UNIVERSITAS GADJAH MADA
DIAGNOSTIC ACCURACY OF P-WAVE AREA IN ASSESSMENT OF LEFT ATRIAL SIZE IN MITRAL STENOSIS PATIENT IN DR.SARDJITO GENERAL HOSPITAL
LALITA DYANI T M, dr. Real Kusumanjaya Marsam, Sp.JP, FIHA, M.Kes & dr. Hasanah Mumpuni, Sp.PD, Sp.J
Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

TABLE OF CONTENTS

Cover Page ..... i
Approval Page ..... ii
Authenticity Statement ..... iii
Preface ..... iv
List of Tables ..... viii
List of Figures ..... ix
List of Appendices ..... x
List of Abrreviations ..... xi
Abstract ..... xiii
Intisari ..... xix

**CHAPTER 1 INTRODUCTION**

A. Background ..... 1
B. Problem Formulation ..... 4
C. Research Question ..... 4
D. Objectives ..... 4
E. Research Authenticity ..... 5
F. Study Benefits ..... 6

**CHAPTER II BIBLIOGRAPHICAL REVIEW**

A. Literature review ..... 7
A.1. Mitral Stenosis ..... 7
A.1.a. Epidemiology and Etiology of Mitral Stenosis ..... 7
A.1.b. Pathophysiology of Mitral Stenosis ..... 7
A.1.c. Physical Finding of Mitral Stenosis ..... 10
A.1.d. Diagnosis of Mitral Stenosis ..... 11
A.1.e. Treatment of Mitral Stenosis ..... 13
A.2. Left Atrial ..... 15
A.2.a Anatomy of the Heart ..... 15
A.2.b. Left Atrial Function and Normal Range ..... 16
A.2.c. Determinants of LAVI ..... 17

UNIVERSITAS GADJAH MADA
DIAGNOSTIC ACCURACY OF P-WAVE AREA IN ASSESSMENT OF LEFT ATRIAL SIZE IN MITRAL STENOSIS PATIENT IN DR.SARDJITO GENERAL HOSPITAL
LALITA DYANI T M, dr. Real Kusumanjaya Marsam, Sp.JP, FIHA, M.Kes & dr. Hasanah Mumpuni, Sp.PD, Sp.J
Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

A.2.d. Diagnosing LAVI increase ..... 21
A.3. P-wave Area ..... 22
A.3.a. P wave reflection in the Measurements of Left Atrium ..... 22
A.3.b. P wave changes in Electrocardiography ..... 23
A.4. Diagnostic Accuracy ..... 26
B. Basic Theory ..... 26
C. Theoretical Framework ..... 28
D. Conceptual Framework ..... 29
E. Hypothesis ..... 29

**CHAPTER III METHODOLOGY**

A. Type and Study Design ..... 30
B. Time and Study Settings ..... 30
C. Study Subjects ..... 30
D. Sample Size ..... 31
E. Study Instruments ..... 32
F. Study Plan ..... 32
G. Research Variable ..... 33
H. Operational Definiton ..... 33
I. Study Schedule ..... 38
J. Statistical Analysis ..... 38
K. Ethical Consideration ..... 39

**CHAPTER IV RESULT AND DISCUSSION**

A. Result ..... 40
B. Discussion ..... 45
C. Research Limitation ..... 50

**CHAPTER V CONCLUSION AND SUGGESTION**

A. Conclusion ..... 52
B. Suggestion ..... 52

**REFERENCES** ..... 53

**APPENDICES** ..... 61

UNIVERSITAS
GADJAH MADA
**DIAGNOSTIC ACCURACY OF P-WAVE AREA IN ASSESSMENT OF LEFT ATRIAL SIZE IN MITRAL STENOSIS PATIENT IN DR.SARDJITO GENERAL HOSPITAL**
LALITA DYANI T M, dr. Real Kusumanjaya Marsam, Sp.JP, FIHA, M.Kes & dr. Hasanah Mumpuni, Sp.PD, Sp.J
**Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/**

# LIST OF TABLE

Table 1. Research Authenticity.....5

Table 2. Anatomical characteristics of the different etiological types of mitral stenosis. .....12

Table 3. Grading of mitral valve characteristics from the echocardiographic examination according to Wilkins (Boston) score .....15

Table 4. Study Schedule.....38

Table 5. Analysis for Contingency Table .....39

Table 6. Baseline Characteristics of Mitral Stenosis Patient .....40

Table 7. Contingency Table for Chi square of P-wave area to LAVI .....43

Table 8. Comparison subject characteristics between no increase of p wave area (≤ 7.9 ms.mV) and increase of p-wave area (>7.9 ms.mV) .....44

