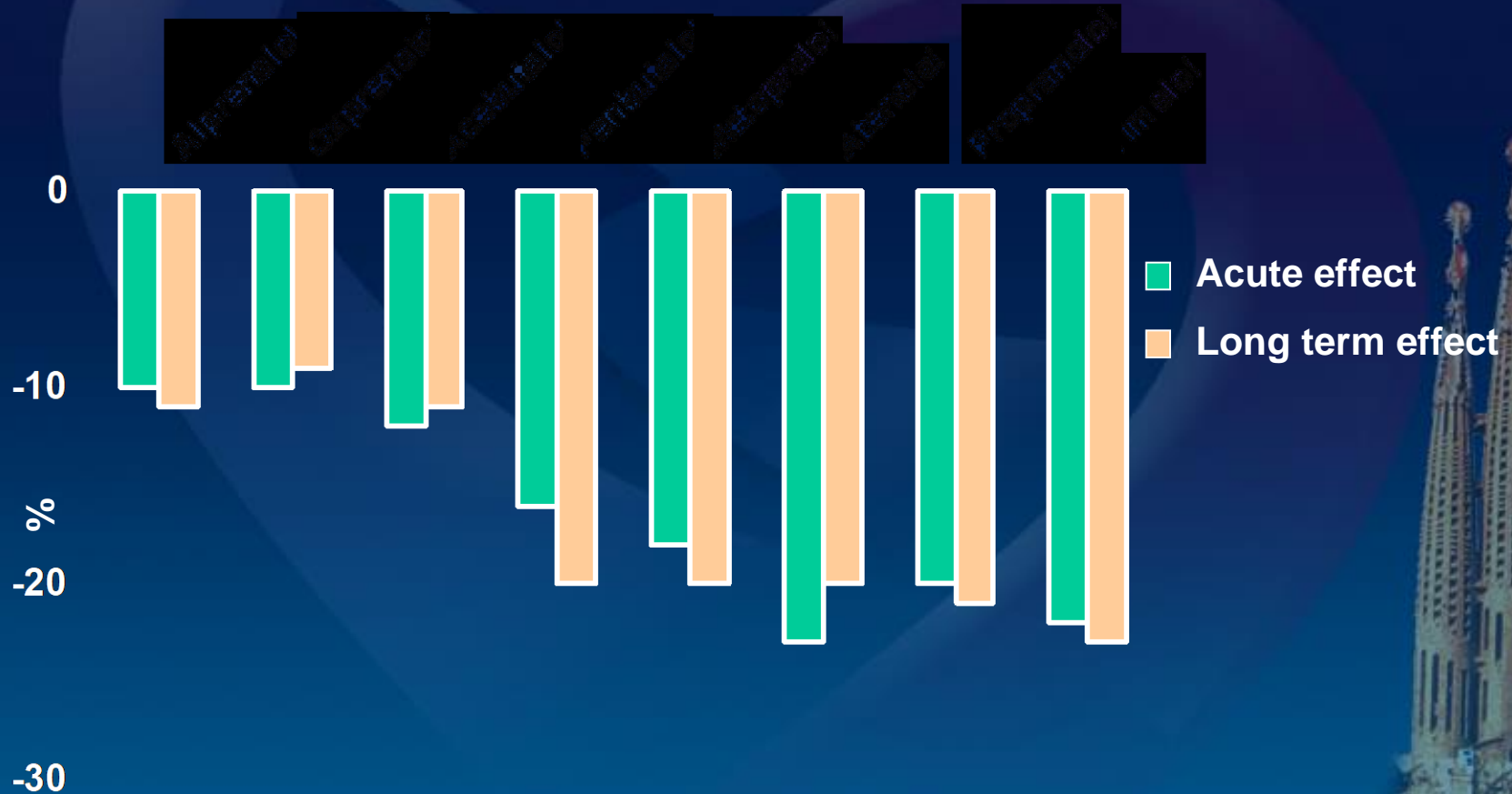
Pharmacological and Therapeutic profile



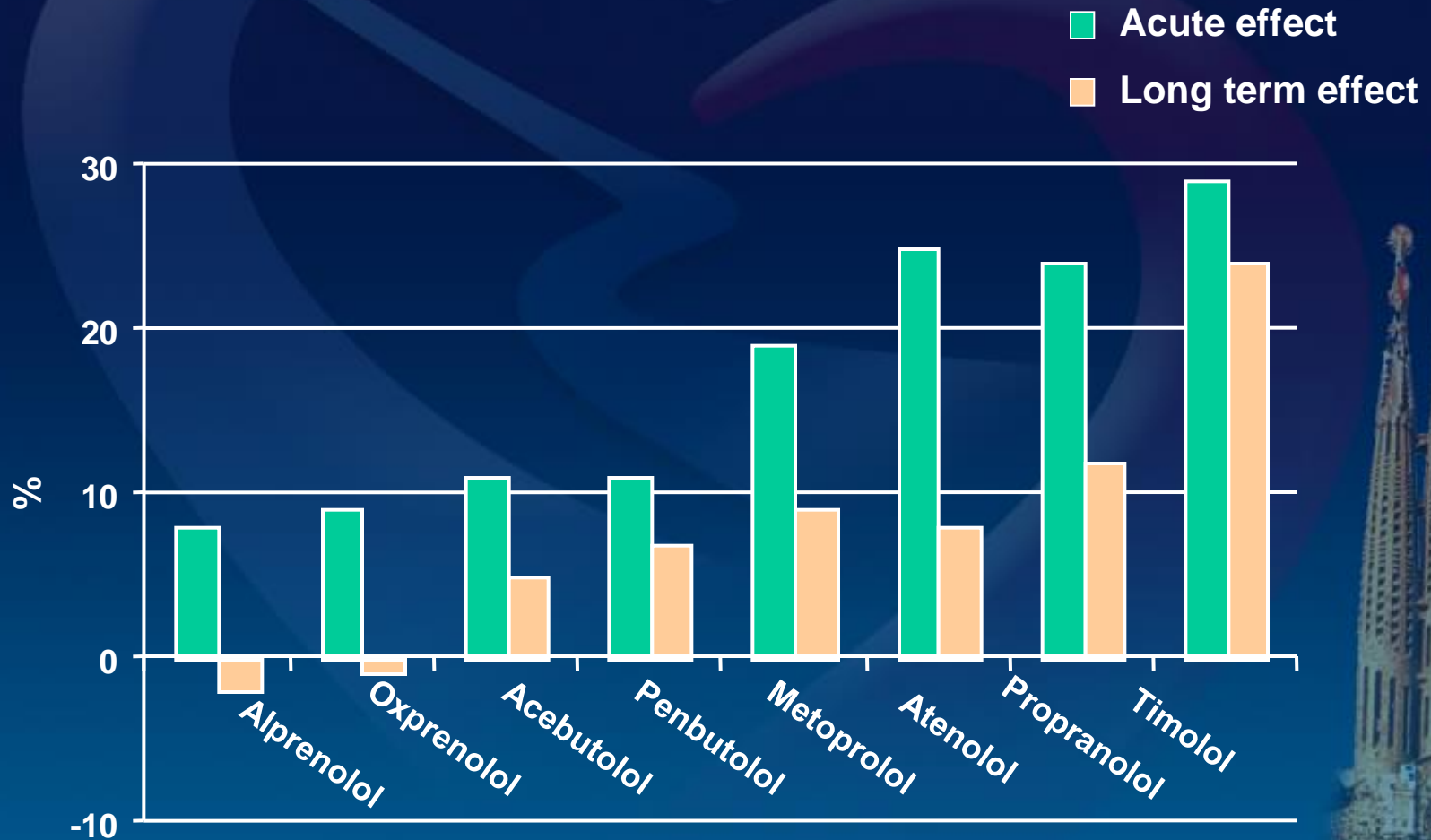
Effect of nitric oxide



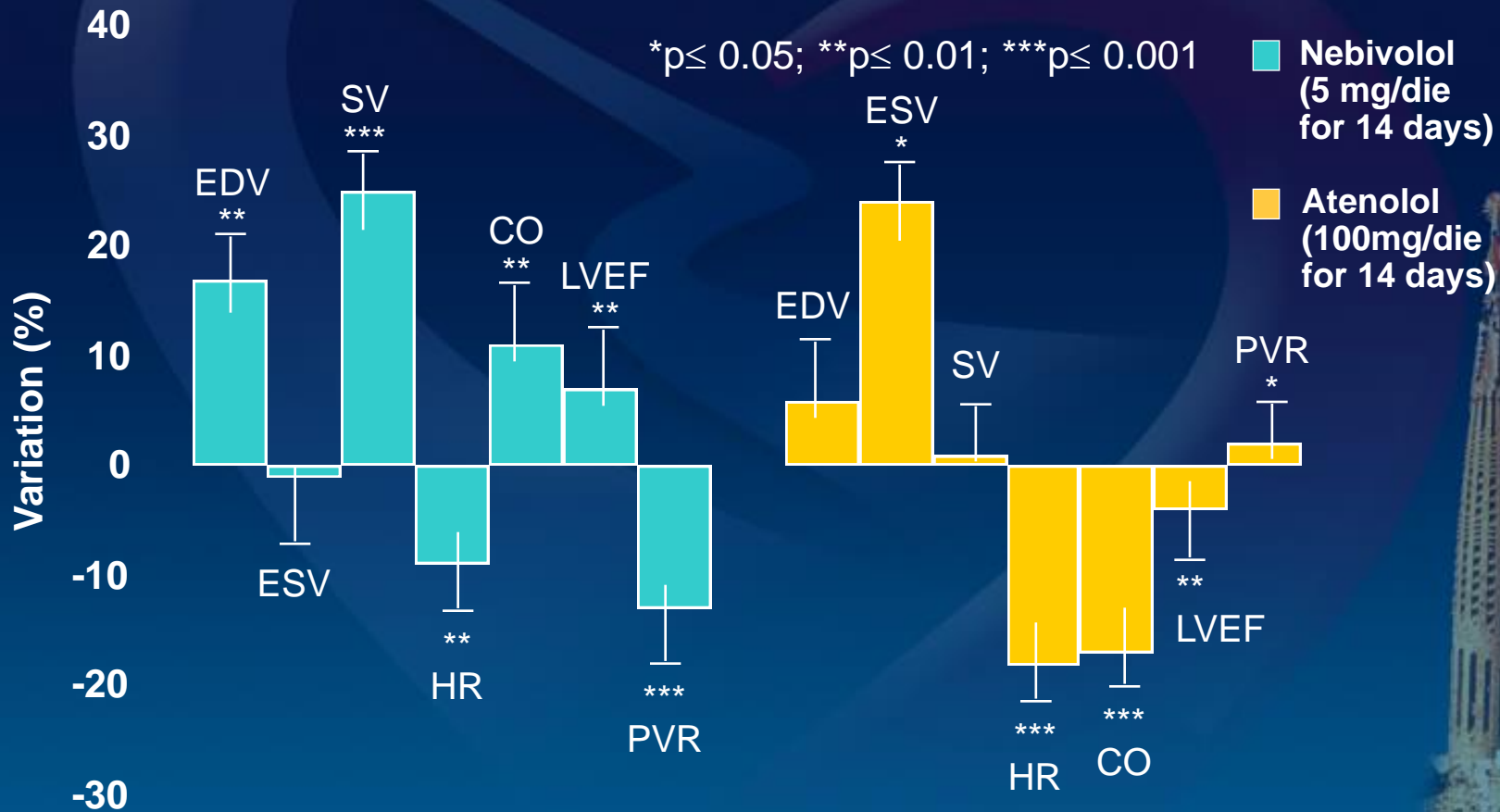
Effect of beta-blockers on Cardiac output



Effect of beta-blockers on Vascular resistance



