

A STUDY OF INCIDENCE AND RISK FACTORS FOR NEW ONSET POSTOPERATIVE ATRIAL FIBRILLATION AMONG ADULT PATIENTS UNDERGOING ELECTIVE CORONARY ARTERY BYPASS GRAFTING SURGERY

*Thesis submitted for partial fulfillment for the requirement of the
degree of DM (Cardiothoracic and Vascular Anaesthesia)*



By

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DECLARATION

I, Dr. Devarakonda Bhargava Venkata, hereby declare that the project in this book titled "A STUDY OF INCIDENCE AND RISK FACTORS FOR NEW ONSET POSTOPERATIVE ATRIAL FIBRILLATION AMONG ADULT PATIENTS UNDERGOING ELECTIVE CORONARY ARTERY BYPASS GRAFTING SURGERY" was undertaken by me under the supervision and guidance of Dr. Rupa Sreedhar, Senior Professor, Division of Cardiothoracic & Vascular Anaesthesiology, Department of Anaesthesiology, Dr. Shrinivas V. Gadhinglajkar, Professor, Division of Cardiothoracic & Vascular Anaesthesiology, Department of Anaesthesiology, Department of Anaesthesiology and Dr. Jayakumar, Senior Professor, Department of Cardiothoracic and Vascular Surgery, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum, India.

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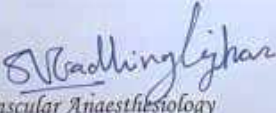
CERTIFICATE

This is to certify that this project entitled "A STUDY OF INCIDENCE AND RISK FACTORS FOR NEW ONSET POSTOPERATIVE ATRIAL FIBRILLATION AMONG ADULT PATIENTS UNDERGOING ELECTIVE CORONARY ARTERY BYPASS GRAFTING SURGERY", has been prepared by Dr. Devarakonda Venkata Bhargava, a D.M Cardiothoracic and Vascular Anaesthesiology resident and has been done under my direct guidance and supervision at Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum. He has shown keen interest in preparing this project.

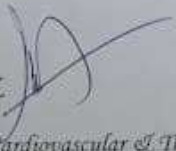
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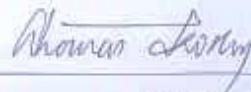
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Dr Devarakonda Bhargava V

ABBREVIATIONS

Abbreviation	Expansion
AF	Atrial fibrillation
CABG	coronary artery bypass grafting
CHA ₂ DS ₂ VASc	Congestive Heart failure, hypertension, Age Vascular disease, Age 65–74, and Sex (female) ≥75 (doubled), Diabetes, Stroke (doubled), Vascular disease, Age 65-74, Sex (Female)
CPB	cardiopulmonary bypass
CPG	Clinical practice guideline
fQRS	Fragmented QRS
hs-CRP	high sensitivity C-reactive protein
IABP	Intra-aortic balloon pump counterpulsation
LAVI	Left atrial volume indexed to body surface area
LOE	Level of evidence
poAF	Postoperative atrial fibrillation
PLAX	Parasternal long-axis view on TTE
NAC	N-acetyl cysteine
NLR	Neutrophil-lymphocyte ratio
OPCABG	Off-pump CABG
OR	odds ratio
OSA	obstructive sleep apnoea
POD	Postoperative day (usually followed by the number) e.g., POD 4
RCA	Right coronary artery
95% CI	95% confidence interval
TTE	Transthoracic echocardiography



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A STUDY OF INCIDENCE AND RISK FACTORS FOR NEW ONSET POSTOPERATIVE ATRIAL FIBRILLATION AMONG ADULT PATIENTS UNDERGOING ELECTIVE CORONARY ARTERY BYPASS GRAFTING SURGERY

Abstract

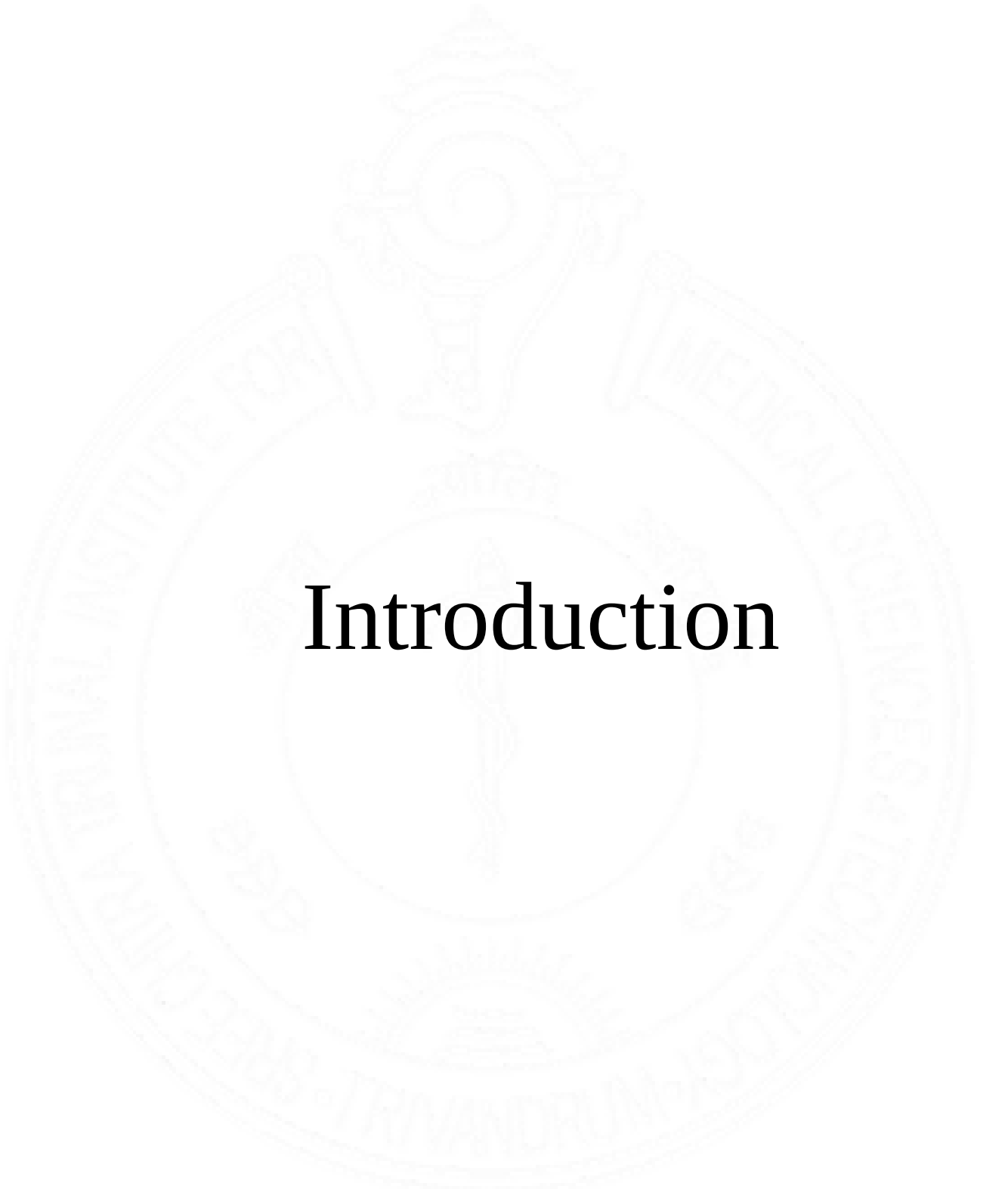
Background: Atrial fibrillation is a common complication after cardiac surgery. The incidence varies between 20 to 60% and it varies between different populations. The various factors associated with its incidence after isolated coronary artery bypass grafting surgery, prophylactic measures, and guidelines for management are available. However, with advances in anaesthetic and surgical techniques, the incidence continues to remain the same. Most studies were retrospective in nature. We performed this study to determine the incidence of atrial fibrillation after isolated coronary artery bypass grafting surgery, to determine the various risk factors associated and its effect on various postoperative patient-related outcomes.

Material & Methods: Study design & setting: Prospective observation study from January to November 2019 at a tertiary care university level teaching hospital. No interventions were planned. Study population: Adults undergoing elective isolated CABG without any other additional procedure. Data of 30 preoperative, intraoperative, and postoperative risk factors along with 5 outcome measures. Another 10 parameters related to each episode of atrial fibrillation were collected. Statistical analysis was performed using R version 3.6.3.

Results: A total of 465 patients were included in the final analysis. The incidence of postoperative atrial fibrillation after isolated coronary artery bypass grafting was 15.6%. The first episode occurred after a median duration of 42 hours of ICU admission, most commonly on the second postoperative day, commonly during ICU stay, without needing reintubation and successfully treated with a bolus followed by infusion of Amiodarone. Recurrence after first successful therapy was noted in 37% of the patients which was successfully treated with Amiodarone infusion. Oral Amiodarone at hospital discharge was needed for 94.4% of the patients who developed atrial fibrillation postoperatively. Advanced age, Diabetes, NYHA

class, lower eGFR, higher CHA2DS2-VASc score, LA size by 2D TTE, RCA occlusion > 90%, prolonged aortic cross-clamp time and delayed reintroduction of beta-blocker therapy in the postoperative period were associated with postoperative atrial fibrillation. The optimum cut-off of CHA2DS2-VASc score for prediction of postoperative atrial fibrillation after coronary artery bypass grafting surgery was 3 (AUC ROC 0.67). Patients who developed postoperative atrial fibrillation had prolonged ICU and hospital stay, higher peak postoperative serum creatinine levels, and need for tracheostomy.

Conclusion. After isolated coronary artery bypass grafting, 15.6% of the patients developed Atrial fibrillation occurs in. Various factors associated with poAF were determined along with its effect on postoperative outcomes. A cut-off score of 3 using CHA2DS2-VASc score was found optimal for predicting postoperative atrial fibrillation. Development of postoperative atrial fibrillation was associated with prolonged ICU and hospital stay, higher peak postoperative serum creatinine levels and need for tracheostomy during the postoperative period.



Introduction

Introduction

Atrial fibrillation is the most common complication after cardiac surgery that accounts for high rates of morbidity and mortality (1). Postoperative atrial fibrillation (poAF) is defined by the Society of Thoracic Surgeons database as new-onset atrial fibrillation / atrial flutter requiring treatment(2). The incidence of atrial fibrillation is still common with studies reporting an incidence between 20% and 40% following coronary artery bypass grafting procedures (CABG) (3)(4)(5)(6). The incidence of poAF is higher following valvular or combined valvular procedures with CABG (3). Postoperative atrial arrhythmias increase the length of hospital stay and readmissions after 'fast track' cardiac surgery (1)(7). Various risk factors have been studied and scoring systems have been proposed for predicting postoperative atrial fibrillation (8)(9)(10)(11).

The incidence of poAF varies depending on the type of surgery (CABG or valve surgery), patient ethnicity, and underlying patient comorbidities(12). A large number of studies and reviews have been conducted to estimate the incidence of new-onset atrial fibrillation and associated risk factors among patients undergoing coronary artery bypass grafting. A large multicentric study involving more than 5000 patients was reported in 2004 (8). Most studies, after this landmark study involving patients after cardiac surgery, have evaluated single predictive factor, after adjusting other risk factors by multiple regression analysis (13)(14)(15)(16)(17)(18)(19)(20)(21). Prospective studies incorporating these factors are limited(22). Besides, there is evolving evidence in favor of certain pharmacologic interventions like a short course of perioperative Ranolazine, short-acting beta-blocker like Landiolol, N-acetyl cysteine (NAC) or vitamin C supplementation(19)(23). The role of renal dysfunction as an additive to the CHA₂DS₂-VASc score for prediction of poAF has been reported(15). Besides, indications for coronary revascularization by CABG, surgical techniques and anesthetic techniques have evolved. A recent meta-analysis that analyzed the long-term

survival of patients with poAF after CABG has found a significantly higher risk of short-term and long-term mortality when compared to those who do not develop poAF after CABG(24). Hence, there is a need for active surveillance and treatment for poAF after CABG.

Various advances in cardiac surgical techniques and evidence-based guidelines have not been able to accomplish a reduction in the incidence of atrial fibrillation after CABG (5)(25). Despite differences in defining poAF after isolated CABG(2), the overall risk-adjusted incidence is 33.1%. The first episode of poAF usually occurs during the first 2 – 6 days after surgery(1). These episodes of poAF are likely to last over 12 hours and commonly complicate the course of hospital stay after surgery, thereby increasing morbidity, mortality, and hospital costs(24).

Various scoring systems and predictive models have been proposed for poAF risk stratification. POAF score(26), Atrial fibrillation risk score(27) and CHA2DS2-VASc Score(28) have been validated externally and have been found to have the limited predictive ability(29). Renal dysfunction, along with diastolic dysfunction has been identified as a significant risk factor for poAF after cardiac surgery(15). These predictive scores provide the necessary perception to anticipate complications and stratify patients as per risk for poAF.

In addition to beta-blockers and amiodarone, various other pharmacological agents like statins, ranolazine, N-acetyl cysteine, colchicine, vitamin C, and steroids have been proposed as monotherapy as well as in combinations for prophylaxis against poAF (30). However, the evidence is not strong enough in favour of agents other than beta-blockers and amiodarone to recommend routine use during cardiac surgery(23). Perioperative prophylaxis with beta-blockers and amiodarone as monotherapy and in combination has been evaluated extensively and found to be effective. Beta-blockers and amiodarone were similar to each other in the prevention of poAF(31).

Atrial pacing, active clearance of chest drainage catheters(32), and posterior pericardiotomy(33)(34) have been studied and found to be effective for the prevention of poAF.

Management of poAF after cardiac surgery aims to maintain hemodynamic stability with control of symptoms, prevent thromboembolism, and recurrence(35). It pivots around cardioversion for hemodynamic instability, pharmacologic conversion to sinus rhythm when stable, and control of ventricular rate when necessary. In addition, the optimization of oxygenation, electrolyte levels, and fluid balance form the background for effective therapy and prevention of recurrence(35). These principles are supported by evidence-based guidelines(36)(37). The incidence of poAF can be significantly reduced by the implementation of simplified clinical practice guidelines as a quality improvement measure(38).

Notwithstanding the existing knowledge, an effective regimen for the prevention of poAF remains inconsistent(23). The presence of poAF after cardiac surgery, usually self-limiting, is not considered benign and is associated with the eventful postoperative course and long-term morbidity. These variations have been attributed to individual patient factors. Hence, there is a need to evolve tailor-made approaches and simplified clinical practices depending on the patient population in consideration.



Review of Literature

Review of Literature

Atrial fibrillation (AF) is a type of supraventricular arrhythmia characterised by uncoordinated atrial contraction leading to reduced atrial mechanical function (39). AF can be classified into paroxysmal, persistent, permanent and long-standing types(40)(41)(42). Fast AF is characterised by ventricular response rate more than 100 per minute(39). Postoperative atrial fibrillation is one of the most common complications encountered after adult cardiac surgery. The year-wise number of PubMed indexed publications corresponding with search query “postoperative atrial fibrillation after cardiac surgery” are depicted in figure 1. The number of PubMed indexed metanalyses in the last few years are shown in Figure 2.

Meta-analysis related to poAF

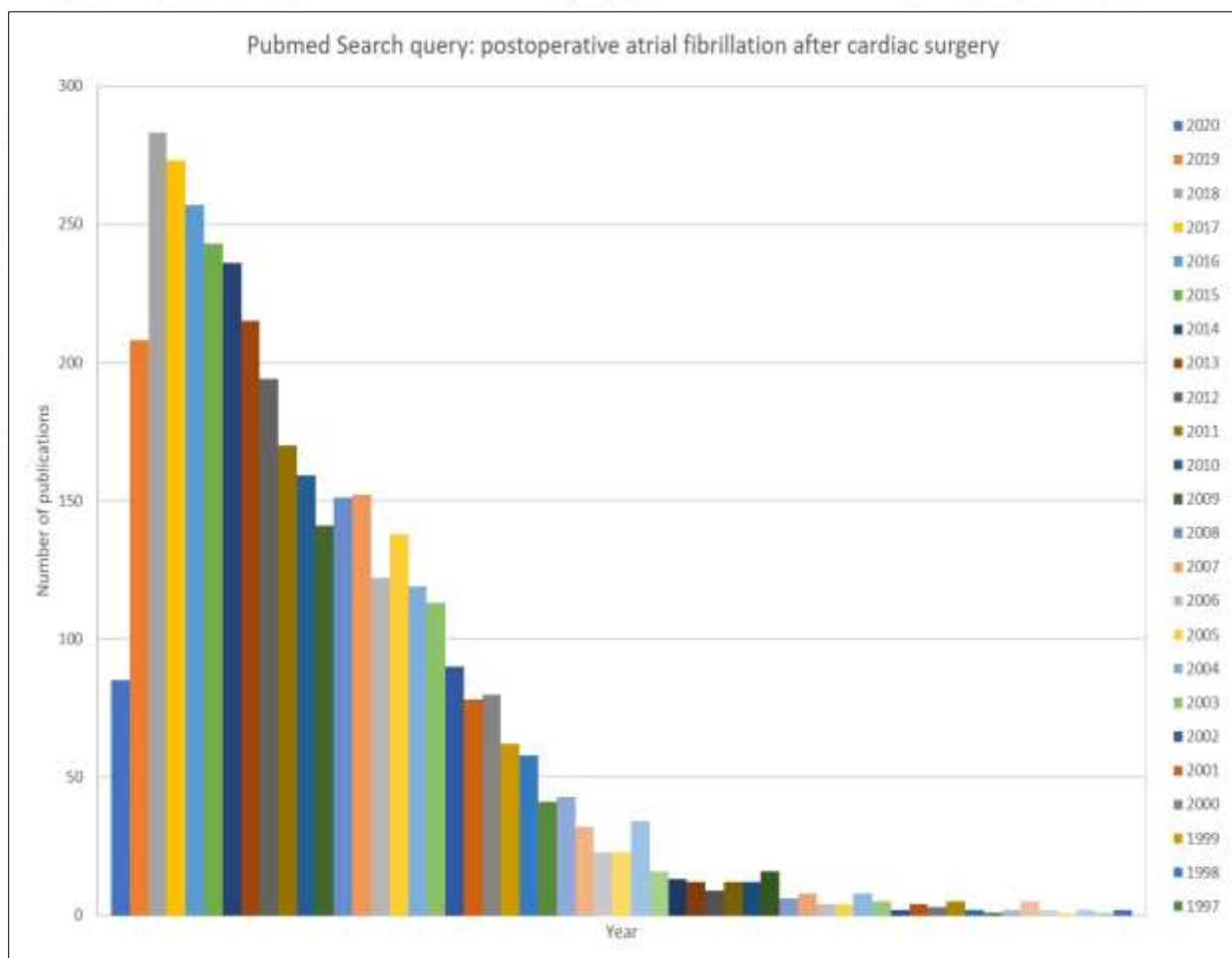
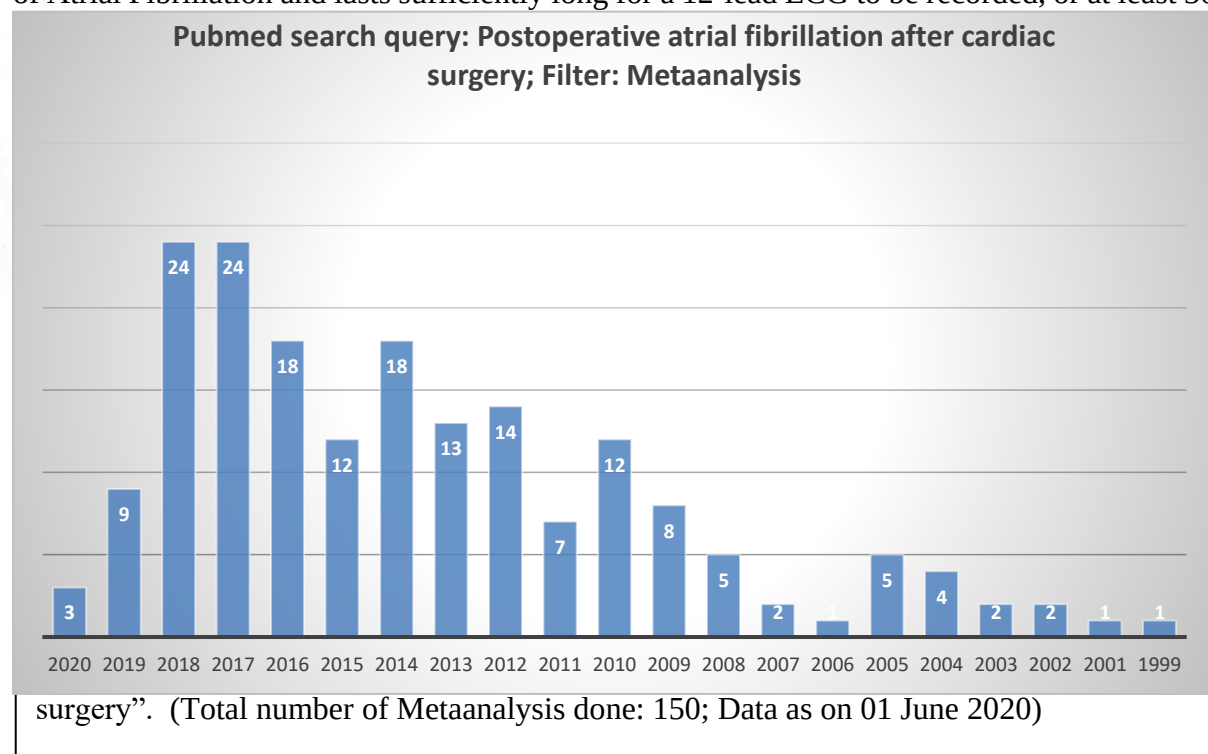


Figure 1. Pubmed search results for “postoperative atrial fibrillation after cardiac surgery”. (Total studies: 3553; Data as on 01 June 2020)

A large number of meta-analyses have been reported to understand the risk factors, newer medications, surgical techniques, preventive strategies and treatment modalities for poAF. The prominent meta-analyses include evaluation of CHA2DS2VASc score for prediction of poAF (10), effect of Ranolazine on prevention of poAF (43), Preop betablockers and new onset AF after cardiac surgery(44), comparison of Amiodarone with betablocker for prevention of poAF (31), effect of polyunsaturated fatty acids on incidence of poAF(45), effect of poAF on long-term mortality (24)(46), association between Vitamin C supplementation and poAF(47), effect of Magnesium supplementation on poAF(48), and Neutrophil Lymphocyte ratio (NLR ratio) for prediction of poAF (49),

Definition of postoperative atrial fibrillation.

