Interpreting Echo Reports

Jamil Mayet
Consultant Cardiologist
Imperial College London
ASSESSMENT OF SYSTOLIC VENTRICULAR FUNCTION
**Transthoracic Echocardiography Report (TTE)**

<table>
<thead>
<tr>
<th>Gender</th>
<th>Female</th>
<th>Race</th>
<th>Unknown</th>
</tr>
</thead>
</table>

**Procedure**
- Referring Physician: Sonographer
- Investigator: Nurse / Assistant
- Technical Quality Comments: Adequate visualization
- Investigation Date: 09/12/2010
- She has informed years ago that she had a congenital heart defect (TAPVR/ASO)
- Experiencing migraines

**Conclusions**
- Good LV & RV systolic function.
- TnT/NaI mildly TR
- Patient refused to have a bubble study therefore PFO could not be excluded.

**Signature**

**Valves**

**Mitrral Valve**
- Peak E-Wave: 0.6 m/s
- Peak A-Wave: 0.4 m/s
- Deceleration Time: 259 msec
- Mitral Valve Summary: Structure: Normal

**Aortic Valve**
- AV Vel: 1.35 m/s
- Aortic Valve Summary: Structure: Normal

**Tricuspid Valve**
- TR: Max: 2.36 m/s
- Tricuspid Valve Summary: Structure: Normal

**Pulmonary Valve**
- Pulmonary Valve Summary: Structure: Normal

**Structures**

<table>
<thead>
<tr>
<th>Left Atrium</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA Dimension: 3.3 cm</td>
</tr>
<tr>
<td>Left Atrium Summary</td>
</tr>
<tr>
<td>LA Size: Normal</td>
</tr>
<tr>
<td>Left Ventricles</td>
</tr>
<tr>
<td>Diastolic Dimension: 4.1 cm</td>
</tr>
<tr>
<td>Systolic Dimension: 2.9 cm</td>
</tr>
</tbody>
</table>
Left ventricular assessment
### Transthoracic Echocardiography Report (TTE)

**Gender:** Female  
**Race:** Caucasian

**Procedure:** Sonographer: Wynn Jd

**Technical Quality:** Good visualization  
**Reason for Request:** Congestive heart failure  
**Investigation Date:** 26/08/2010

### Conclusions

- Mild/moderate bi-ventricular impairment  
- Mild MR  
- Mild dilated LA  
- Ventricular function appears similar to that of previous scan.

**Signature:** Electronically signed by Wynn Jd (Reviewer) on 26/08/2010 05:12

### Valves

#### Mitral Valve
- **Peak E-Wave:** 0.64 m/s  
- **Peak A-Wave:** 0.55 m/s  
- **E/A ratio:** 1.19  
- **E/A ratio:** 0.94

**Mitral Valve Summary**  
Minor thickening at leaflet tips, good excursion  
Mild MR

#### Aortic Valve
- **AV Vmax:** 3.4 m/s  
- **LVOT Peak Velocity:** 0.65 m/s  
- **DIA Vmax:** 0.51

**Aortic Valve Summary**  
Normal aortic valve structure and function.

#### Tricuspid Valve
- **TV Velocity:** 2.42 m/s  
- **TR Gradient:** 21.6/56 mmHg

**Tricuspid Valve Summary**  
PVM in situ, Tricuspid TR

#### Pulmonic Valve

**Pulmonic Valve Summary**  
Normal pulmonic valve structure and function.

### Structures

#### Left Atrium
- **LA Dimension:** 4.2 cm  
- **LA Area:** 21 cm²  
- **Left Atrium Summary:** Mildly dilated

**Left Ventricle**
- **Diastolic Dimension:** 4.3 cm  
- **Systolic Dimension:** 3.3 cm  
- **LVEDVI/LV Ejection Index:** 37 ml/m²  
- **LV Ejection Index:** 0.60  
- **FS:** 23.2%  
- **TT AV:** 7 cm/s  
- **EE:** 7.18  

**Left Ventricle Summary**  
Overall systolic function is mildly impaired  
ET by Simpson’s + chamfer without contrast 44%  

#### Right Atrium

**Right Ventricle**
- **TAPSE:** 1.34 cm  
- **RV S Velocity:** 11 cm/s  

**Right Ventricle Summary**  
PVM in situ,  
2D shows moderate systolic impairment  
TVI shows mild impairment.

**Vessels**
- **Aorta**
  - **Aortic diameter:** 2.2 cm
Right ventricular systolic function
# Transthoracic Echocardiography Report (TTE)

## Procedure
- **Referring Physician**: Sonographer
- **Investigator**: Sumithana Sudha
- **Technical Quality**: Adequate visualization
- **Comments**: Faulty gain; Right Artery Diastolic Report 1st of 50B

## Conclusions
- **Good aortic valve function**
- **Moderate aortic regurgitation**
- **Calcified aortic valve but no significant obstruction to flow, mild aortic regurgitation**
- **Moderate pulmonary hypertension with estimated pulmonary artery systolic pressure of approx. 40 mmHg. There is Doppler evidence for severe diastolic LV dysfunction with raised left atrial pressures and this is the likely cause of the moderately raised pulmonary pressures.**
- **I would advise a trial of furosemide to see if this helps the symptoms.**

## Signature
- Electronically signed by Dr. J. Mehta (Review) on 04/10/2011 11:40

### Structures
- **Left Atrium**: LA dimension: 3.8 cm, LAA: 1.56 cm
- **Left Ventricle**: Diastolic dimension: 4.8 cm, SY: 1.0 cm, PWT: 1.40 cm, TDI Lat E': 5.5 cm/s

### Valves
- **Mitral Valve**: Peak E-Wave: 1.29 m/s, Peak A-Wave: 0.85 m/s, Deceleration Time: 220 ms, Mitral Valve Summation: Mildly thickened with mildly calcified PML base, Opens well, Mild MR
- **Aortic Valve**: AV Vmax: 1.34 m/s, LVOT Peak Velocity: 1.10 m/s, Aortic Valve Summation: Systolic aortic incompetence, Opens well, Mild AR
- **Tricuspid Valve**: TR Vmax: 3.16 m/s, TR Gradient: 10 mmHg, Tricuspid Valve Summation: Structural Normal, Mild TR, Estimated RVSP: 40 mmHg + JVP
- **Pulmonic Valve**: Peak Velocity: 0.72 m/s, Acceleration Time: 2.07 mmHg, 00 msec

### Right Atrium
- Normal right atrium size.

### Right Ventricle
- **TAPSE**: 3.6 cm, RV 1 Velocit: 23 cm/s
- **Right Ventricular Summation**: Normal right ventricle size and function.