Nebivolol: haemodynamic profile in healthy volunteers (angiocardiology evaluation)



Nebivolol

Aim

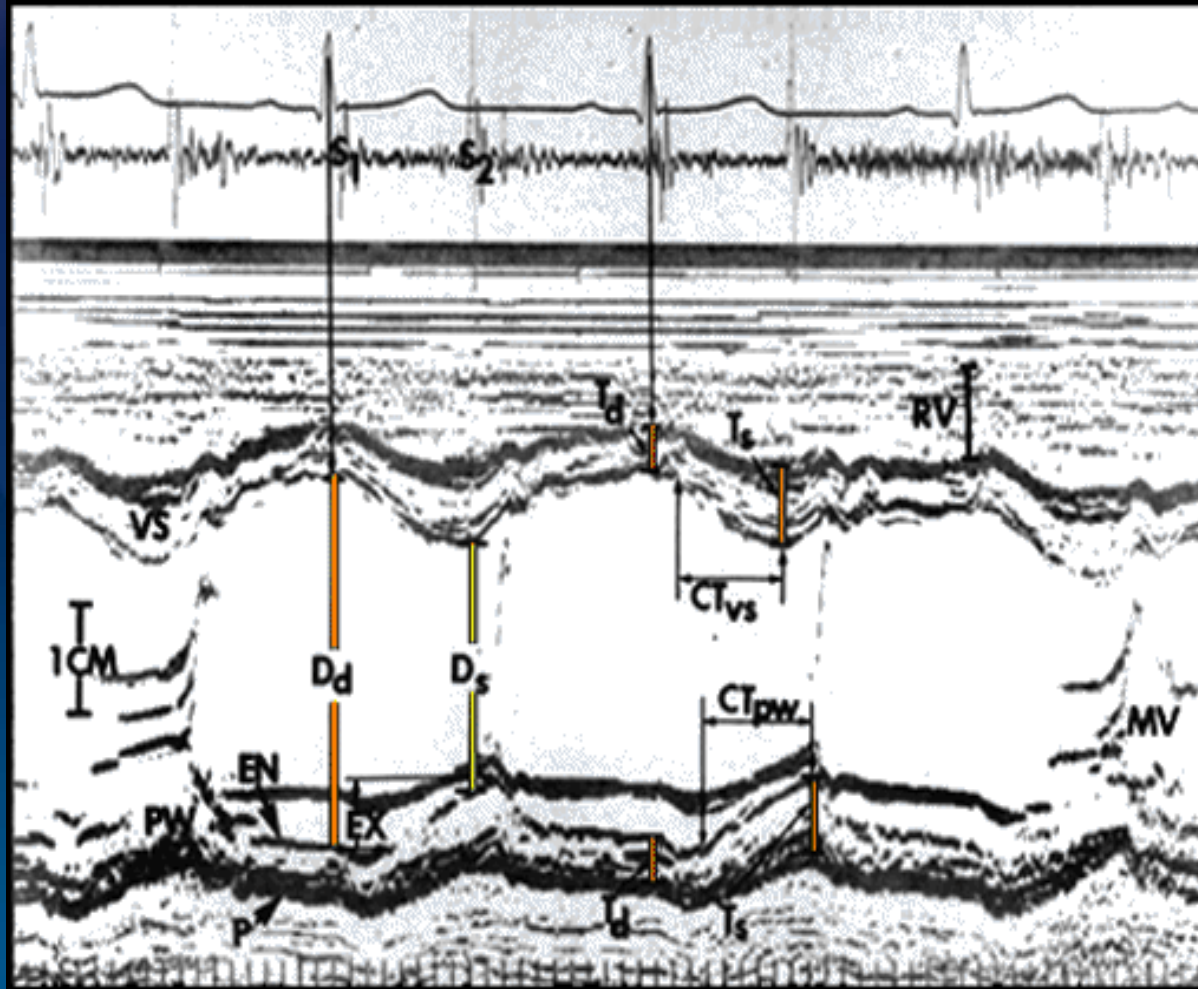
- Comparison of nebivolol versus atenolol on systolic and diastolic LV function in patients with uncomplicated hypertension
- Acute effects: (4 hours after first dose)
- Late effects: (2 weeks)

