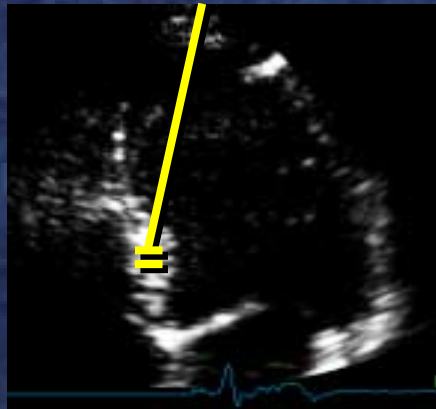


Element 70-00

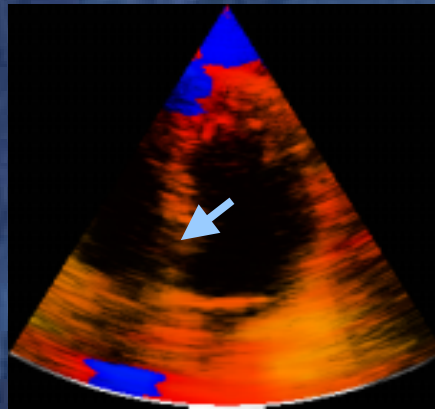
Vanoverschelde

Tissue Doppler

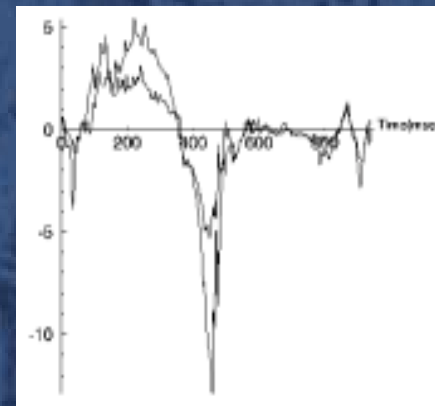
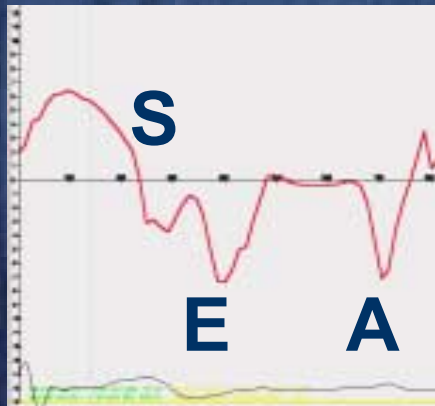
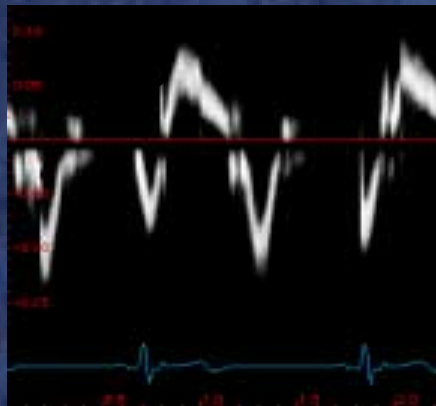
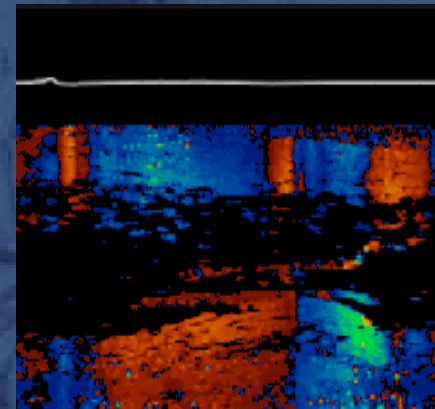
PW