Postoperative atrial fibrillation (poAF) has been defined by the Society of Thoracic surgeons (STS) database as any episode of atrial fibrillation/flutter requiring treatment(50). Similarly, Heart Rhythm Society defines it as “any arrhythmia that has the ECG characteristics of Atrial Fibrillation and lasts sufficiently long for a 12-lead ECG to be recorded, or at least 30



seconds on a rhythm strip”(51). The definition of Atrial fibrillation requiring treatment, as defined by STS database, underestimates the true incidence of atrial fibrillation and is likely to miss patients who might be at increased risk of 30-day mortality(2). Filardo G *et al* proposed another definition where the STS database definition requiring ‘atrial fibrillation requiring treatment’ as a precondition has been challenged. This definition includes any atrial fibrillation detected via continuous monitoring and documented by physician in a chart(2). The underestimation due to STS database definition may lead to increased early mortality among patients who would otherwise be classified as ‘no AF’ group. It is not known whether this increased risk of mortality due to atrial fibrillation not requiring treatment in the postoperative period is associated with adverse outcomes in long-term follow-up. The patients who were likely to be missed can be grouped into either self-terminating poAF, poAF with controlled rate or patients with contraindications to poAF treatment.

Epidemiology of poAF

Incidence of atrial fibrillation after cardiac surgery reported in published literature varies between 20% and 60%. This variation is reported to be due to the variety of cardiac surgeries included, history of pre-existing atrial fibrillation, ethnicity(9) and the definition used to identify atrial fibrillation in various studies(23)(52). In an analysis of Swedish population registry(53) consisting of 9,495 patients over a period between year 1994 and 2004, the postoperative atrial fibrillation occurring after CABG was lower (22.9%) than that occurring after valve surgery (39.8%) or after combined procedures (45.2%). The incidence of new onset atrial fibrillation after CABG after was 29.5% in a multicentric study from year 2002 to 2011 involving 11,239 patients from five centres by analysis of STS database (52). The incidence was found to be 33.1% when adjusted for STS mortality risk and time of surgery. The risk adjusted mean incidence of poAF did not change significantly during the study period reported.

The incidence of poAF in a retrospective study for analysing discharge prescription patterns in a cohort of 8,32,958 patients, from STS Adult Cardiac surgery database, without history of atrial fibrillation or stroke, who underwent first time isolated CABG for was 23.8% (54). The incidence in a retrospective study reported from Malaysia among 637 patients showed incidence of poAF to be of 28.7% after CABG. There was no difference in incidence of poAF between patients undergoing OPCABG (19.3%) versus CABG on-pump (18.3%) ($p=0.3$) (55). In an analysis of 2168 patients(9) who underwent isolated CABG or combined with valve surgery at Singapore's two national heart centres, the incidence of poAF was 17.3%. In another retrospective study(56) conducted among 163 patients in Pakistan, the incidence of poAF after isolated CABG was 25.8%. Incidence of atrial fibrillation after cardiac surgery under cardiopulmonary bypass in a study conducted among 150 Indian adults showed incidence of poAF was 40.7%(57). The median time to first episode of poAF after surgery was 52 hours in the multi-centric study by Filardo *et al* (52) whereas it developed at a mean time period of 45 hours after surgery in a study reported from Malaysia(58). The duration of time spent in first episode of atrial fibrillation after CABG varied between 4 to 7 hours (25)(59). Recurrence or prolongation of poAF was reported in 72.3% of total patients suffering poAF in a study of 290 consecutive patients undergoing CABG. Detection of poAF is commonest by continuous monitoring (telemetry) (76.8%), followed by 12-lead ECG (17.5%) and by physical examination (12.8%) in a multi-national study involving 4657 patients undergoing CABG studied at 70 centres located within 17 countries(8).

Effect of poAF on morbidity and mortality

Postoperative atrial fibrillation after cardiac surgery is consistently associated with increased risk of haemorrhage(54), stroke(60), infection (61), hospital readmission within 30 days(62), short-term and long-term mortality. In a meta-analysis of eleven studies by R Kaw *et al*(46)

involving 40,112 patients, new-onset atrial fibrillation after CABG is associated with higher odds of short-term mortality (OR (95% CI) 2.29 (1.74-3.01). Further, risk of death at 1 year and 4 years was higher (Risk of 2.56 and 2.19 respectively) among patients with poAF. Patients with poAF are at higher risk of death due to thromboembolism. In another analysis of Swedish registry of 9495 patients over 10 year time duration followed-up for median duration of 7.9 years, poAF occurring after CABG affected long term survival adversely than poAF occurring after valve surgery or combined procedures(53). Hence, the onset of poAF after CABG cannot be considered a benign self-limiting event with no prognostic importance(63). After adjusting baseline clinical differences, any recurrence of atrial fibrillation resulted in additional prolongation of 1.1 days to total length of hospital stay (59). In another study of 570 patients undergoing CABG, the adjusted length of hospital stay attributed to atrial fibrillation was 4.9 days(1).

Risk factors for poAF

The risk factors for poAF have been evaluated in a variety of cardiac surgery settings. The prominent factors associated with poAF have been depicted in Figure 3. Most of these factors have clear pathophysiological mechanism, thereby paving the way for interventions to reduce

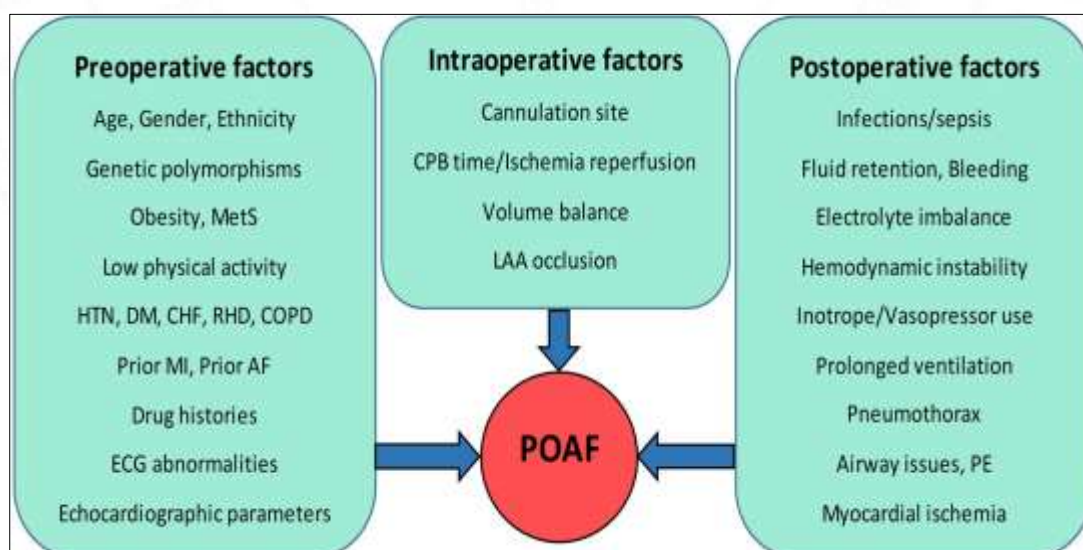


Figure3. Factors associated with poAF. (23)

its incidence. The perioperative factors associated with poAF have been depicted in the Figure 2. The interaction between the perioperative risk factors (Figure 2) and predisposing factors like inflammatory mediators, substrate in cardiac tissue for atrial fibrillation, oxidative stress, autonomic dysfunction and pre-existing atrial remodelling leads lead to initiation of POAF(23). In a study of 570 consecutive patients undergoing CABG(1), increasing age (age 70 to 80 years [OR=2;CI1.3-3], age >80 years [OR=3;CI 1.6-5.8), male gender (OR=1.7;CI 1.1-2.7), hypertension (OR=1.6;CI 1.0-2.3;), need for an intraoperative intra-aortic balloon pump (OR=3.5; CI 1.2-10.9), postoperative pneumonia (OR=3.9; CI 1.3 -11.5), ventilation for >24 hours (OR=2; CI 1.3-3.2), and return to the intensive care unit (OR=3.2; CI, 1.1-8.8) were associated with poAF.

- a) Advanced age: Aging is associated with atrial remodelling(64), increased susceptibility to reperfusion injury, atrial fibrosis leading to conduction abnormalities and oxidative stress(1). In a retrospective study(65) of 304 patients over the age of 60 years undergoing isolated on pump CABG, conducted at the National Centre of Gerontology, China, the incidence of poAF was 23.36%. As age advances, the odds of developing poAF after cardiac surgery increase (age 70 to 80 years [OR=2; CI1.3-3], age >80 years [OR=3;CI 1.6-5.8).
- b) Ethnicity: A retrospective study conducted at The National Heart Institute, Kuala Lumpur involving analysis of medical records of 637 patients, Malaya, Indian and Chinese ethnicity was compared to assess association with poAF. Indian ethnicity was found to be associated with lower incidence of poAF when compared to Chinese or malay ethnicity (9)(58). In a multinational study (8), the incidence of poAF was found to be lowest in South America (17.4%) and India (15.7%).
- c) Preoperative ECG: Features on routine preoperative ECG like Premature atrial contraction, p-wave index > 27msec and p-frontal axis greater than 55° were found to

be associated with higher incidence of poAF.(20). P-wave index (66), measured as standard deviation of mean P wave duration across all 12 leads in an ECG, is a measure of disorganised atrial activity. P wave amplitude of leads aVR and V1 along with more positive p-wave frontal axis was independently associated with poAF(20). Fragmented QRS (fQRS) has been reported to be associated with poAF (67) where fQRS is defined as the presence of RSR' pattern, additional R wave, notching of R or S waves, or more than one fragmentation in two contiguous leads. Presence of fQRS on admission ECG was found to be associated with higher odds (OR 2.801, 95% CI 1.262-6.211) of developing poAF. P wave duration was not significantly associated with poAF in another study of 77 patients(68).

- d) Echocardiographic features for prediction of poAF: Immediate preoperative transthoracic echocardiography was performed among 169 patients undergoing high risk cardiac surgery to assess association of echocardiographic characteristics with poAF(69). Of eleven parameters studied, higher left atrial volume indexed to body surface area (in ml/m²) (37.9±15.5 vs 28.6±12.31; p=0.0001) and diastolic dysfunction (p=0.0011) were found to be significantly associated with occurrence of poAF. However, in a study of 223 patients undergoing cardiac surgery(70), twelve echocardiographic parameters were analysed retrospectively using data collected prospectively. poAF was not found to be significantly associated with diastolic dysfunction in this study population.
- e) Renal dysfunction: poAF was significantly associated with impaired renal function. Mild impairments in renal function (eGFR 60–90 ml/min/1.73 m²) as well as severe impairment in renal function (eGFR < 60 ml/min/1.73 m²) were significantly associated with increased risk of poAF when compared to patients with normal renal function (eGFR > 90 ml/min/1.73 m²) undergoing cardiac surgery (17).

- f) Inflammation – Biomarkers have been studied as predictors for various complications related to cardiac surgical complications. BNP, CRP, IL-6, Serum Creatinine, PAI-1, sVCAM-1, sCD-40L, Aldosterone and Galectin-3 have been evaluated as biomarkers for prediction of poAF after cardiac surgery(71). NT-proBNP, which is formed along with BNP, as a result of breakdown of proBNP released from myocardial stretching, is a biomarker which has been studied for prediction of poAF. Preoperative NT-proBNP levels above 502 pg/mL are associated with higher risk of poAF(71). Elevated BNP levels are associated with higher hospitalisation for heart failure and adverse physical function. There is a variation among different studies along with large standard deviation in the dataset collected in all these studies. The optimum cut-off for predicting poAF has not been investigated. These factors limit the utility of these biomarkers in predicting poAF after cardiac surgery. After the initial acute postoperative period (beyond 3 weeks), certain plasma cytokines like MPO, PTX3, ADAM17, sST2, IL-25, IL-33, TNF alpha and IL-37 have been investigated to find a meaningful association with poAF. ADAM-17 and IL-25 have been always found to be lower in patients with poAF(71). Hence, these cytokines are found to be protective against poAF
- g) Epicardial adipose tissue: Epicardial adipose tissue fat was studied to assess the relation between total epicardial adipose tissue assessed by preoperative three dimensional computed tomography scan, and incidence of poAF(68) among 77 patients cardiac surgery in Japan. In this study, the ratio of left atrial epicardial adipose tissue to total epicardial adipose tissue was associated with poAF. The practical significance of this finding is debatable in view of the additional radiation exposure without any absolute benefit.
- h) Electrolytes – Magnesium is commonly used for prevention and treatment of arrhythmias after cardiac surgery. The blood levels of Magnesium and its

supplementation to prevent / treat postoperative arrhythmias has been a subject of interest. Low serum magnesium levels ($< 1.8\text{mg/dL}$) significantly increased the risk (2.66 times) of poAF (72). There is a diversity of dosages and timing of magnesium therapy for prevention of postoperative arrhythmias. A postoperative 3-day magnesium regimen consisting of 10 mmol (2.47g) of magnesium sulphate infused daily was found to significantly reduce the incidence of poAF(73). The reported doses and timing of magnesium dosage for prevention of poAF after CABG have been summarised by Kohno H and colleagues and they found that it varied between 0.08 mmol/kg before and after CPB to a total maximum dose of 110 mmol over a period of 80 hours after surgery(72). On the other side, magnesium Kaplan M and colleagues did not find a significant reduction in the incidence of poAF when magnesium was administered as an infusion of 3g (24.34mEq) in 100 ml over 2 hours preoperatively, perioperatively and on postoperative days 0, 1, 2 and 3. Klinger R et al (16) assessed the effect of intraoperative administration of magnesium, administered as 50mg/kg bolus after induction of anaesthesia followed by another 50mg/kg over next 3 hours, on the incidence of poAF after cardiac surgery. There was neither significant difference in the incidence of poAF (42.5% vs 37.9% $p=0.40$), the timing of onset of poAF when compared to placebo group (day 2 (2-3) vs day 2 (1-3)) or recurrence of atrial fibrillation (44.3% vs 40.3% $p=0.63$). A meta-analysis including 35 studies involving 6037 patients was published in 2007(48). The timing of magnesium therapy, mode of therapy (bolus vs infusion), its effect on various types of postoperative arrhythmias and adverse effects has been reported. Magnesium therapy administered in the postoperative period as bolus therapy, with doses upto 60 mmol over more than 24 hours, was associated with a reduced risk of poAF without any other adverse effects. However, the meta-analysis was limited by high probability of bias and clinical and

methodological heterogeneity in the included studies. Recently, Osawa E A et al (74) reported recently, in a matched case-control pilot study, that a continuous infusion of magnesium sulphate (loading dose of 10 mmol followed by 3 mmol/h infusion till intensive care unit discharge) reduced the incidence of poAF when compared to control group (40.4% vs 25.3%). The hazard ratio was significantly less in the magnesium supplementation group (hazard ratio 0.45, 95% CI 0.26-0.77; $p=0.004$) when compared to control group. Magnesium supplementation is beneficial even after congenital heart surgery for prevention of arrhythmias (75).

- i) Cardiopulmonary bypass time: The systemic inflammation response resulting from exposure to cardiopulmonary bypass (CPB) may increase the chances of poAF. In a study of 330 patients undergoing open heart surgery, Shahbazian et al (76) found no association between neither duration of CPB nor aortic cross clamp time and incidence of poAF. However, Zhang W et al (9) found that CPB duration > 120 minutes was significantly associated with poAF (OR 1.92, 95% CI 1.47-2.52 $p< 0.001$). The atrial fibrillation risk score system assigns 2 points (for duration of CPB > 120 min)(9).
- j) Obstructive sleep apnoea (OSA): Wong J K et al (14) retrospectively studied medical records of 545 patients undergoing cardiac surgery and found that OSA was associated with higher risk of poAF. However, the risk of poAF appeared to be less among patients using home positive airway pressure therapy (hazard ratio 0.63 (95% CI 0.35-1.15; $p=0.13$).
- k) Metabolic syndrome: Vural U and Aglar AA (61) recently investigated the association between metabolic syndrome, obesity and poAF. They found that metabolic syndrome and obesity were independent risk factors for poAF.

- l) Gene expression: Khan MS et al (77) have reviewed existing literature on gene expression related to poAF and foresee the vital role specific genomic markers for identifying patients likely to develop poAF after CABG.

Prediction models for poAF after CABG

poAF after cardiac surgery is multifactorial. Hence, prediction of poAF with the help of scoring systems has been proposed widely.

- a) POAF score: Marsicalco et al (26) retrieved perioperative data of 17,262 patients from 3 European university hospitals to derive and validate a simple bedside score for prediction of poAF (Table 1). The area under ROC curve for prediction of poAF in the validation cohort was 0.64.

Variable	Additive score points assigned
Age < 60 years	0
Age 60 to 69 years	1
Age 70 to 79 years	2
Age 80 years or more	3
COPD	1
eGFR <15 mL/min per 1.73 m ² or dialysis	1
Emergency	1
Preoperative IABP	1
LVEF < 30%	1
Valve surgery	1

Table 1. POAF Score (26)

- b) Atrial fibrillation risk score: El-Chami et al (27) evaluated a cohort of 18,517 patients undergoing isolated CABG to derive and validate a simple tool called the Atrial fibrillation risk index (Table 2) to predict poAF. The area under ROC curve for prediction of poAF was 0.64.

Variable	Males	Females
Age (years)	> 60 = 1 point	> 66 = 1 point
Weight (kg)	> 76 = 1 point	> 64 = 1 point
Height (cm)	> 176 = 1 point	> 168 = 1 point
Peripheral vascular disease	Present = 1 point	Present = 1 point

Table 2. Atrial fibrillation risk score (27)

- c) Clinical prediction rule for prediction of poAF after isolated CABG: Using clinical features and standard ECG criteria, Amar D et al (78) proposed a clinical prediction rule for predicting poAF after isolated CABG. Four factors (Age (1 point per year), p wave duration on ECG > 110ms (3 points), prior history of atrial fibrillation (12 points) and postoperative low cardiac output state (10 points)) were included in the score. The area under ROC curve for this clinical prediction rule for prediction of poAF was 0.69.
- d) CHA₂DS₂VASc Score: Lip GYH et al (28) first proposed the CHA₂DS₂VASc Score in 2010 as an improvement for the classic CHADS₂ score for stroke risk stratification in patients with atrial fibrillation. Kashani RG et al (13) used this score as a tool for prediction of poAF after cardiac surgery in 2385 patients. The mean CHA₂DS₂VASc score was significantly higher among patients who developed poAF after cardiac surgery (3.6 vs 2.8; $p < 0.0001$) when compared to patients who did not develop poAF. The risk of poAF was found to increase with rise in each point of CHA₂DS₂VASc Score. A meta-analysis by Yun-lin Chen et al, reported in 2020, including 12 studies involving 18,086 patients found that CHA₂DS₂VASc Score was an independent predictor of poAF after cardiac surgery(10). The area under ROC curve for this score for prediction of poAF after cardiac surgery was 0.76. The specificity and sensitivity of this score in in this meta-analysis was 0.70 and 0.72 respectively. CHA₂DS₂VASc Score has been evaluated for prediction of poAF in a cohort of 99 Indian patients undergoing isolated off-pump CABG (79). The mean preoperative CHA₂DS₂VASc

Score was higher among patients who developed poAF when compared to patients who did not develop poAF (3.6 vs 2.11; $p=0.0001$)(8). The area under ROC curve for CHA₂DS₂VASc score for prediction of poAF after isolated off-pump CABG was 0.82. The suggested cut-off was 3, with a sensitivity, specificity, positive predictive value and negative predictive value of 90%, 77%, 50% and 96.63% respectively.

- e) Multivariate analysis by S Perrier et al (11): The CHA₂DS₂VASc Score has also been prospectively evaluated as a part of multivariate analysis for prediction of poAF after CABG with other additional factors like BMI > 35kg/m², Beta blocker, antiplatelet therapy, renal insufficiency.
- f) Renal dysfunction as an addition to CHA₂DS₂VASc Score: SK Chua et al (15) proposed the R- CHA₂DS₂VASc Score as an improved new score for prediction of poAF after cardiac surgery. Renal dysfunction, defined as eGFR < 60ml/min/1.73 m², was assigned as an additional variable with one point assigned to it. The area under ROC curve for this score was 0.71.
- g) Multicentre risk index for atrial fibrillation after cardiac surgery: Mathew JP et al (8) performed a multicentric study at 70 centres in 17 countries involving 4657 patients to derive and validate a risk index for prediction of poAF after cardiac surgery. The score includes Age, Medical history of COPD and atrial fibrillation, concurrent valve surgery, details of therapy with beta-blockers, details of therapy with ACE inhibitors, postoperative potassium supplementation and postoperative NSAID therapy as the variables. Figure 3 shows the variables and the positive or negative scores assigned to each variable for arriving at the score and predicting risk of poAF. The area under ROC for this model for prediction of poAF was 0.77.

