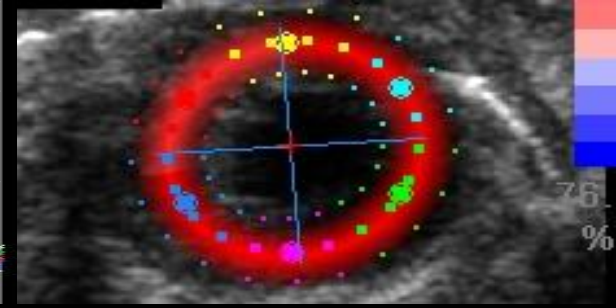




Services



PRIMARY STUDIES

- Screening Echo
- Serial Screening Echo
- Post-Myocardial Ischemia/Infarction Echo
- Post-Surgical Echo

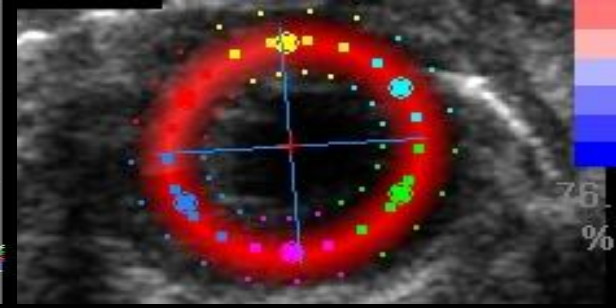
SPECIALTY STUDIES

- Emergency Echo
- Vascular Aorta Imaging
- Non-Cardiac Scanning
- Customized Studies

SPECIALTY ANALYSIS

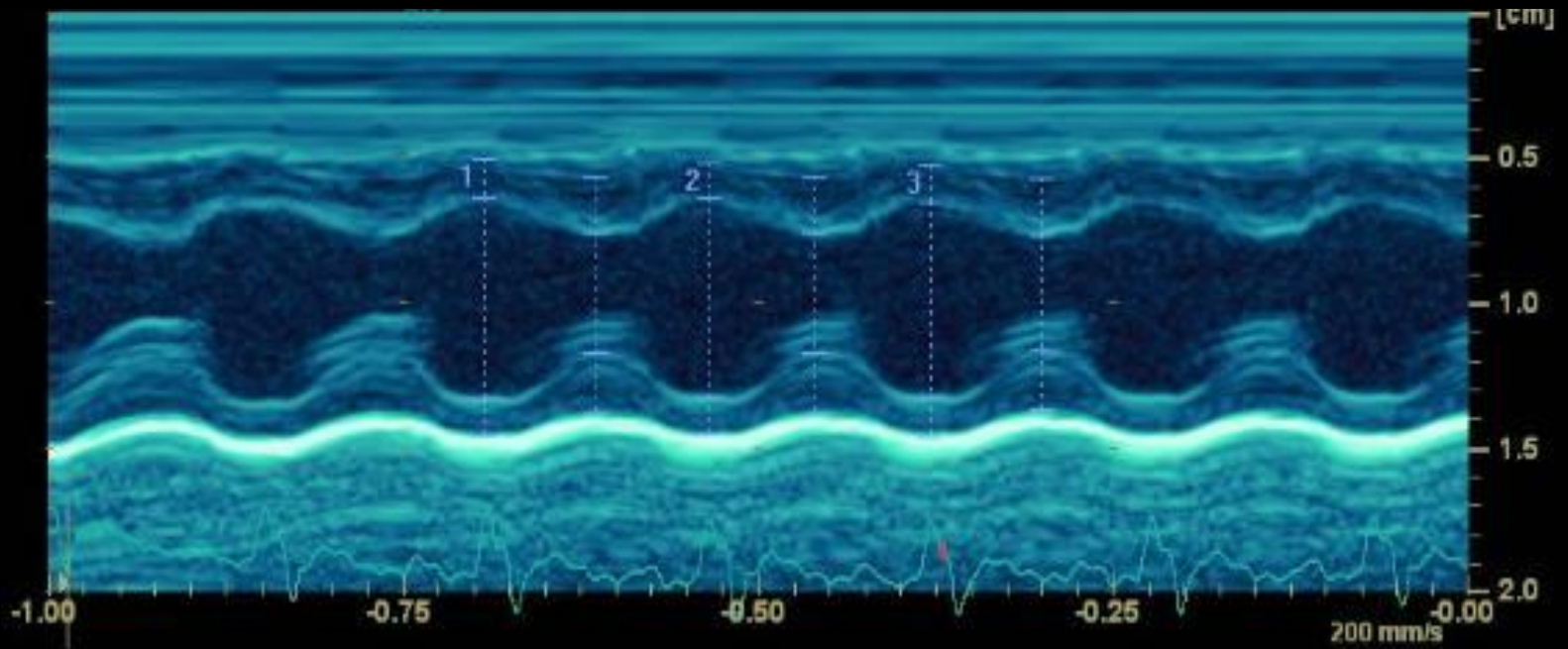
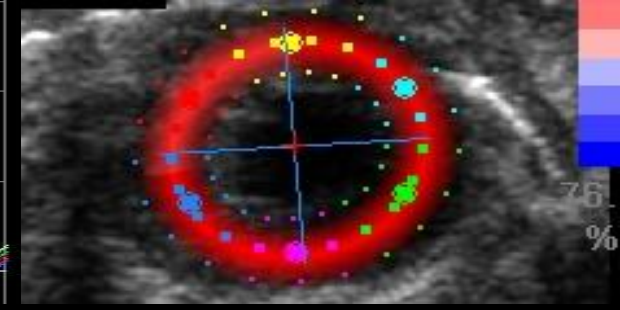
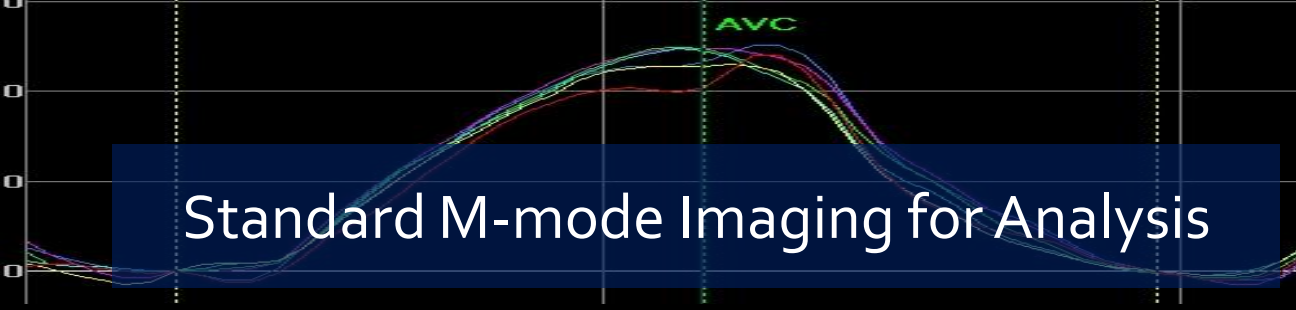
- Strain
- Strain rate
- Doppler Analysis of Diastolic function, Transvalvular velocities and Valve regurgitation

Basic Screening Echo

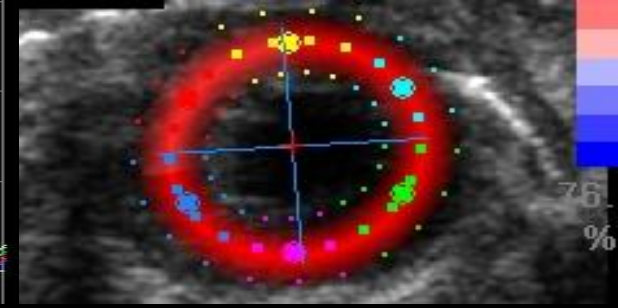
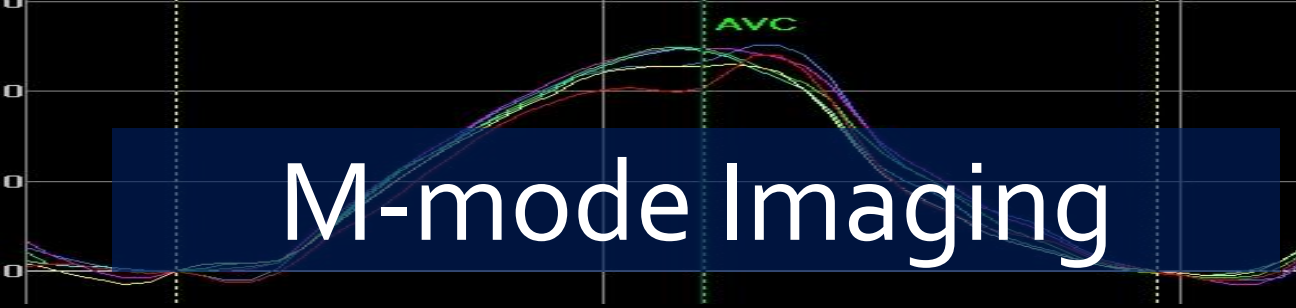


<u>View</u>	<u>Mode</u>	<u>Measurement</u>	<u>Parameter</u>
Parasternal Short-axis	→ 2-D	LV endo and epi areas	LV mass, S & SR
	→ Tissue Doppler	Tissue Velocity	endo & epi V & SR
	→ M-mode	WT, LV dimensions	FS, EF, WT, LV Mass
Parasternal Long-axis	→ 2-D	LV endo & epi areas Aortic annulus diameter	LV mass SV/CO
	→ Tissue Doppler	Tissue Velocity	
Apical Four-chamber	→ Pulsed Doppler	Mitral inflow	E, A
	→ Tissue Doppler	Mitral annulus velocity	E'
	→ Color Doppler	Mitral inflow propagation velocity	Vp
	→ M-mode		
Apical Five-chamber	→ Pulsed Doppler	Mitral inflow/ LVOT outflow LVOT flow velocity	IVRT SV/CO

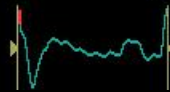
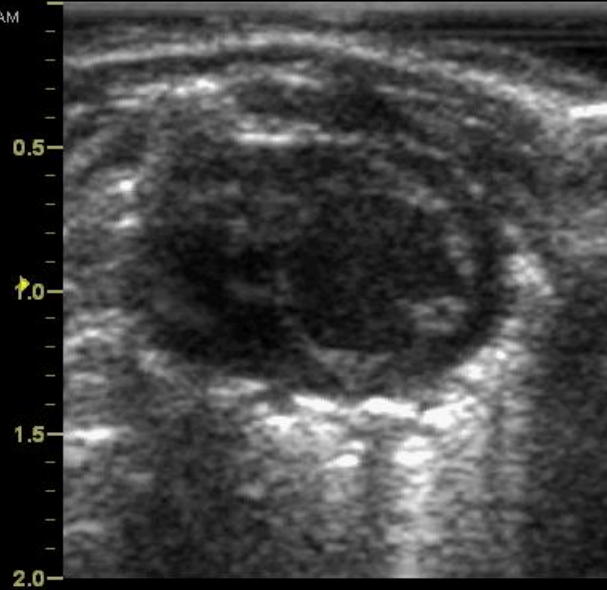
Standard M-mode Imaging for Analysis



M-mode Imaging



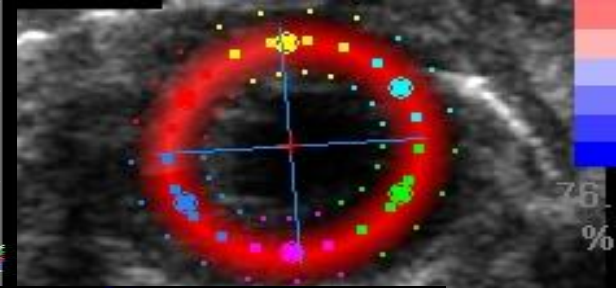
12/16/2011 10:39:16 AM



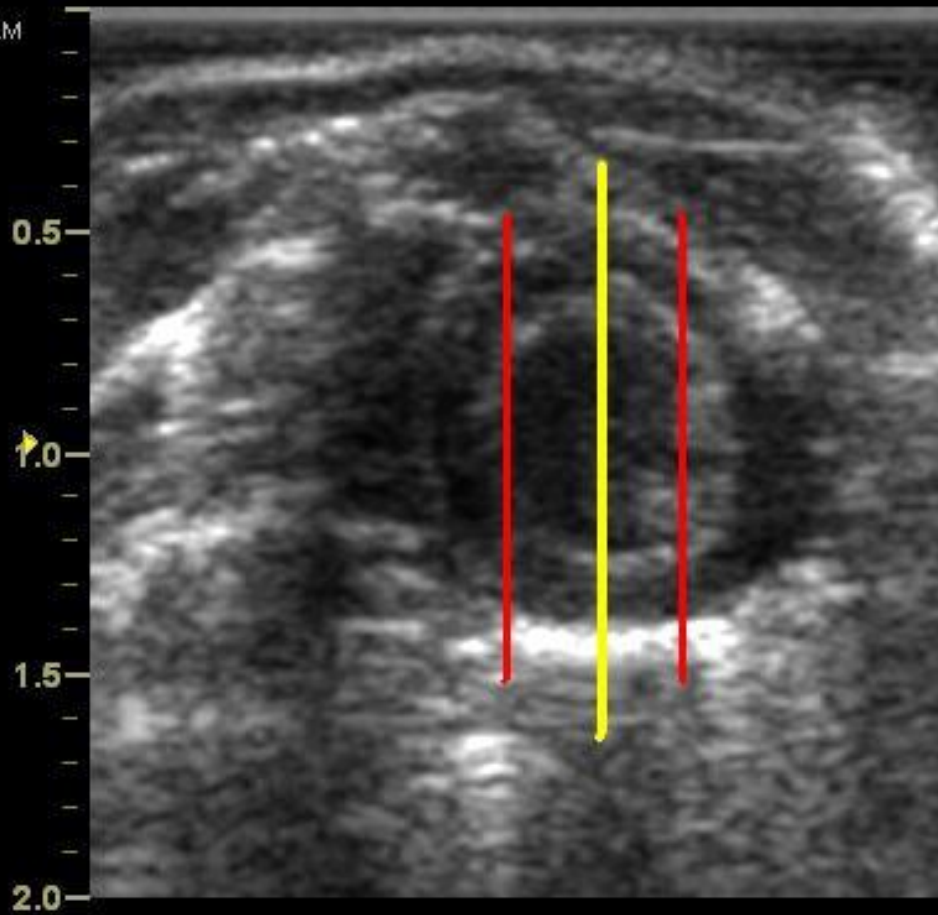
173
91:520 HR

Parasternal Short Axis Papillary Muscle Level

Standardized Measuring Plane: Short Axis- Mid Ventricle - Papillary Muscle Level

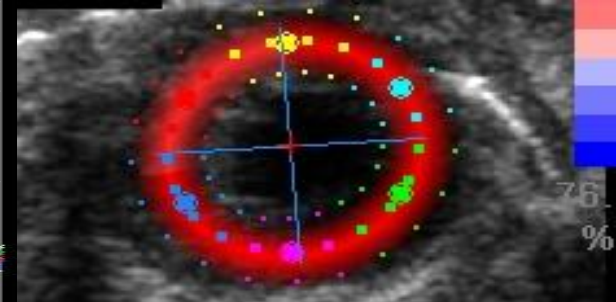
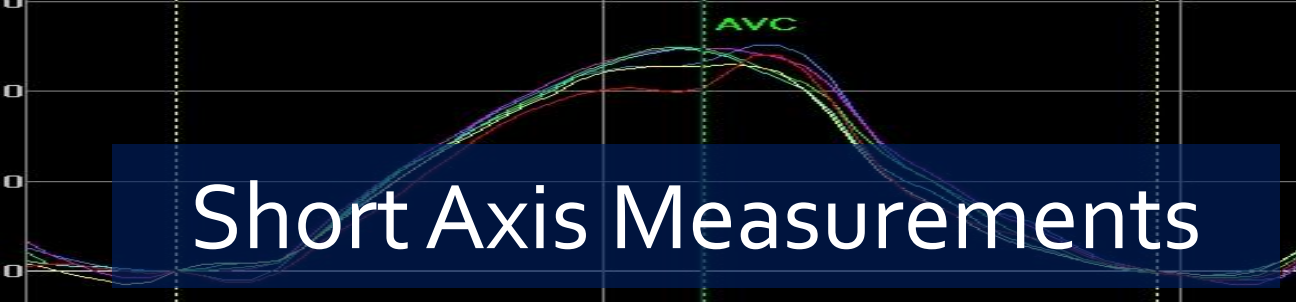


