

***Element 40.00***

**Sogaard**



# **Assessing Mechanical Asynchrony**

**Requires**

**high temporal / spatial resolution**

**"3 D" evaluation**

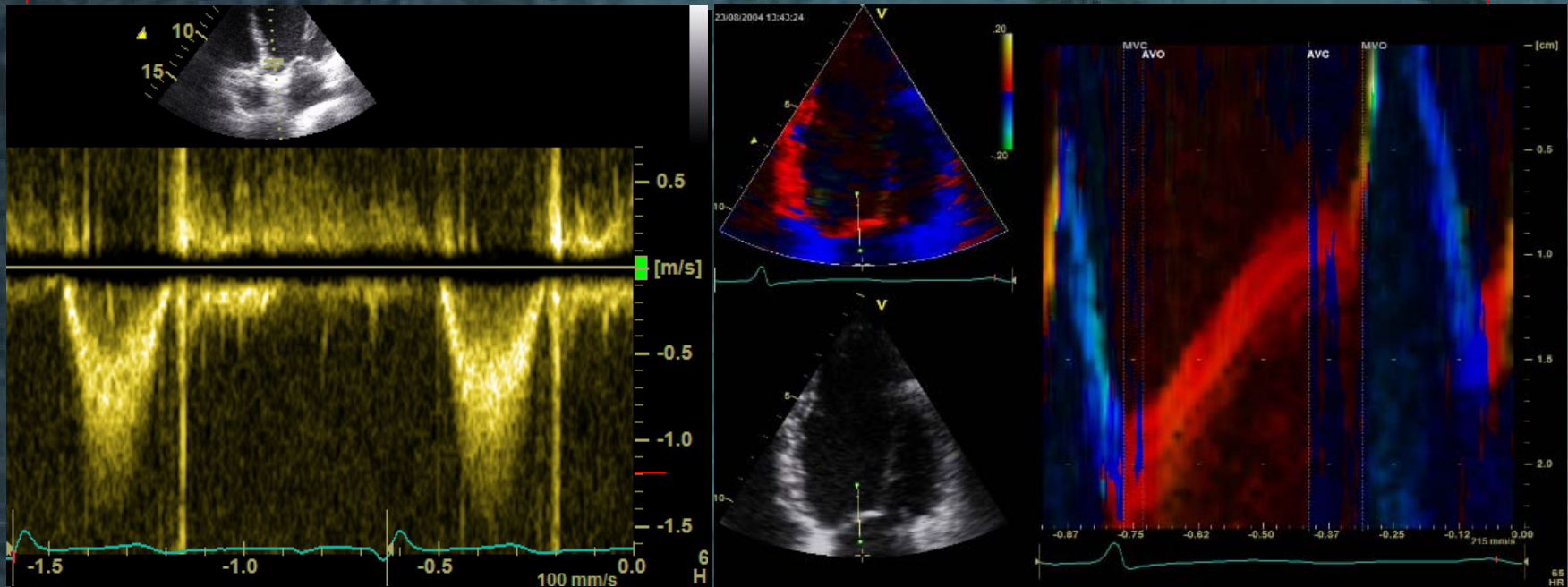
**Suitable for follow-up evaluation**



**Echocardiography**

# Timing Intervals

*Determining global ejection timing*



**Abnormal regional timing cannot be assessed  
without *global timing information***