Systolic LV function

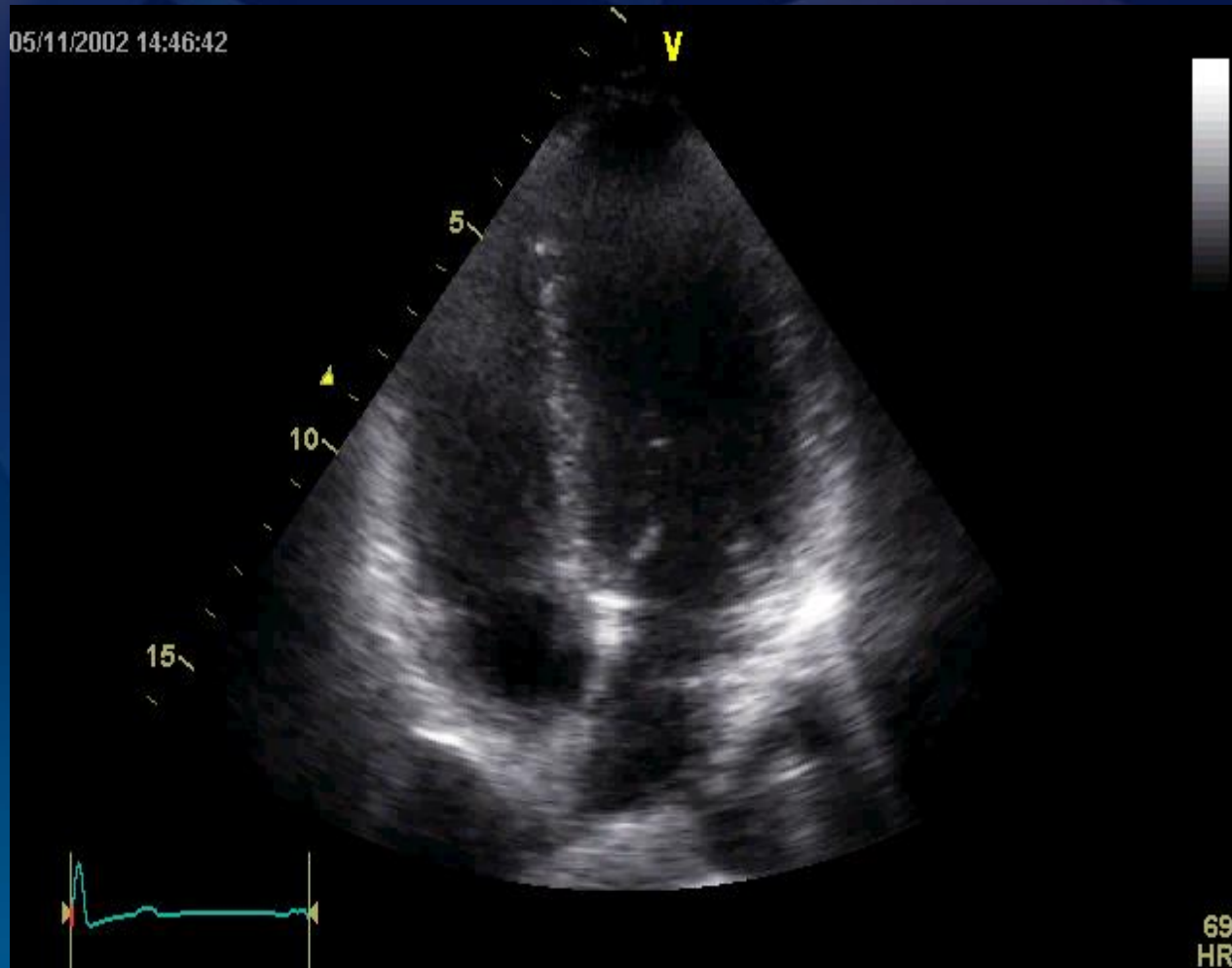
Stroke volume



M-mode measurements



2-D echocardiography



Quantitative 2D-Echocardiography

Left Ventricular Volumes Nongeometric Models



$$V = \frac{\pi}{4} \sum_{i=1}^{20} a_i b_i \frac{L}{20}$$

Method of discs
(modified
Simpson's rule)

