

# **Study of haemodynamics of Chitra Valve in mitral position- a single centre experience**



**Thesis**

**Submitted for the partial fulfilment of the requirement for the degree of**

**MCh in Cardiovascular and Thoracic Surgery**

**by**

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# **Declaration**

I, **Dr Kiran Chowdlu Kalappa**, hereby declare that this thesis titled “ Study of haemodynamics of Chitra Valve in mitral position- a single centre experience” has been prepared by me under the capable supervision and guidance of **Dr. Vivek V Pillai**, Additional Professor and **Prof Jayakumar K**, Professor Senior Grade, Department of Cardiothoracic and Vascular Surgery and **Dr.Sanjay G**, Additional Professor Department of Cardiology, Sree Chitra Tirunal Institute for Medical Sciences & Technology, Thiruvananthapuram.

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# **Certificate**

We hereby certify that this thesis titled

**Study of haemodynamics of  
Chitra Valve in mitral position- a single centre experience**  
is the bonafide work of **Dr Kiran Chowdlu Kalappa**, MCh CVTS resident,  
done under our guidance at Department of cardiovascular and thoracic  
surgery and Department of cardiology at Sree Chitra Tirunal Institute for  
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He has shown keen interest in preparing this project.

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# **Certificate**

I hereby certify that this thesis titled

**Study of haemodynamics of**

**Chitra Valve in mitral position- a single centre experience**

Is the bonafide record of work done by **Dr Kiran Chowdlu Kalappa** , MCh CVTS  
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Thiruvananthapuram

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## ABBREVIATIONS AND EXPANSIONS

|                |                                            |
|----------------|--------------------------------------------|
| <b>MV</b>      | <b>MITRAL VALVE</b>                        |
| <b>MS</b>      | <b>MITRAL STENOSIS</b>                     |
| <b>MVR</b>     | <b>MITRAL VALVE REPLACEMENT</b>            |
| <b>CMC</b>     | <b>CLOSED MITRAL COMMISSUROTOMY</b>        |
| <b>CMV</b>     | <b>CLOSED MITRAL VALVOTOMY</b>             |
| <b>OMV</b>     | <b>OPEN MITRAL VALVOTOMY</b>               |
| <b>BMV</b>     | <b>BALLOON MITRAL VALVOTOMY</b>            |
| <b>RV</b>      | <b>RIGHT VENTRICLE</b>                     |
| <b>PAH</b>     | <b>PULMONARY ARTERIAL HYPERTENSION</b>     |
| <b>RVSP</b>    | <b>RIGHT VENTRICULAR SYSTOLIC PRESSURE</b> |
| <b>CPB</b>     | <b>CARDIOPULMONARY BYPASS</b>              |
| <b>TR</b>      | <b>TRICUSPID REGURGITATION</b>             |
| <b>MR</b>      | <b>MITRAL REGURGITATION</b>                |
| <b>BSA</b>     | <b>BODY SURFACE AREA</b>                   |
| <b>SVP</b>     | <b>SUB VALVULAR PATHOLGY</b>               |
| <b>RHD</b>     | <b>RHEUMATIC HEART DISEASE</b>             |
| <b>MVA</b>     | <b>MITRAL VALVE AREA</b>                   |
| <b>MS GRAD</b> | <b>MITRAL STENOSIS GRADIENT</b>            |
| <b>CHVP</b>    | <b>CHITRA HEART VALVE PROSTHESIS</b>       |

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TITLE

# **STUDY OF HAEMODYNAMICS OF CHITRA VALVE IN MITRAL POSITION- A SINGLE CENTRE EXPERIENCE**

# INTRODUCTION

## INTRODUCTION

In India, a large number of people suffer Rheumatic heart disease and related complications. It is estimated that six out of every 1000 children suffer Rheumatic fever between the age of five and fifteen years. The major cause of long term morbidity and mortality due to Rheumatic fever is the result of heart valve dysfunction. Valve replacement is considered the therapy to avoid risk of heart failure and death.

Although mechanical heart valves (MHV) have evolved a level of universal acceptance, they have never reached a level of performance comparable to that of the natural valve of the heart. Consequently mechanical heart valve implantation is not always an ideal solution. There is continual obligation to better understand the mechanical behaviour of mechanical heart valves in vitro and in vivo, to study the effects and presence of thrombosis, haemolysis, cavitation, transvalvular pressure fluctuations, high level of stress and certainly the association and interaction of all these conditions. Apparently the flow through pivoted leaflets of mechanical heart valves induces a combination of flow characteristics, which are clearly dependent on the specific valve design and orientation that could result too many pathological condition. All these conditions reduce the efficiency of the heart being in a state far from natural. Clinical practice has demonstrated that the orientation of MHV's greatly effects the postoperative performance of the left ventricle.

The second most common heart operation is valve replacement surgery. Cardiac valve are intended to fully replace a diseased natural valve and thus replacement has been established clinical practice for more than four decades. Today more than 1.5 lakh valves are replaced worldwide per year. The most commonly replaced valves are the mitral and aortic valves due to the high pressure loads on the left atrium and left ventricle of the heart. Any of the four valves can become either too leaky (regurgitation) or too tight (stenotic). The two major problems related to the blood flow are thrombus formation and haemolysis, which damage the red blood cells. It is well known that the shear stress in the

fluid and the flow separation around the valve are blamed for such disastrous phenomenon, therefore, it is obvious that there is a need for more effective heart valve to be designed to prevent these types of situation from occurring.

# **REVIEW OF LITERATURE**

## REVIEW OF LITERATURE

It is estimated that six out of every 1000 children suffer Rheumatic fever between the age of five and fifteen years. The major cause of long term morbidity and mortality due to Rheumatic fever is the result of heart valve dysfunction. Valve replacement is considered the therapy to avoid risk of heart failure and death. Although mechanical heart valves (MHV) have evolved a level of universal acceptance, they have never reached a level of performance comparable to that of the natural valve of the heart. Consequently mechanical heart valve implantation is not always an ideal solution. There is continual obligation to better understand the mechanical behaviour of mechanical heart valves in vitro and in vivo, to study the effects and presence of thrombosis, haemolysis, cavitation, transvalvular pressure fluctuations, and high level of stress and certainly the association and interaction of all these conditions.

An artificial heart valve should meet the following requirements to meet this purpose

Functional Requirements

- Must respond to pressure changes quickly, both while opening and closing
- While open, should offer minimal resistance to forward flow of blood
- While closing and while closed, should permit minimal regurgitation

Physical and Mechanical Requirements

- Should be sterilisable
- Should not absorb water or other body fluids and change size or shape
- should have adequate wear resistance and fatigue strength to with stand
- the constant cycling of 38 million cycles per year for the life of the patient

Design and Material Requirements

- Should be biocompatible
- Should be blood compatible : should not induce blood clots to be formed on
- its surface or in its vicinity
- Should have adequate resistance against degradation and corrosion in the
- physiological environment



## **ARTIFICIAL VALVES:**

Various artificial heart valves have been developed over the last five decades. Currently two types of artificial heart valves are mainly used; the mechanical heart valve and the biological tissue valve. Mechanical heart valves are made from materials of synthetic origin like metals, ceramics and polymers whereas the biological valves may employ in addition to synthetic materials, materials of biological origin after proper modification using physicochemical treatments. Mechanical heart valves are classified into three major categories based on the primary design of the valve mechanism; caged ball, tilting disc and bileaflet types.

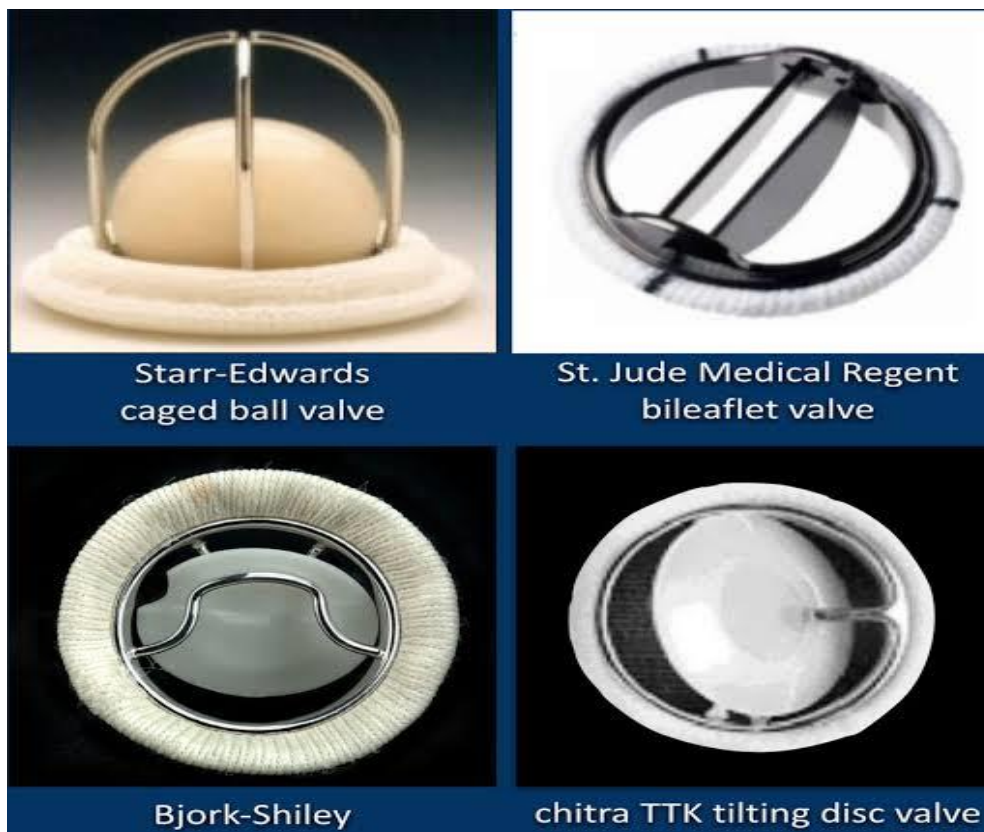


Fig 1. Different types of mechanical valves

The tissue valves could be made from human or animal tissues. The main drawback of the tissue heart valves is their tendency to calcify and become non-functional within a relatively short span (typically 5-7 years), especially in young

recipients [1,2]. Tissue valves, which are made from pig heart valves or bovine pericardium usually do not require the lifelong use of anti-coagulation drugs. Older people who are more vulnerable to the bleeding effects of warfarin/ acitrom are ideal candidate for tissue heart valves. However, for people who are already taking warfarin for another problem such as atrial fibrillation or deep vein thrombosis, a mechanical valve make more sense. On the other hand, recipients of mechanical valves have to be under anticoagulation therapy, throughout their life to minimise the risk of thromboembolic complications.

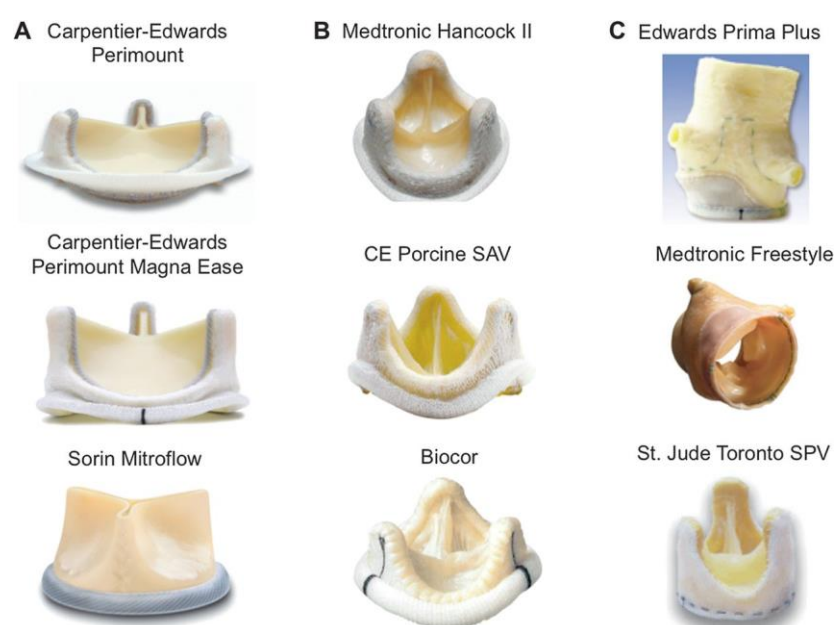


Fig 2. Different types of bioprosthetic valves

Latest to the addition of valve treatments is the percutaneous placement of artificial valve like percutaneous transcatheter mitral valve replacement, percutaneous aortic valve implantation, and percutaneous pulmonary valve replacement. Severe symptomatic valvular heart disease patients who are unfit for surgical valve replacement with concomitant severe systolic heart failure or coronary heart disease as well as in people with comorbidities such as cerebrovascular disease, peripheral vascular disease, and chronic kidney disease are treated with these techniques.



Fig 3. Different types of transcatheter valves

## DIFFERENCES BETWEEN MECHANICAL AND BIOPROSTHETIC VALVE

|                             | MECHANICAL       | BIOPROSTHETIC      |
|-----------------------------|------------------|--------------------|
| LIFESPAN                    | 30 YEARS OR MORE | 10-15 YEARS        |
| THROMBOGENICITY             | MORE             | LESS               |
| NOISE                       | MORE             | NEGLIGIBLE         |
| PATIENT-PROSTHESIS MISMATCH | MORE             | LESS               |
| VALVE DETERIORATION         | DURABLE          | HIGHLY SUSCEPTIBLE |
| HEMODYNAMICS                | IMPROVING        | CLOSE TO NATURAL   |
| ANTICOAGULATION             | LIFELONG         | 3 MONTHS           |
| RISK OF REOPERATION         | LESS             | MORE               |

Table 1. Differences between mechanical and bioprosthetic valve

### Development of mechanical heart valves: International scenario:

Hufnagel and Harvey (1953) were the first to introduce the concept of an artificial heart valve by placing a Lucite caged ball valve in the descending thoracic aorta of a patient for correcting aortic valve insufficiency [3]. However, heart valve replacement became a standard practice only in the 1960s with the replacement of aortic valve with a

caged ball valve by Harken and followed by replacement of mitral valve by Albert Starr. The initial designs of mechanical valves were centrally occluding caged ball type. The Starr- Edwards caged ball valve is made from cobalt based alloy, Stellite-21 and silicone rubber. Even though the caged ball valves proved to be very durable, their centrally occluding design results in a larger pressure drop and higher turbulent shear stresses compared to other mechanical valve designs. The relatively large profile of caged ball valves also increases the possibility of interference with surrounding anatomical structures.

The tilting disc valves, with improved hemodynamic characteristics, were introduced in the late 1960s. The design became successful with the introduction of the Bjork-Shiley valves (1969).

| VALVE DESIGN        | DESIGN CHARACTERISTICS                                                                                                                                                                                                                                                           | DESIGN RELATED DRAWBACKS                                                                                                                                                                                                                                                         |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Caged ball</b>   | <ul style="list-style-type: none"> <li>• Time tested</li> <li>• Structurally sound built in redundancy in the strut design</li> <li>• Low levels of regurgitation in the closed phase.</li> </ul>                                                                                | <ul style="list-style-type: none"> <li>• Relatively large valve height</li> <li>• Flow separation downstream of the valve, which might lead to thrombus formation</li> </ul>                                                                                                     |
| <b>Tilting disc</b> | <ul style="list-style-type: none"> <li>• Better hemodynamic characteristics than the caged ball design</li> <li>• Lower valve height and hence suitable for all anatomical locations</li> <li>• Maximum number of valves used till date is of the tilting disc design</li> </ul> | <ul style="list-style-type: none"> <li>• Lower levels of redundancy in the cage strut structure</li> <li>• Lower minor orifice flow can lead to tissue over growth and thrombosis</li> <li>• Strut fracture and related complications have occurred in certain models</li> </ul> |
| <b>Bileaflet</b>    | <ul style="list-style-type: none"> <li>• Uniform flow profiles</li> <li>• Lower levels of structural complications</li> </ul>                                                                                                                                                    | <ul style="list-style-type: none"> <li>• Hinge design prone to thrombus formation and valve failure</li> <li>• Leaflet escapement reported in certain models</li> </ul>                                                                                                          |

Table 2. Characteristics of mechanical valves

This was followed by the introduction of Lillehei-Kaster (1970), Medtronic-Hall (1977) and Bicer valves (1979) in the market. The initial design consisted of polyacetal (*Delrin*) disc with Stellite-21 cage and poly tetra fluoro ethylene (PTFE) sewing ring as in Bjork-Shiley Delrin valve. Delrin exhibited excellent wear characteristics and mechanical strength with satisfactory long term performance. But the main problem with this material was its propensity to swell on absorption of moisture during steam sterilization and blood contact. This led to the replacement of this material with pyrolytic carbon, which since then had become the most preferred material for mechanical heart valve occluders. Pyrolytic carbon is deposited on high density graphite substrates at temperatures around 1200°C using fluidized bed reactors. Increase in strength and wear resistance is obtained by alloying with silicon. The pyrolytic carbon exhibits excellent blood compatibility as well as wear and fatigue resistance. In the late 1970s, a bileaflet design was introduced by St. Jude Medical (1977) and several different bileaflet models like Duramedics (1982), Carbomedics (1986) and ATS (1992) followed. The leaflets and the housing of these bileaflet valves are made from pyrolytic carbon. The bileaflet valves show improved hemodynamic characteristics especially in smaller sizes compared to tilting disc valves.



### **Need for development of indigenous Chitra Heart Valve Prosthesis:**

*“Nothing was more painful or cruel than the denial of a surgical procedure to a patient on the ground that a life saving device was beyond his or her means”*

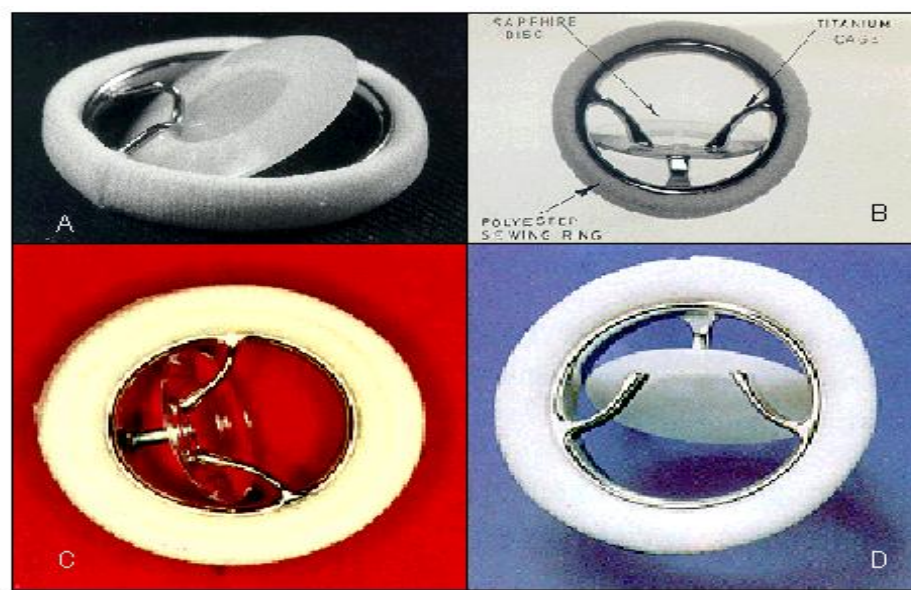
- Dr. M.S. Valiathan.



India's need for artificial was expected to rise in view of high prevalence of Rheumatic heart disease. During the eighties, less than 4000 valves were implanted every year in a population of 680 million. These estimates pointed towards the staggering backlog of cases requiring a prosthetic heart valve for replacement. Apart from prophylaxis at community level, need for artificial valve for replacing the damaged valves was a need anticipated to rise at enormous proportions. It was further identified that the artificial valve was an economical problem in view of the astronomical cost effect of the existing available valves. A multidisciplinary team was formed at Sree Chitra Tirunal Institute for Medical Sciences and Technology to take up this challenge of developing an artificial heart valve.

|            |                                                                                                                          |
|------------|--------------------------------------------------------------------------------------------------------------------------|
| Delrin-500 | Polyacetal material used for the first Chitra valve model                                                                |
| Delrin-ST  | Acetal-Elastomer alloy with improved impact resistance and toughness                                                     |
| Delrin-AF  | Polyacetal containing fibers of Polytetra Fluoro Ethylene (PTFE) for reducing the friction and improving wear resistance |
| EKNOL-PTFE | Composite of EKNOL polyester and PTFE                                                                                    |
| UHMW-PE    | Ultra high molecular weight polyethylene                                                                                 |

Table 3. Shows the different material tried for the occluder.



A .. Titanium - Delrin

C .. Haynes 25 +TiN - Sapphire

B .. Titanium - Sapphire

D .. Haynes 25 - UHMWPE

Fig 5. Different types of Chitra Valve

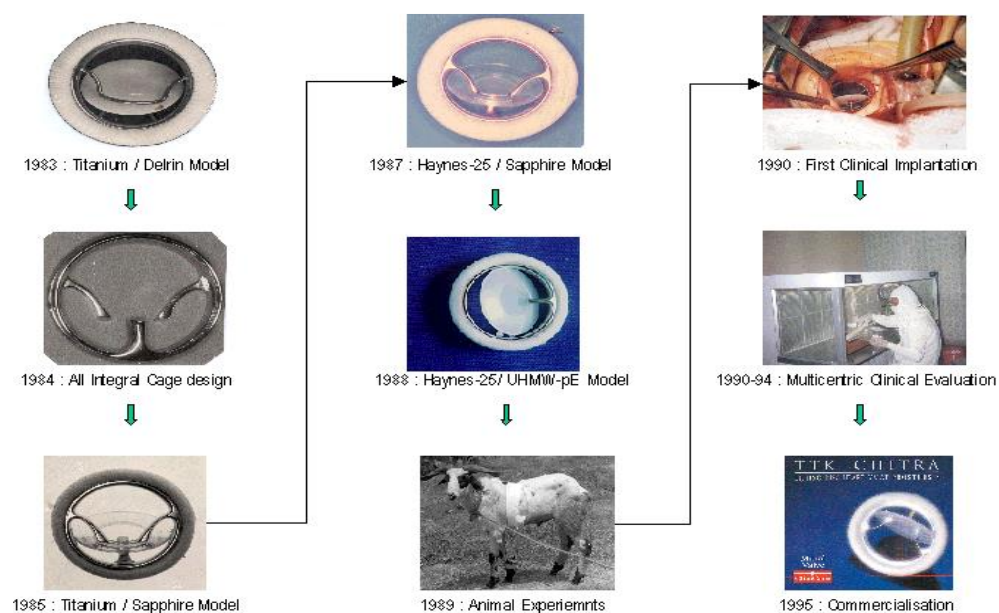


Fig 6. Development of Chitra Heart Valve prosthesis in various stages

The current Chitra heart valve model has an ultrahigh molecular weight polyethylene (UHMWPE) disc; a Haynes-25 alloy cage and a sewing ring fabricated from warp knitted polyethylene terephthalate (PET). The basic features of the design include:

- *Free floating disc* able to rotate on its center to avoid the problem of thrombosis around the hinge as well as to distribute the wear over its surface.
- *Tilt axis* at one fourth the disc diameter (at the quarter chord point)
- *Cage entrance and exit curvature* : Bell mouthing of the inlet and outlet edges at the of the cage to permit smooth entrance and exit of blood
- *Disc Shape*: A planoconvex disc with inlet side flat, increasing the inflow area into the minor orifice and making the fabrication of the cage and disc easier
- *Cage Structure*: The struts machined integral with the ring from solid metallic block.

Chitra heart valve underwent vigorous stage wise testing as per prescribed protocol and further clinical evaluation after approval of institutional ethics committee. The first clinical implantation was carried out on 06 Dec 1990. The valve was implanted at total of six centres between 1990 and 1995. Among all patients who received the implant, 95.4% were followed up successfully for a mean period of 4.25 years. Total follow-up amounted to 1212 patient years. The valve prosthesis results were compared with those of the Medtronic-Hall valve (6). There was no structural valve deterioration or paravalvular leak reported. Linearized rate of late thromboembolism and anticoagulant related bleeding were 6.2%/patient-year and 0.54%/patient-year respectively.

Higher rate of thromboembolism reflects poor socioeconomic background of Indian patients and hence poor compliance to anticoagulants and irregular monitoring of INR values. Rate of infective endocarditis was low (0.54%/patient-year), which suggest resistance of valve to infection. The total actuarial survival estimated at 2 years after valve implantation was 89.5%.



| Sl. No | Mortality / Complication / Actuarial value       | Incidence in % / patient-year |                |
|--------|--------------------------------------------------|-------------------------------|----------------|
|        |                                                  | Chitra                        | Medtronic-Hall |
| 1      | Late Mortality                                   | 4.3 ± 0.6                     | 6.3 ± 0.5      |
| 2      | Valve related mortality                          | 2.9 ± 0.5                     | 2.9 ± 0.3      |
| 3      | Thrombosis                                       | 1.1 ± 0.3                     | 1.2 ± 0.2      |
| 4      | Embolism                                         | 1.8 ± 0.4                     | 3.3 ± 0.3      |
| 5      | Paravalvular leak                                | 0.0                           | 2.2 ± 0.2      |
| 6      | Infective endocarditis                           | 0.5 ± 0.2                     | 0.7 ± 0.2      |
| 7      | Anti-coagulant related hemorrhage                | 0.5 ± 0.2                     | 0.7 ± 0.2      |
| 8      | Freedom from thrombo-embolism at 5 years         | 87.7 ± 2.0                    | 85 ± 2.0       |
| 9      | Freedom from all valve related events at 5 years | 76.3 ± 2.6                    | 75 ± 3.0       |
| 10     | Total Survival at 5 years                        | 75.8 ± 2.6                    | 75 ± 2.0       |

Table 4. Comparison between clinical results of Chitra & Medtronic-Hall Valves

Implantation of tilting-disc valves is routinely performed in many centers all over the world. A mechanical tilting-disc valve consists of an annular metallic stent, which is sutured to the native valve annulus with a sewing ring. The occluding mechanism is a circular disc, which is suspended from the annular ring by a single strut. The strut attaches the disc eccentrically so that the back pressure on larger segment of the disc will tend to close the valve. The disc occluder pivots open 60 to 75 degrees. Eccentric disc position produces two orifices of different size and shape; a major orifice and a minor orifice. The complex flow pattern across the valve, wherein 70% of flow passes through major orifice and 30% through the minor orifice, creates impedance to forward flow and a large area of stagnation on the downstream surface of the disc.

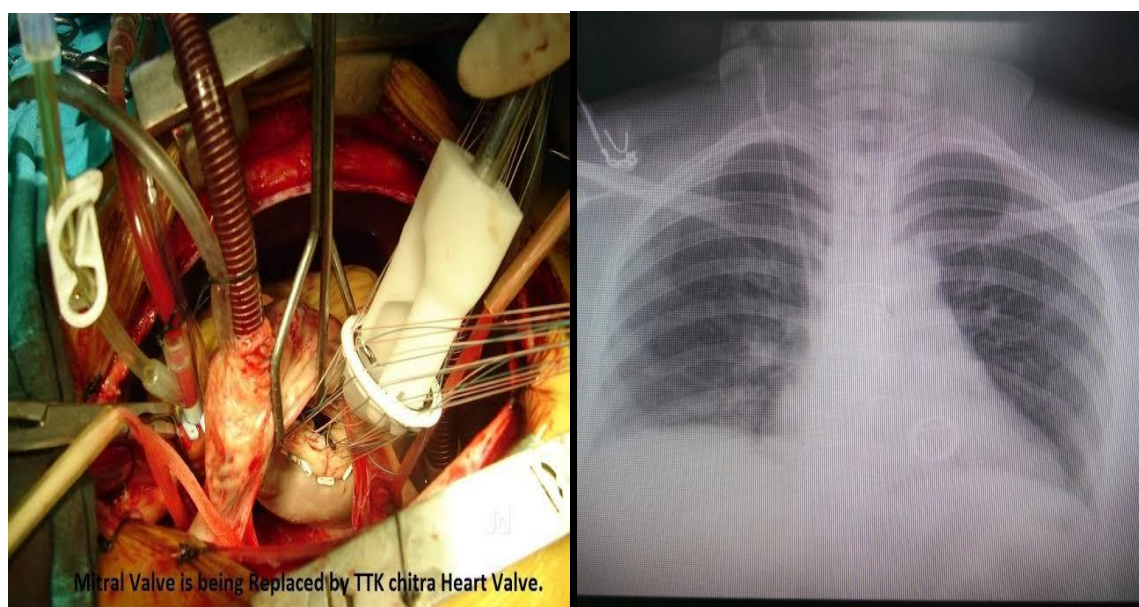


Fig 7. Photos showing mitra valve implantation with chitra Valve and chest X-Ray showing the position of the valve after implantation.

## **COMPLICATIONS OF PROSTHETIC VALVE IMPLANTATION.**

### **PERI PROSTHETIC LEAK**

A mild degree of regurgitation jets are common in all mechanical valves termed “physiologic regurgitation jets”. Two types have been described,

- 1) Closing volume - caused by occluder disc mechanism
- 2) Washing jets – seen where the leaflets meets the housing at hinge points, they are located inside the sewing ring and these washing jets are thought to prevent formation of thrombi at sites of stasis within the housing.

Appearance and number of physiologic regurgitation jets vary with the type of the prosthetic valve. They are located within the sewing ring, usually low in velocity, homogeneous in colour, less than 5 cm in length and regurgitant fraction rarely exceeds 15%.

Pathological regurgitation can be central or paravalvular; it can be seen with both the mechanical and biological valve types. Paravalvular regurgitation is seen outside the sewing ring. Mild degree of central regurgitation is commonly seen with biological valves. Prevalence of paravalvular regurgitation jets is 5 to 20 % immediately following implantation and majority of these leaks have a benign course without causing hemodynamic deterioration and are clinically insignificant. Precise localization of paravalvular regurgitation jets requires multiplane TEE examination and use of off axis views.

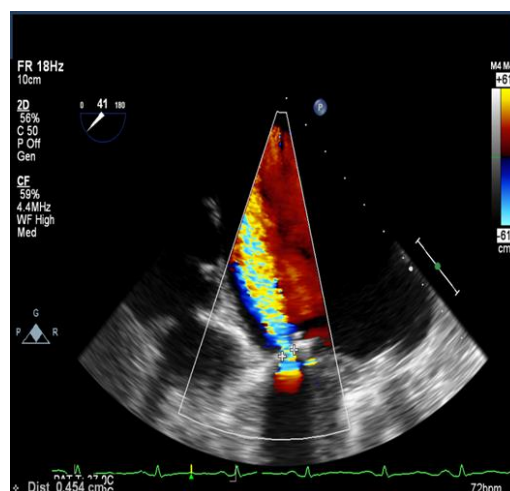


Fig 8. TEE image showing paravalvular leak.

Preoperative infective endocarditis and mitral annular calcification increase the risk of this complication. It can cause refractory haemolytic anaemia. Surgery is indicated in all symptomatic patients and in those with minimal symptoms that requires transfusion. Alternatively, off label application of trans catheter septal defect closure devices for these leaks have been successful.

### **THROMBOEMBOLIC EVENTS**

Thromboembolism is one of the common complications of mitral prosthesis, less to the biologic valves. The incidence of thromboembolism is currently available bileaflet and tilting disc valves is 1.5% to 2% per patient year. Risk is higher in patients with a large left atrium, intra atrial clot or chronic atrial fibrillation. Maintenance of life long therapeutic anticoagulation with warfarin/acitrom is the most important factor in influencing the rate of thromboembolism in patients with a mechanical mitral prosthesis.

### **ACUTE VALVE THROMBOSIS**

This complication occurs more frequently with a mechanical valve than a biologic valve. This complication occurs almost exclusively in the setting of suboptimal anticoagulation. Patients usually present acutely and report a short duration of symptoms. Echocardiography is diagnostic. If the patient is not in the cardiogenic shock, acute thrombotic occlusion can be treated with thrombolytic agents. Haemodynamic instability warrants emergency operation.

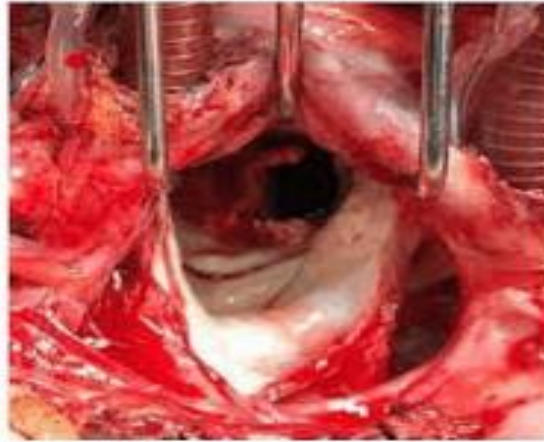


Fig 9. Photo showing the thromboembolic complication of the prosthetic valve leading to restriction of disc movement.

### **STRUCTURAL VALVE DEGENERATION**

Structural valve degeneration is the principle complication of biologic prostheses in the mitral position. The incidence of structural valve degeneration approaches to zero for bileaflet, tilting disc and ball and cage valves. Mechanical valve dysfunction owing to the chronic ingrowth of tissue and impairment of the closure mechanism is observed infrequently.

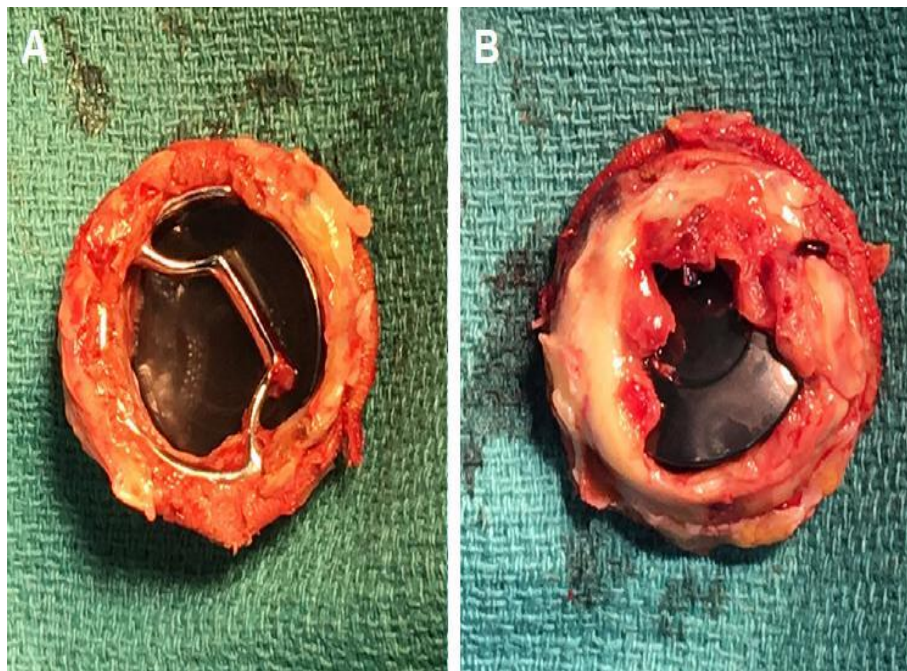


Fig 10. Photo showing the pannus formation in a tilting disc valve

|                              | Normal | Possible stenosis | Significant stenosis |
|------------------------------|--------|-------------------|----------------------|
| Peak velocity (m/sec)        | < 1.9  | 1.9 to 2.5        | >2.5                 |
| Mean gradient (mm Hg)        | < 5    | 6-10              | >10                  |
| VTIPrMV/VTILVOT (DVI)        | < 2.2  | 2.2-2.5           | >2.5                 |
| EOA by CE (cm <sup>2</sup> ) | > 2    | 1-2               | <1                   |
| PHT (m sec)                  | <130   | 130-200           | >200                 |

Table 5. Doppler parameters of prosthetic mitral valve function

### **HAEMORRHAGIC EVENTS FROM ANTICOAGULATION**

Haemorrhage from anticoagulation usually occurs in the gastrointestinal, urogenital and central nervous systems and severity is proportional to the INR. A recent meta-analysis report showed the incidence rates of 1% -2% per year. This improvements has coincided with the haemodynamic improvements of mitral valve prostheses that permit less intense anticoagulation goals. We in our institution have a protocol of maintaining 2.5-3.5 for mechanical valve in mitral position

## **AIM OF THE STUDY**

## **AIM OF THE STUDY**

1. To study the haemodynamic performance and safety of TTK-CHVP in mitral position.
2. To study the complications of TTK-CHVP in mitral position over 5 to 10 years.



## **MATERIALS AND METHODS**

## **MATERIALS AND METHODS**

### **Study Design:**

Retrospective, observational study.

### **Study design – Observational model**

Patient data from medical records will be collected, which includes pre-operative, Intra operative and post-operative follow up records of patient from OPD. Records of Patient history, Clinical findings, Investigations including ECHO parameters will be collected.

Patient will be not called for follow up on purpose, after their regularly yearly follow up data will be collected from records.

### **Setting:**

SCTIMST, a tertiary referral center and university level hospital, annually performing more than 1100 adult cardiac surgeries with valve surgeries amounting to 40% of it.

### **Approval from Institutional Ethics Committee:**

Our study was approved by the Technical Advisory Committee (TAC) and Institutional Ethics Committee (IEC) of SCTIMST. TAC registration number was SCT-/S/2018/740 & IEC registration number was SCT/IEC/1223/JUNE-2018.

### **Participants:**

All patients who underwent Mitral valve replacement with TTK-CHVP during 01 Jan 2003 to 31 Dec 2013.

### **Informed consent:**

Informed written consent was not obtained as this is a retrospective observational study and the permission for the same has been obtained from the TAC committee.

**Study groups:**

All patients who underwent Mitral valve replacement with TTK-CHVP during 01 Jan 2003 to 31 Dec 2013.

**Sample size:**

TTK Chitra prosthetic valve has been in use in our hospital since 90's but extensive use of Chitra Valve started from 2015. We included a sample size of 183 patients in our study.

**Inclusion criteria:**

All patients who underwent Mitral valve replacement with TTK-CHVP during 01 Jan 2003 to 31 dec 2013.

**Exclusion criteria:**

1. Patients under 16 yrs of age.
2. Patients who underwent redo MV replacement.
3. Patients who underwent MVR with other valve replacement.
4. Patients who underwent MVR with CABG.
5. Participants will not include pregnant woman, Neonate, Prisoner, Normal/Healthy volunteer, Student, and Staff of the institute.

**Rationale for selecting them:**

Patients who have undergone MV replacement with CHVP needs follow up for the recurrence of symptoms or failure of valve functioning with thrombus, paravalvular leak or worsening of the disease. I want to evaluate these patients for the haemodynamics of CHVP in mitral position.