12/13/2011 11:11:18 AM

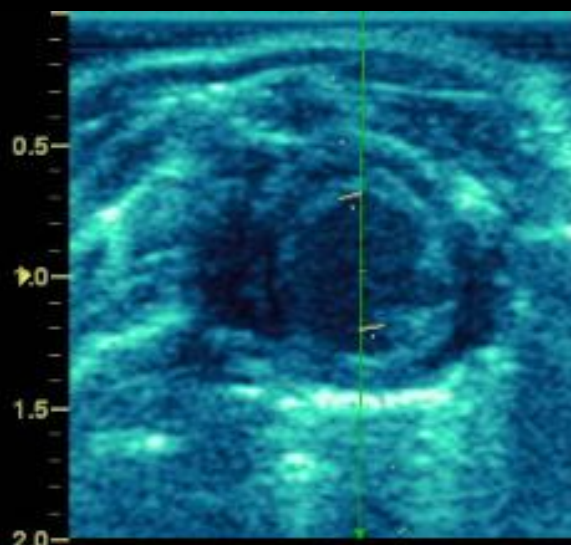


191
2:2 HR

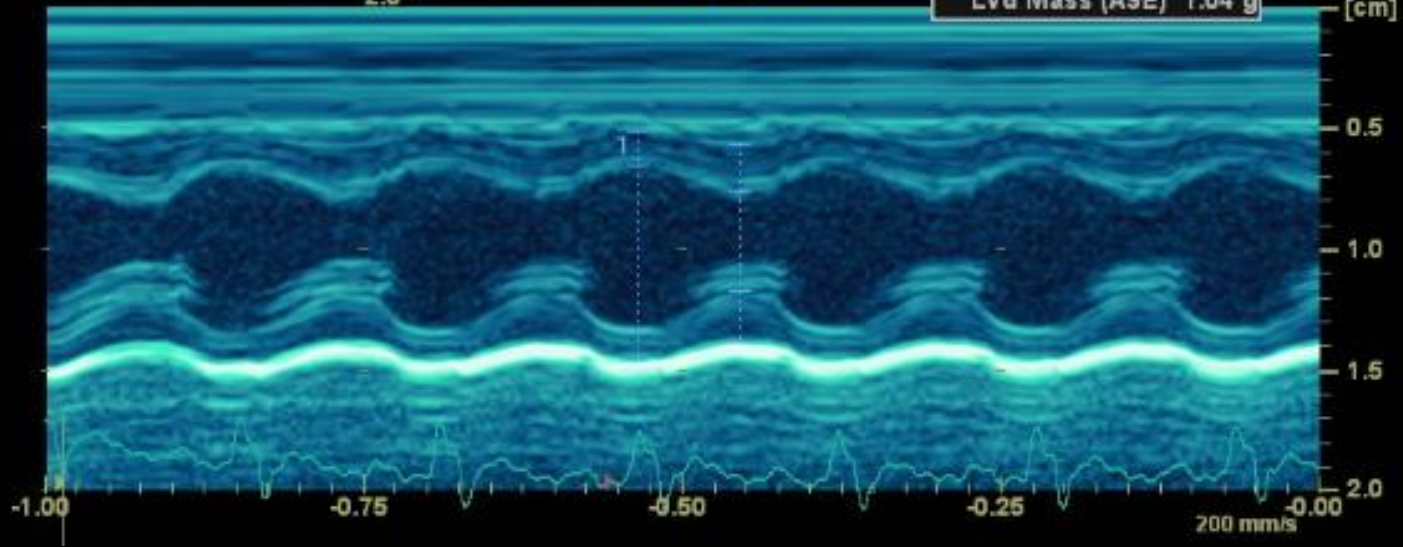
Short Axis Measurements



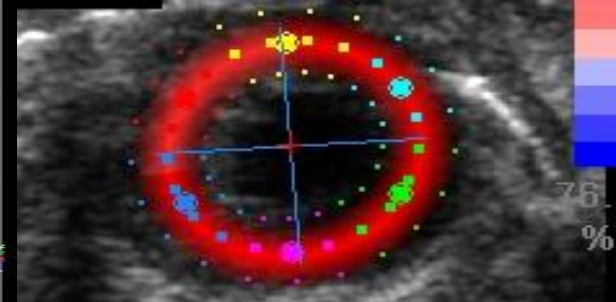
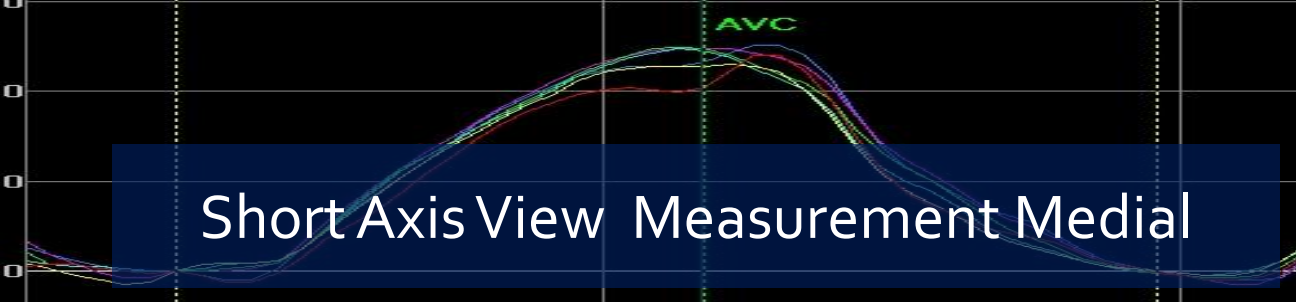
12/13/2011 11:10:51 AM



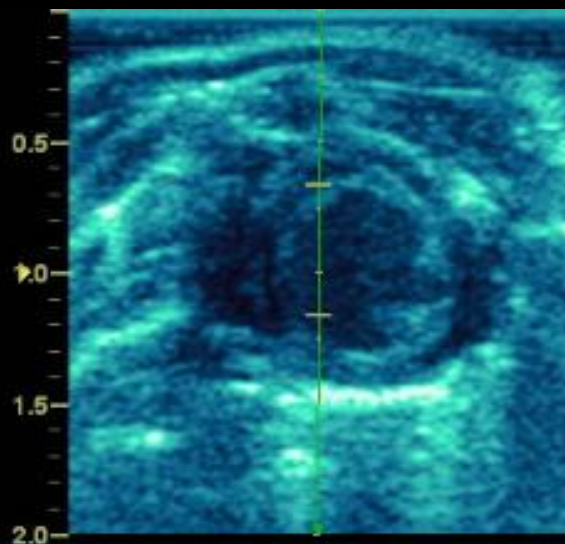
1	IVSd	0.14 cm
	LVIDd	0.67 cm
	LVPWd	0.13 cm
	IVSs	0.19 cm
	LVIDs	0.41 cm
	LVPWs	0.21 cm
	EDV(Teich)	0.70 ml
	ESV(Teich)	0.17 ml
	EF(Teich)	75.05 %
	%FS	38.89 %
	SV(Teich)	0.52 ml
	LVd Mass (ASE)	1.04 g



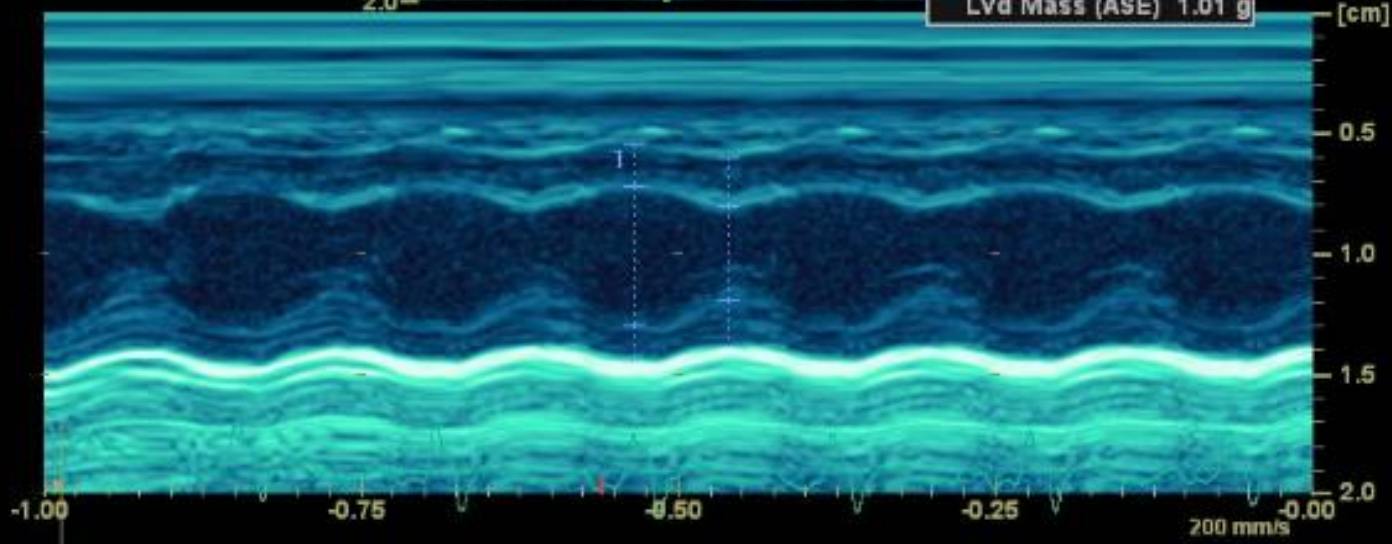
Short Axis View Measurement Medial



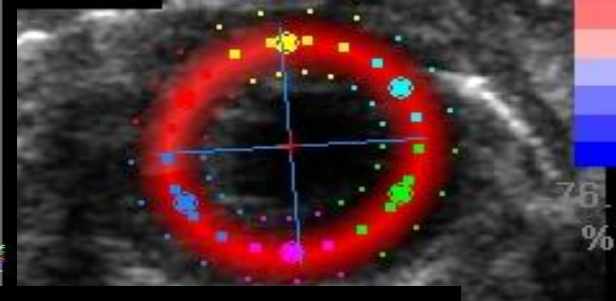
12/13/2011 11:10:51 AM



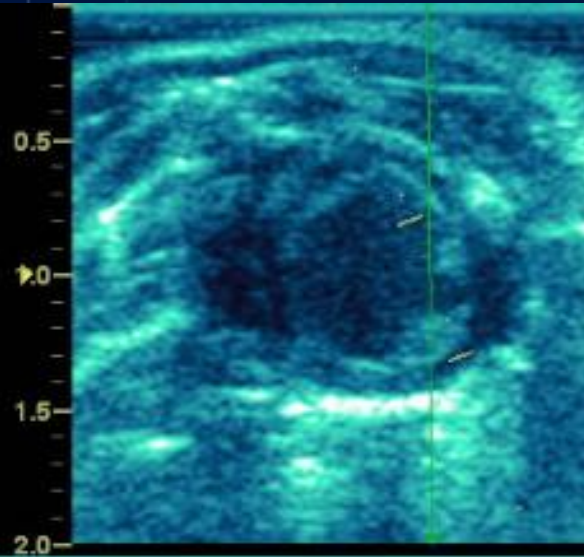
1	IVSd	0.17 cm
	LVIDd	0.58 cm
	LVPWd	0.13 cm
	IVSs	0.20 cm
	LVIDs	0.39 cm
	LVPWs	0.19 cm
	EDV(Teich)	0.45 ml
	ESV(Teich)	0.15 ml
	EF(Teich)	67.13 %
	%FS	32.47 %
	SV(Teich)	0.30 ml
	LVd Mass (ASE)	1.01 g



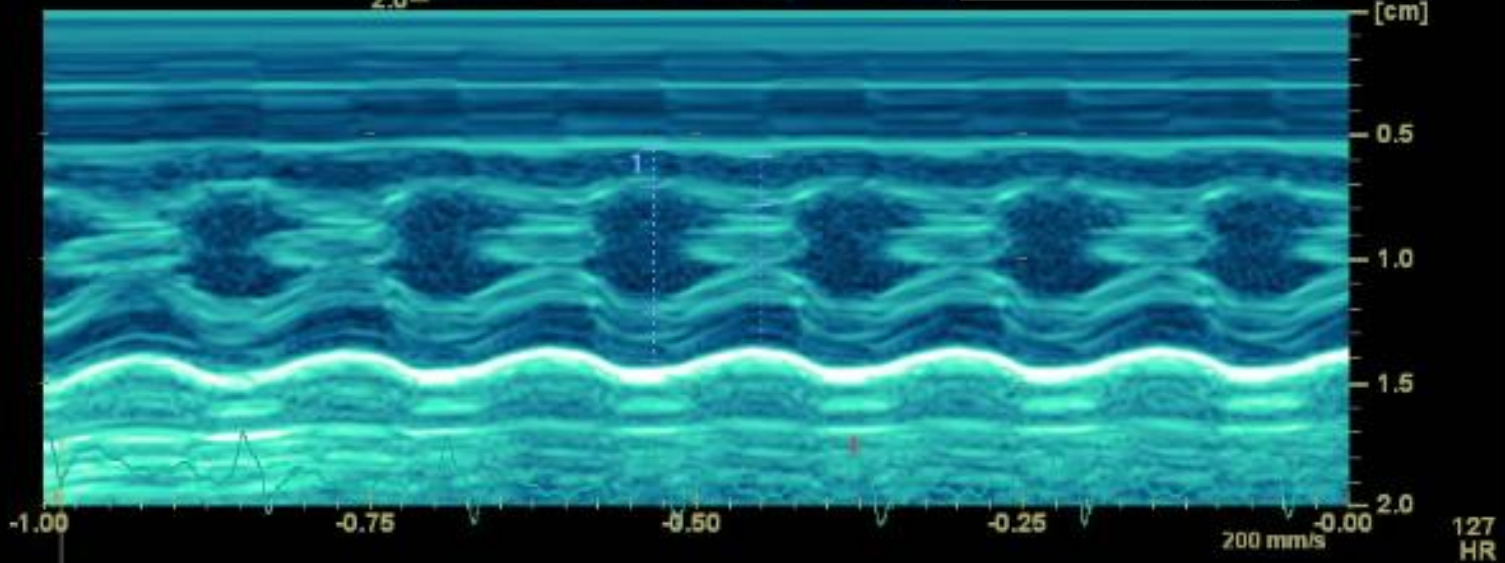
Short Axis View Measurement Lateral



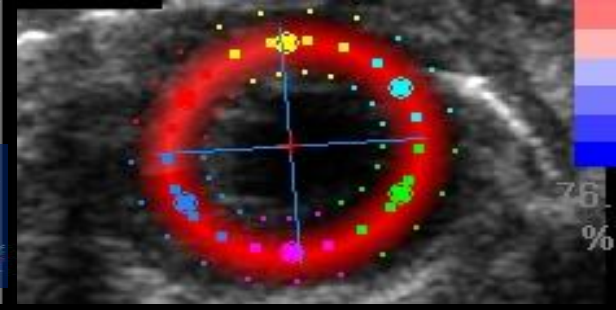
12/13/2011 11:10:51 AM



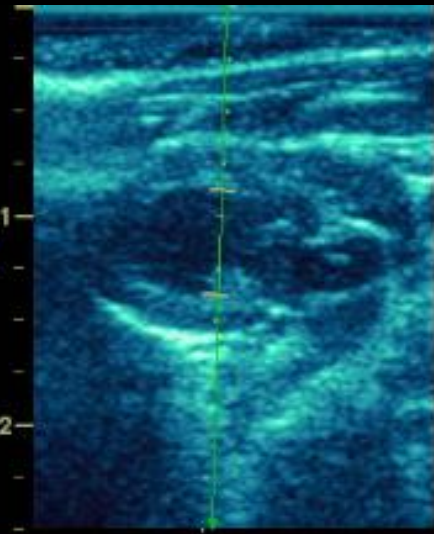
1	IVSd	0.15 cm
	LVIDd	0.51 cm
	LVPWd	0.22 cm
	IVSs	0.19 cm
	LVIDs	0.24 cm
	LVPWs	0.33 cm
	EDV(Teich)	0.32 ml
	ESV(Teich)	0.04 ml
	EF(Teich)	88.51 %
	%FS	52.94 %
	SV(Teich)	0.28 ml
	LVd Mass (ASE)	1.05 g