- h) Comparison of three scores for prediction of poAF: External validation of three scores proposed for prediction of poAF after cardiac surgery was conducted in a cohort of

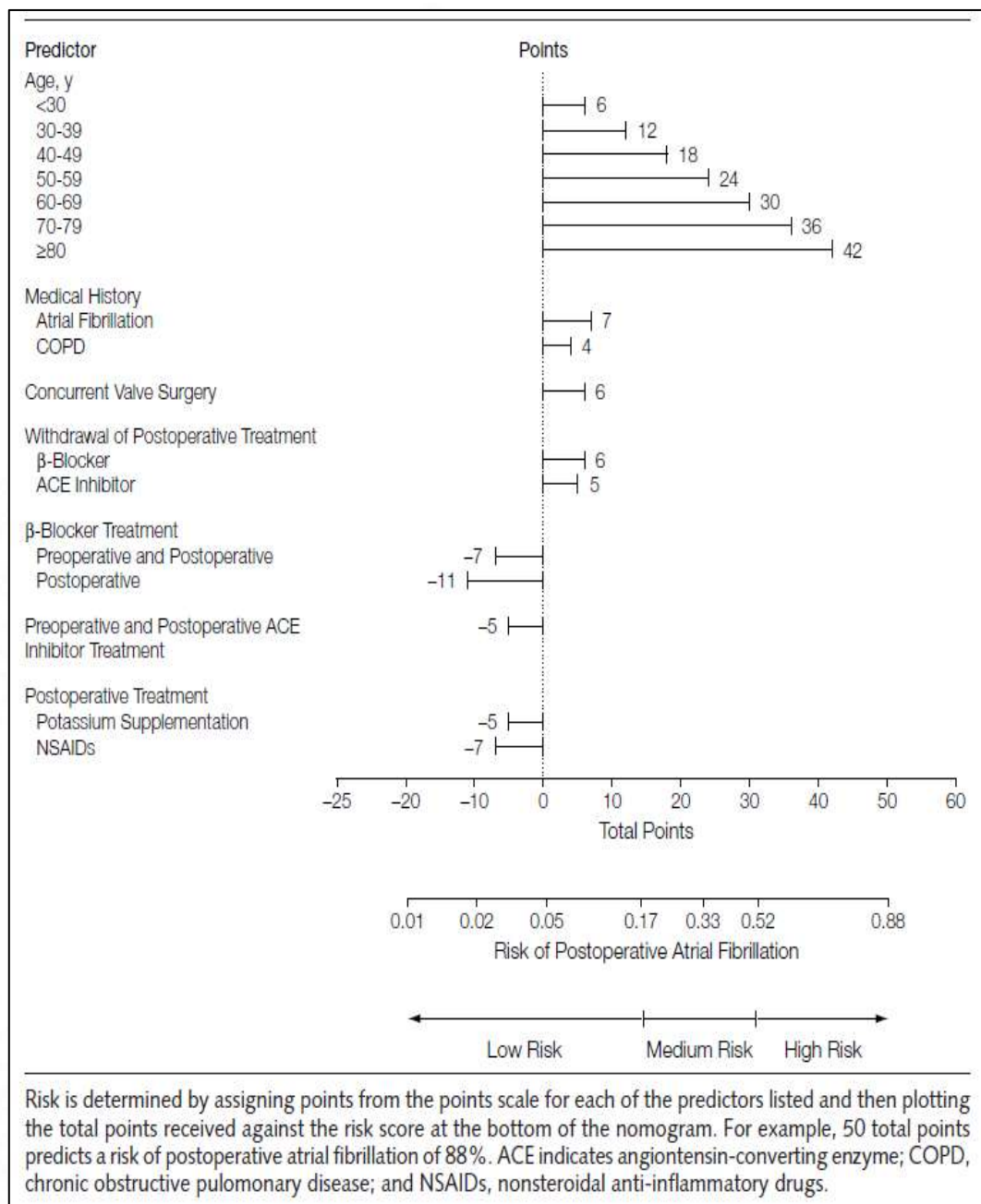


Figure 4: Risk of poAF after cardiac surgery (8).

1416 patients undergoing cardiac surgery (29). All the three scores evaluated in this study, namely POAF score(26)(10), CHA₂DS₂VASc Score(10) and Atrial fibrillation risk index(27) were found to have limited predictive ability for poAF after cardiac surgery with area under ROC curve ranging from 0.56 to 0.65.

- i) Clinical risk prediction for Asian population: Zhang et al (9) proposed the Atrial fibrillation risk score system for prediction of poAF after cardiac surgery specific to Asian population derived from a cohort of 2168 patients.

Variable	Score
Age > 65 years	1
History of atrial fibrillation	3
Intraoperative inotrope use	1
CPB duration > 120 minutes	2
Chinese ethnicity	2
Malay ethnicity	2
Indian ethnicity	0

Table 3. Atrial fibrillation risk score system (9)

Risk category	Point scores	Frequency of poAF
Low	0-2	8.3%
Moderate	3-5	16.5%
High	6-9	41.8%

Table 4. Frequency of poAF at various risk categories using the Atrial fibrillation risk score system (9)

- j) Multivariate logistic regression model including ECG characteristics: Wong JK et al (20) proposed a multivariate regression model which has ECG characteristics. The clinical variables included in the model were Age, Previous cerebral event (including transient ischaemic attacks and cerebrovascular accidents), EF < 55%, Valve surgery and previous A Fib. The ECG characteristics included were premature atrial contractions, PR interval, P-wave index > 27msec and P wave frontal index. The area under ROC curve of this model was 0.78.
- k) Neutrophil-Lymphocyte ratio (NLR): The neutrophil-lymphocyte ratio has emerged as an important biomarker for prediction of poAF after cardiac surgery. In a metanalysis of 12 studies involving 9,262 patients, elevated preoperative NLR was found to be

significantly associated with poAF (OR 1.42 (95% CI 1.16-1.72). However postoperative NLR was not associated with poAF (49).

Prevention of poAF

Various pharmacological and surgical interventions have been evaluated for prevention of poAF after cardiac surgery(80). Perioperative beta-blocker therapy including reintroduction of betablocker therapy after surgery(81) has the strongest evidence for prevention of poAF. Restarting beta-blockers after CABG has been suggested as a part of care bundle for prevention of poAF after cardiac surgery (82). Antiarrhythmics drugs, particularly Amiodarone has the strongest evidence for prevention of poAF(83). Apart from betablocker therapy various other agents/ strategies have been evaluated and reported widely including Cocchine(30), Statins(18,84), Vitamin C(47), Sotalol, Landiolol (85,86), N-Acetyl Cysteine, Digoxin, Dexmedetomidine(87), Propafenone, Procainamide, Steroids, maintenance of high normal serum potassium levels, Ranolazine(19)(43) and their combinations.

- a) Beta blockers and Amiodarone: Prophylaxis with Metoprolol or Landiolol (85,86) for prevention of poAF has been reported. Preoperative use of beta-blockers was associated with reduced new-onset poAF in a meta-analysis of five RCT involving 688 subjects(44). Metoprolol and Amiodarone have been directly compared in a randomised controlled trial where 316 patients, who were free from atrial fibrillation, were randomised to receive either Metoprolol (1 to 3 mg/hour infusion for 48 hours according to heart rate) or Amiodarone (15mg/kg as a daily dose (maximum 1000mg per day starting within 24 hours and continued till 48 hours after surgery). There was no significant difference in the incidence of first episode of poAF in both the groups (23.9% in Metoprolol group vs 24.8% in Amiodarone group; $p=0.85$) (88). In a placebo-controlled, randomized, double-blinded trial with 253 patients(89), oral

Metoprolol was compared with combination of Metoprolol with Amiodarone, Sotalol and placebo. Metoprolol therapy was associated with 13.5% absolute reduction in atrial fibrillation (OR 0.58, $p=0.16$). Landiolol has been evaluated in the PLATON Trial (85) where 60 patients with left ventricular ejection fraction $< 35\%$ were randomised into two groups (intravenous Landiolol infusion group and control group). poAF was significantly less in Landiolol infusion group when compared to control group (10% vs 40%; $p=0.002$). In addition, patients in Landiolol group had significantly shorter hospital stay and did not suffer any adverse effects due to the infusion. The cost-effectiveness of Landiolol vs standard of care therapy has been reported by Walter E and colleagues where Landiolol reduced the incidence of poAF and was significantly cost-effective(86). Similarly Amiodarone therapy was found to be cost-effective for prevention of poAF(90). Timing of beta blocker reintroduction after cardiac surgery and its relation to incidence of poAF has been evaluated recently in French multicentric prospective cohort of 663 patients by Couffignal C et al (81) where it was found that reintroduction of beta blocker therapy within 48 hours after surgery was not statistically associated with decreased incidence of poAF during first 72 hours after cardiac surgery. The reasons listed for non-reintroduction of betablocker therapy within 48 hours after cardiac surgery in this study (60.6% of total patients) were ongoing catecholamine infusions (37%), atrioventricular block (8%), concomitant use of Amiodarone (10%), arterial hypotension (8.7%), bradycardia(6%), anticipated risk of bronchospasm ($<1\%$), reintroduction not considered necessary (2.4%), no oral feeding (1.2%) and undocumented reasons (34%). The study authors caution that lack of statistical significance should not be considered as lack of proof for reintroduction of betablockers for preventing poAF. The authors suggest measures to improve the reintroduction of beta-blocker therapy by bridging with intravenous therapy before oral

intake. Amiodarone (as a single dose of 1800 mg dose orally followed by intravenous infusion of 900mg over 24 hours after induction of anaesthesia for subsequent 3 days) was prospectively compared with three other groups consisting of Amiodarone with thoracic epidural anaesthesia, only thoracic epidural anaesthesia or control group in a study of 196 patients undergoing CABG (91). Amiodarone therapy was effective in reducing the incidence of poAF when compared to thoracic epidural anaesthesia(91). Route of Amiodarone therapy was evaluated in a meta-analysis of 23 studies involving 3950 patients (92) where it was found that oral as well as intravenous routes of Amiodarone therapy were effective for prevention of poAF. The timing of amiodarone therapy also did not make a difference.

- b) Statin therapy: Administration of Statins in the perioperative period have been found to reduce the incidence of poAF after cardiac surgery (18,84). A meta-analysis of 11 trials involving 1105 patients by Patti G et al(18) reported that short-term statin therapy was associated significant reduction in risk of poAF after cardiac surgery. Couffignal et al also reported that reintroduction of statins, but not ACE inhibitors and diuretics, was associated with reduced risk of poAF within 72 hours after cardiac surgery(81).
- c) Ranolazine therapy: Short course of Ranolazine therapy was found to reduce the risk of poAF after cardiac surgery. Hammond DA et al (19) reported the results of a randomised trial involving 205 patients to study the effect of short-course Ranolazine therapy (preoperative Ranolazine 1000mg followed by 1000mg twice a day, starting postoperative evening, for 7 days or until discharge) with standard therapy. Patients in Ranolazine group had lower incidence of poAF when compared to standard therapy within 7 days after cardiac surgery (10% vs 41.9%). In a meta-analysis of four studies involving 663 patients undergoing cardiac surgery, Trivedi et al (43) found that prophylactic Ranolazine was associated with significant reduction in risk of poAF (risk

ratio 0.44; 95% CI 0.25-0.78; $p=0.005$) when compared to standard therapy. Ranolazine was administered prophylactically as 1000mg PO on the morning of surgery followed by 1000mg twice a day for 7 to 14 days postoperatively in most of the studies.

- d) Non-pharmacological methods: Posterior pericardiectomy(33), active clearance of chest drainage(32) and Bi-atrial pacing (39) are the commonly evaluated non-pharmacological methods for prevention of poAF. Oxidation and inflammation of mediastinal shed blood within the pericardium in postoperative period has been proposed as a trigger for poAF(33). Patients who underwent prophylactic posterior pericardiectomy has reduced incidence of poAF after cardiac surgery (6% vs 34%; $p=0.0000007$) when compared to patients without posterior pericardiectomy(34). Active clearance of chest drainage by the use of active tube clearance system was associated with 34% reduction in rate of poAF after cardiac surgery(32). A met-analysis of ten studies showed that Bi-atrial pacing was found to be an effective prophylaxis against poAF(39). However, there was no significant benefit of isolated right atrial pacing. However, bi-atrial pacing was associated with risk of loss of sensing, LV pacing and diaphragmatic pacing. Since the incidence of poAF is highest on the second day after cardiac surgery, it has been recommended to continue pacing for 3-5 days with recommended rates between 80 and 90/min(39). Prophylactic cox-maze procedure has been studied for prevention of poAF after cardiac surgery(80).

Approach to management of poAF

Management of poAF is varied in terms of pharmacological agents, doses and durations. However, the goals of management are based on maintenance of stable hemodynamic with symptom control, prevention of thromboembolism and recurrence(35). Various therapies have been reported to be applied for treatment of poAF in surveys conducted by European

association of cardiothoracic anaesthesiologists and Society of Cardiovascular anaesthesiologists (80).

- a) Rate control vs rhythm control: Rate control vs rhythm control as initial management strategy of poAF after cardiac surgery has been evaluated in a large randomised controlled trial of 523 patients conducted by Gillinov A et al(93). Patients in the rate control group received medications to slow the heart (goal for heart rate less than 100/min) while patients in the rhythm control group received Amiodarone with or without rate control medications. Patients received direct current cardioversion if poAF persisted for 24 to 48 hours. Both strategies for control of poAF were associated with similar hospitalisation days (5.1 vs 5.0; $p=0.76$), rate of death, overall serious adverse effects (24.8 per 100 patient-months in rate-control group vs 26.4 per 100 patient months in rhythm control group, $p=0.61$) and similar rate of stable heart rhythm without atrial fibrillation for 30 days (93.8% in rate control group vs 97.9% in rhythm control group, $p=0.02$).
- b) Amiodarone: Amiodarone, either orally or IV route, is preferred for prevention and pharmacological treatment of poAF after cardiac surgery(80). Amiodarone by intravenous route administered for poAF lasting < 24 hours (administered as initial 5mg/kg infusion over 30 min followed by 10mg/kg as infusion over next 20 hours) restored sinus rhythm in 83% of patients when compared to 44% in the control group in study of 160 patients (94). Intravenous Amiodarone (300 mg IV in 30 min followed by 1125 mg IV in 36 h) combined with Ranolazine (Oral 500 mg + 375 mg after 6 h and 375 mg twice daily orally thereafter) has been found to restore sinus rhythm earlier in patients with poAF when compared to patients in Amiodarone monotherapy group(31). Amiodarone can cause side effects like bradycardia, thyroid dysfunction, pulmonary toxicity, corneal microdeposits and elevated serum transaminases(80).

- c) Amiodarone and early cardioversion: Samuel et al compared the effect of strategy of IV Amiodarone (150mg IV bolus followed by 1gm over next 24 hours) with early cardioversion if not reverted to sinus rhythm within first 24 hours with a control regimen of digoxin, procainamide or digoxin for management of poAF after CABG in a retrospective study(95). This strategy of IV Amiodarone with early cardioversion was significantly better in restoring sinus rhythm within first 24 hour (79% vs 64%) and 48 hour time period (90% vs 73%) when compared to control regimen consisting of combination digoxin and procainamide or diltiazem(95).
- d) Magnesium supplementation: Supplementation by IV magnesium sulphate empirically or prophylactically or when associated with hypomagnesemia is associated with reduced incidence of poAF. Magnesium supplementation has been described in a variety dosages and regimen (16,72,73,75)(39). However, the role of magnesium supplementation is limited to being an adjunct with other agents for treatment of poAF.
- e) Ranolazine: Ranolazine is an antianginal agent with additional antiarrhythmic properties. Prophylactic Ranolazine is reported to be effective in reducing the incidence of poAF when compared to standard therapy(43). However, therapy with Ranolazine as a sole agent for treatment of poAF has not been reported. Ranolazine, orally, in combination with IV Amiodarone for treatment of poAF restores sinus rhythm earlier than patients in 'amiodarone only' group (31).
- f) Vernakalant: Vernakalant is a multi-channel inhibitor for which has been studied for management of poAF after cardiac surgery. It inhibits atrial specific potassium and sodium channels resulting in prolongation of effective refractory period. It blocks Kv1.5 channels in open state and is especially effective at higher heart rates(42). Vernakalant is administered as an intravenous infusion of 3mg/kg in 100ml normal

saline, upto a maximum dose of 339mg. In case of non-restoration of sinus rhythm, an additional dose of 2mg/kg as an infusion is administered after a interruption of 15 min after infusion of first dose(96). Restoration to sinus rhythm was successful in 70% of patients. Vernakalant administration was associated with non-significant reduction in heart rate and no associated adverse effects(96). Practice guidelines published by Society of Cardiovascular anaesthesiologists recommend Vernakalant therapy to be considered (Recommendation class IIb with LOE B) for cardioversion of patients without severe heart failure, hypotension, or severe structural heart disease developing poAF after cardiac surgery(80).

- g) Other agents: Colchicine has been recommended for consideration postoperatively to reduce poAF after cardiac surgery (Recommendation class IIb with LOE B)(80). However, colchicine is associated with gastrointestinal side-effects.

Practice guidelines for poAF after cardiac surgery

Practice guidelines for prophylaxis and treatment of poAF after cardiac surgery have been proposed since 2006 and are updated regularly(36)(97)(98)(39)(80). The most recent guidelines with recommendations and LOE are shown in Figure 4. Perioperative betablocker therapy has the Class I recommendation level (LOE A/B) prevention of poAF. Perioperative amiodarone for prevention of poAF after cardiac surgery has a lower class of recommendation (Recommendation class IIa with LOE A) compared to perioperative beta blockers. In ‘hemodynamically unstable’ patients, restoration of sinus rhythm by electrical cardioversion or antiarrhythmic agents (Amiodarone) is recommended (Recommendation class I with LOE C). Antiarrhythmic drugs or direct current cardioversion should be considered for ‘symptomatic’ poAF (Recommendation class IIa with LOE B/C). It is recommended to manage ‘asymptomatic’ poAF with rate control and anticoagulation (for prevention of stroke) (Recommendation class IIa with LOE A/B). Beta blockers or calcium channel blockers (non-

hydropyridine group like Verapamil and Diltiazem) are recommended to achieve rate control in poAF (Recommendation class I/IIa/NC with LOE B/low)(80)(99).

Simplified clinical practice guideline. A simplified clinical practice guideline (CPG) aimed at prevention of poAF and to promote improved adherence to recommendations to reduce poAF was evaluated in a cohort of patients before (170 patients) and after introduction (189 patients) of CPG (38). The CPG consisted of four goals i.e., early administration of beta-blockers, early electrolyte replacement, adequate oxygenation, and pain control. Prophylactic administration was included for patients in high-risk for developing poAF. Simplified CPG lead to reduction in incidence of poAF from 12.3% (before introduction of CPG) to 8% (after introduction of CPG) ($p=0.04$). The time to resumption of betablocker therapy was shorter after introduction

