Echo HAS_ECH_002

Purpose

To assess the functionality of the heart in order to determine the presence of a mutant phenotype.

Experimental Design

- **Minimum number of animals :** 5-7M + 5-7F
- **Age at test:** Ideal age = 12 weeks ±3 days.
- **Sex:** We would expect the results of this test to show sexual dimorphism

Procedure

1. Place animal in induction chamber and anesthetize the mouse and ensure sedation.
2. Once the animal is sedated, move it to a nose cone for hair removal using cream. Only apply cream to the area of the chest that will be utilized for imaging. Once the hair is removed, wipe area with wet gauze to ensure all hair is removed.
3. Move the animal to the imaging platform and tape its paws to the ECG lead plates and insert rectal probe. Body temperature should be maintained at 36-37°C. During imaging, reduce anesthesia to maintain proper heart rate. If the animal shows signs of being awake, use a higher concentration of anesthetic.

** Before imaging, decrease the Sector X so that the frame rate increases to 110 and change the orientation of the heart by clicking the dot as shown in Fig. 1.*

4. Apply gel on to the area to be imaged.
5. Lower the probe to the gel until it makes contact, making sure that all areas of the probe are covered with gel.
6. The image of the heart should be taken in the short-axis mode with papillary muscles being the point of reference. The papillary muscles should be parallel to the screen as shown on Fig. 2. Some manipulation of the platform may be necessary in order to get a clear image.
7. Once the papillary muscles are parallel in B-Mode, press the M-mode button and place the yellow line in the middle of the LV. Change the Display window to 1000ms. If image is not clear as in Fig. 3, move the yellow line to the left or right. Another option is to leave the line in the center of the LV and move the platform left or right, forward or backwards.
8. When a good clear image is obtained press the Cine store button to save the M-mode data. Save at least 4 short loops of data.
9. Once imaging is complete, remove animal from the platform and allow to recover atop a heating pad.

Figure 1.

Figure 2.

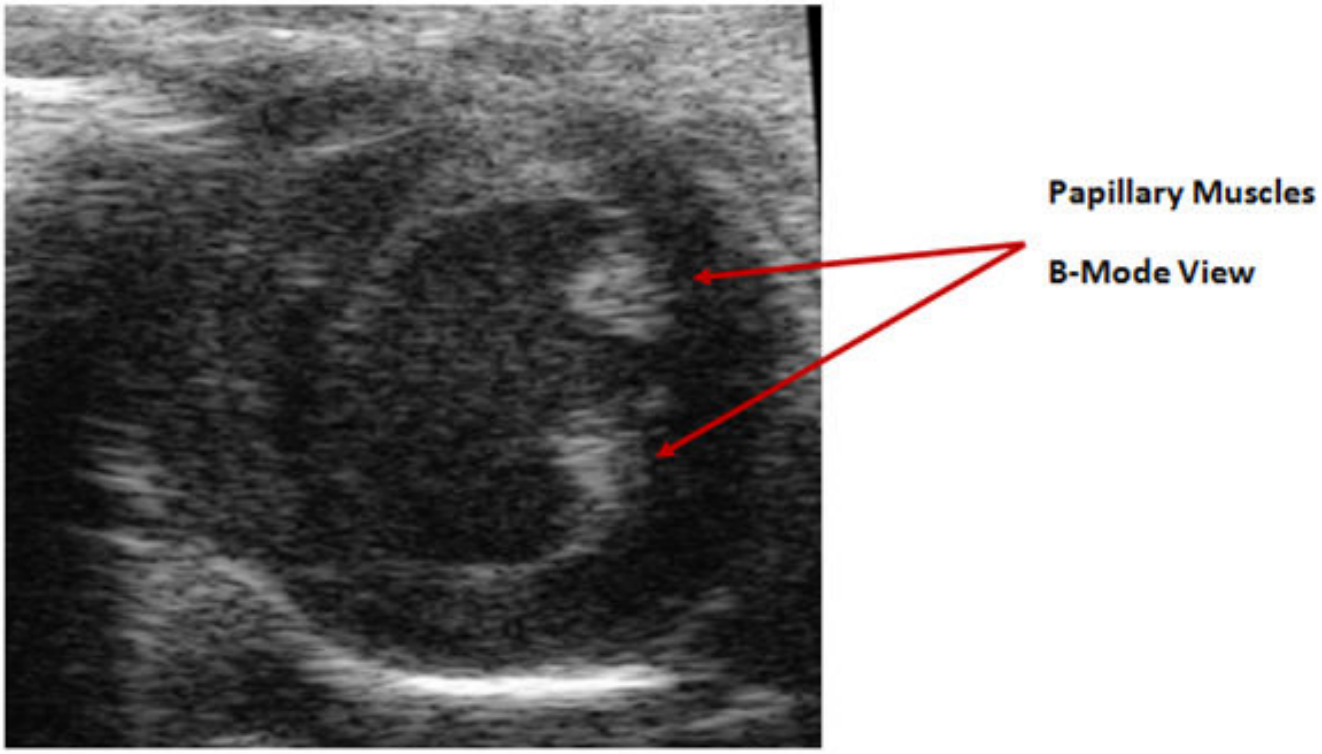
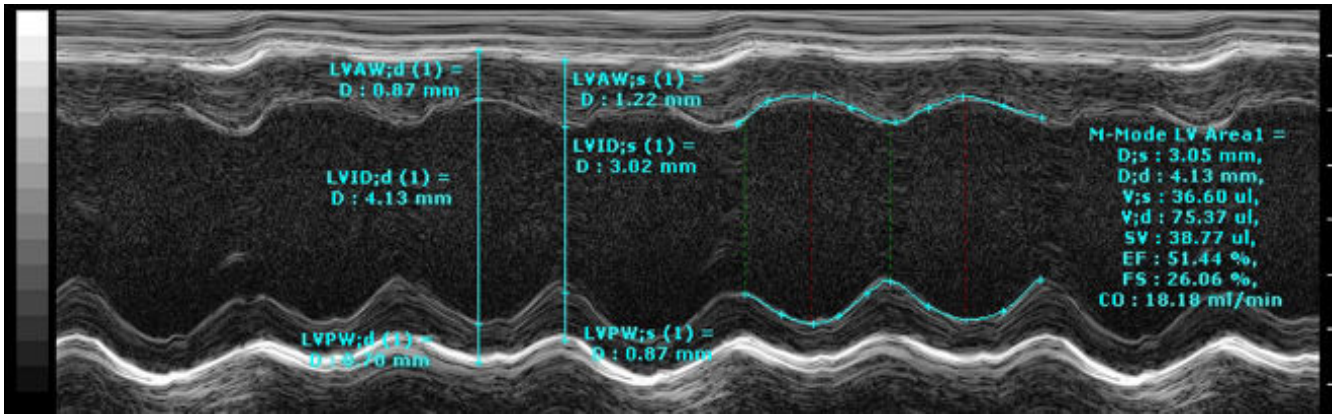