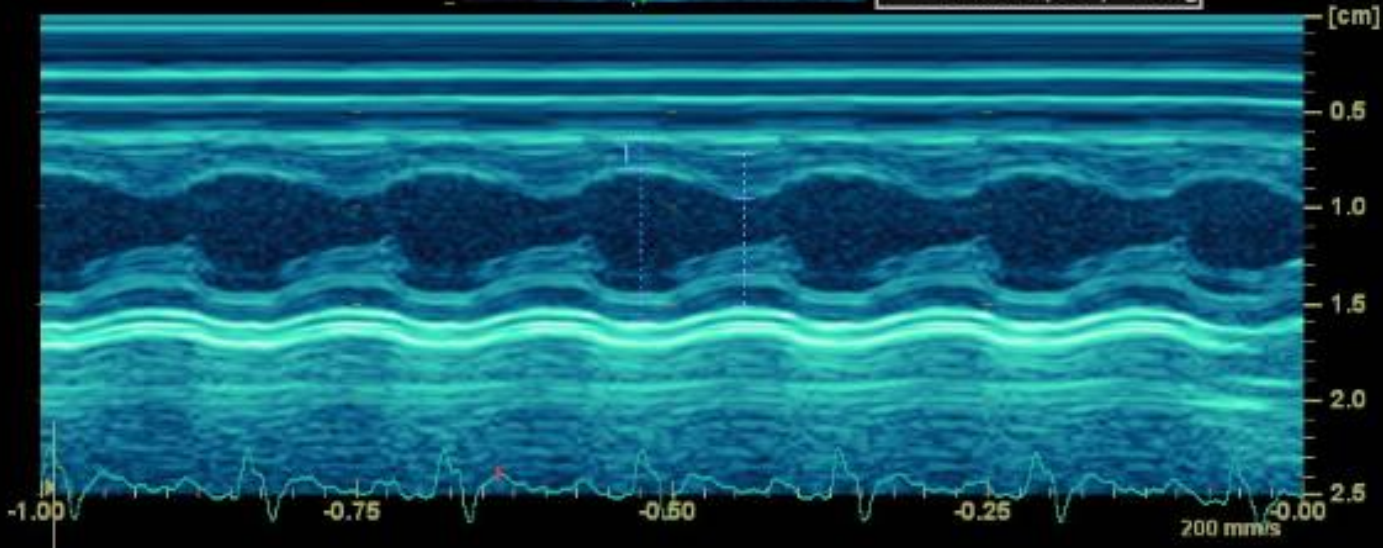
Orthogonal Plane Parasternal Long Axis Measurement at Papillary Muscle Level



12/13/2011 11:11:52 AM

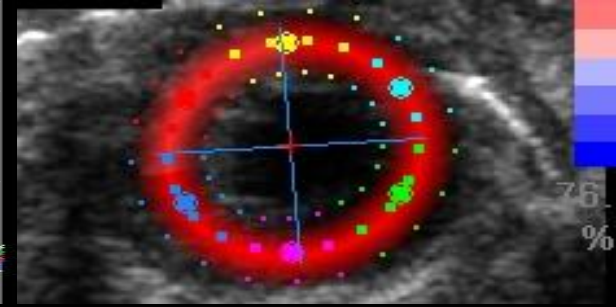


1	IVSd	0.15 cm
	LVIDd	0.66 cm
	LVPWd	0.13 cm
	IVSs	0.22 cm
	LVIDs	0.40 cm
	LVPWs	0.16 cm
	EDV(Teich)	0.65 ml
	ESV(Teich)	0.16 ml
	EF(Teich)	74.73 %
	%FS	38.57 %
	SV(Teich)	0.48 ml
	LVd Mass (ASE)	1.05 g

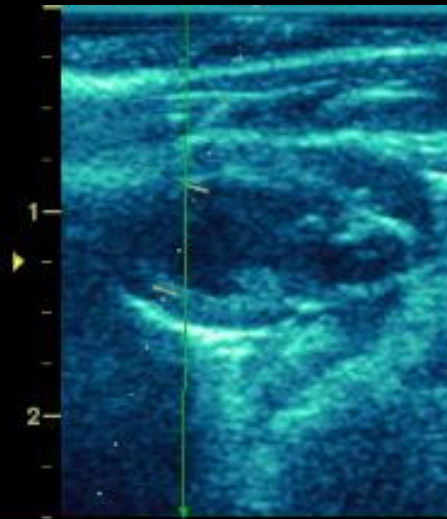


171 HR

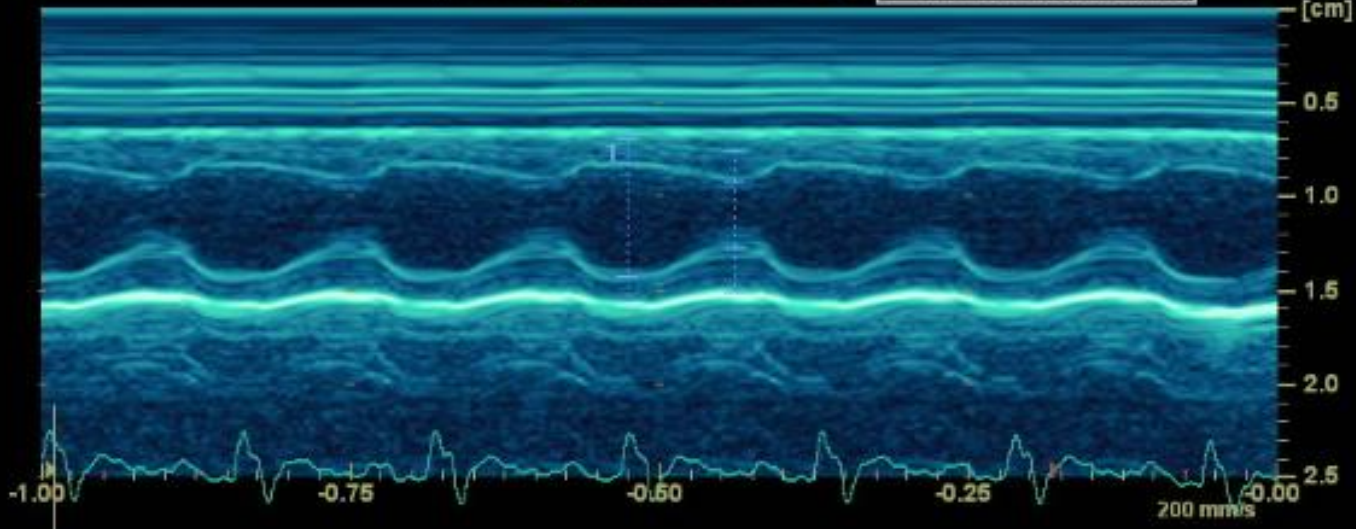
Parasternal Long Axis Measurement Toward Apex



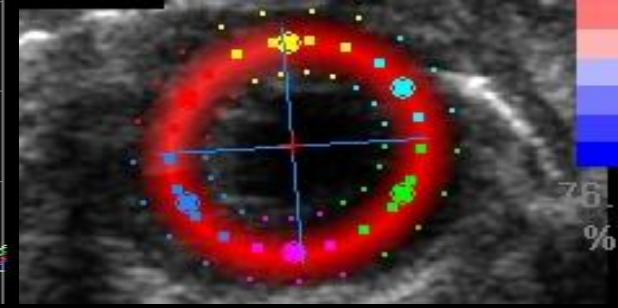
12/13/2011 11:11:52 AM



1	IVSd	0.13 cm
	LVIDd	0.60 cm
	LVPWd	0.13 cm
	IVSs	0.16 cm
	LVIDs	0.36 cm
	LVPWs	0.23 cm
	EDV(Teich)	0.50 ml
	ESV(Teich)	0.11 ml
	EF(Teich)	77.22 %
	%FS	40.63 %
	SV(Teich)	0.39 ml
	LVd Mass (ASE)	0.95 g



Limitations of M-mode

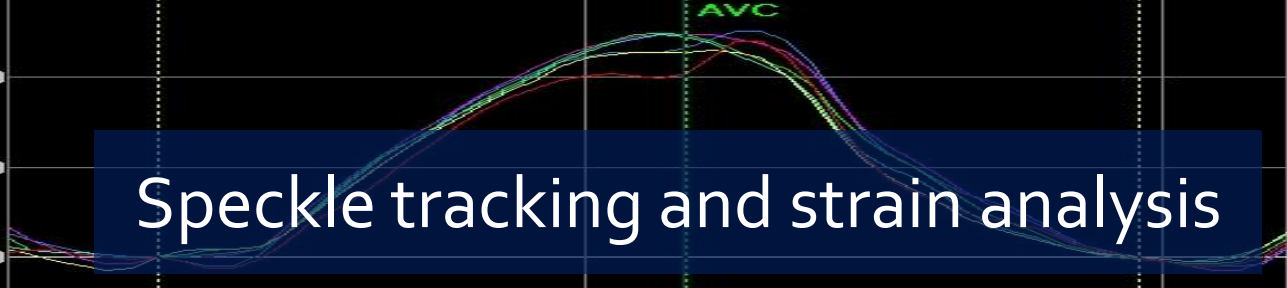


Assessing LV function in mice and rats is typically assessed by M-Mode

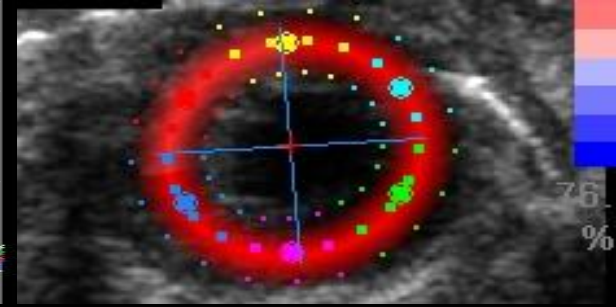
Pros: Simple and fast

Cons: Imprecise

- Sampling along a single interrogation line
(may over/under estimate LV function depending on where the regional dysfunction is located relative to the M-mode cursor placement)
- Does not detect wall motion abnormalities
- May not pick up subtle changes in function
- Rate and Load dependent

A line graph showing multiple colored curves (red, green, blue, purple) representing strain over time. The curves show a peak and then a decline. A vertical dashed line is labeled 'AVC'. The y-axis has '0' markers.

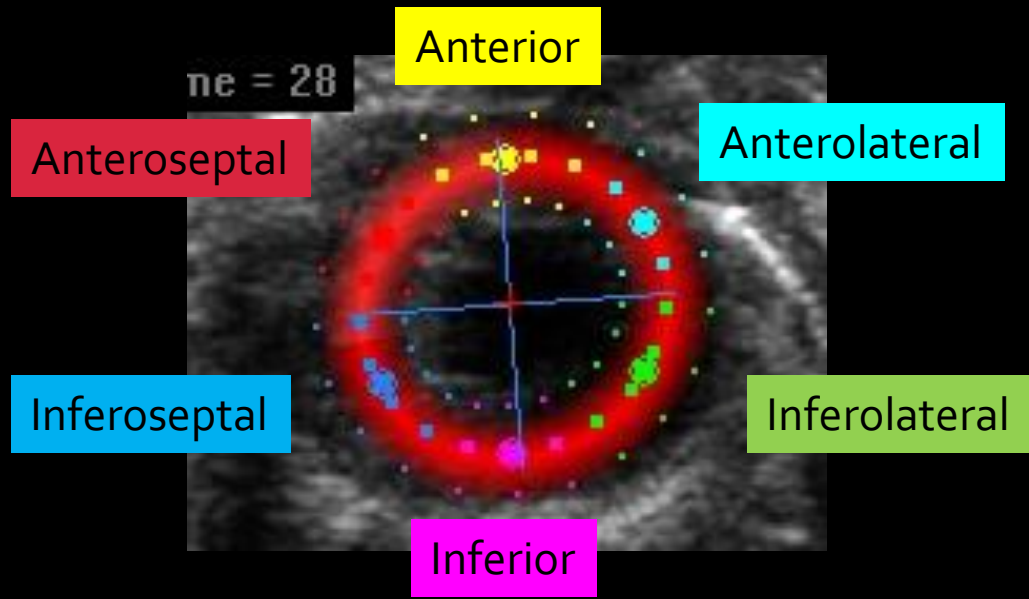
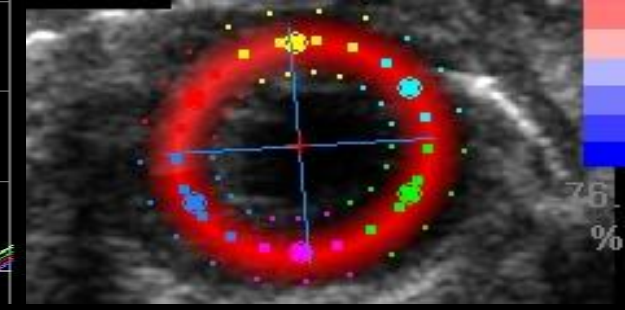
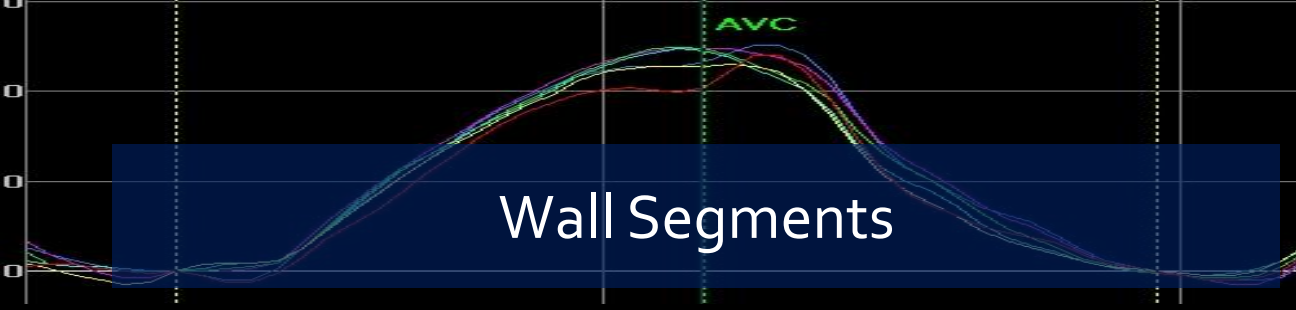
Speckle tracking and strain analysis



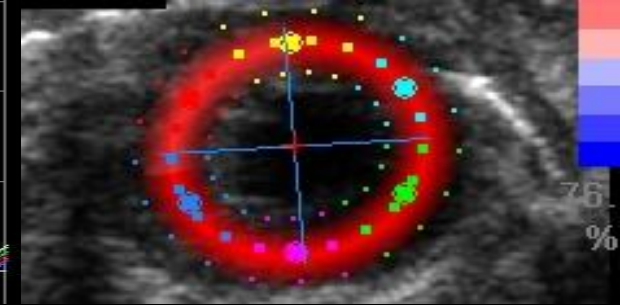
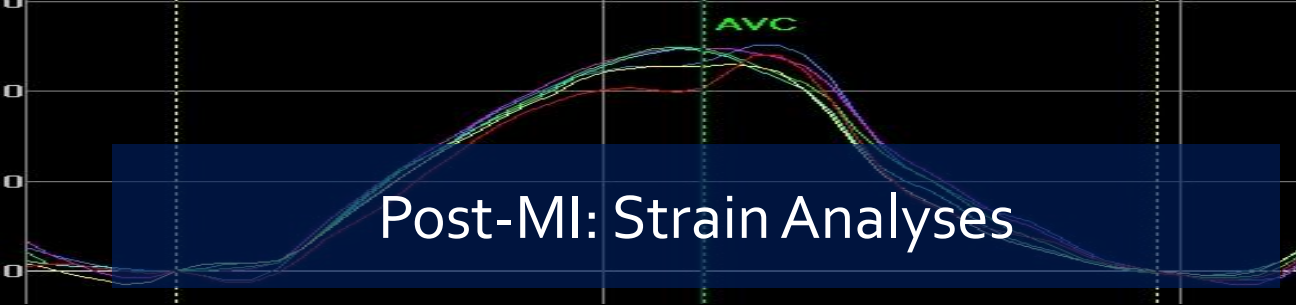
Included in:

- Post-Infarction/Ischemia studies
- Post-Surgical studies (AB)
- Can order as a separate analysis at a any time

The assessment of strain by speckle tracking is a semi-automated process whose speed depends more on the quality of the image and hardware than on the operator.