### Vessels
- **Aorta**: Aortic Annulus: 2.43 cm, Sinus of Valsalva: 2.9 cm
ASSESSMENT OF LV DIASTOLIC FUNCTION
Diastolic heart failure

• Up to a third of patients have clinical heart failure with normal LV systolic function
• Underlying pathophysiology relates to diastolic dysfunction
• Commonest underlying pathologies
  – Normal ageing, Hypertension, Myocardial ischaemia
Left Ventricular Diastolic Dysfunction

LV RELAXATION
NORMAL
IMPAIRED
IMPAIRED
IMPAIRED

LV COMPLIANCE
NORMAL
NORMAL / ↓
↓↓
↓↓↓

ATRIAL PRESSURE
NORMAL
NORMAL
↑↑
↑↑↑
Echocardiographic Classification of Diastolic Dysfunction

- Normal Diastolic Function
- Stage I: Impaired Relaxation
- Stage II: Pseudonormal
- Stage III: Reversible Restrictive
- Stage IV: Fixed Restrictive

### Mitral Inflow

- 0.75 \(<\frac{E}{A}\) \(<\) 1.5
  - DT > 140 ms
- E/A \(\leq\) 0.75
- 0.75 \(<\frac{E}{A}\) \(<\) 1.5
  - DT > 140 ms
- E/A \(>\) 1.5
  - DT < 140 ms

### Doppler Tissue Imaging of Mitral Annular Motion

- \(\frac{E}{Ea}\) \(<\) 10
- \(\frac{E}{Ea}\) \(<\) 10
- \(\frac{E}{Ea}\) \(\geq\) 10
- \(\frac{E}{Ea}\) \(\geq\) 10

### LV Relaxation
- Normal
- Impaired
- Impaired
- Impaired
- Impaired

### LV Compliance
- Normal
- Normal to ↓
- ↓↓
- ↓↓
- ↓↓↓
- ↓↓↓

### Atrial Pressure
- Normal
- Normal
- ↑↑
- ↑↑
- ↑↑↑
- ↑↑↑↑
Relationship of Pulmonary Capillary Wedge Pressure to E/E’

Closed circles: Patients with impaired relaxation on echocardiography.
Open circles: Patients with pseudonormalization on echocardiography.
(Adapted from Nagueh et al. JACC 2003).
Relationship between baseline E/E' and cardiovascular outcome in the ASCOT study

<table>
<thead>
<tr>
<th></th>
<th>$E/E'$ &lt; 8</th>
<th>$E/E'$ 8-11</th>
<th>$E/E'$ 11-14</th>
<th>$E/E'$ &gt;14</th>
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</thead>
<tbody>
<tr>
<td>Number of patients</td>
<td>168</td>
<td>182</td>
<td>69</td>
<td>20</td>
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<tr>
<td>Number of events</td>
<td>15</td>
<td>14</td>
<td>10</td>
<td>10</td>
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<tr>
<td>% patients who had events</td>
<td>8.8</td>
<td>7.7</td>
<td>14.5</td>
<td>50</td>
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</tbody>
</table>
Echo Assessment of Left Ventricular Diastolic Function

- E/A ratio and DT
- E’
- Calculate E/E’

- If doubt
  - Clinical characteristics of patient
  - LA size
  - LV mass
  - Valsalva
  - PV flow
  - Colour M-mode

![Normal and Pseudonormal Waveforms](image)
# Transthoracic Echocardiography Report (TTE)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race</td>
<td>Caucasian</td>
</tr>
</tbody>
</table>
| Procedure       | SonoGrapher
| Referring Physician | Anil Holml |
| Technical Quality | Adequate visualization |
| Investigation Date | 22/01/2010 |

## Conclusions

- Normal LV and RV systolic function.
- E/A reversal LV diastolic filling.
- Mild concentric LVH.
- No significant valvular abnormalities.
- Prominent p2 noted.

### Signature

Elettronically signed by Anil Holml (Reviewer) on 02/07/2010 12:12

## Valves

### Mitral Valve

- Peak E-Wave: 0.6 m/s
- Peak A-Wave: 0.5 m/s
- Peak Gradient: 0.64 mmHg
- E/A Ratio: 0.9

**Mitral Valve Summary**

Normal mitral valve structure and function.

### Aortic Valve

- AV Valve: 1.2 m/s
- LVOT Peak Velocity: 0.8 m/s
- Di Valve: 0.61

**Aortic Valve Summary**

Normal aortic valve structure and function.

### Tricuspid Valve

**Tricuspid Valve Summary**

Normal tricuspid valve structure and function.

## Structures

### LA Atrium

- LA area: 24 cm²
- LA Atrium Summary
  - Normal LA atrium.

### LV Ventricles

- Diastolic Dimension: 4 cm
- Systolic Dimension: 2.8 cm
- Septum: 1.2 cm
- Post Wall: 1.2 cm
- Pts: 30%

**LV Ventricles Summary**

Normal LV with mild concentric LVH.