Figure 3.



Notes

Each animal should have at least four short M-Mode images captured.

In order to analyze these data files, you must use the software package provided by the manufacturer. Perform the analysis using the best image by tracing a minimum of four cycles as well as averaging two wall measurements for diastole and systole as seen in Fig. 3. The parameters derived from the trace are End systolic/diastolic diameter (d;s/d;d), systolic/diastolic volume (V;s/V;d),stroke volume (SV), ejection fraction (EF), fractional shortening (FS), heart rate (HR) and body temp (temp).

All four images can be uploaded as part of the data submission.

These data points can be displayed in a bar graph or a line graph.

Parameters and Metadata

End-Systolic Diameter HAS_ECH_001_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: mm

End-Diastolic Diameter HAS_ECH_002_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: mm

Stroke Volume HAS_ECH_003_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: ul

Ejection Fraction HAS_ECH_004_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: %

Fractional Shortening HAS_ECH_005_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: %

Cardiac Output HAS_ECH_006_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: ml/min

LVAWd HAS_ECH_007_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: mm

LVIDd HAS_ECH_008_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** true **Is Annotated:** true

Unit Measured: mm

LVPWd HAS_ECH_009_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** true **Is Annotated:** true

Unit Measured: mm

LVAWs HAS_ECH_010_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: mm

LVIDs HAS_ECH_011_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** true **Is Annotated:** true

Unit Measured: mm

LVPWs HAS_ECH_012_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: mm

HR HAS_ECH_013_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** true **Is Annotated:** true

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Body Temp HAS_ECH_014_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: C

VTI of aortic flow (Pulse wave doppler mode) HAS_ECH_015_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: cm

Aortic diameter (Dao) HAS_ECH_016_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: mm

Tpeak Tend Interval HAS_ECH_017_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: s

Respiration Rate HAS_ECH_018_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: bpm

M-Mode Images HAS_ECH_019_001 | v1.0

seriesMediaParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** false

Increments: Minimum 1

Equipment ID HAS_ECH_020_001 | v1.0

procedureMetadata

Req. Analysis: false **Req. Upload:** true **Is Annotated:** false

Equipment Manufacturer HAS_ECH_021_001 | v1.0

procedureMetadata

Req. Analysis: true **Req. Upload:** true **Is Annotated:** false

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Equipment Model HAS_ECH_022_001 | v1.0

procedureMetadata

Req. Analysis: true **Req. Upload:** true **Is Annotated:** false

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Anesthetic HAS_ECH_023_001 | v1.0

procedureMetadata

Req. Analysis: true **Req. Upload:** true **Is Annotated:** false

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Experimenter ID HAS_ECH_024_001 | v1.0

procedureMetadata

Req. Analysis: false **Req. Upload:** true **Is Annotated:** false

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Date equipment last calibrated HAS_ECH_025_001 | v1.0

procedureMetadata

Req. Analysis: false **Req. Upload:** false **Is Annotated:** false

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Procedural comments HAS_ECH_026_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** false

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