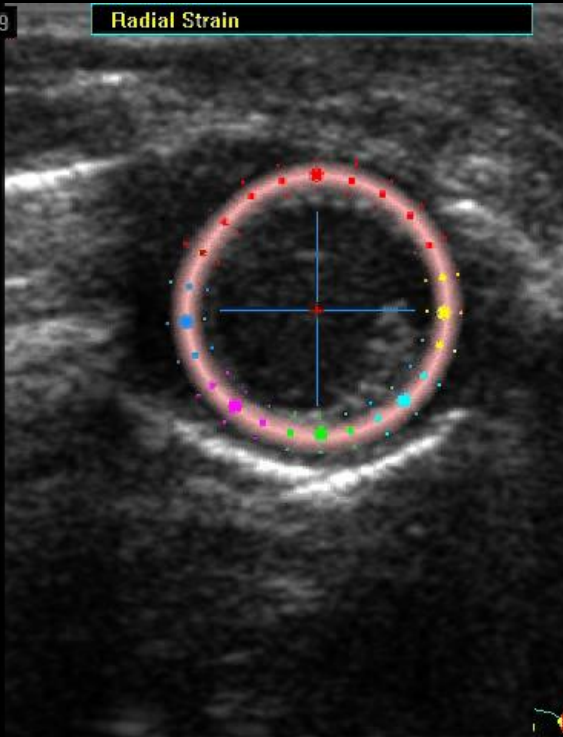
Post-MI: Strain Analyses



8/07/24-10,32,19

Radial Strain

me = 8



S 2008/08/19-09,24,26

58

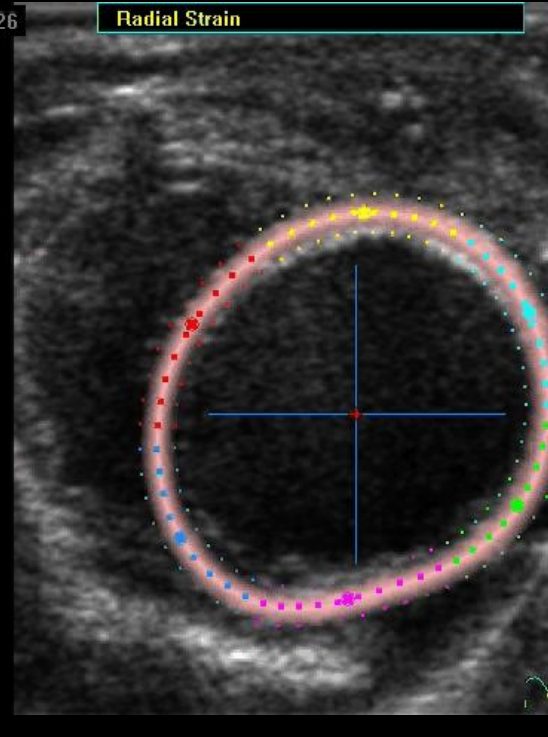
Frame = 8

-58
%

= 230 fps

FR= 230 fps

Radial Strain



SR

58.0

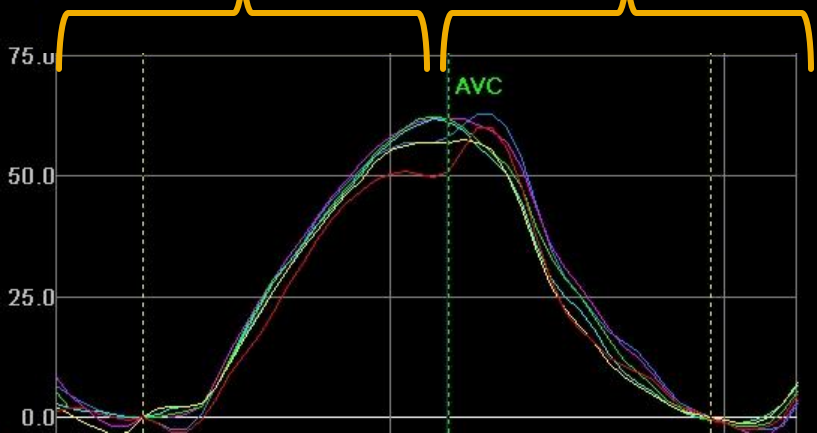
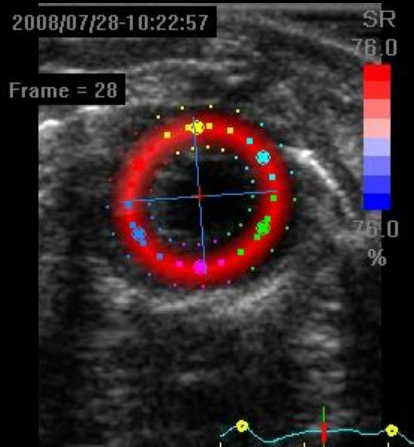
-58.0
%

Post-MI: Strain Analyses

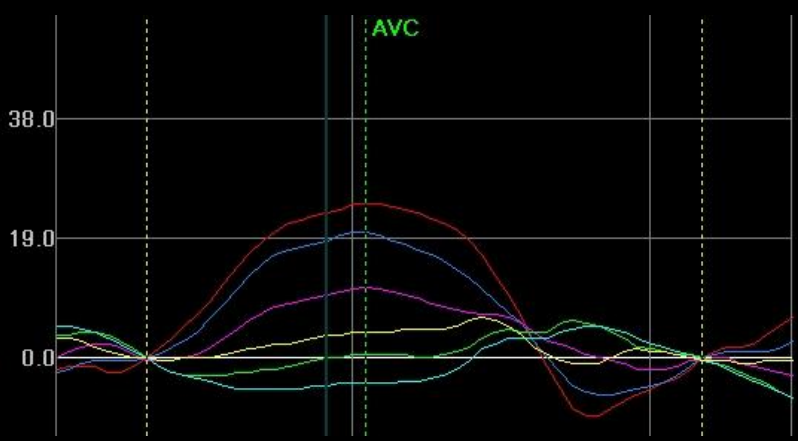
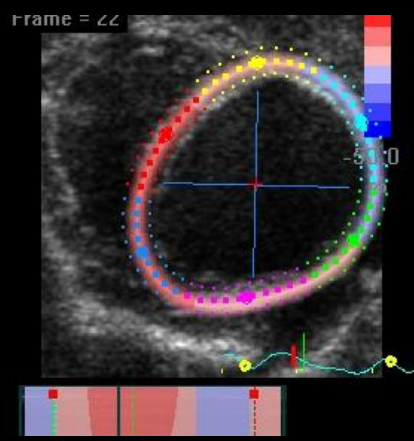


Systole

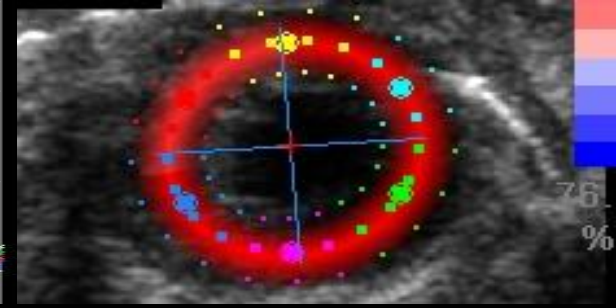
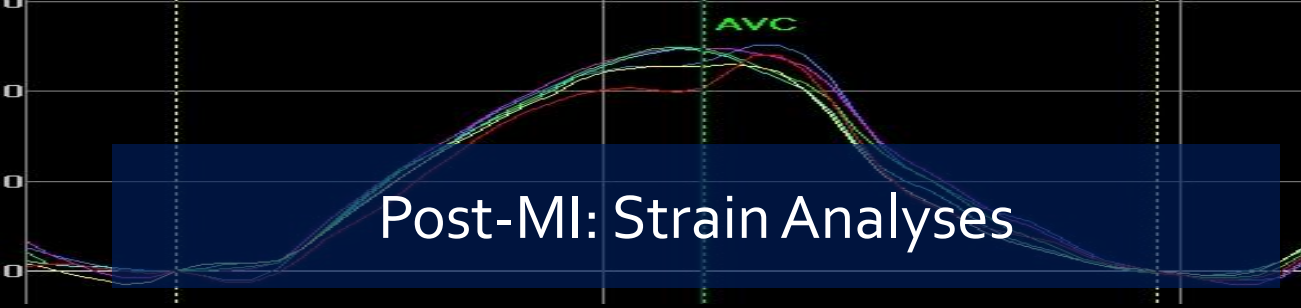
Diastole



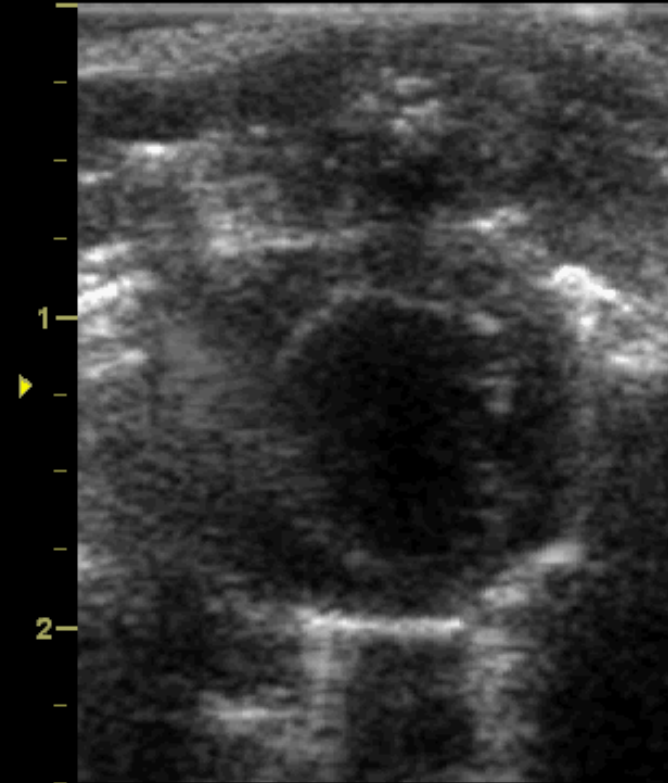
Radial Strain



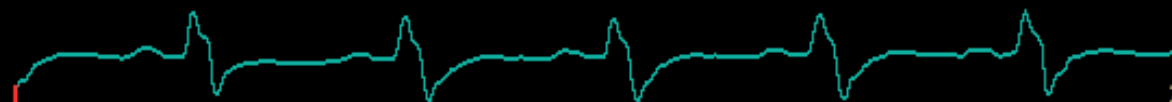
Post-MI: Strain Analyses



08/19/2008 09:34:41 AM

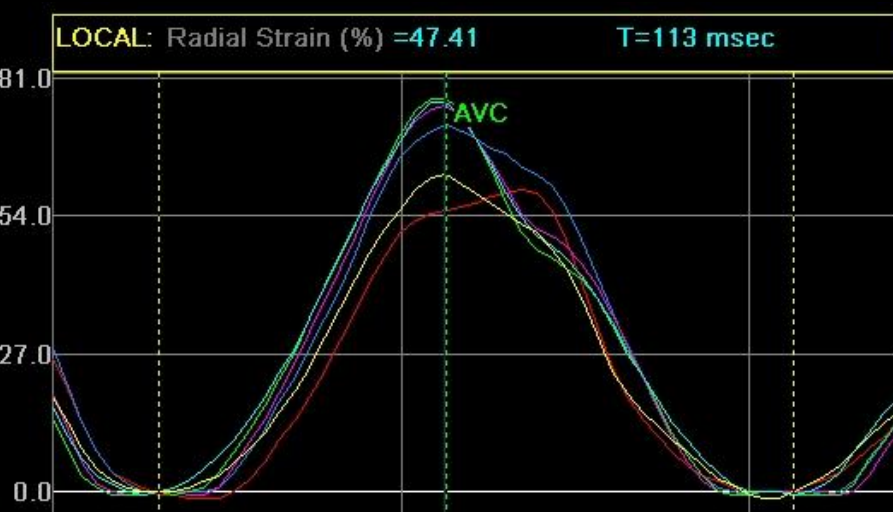
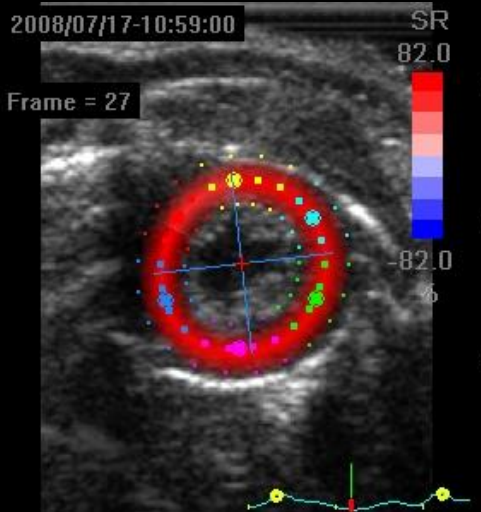
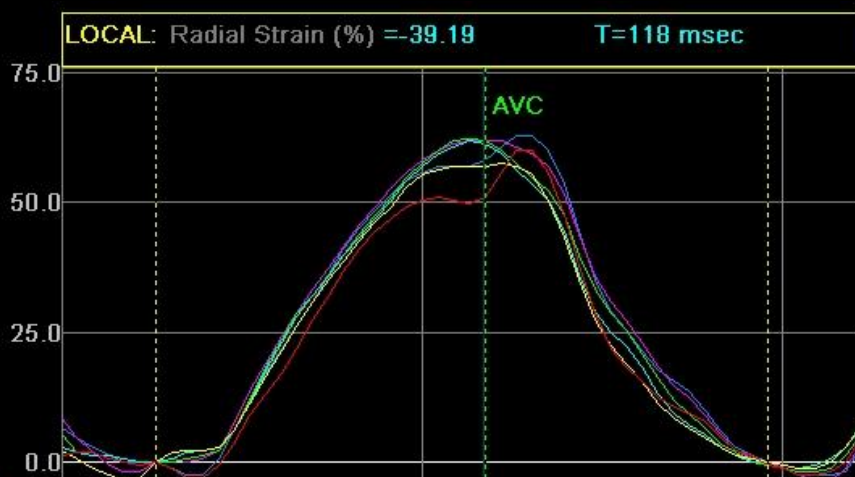
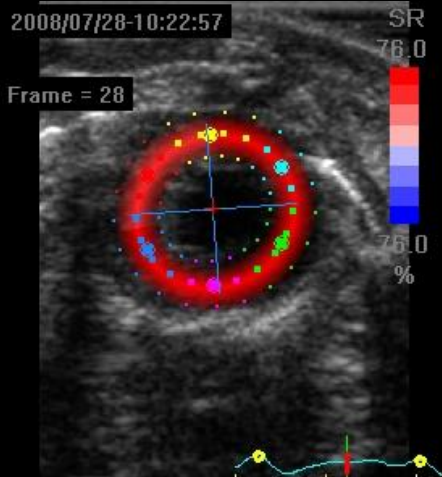
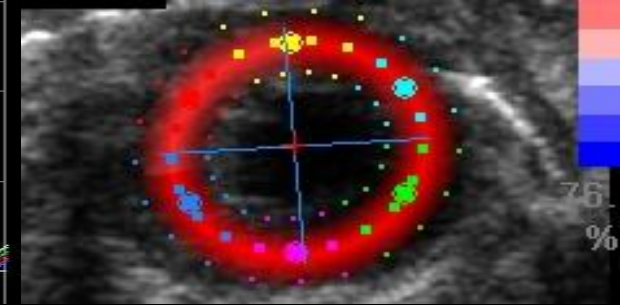
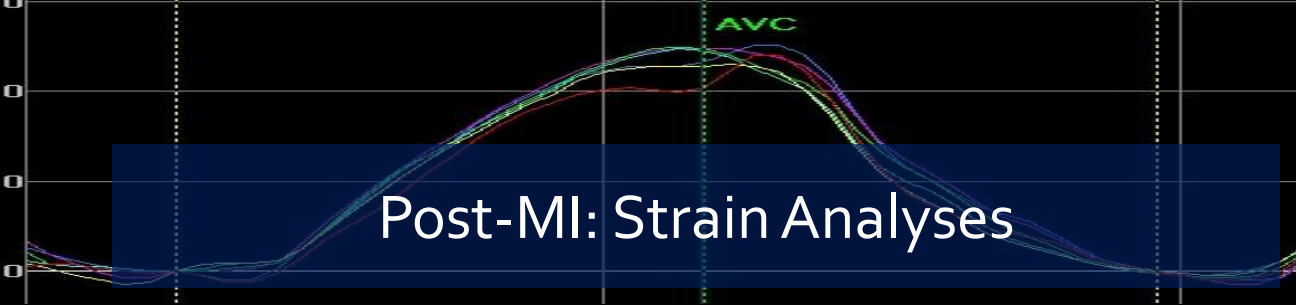