Diastolic filling: Abnormal filling pattern - Impaired relaxation.
### Transthoracic Echocardiography Report (TTE)

#### Procedure
- **Referring Physician:** Sonographer Srinivasan Sudha
- **Investigator:** Nurse / Assistant
- **Technical Quality:** Good visualization
- **ECG:** Sinus
- **Investigation Date:** 31/05/2012
- **Comments:** Papillations and Chest Pain

#### Conclusions
- Good biventricular systolic function
- Structurally normal valves
- No significant valvular abnormalities noted
- No chamber enlargement / hypertrophy

#### signature
- Electronically signed by Srinivasan Sudha/Srinivasan on 31/05/2012 03:47

### Valves

#### Mitral Valve
- **Peak E-Wave:** 0.95 m/s
- **Peak A-Wave:** 0.49 m/s
- **Deceleration Time:** 194 msec

#### Aortic Valve
- **AV Vmax:** 1.19 m/s
- **LVOT Peak Velocity:** 1.04 m/s
- **LVOT Diameter:** 2.1 cm

#### Tricuspid Valve

#### Pulmonic Valve
- **Peak Velocity:** 6.66 m/s

#### Structures

#### Left Atrium
- **LA Dimension:** 3.2 cm
- **LAA/aorta:** 1.52

#### Right Atrium

#### Right Ventricle

#### Left Ventricle
- **Systolic Dimension:** 3.4 cm
- **LV ES/DV LV index:** 109 ml
- **LV ES/DV LV index:** 40 mls
- **FS:** 32%
- **TDI Med E:** 12.8 cm/s
- **E/D:** 4.46

#### Left Ventricle Summary
- Normal left ventricle structure and function.
- LVEF = 64% by Simpson’s biplane method

#### Right Ventricle Summary
- Normal right ventricle structure and function.

#### Vessels
- **Aorta:**
  - **Aortic Annulus:** 2.1 cm
  - **Sinus of Valsalva:** 2.74 cm

#### Vessels Summary
- LAO: No anomalies
- Normal IVC

#### Effusions
- Abdominal: No effusions

#### Effusions Summary
- Normal Pericardium
# Transthoracic Echocardiography Report (TTE)

## Procedure
- **Referring Physician:** Sonographer - Srinivasan Sudha
- **Investigator:** Nurse / Assistant - Unknown
- **Technical Quality:** Adequate visualization, Faulty Color, Rend-Artery Inconsistent Report, HD of 50B
- **Investigation Date:** 04/10/2011

## Conclusions
- **Good atrioventricular function**
- **Moderate concentric LVH**
- **Moderate pulmonary hypertension with estimated pulmonary artery systolic pressure of approx. 50 mmHg.**
- **There is no evidence for severe diastolic LV dysfunction with raised left atrial pressures and this is the likely cause of the moderately raised pulmonary pressures.**
- **I would advise a trial of tirofiban to see if this helps the symptoms.**

## Signature
- Electronically signed by Dr. Jami Mayee Reviewer on 04/10/2011 11:40

## Structures
- **Left Atrium**
  - LA dimension: 3.8 cm
  - LAVOT: 1.56

## Valves

### Mitral Valve
- **Peak E-Wave:** 1.09 m/s
- **Peak A-Wave:** 0.55 m/s
- **Deceleration Time:** 220 mSec

### Aortic Valve
- **AV Vmax:** 1.94 m/s
- **LVOT Peak Velocity:** 1.16 m/s

### Tricuspid Valve
- **TR Velocity:** 3.16 m/s

### Pulmonic Valve
- **Peak Velocity:** 0.72 m/s

## Right Atrium
- Normal right atrium size.

## Right Ventricle
- **TaPS:** 3.5 cm/s
- **Right Ventricular Summary:** Normal right ventricle size and function.

## Vessels
- **Aorta**
  - Aortic Annulus: 2.42 cm
  - Sinus of Valsalva: 2.9 cm

## Hemodynamic summary
- **Structurally Normal**
- **No PS/PR**

## Notes
- **LV:** Normal cavity size
- **Surgical:** No mitral valve obstruction
**Transthoracic Echocardiography Report (TTE)**

### Procedure

<table>
<thead>
<tr>
<th>Referring Physician</th>
<th>Sonographer</th>
<th>Srinivasan Sudha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investigator</td>
<td>Nurse/Assistant</td>
<td></td>
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</tbody>
</table>

### Technical Quality

<table>
<thead>
<tr>
<th>ECO</th>
<th>Comments</th>
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<tbody>
<tr>
<td>Good visualization</td>
<td>Sinus Palpitations</td>
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### Consent

<table>
<thead>
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<th>Investigation Date</th>
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</thead>
<tbody>
<tr>
<td>29/05/2012</td>
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</table>

### Conclusions

- **Good biventricular systolic function**
- **Structurally normal valves**
- **Trace mitral regurgitation**
- **Moderate tricuspid regurgitation**
- **Elevated PA pressure ~ 40mmHg + JVP**
- **No chamber enlargement / hypertrophy**

### Structures

<table>
<thead>
<tr>
<th>Left Atrium</th>
<th>LA Diameter: 3 cm</th>
<th>LA Area: 15.8 cm²</th>
</tr>
</thead>
</table>

#### Left Atrium Summary

- Normal inflow, intact atrial septum

- **Left Ventriole**
  - Diastolic Dimension: 4.5 cm
  - Systolic Dimension: 2.4 cm
  - FS: 47.53%
  - TDI Med E': 10.2 cm/sec
  - E': 6.24
  - **Left Ventriole Summary**
    - Good LV systolic function EF > 70%
    - Normal diastolic function
    - Normal cavity size and wall thickness

- **Right Atrium**
  - RA Area: 17.2 ml

#### Right Atrium Summary

- Normal right atrium

#### Right Ventriole

- **TAPSE:** 2.3 cm
- **Dimension (Base):** 3.23 cm

#### Right Ventriole Summary

- Normal right ventricle structure and function

### Vessels

- **Aorta**
  - Aortic Annulus: 2.1 cm
  - Sinus of Valsalva: 2.30 cm

#### Aorta Summary

- Li aort - No anomalies
- Normal IVC

### Effusions

- **Effusion Summary**
  - Normal Pericardium

### Valves

#### Mitral Valve

<table>
<thead>
<tr>
<th>Peak E-Wave:</th>
<th>0.88 m/s</th>
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</thead>
<tbody>
<tr>
<td>Peak A-Wave:</td>
<td>0.60 m/s</td>
</tr>
<tr>
<td>Deceleration Time:</td>
<td>180 msec</td>
</tr>
</tbody>
</table>