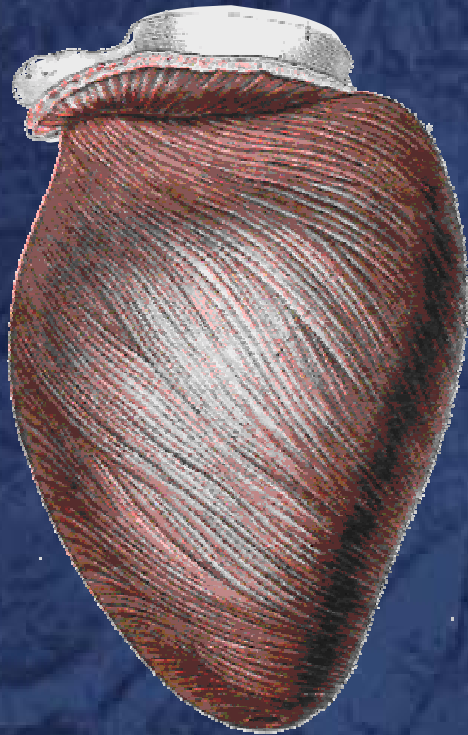
Color



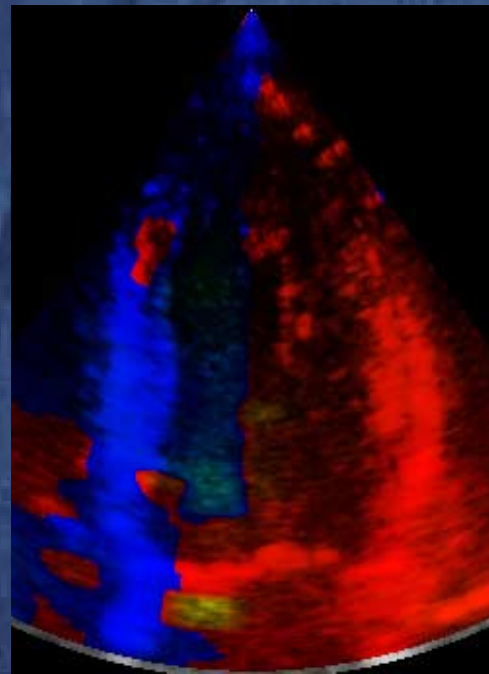
M-mode



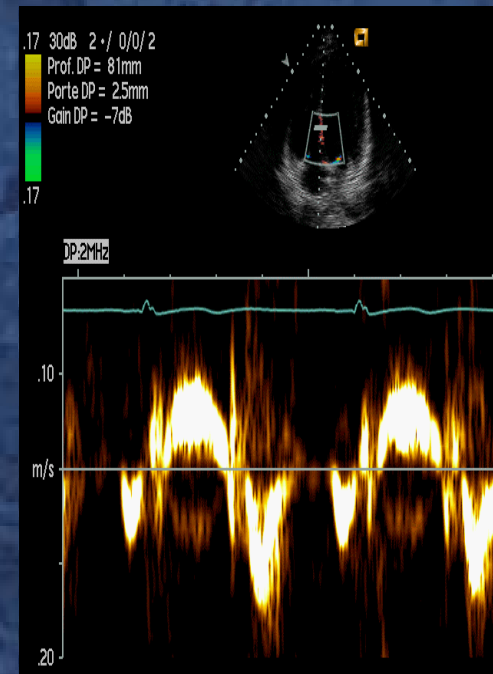
Long-axis Function



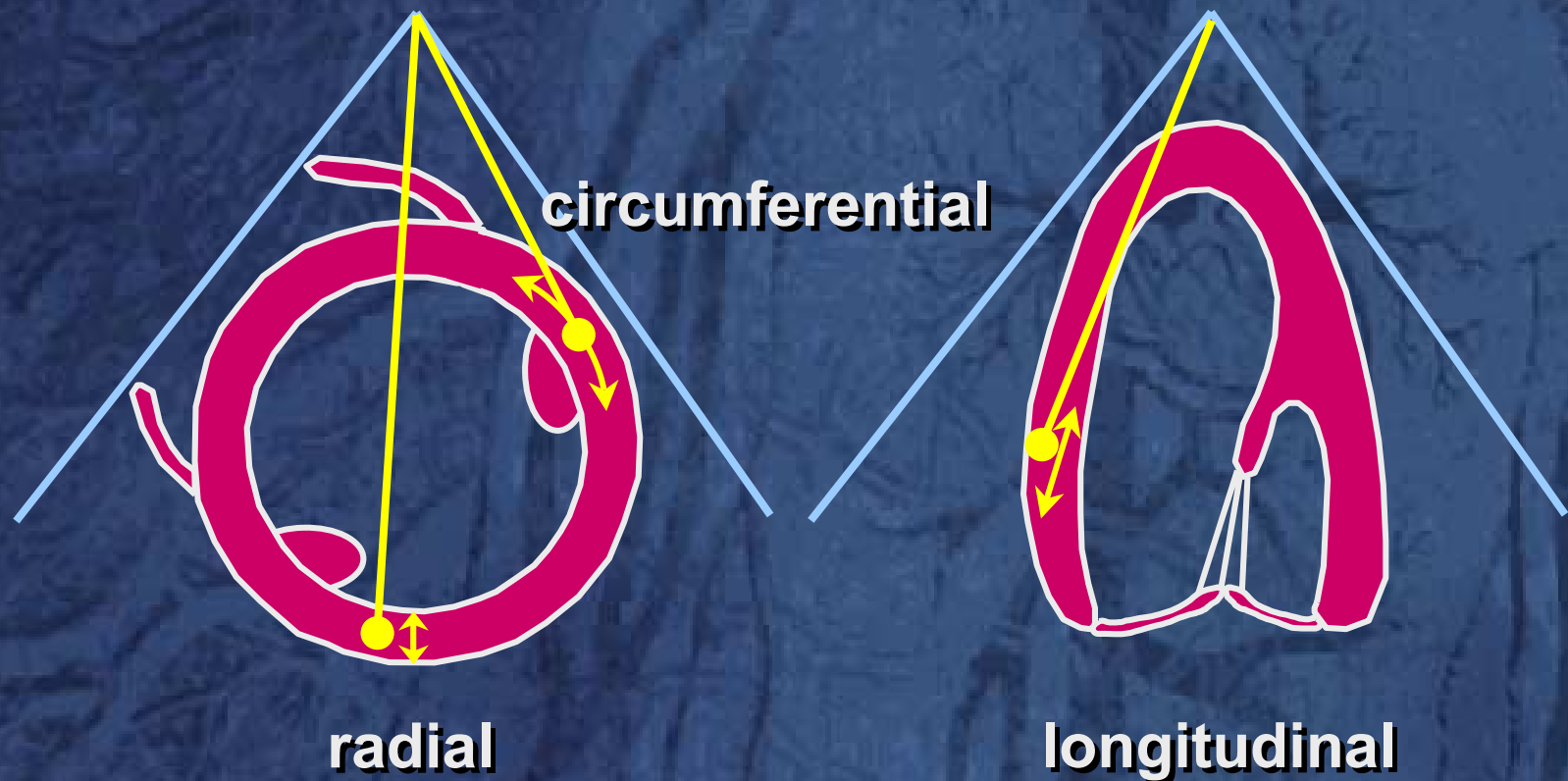
Endocardial fibers



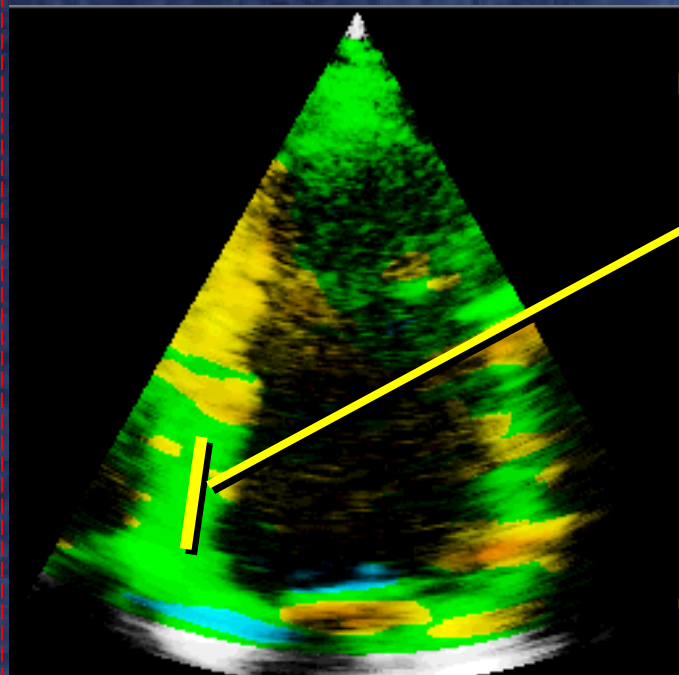