V

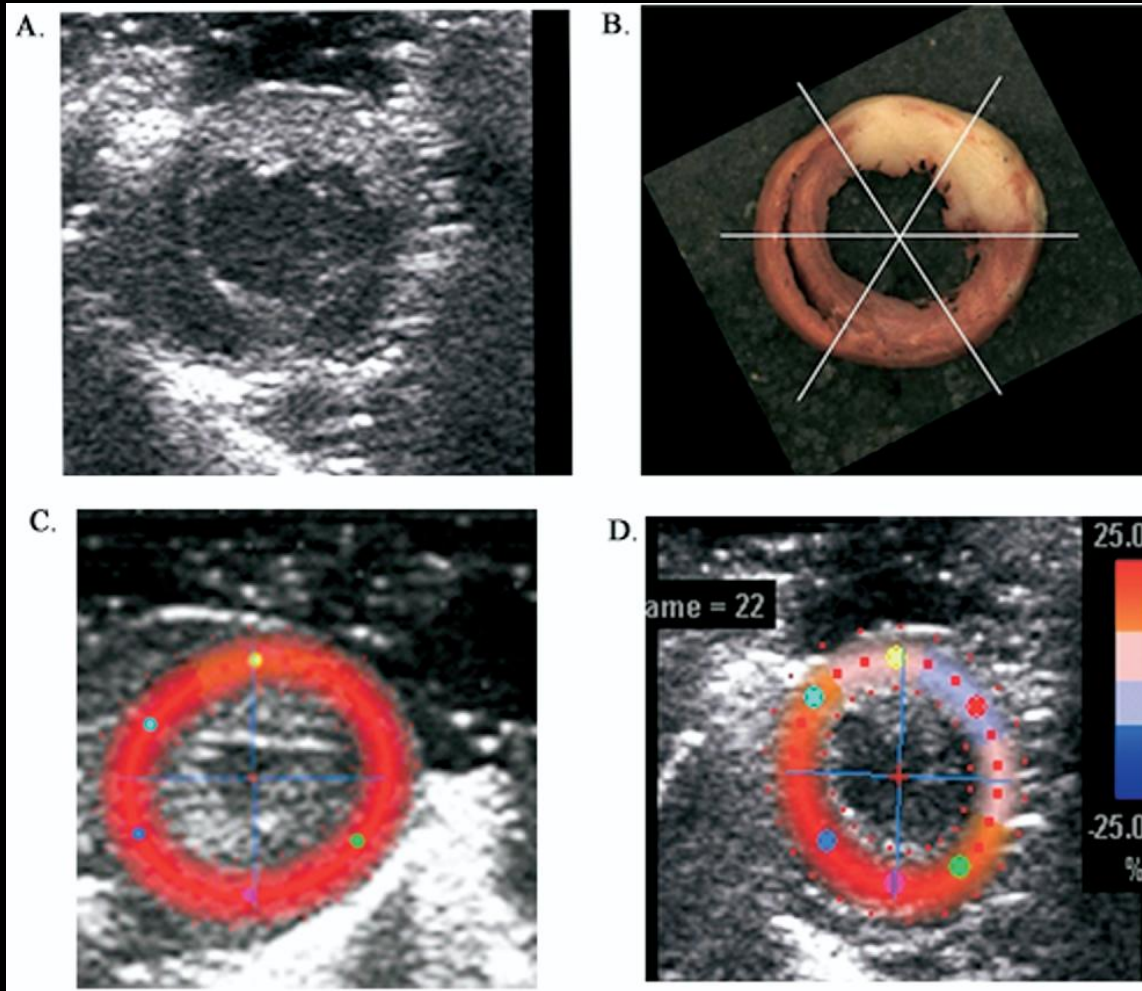
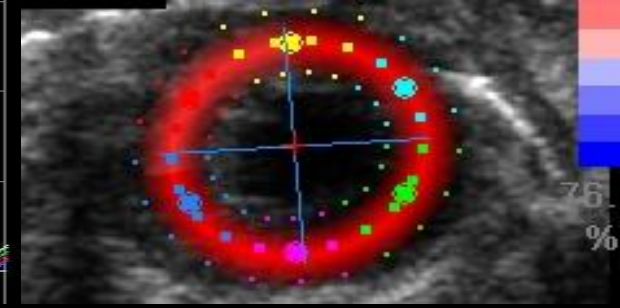
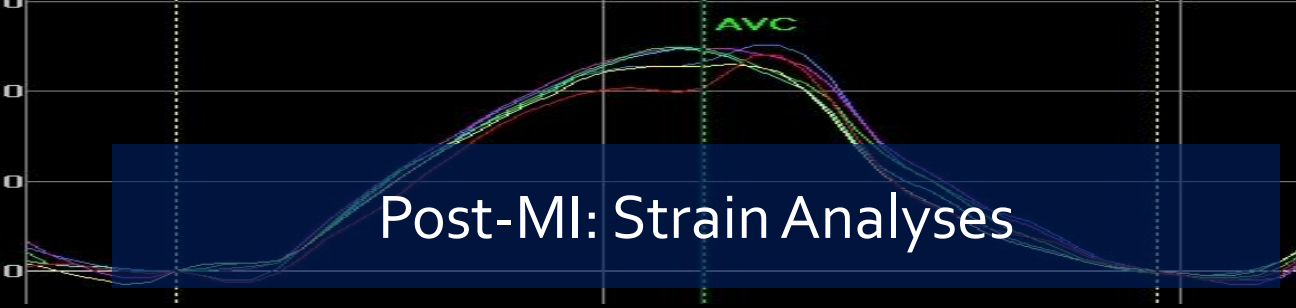


25:446 171 HR

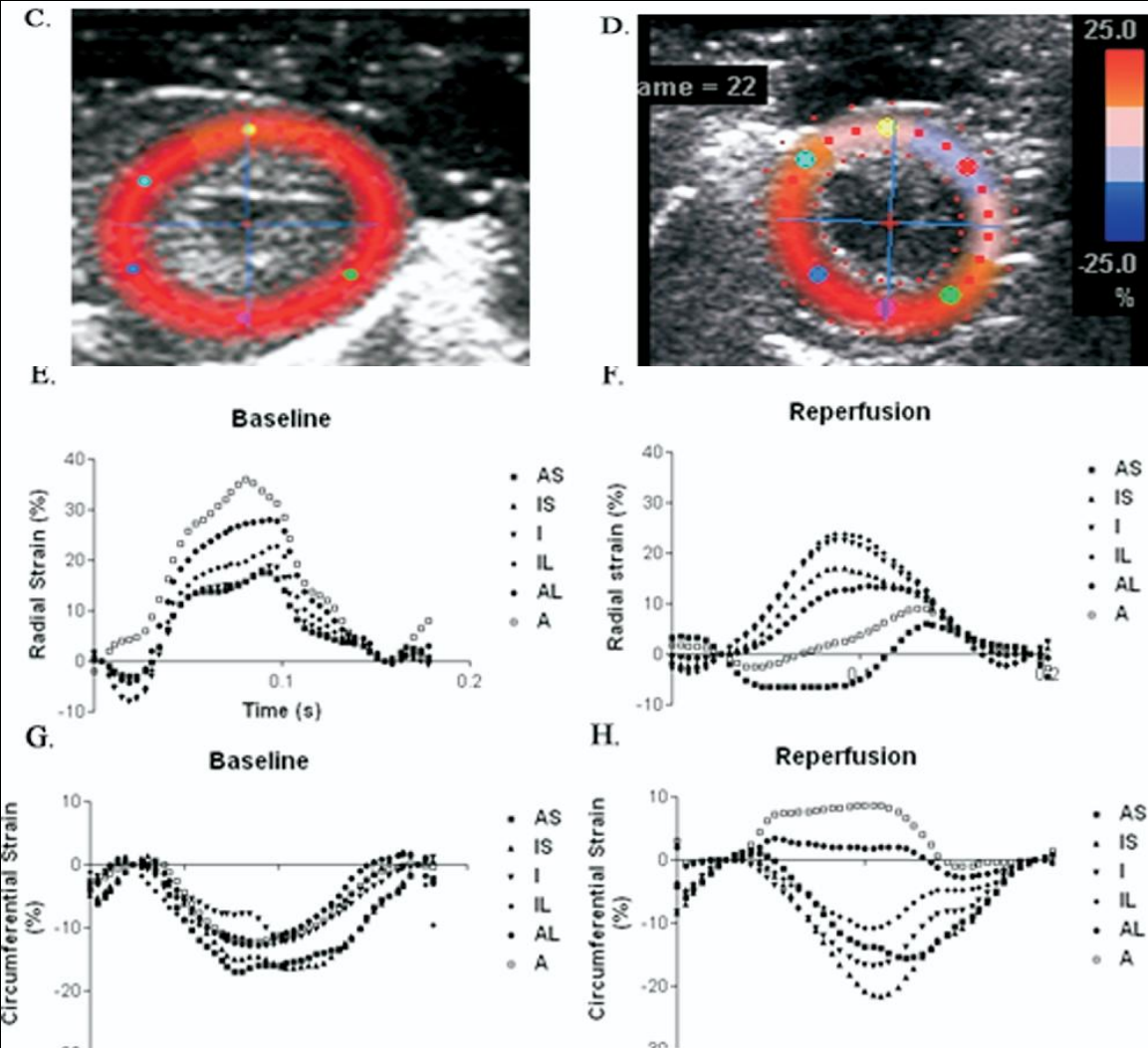
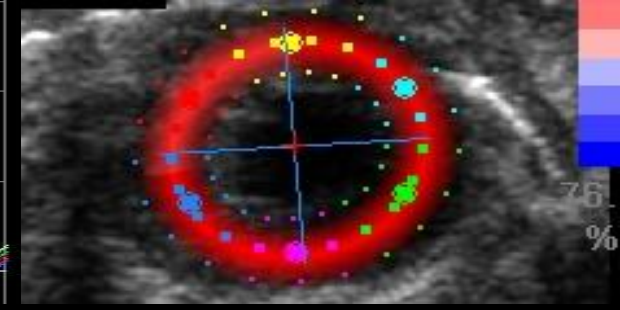
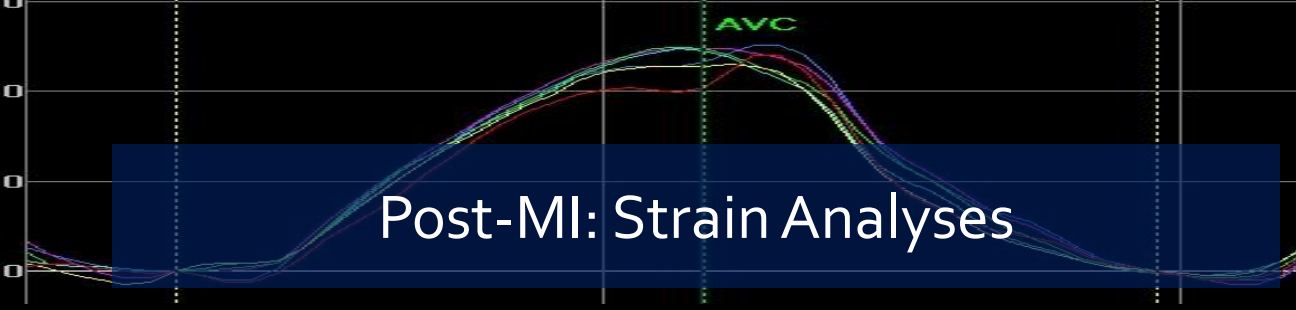
Post-MI: Strain Analyses



Post-MI: Strain Analyses

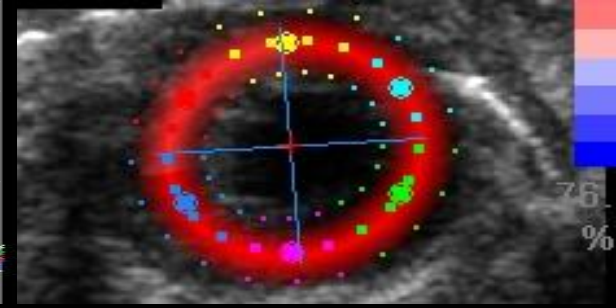


Post-MI: Strain Analyses





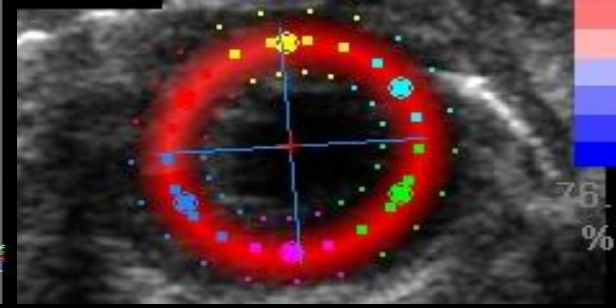
Post-Surgical Echocardiograms



- Surgeries other than MI or ischemia-reperfusion
- Aortic banding procedures
- Transplant procedures
(heart or stem cell)
- Other surgeries or procedures that require more scrutiny of LV function
(systolic or diastolic)



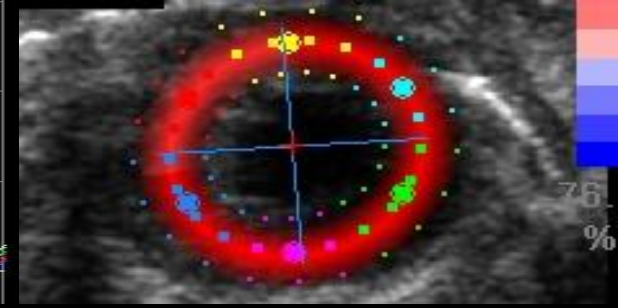
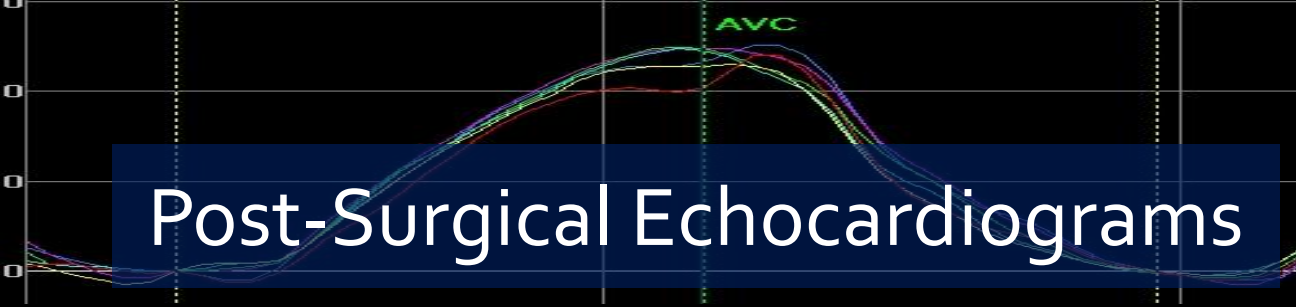
Post-Surgical Echocardiograms



Speckle tracking-derived global S_{circ} efficiently detects acute and chronic LV dysfunction, accurately tracks the progression of TAC-induced heart failure, and is reflective of the fibrotic changes induced by TAC.