# RESULTS

## RESULTS AND OBSERVATION

### Statistical methods:

Post-operative LA size and LV size, MV gradient, need for redo Valve replacement and complications were considered as the outcome variables. The demographic, clinical, preoperative echocardiographic and operative parameters were considered as other relevant variables for analysis.

Descriptive analysis was carried out by mean and standard deviation for quantitative variables, frequency and proportion for categorical variables. Non normally distributed quantitative variables were summarized by median and interquartile range (IQR). Data was also represented using appropriate diagrams like bar diagram, pie diagram.

All Quantitative variables were checked for normal distribution within each category of explanatory variable by using visual inspection of histograms and normality Q-Q plots. Shapiro-wilk test was also conducted to assess normal distribution. Shapiro-wilk test p value of  $>0.05$  was considered as normal distribution.

The change in the quantitative parameters, before and after the intervention was assessed by paired t-test (In case of two time periods). Data was also represented using appropriate diagrams like error bar diagram.

P value  $< 0.05$  was considered statistically significant. IBM SPSS version 22 was used for statistical analysis.

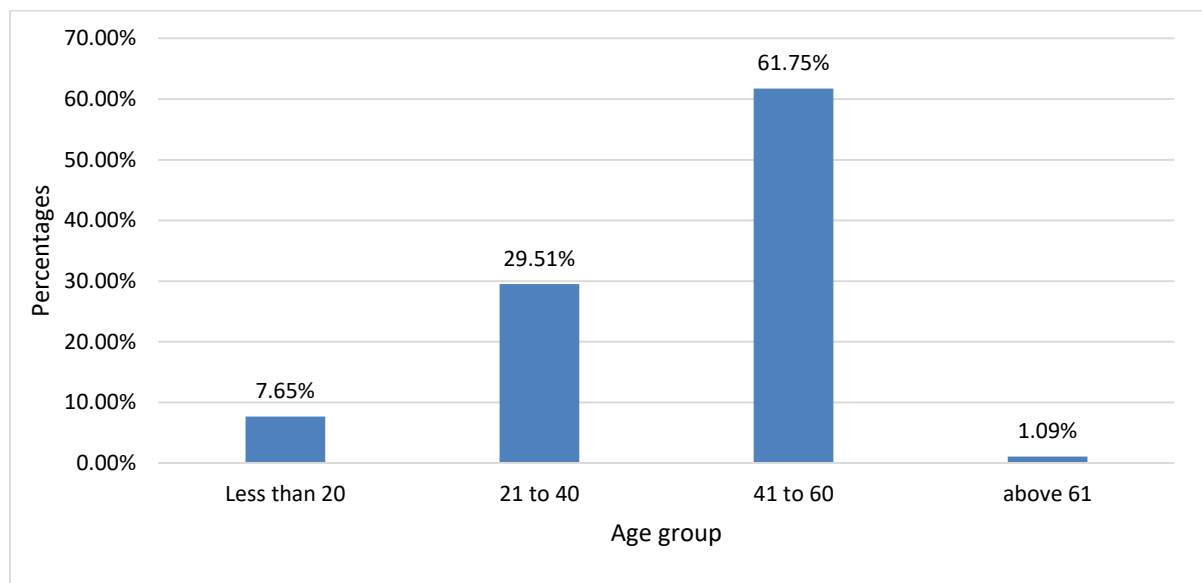
A total of 183 patients satisfied the inclusion criteria for the study of mitral valve replacement by CHVP and their records were followed up. Out of the 183, patients were followed up for minimum of 5 years and some for more than 14 yrs. No in-hospital

mortality was recorded as per the data collected. Many patients were lost to follow up after 5 years.

**Table 6. Descriptive analysis of age group in the study population**

| Age group   | Frequency | Percentages |
|-------------|-----------|-------------|
| 20 and less | 14        | 7.65%       |
| 21 to 40    | 54        | 29.51%      |
| 41 to 60    | 113       | 61.75%      |
| above 61    | 2         | 1.09%       |

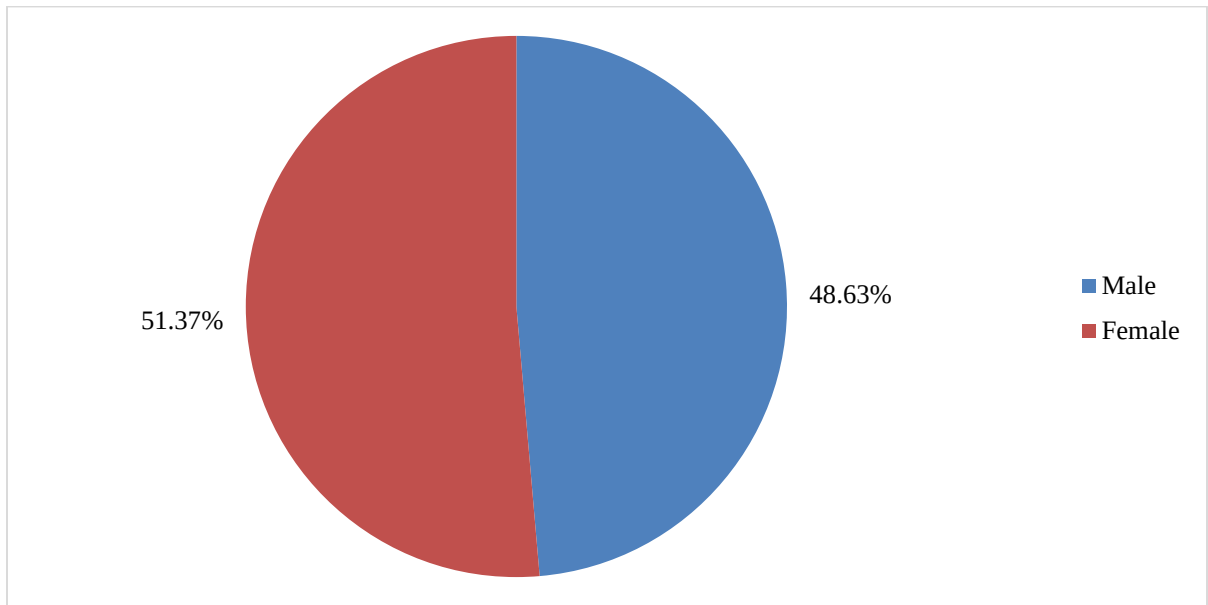
**Figure 11: Bar chart of age group in the study population (N=183)**



About 31% presented in the 2<sup>nd</sup> and 3<sup>rd</sup> decade with symptoms and majority about 61.75% patients after 40 yrs of age.

**Table 7: Descriptive analysis of gender in the study population (N=183)**

| Gender | Frequency | Percentages |
|--------|-----------|-------------|
| Male   | 89        | 48.63%      |
| Female | 94        | 51.37%      |

**Figure 12: Pie chart of gender in the study population (N=183)**

In the study, about 51 % were females and 49 percentage were males.

**Table 8: Descriptive analysis of primary diagnosis in the study population (N=183)**

| Primary Diagnosis    | Frequency | Percentages |
|----------------------|-----------|-------------|
| RHD                  | 157       | 85.79%      |
| IE                   | 6         | 3.28%       |
| Chordal rupture /MVP | 20        | 10.9%       |

Eighty five percentage of patients who underwent MVR had rheumatic heart disease and about 3.28 % had infective endocarditis and valve leaflet tear following BMV leading to severe MR and 11% had chordal rupture with MVP as a indication for surgery.

**Table 9: Descriptive analysis of diagnosis in the study population (N=183)**

| Other diagnosis      | Frequency | Percentage |
|----------------------|-----------|------------|
| Sev MS ( no MR )     | 52        | 28.41%     |
| MS + MR              | 123       | 67.2%      |
| Sev MR ( no MS )     | 8         | 4.3%       |
|                      |           |            |
| MODERATE TR          | 34        | 18.58%     |
| SEVERE TR            | 10        | 5.46%      |
| <b>AF</b>            |           |            |
| Yes                  | 54        | 29.50%     |
| No                   | 129       | 70.50%     |
| <b>LA CLOT</b>       |           |            |
| Yes                  | 20        | 10.93%     |
| <b>PAH</b>           |           |            |
| MILD                 | 8         | 4.37%      |
| MODERATE             | 42        | 22.95%     |
| SEVERE               | 29        | 15.85%     |
| <b>CONTROLLED HF</b> |           |            |
| Yes                  | 3         | 1.64%      |

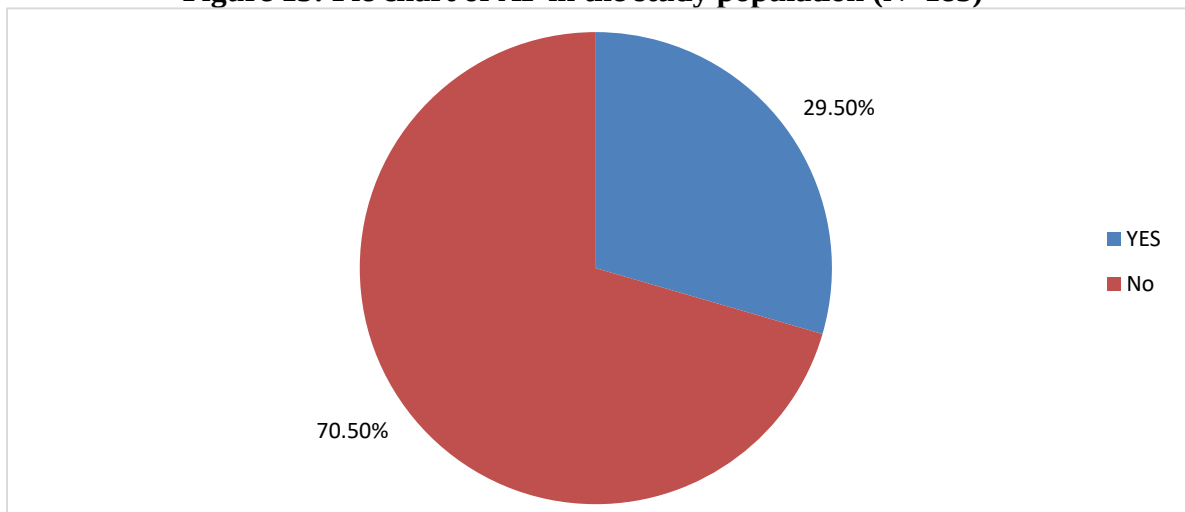
In our study twenty eight percent had severe mitral stenosis with no MR and 67.2% with MS with MR majority from leaflet thickening, calcification of the valve leaflets, commissural fusion and chordal shoertening and 4.3% had severe MR with no MS which



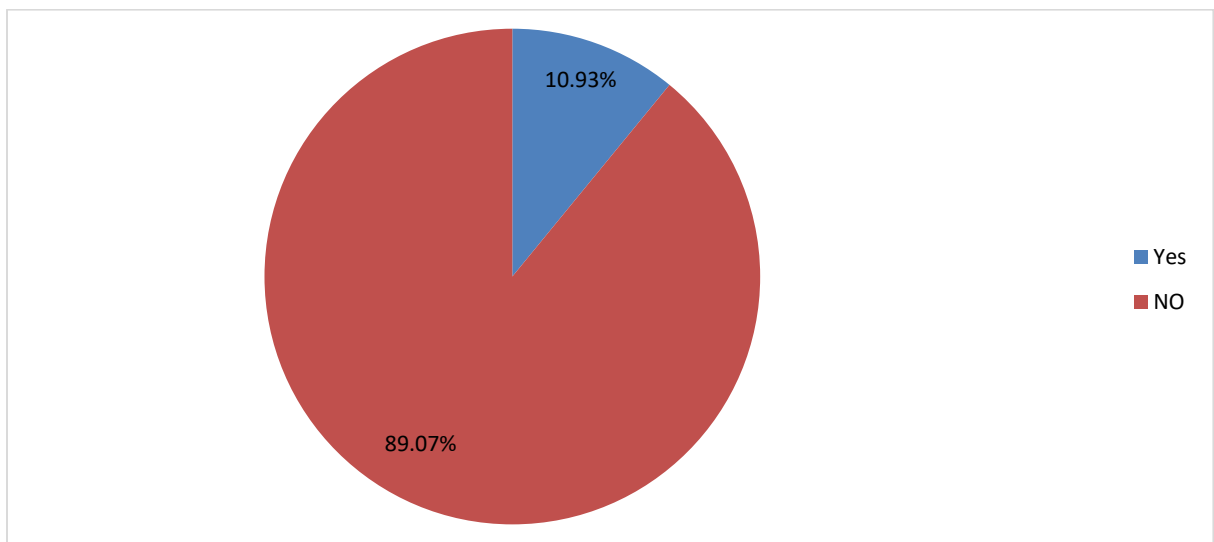
was either due to infective endocarditis with leaflet perforation and torn leaflets or commissural tear following BMV and CMV and from chordal rupture leading to mitral valve prolapse.

In other pre-op diagnosis about 29.5% of patients had presented with atrial fibrillation and 10.95% had LA clot in them. The main cause for atrial fibrillation was because of stretching of LA. In our study the LA size varied from 20 mm to a maximum of 82 mm with mean LA size coming to around 48 mm.

**Figure 13: Pie chart of AF in the study population (N=183)**

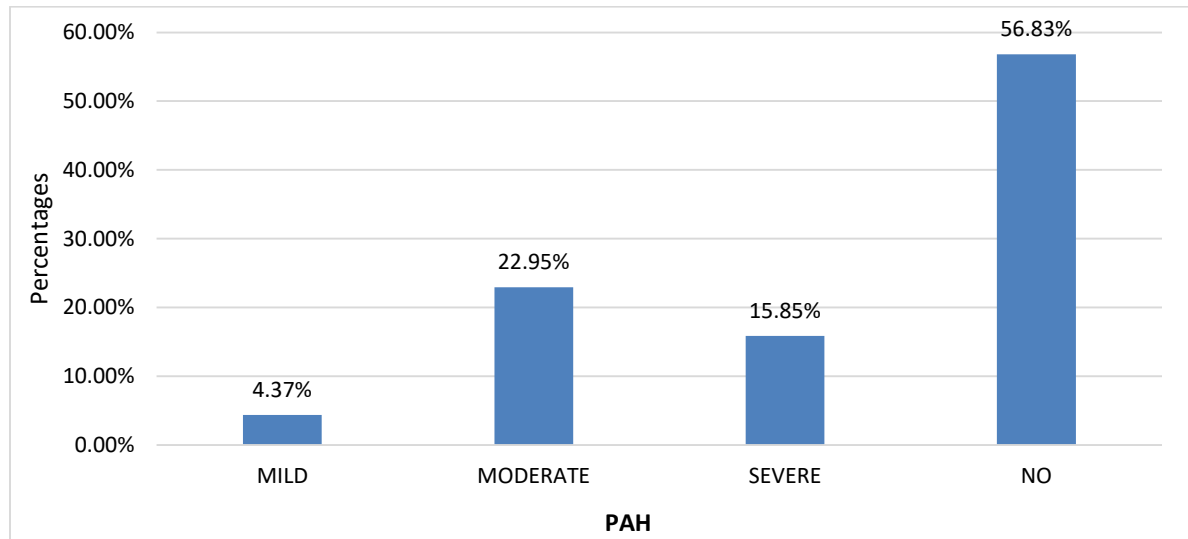


**Figure 14: Pie chart of LA clot in the study population (N=183)**



About 22.85 % of patients had moderate PAH in the pre-op echocardiography and 15.85% had severe PAH at the time of diagnosis. And very few patients had history of previous hospital admission for cardiac failure.

**Figure 15: Bar chart of PAH in the study population (N=183)**



**Table 10: Descriptive analysis of DOE in the study population (N=183)**

| Dyspnoea on exertion | Frequency | Percentages |
|----------------------|-----------|-------------|
| Grade I              | 2         | 1.09%       |
| Grade II             | 62        | 33.88%      |
| Grade III            | 112       | 61.20%      |
| Grade IV             | 7         | 3.83%       |

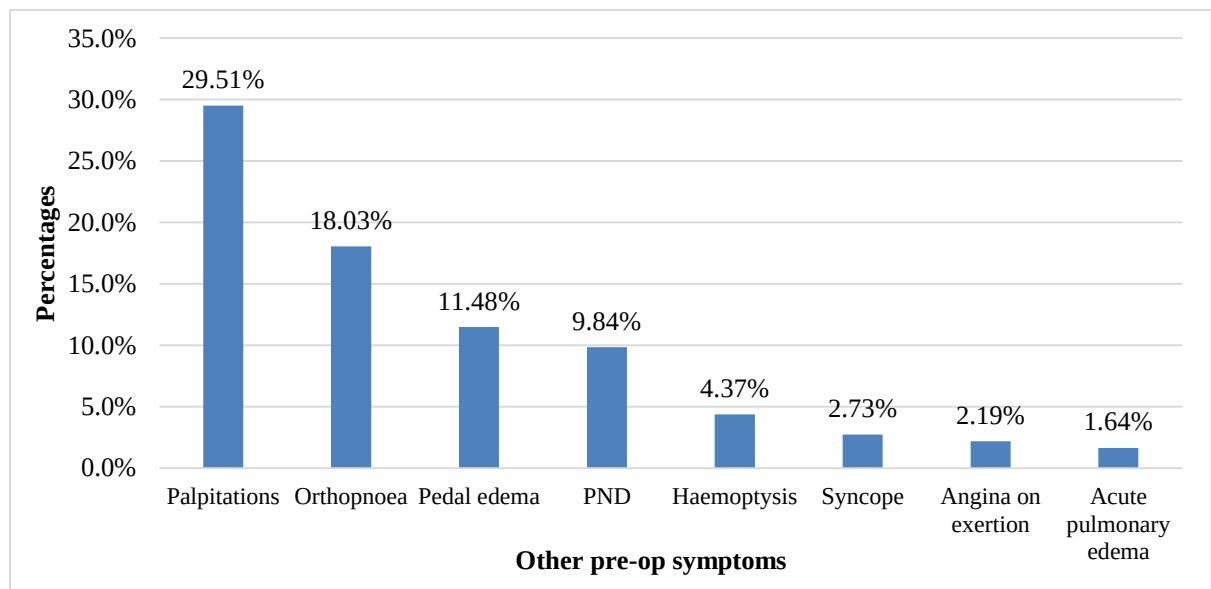
Symptoms wise about 33.88% presented with grade I DOE (dyspnoea on exertion), 61.28% with grade II DOE and 3.83% with grade III DOE.

**Table 11: Descriptive analysis of Other pre-op symptoms in the study population (N=183)**

| Other pre-op symptoms | Frequency | Percentages |
|-----------------------|-----------|-------------|
| Palpitations          | 54        | 29.51%      |
| Orthopnoea            | 33        | 18.03%      |
| Pedal edema           | 21        | 11.48%      |
| PND                   | 18        | 9.84%       |
| Haemoptysis           | 8         | 4.37%       |
| Syncope               | 5         | 2.73%       |
| Angina on exertion    | 4         | 2.19%       |
| Acute pulmonary edema | 3         | 1.64%       |

About 29.5% presented with palpitation, 18.3% with orthopnoea, 11.4% with pedal edema, 9.84% with PND ( Paroxysmal Nocturnal dyspnoea ), 4.35% with haemoptysis, 2.73% with syncope .

**Figure 16: Bar chart of other pre-op symptoms in the study population**



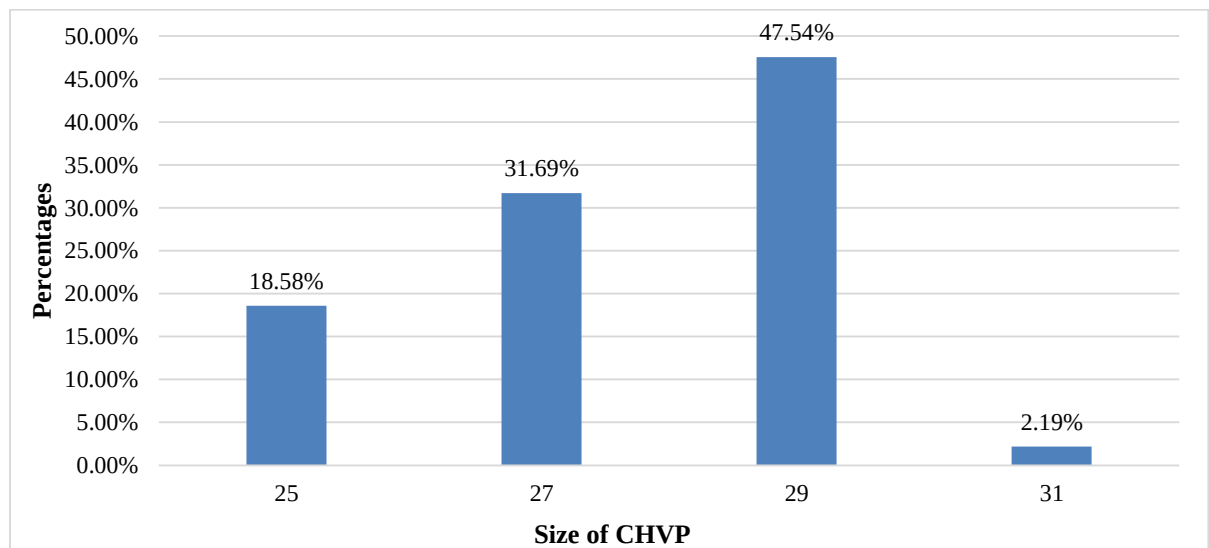
**Table 12: Descriptive analysis of pre-op echo in study population (N=183)**

| Pre-Op Echo | Mean $\pm$ SD     | Median | Minimum | Maximum | 95% C.I |       |
|-------------|-------------------|--------|---------|---------|---------|-------|
|             |                   |        |         |         | Lower   | Upper |
| LA size     | 47.53 $\pm$ 10.71 | 48.00  | 20.00   | 82.00   | 45.97   | 49.09 |
| LV size     | 45.36 $\pm$ 7.56  | 43.00  | 27.00   | 64.00   | 44.25   | 46.46 |

In our study the the LV size varied from minimum of 27 mm to maximum of 67 mm with mean coming to around 43 mm These findings suggest that the major cause of chronically reduced cardiac output in these patients is obstruction at the mitral valve.

**Table 13: Descriptive analysis of size of CHVP in study population (N=183)**

| Size of CHVP | Frequency | Percentages |
|--------------|-----------|-------------|
| 25           | 34        | 18.58%      |
| 27           | 58        | 31.69%      |
| 29           | 87        | 47.54%      |
| 31           | 4         | 2.19%       |

**Figure 17: Bar chart of size of CHVP in the study population (N=183)**

A total of 183 patients underwent mitral valve replacement with Chitra Valve for mitral stenosis and mitral regurgitation in our study. The minimum size valve used was 25 mm and maximum size was of 31 mm. Size 25 was used in 18.55% of patients, 27 in 31.60% of patients, 29 size in 47.54 % and 31 size in 2.19 % of patients.

**Table 14: Descriptive analysis of surgery in study population (N=86)**

| Additional procedure | Frequency | Percent |
|----------------------|-----------|---------|
| ASD CLOSURE          | 6         | 3.2     |
| LA CLOT REMOVAL      | 20        | 10.9    |
| TV ANNULOPLASTY      | 14        | 7.6     |
| LA REDUCTION PLASTY  | 33        | 18.1    |
| PPI                  | 1         | 0.5     |
| LV ENDOCARDECTOMY    | 8         | 4.4     |
| RV ENDOCARDECTOMY    | 6         | 3.2     |
|                      |           |         |
| Total                | 88        | 48.0    |

Concomitant procedures like TV annuloplasty, ASD closure, left atrial appendage exclusion, left ventricle endocardectomy and right ventricle endocardectomy were done along with MVR in about 48 % of patients.

### **Post-operative parameters**

**Table 15: Descriptive analysis of post-op echo in study population**

| Post-Op Echo | Mean $\pm$ SD    | Median | Minimum | Maximum | 95% C.I |       |
|--------------|------------------|--------|---------|---------|---------|-------|
|              |                  |        |         |         | Lower   | Upper |
| LA size      | 44.85 $\pm$ 8.23 | 46.00  | 29.00   | 72.00   | 43.65   | 46.06 |
| LV size      | 46.83 $\pm$ 6.18 | 47.00  | 26.00   | 59.00   | 45.93   | 47.73 |

**Table 16: Descriptive analysis of LV function in the study population**

| LV Function  | Frequency | Percentages |
|--------------|-----------|-------------|
| Fair         | 11        | 6.04%       |
| Good         | 167       | 91.76%      |
| Moderate LVD | 4         | 2.20%       |

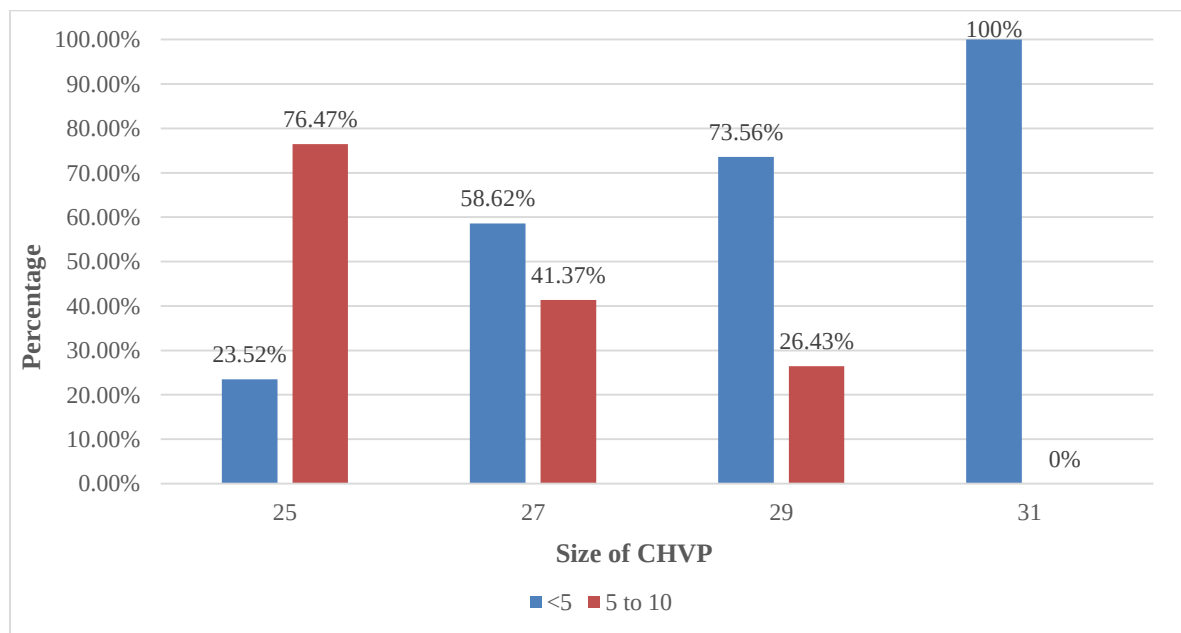
Post op ECHO taken between 5- 10 years post op showed good LV function in about 91% of the patients with LV size varying between 26 mm to 59 mm with a mean of 47 mm. The LA size was varied between 29mm to 72 mm with mean of 46 mm size.

**Table 17: Comparison of size of CHVP with gradient (N-183)**

| Size of CHVP | Gradient    |             |
|--------------|-------------|-------------|
|              | <5          | 5 to 10     |
| 25 (N=34)    | 8 (23.52%)  | 26 (76.47%) |
| 27 (N=58)    | 34 (58.62%) | 24 (41.37%) |
| 29 (N=87)    | 64 (73.56%) | 23 (26.43%) |
| 31 (N=4)     | 4 (100%)    | 0 (0%)      |

*\* No statistical test was applied-due to 0 subjects in the cell*

**Figure 18: Clustered bar chart of Comparison of size of CHVP with gradient (N-183)**



Echo done showed that 73.5% of patients had PV gradient of less than 5 mm Hg after 5 yrs of surgery and between 5-10 mmHg in about 26.43% of the patients for valve of size 29 and 58.62% had PV gradient <5 and 41.37% had a gradient between 5-10 for valve size of 27 in mitral position. 2 patients had increased gradients who were kept in medical follow up since they were asymptomatic . Post op –mitral regurgitation of 3+ was found in only 4.3% of the patients.

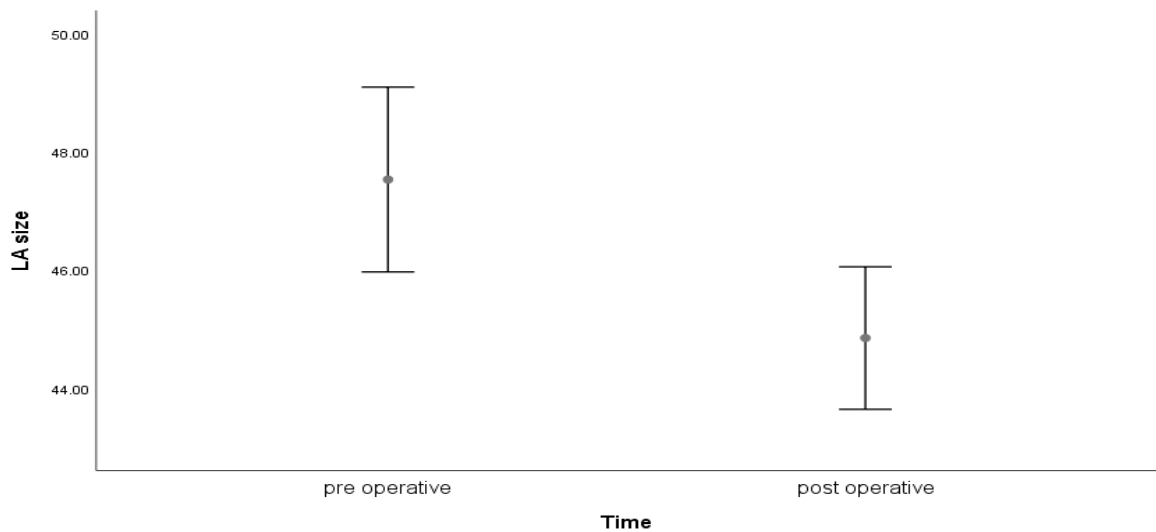
**Table 18: Descriptive analysis of regurgitation if any in the study population**

| Regurgitation if any | Frequency | Percentages |
|----------------------|-----------|-------------|
| MR 1+                | 58        | 31.55%      |
| MR1-2+               | 27        | 14.7%       |
| MR3+                 | 8         | 4.3%        |
| NO MR                | 89        | 48.63%      |

**Table 19: Comparison of mean LA size pre & post-operative**

| ECHO LA size | Mean $\pm$ STD   | Mean Difference | 95% CI of mean difference |       | P-value |
|--------------|------------------|-----------------|---------------------------|-------|---------|
|              |                  |                 | Lower                     | Upper |         |
| Pre-op       | 47.5 $\pm$ 10.73 | 2.65            | 1.24                      | 4.06  | <0.001  |
| Post-op      | 44.85 $\pm$ 8.23 |                 |                           |       |         |

The mean of echo LA size at pre-operative was 47.5  $\pm$  10.73 and has decreases to 44.85  $\pm$  8.23 in post-operative, the difference (2.65) in between pre-operative and post-operative was statistically significant (p value <0.001).

**Figure 19: Comparison of mean LA size pre & post-operative****Table 20: Comparison of mean LV size pre & post-operative (N=183)**

| ECHO LV size | Mean $\pm$ STD   | Mean Difference | 95% CI of mean difference |       | P-value |
|--------------|------------------|-----------------|---------------------------|-------|---------|
|              |                  |                 | Lower                     | Upper |         |
| Pre-op       | 45.4 $\pm$ 7.56  | 1.43            | 0.37                      | 2.50  | 0.009   |
| Post-op      | 46.83 $\pm$ 6.18 |                 |                           |       |         |

The mean of echo LV size at pre-operative was  $45.4 \pm 7.56$  and has increases to  $46.83 \pm 6.18$  in post-operative, the difference (1.43) in between pre-operative and post-operative was statistically significant (p value  $<0.001$ ). (Table 21 & figure 18)

**Table 21: Descriptive analysis of TR 2 in the study population (N=133)**

| TR    | Frequency | Percentages |
|-------|-----------|-------------|
| 1     | 66        | 49.62%      |
| 2     | 42        | 31.58%      |
| 3     | 23        | 17.29%      |
| 4     | 2         | 1.50%       |
| No TR | 50        |             |



Post op one patient had severe tricuspid regurgitation who was operated with TV annuloplasty.

**Table 22: Descriptive analysis of PAH in the study population in post-surgery ECHO**

| PAH      | Frequency | Percentages |
|----------|-----------|-------------|
| Sev PAH  | 1         | 0.5%        |
| Mod PAH  | 17        | 9.2%        |
| Mild PAH | 38        | 20.7%       |
| No PAH   | 128       | 69.9%       |

Post op severe PAH was found to exist in 1 patient and 17 patients with moderate PAH and 38 patients had moderate PAH.

**Table 23: Descriptive analysis of LV function in the study population**

| LV Function  | Frequency | Percentages |
|--------------|-----------|-------------|
| Fair         | 11        | 6.04%       |
| Good         | 167       | 91.76%      |
| Moderate LVD | 4         | 2.20%       |

Post operative showed good left ventricular function in about 91.76% with only 4 patients having moderate left ventricular dysfunction.

**Table 24: Descriptive analysis of complications in the study population (N=16)**

| Complications       | Frequency | Percentages |
|---------------------|-----------|-------------|
| Stuck Valve         | 6         | 37.50%      |
| Para valvular Leak  | 3         | 18.25%      |
| Chronic PE          | 2         | 12.5%       |
| AVR done for SEV AR | 1         | 6.25%       |
| Increased Gradients | 2         | 12.5%       |
| TV repair           | 1         | 6.25%       |

Total 12 patients underwent redo surgery for complications which included 6 for struck valve three for paravalvular leak, one for severe TR, one for severe AR and two for gradual increase in the PV gradients.

## **DISCUSSION:**

## DISCUSSION:

The Chitra Heart valve Prosthesis, an indigenously developed valve has been used in many centres across India and other parts of the world. Due to the low cost of the valve there is a need to analyse its durability and free from complications after implantation. Our study was done to see the haemodynamics and other features which made to compare chitra valve with other established heart valve worldwide.

A total of 183 patients were included in the study after exclusion criteria. Out of these about 10 patients had underwent BMV (balloon Mitral Valvotomy), 1 OMV (open mitral valvotomy and about 62 Patients CMV (closed mitral valvotomy) before coming for the mitral valve replacement. About 31% presented in the 2<sup>nd</sup> and 3<sup>rd</sup> decade with symptoms and majority about 61.75% patients after 40 yrs of age. In US, the average age of the initial attack of rheumatic fever is 12 years, average age of onset of clinical signs of mitral stenosis 20 years, and age at onset of symptoms 31 years (13). The late presentation in our scenario may be because of ignorance of the condition or financial status.

Two-dimensional (2D) echocardiography is highly reliable for diagnosing and quantifying severity of mitral stenosis. It demonstrates degree of stenosis, leaflet mobility, thickening and probable calcification, and any subvalvular obstruction. Doppler echocardiography, enhanced by color flow imaging to identify precise flow direction, is valuable for estimating severity of stenosis.

The following hemodynamic guidelines are useful in defining severity of mitral stenosis (14):

- Mild: valve area 1.5 to 3.5 cm<sup>2</sup> and mean diastolic gradient less than 5 mmHg
  - Moderate: valve area 1.0 to 1.5 cm<sup>2</sup> and mean diastolic gradient 5 to 10 mmHg
  - Severe: valve area less than 1.0 cm<sup>2</sup> and mean diastolic gradient greater than 10 mmHg.
- In our study twenty eight percent had severe mitral stenosis with no MR and 67.2% with MS with MR majority from leaflet thickening, calcification of the valve leaflets, commissural fusion and chordal shortening and 4.3% had severe MR with no MS which was either due to infective endocarditis with leaflet perforation and torn

leaflets or commissural tear following BMV and CMV and from chordal rupture leading to mitral valve prolapse.

Commissural fusion and leaflet thickening *are* the dominant features in clinically important mitral stenosis. Mixed mitral stenosis and regurgitation is primarily rheumatic in origin. Regurgitation results from fibrous retraction of the central unfused portion of the leaflets and either chordal shortening or chordal elongation. Shortening restricts leaflet motion and increases the gaping central orifice, whereas elongation permits cusp prolapse. Occasionally, chordae rupture as a result of the rheumatic process. Endocarditis on a rheumatic stenotic valve adds regurgitation by eroding leaflet or chordal tissue.

Mitral annular calcification may occur in older patients without evident disease of the leaflets or chordae (15,16) Annular calcification is probably a degenerative disease, more common in elderly patients and apparently more common in women. Since our institutional policy of opting mechanical valve for patients less than 60 years of age most of our patients very in the middle age and very few patients in our study had mitral annular calcification (17).

In other pre-op diagnosis about 29.5% of patients had presented with atrial fibrillation and 10.95% had LA clot in them. The main cause for atrial fibrillation was because of stretching of LA. In our study the LA size varied from 20 mm to a maximum of 82 mm with mean LA size coming to around 48 mm.

Most patients with mitral stenosis have normal LV wall thickness, volume, and systolic and diastolic function (18) but do not increase cardiac output under stress, such as when

LV afterload is acutely reduced by infusion of sodium nitroprusside (19). In our study the the LV size varied from minimum of 27 mm to maximum of 67 mm with mean coming to around 43 mm These findings suggest that the major cause of chronically reduced cardiac output in these patients is obstruction at the mitral valve.

Untreated mitral stenosis is associated with a poor prognosis once the severe symptoms occur. 12. Once symptoms develop after the so-called latent period, their progression to a state of total disability (New York Heart Association [NYHA] functional class IV) requires an estimated 7 to 10 years (20, 21). Average age of death of patients

with surgically untreated mitral stenosis is estimated to be 40 to 50 years. Percutaneous BMV is the first line of treatment for mitral stenosis with favorable anatomy. This may be appropriate for symptomatic patients with severe mitral stenosis. Mitral valve surgery is an established therapy for mitral stenosis which predates BMV which includes CMV and mitral valve repair. Mitral valve replacement should be performed in patients in whom mitral valve repair is not suitable ( eg. Extensive valve destruction from endocarditis, severe leaflet calcification and fibrosis from RHD and select patients from ischaemic cardiomyopathy (22).