#### Mitral Valve Summary

- Structurally Normal
- Trace MR - eccentric jet

#### Aortic Valve

<table>
<thead>
<tr>
<th>AV Vmax:</th>
<th>1.25 m/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>LVOT Peak Velocity:</td>
<td>1.12 m/s</td>
</tr>
<tr>
<td>LVOT Diameter:</td>
<td>2 cm</td>
</tr>
</tbody>
</table>

#### Aortic Valve Summary

- Structurally normal tricuspid aortic valve
- No AS/AR

#### Tricuspid Valve

| TR Velocity: | 3.36 m/s |

#### Tricuspid Valve Summary

- Structurally Normal
- Moderate TR
- Estimated RVSP ~ 45mmHg + JVP

#### Pulmonic Valve

<table>
<thead>
<tr>
<th>Peak Velocity:</th>
<th>0.95 m/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Gradient:</td>
<td>3.61 mmHg</td>
</tr>
</tbody>
</table>

#### Pulmonic Valve Summary

- Normal pulmonic valve structure
- Trivial PR
# Transthoracic Echocardiography Report (TTE)

## Gender
- Female

## Procedure
- Transesophageal Echocardiography

## Investigators
- Referring Physician: Sonographer
- Examiners: Smravat Sai

## Technical Quality
- Adequate visualization
- Accessible
- Excellent

## Conclusion
- Suboptimal Enos Window
- Good LV systolic function, normal ventricular dimensions
- No significant valvular abnormalities noted
- Normal aortic valves

## Signature
- Electronically signed by Smravat Sai/Reviewed on 31/05/2012 10:24

## Values

### Mitral Valve
- Peak E-Flow: 0.55 m/s
- Peak A-Flow: 0.81 m/s
- E/A Ratio: 0.6
- Deceleration Time: 100 ms

### Aortic Valve
- AV E-FLOW: 1.26 m/s
- LVOT Peak Velocity: 0.34 m/s
- LVOT Diameter: 1.9 cm

### Tricuspid Valve
- TR Velocity: 2.25 m/s

### Pulmonic Valve
- Peak Velocity: 0.61 m/s

### Right Atrium
- LA Dimension: 2.8 cm
- LA Area: 1.47

### Left Atrium
- LA Dimension: 4.2 cm
- LA Area: 1.1 cm

### Right Ventricle
- Right Atrium Summary
- Normal right atrium

### Left Ventricle
- Left Atrium Summary
- Normal left atrium

### Venous System
- Normal IVC

### Effusion
- No effusion noted

## Structures
- Normal aortic valve structure and function
- Normal mitral valve structure and function
- Normal tricuspid valve structure and function
- Normal pulmonic valve structure and function
Treatment of diastolic heart failure

• Treat underlying cause eg ischaemia
• Impaired relaxation
  – Theoretically rate-limiting agents effective
    • Beta-blockers, verapamil
    • Reduce HR and prolong diastole
    • Reduce myocardial oxygen demand
    • Lower BP and reduce LVH
• Restriction
  – Drugs which reduce fibrosis and lower LA pressure theoretically should be effective
    • ACEI, AII blockers, Diuretics
  – If LA pressure lowered too much cardiac output significantly worsened
    • Can cause significant morbidity
ASSESSMENT OF LV CARDIAC STRUCTURE
Hypertensive Heart Disease

T = P \times R
(\text{where } T = \text{tension}, P = \text{pressure}, R = \text{lumen radius})

\sigma = \frac{T}{h}
(\text{where } \sigma = \text{stress}, h = \text{wall thickness})
Echo definition of LVH

• Healthy cohorts of subjects
• No high BP, diabetes, CV disease, obesity
• LVH defined as LVMI > mean + 2SD
  – >116 g/m^2 males
  – >104 g/m^2 females
• Relative wall thickness = 2xPWTd/LVIDd
  – Increased when 0.43 or more

Left ventricular geometry

Figure 1  Left ventricular geometry at baseline and after 4.8 years antihypertensive treatment. CR, concentric remodelling; C-LVH, concentric LV hypertrophy; E-LVH, eccentric LV hypertrophy; N, normal geometry.
Incidence of cardiovascular mortality according to presence or absence of LVH

4-year age-adjusted incidence of cardiovascular disease according to LVMI

Risks associated with LVM and geometry

Total mortality*  Cardiovascular events†


*P<0.001, †P=0.03
# Transthoracic Echocardiography Report (TTE)

**Gender**
- Female

**Race**
- Caucasian

**Procedure**
- Sonographer: Amil Homol

<table>
<thead>
<tr>
<th>Technical Quantity</th>
<th>Assessment</th>
<th>Date</th>
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<tr>
<td>Adequate visualization</td>
<td>Normal</td>
<td>22/01/2019</td>
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</tbody>
</table>

## Conclusions
- Normal LV and RV systolic function.
- E/A reversal LV diastolic filling.
- Mild concentric LVH.
- No significant vascular abnormalities.
- Prominent papillary muscles.