Longitudinal velocities



Myocardial Strains

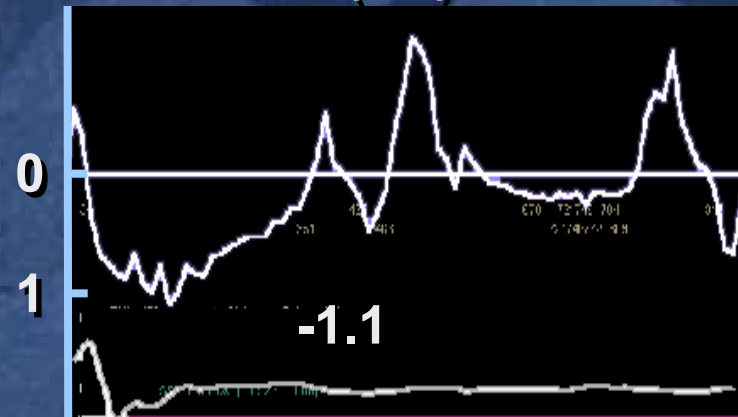


Strain Rate and Strain



Cineloops

Strain rate (1/s)



Strain (%)



Tissue Doppler in HF

- **Current use in 2002**

 - normal vs pseudonormal LV filling patterns*

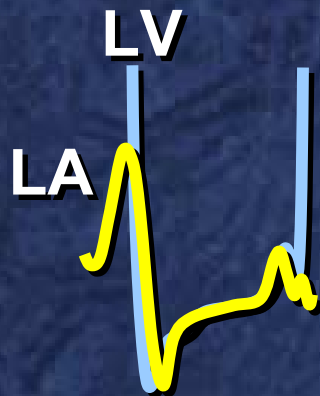
 - restrictive CM vs constrictive pericarditis*

- **Potential applications in the future**

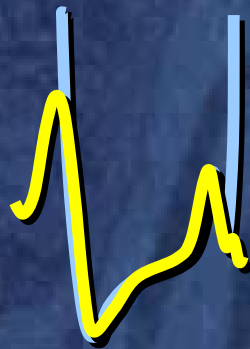
 - strain rate imaging or velocity gradient for subclinical abnormalities*