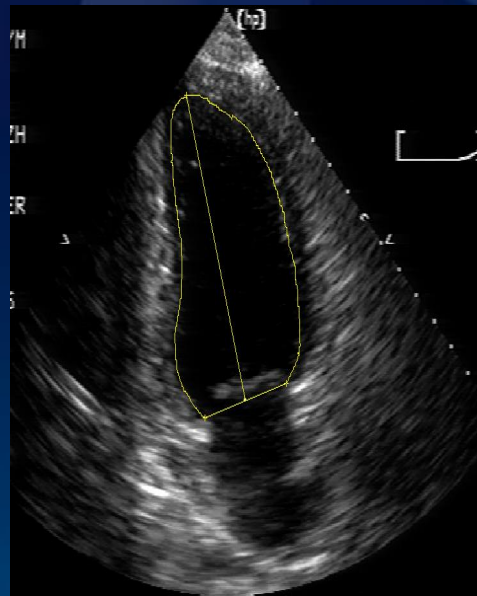


$$V = 0.85 \frac{(A)^2}{L}$$

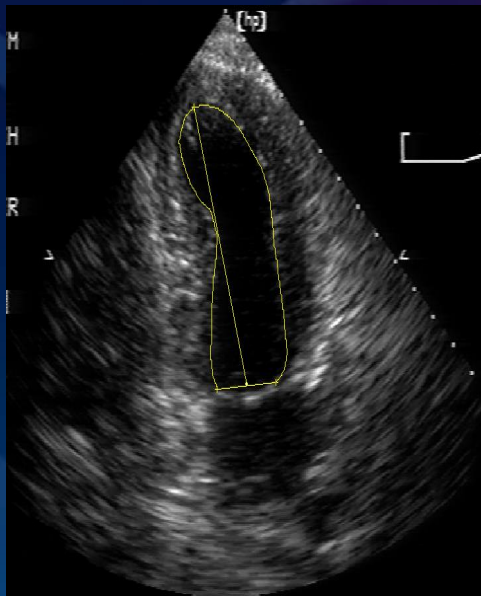
Single plane
area length

JASE 2:358

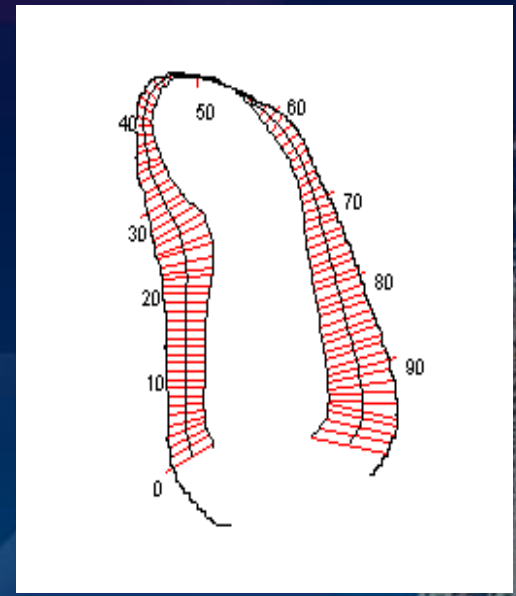
Quantitative 2D-Echocardiography