# Assessing Mechanical Asynchrony

## *Current methods*

- **Standard echo**

  - M-Mode*

  - LVOT and RVOT flow time differences*

- **Tissue Doppler Imaging**

  - Velocities/Tissue timing imaging*

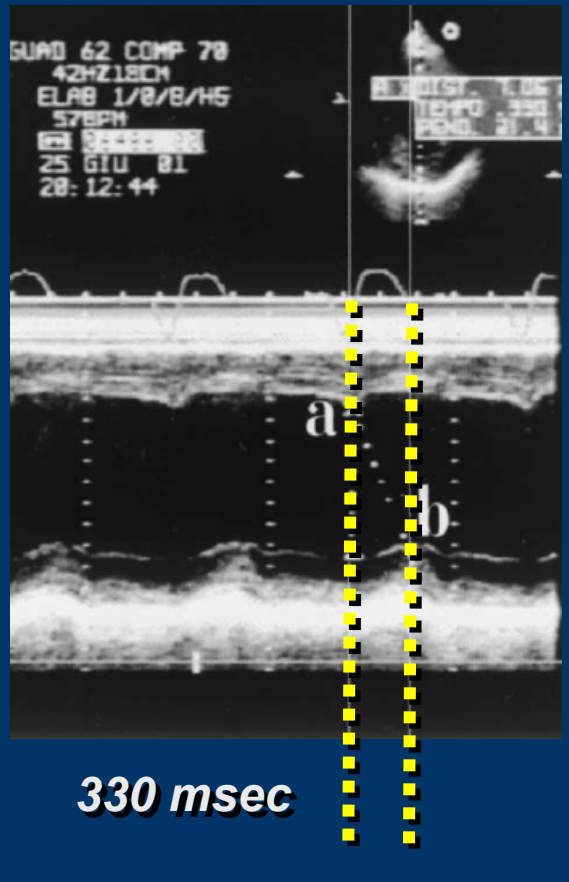
  - M-mode*

  - Deformation analysis (strain/strain rate)*

- **3 D echo**

# M-Mode

## Septum to posterior wall



### PRO

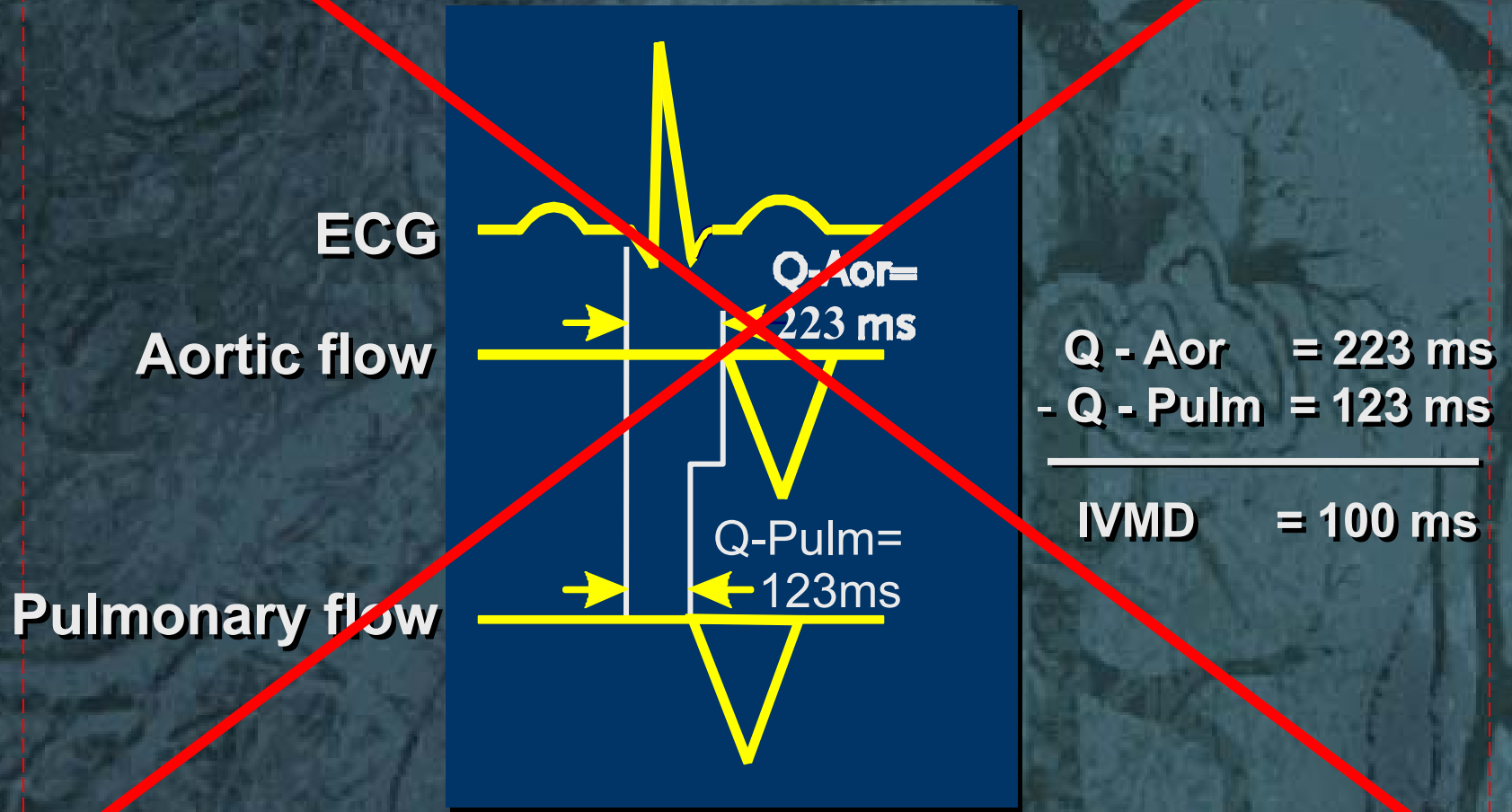
*Easily available*  
*rapid predictive info (> 130 ms)*