 - quantitation of global / regional function*

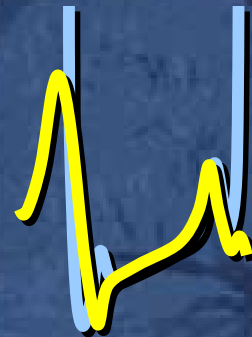
LV Filling



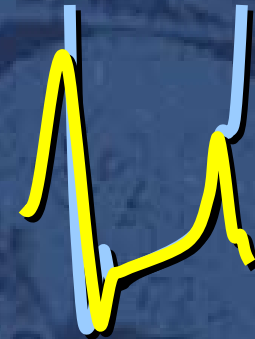
Normal



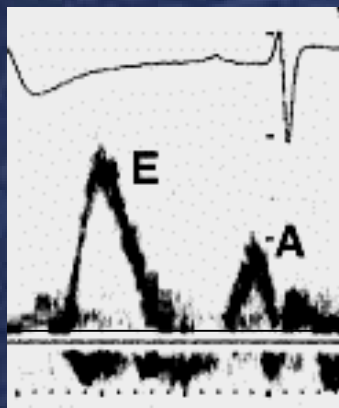
**Impaired
relaxation**



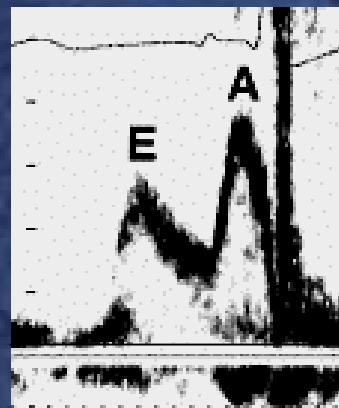
**Pseudo
normal**



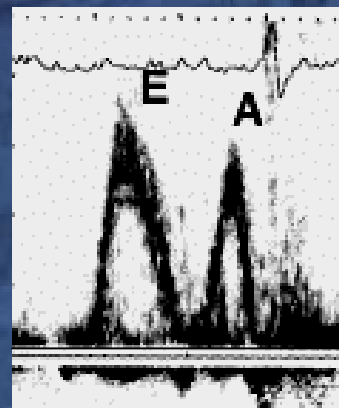
Restrictive



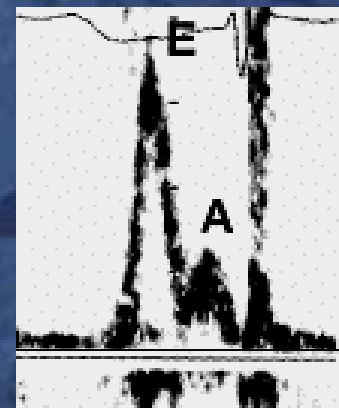
Normal



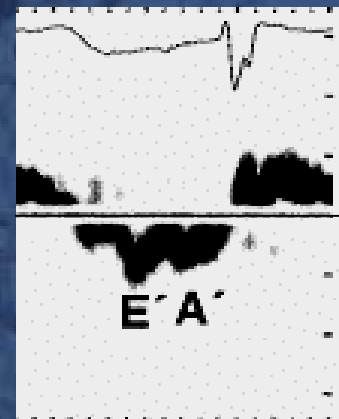
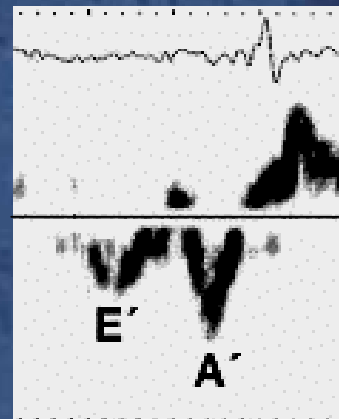
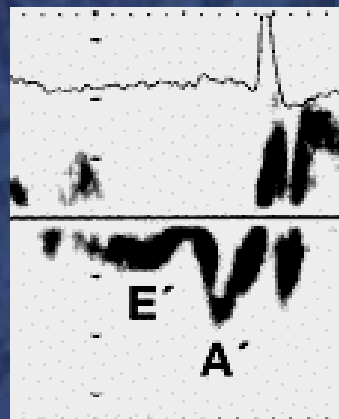
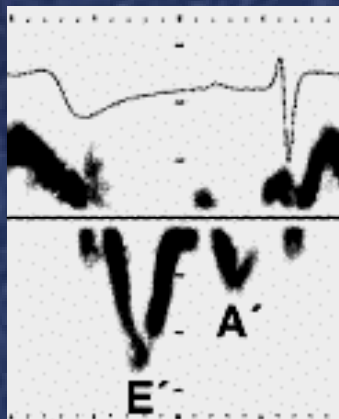
**Impaired
relaxation**