Table 9. Multivariate regression analysis based on chi-square test result ..... 44

UNIVERSITAS
GADJAH MADA
DIAGNOSTIC ACCURACY OF P-WAVE AREA IN ASSESSMENT OF LEFT ATRIAL SIZE IN MITRAL STENOSIS PATIENT IN
DR.SARDJITO GENERAL HOSPITAL
LALITA DYANI T M, dr. Real Kusumanjaya Marsam, Sp.JP, FIHA, M.Kes & dr. Hasanah Mumpuni, Sp.PD, Sp.J
Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

# LIST OF FIGURE

Figure 1. Theoretical Framework.....28
Figure 2. Conceptual Framework.....29
Figure 3. Measurement of P wave area performed in the ECG .....36
Figure 4. Receiver Operating Characteristics Curve of P-wave Area .....41

UNIVERSITAS
GADJAH MADA
**DIAGNOSTIC ACCURACY OF P-WAVE AREA IN ASSESSMENT OF LEFT ATRIAL SIZE IN MITRAL STENOSIS PATIENT IN DR.SARDJITO GENERAL HOSPITAL**
LALITA DYANI T M, dr. Real Kusumanjaya Marsam, Sp.JP, FIHA, M.Kes & dr. Hasanah Mumpuni, Sp.PD, Sp.J
**Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/**

# LIST OF APPENDICES

Appendix 1. Ethical Clearance Approval.....61

Appendix 2. Statement Letter for Ethical Clearance Approval from the Principal Investigator .....62

Appendix 3. Statement Letter for Ethical Clearance Approval from the Paper Advisor .....63

UNIVERSITAS
GADJAH MADA
DIAGNOSTIC ACCURACY OF P-WAVE AREA IN ASSESSMENT OF LEFT ATRIAL SIZE IN MITRAL STENOSIS PATIENT IN
DR.SARDJITO GENERAL HOSPITAL
LALITA DYANI T M, dr. Real Kusumanjaya Marsam, Sp.JP, FIHA, M.Kes & dr. Hasanah Mumpuni, Sp.PD, Sp.J
Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

# LIST OF ABBREVIATION

| Abbreviation | Full Citation |
|---|---|
| 2D | 2 Dimension |
| AS | Aortic Stenosis |
| ASD | Atrial Septal Defect |
| AUC | Area Under the Curve |
| CD4+ | Cluster of Differentiaion 4 |
| CHD | Coronary Heart Disease |
| COPD | Chronic Obstructive Pulmonary Disease |
| ECG | Electrocardiography |
| eGFR | Estimated Glomerular Filtration Rate |
| FN | False Negative |
| FP | False Positive |
| LA | Left Atrial |
| LAE | Left Atrial Enlargement |
| LAVI | Left Atrial Volume Index |
| LV | Left Ventricle |
| mmHg | Milimetre of Mercury |
| mm.mV | Milimetre miliVoltage |
| mm/s | Milimetre per second |
| MS | Mitral Stenosis |
| MV | Mitral Valve |
| MVD | Mitral Valve Disease |
| NPV | Negative Predictive Value |
| NSTEMI | Non ST Elevation Myocardial Infarct |
| NYHA | New York Heart Association |
| PBMV | Percutaneous Balloon Mitral Valvuloplasty |

UNIVERSITAS
GADJAH MADA
**DIAGNOSTIC ACCURACY OF P-WAVE AREA IN ASSESSMENT OF LEFT ATRIAL SIZE IN MITRAL STENOSIS PATIENT IN DR.SARDJITO GENERAL HOSPITAL**
LALITA DYANI T M, dr. Real Kusumanjaya Marsam, Sp.JP, FIHA, M.Kes & dr. Hasanah Mumpuni, Sp.PD, Sp.J
**Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/**

| | |
|---|---|
| PDA | Patent Ductus Arteriosus |
| PPV | Positive Predictive Value |
| RHD | Rheumatic Heart Disease |
| RMVD | Rheumatic Mitral Valve Disease |
| ROC | Receiver Operating Characteristics |
| STEMI | ST Elevation Myocardial Infarct |
| TN | True Negative |
| TP | True Positive |
| TTE | Trans Thoracal Echocardiography |
| VSD | Ventricular Septal Defect |
| WS | Wilkins Score |