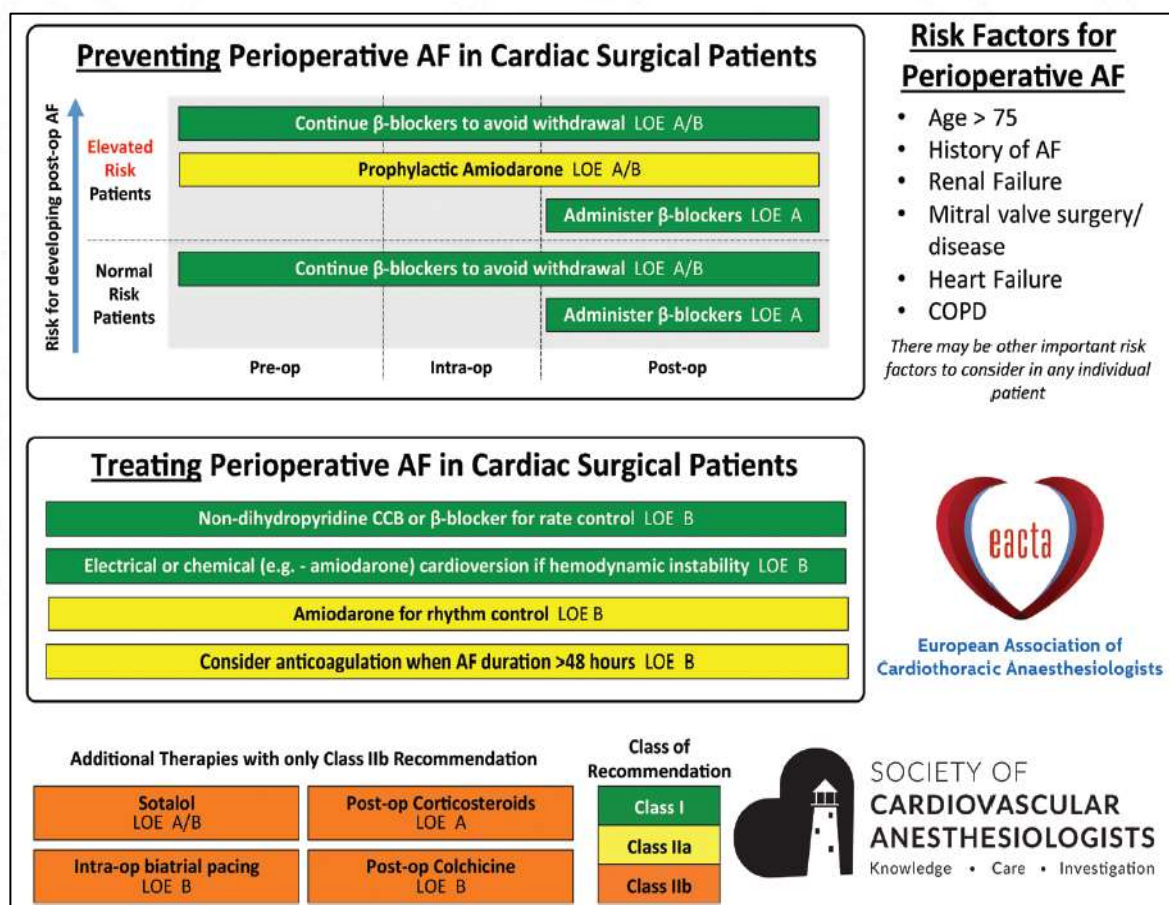
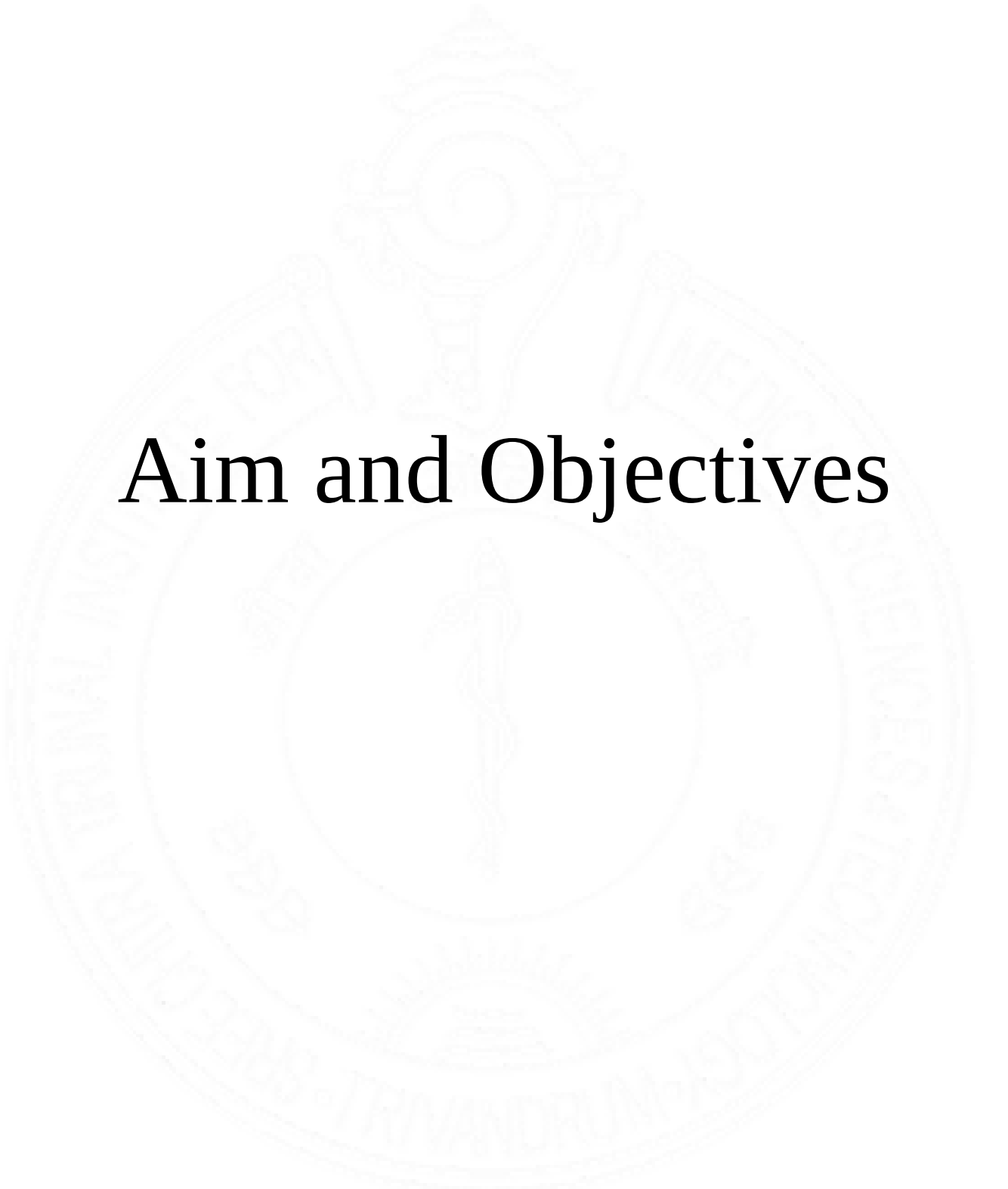


Figure 5. Practice advisory for prevention and treatment of poAF after cardiac surgery as recommended by Society of Cardiovascular Anaesthesiologists and European association of Cardiothoracic Anaesthesiologists.(80).

of CPG (303 ± 99 minutes vs 385.3 ± 112 ; $p=0.04$). There was no difference in the incidence of other postoperative complications like perioperative myocardial infarction, wound infection, early stroke and in-hospital mortality after introduction of CPG. Hence, introduction of CPG as a quality improvement initiative can be practised effectively to reduce the incidence of poAF after cardiac surgery.

Discharge Medication for *de novo* poAF after cardiac surgery

poAF is associated with increased risk of early stroke, morbidity and 30-day mortality(99). Hence, oral anticoagulants at hospital discharge in patients with poAF are associated with reduced long-term mortality. The stroke risk reduction due to long term anticoagulation for patients with high stroke risk after poAF versus stroke risk reduction due to long-term anticoagulants for patients who suffered short episodes of poAF (<48 hours) is not known(60). However, a recent large retrospective cohort study involving 1,66,747 patients from STS Adult Cardiac surgery database (54) was not in favour of anticoagulation therapy at discharge for patients with poAF after CABG. It was found that 25.7% of patients were discharged on anticoagulation with an average CHA₂DS₂VASc score of 3.2 ± 1.3 . Anticoagulation therapy at discharge was not associated with reduced 30-day stroke rates (Adjusted OR 0.87, 95% CI 0.65-1.16; $p=0.35$) but was associated with increased risk of 30-day re-admission for bleeding episodes (Adjusted OR 4.30; 95% CI 3.69-5.30; $p<0.001$)(54).



Aim and Objectives

Aim and Objectives

Hypothesis:

1. We hypothesise that incidence of new onset atrial fibrillation is expected to be about 30% after coronary artery bypass grafting.
2. We hypothesise the association of certain risk factors with new-onset atrial fibrillation
3. We hypothesis that onset of atrial fibrillation is associated with increased stay in ICU, increased hospital stay, increased risk of renal dysfunction and infection.

Objectives:

1. To estimate the incidence of new onset atrial fibrillation after elective coronary artery bypass grafting
2. To assess the association between new onset atrial fibrillation after elective coronary artery bypass grafting with the following risk factors

Factors related to patient medical history

- a) Age
- b) Pre-existing chronic kidney disease
- c) Pre-existing COPD / Chronic respiratory disease
- d) CHA₂ DS₂-VASc Score
- e) NYHA Class
- f) Hypothyroidism
- g) Smoking
- h) Dyslipidemia
- i) Preoperative ICU admission

Factors in preoperative investigations

- a) Baseline hemoglobin

- b) Baseline serum creatinine
- c) RCA stenosis > 90%
- d) eGFR (per 1.73 m² Body surface)
- e) LVEF by preoperative TTE
- f) LA size (TTE PLAX view)

Factors related to perioperative medication and serum potassium levels

- a) Perioperative Beta blocker therapy
- b) Perioperative Amiodarone therapy
- c) Perioperative Ranolazine therapy
- d) Perioperative Magnesium supplementation
- e) Serum potassium levels

Factors related to intraoperative techniques

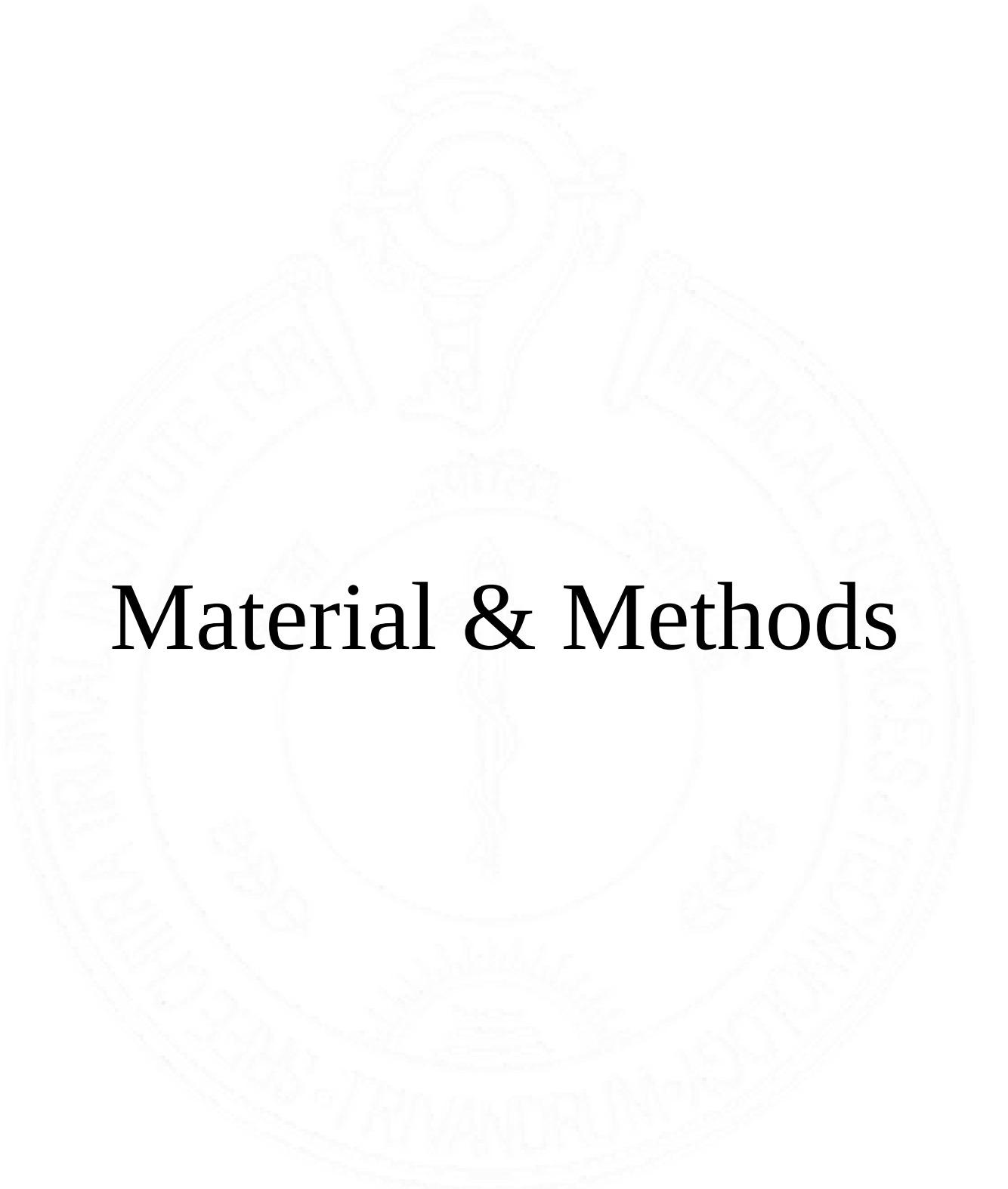
- a) Intra-aortic balloon pump (IABP) use
- b) LV venting via Pulmonary vein
- c) Asynchronous atrial or atrioventricular pacing
- d) Number of grafts
- e) Coronary endarterectomy
- f) CPB time
- g) Aortic cross clamp time
- h) Duration of Operation
- i) Need for IABP
- j) Insertion of Swan Ganz catheter for CABG surgery

3. To assess the relation between incidence of new onset postoperative atrial fibrillation and

- a) Duration of Intensive Care Unit (ICU) stay,
- b) Duration of hospital stay after surgery,

- c) Renal dysfunction,
- d) Infectious complications.
- e) Death
- f) Need for tracheostomy





Material & Methods

Methodology

Design: Prospective observational study

Setting: A tertiary referral center University Hospital, single-center study

Objective:

1. To estimate the incidence of new-onset Atrial fibrillation after elective coronary artery bypass grafting.
2. To prospectively evaluate the risk factors associated with new-onset Atrial fibrillation after elective coronary artery bypass grafting.
3. To assess the association between incidence of poAF and certain outcome parameters

Study population:

Adult patients scheduled for elective coronary artery bypass grafting were considered for inclusion in the study.

Inclusion criteria:

- Adult patients (Age above 18 years).
- Scheduled for elective coronary artery bypass grafting

Exclusion criteria:

- Patient refusing to participate in the study
- Emergency surgery
- Redo surgery
- Patients in ongoing atrial fibrillation / supraventricular arrhythmias during the preoperative period

- A significant cardiac valvular disease which requires surgical intervention
- CABG associated with valve surgery
- Patients undergoing CABG along with any other open-heart procedure

Informed consent: Adult patients scheduled for elective coronary artery bypass grafting were screened for study by investigators. The patients were recruited by the investigators as per the inclusion and exclusion criteria. Informed written consent was obtained from the patient by the principal investigator after educating the patient regarding the proposed study during preoperative anesthesia evaluation and request is made for participation in the study. The consent form was provided in English and Malayalam.

Ethical considerations: Clearance was obtained from Institutional ethics committee (IEC Registration no ECR/189/Inst/KL/2013/RR-16) before commencing the study. IEC approval no. SCT/IEC/1244/August 2018 dated 07/09/2018. The study was prospectively registered with clinical trials registry of India (CTRI/2018/11/016417 dated 26 Nov 2018) before enrollment of first patient on 01Jan 2019.

Study protocol:

- Patients were selected one day before surgery during pre-anaesthetic evaluation by the principal investigator as per specified inclusion and exclusion criteria.
- Patients were educated about the study in the presence of a witness and invited for participation in the study. The witness could counter question the patient whether he/ she has understood the proposed study, of which he/ she would be a part. An informed consent form was signed by patient as per the institute protocol.

- After obtaining institutional ethics committee approval and witnessed informed consent from patient, preoperative characteristics were recorded from medical records as per pre-specified case record format.
- Other data related to risk factors for postoperative Atrial fibrillation were noted from intraoperative medical records and postoperative chart review (as specified in Case record format/observation chart). Any clarifications regarding entries in medical records were sought from anaesthesiologist involved with case.

Study groups: The study involves a single group, in whom all the proposed parameters would be measured. Patients characteristics of patients who developed poAF were compared with characteristics of patients who did not develop poAF.

Observations: The data related to patient related risk factors and outcome parameters were recorded from medical records. All observations were recorded in a pre-specified case record format.

Factors related to patient medical history: Recorded from patient medical records.

- a) Age
- b) Pre-existing chronic kidney disease
- c) Pre-existing COPD / Chronic respiratory disease
- d) CHA₂ DS₂-VASc Score

This score is used for calculating the risk of stroke in patients with Non-rheumatic Mitral valve disease. In addition, this has been reported to predict atrial fibrillation after cardiac surgery (13). The following parameters were used to calculate the score. Score for each factor as indicated.

Congestive Heart failure – 1

Hypertension (BP>140/90 or treated) – 1

Age >= 75 years – 2

Diabetes Mellitus 1

Prior stroke/ TIA/ Embolism – 2

Vascular disease (peripheral artery disease, myocardial infarction)–1

Age 65-75 – 1

Gender Female – 1

All the parameters required for calculation of this score were available from medical records.

- e) NYHA Class
- f) Hypothyroidism
- g) Smoking
- h) Dyslipidemia
- i) Preoperative ICU admission

Factors in preoperative investigations

- a) Baseline hemoglobin
- b) Baseline serum creatinine
- c) RCA occlusion > 90% in preoperative coronary angiography
- a) eGFR (per 1.73 m² Body surface): Preoperative eGFR (estimated glomerular filtration rate) is calculated using Cockcroft Gault formula.

$$\text{eGFR} = ((140 - \text{Age}) * \text{Weight} / \text{Serum Creatinine} * 72)) * 0.85 \text{ (if female)}$$

Serum creatinine and age were recorded from medical records and applied in this formula. The derived value was recorded in the observation chart.

- d) LVEF by preoperative TTE
- e) LA size (TTE PLAX view)

Factors related to perioperative medication and serum potassium levels

- a) Perioperative Beta blocker therapy
- b) Perioperative Amiodarone therapy
- c) Perioperative Ranolazine therapy
- d) Perioperative Magnesium supplementation. Magnesium supplementation is administered for prophylaxis and therapy of poAF after CABG. In addition, Magnesium supplementation is administered intraoperatively (usually 2gm) just after opening of aortic cross clamp during cardiopulmonary bypass.
- e) Serum potassium levels at the time of poAF episode

Factors related to intraoperative techniques

- a) Intra-aortic balloon pump (IABP) use during the perioperative period was recorded. This was as per decision of the operating team.
- b) LV venting via Pulmonary vein. Left ventricle of the heart is drained / vented by the use of a cannula placed via the pulmonary vein. This has been reported to be a risk factor for development of Atrial Fibrillation. This record was available from surgical details of the patient after the surgery. However, none of the patients in the study sample underwent LV venting via pulmonary vein.
- c) Asynchronous atrial or atrioventricular pacing. This is performed in patients with reduced heart rates caused due to various factors in the postoperative period. This has been reported to prevent Atrial fibrillation.
- d) Number of distal grafts placed during CABG
- e) Coronary endarterectomy

- f) CPB time
- g) Aortic cross clamp time
- h) Duration of Operation
- i) Need for IABP
- j) Insertion of Swan Ganz catheter for CABG surgery

None of the patients underwent posterior pericardiectomy for prophylaxis against poAF.

The following outcome parameters were recorded.

- a) Duration of Intensive Care Unit (ICU) stay,
- b) Duration of hospital stay after surgery,
- c) Renal dysfunction,
- d) Infectious complications.
- e) Death
- f) Need for tracheostomy

Interventions: None

Outcome parameters: Postoperative atrial fibrillation is defined as entry into postoperative charts / records of any atrial fibrillation. Renal dysfunction is assessed and described with trends in serum creatinine as markers of disease. Atrial fibrillation was considered to have preceded a complication if it occurred prior to the first day of diagnosis of the complication.

Sample size calculation: Most studies among adult patients after cardiac surgery found that the incidence of new-onset postoperative atrial fibrillation was around 30%. Another multicentric study among patients after CABG found the incidence was 30.5% (52). Assuming an incidence of 30% in the study population, the sample size required for finding the incidence of

postoperative atrial fibrillation with 80% power and error not exceeding 5% (95% confidence interval) is 322. Expecting a dropout rate of 10%, the sample size would be 350.

Statistical analysis: For statistical analysis, the data was entered into Microsoft excel and analysed using R version 3.6.3 (URL <https://www.R-project.org/>). Mean (SD) and percentages were calculated for quantitative and qualitative data respectively. Categorical data association with poAF outcome was assessed using Chi square test for difference between proportions. Association of quantitative data was determined using independent sample t test. ROC curve was plotted to determine the optimal cut off of CHA2DS2-VASc score for predicting poAF.

Risk factors evaluated in the study will

described (Mean, Standard deviation) and evaluated for association with Atrial using univariate analysis. The difference in hospital stay, ICU stay, renal dysfunction and infectious complications between patients with new onset atrial fibrillation and without atrial fibrillation was assessed. p value of less than 0.05 was considered as statistically significant.

Figure 6. Parameters evaluated in present study

Preoperative Factors	Perioperative factors	Outcomes	poAF descriptives
• Age • Gender • Weight • CABG / OPCABG • Baseline hemoglobin • Baseline serum creatinine • Baseline creatinine clearance (eGFR) • Dyslipidaemia • Smoking • Preexisting CKD • COPD / Chronic respiratory disease • Hypothyroidism (optimised) • RCA occlusion > 90% on preoperative angiography • Left ventricular ejection fraction • LA size (2D TTE PLAX view) • CHA2DS2VASc Score • CCF • Hypertension • Age > 75 years - 2 • Diabetes mellitus • Stroke / TIA - 2 • Vascular disease / MI • Age 65-74 years • Sex category Female	• Preop ICU admission • OT duration (hours) • CPB time • Aortic cross clamp time • CPB reinstitution • Number of grafts • Coronary endarterectomy • IABP use • Use of Swan-Ganz catheter • Preoperative betablocker • Preoperative Amiodarone • Preoperative Ranolazine	• Postop ICU stay (hours) • Postop Ward stay (hours) • Postop Hosp stay (hours) • Death • Peak Serum creatinine by POD 7 after surgery • Absolute maximum rise by POD 7 after surgery • Amiodarone at hospital discharge • Referral to EP services • Warfarin at hospital discharge • Low molecular weight heparin at hospital discharge • Infection upto POD 28 • Dialysis during index hospital stay • Tracheotomy during index hospital stay • POD for restarting beta blocker therapy after surgery	• First poAF after ICU admission (hours) • Duration of first poAF episode • Successful management of first poAF • Potassium level before poAF • Location of first poAF episode • Ventilatory status during first poAF • VIS during first poAF • Empirical MgSO4 before poAF • Reintubation for poAF • IABP in situ and poAF • ICU readmission for poAF • Pacing at the time of poAF • Successful therapy for recurrence of poAF • Recurrence poAF (%) • Time between cessation of first poAF and recurrence • POD for starting Amiodarone therapy after surgery



Results

Results

A total of 498 consecutive patients who underwent elective CABG starting from 01 January 2019 to 30 November 2019 were included in the study. In the final analysis, 465 patients were included. The reasons for exclusion are tabulated (Table 5).

A total of 73 patients (15.6%) developed new-onset postoperative atrial fibrillation (poAF) after CABG in this study sample.

Data related to episodes of poAF are shown in table 6. The preoperative characteristics of patients who developed poAF as well as those who did not develop poAF are tabulated in Table 7. Similarly, perioperative characteristics are tabulated in Table 8. Outcomes studied in the study sample are tabulated in table 9.

Table 5. Reasons for exclusion of study patients (n=33). These patients were planned for elective CABG but were excluded from the study due to the additional interventions done based on intraoperative decision making.