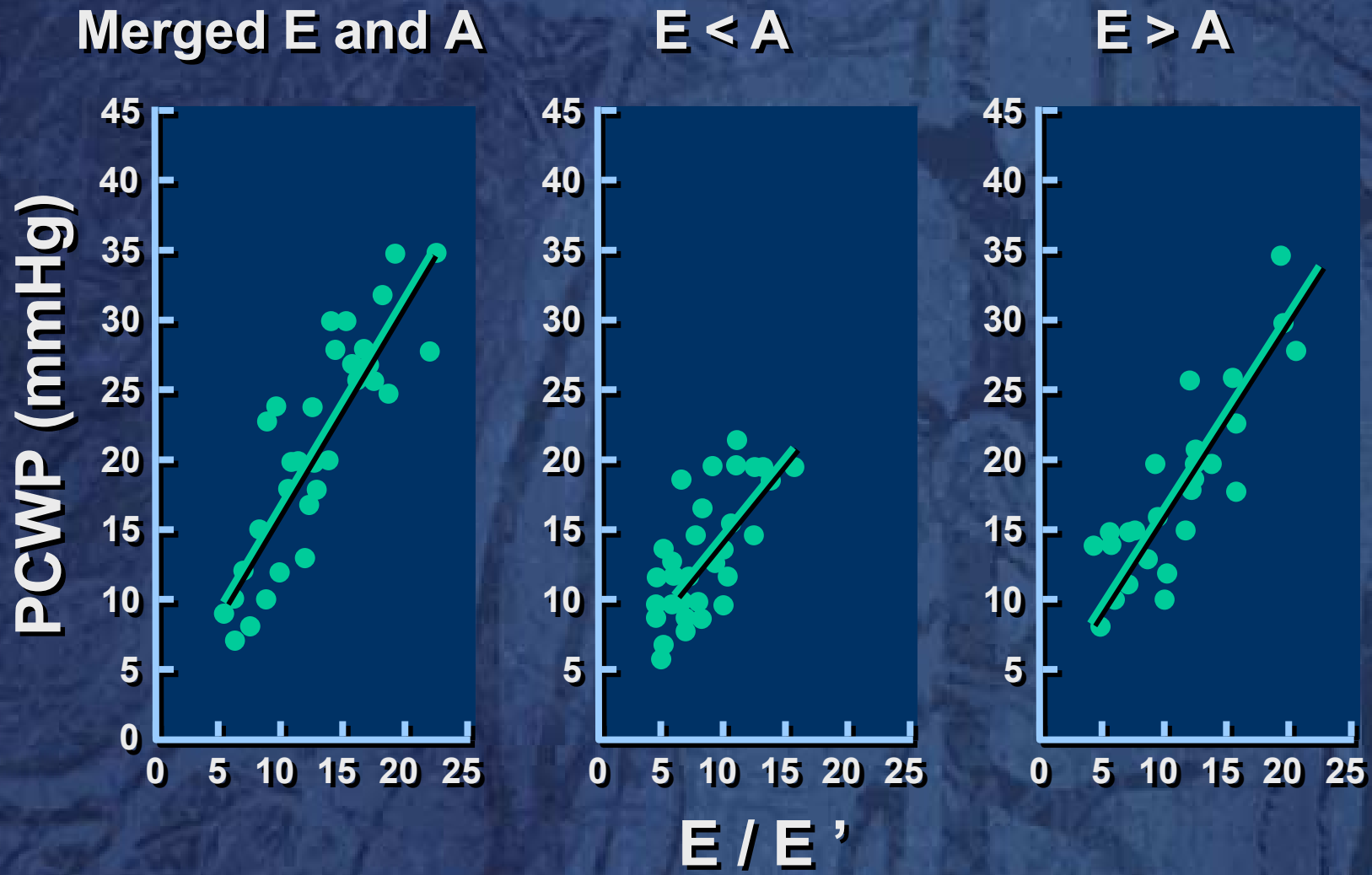
**Pseudo-
normal**



Restrictive



Sohn et al., J Am Coll Cardiol 1997,30:474



Nagueh et al., Circulation 1998,98:1644

Restriction vs Constriction

Restriction

Constriction

2D-echocardiography

RV - LV



RA - LA



wall thickness



nl

septum

nl

septal bounce

Doppler

E/A