Vivid 7: established in mice and rats

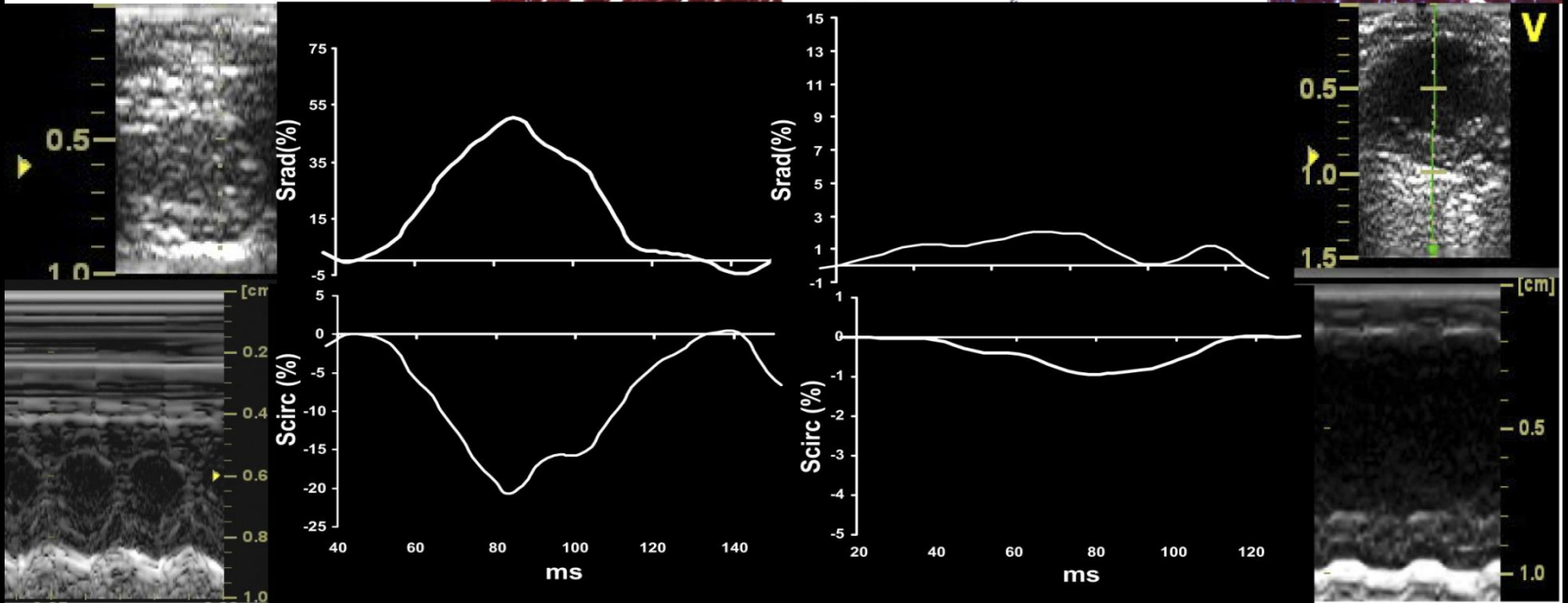
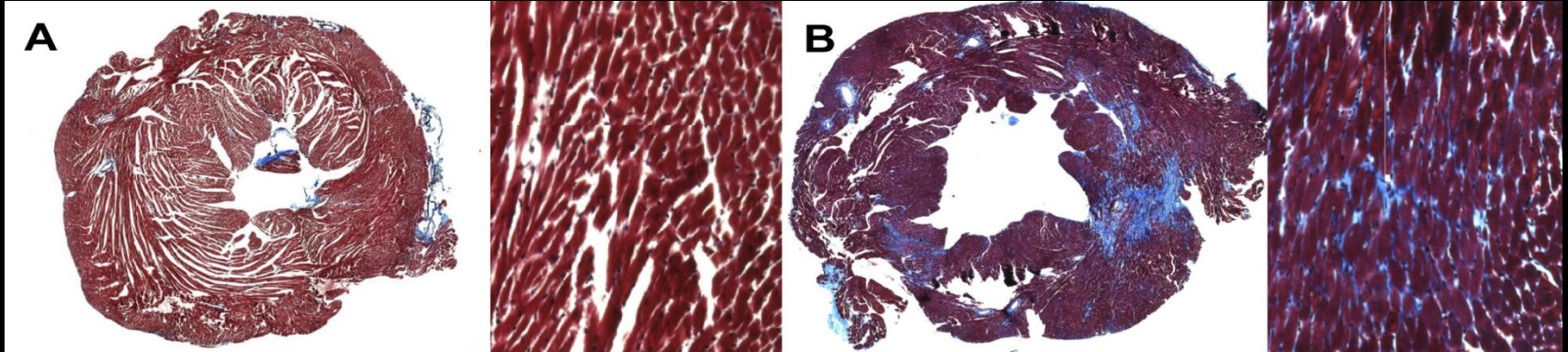
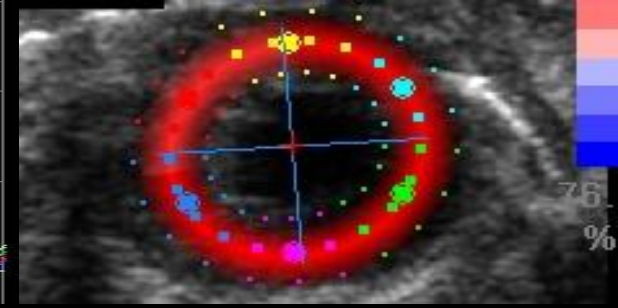
Post-Surgical Echocardiograms



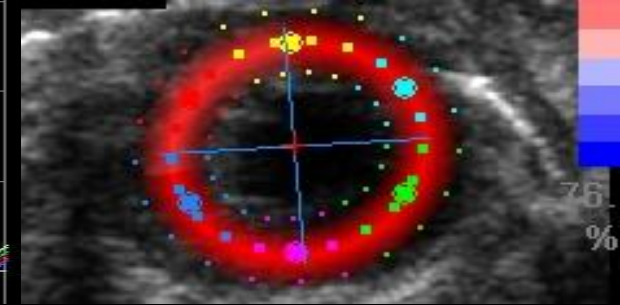
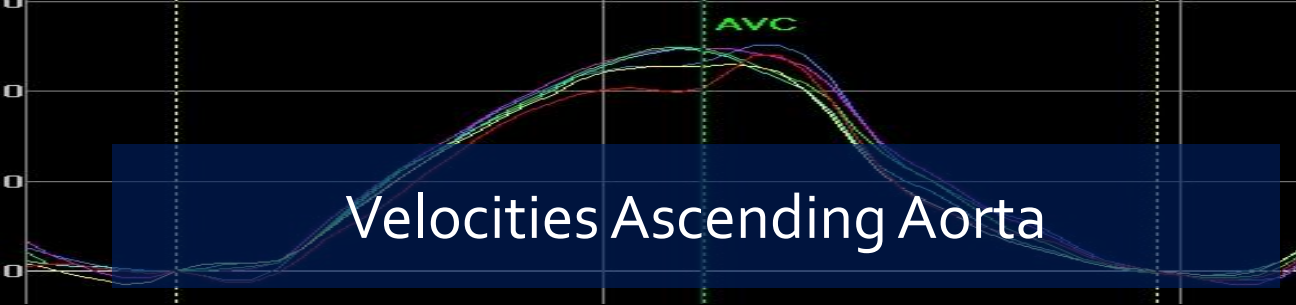
Diastolic strain rates may be used as an additional surrogate of ventricular fibrosis and segmental relaxation abnormalities

Vivid 7: established in mice and rats

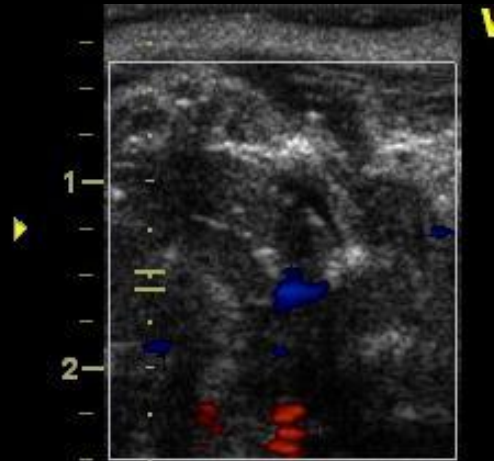
Post-Surgical Echocardiograms



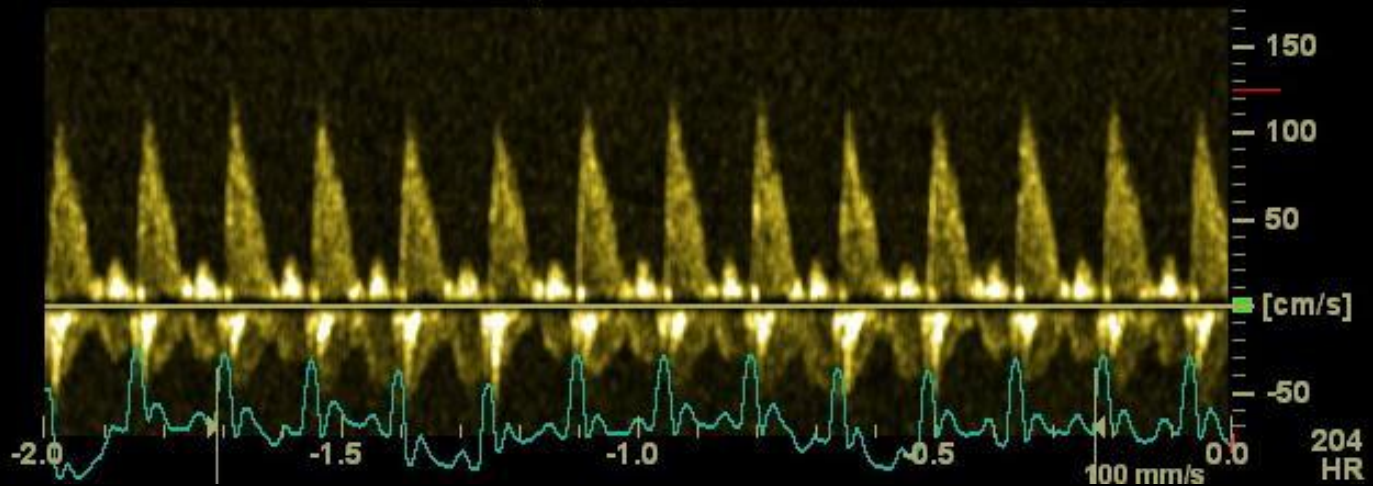
Velocities Ascending Aorta



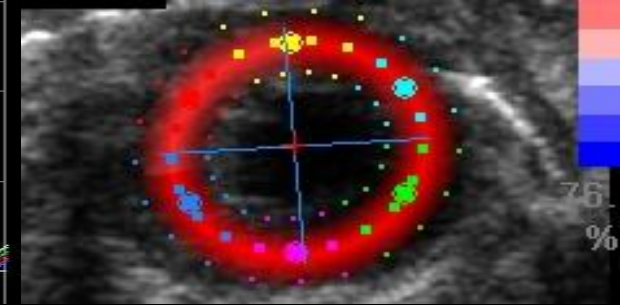
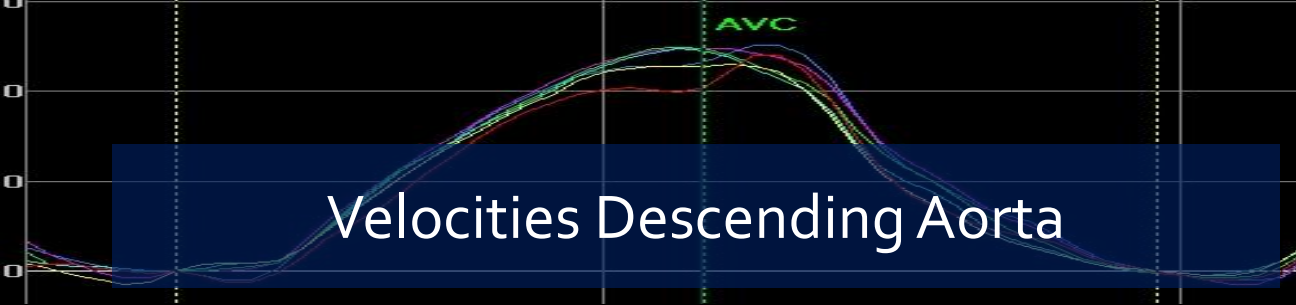
03/03/2011 10:49:57 AM



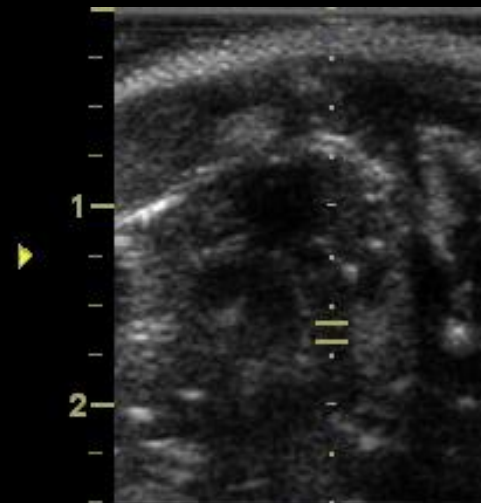
V



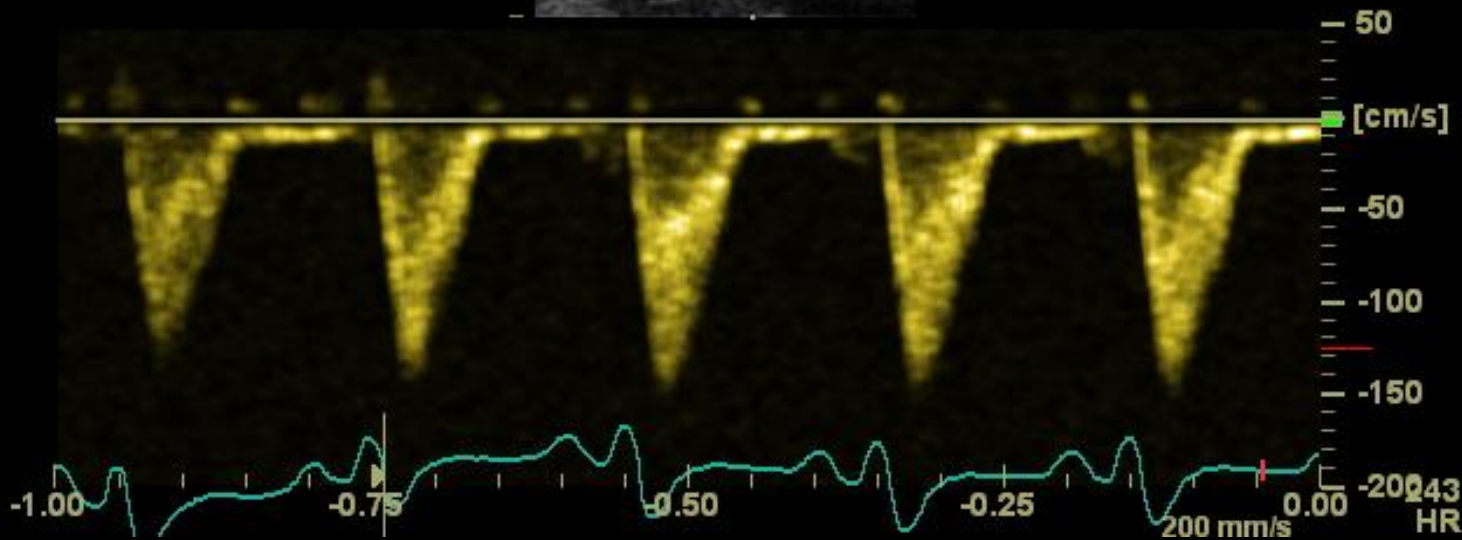
Velocities Descending Aorta

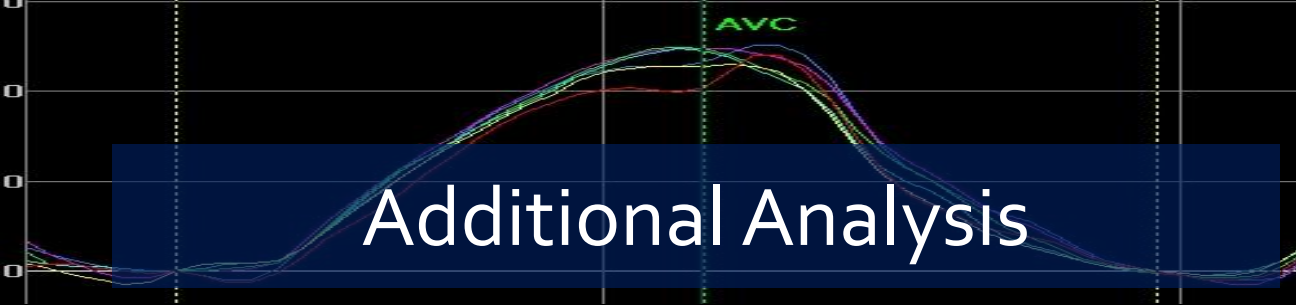


03/03/2011 11:43:30 AM

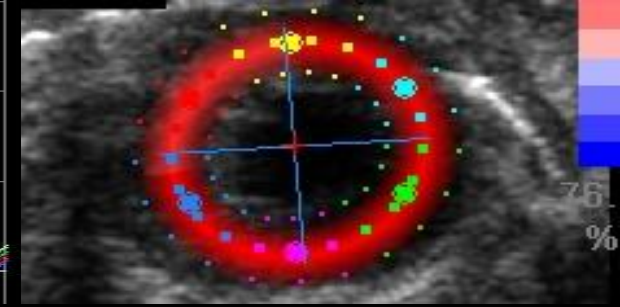


V

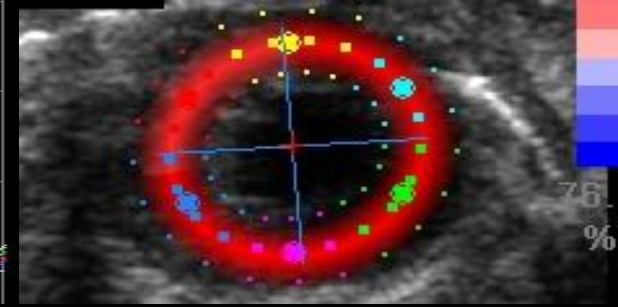
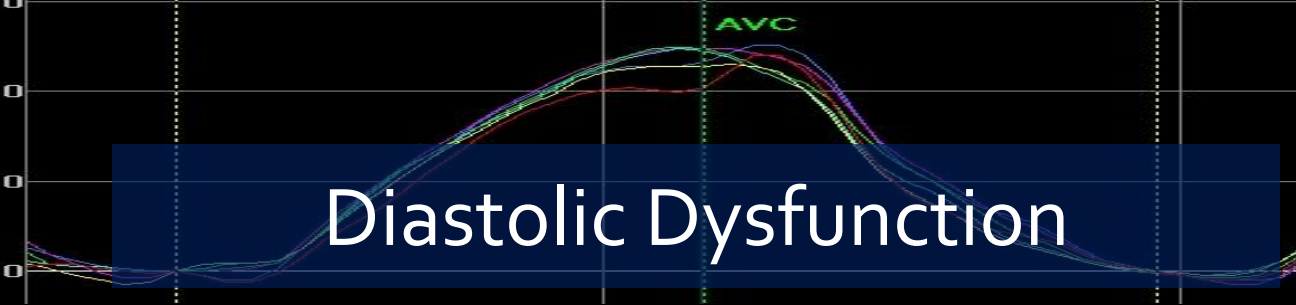