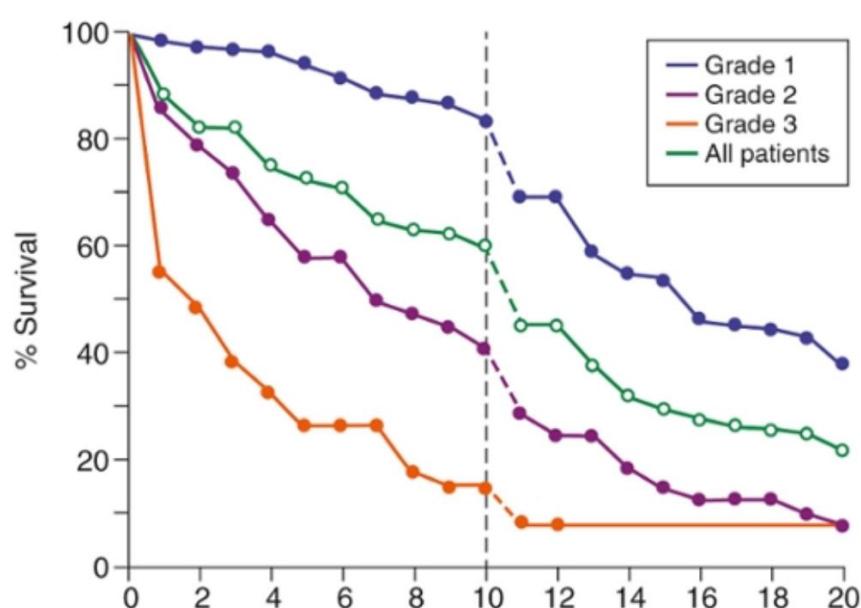


Fig 20. Survival of patients with surgically untreated mitral stenosis stratified by symptom severity at initial evaluation. Grade I –asymptomatic, grade II – mild symptoms and grade III- moderate to severe symptoms.

While performing MVR, chordal sparing MVR is the preferred technique because left ventricular function is better preserved. Typically, the posterior leaflet is left intact and the tissue used to better support valve replacement sutures. In addition this strategy automatically preserves the posterior subvalvular apparatus.

A total of 183 patients underwent mitral valve replacement with Chitra Valve for mitral stenosis and mitral regurgitation in our study. The minimum size valve used was 25 mm and maximum size was of 31 mm. Size 25 was used in 18.55% of patients, 27 in 31.60% of patients , 29 size in 47.54 % and 31 size in 2.19 % of patients. Concomitant

procedures like TV annuloplasty, ASD closure, left atrial appendage exclusion, left ventricle endocardectomy and right ventricle endocardectomy were done along with MVR in about 46 % of patients.

The most important variables that measure prosthetic valve performance are mechanical integrity, hemodynamic characteristics and thrombogenicity. Other adverse events that occur after valve replacement are prosthesis related. It has been shown that thromboembolic rates vary considerable among different series of same prosthesis 6 because of various probable factors, viz., differences in patient population, method of data collection and management of anticoagulation. The incidence of valve thrombosis and hemorrhage is similar to those reported for other mechanical valves(23), However because of a short term and due to poor socio-economic condition of our patients, many could not travel to our center at the said period and ECHO reports of the latest one was studied.

Doppler Echocardiography plays an important role in assessing prosthetic valve function. Doppler recordings are similar to that of native valve studies, except that the velocities are higher because all prosthetic valves are mildly stenotic(24). Movements of the occluder and the sewing ring were evaluated. None of the patients in our series had impaired movement of the occluder or rocking motion of the sewing ring. Doppler echocardiography allows accurate evaluation of trans-valvular flow patterns, thus facilitating recognition of turbulent, stenotic and regurgitant signals.

Peak transvalvular velocities can be readily estimated of various prosthetic valves and have shown the probable gradients, to be considered normal for that prosthesis, across them. Echo done showed that 73.5% of patients had PV gradient of less than 5 mm Hg after 5 yrs of surgery and between 5-10 mmHg in about 26.43% of the patients for valve of size 29 and 58.62% had PV gradient <5 and 41.37% had a gradient between 5-10 for valve size of 27 in mitral position. 2 patients had increased gradients who were kept in medical follow up since they were asymptomatic . Post op –mitral regurgitation of 3+ was found in only 4.3% of the patients.

The gradients across the TTK Chitra valve in the mitral position are comparable to gradients shown (across TTK Chitra valve) by Nagarajan et al (25). Nagarajan et al reported mean gradients of  $5.09 \pm 2.14$  mm of Hg in the mitral position.

**Table 28: Comparison of size of CHVP with gradient (N=183)**

| Size of CHVP | Gradient    |             |
|--------------|-------------|-------------|
|              | <5          | 5 to 10     |
| 25 (N=34)    | 8 (23.52%)  | 26 (76.47%) |
| 27 (N=58)    | 34 (58.62%) | 24 (41.37%) |
| 29 (N=87)    | 64 (73.56%) | 23 (26.43%) |
| 31 (N=4)     | 4 (100%)    | 0 (0%)      |

*\* No statistical test was applied-due to 0 subjects in the cell*

**Table 25. Comparison of mean gradients in mitral position**

| Valve (27 mm)   | Gradient in mm Hg |
|-----------------|-------------------|
| St Jude         | 5+/-2             |
| Starr Edward    | 5+/-2             |
| Medtronic- Hall | 3+/- 1            |

Results after implantation of Chitra heart valve prosthesis have been studied in early short term period (6, 7,8).

In a single centre study (11), outcomes of 152 Chitra valves implanted between December 1992 and July 1998 were studied. In this study, 65 patients underwent isolated AVR and 64 patients underwent isolated MVR, rest had both aortic and mitral valve replaced. Early mortality reported was very low (0.6%). 4.6% of patients had late mortality. Out of 7 late deaths, 2 patients had prosthetic valve thrombosis and 2 died of complications of infective endocarditis. Cause of death could not be found in rest 3 patients. Surviving 144 patients had a total follow up of 622 patient years. Thromboembolic complication was noted in 11 patients (7.2%) with a linearized rate of 1.8 percent/ patient years. TTK Chitra valve was found to be comparable to other mechanical valves on hemodynamic evaluation. Freedom from thromboembolic events and event free survival at 5 years was estimated to be 82% and 78% respectively.

In another single centre study by Malhotra A et al from Bhopal (12), follow up data of 200 patients with 249 TTK Chitra valve replacements was published. There were 122 MVR, 29 AVR and 49 DVR patients, which were followed for a mean duration of 2.5 years. Total follow-up duration was 451 patient-years. Late deaths occurred at a linearized rate of  $3.98\% \pm 0.92\%$  per patient-year ( $n=18$ ). Prosthetic valve thrombosis was noted in only 1 MVR patient, producing a linearized rate of  $0.36\% \pm 0.36\%$  per patient-year. Embolic events after AVR, DVR and MVR were at rate of  $2.74\% \pm 1.91\%$  per patient-year ( $n=2$ ),  $1.95\% \pm 1.36\%$  per patient-year ( $n=2$ ) and  $1.08\% \pm 0.62\%$  per patient-year ( $n=3$ ) respectively. Event free survival at 4 years after MVR, DVR and AVR was  $86\% \pm 4\%$ , and  $89\% \pm 6\%$  respectively. Gradients, both peak and mean and velocities across implanted valve was also comparable to other mechanical valves used commonly. They concluded that TTK Chitra valve is comparable to other mechanical heart valves in terms of hemodynamics and complications.

### **Echocardiography for evaluation of Prosthetic heart valve**

Kumar *et al* (9) studied hemodynamic and Doppler characteristics of Chitra heart valve prosthesis at mitral and aortic position during post-operative follow up. A total of 238 patients were examined for Doppler evaluation of transvalvular gradients and estimation of effective orifice area. In the mitral position, for valve sizes 25, 27 and 29 mm, the mean gradients (in mm Hg) were  $5 \pm 3$ ,  $4 \pm 2$  and  $4 \pm 2$ , and the Effective orifice areas (in cm<sup>2</sup>) were  $2.8 \pm 0.8$ ,  $3.1 \pm 0.7$  and  $2.9 \pm 0.7$  respectively. In the aortic position, for valve sizes 21 and 23 mm, the gradients (in mm Hg) were  $10 \pm 5$  and  $9 \pm 4$ , and the Effective orifice areas (in cm<sup>2</sup>) were  $1.5 \pm 0.5$  and  $1.8 \pm 0.3$  respectively. They concluded that TTK Chitra valve is hemodynamically comparable to other mechanical valves.

**Namboodiri et al (10)** studied Doppler echocardiography in 40 patients of CHVP implanted at mitral position. The study objectives were to determine normal values for Doppler parameters of CHVP and to assess whether mitral valve area derived by pressure half time and continuity equation were comparable. All the patients were clinically and hemodynamically stable without any prosthetic valve-related complications such as valve obstruction, infective endocarditis, significant regurgitation, LV dysfunction or any other



significant pathology. Valve sizes included in the study were 25, 27 and 29 mm. Mitral valve area was derived by both pressure half time(PHT) and continuity equation (CE) methods. The peak Doppler gradient ranged from 5 to 21 (mean 11.0) mmHg, and the mean gradient ranged from 1.7 to 9.2 (mean 4.1) mmHg. Mean gradient negatively correlated with an increase in the actual orifice area (AOA) derived from the valve orifice diameter stated by the manufacturer ( $r = -0.45$ ,  $P = 0.004$ ). Mitral valve area calculated by both PHT and CE increased significantly with an increase in the AOA ( $r = 0.42$ ,  $P = 0.007$  and  $r = 0.32$ ,  $P = 0.046$ , respectively). Mitral valve area estimated by the CE averaged  $1.55 \pm 0.36$  cm<sup>2</sup> and was smaller than that derived by the PHT (mean  $2.04 \pm 0.41$  cm<sup>2</sup>, range 1.40–3.14 cm<sup>2</sup>;  $P = 0.0001$ ; t-test) irrespective of whether the PHT was less than or more than 110 msec. They concluded that CHVP at mitral position is associated with normal hemodynamic and Doppler profile which are comparable with those of other different mechanical valves in common use.

Post op ECHO taken between 5- 10 years post op showed good LV function in about 91% of the patients. Post op severe PAH was found to exist in 1 patient and 13 patients with moderate PAH. Post op one patient had severe tricuspid regurgitation who was operated with TV annuloplasty.

Total twelve patients underwent redo surgery for complications which included six for struck valve three for paravalvular leak, one for severe TR, one for severe AR and two for gradual increase in the PV gradients.

All these variables with low prosthetic valve gradients and low post op complications with proven Doppler study make Chitra heart valve prosthesis comparable to other heart valve used worldwide.

# **CONCLUSION AND LIMITATIONS**

## **CONCLUSION**

The TTK Chitra Heart valve Prosthesis is hemodynamically comparable to other mechanical valves currently in use worldwide. There is no much difference in valve related complications compared to other mechanical valves presently in use. The low cost heart valve can be comfortably used in treating valve related patients. However, a longer follow up will be necessary to assess long-term results.

## **LIMITATIONS**

As it is retrospective study, patients were not studied at a regular interval or a particular period after surgery.

All complications may not be noted as patients may have been treated in other hospitals.

Since ECHO has been done by different of doctors and different echocardiography machines findings are not same and many variables are missed.

Echoes recorded in the study for patients range from 5 yrs to 16 yrs. Some echoes being done after 5 yrs then failed to follow up in our institutions.

Deaths/ complications are not recorded except for that occurred / reported in our hospital.

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# **ANNEXURE**

# IEC APPROVAL



श्री चित्रा तिरुनाल आयुर्विज्ञान और प्रौद्योगिकी संस्थान, त्रिवेन्द्रम  
तिरुवनन्तपुरम - ६९५०११, केरल, इंडिया  
SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY, TRIVANDRUM  
Thiruvananthapuram - 695 011, Kerala, India  
(An Institute of National Importance under Govt. of India)

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## Institutional Ethics Committee (IEC Regn No. ECR/189/Inst/KL/2013/RR-16)

SCT/IEC/1311/DECEMBER-2018

28.12.2018

Dr. Kiran C.K  
Senior Resident  
Department of CVTS  
SCTIMST, Thiruvananthapuram

Dear Dr. Kiran,

The Institutional Ethics Committee reviewed and discussed your application to conduct the study entitled "STUDY OF HAEMODYNAMICS OF TTK - CHITRA HEART VALVE PROSTHESIS (CHVP) IN MITRAL POSITION, A SINGLE CENTRE EXPERIENCE AT SCTIMST, TRIVANDRUM (IEC/1311)" on 15<sup>th</sup> December, 2018.

### The following documents were reviewed:

#### Original submission

1. Covering letter addressed to the Chairman, IEC, SCTIMST dated 19.11.2018 with checklist
2. TAC Approval Letter
3. IEC Application Form
4. Project Proposal
5. Proforma
6. CV of Principal Investigator and Co- Principal Investigators

#### Revised submission

1. Covering letter addressed to the Chairman, IEC, SCTIMST dated 28.12.2018 with checklist
2. TAC Approval Letter
3. IEC Application Form
4. Project Proposal
5. Proforma
6. CV of Principal Investigator and Co- Principal Investigators

The following members of the Ethics Committee were present at the meeting held on 15<sup>th</sup> December, 2018 at G. Parthasarathi Board Room, AMCHSS, SCTIMST

| SL. No. | Member Name              | Highest Degree                         | Gender | Scientific /Non Scientific              | Affiliation with Institution(s) |
|---------|--------------------------|----------------------------------------|--------|-----------------------------------------|---------------------------------|
| 1.      | Dr. R V G Menon          | M Tech, PhD                            | Male   | Lay Person (Chairman)                   | No                              |
| 2.      | Dr. Rema M. N            | MD                                     | Female | Basic Medical Scientist                 | No                              |
| 3.      | Dr. K R S Krishnan       | M.E., Ph.D.                            | Male   | Medical Technology                      | Yes                             |
| 4.      | Dr. Kala Kesavan. P      | MBBS, MD                               | Female | Basic Medical Scientist                 | No                              |
| 5.      | Dr. Harikrishna Varma PR | Ph.D( Materials Science)               | Male   | Medical Technology                      | Yes                             |
| 6.      | Dr. Christina George     | MD Psychiatry                          | Female | Clinician                               | No                              |
| 7.      | Dr. S S Giri Sankar      | LL.M. Ph.D.                            | Male   | Legal Expert                            | No                              |
| 8.      | Dr. Aneesh V Pillai      | BA. LLB (Hons.), LLM, Ph. D, SET (Law) | Male   | Legal Expert                            | No                              |
| 9.      | Dr. P. Manickam          | BSMS, MSc (Epid)., PhD                 | Male   | Health Science Expert/ Social Scientist | No                              |
| 10.     | Mr. Satheesh Chandran    | MSW, PGDPM                             | Male   | Lay person/ NGO/ Social Scientist       | No                              |
| 11.     | Dr. Harikrishnan S       | MD, DM (Cardiology) DNB (Cardiology)   | Male   | Clinician                               | Yes                             |
| 12.     | Dr. Anand Kumar A        | MD, DM                                 | Male   | Clinician                               | No                              |
| 13.     | Dr. V. Raman Kutty       | M D, M Phil, M P H                     | Male   | Health Sciences Expert/Clinician        | Yes                             |
| 14.     | Dr. Mala Ramanathan      | PhD                                    | Female | Social Scientist (Member Secretary)     | Yes                             |

#### IEC Decision

The IEC approved the conduct of the study in the present form.

#### Remarks:

The Institutional Ethics Committee expects to be informed about the progress of the study, any SAE occurring in the course of the study, any changes in the protocol and patient information/informed consent and asks to be provided a copy of the final report.

There was no member of the study team who participated in voting / decision making process. The ethics committee is organized and operated according to the requirements of Good Clinical Practice and the requirements of the Indian Council of Medical Research (ICMR).

Sincerely,



**Mala Ramanathan**  
Member Secretary, IEC



# TAC APPROVAL



## Technical Advisory Committee (Clinical Studies) SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES & TECHNOLOGY THIRUVANANTHAPURAM – 695011, INDIA

**TAC Registration No: SCT-/S/2018/832**

**Date: 26.09.2018**

**Project title:** STUDY OF HAEMODYNAMICS OF TTK - CHITRA HEART VALVE PROSTHESIS (CHVP) IN MITRAL POSITION, A SINGLE CENTRE EXPERIENCE AT SCTIMST, TRIVENDRUM

|                                                                       |                                |
|-----------------------------------------------------------------------|--------------------------------|
| Principal Investigator:                                               |                                |
| Dr. Kiran C K, Senior Resident, Department of CVTS, SCTIMST           | Degree: M.B.B.S, M.S           |
| Co-Principal Investigator(s)                                          |                                |
| Dr. Vivek Pillai, Additional professor, Department of CVTS, SCTIMST   | Degree: M.B.B.S, M.S, Mch CVTS |
| Co- Investigator(s)                                                   |                                |
| Dr. Sanjay G, Additional Professor, Department of Cardiology, SCTIMST | Degree: M.B.B.S, M.D, D.M      |
| Dr. Jayakumar K, Professor and Head, Department of CVTS, SCTIMST      | Degree: M.B.B.S, M.S, Mch CVTS |

### Members who participated in the TAC meeting on 01/09/2018

Dr. Rupa Sreedhar (Chairperson)  
Dr. Prasantakumar Dash  
Dr. Krishna Kumar K  
Dr. Sankara Sarma P  
Dr. Bijulal S  
Dr. Jayadevan ER  
Dr. Syam K  
Dr. Sanjay G  
Dr. Varghese T. Panicker  
Dr. K. Shivakumar (Member Secretary)

Dr. Jayadevan ER, Dr. Bijulal S, Dr. Sanjay G and Dr. Krishna Kumar K, stayed away from the proceedings when the projects in which they are involved as investigator were discussed (# 813, 814, 828, 829, 832).

**Risk Classification of the project (Minimum/ Moderate/ High):** Minimum

**Requirement of DSMB:** No

**Recommended members of DSMB:** Not applicable

### Recommendations of TAC:

Recommended for consideration of IEC in the light of the responses received from the investigator

The PI may note that there can be no additions / alterations in the documents approved by TAC when they are submitted to the IEC.

**Signature of the Member Secretary, TAC (Clinical Studies)**

### Note for IEC

Copy of the investigator's responses to questions/suggestions from TAC is attached (Appendix-1).

**Appendix-1**

Postoperative assessment from chart.... is it one single value in the regular immediate post op echo or are you planning to study the yearly follow up echo also?

**Answer:** I will be looking for the yearly follow up echo also.

## **PROFORMA**

**“Study of haemodynamics of TTK - Chitra Heart Valve Prosthesis (CHVP) in Mitral position, a single centre experience at SCTIMST, Trivendrum.”**

PATIENT NO :

AGE:

SEX:

Diagnosis:

Pre-operative symptoms:

Pre-operative risk factors:

Pre-operative ECHO assessment:

- ☐ LA / LV size -
- ☐ Mitral valve -
- ☐ LV Function:
- ☐ Other Valves:

Pre – Op Diagnosis:

Date of Surgery:

Intra operative findings:

Surgery:

Post-operative ECHO assessment:

- ☐ LA / LV size -
- ☐ CHVP in Mitral position – size -
- ☐ Leaflet Movement –
- ☐ PV gradient & Flow velocity –
- ☐ Regurgitation if any –
- ☐ Thrombus / vegetation if any -
- ☐ LV Function:
- ☐ Other Valves:

# **MASTER CHART**



| s.no  | Age | Sex | Diagnosis                                                      | Primary Diagnosis | MS         | MR      | AV      | TV      | AF  | LA CLOT | PAH  | CONT HF | Others        | Pre-op Symptoms                                                             | DOE | PALPITATIONS | PEDAL EDEMA | ORTHOPNEA | PND | ACUTE PULMONARY EDEMA | HAEMOPTYSIS | SYNCOPE | ANGINA ON EXERTION | Pre-op risk factors      | Pre-op ECHO la size | Pre-op ECHO lv size | Pre-op ECHO LALV Size | Mitral valve                                                                                                          | Other Valves               |
|-------|-----|-----|----------------------------------------------------------------|-------------------|------------|---------|---------|---------|-----|---------|------|---------|---------------|-----------------------------------------------------------------------------|-----|--------------|-------------|-----------|-----|-----------------------|-------------|---------|--------------------|--------------------------|---------------------|---------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------|
| 1.00  | 60  |     | RHD, SEV CAL MS, MILD AR, LAA CLOT, AF                         | RHD               | SEV CAL MS | No      | MILD AR | No      | Yes | Yes     | NO   | No      | LAA CLOT      | DOE-II x 2 yrs-> III 1 yr, palpitations, pedal edema                        | 3.0 | Yes          | Yes         | No        | No  | No                    | No          | No      | No                 | RHD, HTN, HYPOTHYROIDISM | 53                  | 38                  | 53/38                 | CALCIFIED AML, PML                                                                                                    | MOD SUB VAL 1 PATHOLOGY    |
| 2.00  | 46  |     | RHD, P/BMV, RE- SEV CAL MS, MILD AR/MR/TR, MILD PAH CLOT, 2 AF | RHD               | SEV CAL MS | MILD MR | MILD AR | MILD TR | Yes | Yes     | MILD | No      | MILD PAH CLOT | Asymptomatic 4 yrs P/BMV, DOE-II x 2 Ys, palpitations                       | 2.0 | Yes          | No          | No        | No  | No                    | No          | No      | No                 | RHD, HYPOTHYROIDISM      | 52                  | 50                  | 52/50                 | MS Grad- 55/10, MVA- 1cm2                                                                                             | 1 AR2-3+, TR1+             |
| 3.00  | 42  |     | RHD, SEV CAL MS, P/ CMV1987, 2 SEV PAH                         | RHD               | SEV CAL MS | No      | No      | No      | No  | NO      | SEV  | No      | SEV PAH       | DOE-II Prior to CMV, DOE II-III x 2 yrs, palpitations,                      | 2.5 | Yes          | No          | Yes       | No  | No                    | No          | No      | No                 | RHD                      | 56                  | 40                  | 56/40                 | Commissures fused, mild calcific, grad- 35/21 Myxamatous MV, restricted PML, AML prolapse,A2-A3 chordae rupture, MR4+ | TR3+, Mild MR, 1 PR-2+     |
| 4.00  | 51  |     | 2 RHD, SEV MR , AF                                             | RHD               | No         | SEV MR  | No      | No      | Yes | No      | NO   | No      | 999           | DOE I x 25 yrs, DOE II-III x 6 months, orthopnea +, PND +                   | 2.5 | No           | No          | Yes       | Yes | No                    | No          | No      | No                 | RHD                      | 57                  | 64                  | 57/64                 |                                                                                                                       | 1                          |
| 5.00  | 50  |     | RHD, P/BMV- 89 RE- SEV CAL MS, 2 SEV TR, SEV PAH , AF, CONT HF | RHD               | SEV CAL MS | No      | No      | SEV TR  | Yes | No      | SEV  | Yes     | HF            | SEV PAH,CONT DOE-III- IV x 1 yr, palpitations, PND +, Orthopne +pedal edema | 3.5 | Yes          | Yes         | Yes       | Yes | No                    | No          | No      | No                 | RHD                      | 55                  | 35                  | 55/35                 | CALCIFIED AML, PML, GRAD- 24/14, MVA- 0.76CM2, RVSP- 95+RA                                                            | 1 TR3-4+                   |
| 6.00  | 26  |     | RHD, SEV MR, MILD MS, MILD AR, 2 SR                            | RHD               | MILD MS    | SEV MR  | MILD AR | No      | No  | No      | NO   | No      | SR            | DOE II-IIIx 2 YEARS, PALPITATION +, ORTHOPNE +                              | 2.5 | Yes          | No          | Yes       | No  | No                    | No          | No      | No                 | RHD                      | 37                  | 55                  | 37/55                 | SEV MR, MOD SUBVALVAR LESION, MOD-SEV MS, Calcific MV, Nodule in medial commissure, MVA 1cm^2,Mod SVP,MR2+            | 1 AR 2-3+                  |
| 7.00  | 56  |     | 1 RHD, SEV CAL MS, MILD PAH, SR                                | RHD               | SEV CAL MS | No      | No      | No      | No  | NO      | MILD | No      | MILD PAH,SR   | DOE IIx5years, Palpitation                                                  | 2.0 | Yes          | No          | No        | No  | No                    | No          | No      | No                 | RHD                      | 52                  | 54                  | 52/54                 |                                                                                                                       | 1 AR2+                     |
| 8.00  | 42  |     | RHD, SEV CAL MS, MILD MR,MILD 2 AR, AF,                        | RHD               | SEV CAL MS | MILD MR | MILD AR | No      | Yes | No      | NO   | No      | 999           | DOE FCII x 12 years                                                         | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD, HYPOTHYROIDISM      | 53                  | 56                  | 53/56                 | mild calcific valve, sev SVP, Mild MR 2+ Commissures fused, mild calcific, grad- 22/15, MR 4+                         | 1 AR 2+                    |
| 9.00  | 47  |     | 1 RHD, SEV CAL MS, SEV MR, AF,                                 | RHD               | SEV CAL MS | SEV MR  | No      | No      | Yes | No      | NO   | No      | 999           | DOE II 4 years, Palpitation +, haemoptysis+                                 | 2.0 | Yes          | No          | No        | No  | No                    | Yes         | No      | No                 | RHD                      | 62                  | 62                  | 62/62                 | specs of calcium in AML, PML, MVA 0.8cm, Mod PAH                                                                      | AR 2+, PR 4+, 1 RVSP 74+RA |
| 10.00 | 60  |     | RHD, Sev MS, P/ CMV, AML tear, 1 Sev MR, AF                    | RHD               | SEV CAL MS | SEV MR  | No      | No      | Yes | No      | NO   | No      | CMV,AML TEAR  | DOE II-IIIx20years, haemoptysis                                             | 2.5 | No           | No          | No        | No  | No                    | Yes         | No      | No                 | RHD, smoker              | 55                  | 40                  | 55/40                 | MV doomng+, 2small calcific nodule near PML, laterl commissure fused, MR2+                                            | 1 TR2+                     |
| 11.00 | 28  |     | RHD, SEV CAL MS, Mod MR,Sick 1 sinus syndrome                  | RHD               | SEV CAL MS | MOD MR  | No      | No      | No  | No      | NO   | No      | SI            | DOE IIIX5years, syncope +                                                   | 3.0 | No           | No          | No        | No  | No                    | No          | Yes     | No                 | RHD                      | 58                  | 45                  | 58/45                 | Multiple calcific nodules, lateral comisures fused, Mod -Sev SVP,                                                     | 1 TR2+                     |
| 12.00 | 41  |     | RHD, Sev MS, P/ CMV(83), Sev Re 2 MS, SR                       | RHD               | SEV MS     | No      | No      | No      | No  | No      | NO   | No      | SR            | DOE II x20 years, DOE III6months                                            | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                      | 51                  | 55                  | 51/55                 |                                                                                                                       | 2 OS ASD                   |
| 13.00 | 21  |     | 2 RHD, SEV MR,                                                 | RHD               | No         | SEV MR  | No      | No      | No  | No      | NO   | No      | 999           | DOE II x10 years, DOE III x 4months, ANGINA ON EXERTION                     | 3.0 | No           | No          | No        | No  | No                    | No          | No      | Yes                | RHD,                     | 35                  | 51                  | 35/51                 | Ruptured chordae+, mva- 3 cm2, MR 3-4+,                                                                               | 1 AR2+, mod SVP +          |
| 14.00 | 45  |     | RHD, Sev MS, P/ PTMI SEV MR ,Sev 2 PAH,                        | RHD               | SEV MS     | SEV MR  | No      | No      | No  | No      | NO   | No      | SEV PAH       | DOE II x10 years, DOE III x 6 months,ORTHOPNEA+,                            | 3.0 | No           | No          | Yes       | No  | No                    | No          | No      | No                 | RHD                      | 58                  | 41                  | 58/41                 | MVA-0.75CM2, MS GRAD- 35/21, MILD MR                                                                                  | AR1+, SEV SVP, 1 TR1+      |
| 15.00 | 44  |     | 1 RHD, SEV CAL MS, MILD MR                                     | RHD               | SEV CAL MS | MILD MR | No      | No      | No  | No      | NO   | No      | 999           | DOE-III- IV x 6 MONTHS, ACUTE PULMONARY EDEMA,                              | 3.5 | No           | No          | No        | No  | Yes                   | No          | No      | No                 | RHD, smoker              | 30                  | 42                  | 30/42                 | MS GRAD- 19/13 MMHG, MVA-0.7 CM2, SPECKSOF CALCINIUM IN AML AND PML, MR 2-3+                                          | 1 AR1+,                    |

| s.no  | Age | Sex | Diagnosis                                          | Primary Diagnosis | MS         | MR     | AV     | TV     | AF  | LA CLOT | PAH | CONT HF | Others           | Pre-op Symptoms                                      | DOE | PALPITATIONS | PEDAL EDEMA | ORTHOPNEA | PND | ACUTE PULMONARY EDEMA | HAEMOPTYSIS | SYNCOPE | ANGINA ON EXERTION | Pre-op risk factors | Pre-op ECHO Ia size | Pre-op ECHO IV size | Pre-op ECHO LALV Size | Mitral valve                                                                                                                                      | Other Valves                |
|-------|-----|-----|----------------------------------------------------|-------------------|------------|--------|--------|--------|-----|---------|-----|---------|------------------|------------------------------------------------------|-----|--------------|-------------|-----------|-----|-----------------------|-------------|---------|--------------------|---------------------|---------------------|---------------------|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| 16.00 | 36  | 1   | RHD. SEV CAL MS, MOD MR                            | RHD               | SEV CAL MS | MOD MR | No     | No     | No  | No      | NO  | 999     |                  | DOE-2-3 MONTHS, PALPITATIONS, ORTHOPNEA +,           | 2.5 | Yes          | No          | Yes       | No  | No                    | No          | No      | No                 | RHD                 | 34                  | 40                  | 34/40                 | Calcific MV, POSSIBLE RUPTURE CHORDAE , MVA 1cm*2,GRAD-25/18, Mod SVP,MR3+                                                                        | 1 AR3+, TR3+,               |
| 17.00 | 35  | 2   | RHD. SEV MR, MOD MS, AF                            | RHD               | MOD MS     | SEV MR | No     | No     | Yes | No      | NO  | 999     |                  | DOE II x10 years, PEDAL EDEMA +,                     | 2.0 | No           | Yes         | No        | No  | No                    | No          | No      | No                 | RHD                 | 82                  | 54                  | 82/54                 | MS GRAD- 41/21, MVA- 1.4CM2, MR4+,                                                                                                                | ORGANIC TR, 1 TR4+          |
| 18.00 | 55  | 2   | RHD. SEV CAL MS, P/ CMV1992,MOD MR,MOD AR, MOD PAH | RHD               | SEV CAL MS | MOD MR | MOD AR | No     | No  | No      | MOD | No      | MOD PAH          | DOE II x 16 yrs,                                     | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                 | 62                  | 52                  | 62/52                 | AML and PML CALCIFIED, SEV MS, GRAD-16/7, MVA- 0.9 CM2, SEV SVP,LARGE LA, MR 2-3+, AML and PML CALCIFIED, SEV MS, GRAD-30/9, MVA- 0.7 CM2, MR 2+, | AR1-2+, 1 TR2+,PR1+,        |
| 19.00 | 37  | 2   | RHD. SEV CAL MS, SEV TR, LA CLOT, SEV PAH          | RHD               | SEV CAL MS | No     | No     | SEV TR | No  | Yes     | SEV | No      | LA CLOT,SEV PAH  | DOE11 x 12 yrs, DOE III- 1 YR,ORTHOPNEA, PEDAL EDEMA | 3.0 | No           | Yes         | Yes       | No  | No                    | No          | No      | No                 | RHD                 | 50                  | 42                  | 50/42                 | TR4+, RVSP- 1 95+RA,LA CLOT +,                                                                                                                    |                             |
| 20.00 | 52  | 1   | RHD. SEV MR, MOD MS, MOD TR, SEV PAH               | RHD               | MOD MS     | SEV MR | No     | MOD TR | No  | No      | SEV | No      | SEV PAH          | DOE I X 10 YRS, DOEII-III X 2 YRS, PALPITATIONS,     | 2.5 | Yes          | No          | No        | No  | No                    | No          | No      | No                 | RHD                 | 48                  | 56                  | 48/56                 | MVA-1.6 CM2, MR4+, MS GRAD- 12/7 MMHG, CALCIFIC AML, COMMISURES FUSED, SEV SVP, MS 20/10, MR 2+                                                   | TR2+, RVSP- 1 55+RA,        |
| 21.00 | 33  | 2   | RHD,SEV MS, SR, S/PCMV96                           | RHD               | SEV MS     | No     | No     | No     | No  | No      | NO  | No      | SR               | DOE IIX12YEARS, DOE IIIX2YEARS                       | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                 | 45                  | 55                  | 45/55                 | TR2+, AR2+, 1 RVSP 25+RA                                                                                                                          |                             |
| 22.00 | 37  | 2   | RHD. SEV CAL MS,SEV MR, MOD AR,SR                  | RHD               | SEV CAL MS | SEV MR | MOD AR | No     | No  | No      | NO  | No      | SR               | DOE FC IIX12YEARS IIIX3YEARS, HAEMOPTYSISc           | 3.0 | No           | No          | No        | No  | No                    | Yes         | No      | No                 | RHD                 | 37                  | 49                  | 37/49                 | FIBROUS NODULE IN LATERAL COMMISURE, MS 34/11, MVA 0.75, MR 2+, SEV SVP                                                                           | AR2+, TR 2+, 1 RVSP 30+RA   |
| 23.00 | 25  | 1   | RHD. SEV CAL MS,SEV PAHSR, OS ASD                  | RHD               | SEV CAL MS | No     | No     | No     | No  | No      | SEV | No      | SEV PAHSR,OS ASD | DOEX3 YEARS, HEAMOPTYSIS, ORTHOPNEA                  | 1.0 | No           | No          | Yes       | No  | No                    | Yes         | No      | No                 | RHD                 | 50                  | 30                  | 50/30                 | THICKENING OF AML, PML, MVA 0.9, GRADIENT 18/10, 10MM OS ASD, MR 1-2+                                                                             | tr 3+ pr2+, rvsp 1 70+RA    |
| 24.00 | 40  | 2   | RHD. SEV CAL MS,SEV MR, MOD PAH,SR                 | RHD               | SEV CAL MS | SEV MR | No     | No     | No  | No      | MOD | No      | MOD PAH,SR       | DOEX2YEARS, POEDAL OEDEMA, PND, PALPITATION          | 1.0 | Yes          | Yes         | No        | Yes | No                    | No          | No      | No                 | RHD                 | 42                  | 38                  | 42/38                 | AML and PML CALCIFIED, SEV MS, GRAD-25/15, MVA- 1.0 CM2, MOD SVP,LARGE LA, MR 2-3+,                                                               | TR 3+, RVSP 1 45+RA         |
| 25.00 | 36  | 1   | RHD. SEV CAL MS,mod MR, MOD PAH,af                 | RHD               | SEV CAL MS | MOD MR | No     | No     | Yes | No      | MOD | No      | MOD PAH          | DOE FC IIX5YEARS, ANGINA +                           | 2.0 | No           | No          | No        | No  | No                    | No          | No      | Yes                | RHD                 | 48                  | 58                  | 48/58                 | BOTH COMISURES FUSED, MVA 0.9, GRAD 28/8, MR 3+ Multiple calcific nodules, lateral commissures fused, Mod -Sev SVP,                               | TR 1+, PR 1 +, 1 RVSP 30+RA |
| 26.00 | 34  | 1   | RHD. SEV CAL MS,SEV MR, MOD AR,SR                  | RHD               | SEV CAL MS | SEV MR | MOD AR | No     | No  | No      | NO  | No      | SR               | DOE FCIIIX10YEARS                                    | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                 | 45                  | 42                  | 45/42                 | TR2+, AR2+, 1 RVSP 25+RA                                                                                                                          |                             |
| 27.00 | 58  | 1   | RHD. SEV CAL MS,SEV PAH,SR                         | RHD               | SEV CAL MS | No     | No     | No     | No  | No      | SEV | No      | SEV PAH,SR       | DOE FC IIX6YEARS, IIIX3YEARS, PND, ORTHOPNEA, CCF    | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                 | 53                  | 27                  | 53/27                 | MVA 0.86, MS 50/30, RVSP 120+RA,                                                                                                                  | 1 AR 1+, TR 2+              |