**End-Diastolic
Volume**



**End-Systolic
Volume**

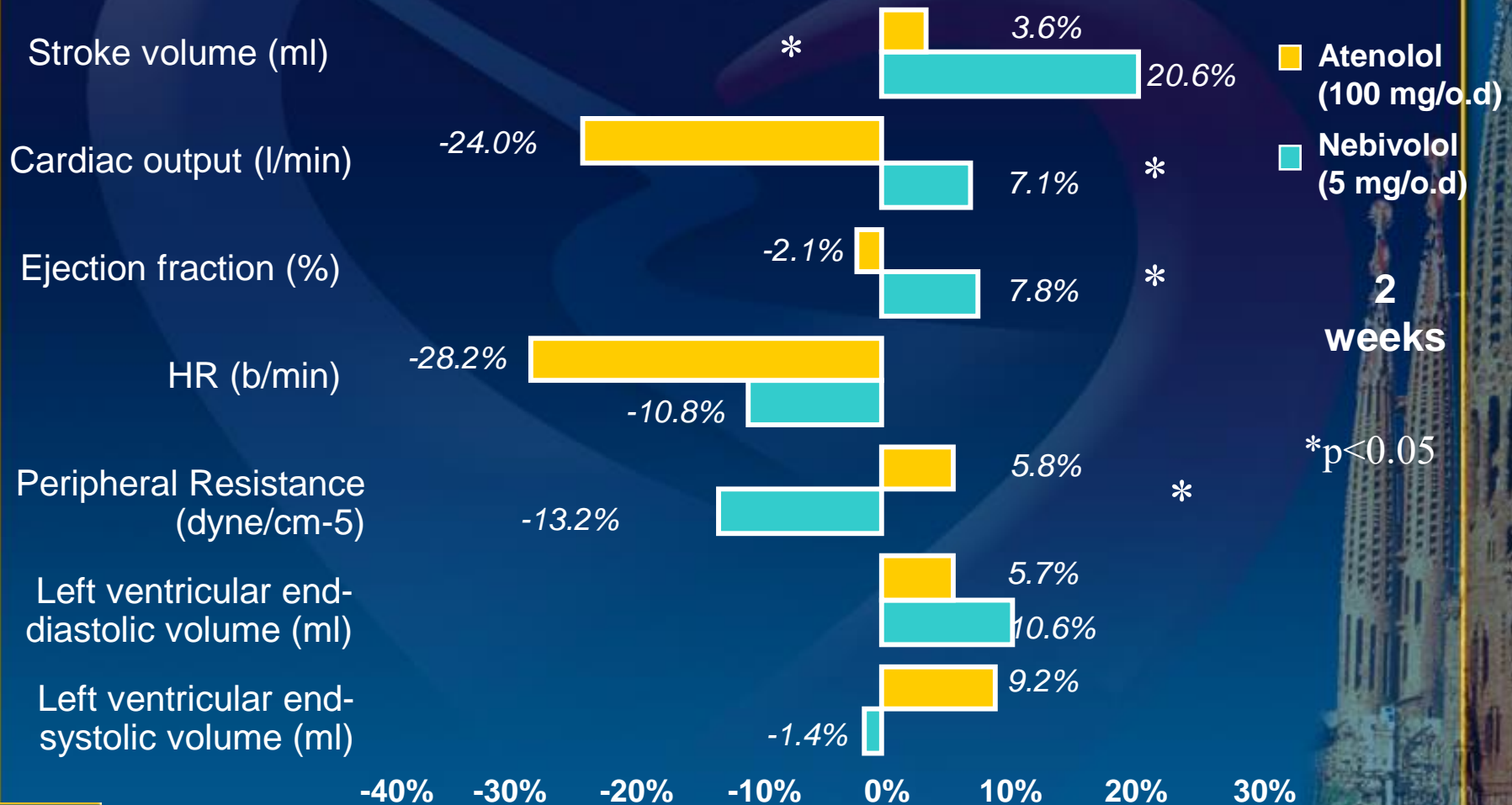


Centerline ED-ES

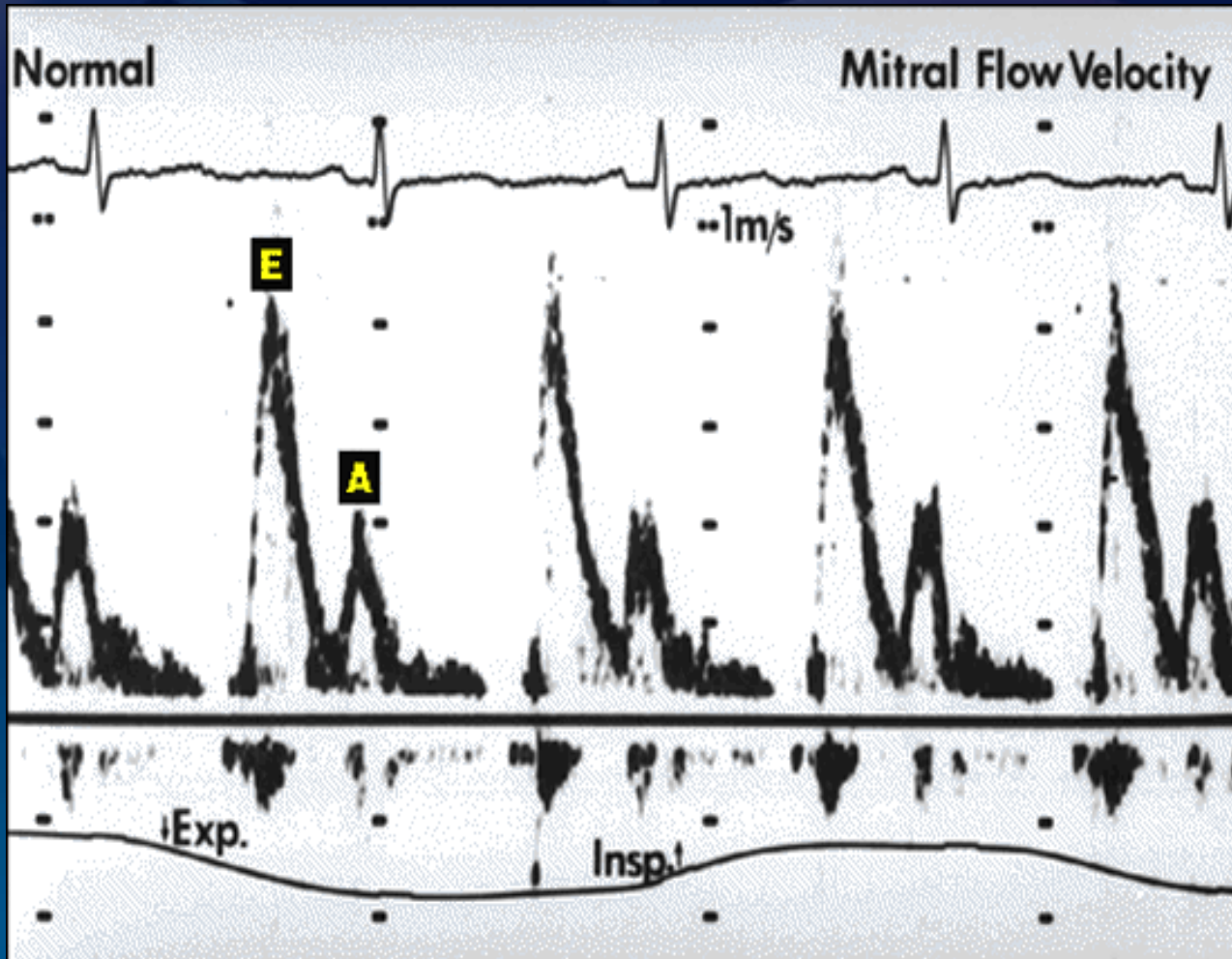
$$EF = \frac{EDV - ESV}{EDV} \times 100\%$$

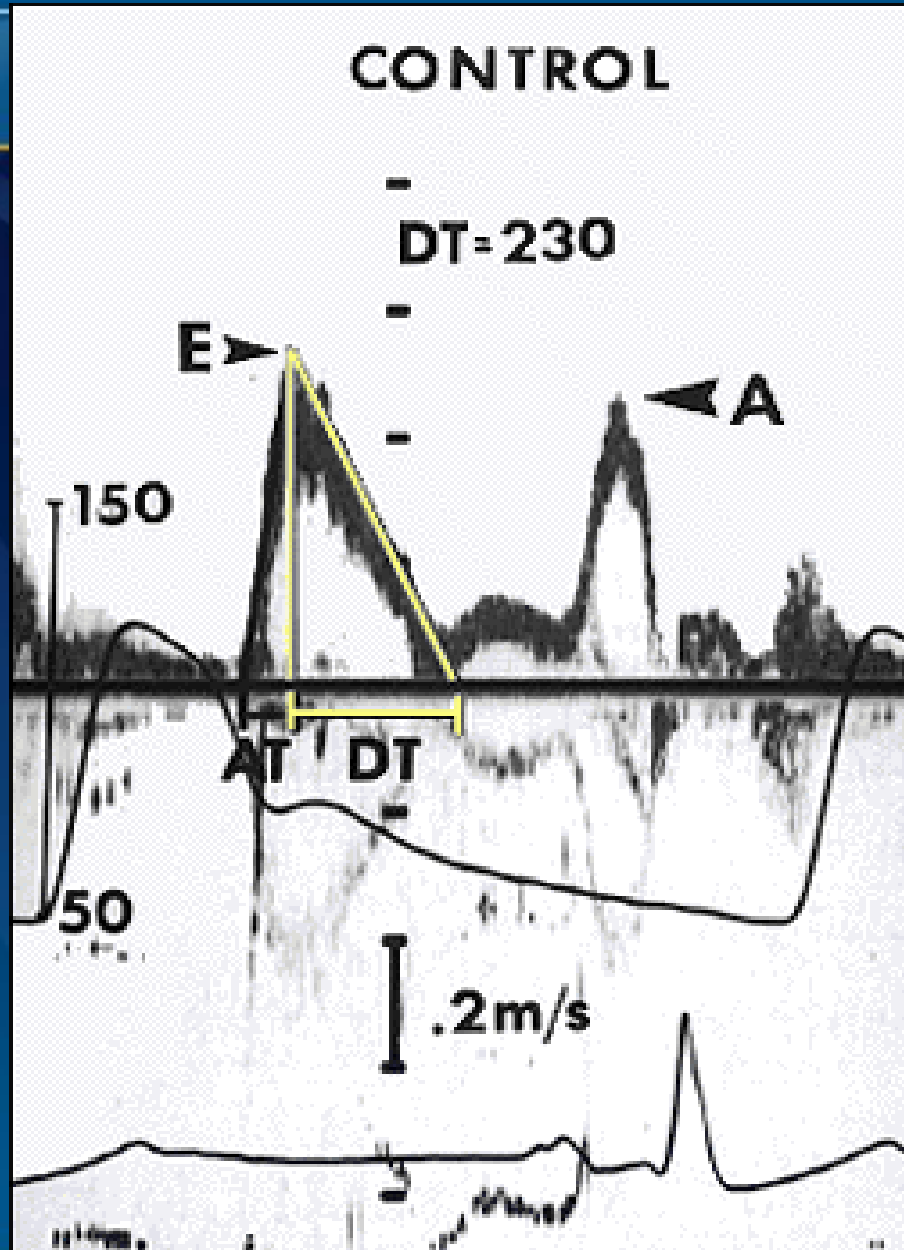
Nebivolol:

haemodynamic effects in hypertensive Patients

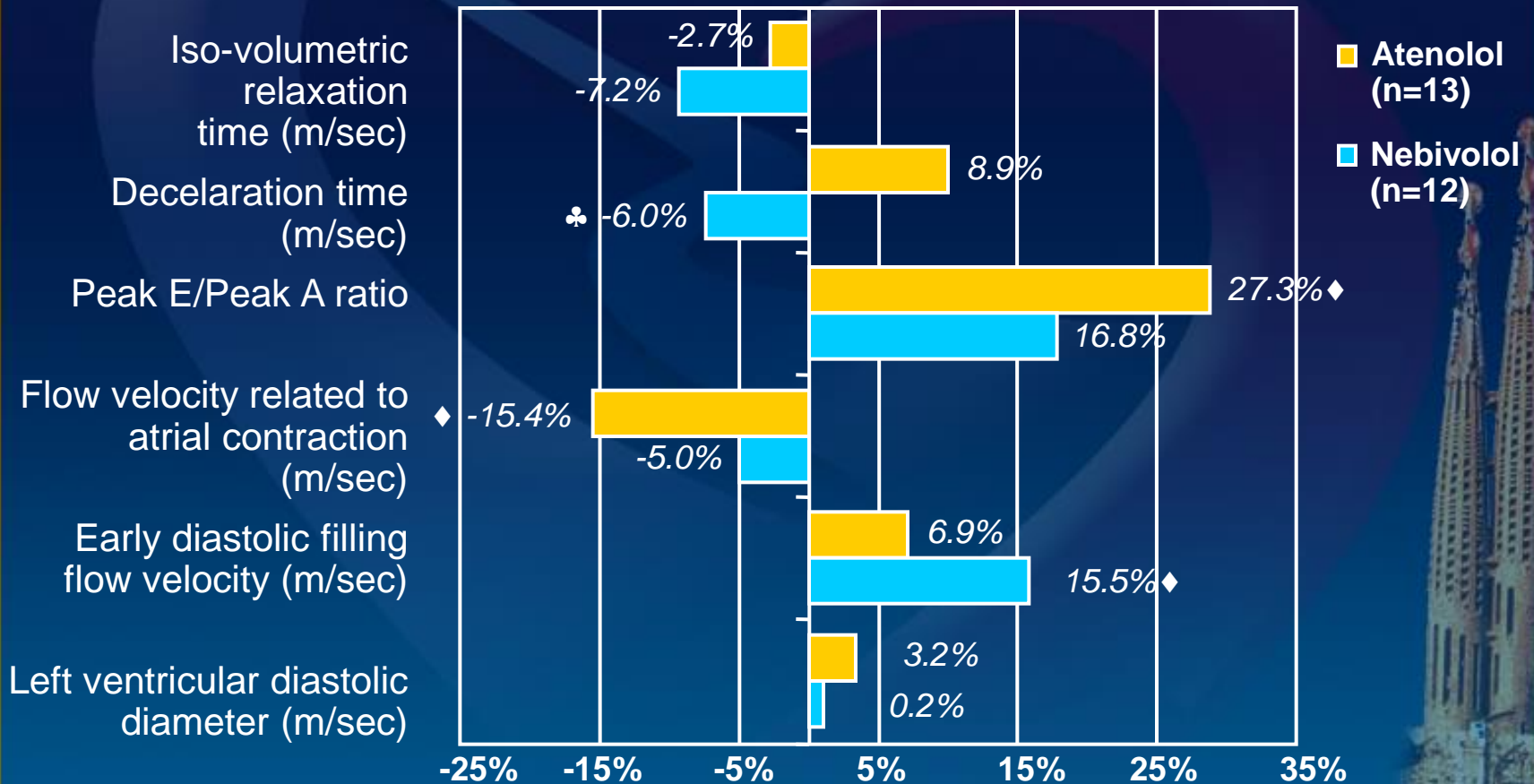


Diastolic LV function





Echocardiographic diastolic function parameters change versus baseline



◆ P < 0.05 (2-tailed) vs pre-treatment;

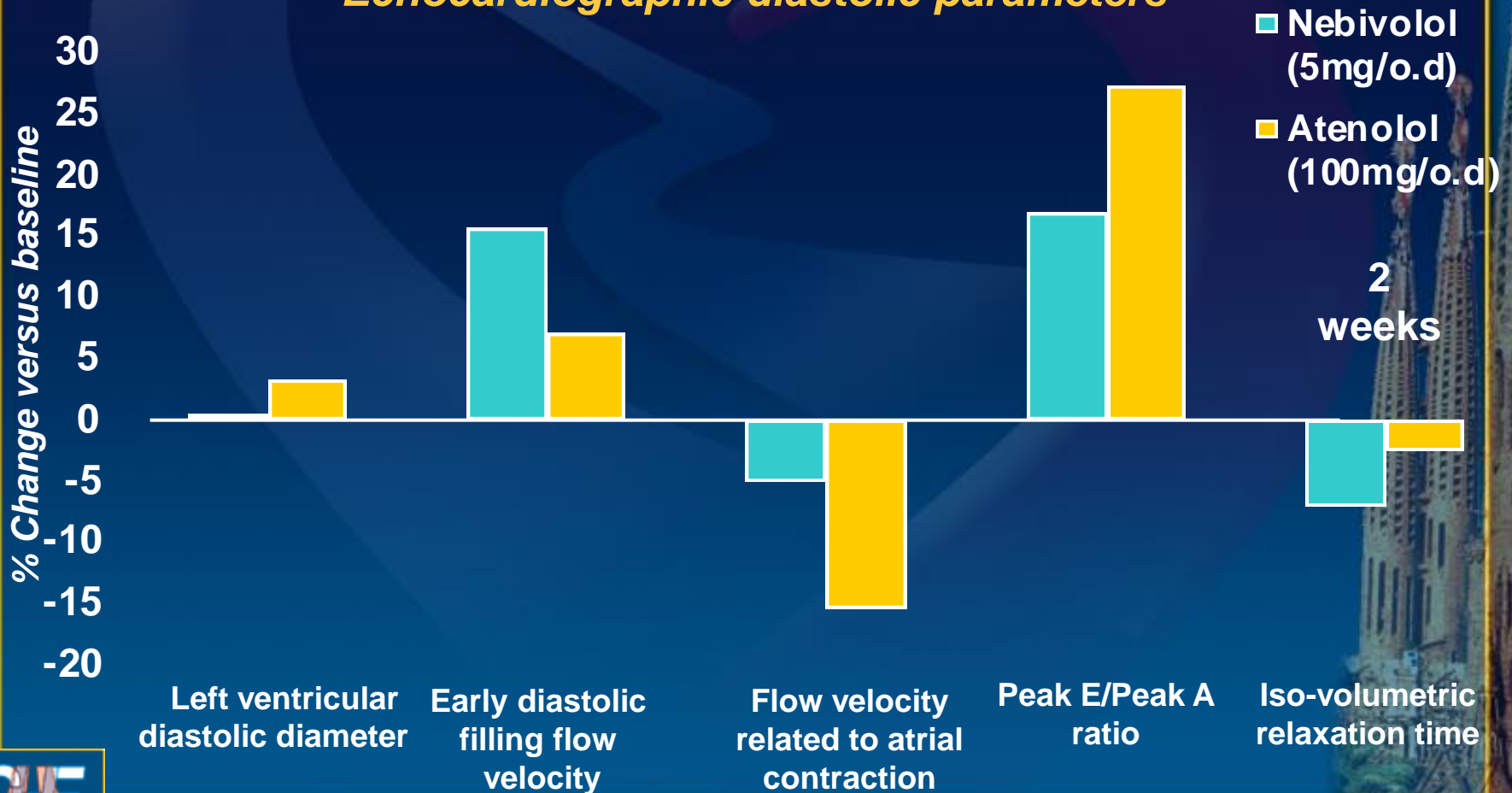
♣ P < 0.05 (2-tailed) Nebivolol vs Atenolol