### CON

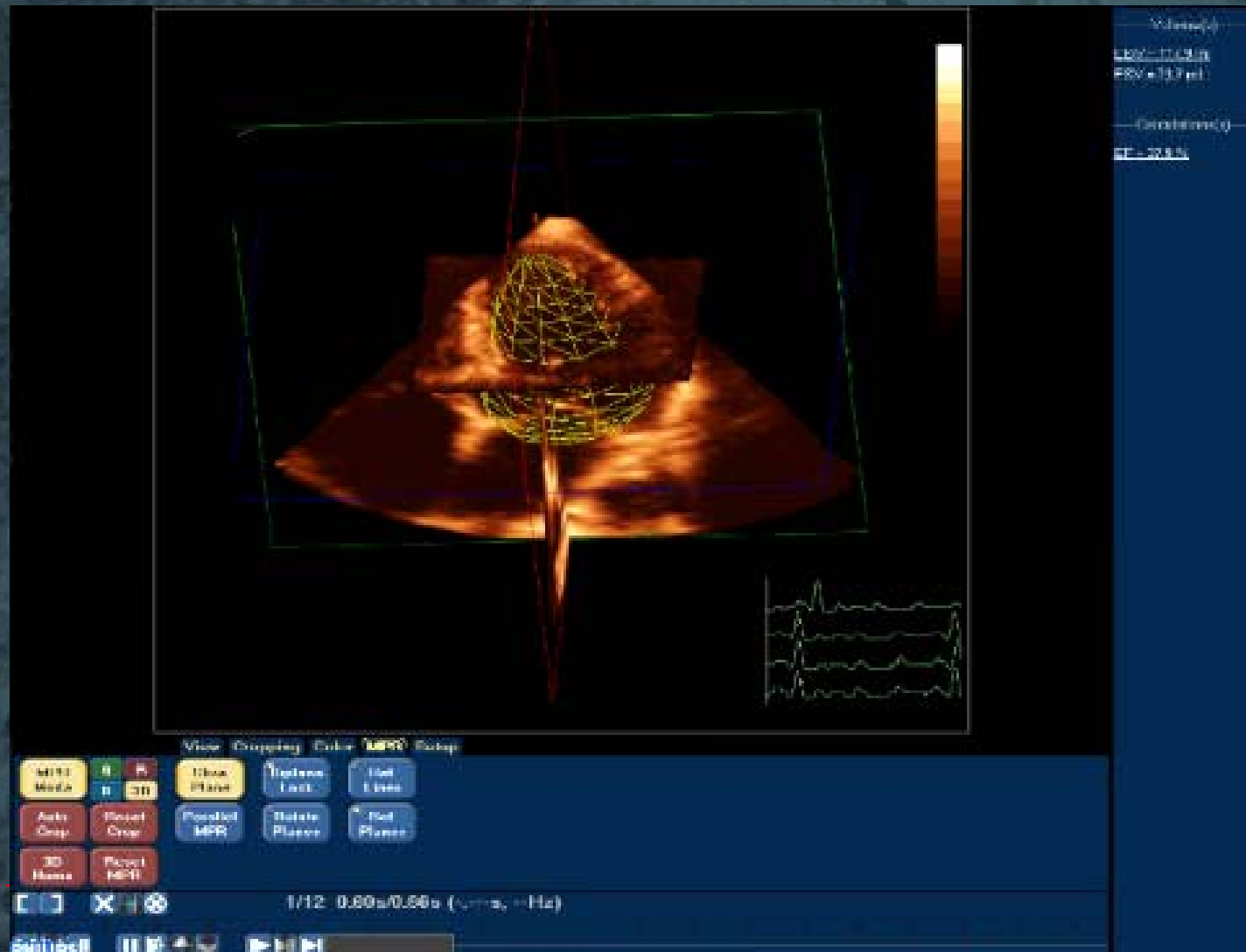
*Only one view*  
*Not related to global timing*  
*Requires "motion" both walls*  
*Septal motion influenced by PA pressure*