SERIAL NO.	REASON FOR EXCLUSION	NUMBER
1	ASD closure along with CABG	1
2	AVR along with CABG	7
3	LA mass (excision/ biopsy done) / LA clot removed / RA mass excision	5
4	Mitral valve surgery along with CABG	9
5	Preoperative supraventricular arrhythmias (in operation theatre) / heart blocks	4
6	CABG along with LV apical clot removal / LV aneurysmorrhaphy	4
7	CABG with MV repair and ASD closure	1
8	Aortic surgery (not planned preoperatively)	1
9	Intraoperative death (in OT, before arrival in ICU)	1

Table 6: Description of various parameters related to first onset poAF (n=73).

S. NO	PARAMETER STUDIED	DESCRIPTION
	First poAF onset POD (hours after ICU admission) (hours) Mean (SD) Median	49 (32) 42 hours
	Incidence of all poAF episodes between postoperative evening upto discharge from hospital (%) POD – Postoperative day	PO evening - 3.5% POD 1 - 21.7 POD 2 – 26.9 POD 3 – 19.1 POD 4 – 13.1 POD 5 – 8.7 POD 6 – 1.7 POD 7 - 1.7 POD 8 to hospital discharge - 3.5
	Duration of first poAF (min) Mean (SD) Median	333 (342) 210
	Successful management of first poAF episode (n=73) Amiodarone bolus only Amiodarone Bolus + infusion DC version + Amiodarone	16.6% 78.3% 5%
	K level at time of poAF ≥4 mEq/L < 4.0 mEq/L Mean (SD) Median	60.1% 39.9% 4.01 (0.32) 4.0
	Location first poAF ICU Ward	88.13% 11.86%
	MgSO4 empirical therapy before onset of poAF within 3 hours (n=73)	86.6%
	VIS score at first poAF onset (n=73) Mean (SD) Median	2.7 (4.23) 0
	Mechanical Ventilatory support at the time of first poAF episode Invasive Mechanical Ventilation Non-Invasive Ventilation Oxygen mask with supplementation Without any O2 supplementation	5.3% 6.7% 74.4% 13.5%
	Reintubation due to first episode of poAF	NIL
	IABP at first poAF onset (n=73)	3.5%
	ICU readmission for poAF (n=73)	NIL
	Pacing at first onset poAF (n=73) NIL	94%

	AOO pacing VVI	3.3% 2%
	Recurrence of poAF after successful treatment of first episode (n=73)	27 recurrences (37%)
	Time to recurrence of poAF after first treatment of first episode of poAF (hours) Mean (SD) Median	14.76 (14.6) 8 hours
	Therapy for recurrence of poAF (n=27) Amiodarone infusion DC version +Amiodarone infusion Referred to Dept of Electrophysiology for paroxysmal AF	92.5% 7.4% 01 patient
	Postoperative day on which oral Amiodarone was initiated for poAF along with other therapy (Amiodarone infusion) Mean (SD) Median	3.05(1.0) 3

The first episode of poAF usually occurred on the second postoperative day after CABG lasting a mean duration of about 333 minutes. Patients who develop poAF were weaned off invasive mechanical ventilation and were on oxygen supplementation by face mask (74.4%) at the time of onset of poAF. This was successfully treatable with Amiodarone bolus followed by infusion in 78.3% of the cases. The need for DC cardioversion was noted in 5% of the cases. Most first episodes of poAF occurred while in ICU. Serum potassium levels were less than the recommended level (4 mEq/L) in 39.9% of the patients. Recurrence of poAF after successful treatment of first episode occurred in 37% of the cases, usually after a median duration of 8 hours, These cases were successfully treated with amiodarone infusion (92.5%).

Table 7. Preoperative characteristics of patients included in the study sample.

S.NO	PARAMETER	<u>POAF</u> <u>GROUP</u> MEAN (SD) N (%)	<u>NO POAF</u> <u>GROUP</u> MEAN (SD) N (%)	<u>TOTAL</u> <u>SAMPLE</u> MEAN (SD) N(%)	<u>p value</u>
	Age (years)	63.5±7.42	58.3±8.16	59.1±8.27	< 0.001
	Gender (n=465)				
	Male	65	330	395	
	Female	8	62	70	0.3749
	Weight	69.2±11.7	66.9±9.7	67.3±10.1	0.13
	Type of Surgery (n=465)				
	CABG on CPB	70	354	424.	
	Off-pump CABG	2	36	38	0.13
	CPB beating heart	1	2	3	
	Preop Hemoglobin (Hb) baseline	13.7±1.58	13.8±1.57	13.8±1.58	0.42
	Preop Creatinine (sCr) baseline	1.27±0.5	1.16±0.5	1.18±0.72	0.13
	eGFR (Cockcroft Gault formula) (ml/min)	62.9±22.3	69.4±20.6	68.5±21	0.02
	Dyslipidemia (n=465)	43 (58.9%)	209 (53.3%)	252 (54.2%)	0.45
	Smoking (n=465)	15 (20.5%)	83 (23.3%)	98 (21%)	1.0
	Preop CKD	6 (8.2%)	12 (3.0%)	18 (3.9%)	0.07
	Preop COPD / Chronic respiratory disease	3 (4.1%)	13 (3.3%)	16 (3.4%)	1.0
	Preop hypothyroidism (on Eltroxin replacement)	6 (8.2%)	17 (4.3%)	23 (4.9%)	0.26
	CHA2DS2-VASc Score				
	Mean (SD)	3.3±1.4	2.4±1.2		<0.0001
	0	0	14	14	
	1	7	72	79	
	2	16	126	142	
	3	16	103	119	
	4	20	58	78	
	5	9	17	26	
	6	3	2	5	
	7	2	0	2	<0.0001
	8	NIL	NIL	NIL	
	9	NIL	NIL	NIL	
	C: CCF or LV dysfunction	27 (36.9%)	85 (21.6%)	112 (24.1%)	0.007
	H: Hypertension	50 (68.4%)	244 (62.2%)	294 (63.2%)	0.37
	A2: Age > 75 years	5 (1.2%)	5 (6.8%)	10 (2.2%)	0.01
	D: Diabetes Mellitus	57 (78%)	250 (63.7%)	307 (66%)	0.025
	S2: Prior Stroke/TIA	7 (9.5%)	18 (4.5%)	25 (5.4%)	0.14

V: Vascular disease (PAD/MI/Aortic plaque)	49 (67.1%)	183 (46.6%)	232 (49.9%)	0.002
A: Age 65-74	30 (41%)	92 (23.4%)	122 (26.2%)	0.002
Sc: Sex category Female	8 (10.9%)	62 (15.8%)	70 (15.1%)	0.3749
NYHA class				
1	7	22	29 (6%)	0.43
2	55	343	398 (85.6%)	
3	11	27	38 (8.2%)	
4	NIL	NIL		
Preop RCA > 90% occluded on coronary angiography	42.2%	16.8%	97 (20.8%)	< 0.001
TTE LV ejection fraction (number)	59.1	60.0		0.54
LA size (TTE PLAX)	35.24	34.17		0.049
Ao size (TTE PLAX)	29.17	28.8		0.51
Preoperative Ranolazine therapy (n=465)	11 (15%)	51 (13.01%)	62 (13.3%)	0.634

Figure 7. ROC curve for CHA2DS2-VASc score for predicting new-onset poAF (AUC 0.672). CHA2DS2-VASc of 3 was the suggested cut-off for predicting new-onset poAF after cardiac surgery.

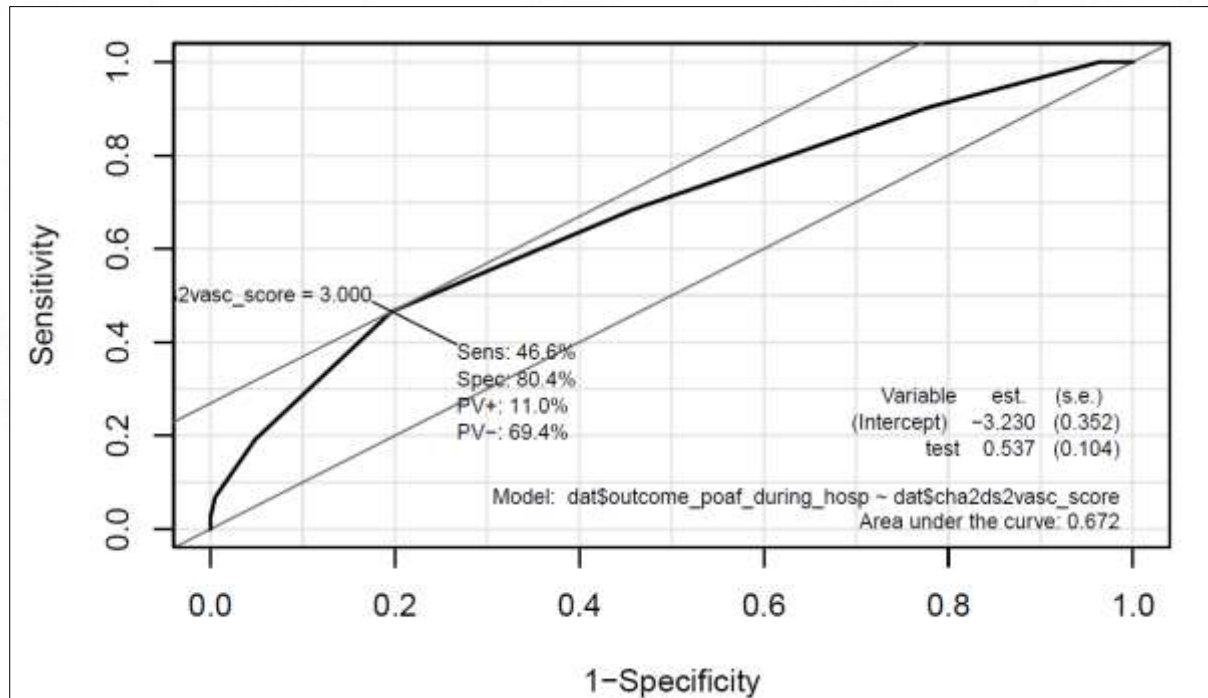


Table 8. Perioperative characteristics of patients included in the study sample.

S. NO.	Parameter	<u>POAF GROUP</u> MEAN (SD) N (%)	<u>NO POAF GROUP</u> MEAN (SD) N (%)	<u>TOTAL SAMPLE</u> MEAN (SD) N(%)	<u>p value</u>
	Preop CMICU / HFICU admission (n=465)	6 (8.2%)	20 (5.1%)	26 (5.6%)	0.43
	Ward stay before surgery (hours)	43 (49.1)	38.8 (26.7)	39.5 (31.3)	0.47
	Operation duration (hours)	6.1 (1.2)	6.3 (1.8)	6.1(1.32)	0.28
	CPB time (min) (n=427)	105 (26)	107 (23.3)	107 (23.8)	0.41
	CPB reinstitution (if any) after first CPB run (n=427)	4 (5.6%)	12 (3.3%)	16 (3.7%)	0.56
	Aortic cross-clamp time (min)	53.7 (13)	57.6 (14.2)	57 (14.2)	0.02
	Number of grafts during CABG	3.8 (0.98)	3.8 (0.90)	3.8 (0.9)	0.86
	Coronary Endarterectomy	1 (1.3%)	7 (1.7%)	8 (1.7%)	1.0
	Need for IABP	3 (4.1%)	12 (3%)	15 (3.2%)	0.91
	Swan Ganz catheter use	1 (1.3%)	4 (1.0%)	5 (1.1%)	1.0

The factors associated with development of poAF after CABG in the present study were advanced age, diabetes, lower eGFR, higher CHA2DS2-VASc score, higher LA size by TTE and prolonged aortic cross clamp time. The optimum cut-off of CHA2DS2-VASc score for prediction of poAF after CABG was 3 (AUC ROC 0.67).

Table 9. Outcomes studied

S.No	Parameter	<u>POAF GROUP</u> MEAN (SD) n (%)	<u>NO POAF</u> <u>GROUP</u> MEAN (SD) n (%)	<u>TOTAL</u> <u>SAMPLE</u> MEAN (SD) n (%)	<u>p value</u>
	Hosp stay after surgery (ICU + Ward) (hours)	198 (202)	130.5 (68.3)	141 (104)	0.005
	Total hosp stay (days) (preop + post op)	10.38 (8.42)	7.36 (3.11)	7.84 (4.52)	0.003
	ICU stay after surgery (hours)	125.4 (104.3)	67.43 (42.0)	76.5 (60.2)	< 0.0001
	Ward stay after surgery (hours)	73 (137.4)	63.1 (49.5)	64.7 (70.8)	0.54
	Death	1 (1.3%)	6 (1.5%)	7 (1.5%)	1.0
	Peak serum (sCr) creatinine (absolute) upto POD 7	1.82 (0.9)	1.43 (0.55)	1.49 (0.63)	0.0005
	Peak % rise sCr from baseline by POD 7	43.8 (40.3)	27.2 (37.8)	29.9 (38.6)	0.0015
	POD on which sCr rise to peak	2.49 (2.2)	1.98 (1.0)	2.07 (1.3)	0.064
	Any infection upto POD 28	11 (15%)	28 (7.1%)	39 (8.4%)	0.04
	Amiodarone at hospital discharge (n=458 due to 7 deaths before discharge)	68 (94.4%)	4 (1%)	72 (15.7%)	<0.0001 One patient referred for holter monitoring
	Warfarin at hospital discharge (n=458 due to 7 deaths before discharge)	3 (4.1%)	13 (3.3%)	16 (3.5%)	1.0
	LMWH at hospital discharge (n=458 due to 7 deaths before discharge)	1	1	2 (0.4%)	0.7
	Renal replacement therapy during postoperative hospital stay	2	2	4 (0.9%)	0.22
	Need for Tracheostomy	3	0	3 (0.6%)	0.001

	Reintroduction of of Beta blockers in postoperative period (n=73) Restarted Death Not started till hospital discharge	71 One death Not started in one patient	383 Deaths 6 Not started in 3 patients	454 Deaths 7 Not started in 4 patients	P=0.85
	Postoperative day on which Beta blocker therapy was restarted (POD number) Mean (SD) Median	3.29(2.22) 3	2.82 (1.22) 2		p=0.0108

Patients developing poAF after CABG had prolonged ICU stay and hospital stay after surgery. The peak rise in serum creatinine was higher in poAF group. Majority of the patients (94.4%) were administered oral Amiodarone at hospital discharge. Preoperative Ranolazine therapy was not associated with poAF after CABG. All patients on preoperative betablocker therapy were continued the same till the time of surgery. The POD on which betablocker therapy was reintroduced was 3.29 ± 2.22 in patients who developed poAF compared to 2.82 ± 1.22 days in patients who did not develop poAF. This difference was statistically significant.

Table 10. The various perioperative factors included in the present study have been tabulated into two categories, one which are associated with poAF after CABG and others which are not.

Perioperative factors for association with poAF after CABG (considered statistically significant association when $p < 0.05$)	
a) Advanced age - Age (0.001) - Age > 75 years (0.01) - Age 65-74 years (0.002) - Age > 50 years (0.009) b) Preexisting CKD (0.07) c) NYHA class (0.04) d) Congestive cardiac failure (0.007) e) Size of LA on TTE (PLAX view) (0.04) f) Diabetes mellitus (0.027) g) Vascular disease (MI/Peripheral vascular disease/Aortic plaque) (0.002) h) RCA occlusion > 90% on preoperative CAG (0.001) i) Baseline Creatinine clearance (eGFR) (0.02) j) Aortic cross clamp time (0.02) k) CHA2DS2-VASc Score (0.0001) l) Beta-blockers were restarted later in patients who developed poAF (0.001)	a) Gender (0.37) b) COPD (1.0) c) Hypothyroidism (optimized before surgery) (0.26) d) Hypertension (0.37) e) Previous Stroke / TIA (0.14) f) Baseline hemoglobin (0.42) g) Baseline serum creatinine (0.13) h) Dyslipidemia (0.45) i) Smoking (1.0) j) LV ejection fraction (0.54) k) Perioperative Ranolazine therapy (0.63) l) Swan-Ganz catheter insertion during CABG surgery (1.0) m) Need for IABP (0.9) n) Coronary endarterectomy (1.0) o) Preoperative ICU admission (0.43) p) Duration of Preoperative ICU admission (0.754) q) Duration of operation (0.28) r) CPB time (0.41) s) Number of grafts (0.86) t) CPB reinstitution (0.56)

Table 11. The various outcome parameters included in the present study have been tabulated into two categories, one which are associated with poAF after CABG and others which are not.

Outcomes studied for association with poAF after CABG (considered statistically significant association when $p < 0.05$)	
a) Prolonged duration of postoperative stay in ICU (0.001) b) Prolonged duration of hospital stay after surgery (hours) (0.005) c) Prolonged duration of hospital stay after surgery (days) (0.003) d) Higher peak serum creatinine level in first 7 days after surgery (0.004) e) Postoperative day when peak serum creatinine rise was observed was earlier in poAF group (0.06) f) Tracheostomy (0.001)	a) Postoperative duration of stay in ward (0.54) b) Death (1.0) c) Infection upto 28 days after surgery (0.441) d) Renal replacement therapy (0.27)



Discussion

Discussion

Incidence of poAF after CABG

The incidence of poAF in our study (15.6%) was lower than the usual expected incidence between 20% and 60% reported in literature. However, it is similar to incidence noted among Indian subset of patients (15%) in a large multinational study reported by Mathew et al in 2004 (8). However, this incidence has not changed from the incidence reported by Mathew et al in spite of the medical advances in the last decade. This lack of variation was pointed out earlier in a study of epidemiology of atrial fibrillation after CABG by Filardo et al (25).

Description of poAF characteristics.

- a) First poAF after ICU admission (hours). The first onset of poAF was after a mean (SD) duration of 49 (32) hours after ICU admission (Median 42 hours). This was similar to the previous report by Farouk Musa et al (58) (Mean (SD) 45(33) hours) and Filardo et al (Median 52 hours) (25). The longest duration after which poAF developed after CABG was 14 days. Most episodes occurred on POD 2 after CABG. The exact reason for this is not known.
- b) Duration of first poAF episode. The first episode of poAF after CABG lasted for a mean duration of 333 minutes (Median 210 minutes), which was comparable to the earlier reported mean duration of seven hours by Filardo et al (25).
- c) Successful management of the first poAF. Management of poAF in our institution was carried as per the latest existing guidelines. Majority of the patients (78.3%) were successfully treated with Inj Amiodarone given as a bolus and then followed by infusion. DC cardioversion was necessary for treatment of poAF in 5% of the

patients. All these patients received Amiodarone infusion after DC cardioversion. This shows that majority of patients do not suffer serious first episodes of poAF after CABG, that warrant DC cardioversion. Majority of the episodes can be managed successfully with Amiodarone alone. However, DC cardioversion should be available for the occasional unstable patients, which amounted to 5% in the present study.

- d) Potassium level during poAF. It is recommended to maintain serum potassium levels above 4 mEq/L to prevent poAF after cardiac surgery (82). In our study, 39.9% of patients who developed poAF were found to have serum potassium levels below 4mEq/L. The mean potassium level (mEq/L) noted was 4.01 (0.32). In the study unit, all patients with serum potassium levels lower than 4 mEq/L were routinely administered adequate correction to maintain potassium levels above 4 mEq/L.
- e) Location of first poAF episode. The location of first poAF episode was ICU in majority of the cases (88.1%). Nevertheless, it is important to stress upon the fact that adequate monitoring should be continued till hospital discharge since the 11% of patients developed poAF after shifting from ICU to postoperative ward.
- f) Ventilatory status during the first poAF. Majority of patients (87%) were weaned off invasive ventilatory support when they developed poAF after CABG. Hence, monitoring of patients who have been weaned off ventilatory support for poAF is important.
- g) Empirical MgSO₄ before poAF. Majority (88.3%) of patients received empirical Magnesium supplementation after detection of poAF or have received supplementation within previous 3 hours of onset of poAF. Routine

supplementation with Magnesium is not followed in the study unit and serum Magnesium levels are not routinely evaluated in the study unit. However, magnesium supplementation is routinely administered intraoperatively in all cases immediately after opening of aortic cross clamp on CPB. Decision to administer empirical magnesium therapy was with the team providing intensive care at the time of onset of poAF.

- h) Reintubation for poAF. There were no episodes of poAF which required reintubation. DC cardioversion was always performed under sedation.
- i) ICU readmission for poAF. There were no instances of ICU readmission for treatment of poAF among patients who developed poAF while in the ward. These episodes of poAF were managed in the postoperative ward without any reported adverse events. Hence, it is important to have adequate facilities in ward for detection and management of poAF after CABG.
- j) Pacing at the time of poAF. Majority of patients were not being paced prophylactically at the time of onset of poAF. The study unit did not practice prophylactic pacing for all patients uniformly. The need to provide atrial pacing was decided, on a case to case basis, by the operating team. However, prophylactic biatrial pacing has been reported to be an effective method for preventing poAF (39).
- k) Recurrence of poAF (%). The recurrence rate of 37% after successful treatment of first episode noted in our study sample was similar to the previous report by Filardo et al (25). This means that one in three patients is likely to develop recurrence of poAF. Hence, patients who develop poAF should be monitored closely even after successful treatment of first episode of poAF.

- l) The time between cessation of first poAF and recurrence. The mean duration for developing recurrence of poAF after successful treatment of first episode of poAF was 14.7 hours (Median 8 hours). This data highlights the importance of continued monitoring for development of poAF even after successful therapy of first episode.
- m) Successful therapy for recurrence of poAF. Recurrence of poAF was successfully treated in majority (92.5%) of patients with Amiodarone infusion. However, one patient was referred to electrophysiology specialist for evaluation of paroxysmal atrial fibrillation developed postoperatively after CABG.
- n) POD for starting Amiodarone therapy after surgery. Majority of patients in our study (94.4%) suffering poAF were initiated on oral Amiodarone therapy for treatment of poAF after completion of infusion of Amiodarone as per institutional protocol. This was usually initiated on third postoperative day, as noted in this study sample.