| s.no  | Age | Sex | Diagnosis                                                         | Primary Diagnosis | MS         | MR      | AV      | TV     | AF  | LA CLOT | PAH | CONT HF | Others  | Pre-op Symptoms                                           | DOE | PALPITATIONS | PEDAL EDEMA | ORTHOPNEA | PND | ACUTE PULMONARY EDEMA | HAEMOPTYSIS | SYNCOPE | ANGINA ON EXERTION | Pre-op risk factors         | Pre-op ECHO la size | Pre-op ECHO lv size | Pre-op ECHO LALV Size | Mitral valve | Other Valves                                                               |                              |
|-------|-----|-----|-------------------------------------------------------------------|-------------------|------------|---------|---------|--------|-----|---------|-----|---------|---------|-----------------------------------------------------------|-----|--------------|-------------|-----------|-----|-----------------------|-------------|---------|--------------------|-----------------------------|---------------------|---------------------|-----------------------|--------------|----------------------------------------------------------------------------|------------------------------|
| 28.00 | 38  |     | RHD,SEV MS, SR, S/P CMV85, SEV 2 RE MS                            | RHD               | SEV MS     | No      | No      | No     | No  | No      | NO  | No      | SR      | DOE FC IIX1YEAR,                                          | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                         | 35                  | 37                  | 35/37                 | 2+           | CALCIFIC AML, PML, MVA 1.0, MS 16/10, MR                                   | 1 TR2-3+                     |
| 29.00 | 50  |     | RHD,SEV MS, MOD MR, MOD PAH, 2 S/P PTMC03, SEV RE MS              | RHD               | SEV MS     | MOD MR  | No      | No     | No  | No      | MOD | No      | MOD PAH | DOE FC IIX4YEARS                                          | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                         | 49                  | 39                  | 49/39                 |              | MVA 0.9, MS 25/16, MR 2-3+, FIBROTIC NODULE LAT COMMISURE                  | PR 2+, RVSP 1 18+RA          |
| 30.00 | 45  |     | SEV MS, S/P CMV 91, RE SEV 1 MS,MR, MOD PAH                       | RHD               | SEV MS     | MR      | No      | No     | No  | No      | MOD | No      | MOD PAH | DOE FC IIX25YEARS, IIX3 YEARS                             | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                         | 35                  | 44                  | 35/44                 |              | MR 3+, mva 1.0, RVSP 43+RA, MV RHEUMATIC, MS 35/19, MVA 0.97, RVSP 88+RA   | 1 NO AR                      |
| 31.00 | 16  |     | RHD, SEV CAL MS, MOD MR, MOD 2 TR                                 | RHD               | SEV CAL MS | MOD MR  | No      | MOD TR | No  | No      | NO  | No      | 999     | DOE FC IIX 2 YEARS                                        | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                         | 50                  | 36                  | 50/36                 |              |                                                                            | 1 TR 2-3+                    |
| 32.00 | 40  |     | RHD, S/P OMV , SEV RE MS, PAH, 1 AF                               | RHD               | SEV MS     | No      | No      | No     | Yes | No      | NO  | No      | PAH     | DOE FC II X 4 YEARS,                                      | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                         | 66                  | 51                  | 66/51                 |              | AML CALCIFIC AND FUSED, SEV SVP, MVA 0.6, LARGE LA, MR 2+                  | 1 TR1+                       |
| 33.00 | 36  |     | RHD, SEV MS, S/P CMV 87, SEV RE 1 MS, MILD AR, AF                 | RHD               | SEV MS     | No      | MILD AR | No     | Yes | No      | NO  | No      | 999     | DOE FC IIX7 YEARS                                         | 3.0 | No           | No          | Yes       | Yes | No                    | No          | No      | No                 | RHD, CVA                    | 54                  | 43                  | 54/43                 |              | MS 32/11, MVA 0.7, LA CLOT +                                               | 1 AR2+, RVSP 30              |
| 34.00 | 42  |     | RHD,SEV MS, MOD MR, MOD PAH, 2 S/P PTMC95, SEV RE MS              | RHD               | SEV MS     | MOD MR  | No      | No     | No  | No      | MOD | No      | MOD PAH | DOE FC IIX6 MONTHS, ORTHOPNEA, PND                        | 3.0 | No           | No          | Yes       | Yes | No                    | No          | No      | No                 | RHD                         | 46                  | 42                  | 46/42                 |              | MVA 1.09, MS 21/12, LEAFLETS CALCIFIED                                     | 1 AR 2+, tr 2+, Pr 2+        |
| 35.00 | 46  |     | RHD, SEV MS, S/P CMV 98, SEV RE 2 MS, MILD AR, AF                 | RHD               | SEV MS     | No      | MILD AR | No     | Yes | No      | NO  | No      | 999     | DOE FC IIX2YEARS                                          | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                         | 39                  | 43                  | 39/43                 |              | MS 22/8, MVA 1.1, MR 3+ MV RHEUMATIC, MVA-1.1 CM2, GRAD- 15/10 MMHG, MR3+, | 1 NO AR                      |
| 36.00 | 46  |     | RHD, SEV MS, S/P CMV 83, SEV RE 2 MS, MILD AR, AF WITH CVR        | RHD               | SEV MS     | No      | MILD AR | No     | Yes | No      | NO  | No      | 999     | DOE I X 10 YR, DOE II X 3 MONTHS                          | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                         | 26                  | 56                  | 26/56                 |              |                                                                            | AR1+, TR2+, 1 RVSP- 20 +RA   |
| 37.00 | 42  |     | RHD, SEV MS, S/P CMV 86, SEV RE MS, SEV TR MILD AR, AF WITH 2 CVR | RHD               | SEV MS     | No      | MILD AR | SEV TR | Yes | No      | NO  | No      | 999     | DOE II X 12 yrs, doe III X 5-6 YRS, PALPITATION, ORHOPNEA | 3.0 | Yes          | No          | Yes       | No  | No                    | No          | No      | No                 | RHD, NIDDM                  | 50                  | 42                  | 50/42                 |              | CALCIFIC AML, PML, MVA 1.2, MS 16/10, TV ANNULUS 40 MM                     | 1 TR2+, MOD PAH              |
| 38.00 | 41  | 1   | RHD, SEV CAL MS, MILD AS, SR                                      | RHD               | SEV CAL MS | No      | MILD AS | No     | No  | No      | NO  | No      | SR      | DOE II X 5 YRS, DOE III X 6 MONTHS , PALPITATIONS,        | 3.0 | Yes          | No          | No        | No  | No                    | No          | No      | No                 | RHD, COPD, SEIZURE DISORDER | 47                  | 41                  | 47/41                 |              | CALCIFIC MV, MVA-1.0CM2, GRAD- 39/19 MMHG, MR2+                            | AR2+, AS 33/13, 1 RVSP-52+RA |
| 39.00 | 30  |     | RHD, SEV CAL MS, MILD MR, SEV 1 PAH                               | RHD               | SEV CAL MS | MILD MR | No      | No     | No  | No      | SEV | No      | SEV PAH | DOE I IIX3 years,+                                        | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                         | 64                  | 51                  | 64/51                 |              | CALCIFIC AML, PML, MVA 1.0, MS 16/10, MR3+                                 | AR2-3+, , RVSP 1 75+RA       |

| s.no  | Age | Sex | Diagnosis                                              | Primary Diagnosis | MS     | MR                     | AV      | TV     | AF  | LA CLOT | PAH | CONT HF | Others     | Pre-op Symptoms                     | DOE | PALPITATIONS | PEDAL EDEMA | ORTHOPNEA | PND | ACUTE PULMONARY EDEMA | HAEMOPTYSIS | SYNCOPE | ANGINA ON EXERTION | Pre-op risk factors | Pre-op ECHO la size | Pre-op ECHO lv size | Pre-op ECHO LALV Size | Mitral valve                                                                                                        | Other Valves               |
|-------|-----|-----|--------------------------------------------------------|-------------------|--------|------------------------|---------|--------|-----|---------|-----|---------|------------|-------------------------------------|-----|--------------|-------------|-----------|-----|-----------------------|-------------|---------|--------------------|---------------------|---------------------|---------------------|-----------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------|
| 40.00 | 13  | 2   | RHD,SEV MS, MOD MR, MOD PAH, SR                        | RHD               | SEV MS | MOD MR                 | No      | No     | No  | No      | MOD | No      | MOD PAH,SR | DOE FC II1.5 YEARS, FC IIIX 2MONTHS | 3.0 | No           | No          | No        | No  | No                    | No          | No      | RHD                |                     | 38                  | 38                  | 38/38                 | MS 24/16, FIROTIC MITRAL LEAFLETS, MR 2-3+                                                                          | AR 2+, TR 4+, 1 RVSP 68+RA |
| 41.00 | 47  | 1   | SEV MS, MOD MR, MOD TR,MOD PAH, SR                     | RHD               | SEV MS | MOD MR                 | No      | MOD TR | No  | No      | MOD | No      | MOD PAH,SR | DOE FC IIIX6YEARS                   | 3.0 | No           | No          | No        | No  | No                    | No          | No      | -                  |                     | 42                  | 50                  | 42/50                 | MV CALCIFIED, LV APEX CALCIFIED, MS 25/13, MVA 0.9, MR 2-3+                                                         | 1 TR 1-2+                  |
| 42.00 | 45  | 2   | RHD,SEV MS, MOD MR, MOD TR,MOD PAH, SR                 | RHD               | SEV MS | MOD MR                 | No      | MOD TR | No  | No      | MOD | No      | MOD PAH,SR | DOE FC II 25YEARS, DOE III 1 YEAR   | 3.0 | No           | No          | No        | No  | No                    | No          | No      | RHD, CVA           |                     | 44                  | 41                  | 44/41                 | CALCIFIC AML, PML, MVA 1.0, MS 31/22, MR 3+                                                                         | 1 NO AR                    |
| 43.00 | 56  | 1   | RHD,SEV MS, MILD MR, MOD TR,SEV PAH, SR                | RHD               | SEV MS | MILD MR                | No      | MOD TR | No  | No      | SEV | No      | SEV PAH,SR | DOE FCII X2 YERS, PALPITATION       | 2.0 | Yes          | No          | No        | No  | No                    | No          | No      | RHD, CVA           |                     | 48                  | 41                  | 48/41                 | MV CALCIFIED, MS 26/15, MVA 0.9, MR 1-2+                                                                            | 1 AR1+ , TR2+              |
| 44.00 | 47  | 2   | RHD, SEV MS, S/P CMV87, SEV RE MS, MILD AR, AF         | RHD               | SEV MS | No                     | MILD AR | No     | Yes | No      | NO  | No      | 999        | DOE FC IIIX1YEAR,                   | 2.0 | No           | No          | No        | No  | No                    | No          | No      | RHD                |                     | 50                  | 51                  | 50/51                 | MV CALCIFIED, LARGE CALCIFIC NODULE N MEDIAL COMMISURE MS 21/9, MVA 1, MR 3+                                        | TR2-3+, RVSP 1 25+RA       |
| 45.00 | 50  | 1   | RHD,SEV MS, MILD MR, MOD TR,SEV PAH, SR                | RHD               | SEV MS | MILD MR MILD MR,SEV MR | No      | MOD TR | No  | No      | SEV | No      | SEV PAH,SR | DOE FC IIIX 3 YEARS, POEDAL OEDEMA+ | 3.0 | No           | Yes         | No        | No  | No                    | No          | No      | RHD, SMOKER        |                     | 56                  | 42                  | 56/42                 | CALCIFIC MV, LA CLOT, MS 25/16, MR 2-3+                                                                             | 1 NO AR                    |
| 46.00 | 17  | 2   | RHD, SEV MS, MILD MR, S/P BMV, SEV MR, AML TEAR        | RHD               | SEV MS |                        | No      | No     | No  | No      | NO  | No      | AML TEAR   | DOE FC IIIX4YEARS, PALPITATION      | 2.0 | Yes          | No          | No        | No  | No                    | No          | No      | RHD                |                     | 40                  | 41                  | 40/41                 | MVA0.5, MS 16/12, MR 4+ CALCIFIC MV, LA CLOT, MS 31/17,MVA 0.8, MR 2+                                               | 1 AR2+, TR4+               |
| 47.00 | 33  | 1   | RHD, SEV MS, S/P CMV97, SEV RE MS, MOD MR, LA CLOT, SR | RHD               | SEV MS | MOD MR                 | No      | No     | No  | Yes     | NO  | No      | LA CLOT,SR | DOE FCII X 3 YEARS, DOE IIIX6MONTHS | 3.0 | No           | No          | No        | No  | No                    | No          | No      | RHD                |                     | 39                  | 43                  | 39/43                 | 15X7 MOBILE VEGETATION ATTACHED TO AML, 3X8MM IN PML, MR 4+                                                         | TR2+, AR 1+, rvsp 1 54+ra  |
| 48.00 | 38  | 1   | S/P IE, SEV MR, GOOD LV, SR                            | IE                | SEV MS | SEV MR                 | No      | No     | No  | No      | NO  | No      | GOOD LV,SR | DOE FC IIX 3 MONTHS                 | 2.0 | No           | No          | No        | No  | No                    | No          | No      | IE                 |                     | 40                  | 59                  | 40/59                 |                                                                                                                     | 1 PR2+                     |
| 49.00 | 40  | 1   | RHD, SEV MS, S/P CMV88, SEV RE MS, MOD MR, LA CLOT SR  | RHD               | SEV MS | MOD MR                 | No      | No     | No  | Yes     | NO  | No      | LA CLOT SR | DOE FC IX 15 YEARS, FC IIX 3 YEARS  | 2.0 | No           | No          | No        | No  | No                    | No          | No      | RHD                |                     | 44                  | 44                  | 44/44                 | CALCIFIC MV, LA CLOT, MS 25/16, MR 2-3+                                                                             | TR3+, Mild MR, 1 PR-2+     |
| 50.00 | 27  | 1   | RHD, SEV MS, S/P CMV89,S/P BMV 96, SEV MR, SR          | RHD               | SEV MS | SEV MR                 | No      | No     | No  | No      | NO  | No      | SR         | DOE FCII 1.5 YEARS, HAEMOPTYSIS+    | 2.0 | No           | No          | No        | No  | No                    | Yes         | No      | RHD                |                     | 34                  | 45                  | 34/45                 | MV CALCIFIC, MR JET CLOSE TO MEDIAL COMMISURE, MR 3-4+, MS 17/6MMHg MV RHEUMATIC, MS 20/8, MVA 1.2, MR3+,RVSP 31+RA | TR2+, AR 2+, 1 RVSP 42+RA  |
| 51.00 | 60  | 1   | RHD, SEV MS, S/P CMV81, SEV RE MS, MOD MR, AF          | RHD               | SEV MS | MOD MR                 | No      | No     | Yes | No      | NO  | No      | 999        | DOEII 15 YEARS                      | 2.0 | No           | No          | No        | No  | No                    | No          | No      | RHD                |                     | 55                  | 52                  | 55/52                 |                                                                                                                     | 1 AR2+                     |

| s.no  | Age | Sex | Diagnosis                                              | Primary Diagnosis | MS         | MR     | AV | TV     | AF  | LA CLOT | PAH  | CONT HF | Others              | Pre-op Symptoms                                         | DOE | PALPITATIONS | PEDAL EDEMA | ORTHOPNEA | PND | ACUTE PULIMONARY EDEMA | HAEMOPTYSIS | SYNCOPE | ANGINA ON EXERTION | Pre-op risk factors | Pre-op ECHO la size | Pre-op ECHO lv size | Pre-op ECHO LALV Size | Mitral valve                                                                                       | Other Valves             |
|-------|-----|-----|--------------------------------------------------------|-------------------|------------|--------|----|--------|-----|---------|------|---------|---------------------|---------------------------------------------------------|-----|--------------|-------------|-----------|-----|------------------------|-------------|---------|--------------------|---------------------|---------------------|---------------------|-----------------------|----------------------------------------------------------------------------------------------------|--------------------------|
| 52.00 | 43  |     | RHD, SEV MS, S/P CMV90, SEV RE 1 MS, MOD MR, SR        | RHD               | SEV MS     | MOD MR | No | No     | No  | No      | NO   | No      | SR                  | DOE IIIX3 YEARS, PND, ORTHOPNEA                         | 3.0 | No           | No          | Yes       | Yes | No                     | No          | No      | No                 | RHD                 | 28                  | 35                  | 28/35                 | MVA 0.5, MS 13/7, MR2+                                                                             | AR1+, TR4+, 1 RVSP 24+RA |
| 53.00 | 34  |     | RHD, SEV MS, S/P CMV94, SEV RE 1 MS, MOD MR, AF        | RHD               | SEV MS     | MOD MR | No | No     | Yes | No      | NO   | No      | 999                 | DOEFCIIIX10YEARS                                        | 3.0 | No           | No          | No        | No  | No                     | No          | No      | No                 | RHD, CVA            | 35                  | 34                  | 35/34                 | OS ASD, CALCIFIED MV,                                                                              | 1 RVSP 40+RA             |
| 54.00 | 48  |     | RHD, SEV MS, S/P CMV 82, SEV RE 2 MS, MOD MR, MILD PAH | RHD               | SEV MS     | MOD MR | No | No     | No  | No      | MILD | No      | MILD PAH            | DOE IIX 15 YRS, DOE III X 6 YRS, PALPITATIONS           | 3.0 | Yes          | No          | No        | No  | No                     | No          | No      | No                 | RHD                 | 36                  | 36                  | 36/36                 | CALCIFIC MV, MS 19/10, MVA 0.8, MR 2-3 + THICKENED AND CALCIFIC AML, PML, MVA 1.0, MS 30/22, MR 2+ | 1 TR2+                   |
| 55.00 | 45  |     | RHD, SEV MS, S/P CMV 93, MOD 2 MR, MOD TR,MOD PAH, SR  | RHD               | SEV MS     | MOD MR | No | MOD TR | No  | No      | MOD  | No      | MOD PAH,SR          | DOE III-IV X 3 MONTHS, ORTHOPNEA, PND, SYNCOPE          | 3.5 | No           | No          | Yes       | Yes | No                     | No          | Yes     | No                 | RHD                 | 10                  | 43                  | 101/43                | 2+, LA CLOT THICKENED AND CALCIFIC AML, PML, MVA 1.0, MS 21/14, MR 2+                              | 1 TR+                    |
| 56.00 | 32  |     | RHD, SEV MS, S/P BMV 93, MOD 2 MR, MOD TR,MOD PAH, SR  | RHD               | SEV MS     | MOD MR | No | MOD TR | No  | No      | MOD  | No      | MOD PAH,SR          | DOE IIX 6 YRS, DOE III X 1 YRS, ORTHOPNEA, PND          | 3.0 | No           | No          | Yes       | Yes | No                     | No          | No      | No                 | RHD                 | 48                  | 42                  | 48/42                 | MVA 0.9, MS 23/9                                                                                   | 1 OS ASD                 |
| 57.00 | 17  | 1   | RHD, SEV MR, MILD MS, SR                               | RHD               | MILD MS    | SEV MR | No | No     | No  | No      | NO   | No      | SR                  | DOEIIIX 2 YEARS, PALAPITATIONS                          | 2.0 | Yes          | No          | No        | No  | No                     | No          | No      | No                 | RHD                 | 49                  | 63                  | 49/63                 | THICKENED AML, PML, COMISSURES FUSED, MVA 2.6, MS 21/14, MR 4+, REDUCTANT A2,A3,P2,P3              | 1 MOD PE                 |
| 58.00 | 28  |     | RHD, SEV CAL MS, Mod MR,Sick 1 sinus syndrome          | RHD               | SEV CAL MS | MOD MR | No | No     | No  | No      | NO   | No      | SICK SINUS SYNDROME | DOE IIIX5years, syncope +                               | 3.0 | No           | No          | No        | No  | No                     | No          | Yes     | No                 | RHD                 | 58                  | 45                  | 58/45                 | MV dooming+, 2small calcific nodule near PML, laterl commissure fused, MR2+                        | 1 TR2+                   |
| 59.00 | 41  |     | RHD, Sev MS, P/ CMV(83), Sev Re 2 MS, SR               | RHD               | SEV MS     | No     | No | No     | No  | No      | NO   | No      | SR                  | DOE II x20 years, DOE III6months                        | 3.0 | No           | No          | No        | No  | No                     | No          | No      | No                 | RHD                 | 51                  | 55                  | 51/55                 | Multiple calcific nodules, lateral commissures fused, Mod -Sev SVP,                                | 2 OS ASD                 |
| 60.00 | 21  | 2   | RHD, SEV MR,                                           | RHD               | No         | SEV MR | No | No     | No  | No      | NO   | No      | 999                 | DOE II x10 years, DOE III x 4months, ANGINA ON EXERTION | 3.0 | No           | No          | No        | No  | No                     | No          | No      | Yes                | RHD,                | 35                  | 51                  | 35/51                 | Ruptured chordae+, mva- 3 cm2, MR 3-4+,                                                            | 1 AR2+, mod SVP +        |
| 61.00 | 53  |     | RHD,SEV MS, MOD MR, MOD PAH, 2 S/P PTMC03, SEV RE MS   | RHD               | SEV MS     | MOD MR | No | No     | No  | No      | MOD  | No      | MOD PAH             | DOE FC IIIX4YEARS                                       | 2.0 | No           | No          | No        | No  | No                     | No          | No      | No                 | RHD                 | 49                  | 39                  | 49/39                 | MVA 0.9, MS 25/16, MR 2-3+, FIBROTIC NODULE LAT COMMISURE                                          | PR 2+, RVSP 1 18+RA      |
| 62.00 | 45  |     | SEV MS, S/P CMV 91, RE SEV 1 MS,MR, MOD PAH            | RHD               | SEV MS     | No     | No | No     | No  | No      | MOD  | No      | MOD PAH             | DOE FCIIIX25YEARS, IIIX3 YEARS                          | 3.0 | No           | No          | No        | No  | No                     | No          | No      | No                 | RHD                 | 35                  | 44                  | 35/44                 | MR 3+, mva 1.0, RVSP 43+RA                                                                         | 1 NO AR                  |
| 63.00 | 16  |     | RHD, SEV CAL MS, MOD MR, MOD 2 TR                      | RHD               | SEV CAL MS | MOD MR | No | MOD TR | No  | No      | NO   | No      | 999                 | DOE FC IIIX 2 YEARS                                     | 3.0 | No           | No          | No        | No  | No                     | No          | No      | No                 | RHD                 | 50                  | 36                  | 50/36                 | MV RHEUMATIC, MS 35/19, MVA 0.97, RVSP 88+RA                                                       | 1 TR 2-3+                |

| s.no  | Age | Sex                                                                                                | Diagnosis                                                                                        | Primary Diagnosis | MS      | MR      | AV      | TV  | AF  | LA CLOT | PAH | CONT HF                          | Others                                   | Pre-op Symptoms                                           | DOE | PALPITATIONS | PEDAL EDEMA | ORTHOPNEA | PND | ACUTE PULMONARY EDEMA | HAEMOPTYSIS | SYNCOPE | ANGINA ON EXERTION  | Pre-op risk factors      | Pre-op ECHO la size | Pre-op ECHO lv size       | Pre-op ECHO LALV Size                                                                                                              | Mitral valve            | Other Valves |
|-------|-----|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------|---------|---------|---------|-----|-----|---------|-----|----------------------------------|------------------------------------------|-----------------------------------------------------------|-----|--------------|-------------|-----------|-----|-----------------------|-------------|---------|---------------------|--------------------------|---------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------|
| 64.00 | 43  | 1 AF                                                                                               | RHD, S/P OMV , SEV RE MS, PAH,                                                                   | RHD SEV MS        | No      | No      | No      | No  | Yes | No      | NO  | No                               | PAH                                      | DOE FCII X 4 YEARS,                                       | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                  | RHD                      | 66                  | 51 66/51                  | AML CALCIFIC AND FUSED, SEV SVP, MVA 0.6, LARGE LA, MR 2+                                                                          | 1 TR1+                  |              |
| 65.00 | 36  | 1 MS, MILD AR, AF                                                                                  | RHD, SEV MS, S/P CMV 87, SEV RE                                                                  | RHD SEV MS        | No      | MILD AR | No      | No  | Yes | No      | NO  | No                               | 999                                      | DOE FCIII X7 YEARS                                        | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                  | RHD, CVA                 | 54                  | 43 54/43                  | MS 32/11, MVA 0.7, LA CLOT +                                                                                                       | 1 AR2+, RVSP 30         |              |
| 66.00 | 44  | 1 RHD. SEV CAL MS, MILD MR                                                                         | RHD. SEV CAL MS, MILD MR                                                                         | RHD SEV CAL MS    | MILD MR | No      | No      | No  | No  | No      | NO  | No                               | 999                                      | DOE-III- IV x 6 MONTHS, ACUTE PULMONARY EDEMA,            | 3.5 | No           | No          | No        | No  | Yes                   | No          | No      | No                  | RHD, smoker              | 30                  | 42 30/42                  | MS GRAD- 19/13 MMHG, MVA-0.7 CM2, SPECKSOF CALCIUM IN AML AND PML, MR 2-3+ Calcific MV, POSSIBLE RUPTURE CHORDAE , MVA 1cm*2,GRAD- | 1 AR1+,                 |              |
| 67.00 | 36  | 1 RHD. SEV CAL MS, MOD MR                                                                          | RHD. SEV CAL MS, MOD MR                                                                          | RHD SEV CAL MS    | MOD MR  | No      | No      | No  | No  | No      | NO  | No                               | 999                                      | DOE-2-3 MONTHS, PALPITATIONS, ORTHOPNEA +,                | 2.5 | Yes          | No          | Yes       | No  | No                    | No          | No      | No                  | RHD                      | 34                  | 40 34/40                  | 25/18, Mod SVP,MR3+                                                                                                                | 1 AR3+, TR3+,           |              |
| 68.00 | 55  | 2 RHD. SEV MR, MOD MS, AF                                                                          | RHD. SEV MR, MOD MS, AF                                                                          | RHD MOD MS        | No      | No      | No      | No  | Yes | No      | NO  | No                               | 999                                      | DOE II x10 years, PEDAL EDEMA +,                          | 2.0 | No           | Yes         | No        | No  | No                    | No          | No      | No                  | RHD                      | 82                  | 54 82/54                  | MS GRAD- 41/21, MVA- 1.4CM2, MR4+,                                                                                                 | ORGANIC TR, 1 TR4+      |              |
| 69.00 | 55  | 2 RHD. SEV CAL MS, P/ CMV1992,MOD MR,MOD AR, MOD PAH                                               | RHD. SEV CAL MS, P/ CMV1992,MOD MR,MOD AR, MOD PAH                                               | RHD SEV CAL MS    | MOD MR  | MOD AR  | No      | No  | No  | No      | MOD | No                               | MOD PAH                                  | DOE II x 16 yrs,                                          | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                  | RHD                      | 62                  | 52 62/52                  | AML and PML CALCIFIED, SEV MS, GRAD-16/7, MVA- 0.9 CM2, SEV SVP,LARGE LA, MR 2-3+,                                                 | AR1-2+, 1 TR2+,PR1+,    |              |
| 70.00 | 60  | 2 RHD. SEV CAL MS, MILD AR, LAA CLOT, AF RHD, P/BMV, RE- SEV CAL MS, MILD AR/MR/TR, MILD PAH CLOT, | RHD. SEV CAL MS, MILD AR, LAA CLOT, AF RHD, P/BMV, RE- SEV CAL MS, MILD AR/MR/TR, MILD PAH CLOT, | RHD SEV CAL MS    | No      | MILD AR | No      | No  | Yes | Yes     | NO  | No                               | LAA CLOT                                 | DOE-II x 2 yrs-> III 1 yr, palpitations, pedal edema      | 3.0 | Yes          | Yes         | No        | No  | No                    | No          | No      | No                  | RHD, HTN, HYPOTHYROIDISM | 53                  | 38 53/38                  | CALCIFIED AML, PML                                                                                                                 | MOD SUB VAL 1 PATHOLOGY |              |
| 71.00 | 46  | 2 AF                                                                                               | RHD. SEV CAL MS, P/ CMV1987, 2 SEV PAH                                                           | RHD SEV MS        | MILD MR | MILD AR | MILD TR | Yes | Yes | MILD    | No  | MILD PAH CLOT 2 Ys, palpitations | Asymptomatic 4 yrs P/BMV, DOE-II x 2 Ys, | 2.0                                                       | Yes | No           | No          | No        | No  | No                    | No          | No      | RHD, HYPOTHYROIDISM | 52                       | 50 52/50            | MS Grad- 55/10, MVA- 1cm2 | 1 AR2-3+, TR1+                                                                                                                     |                         |              |
| 72.00 | 39  | 2 SEV PAH                                                                                          | RHD. SEV CAL MS, P/ CMV1987, 2 SEV PAH                                                           | RHD SEV CAL MS    | No      | No      | No      | No  | No  | No      | SEV | No                               | SEV PAH                                  | DOE-II Prior to CMV, DOE II-III x 2 yrs, palpitations,    | 2.5 | Yes          | No          | No        | No  | No                    | No          | No      | No                  | RHD                      | 56                  | 40 56/40                  | Commissures fused, mild calific, grad- 35/21 Myxamatous MV, restricted PML, AML prolapse,A2-A3 chordae rupture, MR4+               | TR3+, Mild MR, 1 PR-2+  |              |
| 73.00 | 51  | 2 RHD. SEV MR , AF                                                                                 | RHD. SEV MR , AF                                                                                 | RHD No            | SEV MR  | No      | No      | No  | Yes | No      | NO  | No                               | 999                                      | DOE I x 25 yrs, DOE II-III x 6 months, orthopnea +, PND + | 2.5 | No           | No          | Yes       | Yes | No                    | No          | No      | No                  | RHD                      | 57                  | 64 57/64                  |                                                                                                                                    | 1                       |              |
| 74.00 | 47  | 2 MS, MILD AR, AF                                                                                  | RHD, SEV MS, S/P CMV87, SEV RE                                                                   | RHD SEV MS        | No      | MILD AR | No      | No  | Yes | No      | NO  | No                               | 999                                      | DOE FC IIX1YEAR,                                          | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                  | RHD                      | 50                  | 51 50/51                  | MV CALCIFIED, LARGE CALCIFIC NODULE N MEDIAL COMMISSURE MS 21/9, MVA 1, MR 3+                                                      | TR2-3+, RVSP 1 25+RA    |              |
| 75.00 | 52  | 1 S/P IE, SEV MR, GOOD LV, SR                                                                      | IE                                                                                               | No                | SEV MR  | No      | No      | No  | No  | No      | NO  | No                               | GOOD LV,SR                               | DOE FC IIX 3 MONTHS                                       | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                  | IE                       | 40                  | 59 40/59                  | 15X7 MOBILE VEGETATION ATTACHED TO AML, 3X8MM IN PML, MR 4+                                                                        | 1 PR2+                  |              |
| 76.00 | 40  | 1 MS, MOD MR, LA CLOT SR                                                                           | RHD, SEV MS, S/P CMV88, SEV RE                                                                   | RHD SEV MS        | MOD MR  | No      | No      | No  | No  | Yes     | NO  | No                               | LA CLOT SR                               | DOE FC IX 15 YEARS, FC IIX 3 YEARS                        | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                  | RHD, CVA                 | 44                  | 44 44/44                  | CALCIFIC MV, LA CLOT, MS 25/16, MR 2-3+                                                                                            | TR3+, Mild MR, 1 PR-2+  |              |

| s.no  | Age | Sex | Diagnosis                                                               | Primary Diagnosis | MS         | MR      | AV      | TV     | AF  | LA CLOT | PAH | CONT HF | Others     | Pre-op Symptoms                                              | DOE | PALPITATIONS | PEDAL EDEMA | ORTHOPNEA | PND | ACUTE PULMONARY EDEMA | HAEMOPTYSIS | SYNCOPE | ANGINA ON EXERTION | Pre-op risk factors            | Pre-op ECHO la size | Pre-op ECHO lv size | Pre-op ECHO LALV Size | Mitral valve                                                                                                                           | Other Valves                     |
|-------|-----|-----|-------------------------------------------------------------------------|-------------------|------------|---------|---------|--------|-----|---------|-----|---------|------------|--------------------------------------------------------------|-----|--------------|-------------|-----------|-----|-----------------------|-------------|---------|--------------------|--------------------------------|---------------------|---------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| 77.00 | 27  |     | RHD, SEV MS, S/P CMV89,S/P BMV<br>1 96, SEV MR, SR                      | RHD               | SEV MS     | SEV MR  | No      | No     | No  | No      | NO  | No      | SR         | DOE FCII X 1.5 YEARS,<br>HAEMOPTYSIS+                        | 2.0 | No           | No          | No        | No  | No                    | Yes         | No      | No                 | RHD                            | 34                  | 45                  | 34/45                 | MV CALCIFIC, MR JET<br>CLOSE TO MEDIAL<br>COMMISSURE, MR 3-4+,<br>MS 17/6MMHg<br>MV RHEUMATIC, MS<br>20/8, MVA 1.2,<br>MR3+,RVSP 31+RA | TR2+, AR 2+,<br>1 RVSP 42+RA     |
| 78.00 | 60  |     | RHD, SEV MS, S/P CMV81, SEV RE<br>1 MS, MOD MR, AF                      | RHD               | SEV MS     | MOD MR  | No      | No     | Yes | No      | NO  | No      | 999        | DOEII X 15 YEARS                                             | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                            | 55                  | 52                  | 55/52                 | MR3+,RVSP 31+RA                                                                                                                        | 1 AR2+                           |
| 79.00 | 43  |     | RHD, SEV MS, S/P CMV90, SEV RE<br>1 MS, MOD MR, SR                      | RHD               | SEV MS     | MOD MR  | No      | No     | No  | No      | NO  | No      | SR         | DOE IIIX 3 YEARS, PND,<br>ORTHOPNEA                          | 3.0 | No           | No          | Yes       | Yes | No                    | No          | No      | No                 | RHD, SMOKER                    | 28                  | 35                  | 28/35                 | MVA 0.5, MS 13/7, MR2+                                                                                                                 | AR1+, TR4+,<br>1 RVSP 24+RA      |
| 80.00 | 55  |     | RHD, SEV MS, S/P CMV 86, SEV RE<br>MS, SEV TR MILD AR, AF WITH<br>2 CVR | RHD               | SEV MS     | No      | MILD AR | SEV TR | Yes | No      | NO  | No      | 999        | DOE II X 12 yrs, doe III X 5-6 YRS,<br>PALPITATION, ORHOPNEA | 3.0 | Yes          | No          | Yes       | No  | No                    | No          | No      | No                 | RHD, NIDDM                     | 50                  | 42                  | 50/42                 | CALCIFIC AML, PML,<br>MVA 1.2, MS 16/10, TV<br>ANNULUS 40 MM                                                                           | 1 TR2+, MOD PAH                  |
| 81.00 | 41  | 1   | RHD, SEV CAL MS, MILD AS, SR                                            | RHD               | SEV CAL MS | No      | MILD AS | No     | No  | No      | NO  | No      | SR         | DOE II X 5 YRS, DOE III X 6 MONTHS<br>, PALPITATIONS,        | 3.0 | Yes          | No          | No        | No  | No                    | No          | No      | No                 | RHD, COPD, SEIZURE<br>DISORDER | 47                  | 41                  | 47/41                 | CALCIFIC MV, MVA-<br>1.0CM2, GRAD- 39/19<br>MMHG, MR2+                                                                                 | AR2+, AS 33/13 ,<br>1 RVSP-52+RA |
| 82.00 | 30  | 1   | RHD, SEV CAL MS, MILD MR, SEV<br>PAH                                    | RHD               | SEV CAL MS | MILD MR | No      | No     | No  | No      | SEV | No      | SEV PAH    | DOE IIIx3 years,+                                            | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                            | 64                  | 51                  | 64/51                 | CALCIFIC AML, PML,<br>MVA 1.0, MS 16/10,<br>MR3+                                                                                       | AR2-3+ , , RVSP<br>1 75+RA       |
| 83.00 | 16  | 2   | RHD,SEV MS, MOD MR, MOD PAH,<br>SR                                      | RHD               | SEV MS     | MOD MR  | No      | No     | No  | No      | MOD | No      | MOD PAH,SR | DOE FC II 1.5 YEARS, FC IIIX<br>2MONTHS                      | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                            | 38                  | 38                  | 38/38                 | MS 24/16, FIROTIC<br>MITRAL LEAFLETS, MR<br>2-3+                                                                                       | AR 2+, TR 4+,<br>1 RVSP 68+RA    |
| 84.00 | 47  | 1   | SEV MS, MOD MR, MOD TR,MOD<br>PAH, SR                                   | RHD               | SEV MS     | MOD MR  | No      | MOD TR | No  | No      | MOD | No      | MOD PAH,SR | DOE FC IIIX6YEARS                                            | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | -                              | 42                  | 50                  | 42/50                 | MV CALCIFIED, LV<br>APEX CALCIFIED, MS<br>25/13, MVA 0.9, MR 2-3+                                                                      | 1 TR 1-2+                        |
| 85.00 | 45  | 2   | RHD,SEV MS, MOD MR, MOD<br>TR,MOD PAH, SR                               | RHD               | SEV MS     | MOD MR  | No      | MOD TR | No  | No      | MOD | No      | MOD PAH,SR | DOE FC II 25YEARS, DOE III 1 YEAR                            | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD, CVA                       | 44                  | 41                  | 44/41                 | CALCIFIC AML, PML,<br>MVA 1.0, MS 31/22, MR<br>3+                                                                                      | 1 NO AR                          |
| 86.00 | 56  | 1   | RHD,SEV MS, MILD MR, MOD<br>TR,SEV PAH, SR                              | RHD               | SEV MS     | MILD MR | No      | MOD TR | No  | No      | SEV | No      | SEV PAH,SR | DOE FCII X2 YERS, PALPITATION                                | 2.0 | Yes          | No          | No        | No  | No                    | No          | No      | No                 | RHD, CVA                       | 48                  | 41                  | 48/41                 | MV CALCIFIED, MS<br>26/15, MVA 0.9, MR 1-2+                                                                                            | 1 AR1+ , TR2+                    |
| 87.00 | 25  | 2   | RHD, SEV MR,                                                            | RHD               | No         | SEV MR  | No      | No     | No  | No      | NO  | No      | 999        | DOE II x10 years, DOE III x 4months,<br>ANGINA ON EXERTION   | 3.0 | No           | No          | No        | No  | No                    | No          | No      | Yes                | RHD,                           | 35                  | 51                  | 35/51                 | Ruptured chordae+, mva-<br>3 cm2, MR 3-4+,                                                                                             | 1 AR2+, mod SVP +                |