> 2

variable

DT

< 150 ms

variable

respiratory changes

absent

marked

S/D

< 0.5

» 1

propagation

slow

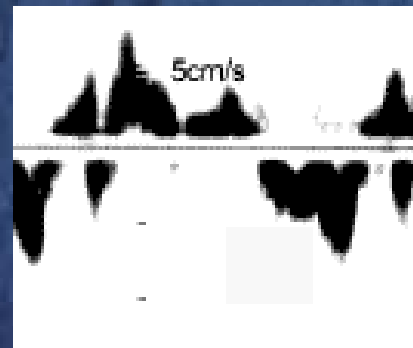
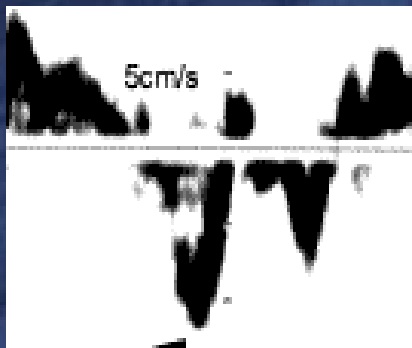
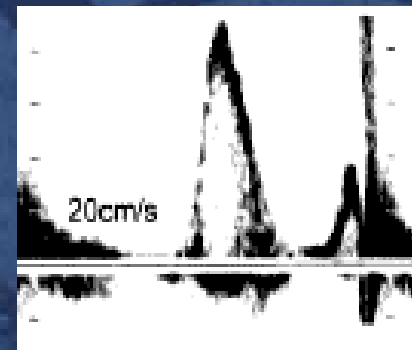
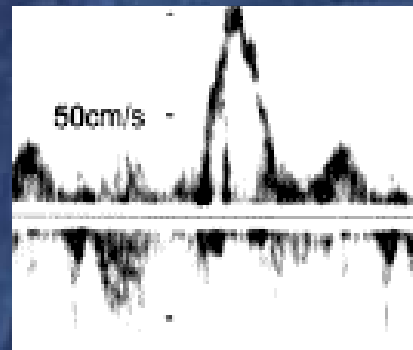
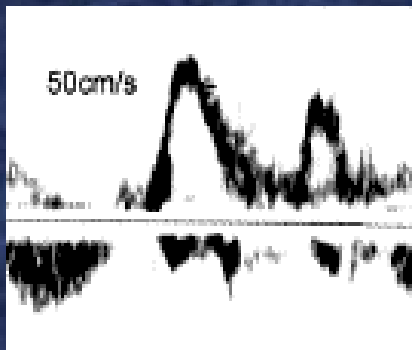
rapid