This study of characteristics of poAF developing after CABG reveals that most patients develop poAF within the first 3 days after surgery, usually after being completely weaned off ventilatory support in ICU and majority can be treated using amiodarone including one third of patients who develop recurrence. However, this does not preclude the necessity for DC cardioversion for severe cases. Patients who have developed an episode of poAF earlier should be monitored closely for recurrence till hospital discharge. Postoperative wards should be adequately equipped for detection and management of poAF with Amiodarone infusion.

Factors associated with poAF

The factors included in the present study for association with poAF after CABG are tabulated in table 10.

- a) Advanced age: Elderly patients have been reported to be at higher risk of poAF. In our study, mean age of patients who developed poAF after CABG was significantly higher (63.5 ± 7.4) when compared to patients who did not develop poAF after CABG (58.3 ± 8.1) ($p < 0.001$) (Table R3). Similarly, patients older than 75 years developed poAF (50%) more often than patients younger than 75 years (19%). This increased risk of poAF in elderly individuals was similarly demonstrated in previous studies (65).
- b) Preexisting chronic kidney disease (defined as Creatinine clearance < 60 ml/min per 1.73 m^2 BSA) is associated with higher incidence of poAF in our study population. In addition, lower preoperative creatinine clearance was significantly associated with poAF. These findings are similar to the earlier reports where patients with lower creatinine clearance were at higher risk of poAF after CABG (17).
- c) NYHA Class and Congestive cardiac failure were associated with poAF in the study sample. Similarly, LA size reported on preoperative TTE (PLAX view) was associated with poAF. CCF has been investigated as part of CHA₂DS₂-VASc score for predicting development of poAF after CABG (13). Increasing LA size in the absence of valvular heart disease can be considered as a sign of congestive heart failure. Left Ventricular Ejection Fraction, which is a marker of LV systolic function, is not associated with poAF after CABG in the present study sample ($p = 0.54$).
- d) Diabetes has been found to be associated with poAF after CABG in the study population ($p = 0.027$). This has also been investigated as part of CHA₂DS₂-VASc score for predicting development of poAF after CABG (13).

- e) Vascular disease consisting of either myocardial infarction, peripheral arterial disease or aortic plaque was significantly associated with poAF after CABG. This factor has also been reported to be associated with poAF after CABG ($p=0.0002$).
- f) On coronary angiography, the extent of RCA occlusion, if more than 90% was significantly associated with development of poAF after CABG ($p=0.001$). This is probably explained by the blood supply provided by RCA to sino-atrial node in majority of cases.
- g) Smoking, COPD or Chronic respiratory disease are not associated with poAF after CABG in the study population. In a previous study of 756 patients (61), poAF after CABG developed in 20% of patients with pre-existing COPD. However, this was not statistically different when compared to patients without COPD. Our study findings are similar to previous findings. Hypothyroidism (on Eltroxin replacement therapy) was not associated with significantly different poAF after CABG ($p=0.26$). Multiple studies have evaluated male gender as a risk factor for poAF after cardiac surgery. However, male gender is not consistently reported to be associated with poAF after cardiac surgery (1) (23). Atrial fibrillation risk score provides separate scoring systems for both genders for prediction of poAF after cardiac surgery(27). Our study results suggest that there is no significant difference between males and females for developing poAF after cardiac surgery. Hypertension was found to be associated with poAF after CABG in published literature (1)(27). However, hypertension was not added to final predictive model developed using statistical methods like Atrial fibrillation risk score. In our study, hypertension was not associated with poAF after CABG. Previous history of Stroke / TIA was not associated with poAF after CABG in our study sample. However, poAF has been

associated with increased risk of stroke after CABG (60). Baseline hemoglobin level was not associated with poAF in the present study.

- h) CHA₂DS₂VASc Score. This score was evaluated in the present study for ability to predict poAF after CABG. The possible score ranges between 0 and 9. The mean score was 3.3 ± 1.4 in patients developing poAF compared to 2.45 ± 1.20 in patients without poAF. This difference was found to be statistically significant ($p < 0.0001$). This difference was similar to results reported by Kashani et al (13). The area under ROC curve in the present study was 0.67 with an optimal cut-off of 3 for prediction of poAF after CABG. However, this was similar to the results from a recent meta-analysis of 12 studies involving 18,086 patients where the ROC AUC of this score was 0.76 (95% CI 0.72 – 0.79) (10). This difference could probably be attributed to the demographic differences in the incidence and risk factors for poAF after cardiac surgery.
- i) Perioperative Ranolazine therapy, as a short course therapy, has been reported to reduce the incidence of poAF after CABG (43). In the present study, patients who were on preoperative Ranolazine were evaluated for association with poAF after CABG. The difference in the incidence of poAF among patients who were continued on pre-existing Ranolazine therapy was not found to be different from those patients not on preoperative Ranolazine therapy ($p = 0.63$). This difference could probably be attributed to the difference in recommended dosage of Ranolazine (1000mg twice a day or combination of oral and parenteral therapy) as well as continuation of this therapy in the postoperative period for 7 days recommended for poAF prophylaxis compared to the usual dosage being used by patients as an anti-anginal medication (500mg twice/thrice a day) in this observational study. In addition, the low number of patients (13%) in the entire

study sample who were on preoperative Ranolazine therapy could also contribute to this result.

- j) Reintroduction of beta-blockers after cardiac surgery has been suggested as a part of care bundle for prevention of poAF after cardiac surgery (82). Restarting betablocker therapy within 48 hours is associated with reduced incidence of poAF after cardiac surgery(81). In the present study, there was no difference in the numbers of patients in whom betablockers were introduced after CABG ($p=0.85$). However, beta blockers were reintroduced later (3.29 days vs 2.82 days; $p=0.01$) in among patients who developed poAF compared to patients who did not develop poAF. In a recently reported prospective study with 663 patients, the incidence of poAF after cardiac surgery was 44% with the median duration before reintroduction after surgery was reported to be 49.5 hours (81). The reasons for failure to reintroduce therapy have been reported(82). The present study did not include collection of data related to barriers for non-reintroduction of betablocker therapy. However, the investigators have noticed that the most common reasons were ongoing inotrope support and low heart rate ($< 60/\text{min}$)
- k) Preoperative ICU admission, Preoperative ICU stay (hours), Operation duration and CPB time, CPB reinstitution after first CPB run, number of distal coronary grafts, IABP use, use of Swan Ganz catheter intraoperatively and coronary endarterectomy did not affect the incidence of poAF in the present study. This was similar to previously reported results (76). Patients who developed poAF were reported to have higher rates use of IABP (55). This association was not detected in the present study. CPB duration more than 120 minutes was included as a factor for atrial fibrillation risk score system (9). In the present study, Aortic cross clamp time was associated with poAF after CABG ($p=0.02$).

- l) CABG on CPB, OPCABG, CPB with beating heart. There was no difference in poAF after CABG among patients undergoing either CABG using CPB, Off pump CABG or CABG on beating heart with CPB ($p=0.1325$) in the present study. Some earlier recommendations suggested that OPCABG was associated with reduced incidence of poAF (39). However, recent literature suggests that there is no difference in terms of poAF between patients who undergo OPCABG versus patients undergoing CABP on-pump (55).

Outcomes

- a) Postoperative stay in ICU (hours) and overall duration of hospital stay after surgery (hours) (number of days) were significantly longer in patients who developed poAF after CABG. This prolongation of ICU stay and hospital length of stay is consistent with existing literature (1)(7)(55). However, the duration of stay in the ward after ICU stay was not different between patients who developed poAF and others ($p=0.54$). This may be attributed to additional hospital stay for certain unrelated factors like optimization of glycemic control and other administrative issues. The present study does not include collection of these parameters.
- b) Death after surgery. A total of seven deaths occurred among all patients included in the study. There is no significant difference in occurrence of death before hospital discharge between patients who developed poAF and patients who did not develop poAF (1.5% vs 1.3%; $p=1.0$). However, poAF has been reported to be associated with increased incidence of death in some earlier studies (55).
- c) Renal dysfunction has been uniformly reported to be associated with poAF after cardiac surgery. Peak Serum Creatinine (absolute rise from baseline as well percentage rise from baseline) within 7 days after surgery is significantly higher in

patients who developed poAF when compared to patients who did not develop poAF ($p<0.001$). The peak rise in serum creatinine occurred between second and third day among patients who developed poAF as well as patients without poAF (2.49 ± 2.24 vs 1.98 ± 1.06 ; $p=0.06$). The number of patients requiring dialysis during hospital stay after CABG was 0.9%. The requirement of dialysis among patients was 2.7% among patients developing poAF when compared to 0.5% among patients who did not develop poAF. However, this difference was not statistically significant ($p=0.27$). Hence, renal dysfunction associated with poAF is higher among patients developing poAF but without higher need for renal replacement therapy.

- d) Infection up to POD 28 after surgery occurred in 15% of patients who developed poAF when compared to 9.1% of patients without poAF. This difference was statistically significant ($p=0.041$). This finding is consistent with the existing literature.
- e) Tracheostomy was performed during hospital stay in three patients included in the study sample. All these patients had an episode of poAF. This difference was statistically significant ($p<0.01$). This association of need for tracheostomy with poAF after CABG is consistent with existing literature (3)(1).

Limitations.

The study was conducted at a cardiac surgical unit without rigid protocols for prevention of poAF after CABG. Contemporary surgical methods for poAF prevention like posterior pericardiectomy and active chest tube drainage could not be evaluated as these techniques were not practiced in the unit. Intensive care protocols for routine assessment of serum magnesium levels and its supplementation were not practiced. Hence, these factors could not be studied. However, magnesium sulphate was administered in all cases after opening of aortic cross clamp

during CPB. Therapy for poAF using broad principles of managing stable poAF with Amiodarone and unstable poAF with DC cardioversion was followed, although this varied depending on the physician managing the patient. No data regarding the efficacy of drugs such as Ibutilide or Digoxin for management of poAF could be generated as these drugs are not routinely administered in this unit. In the study unit, Preoperative betablocker therapy was continued in all cases, however the reintroduction of betablocker therapy after surgery was not uniform, usually due to the either continued requirement of inotropic support requirements or low heart rate. The significant difference in the time of reintroduction of beta-blockers noted between patients who developed poAF and others who did not, could not be evaluated further due to other limiting factors such as intropes and lower heart rate. Long-term follow-up of patients who developed atrial fibrillation after CABG in terms of their morbidity, hospital readmission, mortality, need for anti-arrhythmic therapy and cardiac function were not planned as part of this study.

Conclusion

Conclusions

The present study conducted at a large tertiary care cardiac centre found that 15.6% of patients undergoing isolated CABG developed new-onset poAF. Advanced, lower eGFR, diabetes mellitus, vascular disease and larger LA size are associated with development of poAF after CABG in the study sample. The use of CHA₂DS₂-VASc score with a cut-off of 3 for prediction of poAF has been found feasible.

The episodes of poAF after isolated CABG usually occur on 2nd day after surgery usually lasting about 4 to 6 hours and are successfully treatable with infusion of Amiodarone. Most episodes of poAF have occurred during ICU stay, after weaning off mechanical ventilatory support and usually after tapering off inotropic supports. Recurrence of poAF occurs in 37% of patients after first successful treatment of first episode. This occurs usually about 8 hours after treatment of first episode and is treatable with Amiodarone. No episodes of reintubation or readmission to ICU due to poAF have occurred in the study sample.

Development of poAF is associated with prolonged ICU as well as hospital stay, elevated serum creatinine levels, increased infectious complications and need for tracheostomy. There is no association with mortality, need for renal replacement therapy, or need for IABP associated with poAF after CABG.

Bibliography:

1. Aranki SF, Shaw DP, Adams DH, Rizzo RJ, Couper GS, VanderVliet M, et al. Predictors of atrial fibrillation after coronary artery bypass surgery. *Circulation*. 1996;94(3):390–7.
2. Filardo G, Pollock BD, da Graca B, Phan TK, Sass DM, Ailawadi G, et al. Underestimation of the incidence of new-onset post–coronary artery bypass grafting atrial fibrillation and its impact on 30-day mortality. *J Thorac Cardiovasc Surg*. 2017;154(4):1260–6.
3. Gudbjartsson T, Helgadottir S, Sigurdsson MI, Taha A, Jeppsson A, Christensen TD, et al. New-onset postoperative atrial fibrillation after heart surgery. Vol. 64, *Acta Anaesthesiologica Scandinavica*. 2020. p. 145–55.
4. Ivanov RNJ, Weisel RD, David TE, David Naylor C. Fifteen-year trends in risk severity and operative mortality in elderly patients undergoing coronary artery bypass graft surgery. *Circulation*. 1998;97(7):673–80.
5. Zaman AG, Archbold RA, Helft G, Paul EA, Curzen NP, Mills PG. Atrial Fibrillation After Coronary Artery Bypass Surgery A Model for Preoperative Risk Stratification. *Circulation*. 2000;101:1403.
6. Tran DTT, Perry JJ, Dupuis JY, Elmetekawy E, Wells GA. Predicting New-Onset Postoperative Atrial Fibrillation in Cardiac Surgery Patients. In: *Journal of Cardiothoracic and Vascular Anesthesia*. Elsevier; 2015. p. 1117–26.

7. Kim MH, Deeb GM, Morady F, Bruckman D, Hallock LR, Smith KA, et al. Effect of postoperative atrial fibrillation on length of stay after cardiac surgery (the postoperative atrial fibrillation in cardiac surgery study [PACS2]). *Am J Cardiol.* 2001;87(7):881–5.
8. Mathew JP, Fontes ML, Tudor IC, Ramsay J, Duke P, Mazer CD, et al. A Multicenter Risk Index for Atrial Fibrillation after Cardiac Surgery. *J Am Med Assoc.* 2004;291(14):1720–9.
9. Zhang W, Liu W, Chew STH, Shen L, Ti LK. A Clinical Prediction Model for Postcardiac Surgery Atrial Fibrillation in an Asian Population. *Anesth Analg.* 2016;123(2):283–9.
10. Chen Y lin, Zeng M, Liu Y, Xu Y, Bai Y, Cao L, et al. CHA2DS2-VASc Score for Identifying Patients at High Risk of Postoperative Atrial Fibrillation After Cardiac Surgery: A Meta-analysis. *Ann Thorac Surg.* 2020;109(4):1210–6.
11. Perrier S, Meyer N, Hoang Minh T, Announe T, Bentz J, Billaud P, et al. Predictors of Atrial Fibrillation After Coronary Artery Bypass Grafting: A Bayesian Analysis. *Ann Thorac Surg.* 2017;103(1):92–7.
12. Helgadottir S, Sigurdsson MI, Ingvarsdottir IL, Arnar DO, Gudbjartsson T. Atrial fibrillation following cardiac surgery: risk analysis and long-term survival. *J Cardiothorac Surg.* 2012;7(1):1–7.
13. Kashani RG, Sareh S, Genovese B, Hershey C, Rezentes C, Shemin R, et al. Predicting postoperative atrial fibrillation using CHA2DS2-VASc

- scores. *J Surg Res.* 2015;198(2):267–72.
14. Wong JK, Maxwell BG, Kushida CA, Sainani KL, Lobato RL, Joseph Woo Y, et al. Obstructive Sleep Apnea Is an Independent Predictor of Postoperative Atrial Fibrillation in Cardiac Surgery. *J Cardiothorac Vasc Anesth.* 2015;29(5):1140–7.
 15. Chua SK, Shyu KG, Lu MJ, Hung HF, Cheng JJ, Chiu CZ, et al. Renal dysfunction and the risk of postoperative atrial fibrillation after cardiac surgery: Role beyond the CHA2DS2-VASc score. *Europace.* 2015;17(9):1363–70.
 16. Klinger RY, Thunberg CA, White WD, Fontes M, Waldron NH, Piccini JP, et al. Intraoperative magnesium administration does not reduce postoperative atrial fibrillation after cardiac surgery. *Anesth Analg.* 2015;121(4):861–7.
 17. Limite LR, Magnoni M, Berteotti M, Peretto G, Durante A, Cristell N, et al. The predictive role of renal function and systemic inflammation on the onset of de novo atrial fibrillation after cardiac surgery. *Eur J Prev Cardiol.* 2016;23(2):206–13.
 18. Patti G, Bennett R, Seshasai SRK, Cannon CP, Cavallari I, Chello M, et al. Statin pretreatment and risk of in-hospital atrial fibrillation among patients undergoing cardiac surgery: A collaborative meta-analysis of 11 randomized controlled trials. *Europace.* 2015;17(6):855–63.
 19. Hammond DA, Smotherman C, Jankowski CA, Tan S, Osian O, Kraemer

- D, et al. Short-course of ranolazine prevents postoperative atrial fibrillation following coronary artery bypass grafting and valve surgeries. Clin Res Cardiol. 2015;104(5):410–7.
20. Wong JK, Lobato RL, Pinesett A, Maxwell BG, Mora-Mangano CT, Perez M V. P-wave characteristics on routine preoperative electrocardiogram improve prediction of new-onset postoperative atrial fibrillation in cardiac surgery. J Cardiothorac Vasc Anesth. 2014;28(6):1497–504.
21. Hernandez A V., Kaw R, Pasupuleti V, Bina P, Ioannidis JPA, Bueno H, et al. Association between obesity and postoperative atrial fibrillation in patients undergoing cardiac operations: A systematic review and meta-analysis. Ann Thorac Surg. 2013;96(3):1104–16.
22. Bramer S, Van Straten AHM, Soliman Hamad MA, Berreklouw E, Martens EJ, Maessen JG. The impact of new-onset postoperative atrial fibrillation on mortality after coronary artery bypass grafting. Ann Thorac Surg. 2010;90(2):443–9.
23. Rezaei Y, Peighambari MM, Naghshbandi S, Samiei N, Ghavidel AA, Dehghani MR, et al. Postoperative Atrial Fibrillation Following Cardiac Surgery: From Pathogenesis to Potential Therapies. Vol. 20, American Journal of Cardiovascular Drugs. Springer International Publishing; 2020. p. 19–49.
24. Phan K, Ha HSK, Phan S, Medi C, Thomas SP, Yan TD. New-onset atrial

- fibrillation following coronary bypass surgery predicts long-term mortality: A systematic review and meta-analysis. *Eur J Cardio-thoracic Surg.* 2015;48(6):817–24.
25. Filardo G, Damiano RJ, Ailawadi G, Thourani VH, Pollock BD, Sass DM, et al. Epidemiology of new-onset atrial fibrillation following coronary artery bypass graft surgery. *Heart.* 2018;104(12):985–92.
 26. Mariscalco G, Biancari F, Zanobini M, Cottini M, Piffaretti G, Saccocci M, et al. Bedside tool for predicting the risk of postoperative atrial fibrillation after cardiac surgery: the POAF score. *J Am Heart Assoc.* 2014;3(2):1–9.
 27. El-Chami MF, Kilgo PD, Elfstrom KM, Halkos M, Thourani V, Lattouf OM, et al. Prediction of new onset atrial fibrillation after cardiac revascularization surgery. *Am J Cardiol.* 2012 Sep 1;110(5):649–54.
 28. Lip GYH, Nieuwlaat R, Pisters R, Lane DA, Crijns HJGM, Andresen D, et al. Refining clinical risk stratification for predicting stroke and thromboembolism in atrial fibrillation using a novel risk factor-based approach: The Euro Heart Survey on atrial fibrillation. *Chest.* 2010 Feb 1;137(2):263–72.
 29. Cameron MJ, Tran DTT, Abboud J, Newton EK, Rashidian H, Dupuis JY. Prospective External Validation of Three Preoperative Risk Scores for Prediction of New Onset Atrial Fibrillation after Cardiac Surgery. *Anesth Analg.* 2018;126(1):33–8.

30. Davis EM, Packard KA, Hilleman DE. Pharmacologic prophylaxis of postoperative atrial fibrillation in patients undergoing cardiac surgery: Beyond β -blockers. *Pharmacotherapy*. 2010;30(7):3007.
31. Simopoulos V, Hevas A, Hatziefthimiou A, Dipla K, Skoularigis I. Amiodarone plus Ranolazine for Conversion of Post-Cardiac Surgery Atrial Fibrillation : Enhanced Effectiveness in Reduced Versus Preserved Ejection Fraction Patients. 2018;
32. St-Onge S, Ben Ali W, Bouhout I, Bouchard D, Lamarche Y, Perrault LP, et al. Examining the impact of active clearance of chest drainage catheters on postoperative atrial fibrillation. *J Thorac Cardiovasc Surg*. 2017;154(2):501–8.
33. St-Onge S, Perrault LP, Demers P, Boyle EM, Gillinov AM, Cox J, et al. Pericardial Blood as a Trigger for Postoperative Atrial Fibrillation After Cardiac Surgery. *Ann Thorac Surg*. 2018;105(1):321–8.
34. Kuralay E, Ozal E, Demirkilic U, Tatar H. Effect of posterior pericardiotomy on postoperative supraventricular arrhythmias and late pericardial effusion (posterior pericardiotomy). *J Thorac Cardiovasc Surg*. 1999;118(3):492–5.
35. Ronsoni RDM, Souza AZM, Leiria TLL, de Lima GG. Update on management of postoperative atrial fibrillation after cardiac surgery. Vol. 35, *Brazilian Journal of Cardiovascular Surgery*. 2020. p. 206–10.
36. January CT, Wann LS, Alpert JS, Calkins H, Cigarroa JE, Cleveland JC,

- et al. 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: Executive summary: A report of the American College of cardiology/American heart association task force on practice guidelines and the heart rhythm society. Vol. 130, Circulation. 2014. 2071–2104 p.
37. Fernando HC, Jaklitsch MT, Walsh GL, Tisdale JE, Bridges CD, Mitchell JD, et al. The society of thoracic surgeons practice guideline on the prophylaxis and management of atrial fibrillation associated with general thoracic surgery: Executive summary. *Ann Thorac Surg*. 2011;92(3):1144–52.
38. Omar AS, Ewila H, Allam M, Aboulnagah S, Hanoura S, Sivadasan PC, et al. Improving Incidence of Postoperative Atrial Fibrillation After Cardiac Surgery Using Simplified Clinical Practice Guidelines. *J Intensive Care Med*. 2016;33(8):481–5.
39. Dunning J, Treasure T, Versteegh M, Nashef SAM. Guidelines on the prevention and management of de novo atrial fibrillation after cardiac and thoracic surgery. *Eur J Cardio-thoracic Surg*. 2006;30(6):852–72.
40. Fuster V, Rydén LE, Cannom DS, Crijns HJ, Curtis AB, Ellenbogen KA, et al. ACC/AHA/ESC 2006 guidelines for the management of patients with atrial fibrillation: A report of the American College of Cardiology/American Heart Association Task Force on practice guidelines and the European Society of Cardiology Committee for practice. *Circulation*. 2006;114(7):e257–354.