Additional Analysis



- Strain
- Strain rates
- Diastolic function

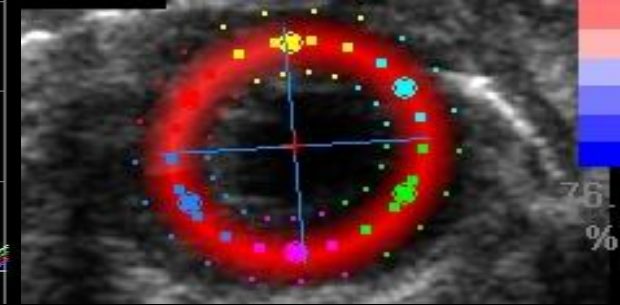
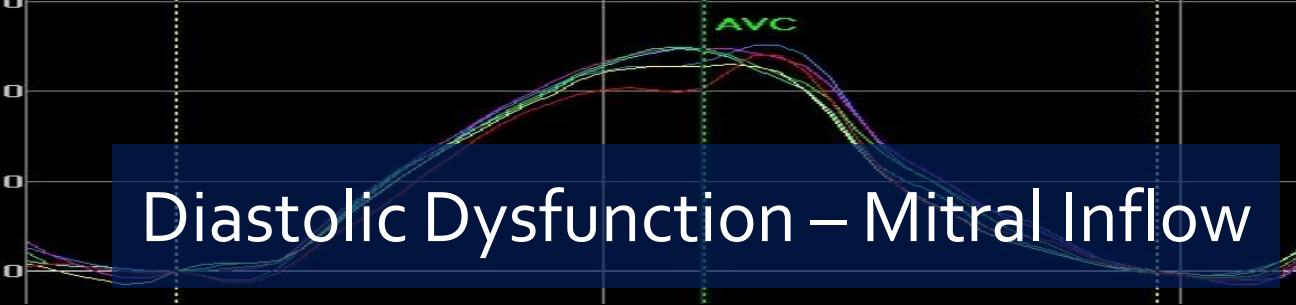


Assessed based on three Doppler-derived parameters:

- E/E'
- V_p
- $IVRT/RR$

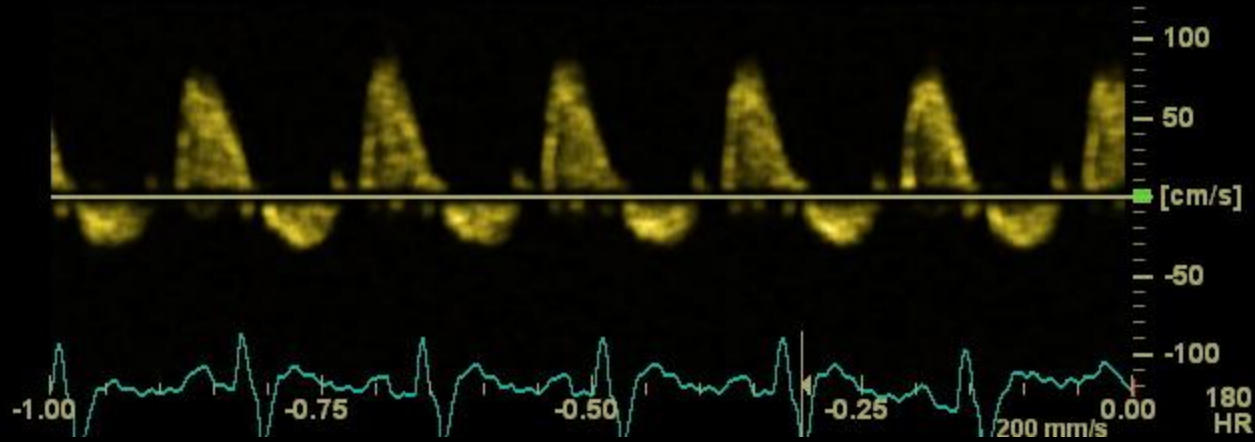
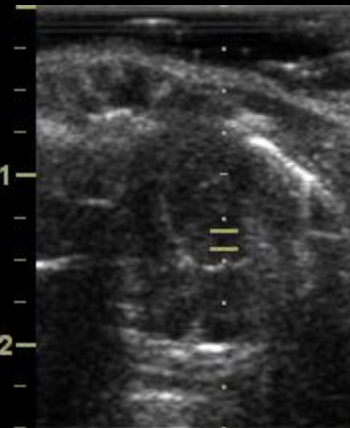
Another index is E/A ; however, distinct E and A peaks are generally not discernible in anesthetized rodents

Diastolic Dysfunction – Mitral Inflow

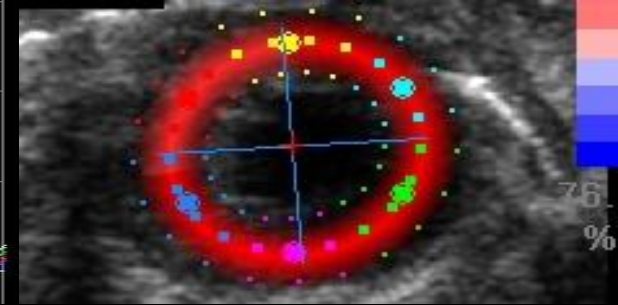
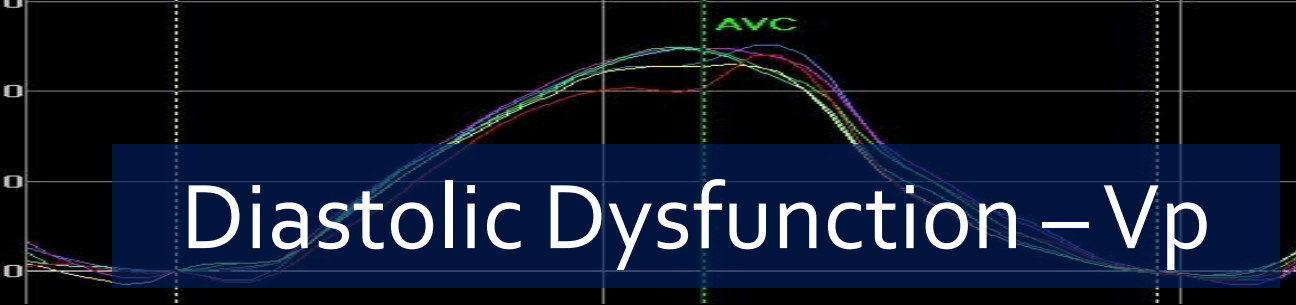


12/16/2011 10:40:55 AM

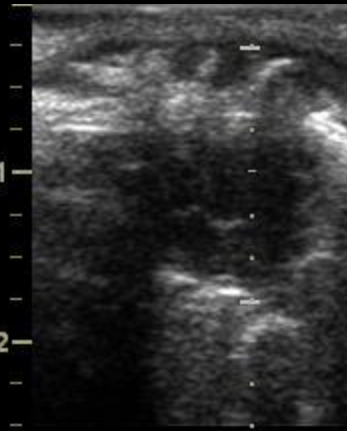
E



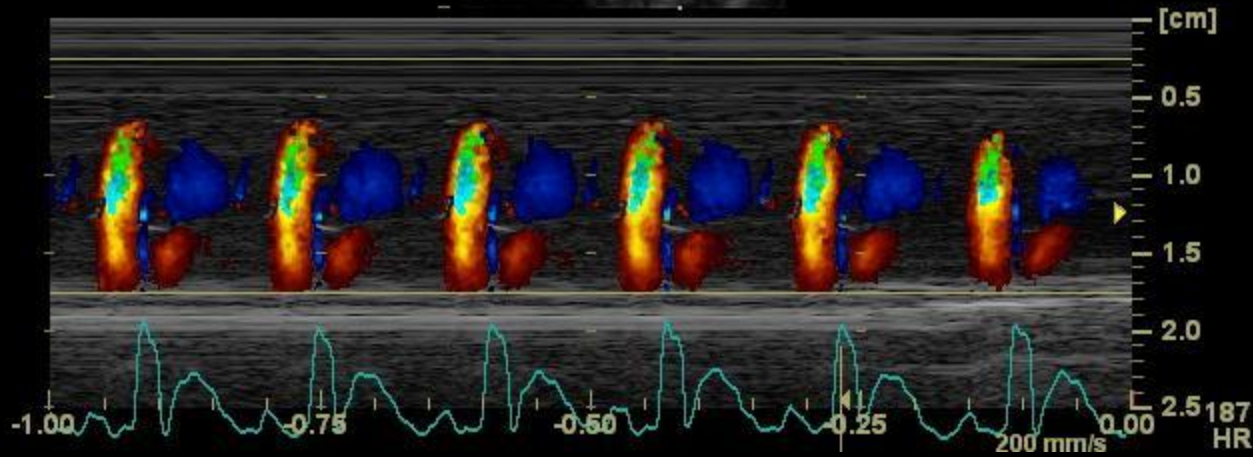
Diastolic Dysfunction – Vp



12/16/2011 10:55:06 AM

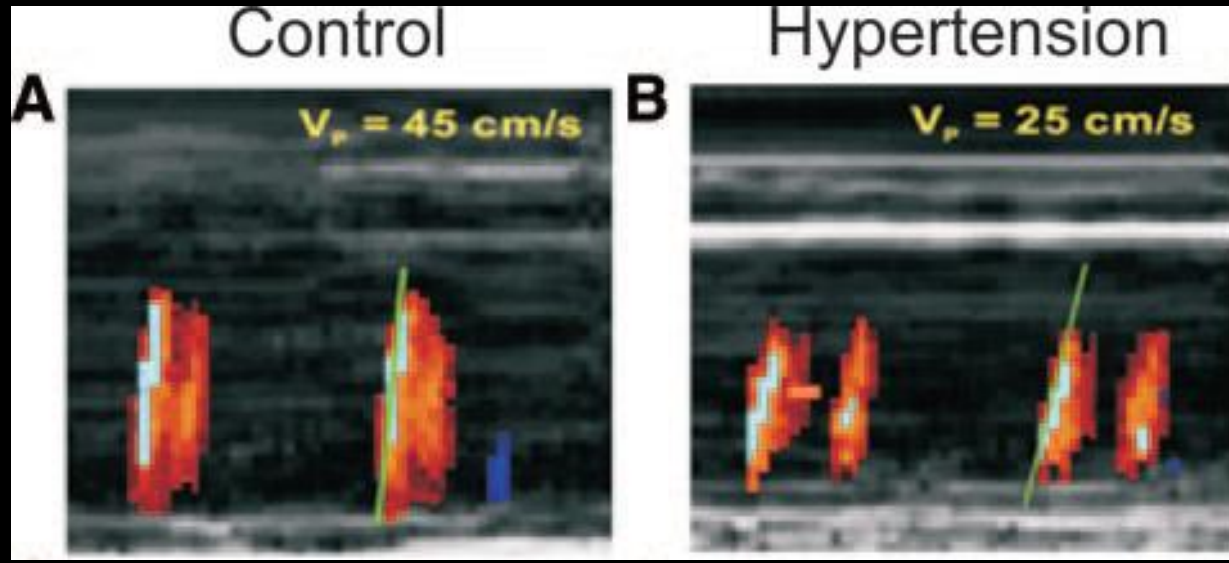
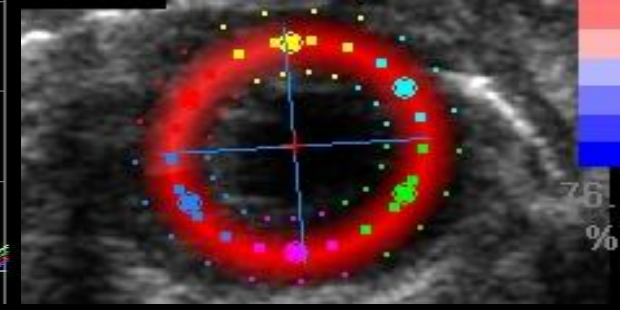
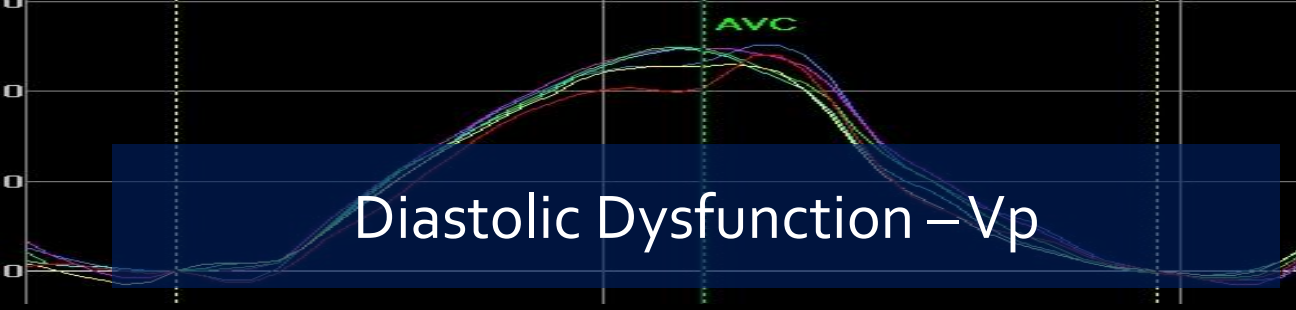


V

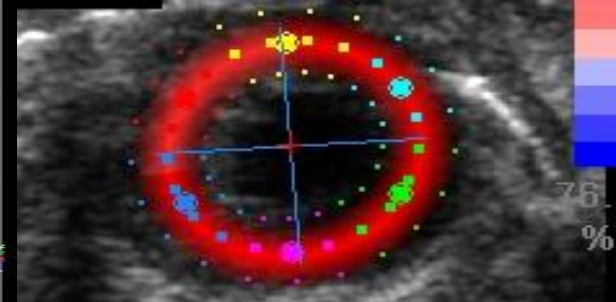
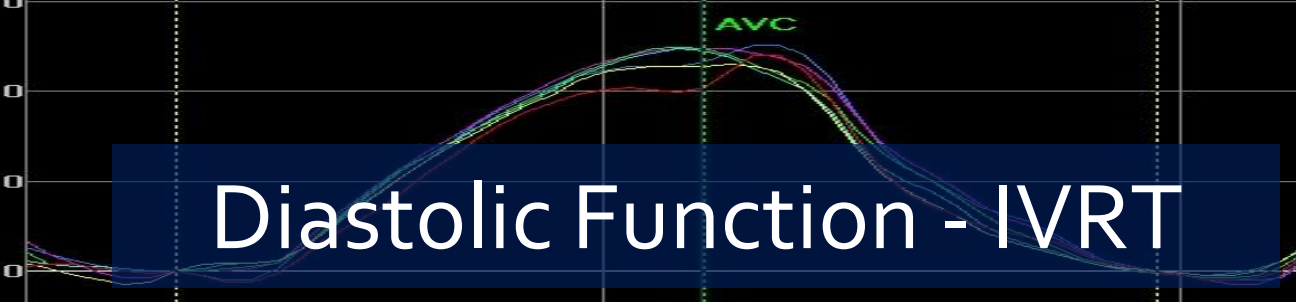