| s.no  | Age | Sex | Diagnosis                                                      | Primary Diagnosis | MS         | MR      | AV      | TV      | AF  | LA CLOT | PAH  | CONT HF | Others        | Pre-op Symptoms                                      | DOE | PALPITATIONS | PEDAL EDEMA | ORTHOPNEA | PND | ACUTE PULMONARY EDEMA | HAEMOPTYSIS | SYNCOPE | ANGINA ON EXERTION | Pre-op risk factors      | Pre-op ECHO la size | Pre-op ECHO lv size | Pre-op ECHO LALV Size | Mitral valve                                                                                                                                           | Other Valves              |
|-------|-----|-----|----------------------------------------------------------------|-------------------|------------|---------|---------|---------|-----|---------|------|---------|---------------|------------------------------------------------------|-----|--------------|-------------|-----------|-----|-----------------------|-------------|---------|--------------------|--------------------------|---------------------|---------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| 88.00 | 50  |     | RHD,SEV MS, MOD MR, MOD PAH, 2 S/P PTMC03, SEV RE MS           | RHD               | SEV MS     | MOD MR  | No      | No      | No  | No      | MOD  | No      | MOD PAH       | DOE FC IIX4YEARS                                     | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                      | 49                  | 39                  | 49/39                 | MVA 0.9, MS 25/16, MR 2-3+, FIBROTIC NODULE LAT COMMISURE                                                                                              | PR 2+, RVSP 1 18+RA       |
| 89.00 | 45  |     | SEV MS, S/P CMV 91, RE SEV 1 MS,MR, MOD PAH                    | RHD               | SEV MS     | SEV MR  | No      | No      | No  | No      | MOD  | No      | MOD PAH       | DOE FCIIIX25YEARS, IIIX3 YEARS                       | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                      | 35                  | 44                  | 35/44                 | MR 3+, mva 1.0, RVSP 43+RA                                                                                                                             | 1 NO AR                   |
| 90.00 | 18  |     | RHD. SEV CAL MS, MOD MR, MOD 2 TR                              | RHD               | SEV CAL MS | MOD MR  | No      | MOD TR  | No  | No      | NO   | No      | 999           | DOE FC IIIX 2 YEARS                                  | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                      | 50                  | 36                  | 50/36                 | MR 3+, mva 1.0, RVSP 43+RA                                                                                                                             | 1 TR 2-3+                 |
| 91.00 | 36  |     | RHD, SEV MS, S/P CMV 87, SEV RE 1 MS, MILD AR, AF              | RHD               | SEV MS     | No      | MILD AR | No      | Yes | No      | NO   | No      | 999           | DOE FCIIIX7 YEARS                                    | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD, CVA                 | 54                  | 43                  | 54/43                 | MS 32/11, MVA 0.7, LA CLOT +                                                                                                                           | 1 AR2+, RVSP 30           |
| 92.00 | 44  | 1   | RHD. SEV CAL MS, MILD MR                                       | RHD               | SEV CAL MS | MILD MR | No      | No      | No  | No      | NO   | No      | 999           | DOE-III- IV x 6 MONTHS, ACUTE PULMONARY EDEMA,       | 3.5 | No           | No          | No        | No  | Yes                   | No          | No      | No                 | RHD, smoker              | 30                  | 42                  | 30/42                 | MS GRAD- 19/13 MMHG, MVA-0.7 CM2, SPECKSOF CALCIUM IN AML AND PML, MR 2-3+ Calcific MV, POSSIBLE RUPTURE CHORDAE , MVA 1cm^2,GRAD- 25/18, Mod SVP,MR3+ | 1 AR1+,                   |
| 93.00 | 36  | 1   | RHD. SEV CAL MS, MOD MR                                        | RHD               | SEV CAL MS | MOD MR  | No      | No      | No  | No      | NO   | No      | 999           | DOE-2-3 MONTHS, PALPITATIONS, ORTHOPNEA +,           | 2.5 | Yes          | No          | Yes       | No  | No                    | No          | No      | No                 | RHD                      | 34                  | 40                  | 34/40                 | MS GRAD- 19/13 MMHG, MVA-0.7 CM2, SPECKSOF CALCIUM IN AML AND PML, MR 2-3+ Calcific MV, POSSIBLE RUPTURE CHORDAE , MVA 1cm^2,GRAD- 25/18, Mod SVP,MR3+ | 1 AR3+, TR3+,             |
| 94.00 | 35  | 2   | RHD. SEV MR, MOD MS, AF                                        | RHD               | MOD MS     | SEV MR  | No      | No      | Yes | No      | NO   | No      | 999           | DOE II x10 years, PEDAL EDEMA +,                     | 2.0 | No           | Yes         | No        | No  | No                    | No          | No      | No                 | RHD                      | 82                  | 54                  | 82/54                 | MS GRAD- 41/21, MVA- 1.4CM2, MR4+,                                                                                                                     | ORGANIC TR, 1 TR4+        |
| 95.00 | 55  |     | RHD. SEV CAL MS, P/ CMV1992,MOD MR,MOD AR, MOD 2 PAH           | RHD               | SEV CAL MS | MOD MR  | MOD AR  | No      | No  | No      | MOD  | No      | MOD PAH       | DOE II x 16 yrs,                                     | 2.0 | Yes          | Yes         | No        | No  | No                    | No          | No      | No                 | RHD                      | 62                  | 52                  | 62/52                 | AML and PML CALCIFIED, SEV MS, GRAD-16/7, MVA- 0.9 CM2, SEV SVP,LARGE LA, MR 2-3+,                                                                     | AR1-2+, 1 TR2+,PR1+,      |
| 96.00 | 60  |     | RHD. SEV CAL MS, MILD AR, LAA 2 CLOT, AF                       | RHD               | SEV CAL MS | No      | MILD AR | No      | No  | No      | NO   | No      | LAA CLOT,AF   | DOE-II x 2 yrs-> III 1 yr, palpitations, pedal edema | 3.0 | Yes          | No          | No        | No  | No                    | No          | No      | No                 | RHD, HTN, HYPOTHYROIDISM | 53                  | 38                  | 53/38                 | CALCIFIED AML, PML                                                                                                                                     | MOD SUB VAL 1 PATHOLOGY   |
| 97.00 | 41  |     | RHD, P/BMV, RE- SEV CAL MS, MILD AR/MR/TR, MILD PAH CLOT, 2 AF | RHD               | SEV MS     | MILD MR | MILD AR | MILD TR | Yes | Yes     | MILD | No      | MILD PAH CLOT | Asymptomatic 4 yrs P/BMV, DOE-II x IIIX6MONTHS       | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD, HYPOTHYROIDISM      | 52                  | 50                  | 52/50                 | MS Grad- 55/10, MVA- 1cm2                                                                                                                              | 1 AR2-3+, TR1+            |
| 98.00 | 33  |     | RHD, SEV MS, S/P CMV97, SEV RE 1 MS, MOD MR, LA CLOT, SR       | RHD               | SEV MS     | MOD MR  | No      | No      | No  | Yes     | NO   | No      | LA CLOT,SR    | DOE FCII X 3 YEARS, DOE IIIX6MONTHS                  | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                      | 39                  | 43                  | 39/43                 | CALCIFIC MV, LA CLOT, MS 31/17,MVA 0.8, MR 2+                                                                                                          | TR2+, AR 1+, rvsp 1 54+ra |
| 99.00 | 38  | 1   | S/P IE, SEV MR, GOOD LV, SR                                    | IE                | No         | SEV MR  | No      | No      | No  | No      | NO   | No      | GOOD LV,SR    | DOE FC IIX 3 MONTHS                                  | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | IE                       | 40                  | 59                  | 40/59                 | 15X7 MOBILE VEGETATION ATTACHED TO AML, 3X8MM IN PML, MR 4+                                                                                            | 1 PR2+                    |



| s.no   | Age | Sex | Diagnosis                                                         | Primary Diagnosis | MS         | MR      | AV      | TV      | AF  | LA CLOT | PAH  | CONT HF | Others                           | Pre-op Symptoms                                           | DOE | PALPITATIONS | PEDAL EDEMA | ORTHOPNEA | PND | ACUTE PULMONARY EDEMA | HAEMOPTYSIS | SYNCOPE | ANGINA ON EXERTION | Pre-op risk factors         | Pre-op ECHO la size | Pre-op ECHO lv size | Pre-op ECHO LALV Size | Mitral valve                                                                                         | Other Valves                  |
|--------|-----|-----|-------------------------------------------------------------------|-------------------|------------|---------|---------|---------|-----|---------|------|---------|----------------------------------|-----------------------------------------------------------|-----|--------------|-------------|-----------|-----|-----------------------|-------------|---------|--------------------|-----------------------------|---------------------|---------------------|-----------------------|------------------------------------------------------------------------------------------------------|-------------------------------|
| 100.00 | 40  |     | RHD, SEV MS, S/P CMV88, SEV RE 1 MS, MOD MR, LA CLOT SR           | RHD               | SEV MS     | MOD MR  | No      | No      | No  | Yes     | NO   | No      | LA CLOT SR                       | DOE FC IX 15 YEARS, FC IIX 3 YEARS                        | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                         | 44                  | 44                  | 44/44                 | CALCIFIC MV, LA CLOT, MS 25/16, MR 2-3+                                                              | TR3+, Mild MR, 1 PR 2+        |
| 101.00 | 29  |     | RHD, SEV MS, S/P CMV89,S/P BMV 1 96, SEV MR, SR                   | RHD               | SEV MS     | SEV MR  | No      | No      | No  | NO      | NO   | NO      | SR                               | DOE FCIIIX 1.5 YEARS, HAEMOPTYSIS+                        | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                         | 34                  | 45                  | 34/45                 | MV CALCIFIC, MR JET CLOSE TO MEDIAL COMMISSURE, MR 3-4+, MS 17/6MMHg MV RHEUMATIC, MS 20/8, MVA 1.2, | TR2+, AR 2+, 1 RVSP 42+RA     |
| 102.00 | 60  |     | RHD, SEV MS, S/P CMV81, SEV RE 1 MS, MOD MR, AF                   | RHD               | SEV MS     | MOD MR  | No      | No      | Yes | NO      | NO   | NO      | 999                              | DOEIIIX 15 YEARS                                          | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                         | 55                  | 52                  | 55/52                 | MR3+,RVSP 31+RA                                                                                      | 1 AR2+                        |
| 103.00 | 43  |     | RHD, SEV MS, S/P CMV90, SEV RE 1 MS, MOD MR, SR                   | RHD               | SEV MS     | MOD MR  | No      | No      | No  | NO      | NO   | NO      | SR                               | DOE IIIX3 YEARS, PND, ORTHOPNEA                           | 3.0 | No           | No          | Yes       | Yes | NO                    | NO          | NO      | NO                 | RHD                         | 28                  | 35                  | 28/35                 | MVA 0.5, MS 13/7, MR2+                                                                               | AR1+, TR4+, 1 RVSP 24+RA      |
| 104.00 | 34  |     | RHD, SEV MS, S/P CMV94, SEV RE 1 MS, MOD MR, AF                   | RHD               | SEV MS     | MOD MR  | No      | No      | Yes | NO      | NO   | NO      | 999                              | DOEFCIIIX10YEARS                                          | 3.0 | No           | No          | No        | NO  | NO                    | NO          | NO      | NO                 | RHD, CVA                    | 35                  | 34                  | 35/34                 | OS ASD, CALCIFIED MV,                                                                                | 1 RVSP 40+RA                  |
| 105.00 | 43  |     | RHD, SEV MS, S/P CMV90, SEV RE 1 MS, MOD MR, SR                   | RHD               | SEV MS     | MOD MR  | No      | No      | No  | NO      | NO   | NO      | SR                               | DOE IIIX3 YEARS, PND, ORTHOPNEA                           | 3.0 | No           | No          | Yes       | Yes | NO                    | NO          | NO      | NO                 | RHD                         | 28                  | 35                  | 28/35                 | MVA 0.5, MS 13/7, MR2+                                                                               | AR1+, TR4+, 1 RVSP 24+RA      |
| 106.00 | 50  |     | RHD, SEV MS, S/P CMV 86, SEV RE MS, SEV TR MILD AR, AF WITH 2 CVR | RHD               | SEV MS     | NO      | MILD AR | SEV TR  | Yes | NO      | NO   | NO      | 999                              | DOE II X 12 yrs, doe III X 5-6 YRS, PALPITATION, ORHOPNEA | 3.0 | Yes          | No          | Yes       | NO  | NO                    | NO          | NO      | NO                 | RHD, NIDDM                  | 50                  | 42                  | 50/42                 | CALCIFIC AML, PML, MVA 1.2, MS 16/10, TV ANNULUS 40 MM                                               | 1 TR2+, MOD PAH               |
| 107.00 | 41  |     | 1 RHD, SEV CAL MS, MILD AS, SR                                    | RHD               | SEV CAL MS | NO      | MILD AS | NO      | NO  | NO      | NO   | NO      | SR                               | DOE II X 5 YRS, DOE III X 6 MONTHS , PALPITATIONS,        | 3.0 | Yes          | No          | NO        | NO  | NO                    | NO          | NO      | NO                 | RHD, COPD, SEIZURE DISORDER | 47                  | 41                  | 47/41                 | CALCIFIC MV, MVA- 1.0CM2, GRAD- 39/19 MMHG, MR2+                                                     | AR2+, AS 33/13 , 1 RVSP-52+RA |
| 108.00 | 55  |     | RHD, SEV CAL MS, P/ CMV1992,MOD MR,MOD AR, MOD 2 PAH              | RHD               | SEV CAL MS | MOD MR  | MOD AR  | NO      | NO  | NO      | MOD  | NO      | MOD PAH                          | DOE II x 16 yrs,                                          | 2.0 | NO           | NO          | NO        | NO  | NO                    | NO          | NO      | NO                 | RHD                         | 62                  | 52                  | 62/52                 | AML and PML CALCIFIED, SEV MS, GRAD-16/7, MVA- 0.9 CM2, SEV SVP,LARGE LA, MR 2-3+,                   | AR1-2+, 1 TR2+,PR1+,          |
| 109.00 | 60  |     | RHD, SEV CAL MS, MILD AR, LAA 2 CLOT, AF                          | RHD               | SEV CAL MS | NO      | MILD AR | NO      | Yes | Yes     | NO   | NO      | LAA CLOT                         | DOE-II x 2 yrs-> III 1 yr, palpitations, pedal edema      | 3.0 | Yes          | Yes         | NO        | NO  | NO                    | NO          | NO      | NO                 | RHD, HTN, HYPOTHYROIDISM    | 53                  | 38                  | 53/38                 | CALCIFIED AML, PML                                                                                   | MOD SUB VAL 1 PATHOLOGY       |
| 110.00 | 46  |     | RHD, P/BMV, RE- SEV CAL MS, MILD AR/MR/TR, MILD PAH CLOT, 2 AF    | RHD               | SEV MS     | MILD MR | MILD AR | MILD TR | Yes | Yes     | MILD | NO      | MILD PAH CLOT 2 Ys, palpitations | Asymptomatic 4 yrs P/BMV, DOE-II x                        | 2.0 | Yes          | NO          | NO        | NO  | NO                    | NO          | NO      | NO                 | RHD, HYPOTHYROIDISM         | 52                  | 50                  | 52/50                 | MS Grad- 55/10, MVA- 1cm2                                                                            | 1 AR2-3+, TR1+                |
| 111.00 | 49  |     | RHD,SEV MS, MILD MR, MOD 1 TR,SEV PAH, SR                         | RHD               | SEV MS     | MILD MR | NO      | MOD TR  | NO  | NO      | SEV  | NO      | SEV PAH,SR                       | DOE FCII X2 YERS, PALPITATION                             | 2.0 | Yes          | NO          | NO        | NO  | NO                    | NO          | NO      | NO                 | RHD, CVA                    | 48                  | 41                  | 48/41                 | MV CALCIFIED, MS 26/15, MVA 0.9, MR 1-2+ MV dooming+, 2small calcific nodule near PML,               | 1 AR1+ , TR2+                 |
| 112.00 | 30  |     | RHD, SEV CAL MS, Mod MR,Sick 1 sinus syndrome                     | RHD               | SEV CAL MS | MOD MR  | NO      | NO      | NO  | NO      | NO   | NO      | SICK SINUS SYNDROME              | DOE IIIx5years, syncope +                                 | 3.0 | NO           | NO          | NO        | NO  | NO                    | NO          | Yes     | NO                 | RHD                         | 58                  | 45                  | 58/45                 | MR2+                                                                                                 | 1 TR2+                        |

| s.no   | Age | Sex | Diagnosis                                                         | Primary Diagnosis | MS         | MR      | AV      | TV      | AF  | LA CLOT | PAH  | CONT HF | Others        | Pre-op Symptoms                                           | DOE | PALPITATIONS | PEDAL EDEMA | ORTHOPNEA | PND | ACUTE PULMONARY EDEMA | HAEMOPTYSIS | SYNCOPE | ANGINA ON EXERTION          | Pre-op risk factors | Pre-op ECHO la size | Pre-op ECHO lv size | Pre-op ECHO LALV Size | Mitral valve                                                                                            | Other Valves                  |
|--------|-----|-----|-------------------------------------------------------------------|-------------------|------------|---------|---------|---------|-----|---------|------|---------|---------------|-----------------------------------------------------------|-----|--------------|-------------|-----------|-----|-----------------------|-------------|---------|-----------------------------|---------------------|---------------------|---------------------|-----------------------|---------------------------------------------------------------------------------------------------------|-------------------------------|
| 113.00 | 41  |     | RHD, Sev MS, P/ CMV(83), Sev Re 2 MS, SR                          | RHD               | SEV MS     | No      | No      | No      | No  | No      | NO   | No      | SR            | DOE II x20 years, DOE III6months                          | 3.0 | No           | No          | No        | No  | No                    | No          | No      | RHD                         |                     | 51                  | 55                  | 51/55                 | Multiple calcific nodules, lateral commissures fused, Mod -Sev SVP,                                     | 2 OS ASD                      |
| 114.00 | 31  |     | RHD, SEV CAL MS, MILD MR, SEV 1 PAH                               | RHD               | SEV CAL MS | MILD MR | No      | No      | No  | No      | SEV  | No      | SEV PAH       | DOE IIIx3 years,+                                         | 3.0 | No           | No          | No        | No  | No                    | No          | No      | RHD, SEIZURES               |                     | 64                  | 51                  | 64/51                 | CALCIFIC AML, PML, MVA 1.0, MS 16/10, MR3+                                                              | AR2-3+ , RVSP 1 75+RA         |
| 115.00 | 13  |     | RHD,SEV MS, MOD MR, MOD PAH, 2 SR                                 | RHD               | SEV MS     | MOD MR  | No      | No      | No  | No      | MOD  | No      | MOD PAH,SR    | DOE FC II1.5 YEARS, FC IIIX 2MONTHS                       | 3.0 | No           | No          | No        | No  | No                    | No          | No      | RHD                         |                     | 38                  | 38                  | 38/38                 | MS 24/16, FIROTIC MITRAL LEAFLETS, MR 2-3+                                                              | AR 2+, TR 4+, 1 RVSP 68+RA    |
| 116.00 | 47  |     | SEV MS, MOD MR, MOD TR,MOD 1 PAH, SR                              | RHD               | SEV MS     | MOD MR  | No      | MOD TR  | No  | No      | MOD  | No      | MOD PAH,SR    | DOE FC IIIx6YEARS                                         | 3.0 | No           | No          | No        | No  | No                    | No          | No      | -                           |                     | 42                  | 50                  | 42/50                 | MV CALCIFIED, LV APEX CALCIFIED, MS 25/13, MVA 0.9, MR 2-3+ CALCIFIC AML, PML, MVA 1.0, MS 31/22, MR 3+ | 1 TR 1-2+                     |
| 117.00 | 45  |     | RHD,SEV MS, MOD MR, MOD 2 TR,MOD PAH, SR                          | RHD               | SEV MS     | MOD MR  | No      | MOD TR  | No  | No      | MOD  | No      | MOD PAH,SR    | DOE FC II 25YEARS, DOE III 1 YEAR                         | 3.0 | No           | No          | No        | No  | No                    | No          | No      | RHD, CVA                    |                     | 44                  | 41                  | 44/41                 |                                                                                                         | 1 NO AR                       |
| 118.00 | 56  |     | RHD,SEV MS, MILD MR, MOD 1 TR,SEV PAH, SR                         | RHD               | SEV MS     | MILD MR | No      | MOD TR  | No  | No      | SEV  | No      | SEV PAH,SR    | DOE FCII X2 YERS, PALPITATION                             | 2.0 | Yes          | No          | No        | No  | No                    | No          | No      | RHD, CVA                    |                     | 48                  | 41                  | 48/41                 | MV CALCIFIED, MS 26/15, MVA 0.9, MR 1-2+                                                                | 1 AR1+ , TR2+                 |
| 119.00 | 61  |     | RHD, SEV CAL MS, MILD AR, LAA 2 CLOT, AF                          | RHD               | SEV CAL MS | No      | MILD AR | No      | Yes | Yes     | NO   | No      | LAA CLOT      | DOE-II x 2 yrs-> III 1 yr, palpitations, pedal edema      | 3.0 | Yes          | Yes         | No        | No  | No                    | No          | No      | RHD, HTN, HYPOTHYROIDISM    |                     | 53                  | 38                  | 53/38                 | CALCIFIED AML, PML                                                                                      | MOD SUB VAL 1 PATHOLOGY       |
| 120.00 | 46  |     | RHD, P/BMV, RE- SEV CAL MS, MILD AR/MR/TR, MILD PAH CLOT, 2 AF    | RHD               | SEV MS     | MILD MR | MILD AR | MILD TR | Yes | Yes     | MILD | No      | MILD PAH CLOT | Asymptomatic 4 yrs P/BMV, DOE-II x 2 Ys, palpitations     | 2.0 | Yes          | No          | No        | No  | No                    | No          | No      | RHD, HYPOTHYROIDISM         |                     | 52                  | 50                  | 52/50                 | MS Grad- 55/10, MVA- 1cm2                                                                               | 1 AR2-3+, TR1+                |
| 121.00 | 33  |     | RHD, SEV MS, S/P CMV97, SEV RE 1 MS, MOD MR, LA CLOT, SR          | RHD               | SEV MS     | MOD MR  | No      | No      | No  | Yes     | NO   | No      | LA CLOT,SR    | DOE FCII X 3 YEARS, DOE IIIx6MONTHS                       | 3.0 | No           | No          | No        | No  | No                    | No          | No      | RHD                         |                     | 39                  | 43                  | 39/43                 | MS 31/17,MVA 0.8, MR 2+                                                                                 | TR2+, AR 1+, nvsp 1 54+ra     |
| 122.00 | 41  |     | 1 S/P IE, SEV MR, GOOD LV, SR                                     | IE                | SEV MS     | SEV MR  | No      | No      | No  | No      | NO   | No      | GOOD LV,SR    | DOE FC IIX 3 MONTHS                                       | 2.0 | No           | No          | No        | No  | No                    | No          | No      | IE                          |                     | 40                  | 59                  | 40/59                 | 15X7 MOBILE VEGETATION ATTACHED TO AML, 3X8MM IN PML, MR 4+                                             | 1 PR2+                        |
| 123.00 | 42  |     | RHD, SEV MS, S/P CMV 86, SEV RE MS, SEV TR MILD AR, AF WITH 2 CVR | RHD               | SEV MS     | No      | MILD AR | SEV TR  | Yes | No      | NO   | No      | 999           | DOE II X 12 yrs, doe III X 5-6 YRS, PALPITATION, ORHOPNEA | 3.0 | Yes          | No          | Yes       | No  | No                    | No          | No      | RHD, NIDDM                  |                     | 50                  | 42                  | 50/42                 | CALCIFIC AML, PML, MVA 1.2, MS 16/10, TV ANNULUS 40 MM                                                  | 1 TR2+, MOD PAH               |
| 124.00 | 41  |     | 1 RHD, SEV CAL MS, MILD AS, SR                                    | RHD               | SEV CAL MS | No      | MILD AS | No      | No  | No      | NO   | No      | SR            | DOE II X 5 YRS, DOE III X 6 MONTHS , PALPITATIONS,        | 3.0 | Yes          | No          | No        | No  | No                    | No          | No      | RHD, COPD, SEIZURE DISORDER |                     | 47                  | 41                  | 47/41                 | CALCIFIC MV, MVA- 1.0CM2, GRAD- 39/19 MMHG, MR2+                                                        | AR2+, AS 33/13 , 1 RVSP-52+RA |
| 125.00 | 55  |     | RHD, SEV CAL MS, P/ CMV1992,MOD MR,MOD AR, MOD 2 PAH              | RHD               | SEV CAL MS | MOD MR  | MOD AR  | No      | No  | No      | MOD  | No      | MOD PAH       | DOE II x 16 yrs,                                          | 2.0 | No           | No          | No        | No  | No                    | No          | No      | RHD                         |                     | 62                  | 52                  | 62/52                 | AML and PML CALCIFIED, SEV MS, GRAD-16/7, MVA- 0.9 CM2, SEV SVP,LARGE LA, MR 2-3+,                      | AR1-2+, 1 TR2+,PR1+,          |
| 126.00 | 58  |     | RHD, SEV CAL MS, MILD AR, LAA 2 CLOT, AF                          | RHD               | SEV CAL MS | No      | MILD AR | No      | Yes | No      | NO   | No      | LAA CLOT      | DOE-II x 2 yrs-> III 1 yr, palpitations, pedal edema      | 3.0 | Yes          | Yes         | No        | No  | No                    | No          | No      | RHD, HTN, HYPOTHYROIDISM    |                     | 53                  | 38                  | 53/38                 | CALCIFIED AML, PML                                                                                      | MOD SUB VAL 1 PATHOLOGY       |

| s.no   | Age | Sex | Diagnosis                                                                                        | Primary Diagnosis | MS         | MR      | AV      | TV      | AF  | LA CLOT | PAH  | CONT HF | Others        | Pre-op Symptoms                                                             | DOE | PALPITATIONS | PEDAL EDEMA | ORTHOPNEA | PND | ACUTE PULMONARY EDEMA | HAEMOPTYSIS | SYNCOPE | ANGINA ON EXERTION       | Pre-op risk factors | Pre-op ECHO Ia size | Pre-op ECHO Iv size | Pre-op ECHO LALV Size | Mitral valve                                                                                                        | Other Valves               |
|--------|-----|-----|--------------------------------------------------------------------------------------------------|-------------------|------------|---------|---------|---------|-----|---------|------|---------|---------------|-----------------------------------------------------------------------------|-----|--------------|-------------|-----------|-----|-----------------------|-------------|---------|--------------------------|---------------------|---------------------|---------------------|-----------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------|
| 127.00 | 30  | 1   | RHD, SEV CAL MS, MILD MR, SEV PAH                                                                | RHD               | SEV CAL MS | MILD MR | No      | No      | No  | No      | SEV  | No      | SEV PAH       | DOE IIIx3 years,+                                                           | 3.0 | No           | No          | No        | No  | No                    | No          | No      | RHD                      |                     | 64                  | 51                  | 64/51                 | CALCIFIC AML, PML, MVA 1.0, MS 16/10, MR3+                                                                          | AR2-3+, RVSP 1 75+RA       |
| 128.00 | 16  | 2   | RHD,SEV MS, MOD MR, MOD PAH, SR                                                                  | RHD               | SEV MS     | MOD MR  | No      | No      | No  | No      | MOD  | No      | MOD PAH,SR    | DOE FC II1.5 YEARS, FC IIIX 2MONTHS                                         | 3.0 | No           | No          | No        | No  | No                    | No          | No      | RHD                      |                     | 38                  | 38                  | 38/38                 | MS 24/16, FIROTIC MITRAL LEAFLETS, MR 2-3+                                                                          | AR 2+, TR 4+, 1 RVSP 68+RA |
| 129.00 | 47  | 1   | SEV MS, MOD MR, MOD TR,MOD PAH, SR                                                               | RHD               | SEV MS     | MOD MR  | No      | MOD TR  | No  | No      | MOD  | No      | MOD PAH,SR    | DOE FC IIIX6YEARS                                                           | 3.0 | No           | No          | No        | No  | No                    | No          | No      | RHD                      |                     | 42                  | 50                  | 42/50                 | MV CALCIFIED, LV APEX CALCIFIED, MS 25/13, MVA 0.9, MR 2-3+                                                         | 1 TR 1-2+                  |
| 130.00 | 47  | 2   | RHD,SEV MS, MOD MR, MOD TR,MOD PAH, SR                                                           | RHD               | SEV MS     | MOD MR  | No      | MOD TR  | No  | No      | MOD  | No      | MOD PAH,SR    | DOE FC II 25YEARS, DOE III 1 YEAR                                           | 3.0 | No           | No          | No        | No  | No                    | No          | No      | RHD, CVA                 |                     | 44                  | 41                  | 44/41                 | CALCIFIC AML, PML, MVA 1.0, MS 31/22, MR 3+                                                                         | 1 NO AR                    |
| 131.00 | 58  | 2   | RHD, SEV CAL MS, MILD AR, LAA CLOT, AF RHD, P/BMV, RE- SEV CAL MS, MILD AR/MR/TR, MILD PAH CLOT, | RHD               | SEV CAL MS | No      | MILD AR | No      | Yes | Yes     | NO   | No      | LAA CLOT      | DOE-II x 2 yrs-> III 1 yr, palpitations, pedal edema                        | 3.0 | Yes          | Yes         | No        | No  | No                    | No          | No      | RHD, HTN, HYPOTHYROIDISM |                     | 53                  | 38                  | 53/38                 | CALCIFIED AML, PML                                                                                                  | MOD SUB VAL 1 PATHOLOGY    |
| 132.00 | 46  | 2   | AF RHD, SEV CAL MS, P/ CMV1987, SEV PAH                                                          | RHD               | SEV MS     | MILD MR | MILD AR | MILD TR | Yes | Yes     | MILD | No      | MILD PAH CLOT | Asymptomatic 4 yrs P/BMV, DOE-II x 2 Ys, palpitations                       | 2.0 | Yes          | No          | No        | No  | No                    | No          | No      | RHD, HYPOTHYROIDISM      |                     | 52                  | 50                  | 52/50                 | MS Grad- 55/10, MVA- 1cm2                                                                                           | 1 AR2-3+, TR1+             |
| 133.00 | 42  | 2   | RHD, SEV CAL MS, P/ CMV1987, SEV PAH                                                             | RHD               | SEV CAL MS | No      | No      | No      | No  | No      | SEV  | No      | SEV PAH       | DOE-II Prior to CMV, DOE II-III x 2 yrs, palpitations,                      | 2.5 | Yes          | No          | No        | No  | No                    | No          | No      | RHD                      |                     | 56                  | 40                  | 56/40                 | Commissures fused, mild calific, grad- 35/21 Myxamatus MV, restricted PML, AML prolapse,A2-A3 chordae rupture, MR4+ | TR3+, Mild MR, 1 PR-2+     |
| 134.00 | 49  | 2   | RHD, SEV MR , AF                                                                                 | RHD               | SEV MS     | SEV MR  | No      | No      | Yes | No      | NO   | No      | 999           | DOE I x 25 yrs, DOE II-III x 6 months, orthopnea +, PND +                   | 2.5 | No           | No          | Yes       | Yes | No                    | No          | No      | RHD                      |                     | 57                  | 64                  | 57/64                 |                                                                                                                     | 1                          |
| 135.00 | 50  |     | RHD, P/BMV- 89 RE- SEV CAL MS, 2 SEV TR, SEV PAH , AF, CONT HF                                   | RHD               | SEV MS     | No      | No      | SEV TR  | Yes | No      | SEV  | Yes     | HF            | SEV PAH,CONT DOE-III- IV x 1 yr, palpitations, PND +, Orthopne +pedal edema | 3.5 | Yes          | Yes         | Yes       | Yes | No                    | No          | No      | RHD, HYPOTHYROIDISM      |                     | 55                  | 35                  | 55/35                 | CALCIFIED AML, PML, GRAD- 24/14, MVA- 0.76CM2, RVSP- 95+RA                                                          | 1 TR3-4+                   |
| 136.00 | 25  | 2   | RHD, SEV MR, MILD MS, MILD AR, SR                                                                | RHD               | MILD MS    | SEV MR  | MILD AR | No      | No  | No      | NO   | No      | SR            | DOE II-IIIX 2 YEARS, PALPITATION +, ORTHOPNE +                              | 2.5 | Yes          | No          | Yes       | No  | No                    | No          | No      | RHD                      |                     | 37                  | 55                  | 37/55                 | SEV MR, MOD SUBVALVAR LESION, MOD-SEV MS,                                                                           | 1 AR 2-3+                  |
| 137.00 | 30  | 1   | RHD, SEV CAL MS, MILD MR, SEV PAH                                                                | RHD               | SEV CAL MS | MILD MR | No      | No      | No  | No      | SEV  | No      | SEV PAH       | DOE IIIx3 years,+                                                           | 3.0 | No           | No          | No        | No  | No                    | No          | No      | RHD, SMOKER              |                     | 64                  | 51                  | 64/51                 | CALCIFIC AML, PML, MVA 1.0, MS 16/10, MR3+                                                                          | AR2-3+, RVSP 1 75+RA       |
| 138.00 | 18  | 2   | RHD,SEV MS, MOD MR, MOD PAH, SR                                                                  | RHD               | SEV MS     | MOD MR  | No      | No      | No  | No      | MOD  | No      | MOD PAH,SR    | DOE FC II1.5 YEARS, FC IIIX 2MONTHS                                         | 3.0 | No           | No          | No        | No  | No                    | No          | No      | RHD                      |                     | 38                  | 38                  | 38/38                 | MS 24/16, FIROTIC MITRAL LEAFLETS, MR 2-3+                                                                          | AR 2+, TR 4+, 1 RVSP 68+RA |
| 139.00 | 47  | 1   | SEV MS, MOD MR, MOD TR,MOD PAH, SR                                                               | RHD               | SEV MS     | MOD MR  | No      | MOD TR  | No  | No      | MOD  | No      | MOD PAH,SR    | DOE FC IIIX6YEARS                                                           | 3.0 | No           | No          | No        | No  | No                    | No          | No      | RHD                      |                     | 42                  | 50                  | 42/50                 | MV CALCIFIED, LV APEX CALCIFIED, MS 25/13, MVA 0.9, MR 2-3+                                                         | 1 TR 1-2+                  |
| 140.00 | 45  | 2   | RHD,SEV MS, MOD MR, MOD TR,MOD PAH, SR                                                           | RHD               | SEV MS     | MOD MR  | No      | MOD TR  | No  | No      | MOD  | No      | MOD PAH,SR    | DOE FC II 25YEARS, DOE III 1 YEAR                                           | 3.0 | No           | No          | No        | No  | No                    | No          | No      | RHD, CVA                 |                     | 44                  | 41                  | 44/41                 | CALCIFIC AML, PML, MVA 1.0, MS 31/22, MR 3+                                                                         | 1 NO AR                    |

| s.no   | Age | Sex | Diagnosis                                                         | Primary Diagnosis | MS         | MR      | AV      | TV     | AF  | LA CLOT | PAH | CONT HF | Others     | Pre-op Symptoms                                           | DOE | PALPITATIONS | PEDAL EDEMA | ORTHOPNEA | PND | ACUTE PULMONARY EDEMA | HAEMOPTYSIS | SYNCOPE | ANGINA ON EXERTION | Pre-op risk factors         | Pre-op ECHO la size | Pre-op ECHO lv size | Pre-op ECHO LALV Size | Mitral valve                                                                                        | Other Valves |                             |
|--------|-----|-----|-------------------------------------------------------------------|-------------------|------------|---------|---------|--------|-----|---------|-----|---------|------------|-----------------------------------------------------------|-----|--------------|-------------|-----------|-----|-----------------------|-------------|---------|--------------------|-----------------------------|---------------------|---------------------|-----------------------|-----------------------------------------------------------------------------------------------------|--------------|-----------------------------|
| 141.00 | 54  |     | RHD,SEV MS, MILD MR, MOD 1 TR,SEV PAH, SR                         | RHD               | SEV MS     | MILD MR | No      | MOD TR | No  | No      | SEV | No      | SEV PAH,SR | DOE FCII X2 YERS, PALPITATION                             | 2.0 | Yes          | No          | No        | No  | No                    | No          | No      | No                 | RHD, CVA                    | 48                  | 41                  | 48/41                 | MV CALCIFIED, MS 26/15, MVA 0.9, MR 1-2+                                                            | 1            | AR1+ , TR2+                 |
| 142.00 | 47  |     | RHD, SEV MS, S/P CMV87, SEV RE 2 MS, MILD AR, AF                  | RHD               | SEV MS     | No      | MILD AR | No     | Yes | No      | NO  | No      | 999        | DOE FC IIX1YEAR,                                          | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                         | 50                  | 51                  | 50/51                 | MV CALCIFIED, LARGE CALCIFIC NODULE N MEDIAL COMMISURE MS 21/9, MVA 1, MR 3+                        | 1            | TR2-3+, RVSP 1 25+RA        |
| 143.00 | 50  |     | RHD,SEV MS, MILD MR, MOD 1 TR,SEV PAH, SR                         | RHD               | SEV MS     | MILD MR | No      | MOD TR | No  | No      | SEV | No      | SEV PAH,SR | DOE FC IIIX 3 YEARS, POEDAL OEDEMA+                       | 3.0 | No           | Yes         | No        | No  | No                    | No          | No      | No                 | RHD, SMOKER                 | 56                  | 42                  | 56/42                 | CALCIFIC MV, LA CLOT, MS 25/16, MR 2-3+                                                             | 1            | NO AR                       |
| 144.00 | 27  |     | RHD, SEV MS, S/P CMV89,S/P BMV 1 96, SEV MR, SR                   | RHD               | SEV MS     | SEV MR  | No      | No     | No  | No      | NO  | No      | SR         | DOE FC IIX 1.5 YEARS, HAEMOPTYSIS+                        | 2.0 | No           | No          | No        | No  | No                    | Yes         | No      | No                 | RHD                         | 34                  | 45                  | 34/45                 | MV CALCIFIC, MR JET CLOSE TO MEDIAL COMMISURE, MR 3-4+, MS 17/6MMHg MV RHEUMATIC, MS 20/8, MVA 1.2, | 1            | TR2+, AR 2+, RVSP 42+RA     |
| 145.00 | 61  |     | RHD, SEV MS, S/P CMV81, SEV RE 1 MS, MOD MR, AF                   | RHD               | SEV MS     | MOD MR  | No      | No     | Yes | No      | NO  | No      | 999        | DOE IIX 15 YEARS                                          | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                         | 55                  | 52                  | 55/52                 | MR3+,RVSP 31+RA                                                                                     | 1            | AR2+                        |
| 146.00 | 43  |     | RHD, SEV MS, S/P CMV90, SEV RE 1 MS, MOD MR, SR                   | RHD               | SEV MS     | MOD MR  | No      | No     | No  | No      | NO  | No      | SR         | DOE IIIX3 YEARS, PND, ORTHOPNEA                           | 3.0 | No           | No          | Yes       | Yes | No                    | No          | No      | No                 | RHD                         | 28                  | 35                  | 28/35                 | MVA 0.5, MS 13/7, MR2+                                                                              | 1            | AR1+, TR4+, RVSP 24+RA      |
| 147.00 | 34  |     | RHD, SEV MS, S/P CMV94, SEV RE 1 MS, MOD MR, AF                   | RHD               | SEV MS     | MOD MR  | No      | No     | Yes | No      | NO  | No      | 999        | DOEFCIIIX10YEARS                                          | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD, CVA                    | 35                  | 34                  | 35/34                 | OS ASD, CALCIFIED MV,                                                                               | 1            | RVSP 40+RA                  |
| 148.00 | 43  |     | RHD, SEV MS, S/P CMV90, SEV RE 1 MS, MOD MR, SR                   | RHD               | SEV MS     | MOD MR  | No      | No     | No  | No      | NO  | No      | SR         | DOE IIIX3 YEARS, PND, ORTHOPNEA                           | 3.0 | No           | No          | Yes       | Yes | No                    | No          | No      | No                 | RHD                         | 28                  | 35                  | 28/35                 | MVA 0.5, MS 13/7, MR2+                                                                              | 1            | AR1+, TR4+, RVSP 24+RA      |
| 149.00 | 42  |     | RHD, SEV MS, S/P CMV 86, SEV RE MS, SEV TR MILD AR, AF WITH 2 CVR | RHD               | SEV MS     | No      | MILD AR | SEV TR | Yes | No      | NO  | No      | 999        | DOE II X 12 yrs, doe III X 5-6 YRS, PALPITATION, ORHOPNEA | 3.0 | Yes          | No          | Yes       | No  | No                    | No          | No      | No                 | RHD, NIDDM                  | 50                  | 42                  | 50/42                 | CALCIFIC AML, PML, MVA 1.2, MS 16/10, TV ANNULUS 40 MM                                              | 1            | TR2+, MOD PAH               |
| 150.00 | 44  | 1   | RHD. SEV CAL MS, MILD AS, SR                                      | RHD               | SEV CAL MS | No      | MILD AS | No     | No  | No      | NO  | No      | SR         | DOE II X 5 YRS, DOE III X 6 MONTHS , PALPITATIONS,        | 3.0 | Yes          | No          | No        | No  | No                    | No          | No      | No                 | RHD, COPD, SEIZURE DISORDER | 47                  | 41                  | 47/41                 | CALCIFIC MV, MVA- 1.0CM2, GRAD- 39/19 MMHG, MR2+                                                    | 1            | AR2+, AS 33/13 , RVSP-52+RA |
| 151.00 | 55  |     | RHD. SEV CAL MS, P/ CMV1992,MOD MR,MOD AR, MOD 2 PAH              | RHD               | SEV CAL MS | MOD MR  | MOD AR  | No     | No  | No      | MOD | No      | MOD PAH    | DOE II x 16 yrs,                                          | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                         | 62                  | 52                  | 62/52                 | AML and PML CALCIFIED, SEV MS, GRAD-16/7, MVA- 0.9 CM2, SEV SVP,LARGE LA, MR 2-3+,                  | 1            | AR1-2+, TR2+,PR1+,          |
| 152.00 | 60  |     | RHD. SEV CAL MS, MILD AR, LAA 2 CLOT, AF                          | RHD               | SEV CAL MS | No      | MILD AR | No     | Yes | Yes     | NO  | No      | LAA CLOT   | DOE-II x 2 yrs-> III 1 yr, palpitations, pedal edema      | 3.0 | Yes          | Yes         | No        | No  | No                    | No          | No      | No                 | RHD, HTN, HYPOTHYROIDISM    | 53                  | 38                  | 53/38                 | CALCIFIED AML, PML                                                                                  | 1            | MOD SUB VAL PATHOLOGY       |