**Signature**

Electronically signed by Amil Homol on 22/07/2016, 12:10

## Valves

### Mitral Valve
- **Peak E-Wave**: 0.6 m/s
- **Peak A-Wave**: 0.5 m/s
- **Peak Gradient**: 0.64 mmHg
- **E/A Ratio**: 0.6

**Mitral Valve Summary**
- Normal mitral valve structure and function.

### Aortic Valve
- **AV Valve**: 1.2 m/s
- **LVOT Peak Velocity**: 0.8 m/s
- **Aortic Valve**: 0.8

**Aortic Valve Summary**
- Normal aortic valve structure and function.

### Tricuspid Valve

**Tricuspid Valve Summary**
- Normal tricuspid valve structure and function.

## Structures

### Left Atrium
- **LA area**: 4 cm

**Left Atrium Summary**
- Normal left atrium.

### Left Ventricle
- **Diastolic Dimension**: 5 cm
- **Systolic Dimension**: 2.8 cm
- **PES**: 30%

**Left Ventricle Summary**
- Normal LV cavity size with mild concentric LVH.
- Diastolic filling: Abnormal filling pattern - impaired relaxation.
### Transthoracic Echocardiography Report (TEE)

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<th>Male</th>
<th>Race</th>
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**Procedure**
- Referring Physician: Sonographer
- Investigator: Nurse / Assistant
- Requesting Physician: N. Franklin
- Request Date: 26/04/2011
- Investigation Date: 26/04/2011

**Conclusions**


**Signature**

Elettronically signed by [signature] on 26/04/2011 12:36

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### Valves

#### Mitral Valve
- Peak E-Wave: 0.6 m/s
- Peak A-Wave: 0.66 m/s
- Peak Gradient: 0.66 mmHg
- EA Ratio: 2.62

**Mitral Valve Summary**
Mild annular calcification. Leaflets appear thin and mobile.

#### Aortic Valve
- AV Vmax: 1.7 m/s
- LVOT Diameter: 2.1 cm

**Aortic Valve Summary**
Thickened. The tip of the leaflets is calcified with reasonable openings excursion. No significant aortic stenosis. No regurgitation.

#### Tricuspid Valve
**Tricuspid Valve Summary**
Leaflets appear thin and mobile. No significant regurgitation.

---

### Structures

#### Left Atrium
**Left Atrium Summary**
Appears normal in size.

#### Left Ventricle
3D echo assessment of LV volume and mass

Intraobserver variability
2D echo 19%  3D echo 8%

Interobserver variability
2D echo 37%  3D echo 7%

ASSESSMENT OF THE VALVES
Valvular anatomy and function
**Transthoracic Echocardiography Report (TTE)**

<table>
<thead>
<tr>
<th>Gender</th>
<th>Female</th>
<th>Race</th>
<th>Caucasian</th>
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<td>Referring Physician</td>
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<td>Investigator</td>
<td>Nurse / Assistant</td>
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<td>Vena vox obtained</td>
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**Conclusions**
Severe aortic stenosis
Non-dilated LV with sonorities mild LVH. Good biventricular systolic function

reported by Alejandro Remond

**Signature**

**Valves**

<table>
<thead>
<tr>
<th>Valve</th>
<th>Peak E-Wave:</th>
<th>Peak Gradient:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitral Valve</td>
<td>0.47 m/s</td>
<td>0.18 mmHg</td>
</tr>
<tr>
<td></td>
<td>1.04 m/s</td>
<td>0.46</td>
</tr>
</tbody>
</table>

**Mitral Valve Summary**
Ultrasound evaluation. The anterior leaflet is mobile with some thickening at the base, the posterior leaflet is mobile and thin. Good overall excursion. Mild mitral regurgitation

<table>
<thead>
<tr>
<th>Valve</th>
<th>AV Vmax:</th>
<th>Peak Gradient:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aortic Valve</td>
<td>5.45 m/s</td>
<td>119.25 mmHg</td>
</tr>
<tr>
<td></td>
<td>114 m/s</td>
<td>65 mmHg</td>
</tr>
<tr>
<td></td>
<td>60 m/s</td>
<td>11 mmHg</td>
</tr>
<tr>
<td></td>
<td>12.2 m/s</td>
<td>0.32 cm²</td>
</tr>
<tr>
<td></td>
<td>1.95 cm</td>
<td>10.99</td>
</tr>
</tbody>
</table>

**Aortic Valve Summary**
Severe aortic stenosis. Diffuse aortic thickening of the aortic cusps with reduction in excursion. Mild aortic regurgitation. Peak AV vel 5.4 m/s, PG 119 mmHg, MPG 69 mmHg, AVA = 0.32 cm²

**Tricuspid Valve**

**Tricuspid Valve Summary**
Normal tricuspid valve structure and function. Unable to look for regurgitation

**Pulmonic Valve**

**Pulmonic Valve Summary**
Normal pulmonic valve structure and function.

**Structures**

<table>
<thead>
<tr>
<th>Structure</th>
<th>LA Dimension:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left Atrium</td>
<td>3.62 cm</td>
</tr>
<tr>
<td>LA/LV</td>
<td>1.08</td>
</tr>
</tbody>
</table>
### Transthoracic Echocardiography Report (TTE)

<table>
<thead>
<tr>
<th>Systolic Function</th>
<th>Comments</th>
</tr>
</thead>
</table>

### Valves

<table>
<thead>
<tr>
<th>Valve</th>
<th>Peak E-wave</th>
<th>Peak Gradient</th>
<th>E/A Ratio</th>
<th>Mitral Valve Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitral</td>
<td>0.74 ms</td>
<td>2.15 mmHg</td>
<td>0.59</td>
<td>Structural normal MV with good excursion.</td>
</tr>
</tbody>
</table>

#### Aortic Valve Summary
- AV Vmax: 2.21 m/s
- LVOT Peak velocity: 1.13 m/s
- LVOT Diameter: 2.34 cm

#### Tricuspid Valve Summary
- TR Velocity: 173 ms
- TR Gradient: 11 mmHg

### Structures

<table>
<thead>
<tr>
<th>Structure</th>
<th>Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left Atrial</td>
<td>3.4 cm</td>
</tr>
</tbody>
</table>
## Transthoracic Echocardiography Report (TTE)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Male</th>
<th>Race</th>
<th>Conclusion</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Referring Physician</th>
<th>Sonographer</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Investigator</th>
<th>Nurse, Assistant</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Technical Quality</th>
<th>Comments</th>
<th>Visualized</th>
</tr>
</thead>
</table>

| Date | 20/04/2012 |

## Conclusions
- Good LV & IVS systolic function.
- Moderate AS with maximum PS=55mmHg, MD=45mmHg and anterior leaflet length of 3.3 cm.
- Mild MR.
- Normal.