41. January CT, Wann LS, Alpert JS, Calkins H, Cigarroa JE, Cleveland JC, et al. 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: Executive summary: A report of the American college of cardiology/American heart association task force on practice guidelines and the heart rhythm society. *J Am Coll Cardiol*. 2014;64(21):2245–80.
42. Bhatt H V., Fischer GW. Atrial Fibrillation: Pathophysiology and Therapeutic Options. *J Cardiothorac Vasc Anesth*. 2015;29(5):1333–40.
43. Trivedi C, Upadhyay A, Solanki K. Efficacy of ranolazine in preventing atrial fibrillation following cardiac surgery: Results from a meta-analysis. *J Arrhythmia*. 2017;33(3):161–6.
44. Thein PM, White K, Banker K, Lunny C, Mirzaee S, Nasis A. Preoperative Use of Oral Beta-Adrenergic Blocking Agents and the Incidence of New-Onset Atrial Fibrillation After Cardiac Surgery. A Systematic Review and Meta-Analysis. Vol. 27, *Heart Lung and Circulation*. Australian and New Zealand Society of Cardiac and Thoracic Surgeons (ANZSCTS) and the Cardiac Society of Australia and New Zealand (CSANZ); 2018. p. 310–21.
45. Wang H, Chen J, Zhao L. N-3 polyunsaturated fatty acids for prevention of postoperative atrial fibrillation: updated meta-analysis and systematic review. *J Interv Card Electrophysiol*. 2018;51(2):105–15.
46. Kaw R, Hernandez A V., Masood I, Gillinov AM, Saliba W, Blackstone EH. Short- and long-term mortality associated with new-onset atrial

- fibrillation after coronary artery bypass grafting: A systematic review and meta-analysis. *J Thorac Cardiovasc Surg.* 2011;141(5):1305–12.
47. Shi R, Li ZH, Chen D, Wu QC, Zhou XL, Tie HT. Sole and combined vitamin C supplementation can prevent postoperative atrial fibrillation after cardiac surgery: A systematic review and meta-analysis of randomized controlled trials. *Clin Cardiol.* 2018;41(6):871–8.
48. Fairley JL, Zhang L, Glassford NJ, Bellomo R. Magnesium status and magnesium therapy in cardiac surgery: A systematic review and meta-analysis focusing on arrhythmia prevention. *J Crit Care.* 2017;42:69–77.
49. Liu Z, Nguyen Khuong J, Borg Caruana C, Jackson SM, Campbell R, Ramson DM, et al. The Prognostic Value of Elevated Perioperative Neutrophil-Lymphocyte Ratio in Predicting Postoperative Atrial Fibrillation After Cardiac Surgery: A Systematic Review and Meta-Analysis. *Heart Lung and Circulation.* Elsevier Ltd; 2020. p. <https://doi.org/10.1016/j.hlc.2019.11.021>.
50. Hui DS, Lee R. Do we need yet another way to classify atrial fibrillation? *J Thorac Cardiovasc Surg.* 2017;154(4):1267–8.
51. Calkins H, Kuck KH, Cappato R, Brugada J, Camm AJ, Chen SA, et al. 2012 HRS/EHRA/ECAS Expert Consensus Statement on Catheter and Surgical Ablation of Atrial Fibrillation: Recommendations for Patient Selection, Procedural Techniques, Patient Management and Follow-up, Definitions, Endpoints, and Research Trial Design. *Hear Rhythm.*

- 2012;9(4):632-696.e21.
52. Filardo G, Damiano RJ, Ailawadi G, Thourani VH, Pollock BD, Sass DM, et al. Epidemiology of new-onset atrial fibrillation following coronary artery bypass graft surgery. *Heart*. 2018 Jun 1;104(12):985–92.
 53. Mariscalco G, Engström KG. Postoperative Atrial Fibrillation Is Associated With Late Mortality After Coronary Surgery, but Not After Valvular Surgery. *Ann Thorac Surg*. 2009;88(6):1871–6.
 54. Matos JD, McIlvaine S, Grau-sepulveda M, Jawitz OK, Brennan JM, Khabbaz KR, et al. Anticoagulation and amiodarone for new atrial fibrillation after coronary artery bypass grafting : Prescription patterns and 30-day outcomes in the United States and Canada. *J Thorac Cardiovasc Surg*. 2020;
 55. Lewicki Ł, Siebert J, Rogowski J. Atrial fibrillation following off-pump versus on-pump coronary artery bypass grafting: Incidence and risk factors. *Cardiol J*. 2016;23(5):518–23.
 56. Mangi AR, Zia K, Ali TA, Karim M, Fatimi SH. Postoperative Atrial Fibrillation Among Patients Undergoing Isolated Coronary Artery Bypass Grafting. *Cureus*. 2019 Mar 28;11(9):e4333.
 57. Dave S, Nirgude A, Gujjar P, Sharma R. Incidence and risk factors for development of atrial fibrillation after cardiac surgery under cardiopulmonary bypass. *Indian J Anaesth*. 2018 Nov 1;62(11):887–91.
 58. Farouk Musa A, Quan CZ, Xin LZ, Soni T, Dillon J, Hay YK, et al. A

- retrospective study on atrial fibrillation after coronary artery bypass grafting surgery at the National Heart Institute, Kuala Lumpur [version 2; referees: 2 approved]. F1000Research. 2018 Feb 8;7:164.
59. Tamis-Holland JE, Kowalski M, Rill V, Firoozi K, Steinberg JS. Patterns of atrial fibrillation after coronary artery bypass surgery. *Ann Noninvasive Electrocardiol.* 2006;11(2):139–44.
 60. Anderson E, Dyke C, Levy JH. Anticoagulation strategies for the management of postoperative atrial fibrillation. *Clin Lab Med.* 2014;34(3):537–61.
 61. Vural Ü, Ağlar AA. What is the role of metabolic syndrome and obesity for postoperative atrial fibrillation after coronary bypass grafting? *BMC Cardiovasc Disord.* 2019;19(1):1–12.
 62. Trooboff SW, Magnus PC, Ross CS, Chaisson K, Kramer RS, Helm RE, et al. A multi-center analysis of readmission after cardiac surgery: Experience of The Northern New England Cardiovascular Disease Study Group. *J Card Surg.* 2019;34(8):655–62.
 63. Maimari M, Baikoussis N, Gaitanakis S, Dalipi-Triantafillou A, Katsaros A, Kantsos C, et al. Does minimal invasive cardiac surgery reduce the incidence of post-operative atrial fibrillation? Vol. 23, *Annals of Cardiac Anaesthesia.* Wolters Kluwer Medknow Publications; 2020. p. 7–13.
 64. Pandit S V, Jalife J. Aging and Af Research: Where We Are and Where We Should Go. *Hear Rhythm.* 2007;4(2):186–7.

65. Luo W, Zhen W, Ouyang X, Wang Z, Ma Y, Tan J, et al. Predictors of postoperative atrial fibrillation after isolated on-pump coronary artery bypass grafting in patients ≥ 60 years old. *Heart Surg Forum*. 2017;20(1):E38–42.
66. Perez M V., Dewey FE, Marcus R, Ashley EA, Al-Ahmad AA, Wang PJ, et al. Electrocardiographic predictors of atrial fibrillation. *Am Heart J*. 2009;158(4):622–8.
67. Keskin HA, Kurtul A. Fragmented QRS complexes are associated with postoperative atrial fibrillation development after coronary artery bypass grafting surgery. *Coron Artery Dis*. 2020 Apr;
68. Kogo H, Sezai A, Osaka S, Shiono M, Tanaka M. Does epicardial adipose tissue influence postoperative atrial fibrillation? *Ann Thorac Cardiovasc Surg*. 2019;25(3):149–57.
69. Mahmood E, Khabbaz KR, Bose R, Mitchell J, Zhang Q, Chaudhary O, et al. Immediate Preoperative Transthoracic Echocardiography for the Prediction of Postoperative Atrial Fibrillation in High-Risk Cardiac Surgery. *J Cardiothorac Vasc Anesth*. 2020;34(3):719–25.
70. Barbara D, Rehfeldt K, Pulido J, Li Z, White R, Schaff H, et al. Diastolic function and new-onset atrial fibrillation following cardiac surgery. *Ann Card Anaesth*. 2015;18(1):8–14.
71. Khan MS, Yamashita K, Sharma V, Ranjan R, Selzman CH, Dossall DJ. Perioperative Biomarkers Predicting Postoperative Atrial Fibrillation Risk

- After Coronary Artery Bypass Grafting: A Narrative Review. J Cardiothorac Vasc Anesth. 2020;34(7):1933–41.
72. Kaplan M, Kut MS, Icer UA, Demirtas MM. Intravenous magnesium sulfate prophylaxis for atrial fibrillation after coronary artery bypass surgery. J Thorac Cardiovasc Surg. 2003;125(2):344–52.
73. Kohno H, Koyanagi T, Kasegawa H, Miyazaki M. Three-day magnesium administration prevents atrial fibrillation after coronary artery bypass grafting. Ann Thorac Surg. 2005;79(1):117–26.
74. Osawa EA, Cutuli SL, Cioccari L, Bitker L, Peck L, Young H, et al. Continuous Magnesium Infusion to Prevent Atrial Fibrillation After Cardiac Surgery: A Sequential Matched Case-Controlled Pilot Study. J Cardiothorac Vasc Anesth. 2020;000:1–8.
75. Schwartz SM. Should magnesium be routine for arrhythmia prevention? J Thorac Cardiovasc Surg. 2018;156(2):762.
76. Shahbazian N, Jafari RM, Haghnia S. Association between incidence of atrial fibrillation and duration of cardiopulmonary bypass in coronary artery bypass graft surgery (CABG): a cohort study. Electron Physician. 2018;10(4):6624–30.
77. Khan MS, Yamashita K, Sharma V, Ranjan R, Dosdall DJ. RNAs and Gene Expression Predicting Postoperative Atrial Fibrillation in Cardiac Surgery Patients Undergoing Coronary Artery Bypass Grafting. J Clin Med. 2020;9(4):1139.

78. Amar D, Shi W, Hogue CW, Zhang H, Passman RS, Thomas B, et al. Clinical prediction rule for atrial fibrillation after coronary artery bypass grafting. *J Am Coll Cardiol*. 2004;44(6):1248–53.
79. Krishna VR, Nitin P, Anitha N. Prospective Evaluation of the Utility of CHA2 DS2 -VASc Score in the Prediction of Postoperative Atrial Fibrillation after Off-pump Coronary Artery Bypass Surgery – An Observational Study. *Ann Card Anaesth*. 2019;22(1):1–5.
80. Muehlschlegel JD, Burrage PS, Ngai JY, Prutkin JM, Huang CC, Xu X, et al. Society of Cardiovascular Anesthesiologists/European Association of Cardiothoracic Anaesthetists Practice Advisory for the Management of Perioperative Atrial Fibrillation in Patients Undergoing Cardiac Surgery. *Anesth Analg*. 2019;128(1):33–42.
81. Couffignal C, Amour J, Ait-Hamou N, Cholley B, Fellahi JL, Duval X, et al. Timing of β -Blocker Reintroduction and the Occurrence of Postoperative Atrial Fibrillation after Cardiac Surgery: A Prospective Cohort Study. *Anesthesiology*. 2020;132(2):267–79.
82. Buerge M, Magboo R, Wills D, Karpouzis I, Balmforth D, Cooper P, et al. Doing simple things well: Practice Advisory Implementation Reduces Atrial Fibrillation after Cardiac Surgery. *J Cardiothorac Vasc Anesth*. 2020;000:1–8.
83. Van der Does WFB, De Groot NMS. Prophylaxis with amiodarone for postoperative atrial fibrillation: When and who? *J Thorac Dis*.

- 2018;10(10):S3831–3.
84. Howard PA, Barnes BJ. Potential use of statins to prevent atrial fibrillation after coronary artery bypass surgery. *Ann Pharmacother*. 2008;42(2):253–8.
 85. Sezai A, Osaka S, Yaoita H, Ishii Y, Arimoto M, Hata H, et al. Safety and efficacy of landiolol hydrochloride for prevention of atrial fibrillation after cardiac surgery in patients with left ventricular dysfunction: Prevention of Atrial Fibrillation after Cardiac Surgery with Landiolol Hydrochloride for Left Ventric. *J Thorac Cardiovasc Surg*. 2015;150(4):957–64.
 86. Walter E, Heringlake M. Cost-Effectiveness Analysis of Landiolol, an Ultrashort-Acting Beta-Blocker, for Prevention of Postoperative Atrial Fibrillation for the Germany Health Care System. *J Cardiothorac Vasc Anesth*. 2020 Apr 1;34(4):888–97.
 87. Liu Y, Zhang L, Wang S, Lu F, Zhen J, Chen W. Dexmedetomidine Reduces Atrial Fibrillation After Adult Cardiac Surgery: A Meta-Analysis of Randomized Controlled Trials. *Am J Cardiovasc Drugs*. 2019;<https://doi.org/10.1177/1534578419854444>.
 88. Metoprolol Versus Amiodarone in the Prevention of Atrial Fibrillation After Cardiac Surgery - A randomised trial. *Ann Intern Med*. 2010;703–10.
 89. Auer J, Weber T, Berent R, Puschmann R, Hartl P, Ng CK, et al. A comparison between oral antiarrhythmic drugs in the prevention of atrial

- fibrillation after cardiac surgery: The Pilot Study of Prevention of Postoperative Atrial Fibrillation (SPPAF), a randomized, placebo-controlled trial. *Am Heart J.* 2004;147(4):636–43.
90. Mehaffey JH, Hawkins RB, Byler M, Smith J, Kern JA, Kron I, et al. Amiodarone Protocol Provides Cost-Effective Reduction in Postoperative Atrial Fibrillation. *Ann Thorac Surg.* 2018;105(6):1697–702.
91. Nygård E, Sørensen LH, Hviid LB, Pedersen FM, Ravn J, Thomassen L, et al. Effects of amiodarone and thoracic epidural analgesia on atrial fibrillation after coronary artery bypass grafting. *J Cardiothorac Vasc Anesth.* 2004;18(6):709–14.
92. Chatterjee S, Sardar P, Mukherjee D, Lichstein E, Aikat S. Timing and route of amiodarone for prevention of postoperative atrial fibrillation after cardiac surgery: A network regression meta-analysis. *PACE - Pacing Clin Electrophysiol.* 2013;36(8):1017–23.
93. Gillinov AM, Bagiella E, Moskowitz AJ, Raiten JM, Groh MA, Bowdish ME, et al. Rate control versus rhythm control for atrial fibrillation after cardiac surgery. *N Engl J Med.* 2016;374(20):1911–21.
94. Cybulski J, Kułakowski P, Budaj A, Danielewicz H, Maciejewicz J, Kawka-Urbanek T, et al. Intravenous amiodarone for cardioversion of recent-onset atrial fibrillation. *Clin Cardiol.* 2003;26(7):329–35.
95. Samuels LE, Holmes EC, Samuels FL. Selective use of amiodarone and early cardioversion for postoperative atrial fibrillation. *Ann Thorac Surg.*

- 2005;79(1):113–6.
96. Schnaubelt S, Niederdöckl J, Simon A, Schütz N, Holaubek C, Edlinger-Stanger M, et al. Hemodynamic effects of Vernakalant in cardio-surgical ICU-patients treated for recent-onset postoperative atrial fibrillation. *Sci Rep*. 2020;10(1):1–7.
 97. Camm AJ, Kirchhof P, Lip GYH, Schotten U, Savelieva I, Ernst S, et al. Guidelines for the management of atrial fibrillation. *Eur Heart J*. 2010;31(19):2369–429.
 98. Mitchell LB. Canadian Cardiovascular Society atrial fibrillation Guidelines 2010: Prevention and treatment of atrial fibrillation following cardiac surgery. *Can J Cardiol*. 2011;27(1):91–7.
 99. Kirchhof P, Benussi S, Kotecha D, Ahlsson A, Atar D, Casadei B, et al. 2016 ESC Guidelines for the management of atrial fibrillation developed in collaboration with EACTS. *Eur Heart J*. 2016;37(38).
 100. Levey AS, Bosch JP, Lewis JB, Greene T. A More Accurate Method To Estimate Glomerular Filtration Rate from Serum Creatinine: A New Prediction Equation. *Ann Intern Med*. 1999;130(6):461–70.
 101. El-Chami MF, Kilgo PD, Elfstrom KM, Halkos M, Thourani V, Lattouf OM, et al. Prediction of new onset atrial fibrillation after cardiac revascularization surgery. *Am J Cardiol*. 2012;110(5):649–54.

Annexures

a) Patient information sheet

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രോഗിക്കുള്ള കാര്യവിവരണ പത്രം

പഠനശീർഷകം: മുൻകൂട്ടി നിശ്ചയിച്ച കൊറോണി ആർട്ടറി ബൈപാസ് ഗ്രാഫ്റ്റിംഗ് ശസ്ത്രക്രിയക്കു വിധേയരായവരിൽപുതുതായി ഉണ്ടാകുന്ന എട്രിയൽ ഫൈബ്രിലേഷന്റെ ആക്രമണ സംഭവങ്ങളും അപായ ഘടകങ്ങളും സംബന്ധിച്ച പഠനം.

ഹൃദയശസ്ത്രക്രിയക്കു ശേഷം ഹൃദയത്തിൽ ഉണ്ടാകുന്ന വൈദ്യുത ... അതിനെ പ്രകോപിപ്പിക്കുന്നതോ തടയുന്നതോ ആയ ഘടകങ്ങളും വിലയിരുത്താൻ ഞങ്ങൾ ആസൂത്രണം ചെയ്യുന്ന ഈ പഠനത്തിൽ പങ്കെടുക്കാൻ താങ്കളോട് ഞങ്ങൾ അഭ്യർത്ഥിക്കുന്നു. പഠനത്തിൽ ഈ ആശുപത്രിയിൽ നിന്നും കുറഞ്ഞത് 450 പേരെ ഉൾപ്പെടുത്താമെന്ന് ഞങ്ങൾ പ്രതീക്ഷിക്കുന്നു.

കാര്യവിവരണപത്രത്തിൽ പഠനസംബന്ധമായി അവശ്യമായ വിശദാംശങ്ങൾ താങ്കൾക്ക് എളുപ്പം മനസ്സിലാക്കാൻ നൽകിയിട്ടുണ്ട്.

എന്താണ് എട്രിയൽ ഫൈബ്രിലേഷൻ?

ഹൃദയം ശരീരത്തിന്റെ വിവിധ അവയവങ്ങളിലേക്ക് രക്തം പമ്പുചെയ്യുന്നു. രക്തം വെൻട്രിക്കിൾ ശരീരത്തിലേക്ക് പമ്പ് ചെയ്യുന്നതിനുമുമ്പ്, എട്രിയത്തിൽ ശേഖരിക്കപ്പെടുകയും വെൻട്രിക്കിളുകളിലേക്ക് ഒഴുകുകയും ചെയ്യുന്നു. ഹൃദയത്തിന്റെ സങ്കോചവും വികാസവും ഹൃദയത്തിനകത്തെ വേണ്ടും വിധമുള്ള വൈദ്യുത പ്രവാഹത്തെ ആശ്രയിച്ചിരിക്കുന്നു. ഹൃദയത്തിനുള്ളിലെ ഈ വൈദ്യുത സംവിധാനത്തിലെ തകരാറുകൾ ഹൃദയത്തിന്റെ സങ്കോച വികാസങ്ങളുടെ വിവിധതരം അസ്വഭാവികതകളിലേക്ക് നയിക്കും. എട്രിയത്തിലെ വൈദ്യുതിയുടെ പ്രവാഹം അസാധാരണമായി വേണ്ടും വിധമല്ലാതെ രക്തം ഹൃദയം പമ്പ് ചെയ്യുന്ന എട്രിയൽ ഫൈബ്രിലേഷൻ ഹൃദയത്തിന്റെ പ്രവർത്തന സംവിധാനത്തിലുണ്ടാകുന്ന ഒരുതരം അസ്വഭാവികതയാണ്.

ഹൃദയശസ്ത്രക്രിയക്കുശേഷമുള്ള എട്രിയൽ ഫൈബ്രിലേഷൻ എത്രത്തോളം സാധാരണമാണ്?

ഹൃദയശസ്ത്രക്രിയക്കുശേഷമുള്ള എട്രിയൽ ഫൈബ്രിലേഷൻ വളരെ സാധാരണമാണ്. ഹൃദയശസ്ത്രക്രിയക്ക് വിധേയരാകുന്ന 10ൽ 3 മുതൽ 7 വരെ രോഗികളിൽ ഇതുണ്ടാകുന്നു.

ഏതുതരം രോഗികളിലാണ് എട്രിയൽ ഫൈബ്രിലേഷൻ സാധ്യതയുള്ളത്?