| s.no   | Age | Sex | Diagnosis                                                       | Primary Diagnosis | MS         | MR      | AV      | TV     | AF  | LA CLOT | PAH | CONT HF | Others     | Pre-op Symptoms                                           | DOE | PALPITATIONS | PEDAL EDEMA | ORTHOPNEA | PND | ACUTE PULIMONARY EDEMA | HAEMOPTYSIS | SYNCOPE | ANGINA ON EXERTION          | Pre-op risk factors | Pre-op ECHO la size | Pre-op ECHO lv size | Pre-op ECHO LALV Size | Mitral valve                                                                       | Other Valves                  |
|--------|-----|-----|-----------------------------------------------------------------|-------------------|------------|---------|---------|--------|-----|---------|-----|---------|------------|-----------------------------------------------------------|-----|--------------|-------------|-----------|-----|------------------------|-------------|---------|-----------------------------|---------------------|---------------------|---------------------|-----------------------|------------------------------------------------------------------------------------|-------------------------------|
| 153.00 | 17  | 2   | RHD,SEV MS, MOD MR, MOD PAH, SR                                 | RHD               | SEV MS     | MOD MR  | No      | No     | No  | No      | MOD | No      | MOD PAH,SR | DOE FC II1.5 YEARS, FC IIIX 2MONTHS                       | 3.0 | No           | No          | No        | No  | No                     | No          | No      | RHD                         |                     | 38                  | 38                  | 38/38                 | MS 24/16, FIROTIC MITRAL LEAFLETS, MR 2-3+                                         | AR 2+, TR 4+, 1 RVSP 68+RA    |
| 154.00 | 47  | 1   | SEV MS, MOD MR, MOD TR,MOD PAH, SR                              | RHD               | SEV MS     | MOD MR  | No      | MOD TR | No  | No      | MOD | No      | MOD PAH,SR | DOE FC IIIX6YEARS                                         | 3.0 | No           | No          | No        | No  | No                     | No          | No      | -                           |                     | 42                  | 50                  | 42/50                 | MV CALCIFIED, LV APEX CALCIFIED, MS 25/13, MVA 0.9, MR 2-3+                        | 1 TR 1-2+                     |
| 155.00 | 45  | 2   | RHD,SEV MS, MOD MR, MOD TR,MOD PAH, SR                          | RHD               | SEV MS     | MOD MR  | No      | MOD TR | No  | No      | MOD | No      | MOD PAH,SR | DOE FC II 25YEARS, DOE III 1 YEAR                         | 3.0 | No           | No          | No        | No  | No                     | No          | No      | RHD, CVA                    |                     | 44                  | 41                  | 44/41                 | CALCIFIC AML, PML, MVA 1.0, MS 31/22, MR 3+                                        | 1 NO AR                       |
| 156.00 | 56  | 1   | RHD,SEV MS, MILD MR, MOD TR,SEV PAH, SR                         | RHD               | SEV MS     | MILD MR | No      | MOD TR | No  | No      | SEV | No      | SEV PAH,SR | DOE FCII X2 YERS, PALPITATION                             | 2.0 | Yes          | No          | No        | No  | No                     | No          | No      | RHD, CVA                    |                     | 48                  | 41                  | 48/41                 | MV CALCIFIED, MS 26/15, MVA 0.9, MR 1-2+                                           | 1 AR1+ , TR2+                 |
| 157.00 | 44  | 2   | RHD, SEV MS, S/P CMV87, SEV RE MS, MILD AR, AF                  | RHD               | SEV MS     | No      | MILD AR | No     | Yes | No      | NO  | No      | 999        | DOE FC IIX1YEAR,                                          | 2.0 | No           | No          | No        | No  | No                     | No          | No      | RHD                         |                     | 50                  | 51                  | 50/51                 | MV CALCIFIED, LARGE CALCIFIC NODULE N MEDIAL COMMISURE MS 21/9, MVA 1, MR 3+       | TR2-3+, RVSP 1 25+RA          |
| 158.00 | 50  | 1   | RHD,SEV MS, MILD MR, MOD TR,SEV PAH, SR                         | RHD               | SEV MS     | MILD MR | No      | MOD TR | No  | No      | SEV | No      | SEV PAH,SR | DOE FC IIIX 3 YEARS, POEDAL OEDEMA+                       | 3.0 | No           | Yes         | No        | No  | No                     | No          | No      | RHD, SMOKER                 |                     | 56                  | 42                  | 56/42                 | CALCIFIC MV, LA CLOT, MS 25/16, MR 2-3+                                            | 1 NO AR                       |
| 159.00 | 38  | 1   | S/P IE, SEV MR, GOOD LV, SR                                     | IE                | No         | SEV MR  | No      | No     | No  | No      | NO  | No      | 999        | DOE FC IIX 3 MONTHS                                       | 2.0 | No           | No          | No        | No  | No                     | No          | No      | IE                          |                     | 40                  | 59                  | 40/59                 | 15X7 MOBILE VEGETATION ATTACHED TO AML, 3X8MM IN PML, MR 4+                        | 1 PR2+                        |
| 160.00 | 39  | 2   | RHD, SEV MS, S/P CMV 86, SEV RE MS, SEV TR MILD AR, AF WITH CVR | RHD               | SEV MS     | No      | MILD AR | SEV TR | Yes | No      | NO  | No      | 999        | DOE II X 12 yrs, doe III X 5-6 YRS, PALPITATION, ORHOPNEA | 3.0 | Yes          | No          | Yes       | No  | No                     | No          | No      | RHD, NIDDM                  |                     | 50                  | 42                  | 50/42                 | CALCIFIC AML, PML, MVA 1.2, MS 16/10, TV ANNULUS 40 MM                             | 1 TR2+, MOD PAH               |
| 161.00 | 41  | 1   | RHD. SEV CAL MS, MILD AS, SR                                    | RHD               | SEV CAL MS | No      | MILD AS | No     | No  | No      | NO  | No      | SR         | DOE II X 5 YRS, DOE III X 6 MONTHS , PALPITATIONS,        | 3.0 | Yes          | No          | No        | No  | No                     | No          | No      | RHD, COPD, SEIZURE DISORDER |                     | 47                  | 41                  | 47/41                 | CALCIFIC MV, MVA- 1.0CM2, GRAD- 39/19 MMHG, MR2+                                   | AR2+, AS 33/13 , 1 RVSP-52+RA |
| 162.00 | 53  | 2   | RHD. SEV CAL MS, P/ CMV1992,MOD MR,MOD AR, MOD PAH              | RHD               | SEV CAL MS | MOD MR  | MOD AR  | No     | No  | No      | MOD | No      | MOD PAH    | DOE II x 16 yrs,                                          | 2.0 | No           | No          | No        | No  | No                     | No          | No      | RHD                         |                     | 62                  | 52                  | 62/52                 | AML and PML CALCIFIED, SEV MS, GRAD-16/7, MVA- 0.9 CM2, SEV SVP,LARGE LA, MR 2-3+, | AR1-2+, 1 TR2+,PR1+,          |
| 163.00 | 60  | 2   | RHD. SEV CAL MS, MILD AR, LAA CLOT, AF                          | RHD               | SEV CAL MS | No      | MILD AR | No     | Yes | Yes     | NO  | No      | LAA CLOT   | DOE-II x 2 yrs-> III 1 yr, palpitations, pedal edema      | 3.0 | Yes          | Yes         | No        | No  | No                     | No          | No      | RHD, HTN, HYPOTHYROIDISM    |                     | 53                  | 38                  | 53/38                 | CALCIFIED AML, PML                                                                 | MOD SUB VAL 1 PATHOLOGY       |

| s.no   | Age | Sex | Diagnosis                                                    | Primary Diagnosis | MS         | MR      | AV      | TV     | AF  | LA CLOT | PAH | CONT HF | Others     | Pre-op Symptoms                                                             | DOE | PALPITATIONS | PEDAL EDEMA | ORTHOPNEA | PND | ACUTE PULMONARY EDEMA | HAEMOPTYSIS | SYNCOPE | ANGINA ON EXERTION | Pre-op risk factors | Pre-op ECHO la size | Pre-op ECHO lv size | Pre-op ECHO LALV Size | Mitral valve                                                                                                       | Other Valves               |
|--------|-----|-----|--------------------------------------------------------------|-------------------|------------|---------|---------|--------|-----|---------|-----|---------|------------|-----------------------------------------------------------------------------|-----|--------------|-------------|-----------|-----|-----------------------|-------------|---------|--------------------|---------------------|---------------------|---------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------|----------------------------|
| 164.00 | 30  | 1   | RHD, SEV CAL MS, MILD MR, SEV PAH                            | RHD               | SEV CAL MS | MILD MR | No      | No     | No  | No      | SEV | No      | SEV PAH    | DOE IIIx3 years,+                                                           | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                 | 64                  | 51                  | 64/51                 | CALCIFIC AML, PML, MVA 1.0, MS 16/10, MR3+ Myxamalous MV, restricted PML, AML prolapse,A2-A3 chordae rupture, MR4+ | AR2-3+ , RVSP 1 75+RA      |
| 165.00 | 58  | 2   | RHD, SEV MR , AF                                             | RHD               | SEV MS     | SEV MR  | No      | No     | Yes | No      | NO  | No      | 999        | DOE I x 25 yrs, DOE II-III x 6 months, orthopnea +, PND +                   | 2.5 | No           | No          | Yes       | Yes | No                    | No          | No      | No                 | RHD, HYPOTHYROIDISM | 57                  | 64                  | 57/64                 |                                                                                                                    | 1                          |
| 166.00 | 50  | 2   | RHD, P/BMV- 89 RE- SEV CAL MS, SEV TR, SEV PAH , AF, CONT HF | RHD               | SEV MS     | No      | No      | SEV TR | Yes | No      | SEV | Yes     | HF         | SEV PAH,CONT DOE-III- IV x 1 yr, palpitations, PND +, Orthopne +pedal edema | 3.5 | Yes          | Yes         | Yes       | Yes | No                    | No          | No      | No                 | RHD,STROKE, DM      | 55                  | 35                  | 55/35                 | CALCIFIED AML, PML, GRAD- 24/14, MVA- 0.76CM2, RVSP- 95+RA                                                         | 1 TR3-4+                   |
| 167.00 | 29  | 2   | RHD, SEV MR, MILD MS, MILD AR, SR                            | RHD               | MILD MS    | SEV MR  | MILD AR | No     | No  | No      | NO  | No      | SR         | DOE II-IIIx 2 YEARS, PALPITATION +, ORTHOPNE +                              | 2.5 | Yes          | No          | Yes       | No  | No                    | No          | No      | No                 | RHD                 | 37                  | 55                  | 37/55                 | SEV MR, MOD SUBVALVAR LESION, MOD-SEV MS,                                                                          | 1 AR 2-3+                  |
| 168.00 | 30  | 1   | RHD, SEV CAL MS, MILD MR, SEV PAH                            | RHD               | SEV CAL MS | MILD MR | No      | No     | No  | No      | SEV | No      | SEV PAH    | DOE IIIx3 years,+                                                           | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                 | 64                  | 51                  | 64/51                 | CALCIFIC AML, PML, MVA 1.0, MS 16/10, MR3+                                                                         | AR2-3+ , RVSP 1 75+RA      |
| 169.00 | 13  | 2   | RHD,SEV MS, MOD MR, MOD PAH, SR                              | RHD               | SEV MS     | MOD MR  | No      | No     | No  | No      | MOD | No      | MOD PAH,SR | DOE FC II1.5 YEARS, FC IIIX 2MONTHS                                         | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                 | 38                  | 38                  | 38/38                 | MS 24/16, FIROTIC MITRAL LEAFLETS, MR 2-3+                                                                         | AR 2+, TR 4+, 1 RVSP 68+RA |
| 170.00 | 17  | 1   | SEV MS, MOD MR, MOD TR,MOD PAH, SR                           | RHD               | SEV MS     | MOD MR  | No      | MOD TR | No  | No      | MOD | No      | MOD PAH,SR | DOE FC IIIIX6YEARS                                                          | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | IE                  | 42                  | 50                  | 42/50                 | MV CALCIFIED, LV APEX CALCIFIED, MS 25/13, MVA 0.9, MR 2-3+                                                        | 1 TR 1-2+                  |
| 171.00 | 45  | 2   | RHD,SEV MS, MOD MR, MOD TR,MOD PAH, SR                       | RHD               | SEV MS     | MOD MR  | No      | MOD TR | No  | No      | MOD | No      | MOD PAH,SR | DOE FC II 25YEARS, DOE III 1 YEAR                                           | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD, CVA, DM        | 44                  | 41                  | 44/41                 | CALCIFIC AML, PML, MVA 1.0, MS 31/22, MR 3+                                                                        | 1 NO AR                    |
| 172.00 | 56  | 1   | RHD,SEV MS, MILD MR, MOD TR,SEV PAH, SR                      | RHD               | SEV MS     | MILD MR | No      | MOD TR | No  | No      | SEV | No      | SEV PAH,SR | DOE FCII X2 YERS, PALPITATION                                               | 2.0 | Yes          | No          | No        | No  | No                    | No          | No      | No                 | RHD, CVA,HTN        | 48                  | 41                  | 48/41                 | MV CALCIFIED, MS 26/15, MVA 0.9, MR 1-2+                                                                           | 1 AR1+ , TR2+              |
| 173.00 | 43  | 2   | RHD, SEV MS, S/P CMV87, SEV RE MS, MILD AR, AF               | RHD               | SEV MS     | No      | MILD AR | No     | No  | No      | NO  | No      | 999        | DOE FC IIX1YEAR,                                                            | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                 | 50                  | 51                  | 50/51                 | MV CALCIFIED, LARGE CALCIFIC NODULE N MEDIAL COMMISSURE MS 21/9, MVA 1, MR 3+                                      | TR2-3+, RVSP 1 25+RA       |
| 174.00 | 19  | 2   | RHD,SEV MS, MOD MR, MOD PAH, SR                              | RHD               | SEV MS     | MOD MR  | No      | No     | No  | No      | MOD | No      | MOD PAH,SR | DOE FC II1.5 YEARS, FC IIIX 2MONTHS                                         | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                 | 38                  | 38                  | 38/38                 | MS 24/16, FIROTIC MITRAL LEAFLETS, MR 2-3+                                                                         | AR 2+, TR 4+, 1 RVSP 68+RA |
| 175.00 | 47  | 1   | SEV MS, MOD MR, MOD TR,MOD PAH, SR                           | RHD               | SEV MS     | MOD MR  | No      | MOD TR | No  | No      | MOD | No      | MOD PAH,SR | DOE FC IIIIX6YEARS                                                          | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | No h/o RHD          | 40                  | 52                  | 40/52                 | MV CALCIFIED, LV APEX CALCIFIED, MS 25/13, MVA 0.9, MR 2-3+                                                        | 1 TR 1-2+                  |

| s.no   | Age | Sex | Diagnosis                                        | Primary Diagnosis | MS         | MR      | AV      | TV     | AF  | LA CLOT | PAH | CONT HF | Others              | Pre-op Symptoms                    | DOE | PALPITATIONS | PEDAL EDEMA | ORTHOPNEA | PND | ACUTE PULMONARY EDEMA | HAEMOPTYSIS | SYNCOPE | ANGINA ON EXERTION | Pre-op risk factors | Pre-op ECHO la size | Pre-op ECHO lv size | Pre-op ECHO LALV Size | Mitral valve                                                                                                 | Other Valves         |             |
|--------|-----|-----|--------------------------------------------------|-------------------|------------|---------|---------|--------|-----|---------|-----|---------|---------------------|------------------------------------|-----|--------------|-------------|-----------|-----|-----------------------|-------------|---------|--------------------|---------------------|---------------------|---------------------|-----------------------|--------------------------------------------------------------------------------------------------------------|----------------------|-------------|
| 176.00 | 45  |     | RHD,SEV MS, MOD MR, MOD 2 TR,MOD PAH, SR         | RHD               | SEV MS     | MOD MR  | No      | MOD TR | No  | No      | MOD | No      | MOD PAH,SR          | DOE FC II 25YEARS, DOE III 1 YEAR  | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD, CVA            | 44                  | 41                  | 44/41                 | CALCIFIC AML, PML, MVA 1.0, MS 31/22, MR 3+                                                                  | 1                    | NO AR       |
| 177.00 | 54  |     | RHD,SEV MS, MILD MR, MOD 1 TR,SEV PAH, SR        | RHD               | SEV MS     | MILD MR | No      | MOD TR | No  | No      | SEV | No      | SEV PAH,SR          | DOE FCII X2 YERS, PALPITATION      | 2.0 | Yes          | No          | No        | No  | No                    | No          | No      | No                 | RHD, CVA, DM        | 48                  | 41                  | 48/41                 | MV CALCIFIED, MS 26/15, MVA 0.9, MR 1-2+                                                                     | 1                    | AR1+ , TR2+ |
| 178.00 | 47  |     | RHD, SEV MS, S/P CMV87, SEV RE 2 MS, MILD AR, AF | RHD               | SEV MS     | No      | MILD AR | No     | Yes | No      | NO  | No      | 999                 | DOE FC IIX1YEAR,                   | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                 | 50                  | 51                  | 50/51                 | MV CALCIFIED, LARGE CALCIFIC NODULE N MEDIAL COMMISSURE MS 21/9, MVA 1, MR 3+                                | TR2-3+, RVSP 1 25+RA |             |
| 179.00 | 53  |     | RHD,SEV MS, MILD MR, MOD 1 TR,SEV PAH, SR        | RHD               | SEV MS     | MILD MR | No      | MOD TR | No  | No      | SEV | No      | SEV PAH,SR          | DOE FC IIX 3 YEARS, POEDAL OEDEMA+ | 3.0 | No           | Yes         | No        | No  | No                    | No          | No      | No                 | RHD, SMOKER, HTN    | 56                  | 42                  | 56/42                 | CALCIFIC MV, LA CLOT, MS 25/16, MR 2-3+                                                                      | 1                    | NO AR       |
| 180.00 | 40  | 1   | S/P IE, SEV MR, GOOD LV, SR                      | IE                | SEV MS     | SEV MR  | No      | No     | No  | No      | NO  | No      | GOOD LV,SR          | DOE FC IIX 3 MONTHS                | 2.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | IE                  | 40                  | 59                  | 40/59                 | 15X7 MOBILE VEGETATION ATTACHED TO AML, 3X8MM IN PML, MR 4+ specs of calcium in AML, PML, MVA 0.8cm, Mod PAH | 1                    | PR2+        |
| 181.00 | 60  |     | RHD, Sev MS, P/ CMV, AML tear, 1 Sev MR, AF      | RHD               | SEV MS     | SEV MR  | No      | No     | Yes | No      | NO  | No      | AML TEAR            | DOE II-IIX20years, haemoptysis     | 2.5 | No           | No          | No        | No  | No                    | Yes         | No      | No                 | RHD, smoker         | 55                  | 40                  | 55/40                 | MV dooming+, 2small calcific nodule near PML, laterl commissure fused,                                       | 1                    | TR2+        |
| 182.00 | 28  |     | RHD, SEV CAL MS, Mod MR,Sick 2 sinus syndrome    | RHD               | SEV CAL MS | MOD MR  | No      | No     | No  | No      | NO  | No      | SICK SINUS SYNDROME | DOE IIIx5years, syncope +          | 3.0 | No           | No          | No        | No  | No                    | No          | Yes     | No                 | RHD                 | 58                  | 45                  | 58/45                 | MR2+ Multiple calcific nodules, lateral commissures fused,                                                   | 1                    | TR2+        |
| 183.00 | 41  |     | RHD, Sev MS, P/ CMV(83), Sev Re 2 MS, SR         | RHD               | SEV MS     | No      | No      | No     | No  | No      | NO  | No      | SR                  | DOE II x20 years, DOE III6months   | 3.0 | No           | No          | No        | No  | No                    | No          | No      | No                 | RHD                 | 51                  | 55                  | 51/55                 | Mod -Sev SVP,                                                                                                | 2                    | OS ASD      |

| Intra-op findings                                                                                                                                                     | COMMISSURES |     |     |     |     |     |     | Surgery                                                          | Size of CHVP | additional procedure   | Post-op ECHO LA size | Post-op ECHO LV size | Post-op ECHO | CHVP size | Leaflet movement | PV GRADIENT | V48 | V49 | FLOW VELOCITY &lt; 5, 5 to 10, &gt; 10 | Regurgitation if any | Thrombus/vegetation | LV function | Other Valves                  | TR | AR | PR | RVSP  | REDO                                                                         | Complications       |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----|-----|-----|-----|-----|-----|------------------------------------------------------------------|--------------|------------------------|----------------------|----------------------|--------------|-----------|------------------|-------------|-----|-----|----------------------------------------|----------------------|---------------------|-------------|-------------------------------|----|----|----|-------|------------------------------------------------------------------------------|---------------------|-----|
| Commissures fused, thickened calcified leaflets and chordae, LVH, Commissures fused, thickened calcified leaflets and chordae, LA large,                              | Yes         | Yes | Yes | Yes | No  | No  | No  | MVR# 27 CHVP +LAA LIGATION, PPI ON 03/06/2010                    | 27           | LAA LIGATION, PPI      | #NULL!               | #NULL!               |              | #NULL!    | 1                |             |     |     | 999                                    | No                   | No                  | #NULL!      |                               |    | 2  | 2  | 2     | No                                                                           | No                  | 999 |
| Commissures fused, thickened calcified leaflets and chordae, LA large, Commissures fused, thickened calcified leaflets and chordae, LA large, sev SVP, Fixed stenosis | Yes         | Yes | Yes | No  | Yes | No  | No  | MVR# 25 CHVP + PPMLP                                             | 25           | PPMLP                  | 46                   | 55                   | 46/55        | 25        | 1                | 13/6        | 13  | 6   | 5 to 10                                | MR 1+                | No                  | 2           | TR1+, RVSP-28+RA              | 1  | 2  | 2  | 28+RA | No                                                                           | 999                 |     |
| Myxamatus MV, restricted PML, AML prolapse, A2-A3 chordae rupture                                                                                                     | Yes         | Yes | No  | No  | Yes | No  | No  | MVR# 27 CHVP                                                     | 27           |                        | 43                   | 48                   | 43/48        | 27        | 1                | 10/4        | 10  | 4   | <5                                     | No                   | No                  | 2           | TR1+, RVSP-23+RA              | 1  | 2  | 2  | 23+RA | No                                                                           | 999                 |     |
| Commissures fused, thickened calcified leaflets and chordae, LA large, dilated TV                                                                                     | No          | No  | No  | No  | No  | Yes | Yes | MVR# 29 CHVP + PMLP                                              | 27           | PMLP                   | 46                   | 58                   | 46/58        | 29        | 1                | 8/5         | 8   | 5   | 5 to 10                                | MR1-2+               | No                  | 3           | TR1+, AR1+, RVSP-26+RA        | 1  | 1  | 2  | 26+RA | No                                                                           | 999                 |     |
| Commissures fused, thickened calcified leaflets and chordae, LA large, dilated TV                                                                                     | Yes         | Yes | Yes | Yes | No  | No  | No  | MVR# 27 CHVP + ring annuloplasty of TV ( # 28 carpentier edwards | 27           | RING ANNULPLASTY OF TV | 57                   | 58                   | 57/58        | 25        | 1                | 24/1        | 24  | 1   | <5                                     | No                   | No                  | 2           | TR2-3+, RVSP-37+RA            | 3  | 2  | 2  | 37+RA | No                                                                           | 999                 |     |
| Commissures fused, thickened calcified leaflets and chordae, LVH, fixed orifice MR, Mod SVP                                                                           | Yes         | Yes | Yes | Yes | No  | No  | No  | MVR #27 CHVP                                                     | 27           |                        | 35                   | 50                   | 35/50        | 27        | 1                | 10/5        | 10  | 5   | 5 to 10                                | No                   | No                  | 2           | AR 2-3+                       | 2  | 3  | 2  | No    | No                                                                           | 999                 |     |
| Commissures fused, thickened calcified leaflets and chordae, Mod-sev SVP                                                                                              | Yes         | Yes | Yes | Yes | No  | No  | No  | MVR#27chvp                                                       | 27           |                        | 29                   | 50                   | 29/50        | 27        | 1                | 9/4         | 9   | 4   | <5                                     | No                   | No                  | 2           | AR 1+, RVSP 22+RA             | 2  | 1  | 2  | 22+RA | No                                                                           | 999                 |     |
| Commissures fused, thickened calcified leaflets and chordae, Mod-SVP                                                                                                  | Yes         | Yes | Yes | No  | No  | No  | No  | MVR#29CHVP                                                       | 29           |                        | 39                   | 49                   | 39/49        | 29        | 1                | 9/4         | 9   | 4   | <5                                     | 2+ PV                | No                  | 2           | AR 2-3+, TR 1 +, PR 1 +, RVSP | 1  | 3  | 1  | 26+RA | No                                                                           | 999                 |     |
| Commissures fused, thickened calcified leaflets and chordae, sev SVP, LA grossly enlarged                                                                             | Yes         | Yes | Yes | No  | No  | No  | No  | MVR#29CHVP                                                       | 29           |                        | 53                   | 32                   | 53/32        | 29        | 1                | 15/5        | 15  | 5   | 5 to 10                                | No                   | No                  | 2           | AR2+. TR 3+                   | 3  | 2  | 2  | No    | No                                                                           | 999                 |     |
| Stenotic thickened valve ith calcified AML, PML, irregular tear in AML, SEV SVP                                                                                       | No          | No  | No  | No  | No  | Yes | Yes | MVR#27chvp                                                       | 29           |                        | 54                   | 44                   | 54/44        | 27        | 1                | 11/6        | 11  | 6   | 5 to 10                                | No                   | No                  | 2           | TR4+                          | 4  | 2  | 2  | No    | REDO with TV repair (4/2018)                                                 | TV repair           |     |
| RA/RV elarged, Miimal calcification of cusp, Sev SVP                                                                                                                  | No          | No  | No  | No  | No  | No  | No  | MVR 29CHVP+ LAAE+ PPI                                            | 29           | LAAE,PI                | 49                   | 50                   | 49/50        | 29        | 1                | 12/5        | 12  | 5   | 5 to 10                                | 1-2+                 | No                  | 2           | AR1+, TR1+, PR1+              | 1  | 1  | 1  | No    | No                                                                           | 999                 |     |
| Commissures fused, thickened calcified leaflets and chordae, LA large, sev SVP, Fixed orifice MR                                                                      | Yes         | Yes | Yes | No  | Yes | No  | No  | MVR #27CHVP+ DC OS ASD                                           | 27           | DC OS ASD              | 52                   | 58                   | 52/58        | 27        | 1                | 10/4        | 10  | 4   | <5                                     | 1+                   | No                  | 2           | TR2+,AR1+                     | 2  | 1  | 2  | No    | No                                                                           | 999                 |     |
| Mitral valve thickened with chordal rupture and non coapting leaflets                                                                                                 | No          | No  | No  | No  | No  | No  | No  | MVR#25CHVP                                                       | 25           |                        | 38                   | 48                   | 38/48        | 25        | 1                | 8/3         | 8   | 3   | <5                                     | NO MR                | No                  | 2           | Tr2+, rvsp-23 +RA             | 2  | 2  | 2  | 23+RA | Redo MVR for struck valve with# 28 SEPon Jan 2005 and PPI for CHB on 05/2005 | Yes                 | 999 |
| Stenotic thickened valve ith calcified AML, PML, tear in PML, SEV MR, MOD- SEV SVP, SHORTENED CHORDAE                                                                 | No          | No  | No  | No  | No  | Yes | Yes | MVR#27chvp                                                       | 27           |                        | 56                   | 55                   | 56/55        | 27        | 1                | 23/9        | 23  | 9   | 5 to 10                                | NO MR                | No                  | 1           | TR2+, RVSP-26+RA, MILD LV     | 2  | 2  | 2  | 26+RA | ON MEDICAL FOLLOWUP FOR INCREASED GRADIENTS                                  | INCREASED GRADIENTS |     |
| Commissures fused, thickened calcified leaflets and chordae, Fixed stenosis, MOD-SEV SVP, LA ENLARGED AND THICKENED                                                   | Yes         | Yes | Yes | No  | No  | No  | No  | MVR#25CHVP                                                       | 25           |                        | 48                   | 41                   | 48/41        | 25        | 1                | 10/6        | 10  | 6   | 5 to 10                                | NO MR                | No                  | 2           | MR1+, TR1-2+, RVSP-29+RA      | 2  | 2  | 2  | 29+RA | PE DRAINAGE DONE AFTER 1 MONTH OF SURGERY                                    | No                  | 999 |



| Intra-op findings                                                                                                                                                                                             | COMMISSURES |     |     |    |     |     |     | Surgery                                                  | Size of CHVP | additional procedure           | Post-op ECHO LA size | Post-op ECHO LV size | Post-op ECHO | CHVP size | Leaflet movement | PV GRADIENT | V48 | V49     | FLOW VELOCITY &lt; 5, 5 to 10, &gt; 10 | Regurgitation if any | Thrombus/vegetation | LV function                  | Other Valves | TR | AR | PR | RVSP  | REDO                | Complications       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----|-----|----|-----|-----|-----|----------------------------------------------------------|--------------|--------------------------------|----------------------|----------------------|--------------|-----------|------------------|-------------|-----|---------|----------------------------------------|----------------------|---------------------|------------------------------|--------------|----|----|----|-------|---------------------|---------------------|
|                                                                                                                                                                                                               |             |     |     |    |     |     |     |                                                          |              |                                |                      |                      |              |           |                  |             |     |         |                                        |                      |                     |                              |              |    |    |    |       |                     |                     |
| Commissures fused, thickened calcified and rolled PML, rupture chordae, ? Vegetations                                                                                                                         | Yes         | Yes | Yes | No | No  | No  | No  | MVR#25CHVP                                               | 25           |                                | 36                   | 47 36/47             |              | 25        | 1 12/4           | 12          | 4   | <5      | NO MR                                  | No                   |                     | 2 AR1+, TR1+, PR1+           |              | 1  | 1  | 1  | No    | No                  | 999                 |
| thickened AND FIBROTIC, INCOMPETENT, VERY LARGE LA                                                                                                                                                            | No          | No  | No  | No | No  | No  | No  | MVR#27chvp + LA PLICATION + TV ANNUOPLASTY ( DEVEGA)     | 27           | LA PLICATION,TV ANNUOPLASTY    | 67                   | 50 67/50             |              | 27        | 1 23/9           | 23          | 9   | 5 to 10 | NO MR                                  | No                   |                     | 2 AR2+, TR3 +, RVSP-35+RA    |              | 3  | 2  | 2  | 35+RA | No                  | 999                 |
| Commissures fused, thickened calcified leaflets and chordae,LA large,                                                                                                                                         | Yes         | Yes | Yes | No | Yes | No  | No  | MVR#27chvp                                               | 27           |                                | 53                   | 47 53/47             |              | 27        | 1 8/3            | 8           | 3   | <5      | 1+                                     | No                   |                     | 2 AR1+,TR2+                  |              | 2  | 1  | 2  | No    | No                  | 999                 |
| Commissures fused, thickened calcified leaflets WITH ROLLED OUT EDGES,sev SVP, LA CLOT + Commissures fused, leaflets WITH ROLLED OUT EDGES,sev SVP, LARGE LA, TENSE PA, TV GROSSLY ENLARGED, FIXED ORIFICE MR | Yes         | Yes | No  | No | No  | No  | No  | MVR#25 chvp + LA CLOT REMOVAL + TV ANNUOPLASTY ( DEVEGA) | 25           | LA CLOT REMOVAL,TV ANNUOPLASTY | 30                   | 33 30/33             |              | 25        | 1 16/5           | 16          | 5   | 5 to 10 | 1+                                     | No                   |                     | 2 NO TR, PR                  |              | 2  | 2  | 2  | No    | No                  | 999                 |
|                                                                                                                                                                                                               | Yes         | No  | No  | No | No  | No  | No  | MVR#27chvp + TV ANNUOPLASTY ( DEVEGA)                    | 27           | TV ANNULOPLAST                 | 72                   | 52 72/52             |              | 27        | 1 12/5           | 12          | 5   | 5 to 10 | 2+                                     | No                   |                     | 2 AR1-2+, RVSP- 32 +RA       |              | 2  | 2  | 2  | 32+RA | No                  | 999                 |
| Commissures fused, thickened calcified leaflets and chordae,LA large,                                                                                                                                         | Yes         | Yes | Yes | No | Yes | No  | No  | mvr#27CHVP                                               | 27           |                                | 50                   | 42 50/42             |              | 27        | 1 16/7           | 16          | 7   | 5 to 10 | 1-2+                                   | No                   |                     | 2 AR2-3+                     |              | 2  | 3  | 2  | No    | No                  | 999                 |
| Commissures fused, thickened calcified leaflets WITH ROLLED OUT EDGES,sev SVP                                                                                                                                 | Yes         | No  | No  | No | No  | No  | No  | MVR#27CHVP                                               | 27           |                                | 43                   | 47 43/47             |              | 27        | 1 8/3            | 8           | 3   | <5      | 1+                                     | No                   |                     | 2 AR3-4+, TR 1-2+, RVSP 25+F |              | 2  | 4  | 2  | 25+RA | AVR DONE FOR SEV AR | AVR DONE FOR SEV AR |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, OS ASD                                                                                                                                     | No          | No  | No  | No | No  | Yes | Yes | MVR#29CGVP +ASD CLOSURE                                  | 29           | ASD CLOSURE                    | 50                   | 45 50/45             |              | 29        | 1 12/3           | 12          | 3   | <5      | No                                     | No                   |                     | 2 TR2-3+, PR 1-2+, RVSP 40+F |              | 3  | 2  | 2  | 40+RA | No                  | 999                 |
| MV LEAFLETS THICKENED, CALCIFIC ANNULUS, FIXED ORIFISE MR, ENLARGED LA                                                                                                                                        | Yes         | No  | No  | No | No  | Yes | Yes | MVR#27CHVP+PMLP                                          | 27           | PMLP                           | 32                   | 40 32/40             |              | 27        | 1 18/7           | 18          | 7   | 5 to 10 | No                                     | No                   |                     | 2 tr 2+, rvsp 32+ra          |              | 2  | 2  | 2  | 32+RA | No                  | 999                 |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, FIXED ORIFISE MR, LA ENLARGED                                                                                                              | Yes         | No  | No  | No | No  | Yes | Yes | MVR#27CHVP+PMLP                                          | 27           | PMLP                           | 50                   | 43 50/43             |              | 27        | 1 14/6           | 14          | 6   | 5 to 10 | No                                     | No                   |                     | 2 AR2-3+                     |              | 2  | 3  | 2  | No    | No                  | 999                 |
| Commissures fused, thickened calcified leaflets WITH ROLLED OUT EDGES,sev SVP                                                                                                                                 | Yes         | Yes | No  | No | No  | No  | No  | MVR#25 CHVP                                              | 25           |                                | 45                   | 42 45/42             |              | 25        | 1 11/3           | 11          | 3   | <5      | No                                     | No                   |                     | 2 AR 3+, TR 3+, RVSP 50+RA   |              | 3  | 3  | 2  | 50+RA | No                  | 999                 |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA ENLARGED                                                                                                                                | Yes         | No  | No  | No | No  | Yes | Yes | MVR#29CHVP                                               | 29           |                                | 50                   | 26 50/26             |              | 29        | 1 12/4           | 12          | 4   | <5      | No                                     | No                   |                     | 2 AR 1+, TR 2+,RVSP 40+RA    |              | 2  | 1  | 2  | 40+RA | No                  | 999                 |