## Valves
### Mitral Valve
- Peak E-wave: 1.8 m/s
- Peak A-wave: 1.1 m/s
- Deceleration time: 274 ms

### Aortic Valve
- AV Valve: 1.37 m/s
- AV Max Velocity: 0.84 m/s
- LVIDD: 2.9 cm

### Tricuspid Valve
- Tricuspid Valve Summary
- Normal tricuspid valve structure and function.

### Pulmonic Valve
- Pulmonic Valve Summary
- Normal pulmonic valve structure and function.

## Structures
### Left Atrium
- LA Dimension: 3.6 cm
- LA Size: Normal
# Transthoracic Echocardiography Report (TTE)

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Referring Physician</th>
<th>Investigator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Referring Physician</td>
<td>Sonographer</td>
<td>Nurse / Assistant</td>
</tr>
<tr>
<td>Requesting Physician</td>
<td>5:05:34pm</td>
<td>Valve clinic</td>
</tr>
<tr>
<td>Reason for Request</td>
<td>Mitral stenosis and mitral regurgitation</td>
<td>01/05/2012</td>
</tr>
</tbody>
</table>

## Conclusions
- Thickened mitral valve especially at tips of leaflets. Restriction of posterior mitral valve leaflet.
- Moderate mitral stenosis with mean gradient of 5.7mmHg, valve area 1.3cm² by planimetry.
- Mild-to-moderate mitral regurgitation due to anterior mitral valve leaflet prolapse.
- Good LV function.

## Signature

Electronically signed by Dr Catherine Fletcher/Reviewer on 01/05/2012 11:56

## Valves

### Mitral Valve
- MR PISA Radius: 0.6cm
- Mean Gradient: 6 mmHg
- Area ID: 1.3 cm²
- Mitral Valve Summary
  - Anterior leaflet thickened at tips, posterior leaflet restricted and thickened. Mild anterior leaflet prolapse.
  - Moderate mitral stenosis with mean gradient of 5.7mmHg, valve area 1.3cm² by planimetry.
  - Mild-to-moderate mitral regurgitation due to anterior leaflet prolapse.

### Aortic Valve
- AV Vmax: 1.49 m/s
- Peak Gradient: 8.58 mmHg
- LVOT Peak Velocity: 0.8 m/s
- LVOT Diameter: 1.0 cm
- AR PHT: 771 mmHg

### Aortic Valve Summary
- Trileaflet valve opens well, no significant stenosis and mild regurgitation.

### Tricuspid Valve
- TR Vmax: 2.49 m/s
- TR Gradient: 24 mmHg

### Tricuspid Valve Summary
- Structurally normal valve with no significant stenosis and mild TR.

### Pulmonic Valve

### Pulmonic Valve Summary
- Structurally normal valve. No significant stenosis or regurgitation.

### Structures

#### Left Atrium
- LA Dimension: 4.3 cm
- Left Atrium Summary
  - Moderately dilated LA.

#### Left Ventricles
- Diastolic Dimension: 4.9 cm
- Systolic Dimension: 3.6 cm
- FS: 26.53 %
- TDI Med 'E': 3 m/s
- Left Ventricular Summary
  - Normal dimensions and good systolic function.

#### Right Atrium
- Right Atrium Summary
  - Normal appearance.

#### Right Ventricles
- RV S Velocity: 12 cm/s
- Right Ventricular Summary
  - Normal systolic function. Estimated RVSP 50mmHg.

### Vessels

#### Aorta
- LVOT Diameter: 1.9 cm

### Vessels Summary
- IVC collapses normally with inspiration.
### Transthoracic Echocardiography Report (TTE)

**Gender**: Male  
**Race**: Unknown

**Procedure**
- Referring Physician: Sonographer  
- Referring Physician: Dr Catherine Fletcher  
- Investigator: Nurse/Assistant  
- ECG: Sinus rhythm  
- Reason for Request: Valve aortic stenosis  
- Consent: Consent obtained  
- Investigation Date: 01/06/2012

**Conclusions**
Moderate aortic stenosis with moderate aortic regurgitation. Good LV systolic function with no significant LVH. Unchanged from previous echocardiogram.

**Signature**
Electronically signed by Dr Catherine Fletcher (Reviewer) on 01/06/2012 02:19

### Valves

#### Mitral Valve
- Peak E-Wave: 0.64 m/s  
- Peak A-Wave: 1.24 m/s

#### Mitral Valve Summary
Structurally normal valve with no significant stenosis or regurgitation.

#### Aortic Valve
- A2/Vmax: 3.2 m/s  
- LVOT Peak Velocity: 1.08 m/s  
- LVOT Diameter: 1.5 cm  
- AR PHT: 410 mmHg  
- Aortic Valve Summary
  - Trileaflet valve with moderate restriction to opening.  
  - Moderate AS, peak velocity 3.2m/sec.  
  - Moderate AR with PHT at 10mmHg

#### Tricuspid Valve
- TR Velocity: 2.1 m/s

#### Tricuspid Valve Summary
Structurally normal valve with trivial TR.

#### Pulmonic Valve
- PR ED Velocity: 1.1 m/s

#### Pulmonic Valve Summary

### Structures

#### Left Atrium
- LA Dimension: 4.2 cm  
- Left Atrium Summary
  - Mildly enlarged LA

#### Left Ventricle
- Diastolic Dimension: 4.3 cm  
- Systolic Dimension: 3.2 cm  
- FS: 26.4%  
- TDI Med E': 5 cm/s  
- EE': 10.67

#### Left Ventricular Summary
- Normal dimensions and no significant LVH.  
- Good systolic function.  
- No diastolic dysfunction.