Vp is relatively independent of changes in preload and heart rate and also closely reflects tau

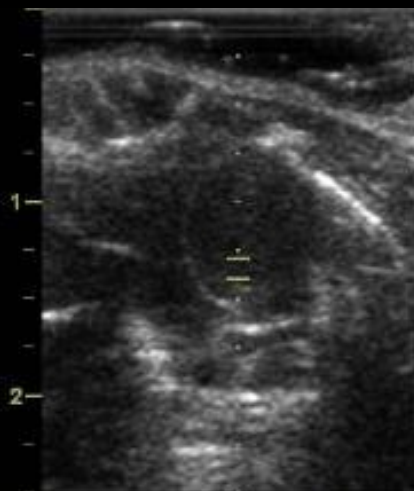
Diastolic Dysfunction – Vp



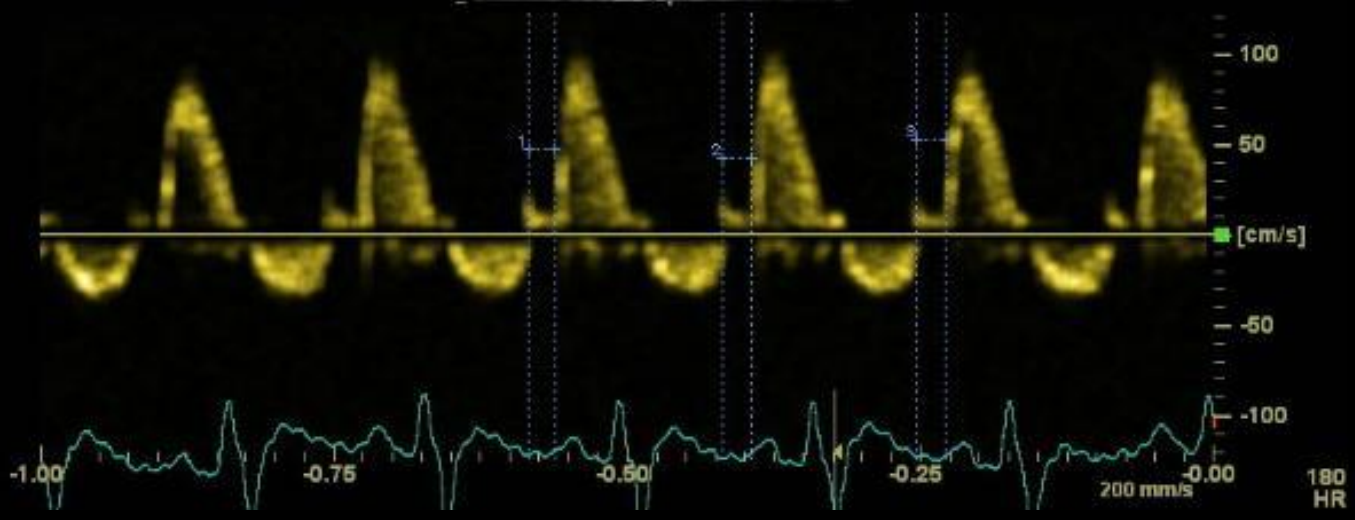
Diastolic Function - IVRT



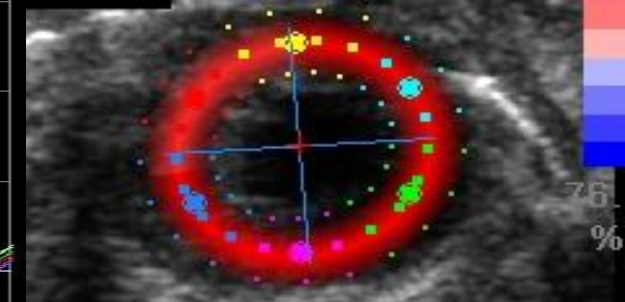
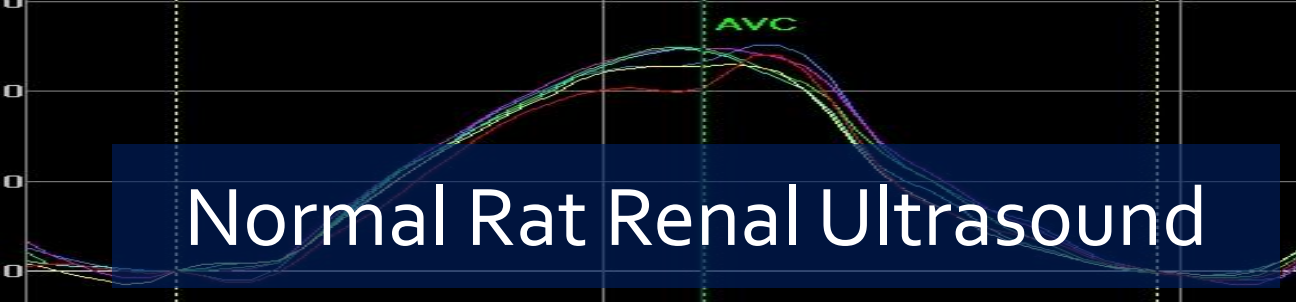
12/16/2011 10:41:02 AM



3	Time	24.25 ms
2	Time	24.25 ms
1	Time	22.82 ms



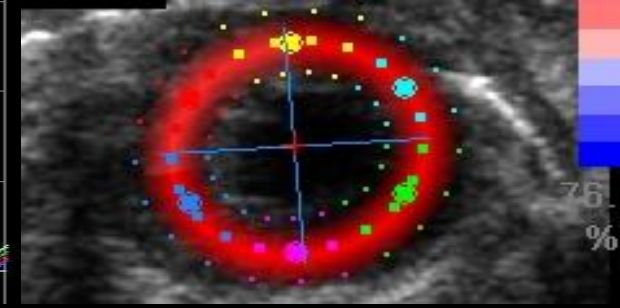
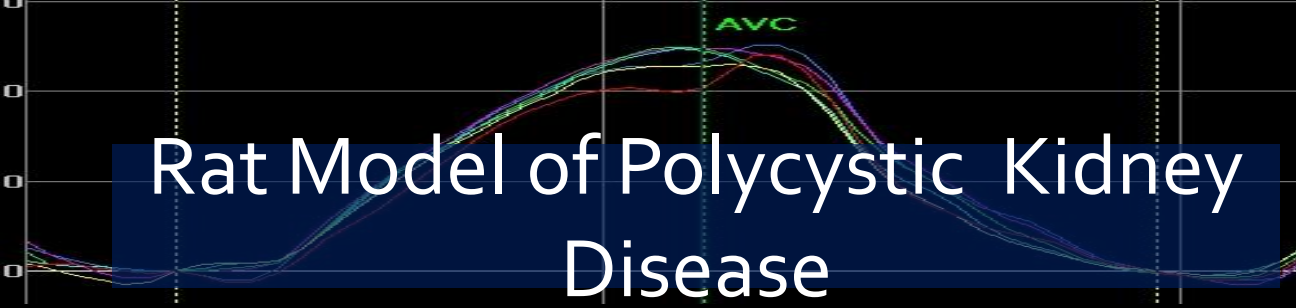
Normal Rat Renal Ultrasound



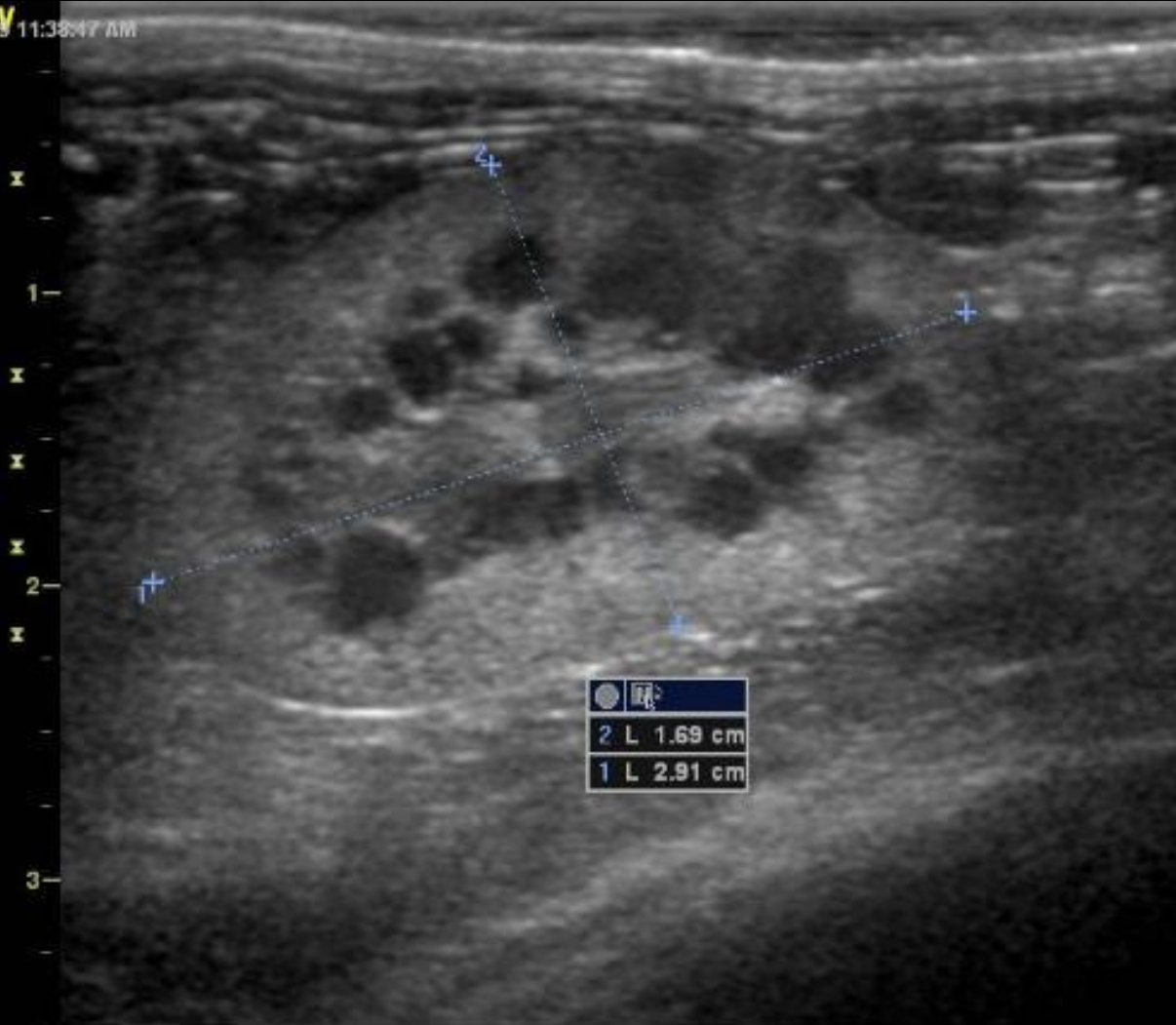
02/23/2010 02:20:43 PM



Rat Model of Polycystic Kidney Disease



10/06/2009 11:38:47 AM





Cost Structure

PRIMARY STUDIES

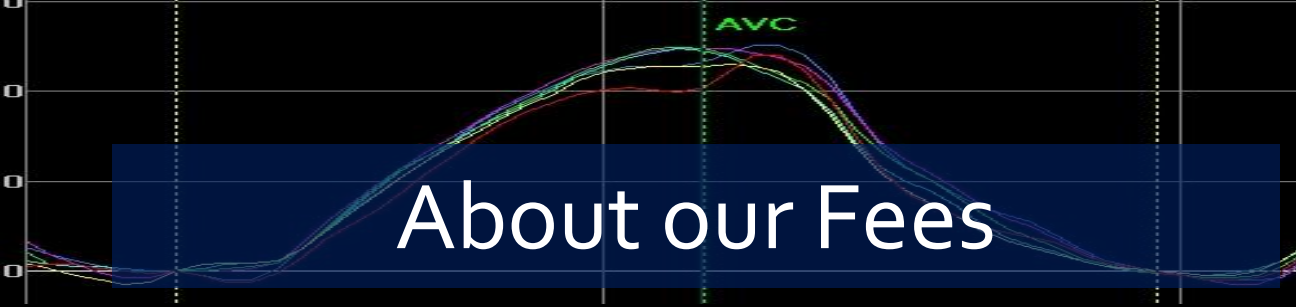
- Screening Echo \$75
- Serial Screening Echo \$75
- Post-Myocardial Ischemia/Infarction Echo \$90
- Post-Surgical Echo \$90

SPECIALTY STUDIES

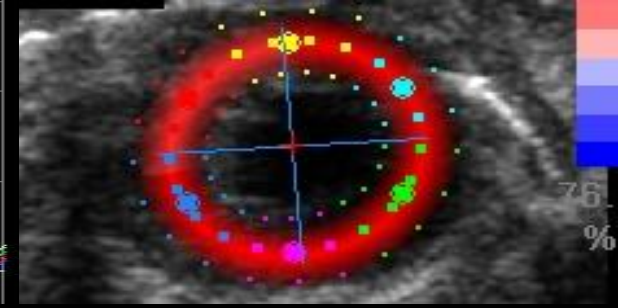
- Emergency Echo \$125
- Vascular Aorta Imaging \$80
- Non-Cardiac Scanning \$40
- Customized Studies (TBD)

SPECIALTY ANALYSIS

- Strain \$10
- Strain rate \$6
- Doppler Analysis of Diastolic function, Transvalvular velocities and Valve regurgitation \$6

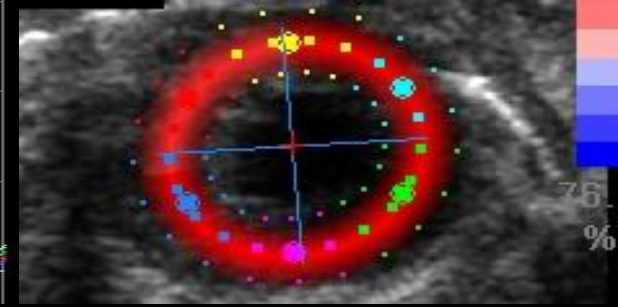
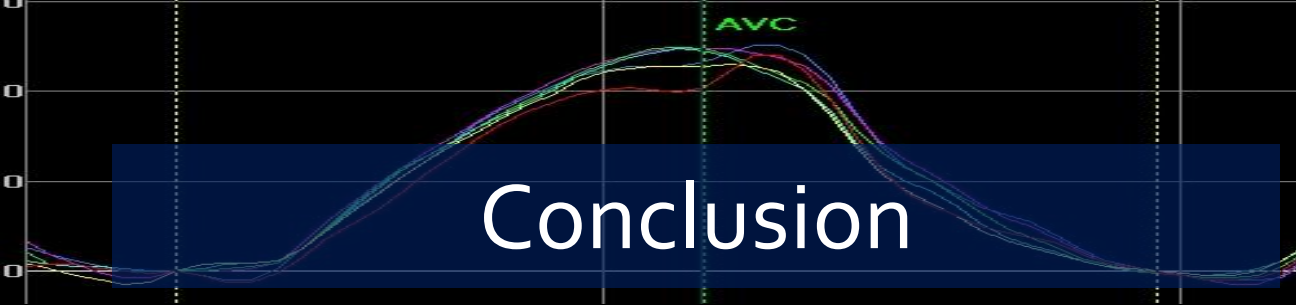


About our Fees



The core is not a business and does not attempt to generate net revenue.

The Core's only mission is to support and enable experiments by other Investigators.



1. Echo can be a useful tool to assess cardiac function in rodents
2. A comprehensive scan yields a lot of information on systolic and diastolic function along with SV and CO
3. An initial comprehensive scan will allow you to go back later and reanalyze your data