| Intra-op findings                                                                                            | COMMISSURES |     | LEAFLETS | CHORDAE | LVH | LA  | Aml | PML                                  | Surgery                  | Size of CHVP | additional procedure | Post-op ECHO LA size | Post-op ECHO LV size | Post-op ECHO | CHVP size | Leaflet movement | PV GRADIENT | V48 | V49     | FLOW VELOCITY &lt; 5, 5 to 10, &gt; 10 | Regurgitation if any | Thrombus/vegetation        | LV function | Other Valves | TR | AR | PR | RVSP  | REDO                                                | Complications |                               |
|--------------------------------------------------------------------------------------------------------------|-------------|-----|----------|---------|-----|-----|-----|--------------------------------------|--------------------------|--------------|----------------------|----------------------|----------------------|--------------|-----------|------------------|-------------|-----|---------|----------------------------------------|----------------------|----------------------------|-------------|--------------|----|----|----|-------|-----------------------------------------------------|---------------|-------------------------------|
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, CHORDAE FUSED, LA ENLARGED                | Yes         | No  | Yes      | No      | No  | Yes | Yes | MVR#29CHVP                           |                          | 29           |                      | 39                   | 47 39/47             |              | 29        | 1 12             | 12          |     | 999     | No                                     | No                   | 2 NO                       |             |              | 2  | 2  | 2  | No    |                                                     | No            | 999                           |
| LA ENLARGED, COMMISURE FUSED, SEV SVP                                                                        | Yes         | No  | No       | No      | No  | No  | No  | MVR #31CHVP+LAAE+LA REDUCTION PLASTY | LAAE,LA REDUCTION PLASTY | 31           |                      | 46                   | 40 46/40             |              | 31        | 1 10/3           | 10          | 3   | <5      | 3+ pv                                  | No                   | 2 tr 2+, rvsp 30+ra, pr 2+ |             |              | 2  | 2  | 2  | 30+RA | ON MEDICAL FOLLOW UP, PLAN FOR DEVICE CLOSURE OF PV | No            | PLAN FOR DEVICE CLOSURE OF PV |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, SHALLOW LA APPENDAGE                      | Yes         | No  | No       | No      | No  | Yes | Yes | MVR#29CHVP                           |                          | 29           |                      | 35                   | 50 35/50             |              | 29        | 1 6/2            | 6           | 2   | <5      | 1+                                     | No                   | 2 TR2+, RVSP 44+RA         |             |              | 2  | 2  | 2  | 44+RA |                                                     | No            | 999                           |
| Commissures fused, thickened calcified leaflets and chordae,LA large, MOD SVP                                | Yes         | Yes | Yes      | No      | No  | No  | No  | MVR#29CHVP+PMLP+LA PLICATION         | PMLP,LA PLICATION        | 29           |                      | 32                   | 43 32/43             |              | 29        | 1 7/3            | 7           | 3   | <5      | 1+                                     | No                   | 2 TR1+                     |             |              | 1  | 2  | 2  | No    |                                                     | No            | 999                           |
| LEAFLETS CALCIFIED, SEV SVP, CALCIUM EXTENDING TO ANNULUS                                                    | No          | Yes | No       | No      | No  | No  | No  | MVR#29CHVP+LA PLICATION              | 29 LA PLICATION          | 29           |                      | 48                   | 50 48/50             |              | 29        | 1 13/6           | 13          | 6   | 5 to 10 | 2+                                     | No                   | 1 TR 1+                    |             |              | 1  | 2  | 2  | No    |                                                     | No            | 999                           |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA CLOT +                                 | Yes         | No  | No       | No      | No  | Yes | Yes | MVR#29CHVP+LAAE                      |                          | 29           | LAAE                 | 46                   | 40 46/40             |              | 29        | 1 11/2           | 11          | 2   | <5      | 1+                                     | No                   | 2 AR2+                     |             |              | 1  | 2  | 2  | No    |                                                     | No            | 999                           |
| large LA, LEAFLETS THICKENED, COMMISSURAL FUSION, FIXED ORIFISE MR, SEV SVP                                  | No          | No  | No       | No      | No  | No  | No  | MVR#27CHVP+LAAE                      |                          | 27           | LAAE                 | 48                   | 47 48/47             |              | 27        | 1 16/7           | 16          | 7   | 5 to 10 | 1+                                     | No                   | 2 AR1+TR1+                 |             |              | 1  | 1  | 2  | No    |                                                     | No            | 999                           |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, CHORDAE SHORTENED                         | No          | No  | No       | No      | No  | No  | No  | MVR#27CHVP                           |                          | 27           |                      | 40                   | 48 40/48             |              | 27        | 1 12/4           | 12          | 4   | <5      | No                                     | No                   | 2 NO                       |             |              | 2  | 2  | 2  | No    |                                                     | No            | 999                           |
| Commissures fused, thickened calcified leaflets and chordae,LA large, PE +                                   | No          | No  | No       | No      | No  | No  | No  | MVR#29CHVP                           |                          | 29           |                      | 56                   | 51 56/51             |              | 29        | 1 14/5           | 14          | 5   | 5 to 10 | 1-2+                                   | No                   | 2 TR2+, RVSP-28+RA         |             |              | 2  | 2  | 2  | 28+RA |                                                     | No            | 999                           |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, CHORDAL ENTRAPMENT CAUSING TR | No          | No  | No       | No      | No  | No  | No  | MVR#29CHVP + RV ENDOCARDECTOMY       | RV ENDOCARDECT 29 OMY    | 29           |                      | 52                   | 43 52/43             |              | 29        | 1 14/4           | 14          | 4   | <5      | 2-3+ pv                                | No                   | 2 TR3+,PR1-2+              |             |              | 3  | 2  | 2  | No    | TEE DONE SHOWED NO PV LEAK                          | No            | 999                           |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA ENLARGED, ANNULAR CALCIFICATION        | No          | No  | No       | No      | No  | No  | No  | MVR#25 CHVP                          |                          | 25           |                      | 34                   | 42 34/42             |              | 25        | 1 16/8           | 16          | 8   | 5 to 10 | 2+                                     | No                   | 2 TR1+AR1+                 |             |              | 1  | 1  | 2  | No    |                                                     | No            | 999                           |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA                                | No          | No  | No       | No      | No  | No  | No  | MVR#29CHVP+LAAE                      |                          | 29           | LAAE                 | 48                   | 47 48/47             |              | 29        | 1 10/4           | 10          | 4   | <5      | 1+                                     | No                   | 2 TR2+, AR1+               |             |              | 2  | 1  | 2  | No    |                                                     | No            | 999                           |

| Intra-op findings                                                                                           | COMMISSURES | LEAFLETS | CHORDAE | LVH | LA | Aml | PML | Surgery                        | Size of CHVP | additional procedure | Post-op ECHO LA size | Post-op ECHO LV size | Post-op ECHO | CHVP size | Leaflet movement | PV GRADIENT | V48 | V49     | FLOW VELOCITY &lt;= 5 to10, &gt;= 10 | Regurgitation if any | Thrombus/vegetation | LV function              | Other Valves | TR | AR | PR      | RVSP                                                       | REDO | Complications |
|-------------------------------------------------------------------------------------------------------------|-------------|----------|---------|-----|----|-----|-----|--------------------------------|--------------|----------------------|----------------------|----------------------|--------------|-----------|------------------|-------------|-----|---------|--------------------------------------|----------------------|---------------------|--------------------------|--------------|----|----|---------|------------------------------------------------------------|------|---------------|
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, PML PLASTERED TO LV          | No          | No       | No      | No  | No | No  | No  | MVR #25CHVP                    | 25           |                      | 32                   | 40 32/40             |              | 25        | 1 15/8           | 15          | 8   | 5 to 10 | No                                   | No                   |                     | 2 TR1-2+ RVSP 20+RA      |              | 2  | 2  | 2 20+RA |                                                            | No   | 999           |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, LV APEX CALCIFIED            | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP + LV ENDOCARDECTOMY | 29           | LV ENDOCARDECT OMY   | 44                   | 55 44/55             |              | 29        | 1 10/9           | 10          | 9   | 5 to 10 | 1+                                   | No                   |                     | 2 TR 1+                  |              | 1  | 2  | 2 No    |                                                            | No   | 999           |
| Commissures fused, thickened calcified, MOD SVP                                                             | Yes         | No       | No      | No  | No | No  | No  | MVR#29CHVP                     | 29           |                      | 38                   | 51 38/51             |              | 29        | 1 21/1           | 21          | 1   | <5      | 2+                                   | No                   |                     | 2 TR3+, AR 2-3+          |              | 3  | 3  | 2 No    | STUCK VALVE IN 2019, RED MVR DONE WITH 25CHVP ON JUNE 2019 | Yes  | MVR           |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA ENLARGED                              | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP                     | 29           |                      | 35                   | 42 35/42             |              | 29        | 1 6/2            | 6           | 2   | <5      | No                                   | No                   |                     | 1 TR1+, AR1+, RVSP-26+RA |              | 1  | 1  | 2 26+RA |                                                            | No   | 999           |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA ENLARGED, TV MILD THICKENING          | No          | No       | No      | No  | No | No  | No  | MVR#27CHVP                     | 27           |                      | 51                   | 50 51/50             |              | 27        | 1 20/6           | 20          | 6   | 5 to 10 | No                                   | No                   |                     | 2 NO                     |              | 2  | 2  | 2 No    |                                                            | No   | 999           |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, ANNULR CLCIFICATION, THICKENED AND FUSD CHODAE  | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP                     | 29           |                      | 44                   | 59 44/59             |              | 29        | 1 9/3            | 9           | 3   | <5      | 1+                                   | No                   |                     | 2 TR1+                   |              | 1  | 2  | 2 No    |                                                            | No   | 999           |
| MOD THICKENED LEAFLETS WITH AML TEAR UPTO ANNULUS, MOD SVP                                                  | No          | No       | No      | No  | No | No  | No  | MVR #25CHVP                    | 25           |                      | 41                   | 40 41/40             |              | 25        | 1 17/7           | 17          | 7   | 5 to 10 | No                                   | No                   |                     | 2 NO                     |              | 2  | 2  | 2 No    |                                                            | No   | 999           |
| mv sev stenosis, leaflet thickened, sev SVP, organised la clot                                              | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP+LA CLOT REMOVAL     | 29           | LA CLOT REMOVAL      | 40                   | 48 40/48             |              | 29        | 1 10/5           | 10          | 5   | 5 to 10 | No                                   | No                   |                     | 2 NO                     |              | 2  | 2  | 2 No    |                                                            | No   | 999           |
| NO CALCIFIED LEAFLETSN PLIABLE VEGETATIONS ON AML AND PML, NO LEAFLET PERFORATION                           | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP                     | 29           |                      | 50                   | 48 50/48             |              | 29        | 1 11/4           | 11          | 4   | <5      | No                                   | No                   |                     | 2 TR1+                   |              | 1  | 2  | 2 No    |                                                            | No   | 999           |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, PML PLASTERED TO LV, LA CLOT | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP+LA CLOT REMOAL      | 29           | LA CLOT REMOVAL      | 50                   | 49 50/49             |              | 29        | 1 12/4           | 12          | 4   | <5      | 1+                                   | No                   |                     | 2 NO                     |              | 2  | 2  | 2 No    |                                                            | No   | 999           |
| Commissures fused, thickened calcified, MOD SVP, TEAR AT PM COMMISSURE                                      | No          | No       | No      | No  | No | No  | No  | MVR#27CHVP                     | 27           |                      | 34                   | 40 34/40             |              | 27        | 1 13/4           | 13          | 4   | <5      | 1+                                   | No                   |                     | 2 TR1+                   |              | 1  | 2  | 2 No    |                                                            | No   | 999           |
| LEAFLETS THICKENED, SEV SVP, COMMISSURES FUSED                                                              | No          | Yes      | No      | No  | No | No  | No  | MVR#27CHVP                     | 27           |                      | 50                   | 42 50/42             |              | 27        | 1 12/3           | 12          | 3   | <5      | No                                   | No                   |                     | 2 NO                     |              | 2  | 2  | 2 No    |                                                            | No   | 999           |

| Intra-op findings                                                                                     | COMMISSURES | LEAFLETS | CHORDAE | LVH | LA  | Aml | PML | Surgery                                     | Size of CHVP | additional procedure      | Post-op ECHO LA size | Post-op ECHO LV size | Post-op ECHO | CHVP size | Leaflet movement | PV GRADIENT | V48 | V49     | FLOW VELOCITY &lt; 5, 5 to 10, &gt; 10 | Regurgitation if any | Thrombus/vegetation        | LV function | Other Valves | TR | AR | PR | RVSP  | REDO                                                                         | Complications |                               |
|-------------------------------------------------------------------------------------------------------|-------------|----------|---------|-----|-----|-----|-----|---------------------------------------------|--------------|---------------------------|----------------------|----------------------|--------------|-----------|------------------|-------------|-----|---------|----------------------------------------|----------------------|----------------------------|-------------|--------------|----|----|----|-------|------------------------------------------------------------------------------|---------------|-------------------------------|
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, DILATED TV             | No          | No       | No      | No  | No  | No  | No  | MVR#29CHVP+TV ANNULOPLASTY(DEVEGA)          | 29 Y         | TV ANNULOPLAST            | 45                   | 40 45/40             |              | 29        | 1 11/3           | 11          | 3   | <5      | No                                     | No                   | 2 NO                       |             |              | 2  | 2  | 2  | No    | No                                                                           | 999           |                               |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, DILATED TV ANNULUS, MILD PE        | No          | No       | No      | No  | No  | No  | No  | MVR#29CHVP+TV ANNULOPLASTY(DEVEGA)          | 29 Y         | TV ANNULOPLAST            | 41                   | 40 41/40             |              | 29        | 1 14/4           | 14          | 4   | <5      | No                                     | No                   | 2 NO                       |             |              | 2  | 2  | 2  | No    | No                                                                           | 999           |                               |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP                                   | No          | No       | No      | No  | No  | No  | No  | MVR#29CHVP                                  | 29           |                           | 40                   | 52 40/52             |              | 29        | 1 12/3           | 12          | 3   | <5      | No                                     | No                   | 2 AR1+                     |             |              | 2  | 1  | 2  | No    | No                                                                           | 999           |                               |
| Commissures fused, thickened calcified, MOD SVP, DILATED TV                                           | Yes         | No       | No      | No  | No  | No  | No  | MVR# 31CHVP+ PPMLP +TV ANNULOPLASTY(DEVEGA) | 31           | PPMLP,TV ANNULOPASTY      | 45                   | 50 45/50             |              | 31        | 1 12/4           | 12          | 4   | <5      | 1+                                     | No                   | 2 NO                       |             |              | 2  | 2  | 2  | No    | No                                                                           | 999           |                               |
| Commissures fused, thickened calcified, MOD SVP, 5X3 MM OS ASD                                        | Yes         | No       | No      | No  | No  | No  | No  | MVR #25CHVP + PMLP + DC OF ASD              | 25           | PMLP,DC OF ASD            | 42                   | 28 42/28             |              | 25        | 1 13/4           | 13          | 4   | <5      | 1+                                     | No                   | 2 TR1+                     |             |              | 1  | 2  | 2  | No    | No                                                                           | 999           |                               |
| THICKENED AML, PML, COMISSURES FUSED, REDUCTANT A2,A3,P2,P3, THICKENED AND PULLED UP PAPILLARY MUSCLE | Yes         | No       | No      | No  | No  | No  | No  | MVR#27CHVP WITH TOTAL CHORDALPRESERVATION   | 27           | TOTAL CHORDALPRESERVATION | 49                   | 51 49/51             |              | 27        | 1 12/3           | 12          | 3   | <5      | No                                     | No                   | 2 NO                       |             |              | 2  | 2  | 2  | No    | No                                                                           | 999           |                               |
| RA/RV elarged, Miimal calcification of cusp, Sev SVP                                                  | Yes         | No       | No      | No  | No  | No  | No  | MVR 29CHVP+ LA AE+ PPI                      | 29           | LAAE PPI                  | 49                   | 50 49/50             |              | 29        | 1 12/5           | 12          | 5   | 5 to 10 | 1-2+                                   | No                   | 2 AR1+, TR1+, PR1+         |             |              | 1  | 1  | 1  | No    | No                                                                           | 999           |                               |
| Commissures fused, thickened calcified leaflets and chordae,LA large, sev SVP, Fixed orifise MR       | Yes         | Yes      | Yes     | No  | Yes | No  | No  | MVR #27CHVP+ DC OS ASD                      | 27           | DC OS ASD                 | 52                   | 58 52/58             |              | 27        | 1 10/4           | 10          | 4   | <5      | 1+                                     | No                   | 2 TR2+,AR1+                |             |              | 1  | 1  | 2  | No    | No                                                                           | 999           |                               |
| Mitral valve thickened with chordal rupture and non coapting lealets                                  | No          | No       | No      | No  | No  | No  | No  | MVR#25CHVP                                  | 25           |                           | 38                   | 48 38/48             |              | 25        | 1 8/3            | 8           | 3   | <5      | NO MR                                  | No                   | 2 Tr2+, rvsp- 23 +RA       |             |              | 2  | 2  | 2  | 23+RA | Redo MVR for struck valve with# 30 SEPon Jan 2007 and PPI for CHB on 02/2007 | Yes           | 999                           |
| LA ENLARGED, COMMISURE FUSED, SEV SVP                                                                 | No          | No       | No      | No  | No  | No  | No  | MVR #31CHVP+LAAE+LA REDUCTION PLASTY        | 31           | LAAE,LA REDUCTION PLASTY  | 46                   | 40 46/40             |              | 31        | 1 10/3           | 10          | 3   | <5      | 3+ pv                                  | No                   | 2 tr 2+, rvsp 30+ra, pr 2+ |             |              | 2  | 2  | 2  | 30+RA | ON MEDICAL FOLLOW UP, PLAN FOR DEVICE CLOSURE OF PV                          | No            | PLAN FOR DEVICE CLOSURE OF PV |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, SHALLOW LA APPENDAGE               | No          | No       | No      | No  | No  | No  | No  | MVR#29CHVP                                  | 29           |                           | 35                   | 50 35/50             |              | 29        | 1 6/2            | 6           | 2   | <5      | 1+                                     | No                   | 2 TR2+, RVSP 44+RA         |             |              | 2  | 2  | 2  | 44+RA | No                                                                           | 999           |                               |
| Commissures fused, thickened calcified leaflets and chordae,LA large, MOD SVP                         | Yes         | Yes      | Yes     | No  | Yes | No  | No  | MVR#29CHVP+PMLP+LA PLICATION                | 29           | PMLP,LA PLICATION         | 32                   | 43 32/43             |              | 29        | 1 7/3            | 7           | 3   | <5      | 1+                                     | No                   | 2 TR1+                     |             |              | 1  | 2  | 2  | No    | No                                                                           | 999           |                               |

| Intra-op findings                                                                                                                      | COMMISSURES |     |     |     |     |    |    |                                                      | Surgery                        | Size of CHVP | additional procedure | Post-op ECHO LA size | Post-op ECHO LV size | Post-op ECHO | CHVP size | Leaflet movement | PV GRADIENT | V48 | V49     | FLOW VELOCITY &lt; 5 to 10, &gt; 10 | Regurgitation if any | Thrombus/vegetation | LV function                 | Other Valves | TR | AR | PR | RVSP    | REDO                                      | Complications |             |
|----------------------------------------------------------------------------------------------------------------------------------------|-------------|-----|-----|-----|-----|----|----|------------------------------------------------------|--------------------------------|--------------|----------------------|----------------------|----------------------|--------------|-----------|------------------|-------------|-----|---------|-------------------------------------|----------------------|---------------------|-----------------------------|--------------|----|----|----|---------|-------------------------------------------|---------------|-------------|
| LEAFLETS CALCIFIED, SEV SVP, CALCIUM EXTENDING TO ANNULUS                                                                              | No          | Yes | No  | No  | No  | No | No | MVR#29CHVP+LA PLICATION                              | 29 LA PLICATION                |              |                      | 48                   | 50 48/50             |              | 29        | 1 13/6           | 13          | 6   | 5 to 10 | 2+                                  | No                   |                     | 1 TR 1+                     |              |    | 1  | 2  | 2       | No                                        | No            | 999         |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA CLOT +                                                           | No          | No  | No  | No  | No  | No | No | MVR#29CHVP+LAAE                                      | 29 LAAE                        |              |                      | 46                   | 40 46/40             |              | 29        | 1 11/2           | 11          | 2   | <5      | 1+                                  | No                   |                     | 2 AR2+                      |              |    | 2  | 2  | 2       | No                                        | No            | 999         |
| Commissures fused, thickened calcified leaflets and chordae, Fixed stenosis, MOD-SEV SVP, LA ENLARGED AND THICKENED                    | Yes         | Yes | Yes | No  | Yes | No | No | MVR#25CHVP                                           | 25                             |              |                      | 48                   | 41 48/41             |              | 25        | 1 10/6           | 10          | 6   | 5 to 10 | NO MR                               | No                   |                     | 2 MR1+, TR1-2+, RVSP- 29+R/ |              |    | 2  | 2  | 2 29+RA | PE DRAINAGE DONE AFTER 1 MONTH OF SURGERY | No            | PE DRAINAGE |
| Commissures fused, thickened calcified and rolled PML, rupture chordae, ? Vegetations                                                  | Yes         | Yes | No  | No  | No  | No | No | MVR#25CHVP                                           | 25                             |              |                      | 36                   | 47 36/47             |              | 25        | 1 12/4           | 12          | 4   | <5      | NO MR                               | No                   |                     | 2 AR1+, TR1+, PR1+          |              |    | 1  | 1  | 1       | No                                        | No            | 999         |
| thickened AND FIBROTIC, INCOMPETENT, VERY LARGE LA                                                                                     | No          | No  | No  | No  | No  | No | No | MVR#27chvp + LA PLICATION + TV ANNUOPLASTY ( DEVEGA) | LA PLICATION,TV 27 ANNUOPLASTY |              |                      | 67                   | 50 67/50             |              | 27        | 1 23/9           | 23          | 9   | 5 to 10 | NO MR                               | No                   |                     | 2 AR2+, TR3 +, RVSP-35+RA   |              |    | 3  | 2  | 2 35+RA | ON MEDICAL FOLLOW UP                      | No            | 999         |
| Commissures fused, thickened calcified leaflets and chordae,LA large,                                                                  | Yes         | Yes | No  | No  | Yes | No | No | MVR#27chvp                                           | 27                             |              |                      | 53                   | 47 53/47             |              | 27        | 1 8/3            | 8           | 3   | <5      | 1+                                  | No                   |                     | 2 AR1+,TR2+                 |              |    | 2  | 1  | 2       | No                                        | No            | 999         |
| Commissures fused, thickened calcified leaflets and chordae,LVH, Commissures fused, thickened calcified leaflets and chordae,LA large, | Yes         | Yes | Yes | Yes | No  | No | No | MVR# 27 CHVP +LAA LIGATION, PPI ON 03/06/2010        | LAA 27 LIGATION,PPI            |              |                      | 51                   | 40 51/40             |              | 27        | 1 14/5           | 14          | 5   | 5 to 10 | No                                  | No                   |                     | 2 AR2+                      |              |    | 2  | 2  | 2       | No                                        | No            | 999         |
| Commissures fused, thickened calcified leaflets and chordae,LA large,                                                                  | Yes         | Yes | Yes | No  | Yes | No | No | MVR# 25 CHVP + PPMLP                                 | 25 PPMLP                       |              |                      | 46                   | 55 46/55             |              | 25        | 1 13/6           | 13          | 6   | 5 to 10 | MR 1+                               | No                   |                     | 2 TR1+, RVSP- 28+RA         |              |    | 1  | 2  | 2 28+RA |                                           | No            | 999         |
| Commissures fused, thickened calcified leaflets and chordae,LA large, sev SVP, Fixed stenosis                                          | Yes         | Yes | Yes | No  | Yes | No | No | MVR# 27 CHVP                                         | 27                             |              |                      | 46                   | 50 46/50             |              | 27        | 1 12/4           | 12          | 4   | <5      | No                                  | No                   |                     | 2 TR2+, RVSP-27+RA          |              |    | 2  | 2  | 2 27+RA |                                           | No            | 999         |
| Myxamatous MV, restricted PML, AML prolapse,A2-A3 chordae rupture                                                                      | No          | No  | No  | No  | No  | No | No | MVR# 29 CHVP + PMLP                                  | 29 PMLP                        |              |                      | 46                   | 58 46/58             |              | 29        | 1 8/5            | 8           | 5   | 5 to 10 | MR1-2+                              | No                   |                     | 3 TR1+, AR1+, RVSP-26+RA    |              |    | 1  | 1  | 2 26+RA |                                           | No            | 999         |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA ENLARGED, TV MILD THICKENING                                     | No          | No  | No  | No  | No  | No | No | MVR#27CHVP                                           | 27                             |              |                      | 51                   | 50 51/50             |              | 27        | 1 20/6           | 20          | 6   | 5 to 10 | No                                  | No                   |                     | 2 NO                        |              |    | 2  | 2  | 2       | No                                        | No            | 999         |
| NO CALCIFIED LEAFLETSN PLIABLE VEGETATIONS ON AML AND PML, NO LEAFLET PERFORATION                                                      | No          | No  | No  | No  | No  | No | No | MVR#29CHVP                                           | 29                             |              |                      | 50                   | 48 50/48             |              | 29        | 1 11/4           | 11          | 4   | <5      | No                                  | No                   |                     | 2 NO                        |              |    | 2  | 2  | 2       | No                                        | No            | 999         |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, PML PLASTERED TO LV, LA CLOT                            | No          | No  | No  | No  | No  | No | No | MVR#29CHVP+LA CLOT REMOAL                            | LA CLOT 29 REMOVAL             |              |                      | 50                   | 49 50/49             |              | 29        | 1 12/4           | 12          | 4   | <5      | 1+                                  | No                   |                     | 2 NO                        |              |    | 2  | 2  | 2       | No                                        | No            | 999         |

| Intra-op findings                                                                                            | COMMISSURES |          |         |     |    |     |     | Surgery                            | Size of CHVP | additional procedure | Post-op ECHO LA size | Post-op ECHO LV size | Post-op ECHO | CHVP size | Leaflet movement | PV GRADIENT | V48     | V49     | FLOW VELOCITY &lt; 5, 5 to 10, &gt; 10 | Regurgitation if any | Thrombus/vegetation      | LV function | Other Valves | TR | AR | PR | RVSP  | REDO                                                                         | Complications |
|--------------------------------------------------------------------------------------------------------------|-------------|----------|---------|-----|----|-----|-----|------------------------------------|--------------|----------------------|----------------------|----------------------|--------------|-----------|------------------|-------------|---------|---------|----------------------------------------|----------------------|--------------------------|-------------|--------------|----|----|----|-------|------------------------------------------------------------------------------|---------------|
|                                                                                                              | COMMISSURES | LEAFLETS | CHORDAE | LVH | LA | Aml | PML |                                    |              |                      |                      |                      |              |           |                  |             |         |         |                                        |                      |                          |             |              |    |    |    |       |                                                                              |               |
| Commissures fused, thickened calcified, MOD SVP, TEAR AT PM COMMISSURE                                       | Yes         | Yes      | No      | No  | No | No  | No  | MVR#27CHVP                         | 27           |                      | 34                   | 40 34/40             | 27           | 1 13/4    | 13               | 4           | <5      | 1+      | No                                     |                      | 2 TR1+                   |             |              | 1  | 2  | 2  | No    | No                                                                           | 999           |
| LEAFLETS THICKENED, SEV SVP, COMMISSURES FUSED                                                               | Yes         | Yes      | No      | No  | No | No  | No  | MVR#27CHVP                         | 27           |                      | 50                   | 42 50/42             | 27           | 1 12/3    | 12               | 3           | <5      | No      | No                                     |                      | 2 NO                     |             |              | 2  | 2  | 2  | No    | No                                                                           | 999           |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, DILATED TV                    | Yes         | No       | No      | No  | No | No  | No  | MVR#29CHVP+TV ANNULOPLASTY(DEVEGA) | 29 Y         | TV ANNULOPLAST       | 45                   | 40 45/40             | 29           | 1 11/3    | 11               | 3           | <5      | No      | No                                     |                      | 2 NO                     |             |              | 2  | 2  | 2  | No    | No                                                                           | 999           |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, CHORDAL ENTRAPMENT CAUSING TR | Yes         | No       | No      | No  | No | No  | No  | MVR#29CHVP + RV ENDOCARDECTOMY     | 29 OMY       | RV ENDOCARDECT       | 52                   | 43 52/43             | 29           | 1 14/4    | 14               | 4           | <5      | 2-3+ pv | No                                     |                      | 2 TR3+,PR1-2+            |             |              | 3  | 2  | 2  | No    | TEE DONE SHOWED NO PV LEAK                                                   | No 999        |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA ENLARGED, ANNULAR CALCIFICATION        | Yes         | No       | No      | No  | No | No  | No  | MVR#25 CHVP                        | 25           |                      | 34                   | 42 34/42             | 25           | 1 16/8    | 16               | 8           | 5 to 10 | 2+      | No                                     |                      | 2 TR1+AR1+               |             |              | 1  | 1  | 2  | No    | No                                                                           | 999           |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA                                | Yes         | No       | No      | No  | No | No  | No  | MVR#29CHVP+LAAE                    | 29 LAAE      |                      | 48                   | 47 48/47             | 29           | 1 10/4    | 10               | 4           | <5      | 1+      | No                                     |                      | 2 TR2+, AR1+             |             |              | 2  | 1  | 2  | No    | No                                                                           | 999           |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, PML PLASTERED TO LV           | Yes         | No       | No      | No  | No | No  | No  | MVR #25CHVP                        | 25           |                      | 32                   | 40 32/40             | 25           | 1 15/8    | 15               | 8           | 5 to 10 | No      | No                                     |                      | 2 TR1-2+ RVSP 20+RA      |             |              | 2  | 2  | 2  | 20+RA | No                                                                           | 999           |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, LV APEX CALCIFIED             | Yes         | No       | No      | No  | No | No  | No  | MVR#29CHVP + LV ENDOCARDECTOMY     | 29 OMY       | LV ENDOCARDECT       | 44                   | 55 44/55             | 29           | 1 10/9    | 10               | 9           | 5 to 10 | 1+      | No                                     |                      | 2 TR 1+                  |             |              | 1  | 2  | 2  | No    | STUCK VALVE IN 2014, RED MVR DONE WITH 23CHVP ON JUNE 2014                   | No 999        |
| Commissures fused, thickened calcified, MOD SVP                                                              | Yes         | No       | No      | No  | No | No  | No  | MVR#27CHVP                         | 27           |                      | 38                   | 51 38/51             | 27           | 1 21/1    | 21               | 1           | <5      | 2+      | No                                     |                      | 2 TR3+, AR 2-3+          |             |              | 3  | 3  | 2  | No    | Yes                                                                          | Stuck Valve   |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA ENLARGED                               | Yes         | No       | No      | No  | No | No  | No  | MVR#29CHVP                         | 29           |                      | 35                   | 42 35/42             | 29           | 1 6/2     | 6                | 2           | <5      | No      | No                                     |                      | 1 TR1+, AR1+, RVSP-26+RA |             |              | 1  | 1  | 2  | 26+RA | No                                                                           | Stuck Valve   |
| Mitral valve thickened with chordal rupture and non coapting lealets                                         | No          | No       | No      | No  | No | No  | No  | MVR#25CHVP                         | 25           |                      | 38                   | 48 38/48             | 25           | 1 8/3     | 8                | 3           | <5      | NO MR   | No                                     |                      | 2 Tr2+, rvsp- 23 +RA     |             |              | 2  | 2  | 2  | 23+RA | Redo MVR for struck valve with# 30 SEPon Jan 2003 and PPI for CHB on 03/2003 | Yes 999       |

| Intra-op findings                                                                                                                      | COMMISSURES |     |     |     |     |    |    | Surgery                                              | Size of CHVP | additional procedure        | Post-op ECHO LA size | Post-op ECHO LV size | Post-op ECHO | CHVP size | Leaflet movement | PV GRADIENT | V48     | V49   | FLOW VELOCITY &lt;= 5 to10, &gt; 10 | Regurgitation if any | Thrombus/vegetation        | LV function | Other Valves | TR | AR | PR    | RVSP                                                | REDO | Complications                 |
|----------------------------------------------------------------------------------------------------------------------------------------|-------------|-----|-----|-----|-----|----|----|------------------------------------------------------|--------------|-----------------------------|----------------------|----------------------|--------------|-----------|------------------|-------------|---------|-------|-------------------------------------|----------------------|----------------------------|-------------|--------------|----|----|-------|-----------------------------------------------------|------|-------------------------------|
|                                                                                                                                        |             |     |     |     |     |    |    |                                                      |              |                             |                      |                      |              |           |                  |             |         |       |                                     |                      |                            |             |              |    |    |       |                                                     |      |                               |
| LA ENLARGED, COMMISSURE FUSED, SEV SVP                                                                                                 | No          | No  | No  | No  | No  | No | No | MVR #31CHVP+LAAE+LA REDUCTION PLASTY                 | 31           | LA REDUCTION PLASTY         | 46                   | 40 46/40             | 31           | 1 10/3    | 10               | 3           | <5      | 3+ pv | No                                  |                      | 2 tr 2+, rvsp 30+ra, pr 2+ |             | 2            | 2  | 2  | 30+RA | ON MEDICAL FOLLOW UP, PLAN FOR DEVICE CLOSURE OF PV | No   | PLAN FOR DEVICE CLOSURE OF PV |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, SHALLOW LA APPENDAGE                                                | Yes         | No  | No  | No  | No  | No | No | MVR#29CHVP                                           | 29           |                             | 35                   | 50 35/50             | 29           | 1 6/2     | 6                | 2           | <5      | 1+    | No                                  |                      | 2 TR2+, RVSP 44+RA         |             | 2            | 2  | 2  | 44+RA |                                                     | No   | 999                           |
| Commissures fused, thickened calcified leaflets and chordae,LA large, MOD SVP                                                          | Yes         | No  | No  | No  | No  | No | No | MVR#29CHVP+PMLP+LA PLICATION                         | 29           | LA PLICATION                | 32                   | 43 32/43             | 29           | 1 7/3     | 7                | 3           | <5      | 1+    | No                                  |                      | 2 TR1+                     |             | 1            | 2  | 2  | No    |                                                     | No   | 999                           |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA CLOT +                                                           | Yes         | No  | No  | No  | No  | No | No | MVR#29CHVP+LAAE                                      | 29           | LAAE                        | 46                   | 40 46/40             | 29           | 1 11/2    | 11               | 2           | <5      | 1+    | No                                  |                      | 2 AR2+                     |             | 2            | 2  | 2  | No    |                                                     | No   | 999                           |
| Commissures fused, thickened calcified leaflets and chordae, Fixed stenosis, MOD-SEV SVP, LA ENLARGED AND THICKENED                    | Yes         | Yes | Yes | No  | Yes | No | No | MVR#25CHVP                                           | 25           |                             | 48                   | 41 48/41             | 25           | 1 10/6    | 10               | 6           | 5 to 10 | NO MR | No                                  |                      | 2 MR1+, TR1-2+             |             | 2            | 2  | 2  | No    | PE DRAINAGE DONE AFTER 1 MONTH OF SURGERY           | No   | PE DRAINAGE                   |
| Commissures fused, thickened calcified and rolled PML, rupture chordae, ? Vegetations                                                  | Yes         | No  | No  | No  | No  | No | No | MVR#25CHVP                                           | 25           | LA PLICATION,TV ANNULOPLAST | 36                   | 47 36/47             | 25           | 1 12/4    | 12               | 4           | <5      | NO MR | No                                  |                      | 2 AR1+, TR1+, PR1+         |             | 1            | 1  | 1  | No    |                                                     | No   | 999                           |
| thickened AND FIBROTIC, INCOMPETENT, VERY LARGE LA                                                                                     | No          | No  | No  | No  | No  | No | No | MVR#27chvp + LA PLICATION + TV ANNUOPLASTY ( DEVEGA) | 27           | Y                           | 67                   | 50 67/50             | 27           | 1 23/9    | 23               | 9           | 5 to 10 | NO MR | No                                  |                      | 2 AR2+, TR3 +, RVSP-35+RA  |             | 3            | 2  | 2  | 35+RA | ON MEDICAL FOLLOW UP                                | No   | 999                           |
| Commissures fused, thickened calcified leaflets and chordae,LA large,                                                                  | Yes         | Yes | Yes | No  | Yes | No | No | MVR#27chvp                                           | 27           |                             | 53                   | 47 53/47             | 27           | 1 8/3     | 8                | 3           | <5      | 1+    | No                                  |                      | 2 AR1+,TR2+                |             | 2            | 1  | 2  | No    |                                                     | No   | 999                           |
| Commissures fused, thickened calcified leaflets and chordae,LVH, Commissures fused, thickened calcified leaflets and chordae,LA large, | Yes         | Yes | Yes | Yes | No  | No | No | MVR# 27 CHVP +LAA LIGATION, PPI ON 03/06/2010        | 27           | LAA LIGATION,PPI            | 51                   | 42 51/42             | 27           | 1 10/3    | 10               | 3           | <5      | No    | No                                  |                      | 2 AR1+, TR1+, PR1+         |             | 1            | 1  | 1  | No    |                                                     | No   | 999                           |
|                                                                                                                                        | Yes         | Yes | Yes | No  | Yes | No | No | MVR# 25 CHVP + PPMLP                                 | 25           | PPMLP                       | 46                   | 55 46/55             | 25           | 1 13/6    | 13               | 6           | 5 to 10 | MR 1+ | No                                  |                      | 2 TR1+, RVSP- 28+RA        |             | 1            | 2  | 2  | 28+RA |                                                     | No   | 999                           |
| mv sev stenosis, leaflet thickened, sev SVP, organised la clot                                                                         | No          | Yes | No  | No  | No  | No | No | MVR#29CHVP+LA CLOT REMOVAL                           | 29           | LA CLOT REMOVAL             | 40                   | 48 40/48             | 29           | 1 10/5    | 10               | 5           | 5 to 10 | No    | No                                  |                      | 2 NO                       |             | 2            | 2  | 2  | No    |                                                     | No   | 999                           |
| NO CALCIFIED LEAFLETSN PLIABLE VEGETATIONS ON AML AND PML, NO LEAFLET PERFORATION                                                      | No          | No  | No  | No  | No  | No | No | MVR#29CHVP                                           | 29           |                             | 50                   | 48 50/48             | 29           | 1 11/4    | 11               | 4           | <5      | No    | No                                  |                      | 2 NO                       |             | 2            | 2  | 2  | No    |                                                     | No   | 999                           |