O.Kamp In press Am. J. of Cardiol. 2003

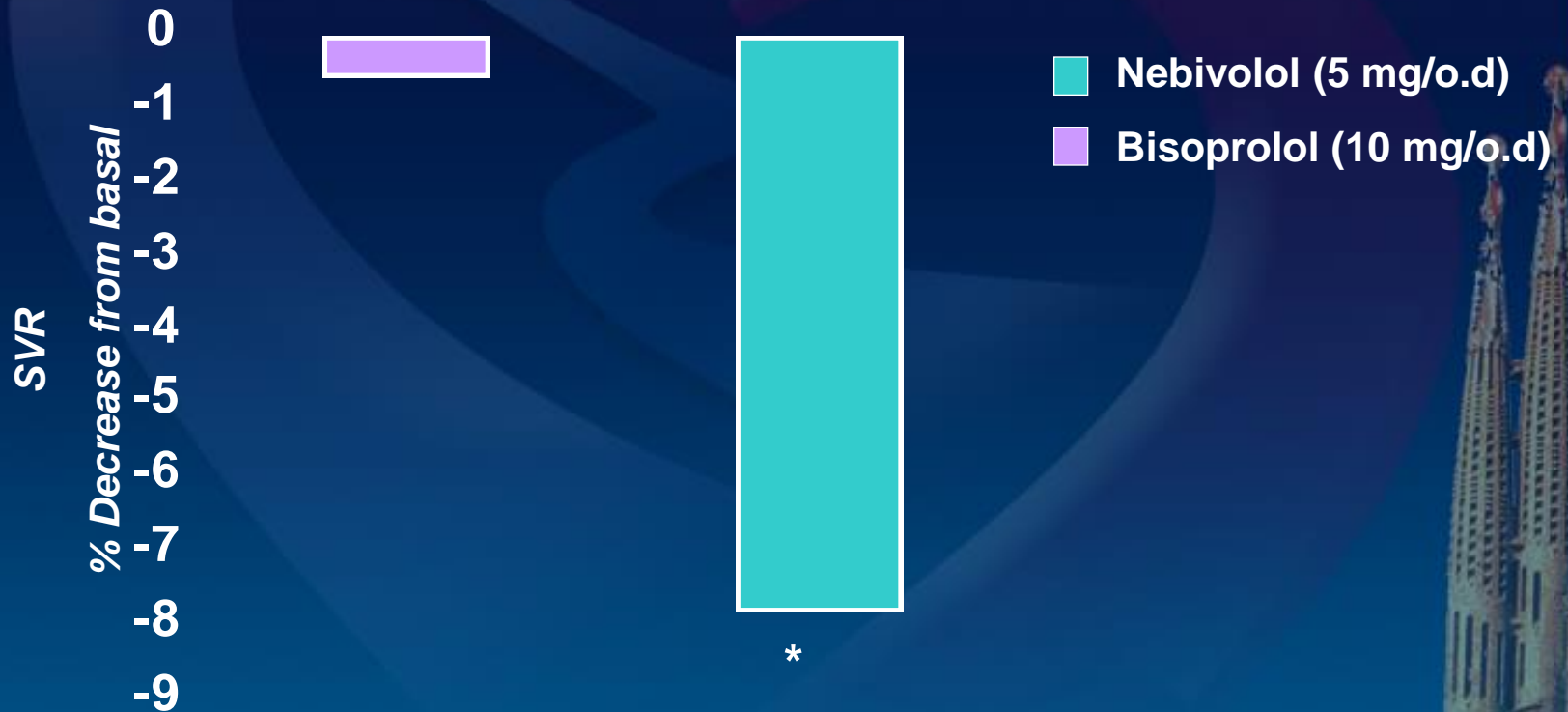
Nebivolol:

haemodynamic effects in hypertensive Patients

Echocardiographic diastolic parameters



Nebivolol: SVR decrease

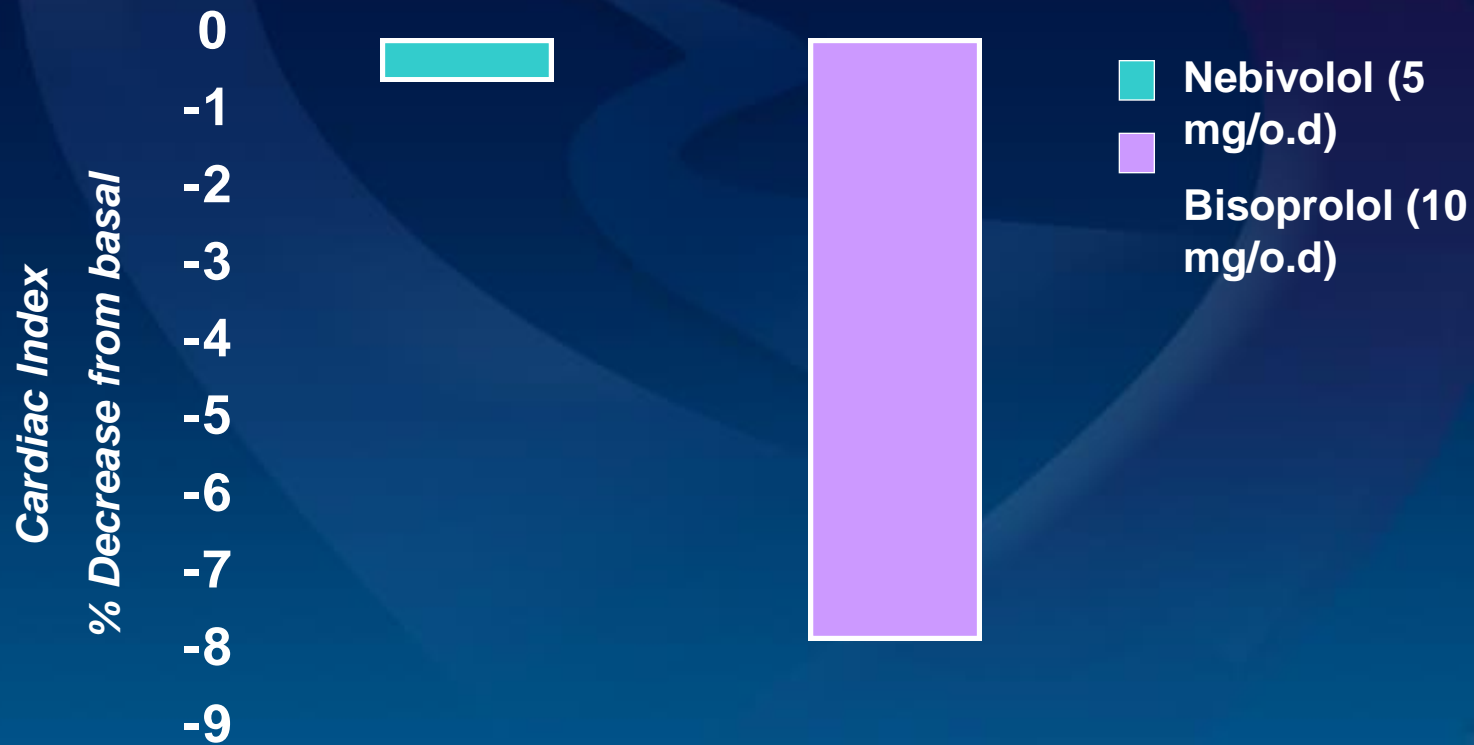


**p < 0.01 vs baseline*

Nebivolol:

haemodynamic profile in hypertensive patients

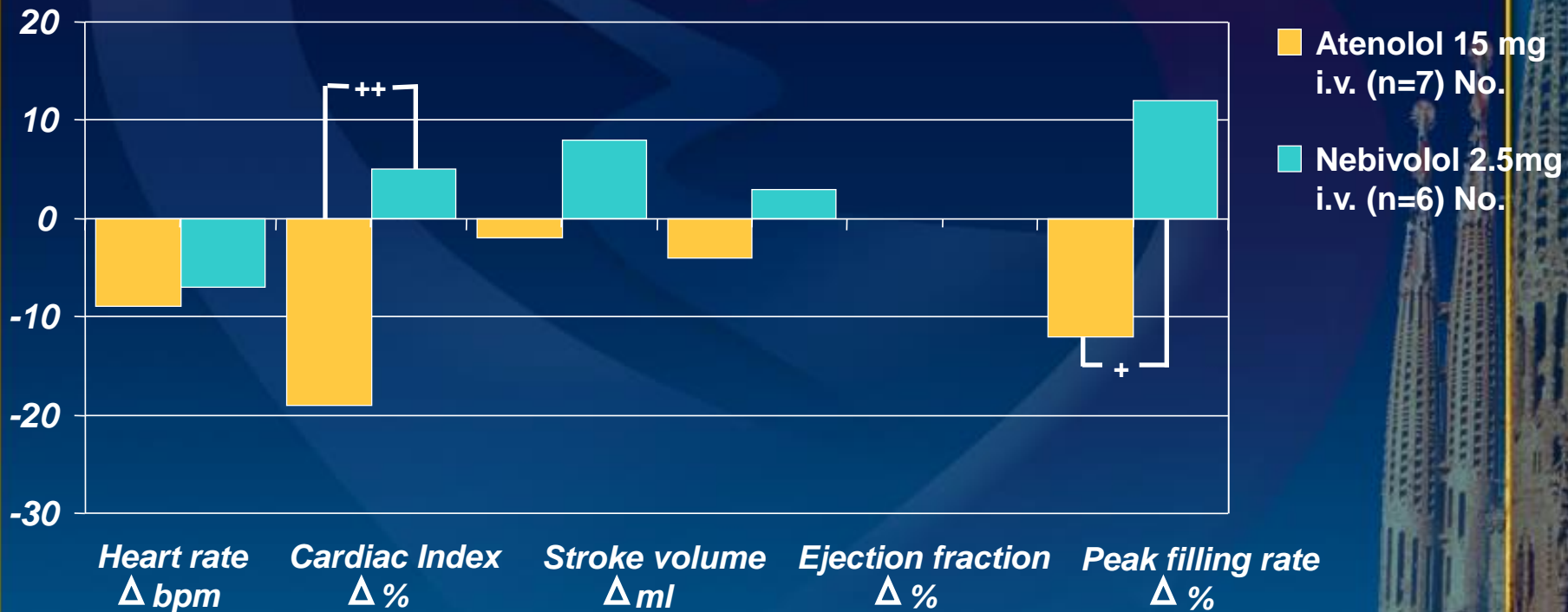
Cardiac index decrease



$p < 0.01$ vs baseline

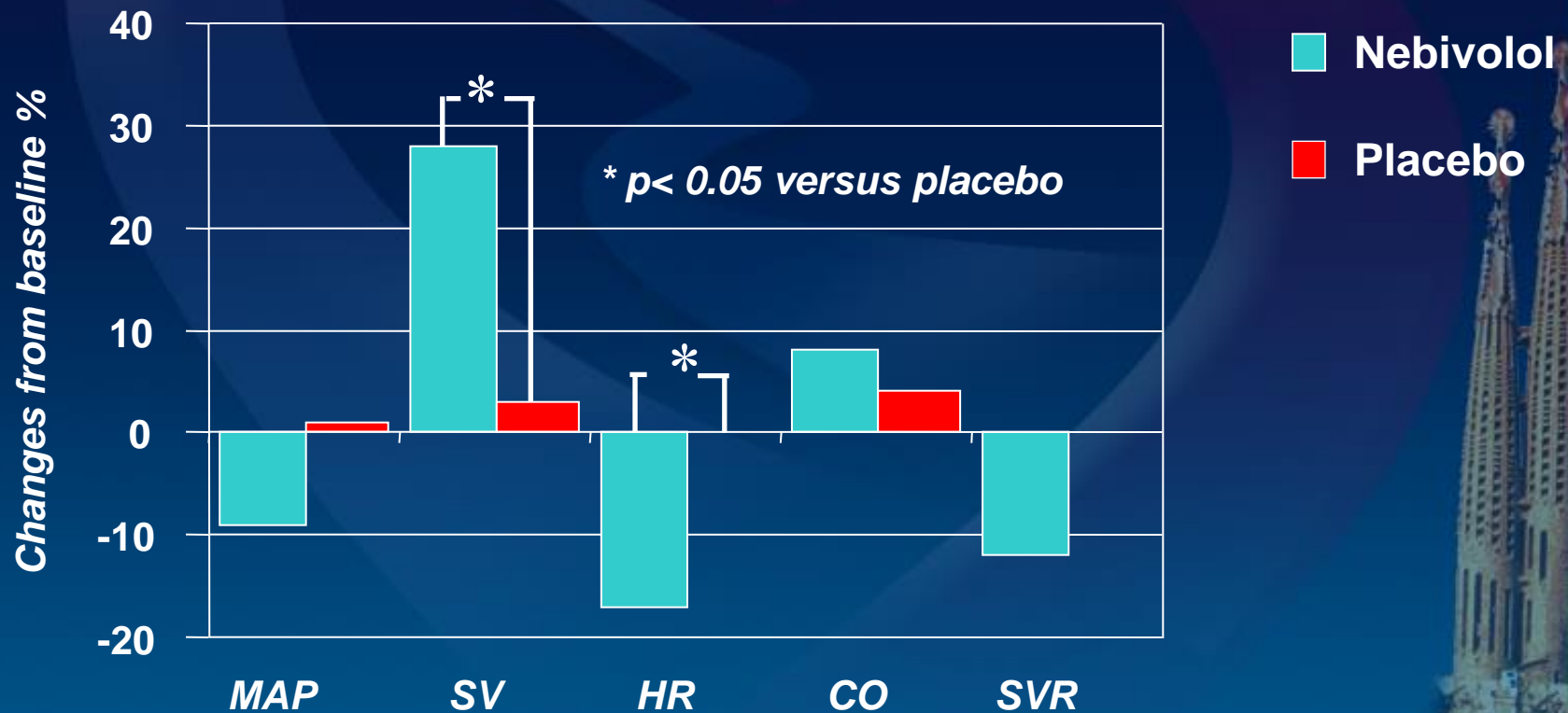
Nebivolol:

haemodynamic effects in CHD patients



Nebivolol

Hemodynamic effects in Congestive Heart Failure



Nebivolol

Hemodynamic profile

Conclusions

- Nebivolol differently from other selective β_1 -antagonists has a peculiar haemodynamic profile
- **Nebivolol:**
 - increases stroke volume
 - maintain cardiac output (despite the bradycardic effect)
 - reduces the SVR for the vasodilating activity
 - increases or not decreases the EF
 - improves the diastolic filling pattern