annulus E wave

< 0.8 cm/s

> 0.8 cm/s

Restriction and Constriction

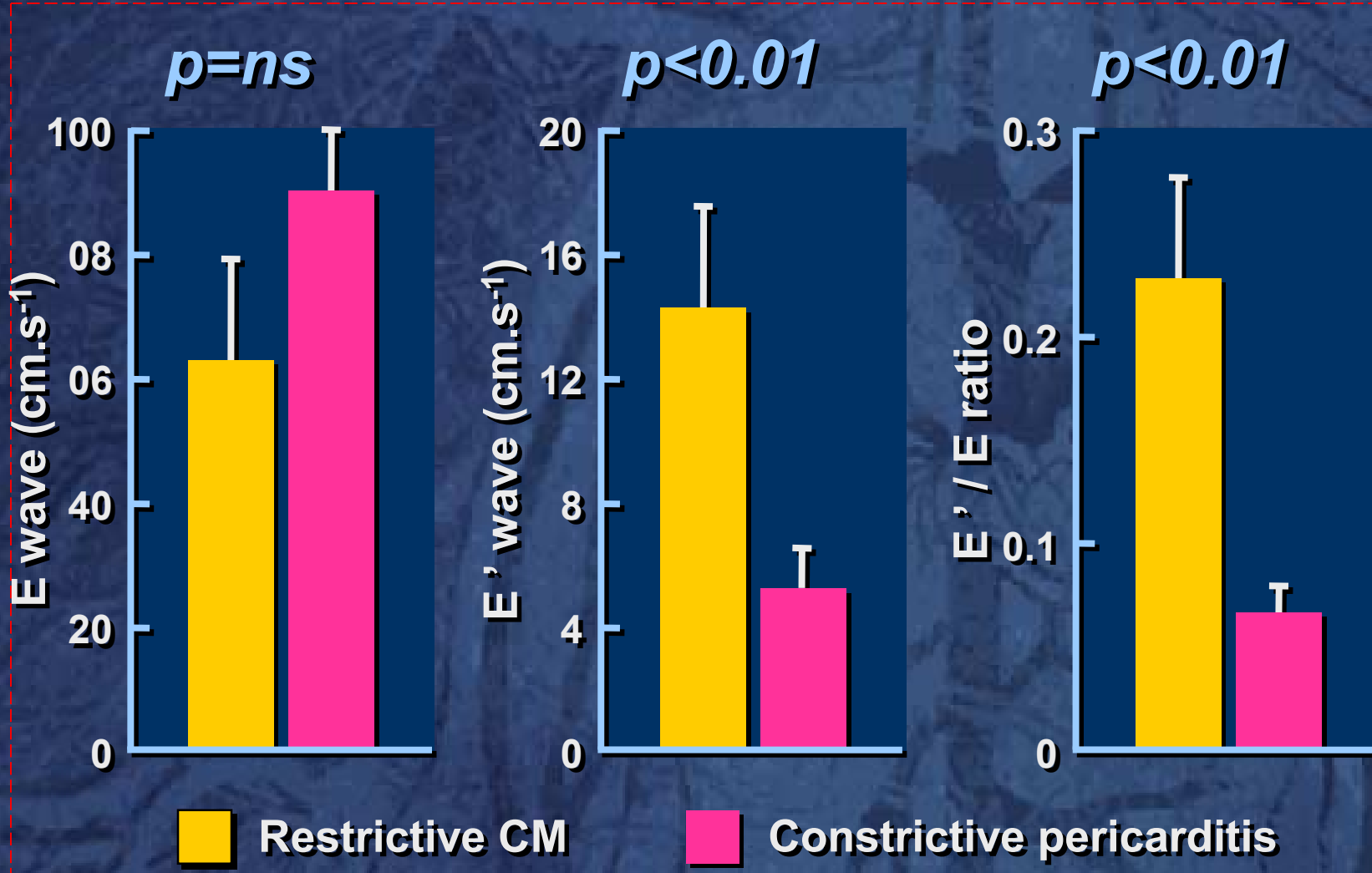


Normal

Restriction

Constriction

Garcia et al., J Am Coll Cardiol 1996,27:108



Garcia et al., J Am Coll Cardiol 1996,27:108

Limitations

- Site-dependence of elongation velocities and E'/A' ratio
- Persistent preload-dependence
- “Annulus paradoxus”
paradoxical relation to PCWP in constrictive pericarditis

Annulus Paradoxus