#### Right Atrium
- Right Atrium Summary
  - Normal appearance

#### Right Ventricle
- TAPSE: 1.5 cm  
- Right Ventricle Summary
  - Normal dimensions and systolic function.

#### Aorta
- Size of Aorta: 2.4 cm  
- LVOT Diameter: 1.5 cm  
- Vessels Summary
  - IVC collapses normally on inspiration.
**Transthoracic Echocardiography Report (TTE)**

<table>
<thead>
<tr>
<th>Gender</th>
<th>Female</th>
<th>Race</th>
<th>Black</th>
</tr>
</thead>
</table>

**Procedure**
- Investigator: Sonographer
- Technical Quality: Good visualization
- Investigation Date: 07/12/2011

**Conclusions**
- Good LV and RV systolic function.
- Normal LV diastolic function.
- Mitral valve with mild to moderate MR.
- No other cardiac abnormalities noted.

**Signature**
- Electronically signed by Avril Hamel on 07/12/2011 09:32

## Valves

### Mitral Valve
- Peak E-Wave: 1.3 m/s
- Peak A-Wave: 0.9 m/s

### Aortic Valve
- AV Valve: 1.6 m/s
- LVOT Peak Velocity: 0.9 m/s

### Pulmonic Valve
- Peak Velocity: 1 m/s

### Mitral Valve Summary
- Mitral valve with mild to moderate MR.

### Aortic Valve Summary
- Tricuspid AV without restriction or regurgitation.

### Pulmonic Valve Summary
- Normal pulmonic valve structure and function.

### Structures

<table>
<thead>
<tr>
<th>Left Atrial</th>
<th>LA Dimension: 3.1 cm</th>
<th>LA/Ao: 1.55</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA area:</td>
<td>15.6 cm</td>
<td></td>
</tr>
</tbody>
</table>
# Transthoracic Echocardiography Report (TTE)

**Gender**: Male  
**Race**: Caucasian

**Procedure**

<table>
<thead>
<tr>
<th>Referring Physician</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOO</td>
<td>Sonographer</td>
</tr>
<tr>
<td>Investigator</td>
<td>Nurse / Assistant</td>
</tr>
</tbody>
</table>

**Demographics**

- **HR**: 57 bpm
- **BP**: 155/85 mmHg
- **Weight**: 75 kg
- **BMI**: 23.21 kg/m²
- **Height**: 170 cm
- **BMI**: 23.21 kg/m²
- **Height**: 170 cm
- **Weight**: 75 kg
- **BMI**: 23.21 kg/m²
- **Height**: 170 cm
- **Weight**: 75 kg

**Comments**: Murmur

**Conclusions**

- **Hypertensive and known white coat hypertensive.**
- **Dimensions are WNL**
- **AVMs: Absent and open well. No Aort.**
- **MV islets are normal and open well. No MVR.**
- **PA, PV are normal. Physiological PR.**
- **TV is normal. Physiological TR.**
- **IVC is normal and responds to respiration.**
- **RVSP is not raised.**
- **LA and IVC are intact to colour Doppler.**
- **Asc., arch and desc. aorta are normal.**

**Algorithms**

- Electronically signed by Andrew Porter (Reviewer) on 06/05/2012 10:10.

## Valves

### Mitral Valve

- **Peak E-Wave**: 1.06 m/s  
- **Peak A-Wave**: 0.489 m/s  
- **Peak Gradient**: 4.49 mmHg  
- **E/A Ratio**: 2.17

### Aortic Valve

- **AV Vmax**: 2.0 m/s  
- **LVOT Peak Vmax**: 1.57 m/s  
- **LVOT VTI**: 0.283 m  
- **Peak Gradient**: 10 mmHg  
- **E/A Ratio**: 0.78

### Tricuspid Valve

- **TV Vmax**: 2.51 m/s  
- **TR Gradient**: 25 mmHg

### Pulmonic Valve

- **Peak Vmax**: 1.53 m/s  
- **Peak Gradient**: 9.36 mmHg

## Structures

- **Left Atrium**: 3.3 cm  
- **LA/Aorta**: 1.36
Transthoracic Echocardiography Report (TTE)

Gender: Male  Race: Unknown

Procedure
Referring Physician: Fox Rapid Access Cardiology
Sonographer: Judith Kling
Investigator: Nurse / Assistant

Technical Quality
ECG: Adequate visualization
BVG: Adequate visualization
Requesting Physician: Dr. J. Gniadecki
Comments: Metastatic adenocarcinoma

Conclusions
AF: The LV measures WNL with good systolic function.
Aortic stenosis: mildly thickened, opens well. There is no significant gradient across the valve.
MV opens well with normal structure and function. Mild MR
LA is mildly moderately dilated
Tricuspid annulus is intobolized to the aorta
RV measures WNL with good systolic function.
RA measures WNL
PA and TV are normal, mild TR
Pulmonary Valve: Normal RVSP
The tricuspid valve is normal with normal respiratory variation.

Conclusion
TV opens well and coasts well, it is thin and mobile.
Normal PV
RV function is good
Good LV function. Dilated LA

Signature

Electronically signed by Judith Kling (Reviewer) on 27/07/2011 10:54

Structures

| Left Atrium | LA Dimension: 4.7 cm | LA Area: 36.7 cm² |
| Left Ventricle | Diastolic Dimension: 5 cm | Septum: 9.4 cm |
| | Systolic Dimension: 3.7 cm | Post Wall: 0.80 cm |
| | Fib: 26 % | TAPSE: 1.7 cm |
| Right Ventricle | | |
| | | |

Vessels
Aorta
Aortic Annulus: 3.3 cm

Veins
IVC Exprent: 2.1 cm

Valves

Mitral Valve
Peak E Wave: 0.566 m/s
Peak Gradient: 1.05 mmHg

Aortic Valve
AV Vmax: 1.33 m/s
AV VTE: 0.247 m
LVOT Peak Velocity: 0.961 m/s
LVOT VTI: 0.14 m

Tricuspid Valve
TR Vmax: 2.25 m/s
TR Gradient: 20 mmHg

Pulmonary Valve
Peak Velocity: 0.928 m/s
Peak Gradient: 3.44 mmHg
# Transthoracic Echocardiography Report (TTE)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race</td>
<td>Caucasian</td>
</tr>
</tbody>
</table>

**Procedure**
- Referring Physician: Echocardiography
- Investigator: Sonographer | Avrit Horn
- Technical Quality Requesting Physician: Nurse / Assistant
- Adequate visualization: Pre-assessment
- Technical Quality Requesting Physician: Investigation Date: 01/02/2012

**Conclusions**
- Good LV and RV systolic function.
- Chordal SAM noted, without outflow obstruction.
- No other valvular abnormalities noted.