| Intra-op findings                                                                                                                      | COMMISSURES | LEAFLETS | CHORDAE | LVH | LA | Aml | PML | Surgery                                       | Size of CHVP | additional procedure | Post-op ECHO LA size | Post-op ECHO LV size | Post-op ECHO | CHVP size | Leaflet movement | PV GRADIENT | V48 | V49 | FLOW VELOCITY &lt; 5 to 10, &gt; 10 | Regurgitation if any | Thrombus/vegetation | LV function              | Other Valves | TR | AR | PR | RVSP  | REDO                  | Complications |
|----------------------------------------------------------------------------------------------------------------------------------------|-------------|----------|---------|-----|----|-----|-----|-----------------------------------------------|--------------|----------------------|----------------------|----------------------|--------------|-----------|------------------|-------------|-----|-----|-------------------------------------|----------------------|---------------------|--------------------------|--------------|----|----|----|-------|-----------------------|---------------|
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, PML PLASTERED TO LV, LA CLOT                            | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP+LA CLOT REMOAL                     | 29           | LA CLOT REMOVAL      | 50                   | 49                   | 50/49        | 29        | 1                | 12/4        | 12  | 4   | <5                                  | 1+                   | No                  | 2 NO                     |              | 2  | 2  | 2  | No    | No                    | 999           |
| Commissures fused, thickened calcified, MOD SVP, TEAR AT PM COMMISSURE                                                                 | No          | No       | No      | No  | No | No  | No  | MVR#27CHVP                                    | 27           |                      | 34                   | 40                   | 34/40        | 27        | 1                | 13/4        | 13  | 4   | <5                                  | 1+                   | No                  | 2 TR1+                   |              | 1  | 2  | 2  | No    | No                    | 999           |
| LEAFLETS THICKENED, SEV SVP, COMMISSURES FUSED                                                                                         | No          | No       | No      | No  | No | No  | No  | MVR#27CHVP                                    | 27           |                      | 50                   | 42                   | 50/42        | 27        | 1                | 12/3        | 12  | 3   | <5                                  | No                   | No                  | 2 NO                     |              | 2  | 2  | 2  | No    | No                    | 999           |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, DILATED TV                                              | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP+TV ANNULOPLASTY(DEVEGA)            | 29           | TV ANNULOPLAST Y     | 45                   | 40                   | 45/40        | 29        | 1                | 11/3        | 11  | 3   | <5                                  | No                   | No                  | 2 NO                     |              | 2  | 2  | 2  | No    | No                    | 999           |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, DILATED TV ANNULUS, MILD PE                                         | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP+TV ANNULOPLASTY(DEVEGA)            | 29           | TV ANNULOPLAST Y     | 41                   | 40                   | 41/40        | 29        | 1                | 14/4        | 14  | 4   | <5                                  | No                   | No                  | 2 NO                     |              | 2  | 2  | 2  | No    | No                    | 999           |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, DILATED TV                                              | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP+TV ANNULOPLASTY(DEVEGA)            | 29           | TV ANNULOPLAST Y     | 45                   | 40                   | 45/40        | 29        | 1                | 11/3        | 11  | 3   | <5                                  | No                   | No                  | 2 NO                     |              | 2  | 2  | 2  | No    | No                    | 999           |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, CHORDAL ENTRAPMENT CAUSING TR                           | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP + RV ENDOCARDECTOMY                | 29           | RV ENDOCARDECT OMY   | 52                   | 43                   | 52/43        | 29        | 1                | 14/4        | 14  | 4   | <5                                  | No                   | No                  | 2 TR3+,PR1-2+            |              | 3  | 2  | 2  | No    | No                    | 999           |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA ENLARGED, ANNULAR CALCIFICATION                                  | No          | No       | No      | No  | No | No  | No  | MVR#25 CHVP                                   | 25           |                      | 34                   | 42                   | 34/42        | 25        | 1                | 16/8        | 16  | 8   | 5 to 10                             | 2+, pvl              | No                  | 2 TR1+AR1+               |              | 1  | 1  | 2  | No    | REDO MVR WITH 25 CHVP | Yes 999       |
| Commissures fused, thickened calcified leaflets and chordae,LA large,                                                                  | No          | No       | No      | No  | No | No  | No  | MVR#27chvp                                    | 27           |                      | 53                   | 47                   | 53/47        | 27        | 1                | 8/3         | 8   | 3   | <5                                  | 1+                   | No                  | 2 AR1+,TR2+              |              | 1  | 1  | 2  | No    | No                    | 999           |
| Commissures fused, thickened calcified leaflets and chordae,LVH, Commissures fused, thickened calcified leaflets and chordae,LA large, | No          | No       | No      | No  | No | No  | No  | MVR# 27 CHVP +LAA LIGATION, PPI ON 03/06/2010 | 27           | LAA LIGATION         | 58                   | 43                   | 58/43        | 27        | 1                | 6/3         | 6   | 3   | <5                                  | No                   | No                  | 2 AR1+                   |              | 2  | 1  | 2  | No    | No                    | 999           |
|                                                                                                                                        | No          | No       | No      | No  | No | No  | No  | MVR# 25 CHVP + PPMLP                          | 25           | PPMLP                | 46                   | 55                   | 46/55        | 25        | 1                | 13/6        | 13  | 6   | 5 to 10                             | MR 1+                | No                  | 2 TR1+, RVSP- 28+RA      |              | 1  | 2  | 2  | 28+RA | No                    | 999           |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA ENLARGED                                                         | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP                                    | 29           |                      | 35                   | 42                   | 35/42        | 29        | 1                | 6/2         | 6   | 2   | <5                                  | No                   | No                  | 1 TR1+, AR1+, RVSP-26+RA |              | 1  | 1  | 2  | 26+RA | No                    | 999           |
| RA/RV elarged, Miimal calcification of cusp, Sev SVP                                                                                   | No          | No       | No      | No  | No | No  | No  | MVR 29CHVP+ LAAE+ PPI                         | 29           | LAAE,PPI             | 49                   | 50                   | 49/50        | 29        | 1                | 12/5        | 12  | 5   | 5 to 10                             | 1-2+                 | No                  | 2 AR1+, TR1+, PR1+       |              | 1  | 1  | 1  | No    | No                    | 999           |



| Intra-op findings                                                                                                                      | COMMISSURES | LEAFLETS | CHORDAE | LVH | LA | Aml | PML | Surgery                                       | Size of CHVP          | additional procedure | Post-op ECHO LA size | Post-op ECHO LV size | Post-op ECHO | CHVP size | Leaflet movement | PV GRADIENT | V48 | V49     | FLOW VELOCITY &lt; 5, 5 to 10, &gt; 10 | Regurgitation if any | Thrombus/vegetation      | LV function | Other Valves | TR | AR | PR | RVSP  | REDO                          | Complications |     |
|----------------------------------------------------------------------------------------------------------------------------------------|-------------|----------|---------|-----|----|-----|-----|-----------------------------------------------|-----------------------|----------------------|----------------------|----------------------|--------------|-----------|------------------|-------------|-----|---------|----------------------------------------|----------------------|--------------------------|-------------|--------------|----|----|----|-------|-------------------------------|---------------|-----|
| Commissures fused, thickened calcified leaflets and chordae,LA large, sev SVP, Fixed orifice MR                                        | No          | No       | No      | No  | No | No  | No  | MVR #27CHVP+ DC OS ASD                        | 27 DC OS ASD          |                      | 52                   | 58 52/58             |              | 27        | 1 10/4           | 10          | 4   | <5      | 1+                                     | No                   | 2 TR2+,AR1+              |             |              | 2  | 1  | 2  | No    | No                            | 999           |     |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA                                                          | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP+LAAE                               | 29                    |                      | 48                   | 47 48/47             |              | 29        | 1 10/4           | 10          | 4   | <5      | 1+                                     | No                   | 2 TR2+, AR1+             |             |              | 2  | 1  | 2  | No    | No                            | 999           |     |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, PML PLASTERED TO LV                                     | No          | No       | No      | No  | No | No  | No  | MVR #25CHVP                                   | 25                    |                      | 32                   | 40 32/40             |              | 25        | 1 15/8           | 15          | 8   | 5 to 10 | No                                     | No                   | 2 TR1-2+ RVSP 20+RA      |             |              | 2  | 2  | 2  | 20+RA | No                            | 999           |     |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, LV APEX CALCIFIED                                       | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP + LV ENDOCARDECTOMY                | LV ENDOCARDECT 29 OMY |                      | 44                   | 55 44/55             |              | 29        | 1 10/9           | 10          | 9   | 5 to 10 | 1+                                     | No                   | 2 TR 1+                  |             |              | 1  | 2  | 2  | No    | No                            | 999           |     |
| Commissures fused, thickened calcified, MOD SVP                                                                                        | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP                                    | 29                    |                      | 38                   | 51 38/51             |              | 29        | 1 21/1           | 21          | 1   | <5      | 2+                                     | No                   | 2 TR3+, AR 2-3+          |             |              | 3  | 3  | 2  | No    | No                            | 999           |     |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA ENLARGED                                                         | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP                                    | 29                    |                      | 35                   | 42 35/42             |              | 29        | 1 6/2            | 6           | 2   | <5      | No                                     | No                   | 1 TR1+, AR1+, RVSP-26+RA |             |              | 1  | 1  | 2  | 26+RA | No                            | 999           |     |
| Commissures fused, thickened calcified leaflets and chordae,LVH, Commissures fused, thickened calcified leaflets and chordae,LA large, | No          | No       | No      | No  | No | No  | No  | MVR# 27 CHVP +LAA LIGATION, PPI ON 03/06/2010 | LAA LIGATION,PPI 27   |                      | 62                   | 46 62/46             |              | 27        | 1 8/4            | 8           | 4   | <5      | No                                     | No                   | 2 TR1+,AR1+              |             |              | 1  | 1  | 2  | No    | No                            | 999           |     |
|                                                                                                                                        | No          | No       | No      | No  | No | No  | No  | MVR# 25 CHVP + PPMLP                          | 25 PPMLP              |                      | 46                   | 55 46/55             |              | 25        | 1 13/6           | 13          | 6   | 5 to 10 | MR 1+                                  | No                   | 2 TR1+, RVSP- 28+RA      |             |              | 1  | 2  | 2  | 28+RA | No                            | 999           |     |
| mv sev stenosis, leaflet thickened, sev SVP, organised la clot                                                                         | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP+LA CLOT REMOVAL                    | LA CLOT REMOVAL 29    |                      | 40                   | 48 40/48             |              | 29        | 1 10/5           | 10          | 5   | 5 to 10 | No                                     | No                   | 2 NO                     |             |              | 2  | 2  | 2  | No    | No                            | 999           |     |
| NO CALCIFIED LEAFLETSN PLIABLE VEGETATIONS ON AML AND PML, NO LEAFLET PERFORATION                                                      | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP                                    | 29                    |                      | 50                   | 48 50/48             |              | 29        | 1 11/4           | 11          | 4   | <5      | No                                     | No                   | 2 NO                     |             |              | 2  | 2  | 2  | No    | No                            | 999           |     |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, DILATED TV                                              | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP + RV ENDOCARDECTOMY                | RV ENDOCARDECT 29 OMY |                      | 52                   | 43 52/43             |              | 29        | 1 14/4           | 14          | 4   | <5      | 1+ pvl                                 | No                   | 2 TR3+,PR1-2+            |             |              | 3  | 2  | 2  | No    | TEE DONE CONFIRMED NO PV LEAK | No            | 999 |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA ENLARGED, ANNULAR CALCIFICATION                                  | No          | No       | No      | No  | No | No  | No  | MVR#25 CHVP                                   | 25                    |                      | 34                   | 42 34/42             |              | 25        | 1 16/8           | 16          | 8   | 5 to 10 | 2+                                     | No                   | 2 TR1+AR1+               |             |              | 1  | 1  | 2  | No    | No                            | 999           |     |
| Commissures fused, thickened calcified leaflets and chordae,LA large,                                                                  | No          | No       | No      | No  | No | No  | No  | MVR#27chvp                                    | 27                    |                      | 53                   | 47 53/47             |              | 27        | 1 8/3            | 8           | 3   | <5      | 1+                                     | No                   | 2 AR1+,TR2+              |             |              | 2  | 1  | 2  | No    | No                            | 999           |     |
| Commissures fused, thickened calcified leaflets and chordae,LVH,                                                                       | No          | No       | No      | No  | No | No  | No  | MVR# 27 CHVP +LAA LIGATION,                   | 27 LAA LIGATION       |                      | 59                   | 42 59/42             |              | 27        | 1 9/4            | 9           | 4   | <5      | No                                     | No                   | 2 TR1+, AR1+,            |             |              | 1  | 1  | 2  | No    | No                            | 999           |     |

| Intra-op findings                                                                                                                                                                                                                       | COMMISSURES | LEAFLETS | CHORDAE | LVH | LA | Aml | PML | Surgery                                                          | Size of CHVP          | additional procedure | Post-op ECHO LA size | Post-op ECHO LV size | Post-op ECHO | CHVP size | Leaflet movement | PV GRADIENT | V48 | V49     | FLOW VELOCITY &lt; 5, 5 to 10, &gt; 10 | Regurgitation if any | Thrombus/vegetation | LV function              | Other Valves | TR | AR | PR | RVSP  | REDO | Complications                                             |     |             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------|---------|-----|----|-----|-----|------------------------------------------------------------------|-----------------------|----------------------|----------------------|----------------------|--------------|-----------|------------------|-------------|-----|---------|----------------------------------------|----------------------|---------------------|--------------------------|--------------|----|----|----|-------|------|-----------------------------------------------------------|-----|-------------|
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA                                                                                                                                                           | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP+LAAE                                                  | 29 LAAE               |                      | 48                   | 47 48/47             |              | 29        | 1 10/4           | 10          | 4   | <5      | 1+                                     | No                   |                     | 2 TR2+, AR1+             |              | 2  | 1  | 2  | No    |      | No                                                        | 999 |             |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, PML PLASTERED TO LV                                                                                                                                      | No          | No       | No      | No  | No | No  | No  | MVR #25CHVP                                                      | 25                    |                      | 32                   | 40 32/40             |              | 25        | 1 15/8           | 15          | 8   | 5 to 10 | No                                     | No                   |                     | 2 TR1-2+ RVSP 20+RA      |              | 2  | 2  | 2  | 20+RA |      | No                                                        | 999 |             |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, LV APEX CALCIFIED                                                                                                                                        | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP + LV ENDOCARDECTOMY                                   | LV ENDOCARDECT 29 OMY |                      | 44                   | 55 44/55             |              | 29        | 1 10/9           | 10          | 9   | 5 to 10 | 1+                                     | No                   |                     | 2 TR 1+                  |              | 1  | 2  | 2  | No    |      | No                                                        | 999 |             |
| Commissures fused, thickened calcified, MOD SVP                                                                                                                                                                                         | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP                                                       | 29                    |                      | 38                   | 51 38/51             |              | 29        | 1 21/1           | 21          | 1   | <5      | 2+                                     | No                   |                     | 2 TR3+, AR 2-3+          |              | 3  | 3  | 2  | No    |      | STUCK VALVE IN 2019, RED MVR DONE WITH 30 SJM IN FEB 2019 | Yes | Stuck Valve |
| Commissures fused, thickened calcified leaflets and chordae, LVH, Commissures fused, thickened calcified leaflets and chordae, LA large, Commissures fused, thickened calcified leaflets and chordae, LA large, sev SVP, Fixed stenosis | No          | No       | No      | No  | No | No  | No  | MVR# 27 CHVP +LAA LIGATION, PPI ON 23/06/2014                    | LAA 27 LIGATION,PPI   |                      | 62                   | 47 62/47             |              | 27        | 1 12/6           | 12          | 6   | 5 to 10 | No                                     | No                   |                     | 2 AR1+                   |              | 1  | 2  | 2  | No    |      | No                                                        | 999 |             |
|                                                                                                                                                                                                                                         | No          | No       | No      | No  | No | No  | No  | MVR# 25 CHVP + PPMLP                                             | 25 PPMLP              |                      | 46                   | 55 46/55             |              | 25        | 1 13/6           | 13          | 6   | 5 to 10 | MR 1+                                  | No                   |                     | 2 TR1+, RVSP- 28+RA      |              | 1  | 2  | 2  | 28+RA |      | No                                                        | 999 |             |
|                                                                                                                                                                                                                                         | No          | No       | No      | No  | No | No  | No  | MVR# 27 CHVP                                                     | 27                    |                      | 42                   | 46 42/46             |              | 27        | 1 12/5           | 12          | 5   | 5 to 10 | MR1+                                   | No                   |                     | 2 AR1+,TR1+              |              | 1  | 1  | 2  | No    |      | No                                                        | 999 |             |
| Myxamatus MV, restricted PML, AML prolapse, A2-A3 chordae rupture                                                                                                                                                                       | No          | No       | No      | No  | No | No  | No  | MVR# 29 CHVP + PMLP                                              | 29 PMLP               |                      | 46                   | 58 46/58             |              | 29        | 1 8/5            | 8           | 5   | 5 to 10 | MR1-2+                                 | No                   |                     | 3 TR1+, AR1+, RVSP-26+RA |              | 1  | 1  | 2  | 26+RA |      | No                                                        | 999 |             |
| Commissures fused, thickened calcified leaflets and chordae, LA large, dilated TV                                                                                                                                                       | No          | No       | No      | No  | No | No  | No  | MVR# 27 CHVP + ring annuloplasty of TV ( # 28 carpentier edwards | RING 27 ANNULPLASTY   |                      | 57                   | 58 57/58             |              | 25        | 1 24/1           | 24          | 1   | <5      | No                                     | No                   |                     | 2 TR2-3+, RVSP-37+RA     |              | 3  | 2  | 2  | 37+RA |      | No                                                        | 999 |             |
| Commissures fused, thickened calcified leaflets and chordae, LVH, fixed onfise MR, Mod SVP                                                                                                                                              | No          | No       | No      | No  | No | No  | No  | MVR #27 CHVP                                                     | 27                    |                      | 35                   | 50 35/50             |              | 27        | 1 10/5           | 10          | 5   | 5 to 10 | No                                     | No                   |                     | 2 AR 2-3+                |              | 2  | 3  | 2  | No    |      | No                                                        | 999 |             |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA                                                                                                                                                           | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP+LAAE                                                  | 29 LAAE               |                      | 48                   | 47 48/47             |              | 29        | 1 10/4           | 10          | 4   | <5      | 1+                                     | No                   |                     | 2 TR2+, AR1+             |              | 2  | 1  | 2  | No    |      | No                                                        | 999 |             |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, PML PLASTERED TO LV                                                                                                                                      | No          | No       | No      | No  | No | No  | No  | MVR #25CHVP                                                      | 25                    |                      | 32                   | 40 32/40             |              | 25        | 1 15/8           | 15          | 8   | 5 to 10 | No                                     | No                   |                     | 2 TR1-2+ RVSP 20+RA      |              | 2  | 2  | 2  | 20+RA |      | No                                                        | 999 |             |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, LV APEX CALCIFIED                                                                                                                                        | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP + LV ENDOCARDECTOMY                                   | LV ENDOCARDECT 29 OMY |                      | 44                   | 55 44/55             |              | 29        | 1 10/9           | 10          | 9   | 5 to 10 | 1+                                     | No                   |                     | 2 TR 1+                  |              | 1  | 2  | 2  | No    |      | No                                                        | 999 |             |
| Commissures fused, thickened calcified, MOD SVP                                                                                                                                                                                         | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP                                                       | 29                    |                      | 38                   | 51 38/51             |              | 29        | 1 21/1           | 21          | 1   | <5      | 2+                                     | No                   |                     | 2 TR3+, AR 2-3+          |              | 3  | 3  | 2  | No    |      | No                                                        | 999 |             |

| Intra-op findings                                                                                            | COMMISSURES | LEAFLETS | CHORDAE | LVH | LA | Aml | PML | Surgery                            | Size of CHVP    | additional procedure | Post-op ECHO LA size | Post-op ECHO LV size | Post-op ECHO | CHVP size | Leaflet movement | PV GRADIENT | V48 | V49     | FLOW VELOCITY &lt; 5, 5 to 10, &gt; 10 | Regurgitation if any | Thrombus/vegetation      | LV function | Other Valves | TR | AR      | PR                         | RVSP | REDO | Complications |
|--------------------------------------------------------------------------------------------------------------|-------------|----------|---------|-----|----|-----|-----|------------------------------------|-----------------|----------------------|----------------------|----------------------|--------------|-----------|------------------|-------------|-----|---------|----------------------------------------|----------------------|--------------------------|-------------|--------------|----|---------|----------------------------|------|------|---------------|
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA ENLARGED                               | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP                         | 29              |                      | 35                   | 42 35/42             |              | 29        | 1 6/2            | 6           | 2   | <5      | No                                     | No                   | 1 TR1+, AR1+, RVSP-26+RA |             | 1            | 1  | 2 26+RA |                            | No   | 999  |               |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA ENLARGED, TV MILD THICKENING           | No          | No       | No      | No  | No | No  | No  | MVR#27CHVP                         | 27              |                      | 51                   | 50 51/50             |              | 27        | 1 20/6           | 20          | 6   | 5 to 10 | No                                     | No                   | 2 NO                     |             | 2            | 2  | 2 No    |                            | No   | 999  |               |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, ANNULR CLCIFICATION, THICKENED AND FUSD CHODAE   | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP                         | 29              |                      | 44                   | 59 44/59             |              | 29        | 1 9/3            | 9           | 3   | <5      | 1+                                     | No                   | 2 TR1+                   |             | 1            | 2  | 2 No    |                            | No   | 999  |               |
| Commissures fused, thickened calcified, MOD SVP, TEAR AT PM COMMISSURE                                       | No          | No       | No      | No  | No | No  | No  | MVR#27CHVP                         | 27              |                      | 34                   | 40 34/40             |              | 27        | 1 13/4           | 13          | 4   | <5      | 1+                                     | No                   | 2 TR1+                   |             | 1            | 2  | 2 No    |                            | No   | 999  |               |
| LEAFLETS THICKENED, SEV SVP, COMMISSURES FUSED                                                               | No          | No       | No      | No  | No | No  | No  | MVR#27CHVP                         | 27              |                      | 50                   | 42 50/42             |              | 27        | 1 12/3           | 12          | 3   | <5      | No                                     | No                   | 2 NO                     |             | 2            | 2  | 2 No    |                            | No   | 999  |               |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, DILATED TV                    | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP+TV ANNULOPLASTY(DEVEGA) | 29 Y            | TV ANNULOPLAST       | 45                   | 40 45/40             |              | 29        | 1 11/3           | 11          | 3   | <5      | No                                     | No                   | 2 NO                     |             | 2            | 2  | 2 No    |                            | No   | 999  |               |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, DILATED TV ANNULUS, MILD PE               | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP+TV ANNULOPLASTY(DEVEGA) | 29 Y            | TV ANNULOPLAST       | 41                   | 40 41/40             |              | 29        | 1 14/4           | 14          | 4   | <5      | No                                     | No                   | 2 NO                     |             | 2            | 2  | 2 No    |                            | No   | 999  |               |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, DILATED TV                    | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP+TV ANNULOPLASTY(DEVEGA) | 29 Y            | TV ANNULOPLAST       | 45                   | 40 45/40             |              | 29        | 1 11/3           | 11          | 3   | <5      | No                                     | No                   | 2 NO                     |             | 2            | 2  | 2 No    |                            | No   | 999  |               |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, CHORDAL ENTRAPMENT CAUSING TR | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP + RV ENDOCARDECTOMY     | 29 OMY          | RV ENDOCARDECT       | 52                   | 43 52/43             |              | 29        | 1 14/4           | 14          | 4   | <5      | 2-3+ pv                                | No                   | 2 TR3+,PR1-2+            |             | 3            | 2  | 2 No    | TEE DONE SHOWED NO PV LEAK | No   | 999  |               |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA ENLARGED, ANNULAR CALCIFICATION        | No          | No       | No      | No  | No | No  | No  | MVR#25 CHVP                        | 25              |                      | 34                   | 42 34/42             |              | 25        | 1 16/8           | 16          | 8   | 5 to 10 | 2+                                     | No                   | 2 TR1+AR1+               |             | 1            | 1  | 2 No    |                            | No   | 999  |               |
| Commissures fused, thickened calcified leaflets and chordae,LA large,                                        | No          | No       | No      | No  | No | No  | No  | MVR#27chvp                         | 27              |                      | 53                   | 47 53/47             |              | 27        | 1 8/3            | 8           | 3   | <5      | 1+                                     | No                   | 2 AR1+,TR2+              |             | 2            | 1  | 2 No    |                            | No   | 999  |               |
| Commissures fused, thickened calcified leaflets and chordae,LVH,                                             | No          | No       | No      | No  | No | No  | No  | MVR# 25 CHVP +LAA LIGATION,        | 25 LAA LIGATION |                      | 58                   | 41 58/41             |              | 25        | 1 10/5           | 10          | 5   | 5 to 10 | No                                     | No                   | 2 TR1+                   |             | 1            | 2  | 2 No    |                            | No   | 999  |               |

| Intra-op findings                                                                                            | COMMISSURES |    |    |    |    |    |    | Surgery                        | Size of CHVP | additional procedure | Post-op ECHO LA size | Post-op ECHO LV size | Post-op ECHO | CHVP size | Leaflet movement | PV GRADIENT | V48 | V49     | FLOW VELOCITY &lt;= 5 to10, &gt; 10 | Regurgitation if any | Thrombus/vegetation | LV function              | Other Valves | TR | AR | PR      | RVSP                                                        | REDO | Complications |
|--------------------------------------------------------------------------------------------------------------|-------------|----|----|----|----|----|----|--------------------------------|--------------|----------------------|----------------------|----------------------|--------------|-----------|------------------|-------------|-----|---------|-------------------------------------|----------------------|---------------------|--------------------------|--------------|----|----|---------|-------------------------------------------------------------|------|---------------|
|                                                                                                              |             |    |    |    |    |    |    |                                |              |                      |                      |                      |              |           |                  |             |     |         |                                     |                      |                     |                          |              |    |    |         |                                                             |      |               |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, PML PLASTERED TO LV           | No          | No | No | No | No | No | No | MVR #25CHVP                    | 25           |                      | 32                   | 40 32/40             |              | 25        | 1 15/8           | 15          | 8   | 5 to 10 | No                                  | No                   |                     | 2 TR1-2+ RVSP 20+RA      |              | 2  | 2  | 2 20+RA |                                                             | No   | 999           |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, LV APEX CALCIFIED             | No          | No | No | No | No | No | No | MVR#29CHVP + LV ENDOCARDECTOMY | 29           | LV ENDOCARDECT OMY   | 44                   | 55 44/55             |              | 29        | 1 10/9           | 10          | 9   | 5 to 10 | 1+                                  | No                   |                     | 2 TR 1+                  |              | 1  | 2  | 2 No    |                                                             | No   | 999           |
| Commissures fused, thickened calcified, MOD SVP                                                              | No          | No | No | No | No | No | No | MVR#29CHVP                     | 29           |                      | 38                   | 51 38/51             |              | 29        | 1 21/1           | 21          | 1   | <5      | 2+                                  | No                   |                     | 2 TR3+, AR 2-3+          |              | 3  | 3  | 2 No    | STUCK VALVE IN 2017, REDO MVR DONE WITH 27 CHVP ON AUG 2017 | Yes  | Stuck Valve   |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA ENLARGED                               | No          | No | No | No | No | No | No | MVR#29CHVP                     | 29           |                      | 35                   | 42 35/42             |              | 29        | 1 6/2            | 6           | 2   | <5      | No                                  | No                   |                     | 1 TR1+, AR1+, RVSP-26+RA |              | 1  | 1  | 2 26+RA |                                                             | No   | 999           |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA ENLARGED, TV MILD THICKENING           | No          | No | No | No | No | No | No | MVR#27CHVP                     | 27           |                      | 51                   | 50 51/50             |              | 27        | 1 20/6           | 20          | 6   | 5 to 10 | No                                  | No                   |                     | 2 NO                     |              | 2  | 2  | 2 No    |                                                             | No   | 999           |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, ANNULR CLCIFICATION, THICKENED AND FUSD CHODAE   | No          | No | No | No | No | No | No | MVR#29CHVP                     | 29           |                      | 44                   | 59 44/59             |              | 29        | 1 9/3            | 9           | 3   | <5      | 1+                                  | No                   |                     | 2 TR1+                   |              | 1  | 2  | 2 No    |                                                             | No   | 999           |
| NO CALCIFIED LEAFLETSN PLIABLE VEGETATIONS ON AML AND PML, NO LEAFLET PERFORATION                            | No          | No | No | No | No | No | No | MVR#29CHVP                     | 29           |                      | 50                   | 48 50/48             |              | 29        | 1 11/4           | 11          | 4   | <5      | No                                  | No                   |                     | 2 NO                     |              | 2  | 2  | 2 No    |                                                             | No   | 999           |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, CHORDAL ENTRAPMENT CAUSING TR | No          | No | No | No | No | No | No | MVR#29CHVP + RV ENDOCARDECTOMY | 29           | RV ENDOCARDECT OMY   | 52                   | 43 52/43             |              | 29        | 1 14/4           | 14          | 4   | <5      | 2-3+ pv                             | No                   |                     | 2 TR3+,PR1-2+            |              | 3  | 2  | 2 No    | TEE DONE SHOWED NO PV LEAK                                  | No   | 999           |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA ENLARGED, ANNULAR CALCIFICATION        | No          | No | No | No | No | No | No | MVR#25 CHVP                    | 25           |                      | 34                   | 42 34/42             |              | 25        | 1 16/8           | 16          | 8   | 5 to 10 | 2+                                  | No                   |                     | 2 TR1+AR1+               |              | 1  | 1  | 2 No    |                                                             | No   | 999           |
| Commissures fused, thickened calcified leaflets and chordae,LA large,                                        | No          | No | No | No | No | No | No | MVR#27chvp                     | 27           |                      | 53                   | 47 53/47             |              | 27        | 1 8/3            | 8           | 3   | <5      | 1+                                  | No                   |                     | 2 AR1+,TR2+              |              | 2  | 1  | 2 No    |                                                             | No   | 999           |
| Commissures fused, thickened calcified leaflets and chordae,LVH,                                             | No          | No | No | No | No | No | No | MVR# 27 CHVP                   | 27           |                      | 48                   | 50 48/50             |              | 27        | 1 12/7           | 12          | 7   | 5 to 10 | No                                  | No                   |                     | 2 TR1+                   |              | 1  | 2  | 2 No    |                                                             | No   | 999           |

| Intra-op findings                                                                                  | COMMISSURES | LEAFLETS | CHORDAE | LVH | LA | Aml | PML | Surgery                                                          | Size of CHVP          | additional procedure | Post-op ECHO LA size | Post-op ECHO LV size | Post-op ECHO | CHVP size | Leaflet movement | PV GRADIENT | V48 | V49     | FLOW VELOCITY &lt;= 5, 5 to 10, &gt; 10 | Regurgitation if any | Thrombus/vegetation | LV function              | Other Valves | TR | AR | PR | RVSP  | REDO                                                       | Complications |             |
|----------------------------------------------------------------------------------------------------|-------------|----------|---------|-----|----|-----|-----|------------------------------------------------------------------|-----------------------|----------------------|----------------------|----------------------|--------------|-----------|------------------|-------------|-----|---------|-----------------------------------------|----------------------|---------------------|--------------------------|--------------|----|----|----|-------|------------------------------------------------------------|---------------|-------------|
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA                      | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP+LAAE                                                  | 29 LAAE               |                      | 48                   | 47 48/47             |              | 29        | 1 10/4           | 10          | 4   | <5      | 1+                                      | No                   |                     | 2 TR2+, AR1+             |              | 2  | 1  | 2  | No    | No                                                         | 999           |             |
| Myxomatous MV, restricted PML, AML prolapse,A2-A3 chordae rupture                                  | No          | No       | No      | No  | No | No  | No  | MVR# 29 CHVP + PMLP                                              | 29 PMLP               |                      | 46                   | 58 46/58             |              | 29        | 1 8/5            | 8           | 5   | 5 to 10 | MR1-2+                                  | No                   |                     | 3 TR1+, AR1+, RVSP-26+RA |              | 1  | 1  | 2  | 26+RA | No                                                         | 999           |             |
| Commissures fused, thickened calcified leaflets and chordae,LA large, dilated TV                   | No          | No       | No      | No  | No | No  | No  | MVR# 27 CHVP + ring annuloplasty of TV ( # 28 carpentier edwards | RING 27 ANNULPLASTY   |                      | 57                   | 58 57/58             |              | 25        | 1 24/1           | 24          | 1   | <5      | No                                      | No                   |                     | 2 TR2-3+, RVSP-37+RA     |              | 3  | 2  | 2  | 37+RA | No                                                         | 999           |             |
| Commissures fused, thickened calcified leaflets and chordae,LVH, fixed orifise MR, Mod SVP         | No          | No       | No      | No  | No | No  | No  | MVR #27 CHVP                                                     | 27                    |                      | 35                   | 50 35/50             |              | 27        | 1 10/5           | 10          | 5   | 5 to 10 | No                                      | No                   |                     | 2 AR 2-3+                |              | 2  | 3  | 2  | No    | No                                                         | 999           |             |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA                      | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP+LAAE                                                  | 29                    |                      | 48                   | 47 48/47             |              | 29        | 1 10/4           | 10          | 4   | <5      | 1+                                      | No                   |                     | 2 TR2+, AR1+             |              | 2  | 1  | 2  | No    | No                                                         | 999           |             |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, PML PLASTERED TO LV | No          | No       | No      | No  | No | No  | No  | MVR #25CHVP                                                      | 25                    |                      | 32                   | 40 32/40             |              | 25        | 1 15/8           | 15          | 8   | 5 to 10 | No                                      | No                   |                     | 2 TR1-2+ RVSP 20+RA      |              | 2  | 2  | 2  | 20+RA | No                                                         | 999           |             |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, LV APEX CALCIFIED   | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP + LV ENDOCARDECTOMY                                   | LV ENDOCARDECT 29 OMY |                      | 44                   | 55 44/55             |              | 29        | 1 10/9           | 10          | 9   | 5 to 10 | 1+                                      | No                   |                     | 2 TR 1+                  |              | 1  | 2  | 2  | No    | No                                                         | 999           |             |
| Commissures fused, thickened calcified, MOD SVP                                                    | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP                                                       | 29                    |                      | 38                   | 51 38/51             |              | 29        | 1 21/1           | 21          | 1   | <5      | 2+                                      | No                   |                     | 2 TR3+, AR 2-3+          |              | 3  | 3  | 2  | No    | STUCK VALVE IN 2019, RED MVR DONE WITH 25CHVP ON JUNE 2019 | Yes           | Stuck Valve |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA ENLARGED                     | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP                                                       | 29                    |                      | 35                   | 42 35/42             |              | 29        | 1 6/2            | 6           | 2   | <5      | No                                      | No                   |                     | 1 TR1+, AR1+, RVSP-26+RA |              | 1  | 1  | 2  | 26+RA | No                                                         | 999           |             |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA ENLARGED, TV MILD THICKENING | No          | No       | No      | No  | No | No  | No  | MVR#27CHVP                                                       | 27                    |                      | 51                   | 50 51/50             |              | 27        | 1 20/6           | 20          | 6   | 5 to 10 | No                                      | No                   |                     | 2 NO                     |              | 2  | 2  | 2  | No    | No                                                         | 999           |             |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, PML PLASTERED TO LV | No          | No       | No      | No  | No | No  | No  | MVR #25CHVP                                                      | 25                    |                      | 32                   | 40 32/40             |              | 25        | 1 15/8           | 15          | 8   | 5 to 10 | No                                      | No                   |                     | 2 TR1-2+ RVSP 20+RA      |              | 2  | 2  | 2  | 20+RA | No                                                         | 999           |             |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, SEV SVP, LARGE LA, LV APEX CALCIFIED   | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP + LV ENDOCARDECTOMY                                   | LV ENDOCARDECT 29 OMY |                      | 44                   | 55 44/55             |              | 29        | 1 10/9           | 10          | 9   | 5 to 10 | 1+                                      | No                   |                     | 2 TR 1+                  |              | 2  | 2  | 2  | No    | No                                                         | 999           |             |

| Intra-op findings                                                                                          | COMMISSURES | LEAFLETS | CHORDAE | LVH | LA | Aml | PML | Surgery                | Size of CHVP | additional procedure | Post-op ECHO LA size | Post-op ECHO LV size | Post-op ECHO | CHVP size | Leaflet movement | PV GRADIENT | V48     | V49  | FLOW VELOCITY &lt;= 5, 5 to10, &gt; 10 | Regurgitation if any | Thrombus/vegetation      | LV function | Other Valves | TR | AR | PR    | RVSP                                                       | REDO | Complications |
|------------------------------------------------------------------------------------------------------------|-------------|----------|---------|-----|----|-----|-----|------------------------|--------------|----------------------|----------------------|----------------------|--------------|-----------|------------------|-------------|---------|------|----------------------------------------|----------------------|--------------------------|-------------|--------------|----|----|-------|------------------------------------------------------------|------|---------------|
| Commissures fused, thickened calcified, MOD SVP                                                            | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP             | 29           |                      | 38                   | 51 38/51             | 29           | 1 21/1    | 21               | 1           | <5      | 2+   | No                                     | No                   | 2 TR3+, AR 2-3+          |             | 3            | 3  | 2  | No    | STUCK VALVE IN 2018, REDO MVR DONE WITH 27CHVP ON APR 2018 | Yes  | Stuck Valve   |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA ENLARGED                             | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP             | 29           |                      | 35                   | 42 35/42             | 29           | 1 6/2     | 6                | 2           | <5      | No   | No                                     | No                   | 1 TR1+, AR1+, RVSP-26+RA |             | 1            | 1  | 2  | 26+RA |                                                            | No   | 999           |
| AML, PML GROSSLY THICKENE AND FIBROSED, COMISURAL FUSION, SEV SVP, LA ENLARGED, TV MILD THICKENING         | No          | No       | No      | No  | No | No  | No  | MVR#27CHVP             | 27           |                      | 51                   | 50 51/50             | 27           | 1 20/6    | 20               | 6           | 5 to 10 | No   | No                                     | No                   | 2 NO                     |             | 2            | 2  | 2  | No    |                                                            | No   | 999           |
| AML, PML GROSSLY THICKENED AND FIBROSED, COMISSURAL FUSION, ANNULR CLCIFICATION, THICKENED AND FUSD CHODAE | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP             | 29           |                      | 44                   | 59 44/59             | 29           | 1 9/3     | 9                | 3           | <5      | 1+   | No                                     | No                   | 2 TR1+                   |             | 2            | 1  | 2  | No    |                                                            | No   | 999           |
| NO CALCIFIED LEAFLETSN PLIABLE VEGETATIONS ON AML AND PML, NO LEAFLET PERFORATION                          | No          | No       | No      | No  | No | No  | No  | MVR#29CHVP             | 29           |                      | 50                   | 48 50/48             | 29           | 1 11/4    | 11               | 4           | <5      | No   | No                                     | No                   | 2 NO                     |             | 2            | 2  | 2  | No    |                                                            | No   | 999           |
| Stenotic thickened valve ith calcified AML, PML, irregular tear in AML, SEV SVP                            | No          | No       | No      | No  | No | No  | No  | MVR#27chvp             | 27           |                      | 54                   | 44 54/44             | 27           | 1 11/6    | 11               | 6           | 5 to 10 | No   | No                                     | No                   | 2 TR4+                   |             | 4            | 2  | 2  | No    | REDO with TV repair (4/2018)                               | Yes  | 999           |
| RA/RV elarged, Miimal calcification of cusp, Sev SVP                                                       | No          | No       | No      | No  | No | No  | No  | MVR 29CHVP+ LAAE+ PPI  | 29           | LAAE PPI             | 49                   | 50 49/50             | 29           | 1 12/5    | 12               | 5           | 5 to 10 | 1-2+ | No                                     | No                   | 2 AR1+, TR1+, PR1+       |             | 1            | 1  | 1  | No    |                                                            | No   | 999           |
| Commissures fused, thickened calcified leaflets and chordae,LA large, sev SVP, Fixed orifise MR            | No          | No       | No      | No  | No | No  | No  | MVR #27CHVP+ DC OS ASD | 27           | DC OS ASD            | 52                   | 58 52/58             | 27           | 1 10/4    | 10               | 4           | <5      | 1+   | No                                     | No                   | 2 TR2+,AR1+              |             | 1            | 1  | 2  | No    |                                                            | No   | 999           |

## ANNEXURE



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