# ***Interventricular mechanical delay***

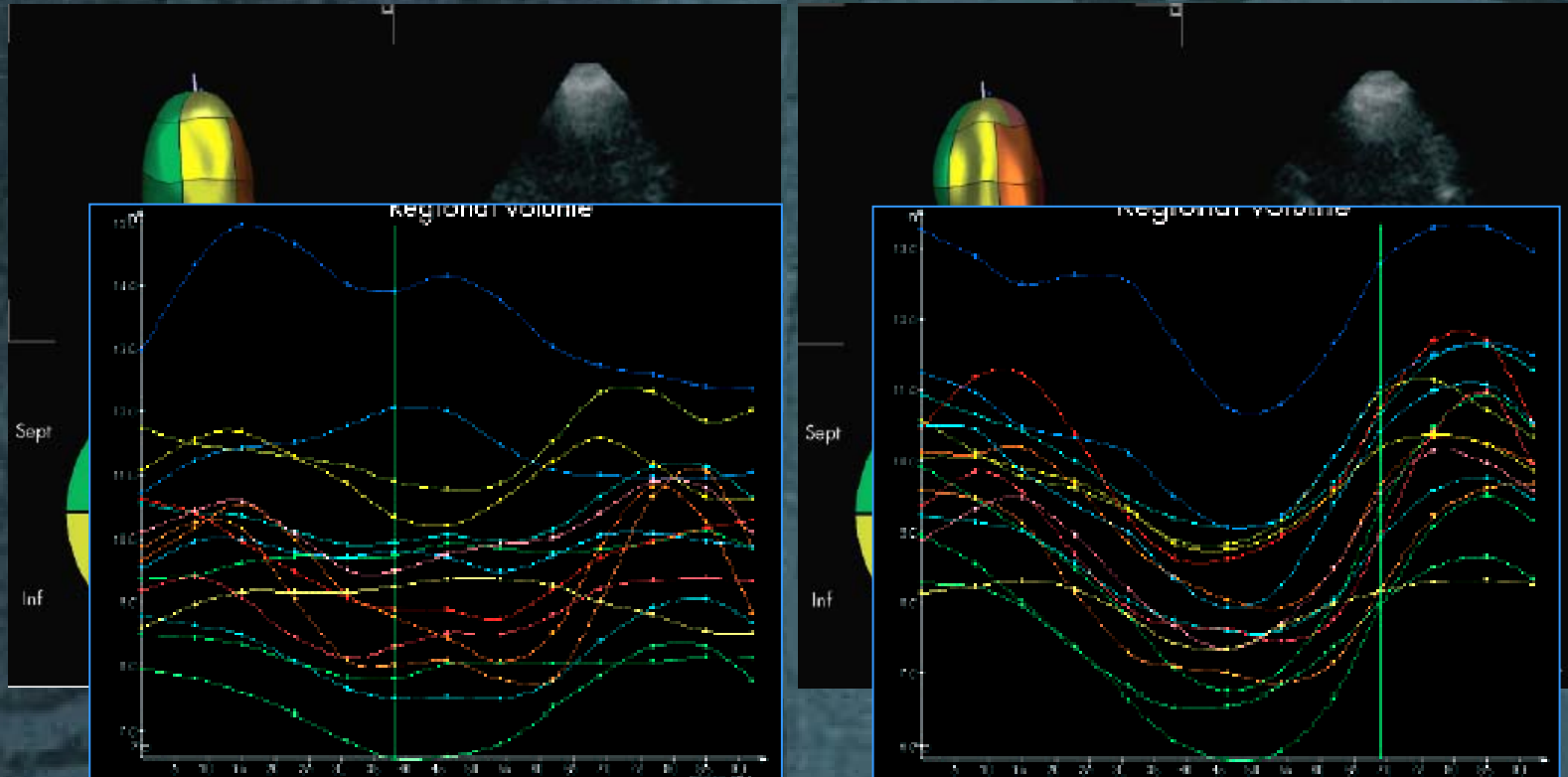
***PW Doppler***



# 3D Echo



# 3D Echo



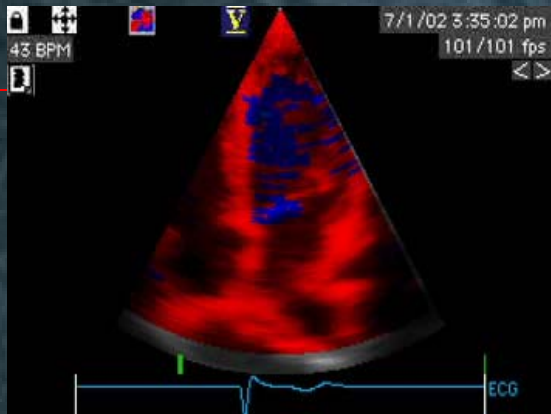
# 3D Echo

## PRO

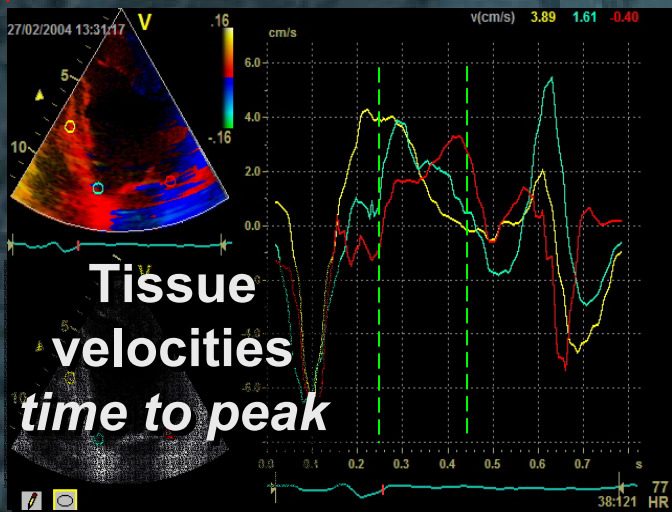
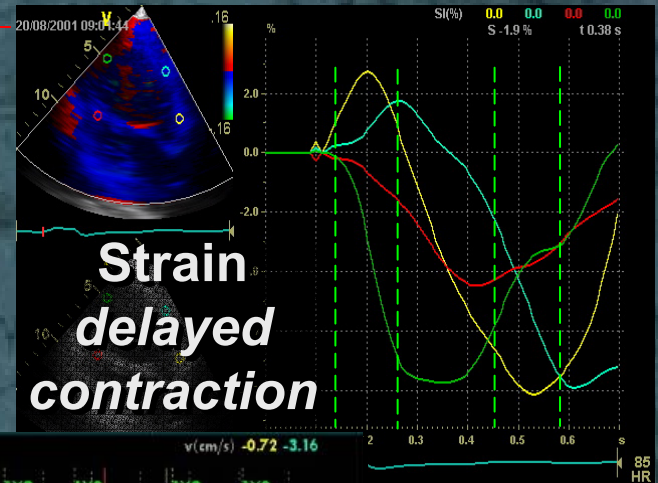
*Both regional / global  
Fast (2-3 min)*

## CON

*Little clinical data available  
Low frame rate  
"Timing"*



# DTI



# **Tissue Doppler Imaging**

## ***Mechanical asynchrony***

### **Pro**

***High temporal resolution***

***Predictiv value confirmed in several studies***

### **Con**

***Several indices have been proposed***

***Sophisticated off-line analysis are time consuming***

***No randomized trials (Substudy in CARE-HF)***

***Yu; Circulation 2002***

***Gorcsan; Am J Cardiol 2003***

***Sogaard; JACC 2002***

***Bax; JACC 2004***

# Tissue Doppler Imaging

*Assessing mechanical asynchrony, the simple approach*

- Determine AVO and AVC
- Time to peak velocity between AVO and AVC (*Reduces interference from translation and tethering*)
- Time difference of 85 ms corresponds to delayed contraction (*after AVC*)
- In selected cases use deformation analysis