**Signature**
- Electronically signed by Avrit Horn (Reviewer) on 01/02/2012 01:10

## Valves

### Mitral Valve
- Peak E-Wave: 0.6 m/s
- Peak A-Wave: 0.7 m/s
- Mitral Valve Summary: Normal mitral valve structure and function.

### Aortic Valve
- AV Vmax: 1.4 m/s
- LVOT Peak Velocity: 1.3 m/s
- Aortic Valve Summary: Normal aortic valve structure and function.

### Tricuspid Valve
- Tricuspid Valve Summary: Normal tricuspid valve structure and function.

### Pulmonic Valve
- Peak Velocity: 0.9 m/s
- Pulmonic Valve Summary: Normal pulmonic valve structure and function.

## Structures

### Left Atrium
- LA Dimension: 3.2 cm
- L.A./Aorta: 1.33
- Left Atrium Summary: Normal left atrium.
- Left Ventricle
A GOOD REPORT
What makes a good GP echo report

• All 4 chambers and 4 valves described
• Simple summary of results
• Avoid abbreviations
• Results contextualised eg Mild mitral regurgitation. No significant valve disease
• If significant abnormality, described in summary
• If abnormal, advise on action
• Rapid reporting and communication
What makes a good GP echo report

• Need senior clinical opinion interpreting / translating
• Put yourself in the position of the GP
• A bad report generates more unnecessary work for everyone
• Easy to get descriptions a little “wrong” even if very experienced
• Support for enquiries
## Transthoracic Echocardiography Report (TTE)

### Gender
- Male
- Race: Black

### Procedure
- Referring Physician: N/A
- Sonographer: N/A
- Investigator: N/A
- Technical Quality: Adequate visualization
- MI: 120 bpm throughout
- LV systolic function: Good
- RV systolic function: Good
- Atrial fibrillation: No
- Hypertension: No
- Diabetes mellitus: No
- Anemia: No
- CABG: No
- Valve disease: No

### Conclusions
- HR 120 bpm throughout
- Good LV and RV systolic function
- All LV segments including the inferior wall contract well
- Mid RV and AR
- No significant valve disease
- No evidence for previous MI

### Signature
- Electronically signed by Dr. J. Maye (Reviewer) on 30/06/2010 09:31

## Valves

### Mitral Valve
- Peak E- Wave: 1.04 m/s
- Peak A- Wave: 0.79 m/s
- Deceleration Time: 97 ms

### Aortic Valve
- AV Veloc: 1.23 m/s
- LVOT Peak Velocity: 0.89 m/s
- LVOT Diameter: 1.61 cm

### Tricuspid Valve
- TR Veloc: 2.9 m/s

### Pulmonic Valve
- Peak Veloc: 1.43 m/s
- Peak Gradient: 8.18 mmHg

## Structures

### Left Atrium
- LA dimension: 3 cm
- LAA area: 14.5 cm²
- LA:Aorta: 2.15

### Left Ventricle
- Ejection Fraction: 3.14 cm
- Sytocholic Dimension: 2.13 cm
- Post Wall: 1.36 cm
- TDI Let f: 14.5 cm

### Right Atrium
- RA area: 10.2 ml

### Right Ventricle
- RV dimension (base): 2.3 cm
- RV S Velocity: 3.4 cm/s

### Vessels
- IVC Inspirat: 1.5 cm
- IVC Exciput: 3.9 cm
- Aorta Anus: 1.97 cm
- Sinus of Valsalva: 3.06 cm
- Ascending aorta: 1.29 cm
- Descending aorta: 3.05 cm

---

For more information, please refer to the full report.
## Transthoracic Echocardiography Report (TTE)

### Patient Details
- **Gender:** Male
- **Race:** Unknown
- **Procedure:** Sonographer: Simharaan Sudha

### Technical Quality
- **ECG:** Faulty Leads
- **Comments:** Right Atrium Stenosis Reported on 06/09/11

### Conclusions
**Good Atrial Ventricular Function**
- **Moderate mitral valve stenosis (MVD):**
  - Mitral Valve thickening with mildly calcified PML base
  - Mitral Valve Echogenicity
  - Mitril Valve opening well
  - Mild MR
- **Aortic Valve:**
  - AV A-wave: 1.56 m/s
  - LVOT Peak Velocity: 1.15 m/s
  - Normal AV opens well
  - Grade AR
- **Tricuspid Valve:**
  - TR Velocity: 3.16 m/s
  - Tricuspid Valve Stenosis
  - Normal Mid TR
  - Estimated RVSP = 40mmHg + JVP
- **Pulmonary Valve:**
  - Peak Velocity: 0.72 m/s
  - Acceleration Time: 50 msecs

### Structures
- **Left Atrium:**
  - LA Diameter: 3.8 cm
  - LAA Diameter: 1.56
- **Left Ventricular:**
  - Diastolic Diameter: 4.8 cm
  - Systolic Diameter: 2.5 cm
  - FS: 42.22%
  - TDI E': 6.0 cm/s
  - TDI E: 19.82
- **Right Atrium:**
  - Normal right atrial size.
- **Right Ventricular:**
  - TRAPS: 3.5 cm
  - RV free wall: 2.3 cm
- **Vessels:**
  - Aorta:
    - Aortic Annulus: 2.43 cm
    - Sinus of Valsalva: 2.9 cm