ചില രോഗികൾക്ക് എട്രിയൽ പെഫ്ബ്രിലേഷന്റെ ഉയർന്ന അപായ സാധ്യതയുണ്ട്. വയസ്സായ രോഗികൾ, 65 വയസ്സിലേറെ, വാൽവ് രോഗമുള്ളവർ, ദീർഘകാലമായി ശ്വാസകോക രോഗമുള്ളവർ, ഹൃദയാഘാതം ഉണ്ടായ രോഗികൾ, ഹൃദയശസ്ത്രക്രിയക്കുശേഷം രക്തസമ്മർദ്ദത്തെ സഹായിക്കാൻ മരുന്ന് വേണ്ട രോഗികൾ എന്നിവരാണ്. ഹൃദയശസ്ത്രക്രിയതന്നെ എട്രിയൽ ഫൈബ്രിലേഷന്റെ അപായം വർദ്ധിപ്പിക്കുന്നു.

എട്രിയൽ ഫൈബ്രിലേഷന്റെ അപായസാധ്യതകൾ എന്തെല്ലാം?

എട്രിയൽ ഹൃദയശസ്ത്രക്രിയക്കു ശേഷമുണ്ടാകുന്ന എട്രിയൽ ഫൈബ്രിലേഷൻ തീവ്രപരിചരണവിഭാഗത്തിലെയും ആശുപത്രിയിലെയും നീണ്ട വാസത്തിനിടയാക്കുന്നു. വൃക്കകളുടെ പ്രശ്നങ്ങളും അണുബാധയുമുണ്ടാകുന്നു. ആകയാൽ എട്രിയൽ ഫൈബ്രിലേഷൻ തടയുന്നത് ഹൃദയ ശസ്ത്രക്രിയക്കുശേഷമുള്ള സുഖപ്പെടുമിനെ മെച്ചപ്പെടുത്തും.

ഞങ്ങളെന്തിന് ഈ പഠനം നടത്തുന്നു.

ഹൃദയശസ്ത്രക്രിയക്കു ശേഷം എട്രിയൽ ഫൈബ്രിലേഷൻ ഉണ്ടാകുന്ന രോഗികളുടെ എണ്ണം കുറയ്ക്കുക എന്നതാണ് ഈ പഠനത്തിന്റെ ലക്ഷ്യം. മുളിയിപ്പാഞ്ഞ എട്രിയൽ ഫൈബ്രിലേഷന്റെ അപായ

ഘടകങ്ങളുള്ള രോഗികളുടെ എണ്ണം അപഗ്രഥിക്കും. ഇത് ചികിത്സാരേഖകളും ശസ്ത്രക്രിയാനന്തരമുള്ള ചാർട്ടുകളുമുപയോഗിച്ചാണ്.

പഠനമാരംഭിച്ചശേഷം താങ്കൾക്ക് പിൻമാറ്റമോ?

താങ്കളുടെ പഠനത്തിലുള്ള പങ്കാളിത്തം തികച്ചും സമയേയായാണ്, പഠനത്തിലെ പങ്കാളിത്തത്തിൽ നിന്നും പിൻമാറ്റാൻ തീരുമാനമെടുക്കാൻ താങ്കൾക്ക് സ്വാതന്ത്ര്യമുണ്ട്. താങ്കളങ്ങിനെ ചെയ്താലും താങ്കളുടെ ഈ ആശുപത്രിയിലെ പതിവ് ചികിത്സയെ ഒരുവിധത്തിലും ബാധിക്കില്ല.

പഠനവുമായി ബന്ധപ്പെട്ട് താങ്കൾക്ക് എന്തെങ്കിലും പരമപ്പെടുത്തലായാലേന്ത് സംഭവിക്കും? അധികമായി ചികിത്സയോ പരിശോധനകൾക്കായി രക്തസാമ്പിൾ എടുക്കുകയോ ചെയ്യുന്നില്ല എന്നതിനാൽ ഞങ്ങളുടെ പഠനംകൊണ്ട് താങ്കൾക്ക് പരമപ്പെടാകുമെന്ന് ഞങ്ങൾ പ്രതീക്ഷിക്കുന്നില്ല.

പഠനത്തിനായി താങ്കൾ പണം ചിലവാക്കുമോ?
വേണ്ട

താങ്കളുടെ വ്യക്തി വിവരങ്ങൾ രഹസ്യമായിരിക്കുമോ?
താങ്കളുടെ വ്യക്തിവിവരങ്ങൾ രഹസ്യമായി സൂക്ഷിക്കും. പഠനഫലങ്ങൾ ഒരു വൈദ്യശാസ്ത്ര ഷേർണലിൽ പ്രസിദ്ധീകരിക്കുമെങ്കിലും താങ്കളെ വ്യക്തിപരമായി തിരിച്ചറിയാനിടയാക്കുന്നതൊന്നും പ്രസിദ്ധീകരണത്തിലോ, പഠനഫലങ്ങളുടെ പ്രദർശനത്തിലോ ഉണ്ടാവില്ല.

താങ്കൾക്ക് കൂടുതൽ എന്തെങ്കിലും ചോദ്യങ്ങൾ ഉണ്ടെങ്കിൽ ദയവായി ചോദിക്കുക
ഡോ. (ലെഫ്.കേ.) ദേവരകൊണ്ട ഭാർഗ്ഗവ വെങ്കട, സീനിയർ റസിഡന്റ്, ഡിപ്പാർട്ട്മെന്റ് ഓഫ് കാർഡിയോതൊറാസിക് ആന്റ് വാസ്കുലാർ അനസ്തീഷ്യ (ഫോൺ: 8135855155).
ഡോ രൂപ ശ്രീധർ, പ്രൊഫസർ അന്റ് ഹെഡ്, ഡിപ്പാർട്ട്മെന്റ് ഓഫ് അനസ്തീഷ്യോളജി

പഠനവുമായി ബന്ധമില്ലാത്ത വ്യക്തിയെ ബന്ധപ്പെടുന്നതിന് ദയവായി സ്ഥാപനത്തിലെ നൈതിക കമ്മിറ്റി മെമ്പർ സെക്രട്ടറി ഡോ. മാല രാമനാഥനെ ബന്ധപ്പെടാം. ഫോൺ 04712524234, email: iec.mem.sec@sctimst.ac.in

b) Consent form

CONSENT FORM

I, _____, (Participant's name)

Age (in years) _____ / Born on _____ (Date of Birth)

Son / daughter / wife of _____

declare that I have read the information provided to me regarding the study titled 'A STUDY OF INCIDENCE AND RISK FACTORS FOR NEW ONSET POSTOPERATIVE ATRIAL FIBRILLATION AMONG ADULT PATIENTS UNDERGOING ELECTIVE CORONARY ARTERY BYPASS GRAFTING SURGERY' in patient information sheet:

- I have been clarified about any doubts that I had. []
- I also understand that my participation in this study is entirely voluntary and that I am free to withdraw permission to continue to participate at any time without affecting my usual treatment or my legal rights []
- I understand that the study staff and institutional ethics committee members will not need my permission to look at my health records even if I withdraw from the trial. I agree to this access []
- I understand that my identity will not be revealed in any information released to third parties or published []
- I voluntarily agree to take part in this study []

1) I received a copy of this signed consent form []

(Please tick boxes)

Signature:

Name:

Date:

Name of witness:

Relation to participant:

Person Obtaining Consent

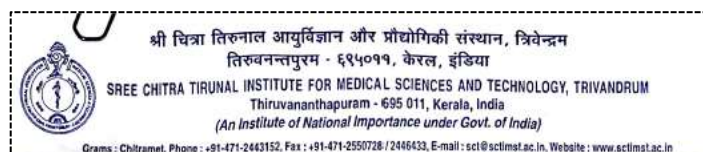
I attest that the requirements for informed consent for the medical research project described in this form have been satisfied. I have discussed the research project with the participant and explained to him or her in nontechnical terms all the information contained in this informed consent form, including any risks and adverse reactions that may reasonably be expected to occur. I further certify that I encouraged the participant to ask questions and that all questions asked were answered.

Dr. Devarakonda Bhargava Venkata,
Senior Resident, Cardiothoracic & Vascular Anaesthesia,
Department of Anaesthesiology,
Sree Chitra Tirunal Institute for Medical Sciences & Technology (SCTIMST).
Trivandrum

Consent form (Malayalam)

സമ്മതപത്രം	
പഠനശീർഷകം: മുൻകൂട്ടി നിശ്ചയിച്ച കൊറോണാവി അക്ടിവി ബൈപാസ് ഗ്രാഫ്റ്റിംഗ് ശസ്ത്രക്രിയയുടെ വിധേയരായവരിൽപുരുഷന്മാരി ഉണ്ടാകുന്ന ഏട്രിയൽ ഫൈബ്രിലേഷന്റെ ആക്രമണ സംഭവങ്ങളും അപായ ഘടകങ്ങളും സംബന്ധിച്ച പഠനം. അാൻ (പങ്കെടുക്കുന്നയാളുടെ പേര്) ജനനതീയതി/വയസ്സ് (വർഷത്തിൽ) മകൻ/മകൾ/ചേരി (ഭയവായി പ്രസക്തമായ കോളങ്ങൾ അടയാളപ്പെടുത്തുക) • മുൻകൂട്ടി നിശ്ചയിച്ച കൊറോണാവി അക്ടിവി ബൈപാസ് ഗ്രാഫ്റ്റിംഗ് ശസ്ത്രക്രിയയുടെ വിധേയരായവരിൽപുരുഷന്മാരി ഉണ്ടാകുന്ന ഏട്രിയൽ ഫൈബ്രിലേഷന്റെ ആക്രമണ സംഭവങ്ങളും അപായ ഘടകങ്ങളും സംബന്ധിച്ച പഠന സംബന്ധമായി എനിക്ക് നൽകിയ വിവരങ്ങൾ വായിച്ചതായും എനിക്കുണ്ടായ സംശയങ്ങൾ പരിഹരിച്ചതായും അാൻ പ്രസ്താവിക്കുന്നു. [] • എന്റെ ഈ പഠനത്തിലുള്ള പങ്കാളിത്തം സ്വമേധയായുള്ളതാണെന്നും, എനിക്ക് ഒരു കാരണവും കൂടാതെ ഏതുസമയത്തും, എനിക്കുള്ള കൈവശ്യശൃംഖലയെയോ നിയമപരമായ അവകാശങ്ങളെയോ ബാധിക്കാതെ പിൻവാങ്ങാമെന്നും അാൻ മനസ്സിലാക്കുന്നു. [] • ഈ പഠനത്തിന്റെ ഗവേഷകർ, കൈനിക കമ്മിറ്റി, നിയന്ത്രണാധികാരികൾ എന്നിവർക്ക് എന്റെ ആരോഗ്യവിവരങ്ങൾ അാൻ പഠനത്തിൽനിന്നും പിൻവാങ്ങിയാലും പരിശോധിക്കാൻ എന്റെ സമ്മതം അവശ്യമില്ലെന്ന് അാൻ മനസ്സിലാക്കുന്നു. ഇതിനു അാൻ സമ്മതിക്കുന്നു. [] • ഭാവിയിൽ മൂന്നാം കക്ഷികൾക്കോ പ്രസിദ്ധീകരണത്തിനോ നൽകുവാനോ എന്റെ വ്യക്തിവിവരങ്ങൾ വെളിച്ചപ്പെടുത്തുകയില്ലെന്നും അാൻ മനസ്സിലാക്കുന്നു. [] • സ്വമേധയാ പഠനത്തിൽ പങ്കെടുക്കാൻ അാൻ സമ്മതിക്കുന്നു. [] • സമ്മതപത്രത്തിന്റെ പൂർണ്ണ ഒരു പ്രതി എനിക്ക് കിട്ടി. []	
പേര് _____ ഒപ്പ് _____ തീയതി _____	സാക്ഷിയുടെ പേര് _____ ഒപ്പ് _____ തീയതി _____
(സമ്മതം വാങ്ങുന്നയാൾ) മെഡിക്കൽ റിസർച്ച് പ്രോജക്ടിനാവശ്യമായ സമ്മതപത്രത്തിനു വേണ്ടുന്ന എല്ലാ ഘടകങ്ങളും തൃപ്തികരമായി നിർവഹിച്ചിരിക്കുന്നുവെന്ന് അാൻ ബോധ്യപ്പെടുത്തുന്നു. പഠനപങ്കാളിയുമായി ഗവേഷണപദ്ധതിയെപ്പറ്റി സാങ്കേതികതരം പരസ്പരബോധിച്ച് എല്ലാ വിവരങ്ങളെപ്പറ്റിയും ചർച്ച നടത്തുകയും പ്രതീക്ഷിക്കാവുന്ന അപകടസാധ്യതകളും പാർശ്വഫലങ്ങളും വിശദീകരിക്കുകയും ചെയ്തു. പങ്കാളിയെ ചോദ്യങ്ങൾ ചോദിക്കാൻ പ്രേരിപ്പിക്കുകയും എല്ലാ ചോദ്യങ്ങൾക്കും ഉത്തരം നൽകുകയും ചെയ്തു എന്നും അാൻ സാക്ഷ്യപ്പെടുത്തുന്നു. സമ്മതപത്രം വാങ്ങുന്ന ആളുടെ പേരും ഒപ്പും _____	
2 ഡോ അജയ് അലക്സ് (ഫോൺ. 989553639) പഠനവുമായി ബന്ധമില്ലാത്ത വ്യക്തിയെ ബന്ധപ്പെടുന്നതിന് ഭയവായി സ്ഥാപനത്തിലെ നൈതിക കമ്മിറ്റി മെമ്പർ സെക്രട്ടറി ഡോ. മാല രാമനാഥനെ ബന്ധപ്പെടാം. ഫോൺ 04712524234, email: iec.mem.sec@sctimst.ac.in	

c) IEC approval letter



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

SCTIEC/1244/AUGUST-2018

07.09.2018

Dr. Devarakonda Bhargava Venkata
Senior Resident
Department of Anaesthesiology
SCTIMST, Thiruvananthapuram

Dear Dr. Devarakonda Bhargava Venkata,

The Institutional Ethics Committee reviewed and discussed your application to conduct the study entitled "A STUDY OF INCIDENCE AND RISK FACTORS FOR NEW ONSET POSTOPERATIVE ATRIAL FIBRILLATION AMONG ADULT PATIENTS UNDERGOING ELECTIVE CORONARY ARTERY BYPASS GRAFTING SURGERY (IEC/1244)" on 17th August, 2018.

The following documents were reviewed:

Original submission

1. Covering letter addressed to the Secretary, IEC, SCTIMST dated 21.07.2018 with checklist
2. TAC Approval Letter
3. IEC Application Form
4. Project Proposal
5. Observation chart
6. Declaration Form
7. Patient Information Sheet and Consent Form in English and Malayalam
8. CV of Principal Investigator and Co-Principal Investigators

Revised submission

1. Covering letter addressed to the Member Secretary, IEC, SCTIMST dated 28.08.2018 with checklist
2. TAC Approval Letter
3. IEC Application Form
4. Project Proposal
5. Observation chart
6. Declaration Form
7. Patient Information Sheet and Consent Form in English and Malayalam
8. CV of Principal Investigator and Co-Principal Investigators

The following members of the Ethics Committee were present at the meeting held on 17th August, 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. V. Raman Kutty	M D, M Phil, M P H	Male	Health Sciences Expert/Clinician	Yes
3.	Dr. K R S Krishnan	M.E., Ph.D.	Male	Medical Technology	Yes
4.	Dr. Rema M. N	MD	Female	Basic Medical Scientist	No
5.	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

d) CTRI Registration

CLINICAL TRIALS REGISTRY - INDIA ICMR - National Institute of Medical Statistics		PDF of Trial CTRI Website URL - http://ctri.nic.in	
Clinical Trial Details (PDF Generation Date :- Fri, 14 Dec 2018 15:20:33 GMT)			
CTRI Number	CTRI/2018/11/016417 [Registered on: 28/11/2018] - Trial Registered Prospectively		
Last Modified On	16/11/2018		
Post Graduate Thesis	Yes		
Type of Trial	Observational		
Type of Study	Follow Up Study		
Study Design	Single Arm Trial		
Public Title of Study	Study of incidence and risk factors for Atrial fibrillation after Coronary artery bypass grafting surgery - Prospective study		
Scientific Title of Study	A STUDY OF INCIDENCE AND RISK FACTORS FOR NEW ONSET POSTOPERATIVE ATRIAL FIBRILLATION AMONG ADULT PATIENTS UNDERGOING ELECTIVE CORONARY ARTERY BYPASS GRAFTING SURGERY		
Secondary IDs if Any	Secondary ID	Identifier	
	NIL	NIL	
Details of Principal Investigator or overall Trial Coordinator (multi-center study)	Details of Principal Investigator		
	Name	Dr Devarakonda Bhargava Venkata	
	Designation	Senior Resident, Cardiothoracic Vascular Anesthesia	
	Affiliation	Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum 695011	
	Address	Department of Anesthesia, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum - 695011 Thiruvananthapuram KERALA 695011 India	
	Phone	8135855155	
	Fax		
	Email	bhargavadv@rediffmail.com	
	Details Contact Person (Scientific Query)	Details Contact Person (Scientific Query)	
Name		Dr Devarakonda Bhargava Venkata	
Designation		Senior Resident, Cardiothoracic Vascular Anesthesia	
Affiliation		Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum 695011	
Address		Department of Anesthesia, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum - 695011 Thiruvananthapuram KERALA 695011 India	
Phone		8135855155	
Fax			
Email		bhargavadv@rediffmail.com	
Details Contact Person (Public Query)		Details Contact Person (Public Query)	
	Name	Dr Rupa Sreedhar	
	Designation	Professor & Head	
	Affiliation	Sree Chitra Tirunal Institute for Medical Sciences and Technology	
	Address	Department of Anesthesia, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum - 695011 Thiruvananthapuram KERALA	

e) Plagiarism check report



Document Information

Analyzed document	Dr Bhargav THESIS AFib.docx (D78334940)
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Sources included in the report

W	URL: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5875315/ Fetched: 8/29/2020 1:02:00 PM		1
W	URL: https://www.researchgate.net/publication/279863464_Postoperative_atrial_fibrillati ... Fetched: 12/19/2019 7:15:11 PM		1
W	URL: https://www.researchgate.net/publication/6963558_Intravenous_Administration_of_Met ... Fetched: 1/16/2020 9:11:35 PM		2
W	URL: https://www.researchgate.net/publication/322414647_Epidemiology_of_new-onset_atria ... Fetched: 12/19/2019 7:11:20 PM		2
W	URL: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3466882/ Fetched: 8/29/2020 1:02:00 PM		1
SA	Artikel 3.pdf Document Artikel 3.pdf (D30387824)		1
W	URL: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4480995/ Fetched: 8/29/2020 1:02:00 PM		1
W	URL: https://link.springer.com/article/10.1007/s40140-019-00321-4 Fetched: 12/5/2019 9:34:16 AM		3
W	URL: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6009790/ Fetched: 8/29/2020 1:02:00 PM		1

f) Master chart

R1	date_of_surgery	procedure	discharge_age	gender	cabg_on_cabg_time	acc_time	cabg_reint	cabg_well	number_o	preop_los	group_hb	maxtime	peak_crow	peak_crow	any_infect	inf_1	infection_date	inf2	endocarditis	
1	1	06-Jan-19 CABG	1	51 M	1	70	39	0	0	3	0	14.5	1.22	1.31	1	0	1	0	11-09-2019	0
2	2	20-Jan-19 CABG	1	43 M	1	81	40	0	0	4	0	11.8	0.99	1.27	1	0	1	0	04-07-2019	0
3	3	30-Sep-19 CABG	1	80 M	1	100	97	0	0	4	0	13.9	0.88	1.36	2	0	1	0	07-10-2019	0
4	4	15-Feb-19 CABG	1	84 M	1	108	67	1	0	5	0	13.4	1.25	1.62	3	1	23 Klebsiella	11-03-2019	0	
5	5	08-Sep-19 CABG+EV+	1	87 M	1	42	26	0	0	2	0	12.4	1.2	2.29	3	0	1	0	13-09-2019	0
6	6	17-Aug-19 CABG	1	70 F	1	50	31	0	0	2	1	14.1	0.61	0.83	1	1	2 ET - Morax	24-08-2019	0	
7	7	28-Aug-19 CABG	1	58 M	1	56	34	0	0	2	0	15	0.96	1.46	1	0	1	0	03-09-2019	0
8	8	11-Jul-19 CABG+EV+	1	50 F	1	56	28	0	0	8	0	13.3	0.67	0.84	1	0	1	0	17-07-2019	0
9	9	02-Jul-19 CABG	1	51 M	1	61	31	0	0	3	0	14.8	0.94	1.38	4	0	1	0	07-07-2019	0
10	10	02-Sep-19 CABG	1	50 M	1	61	30	0	0	3	0	14.4	1.03	1.01	0	0	1	0	07-09-2019	0
11	11	25-Nov-19 CABG+EV+	1	59 M	1	65	30	0	0	4	0	13.2	1.08	1.16	1	0	1	0	03-12-2019	0
12	12	18-Jan-19 CABG	1	54 M	1	67	38	0	0	2	0	14	1.79	2.53	2	0	1	0	24-01-2019	0
13	13	10-Jan-19 CABG	1	70 M	1	68	34	0	0	3	0	15.6	1.12	1.28	2	0	1	0	15-06-2019	0
14	14	23-Sep-19 CABG	1	71 M	1	68	36	0	0	8	0	15	1.18	1.95	2	0	1	0	28-09-2019	0
15	15	27-Mar-19 CABG	1	49 M	1	68	37	0	0	5	0	18.2	1.34	1.09	1	0	1	0	01-04-2019	0
16	16	22-Apr-19 CABG	1	51 M	1	68	39	0	0	3	0	15.9	1.31	1.94	4	0	1	0	28-04-2019	0
17	17	02-Apr-19 CABG	1	58 M	1	69	40	0	0	2	0	15.4	1.1	1.2	2	0	1	0	07-04-2019	0
18	18	27-Feb-19 CABG	1	66 M	1	70	38	0	0	3	0	15.3	0.81	1.1	1	0	1	0	06-03-2019	0
19	19	05-Jul-19 CABG	1	81 M	1	71	36	0	0	2	0	13.5	1.3	2.8	2	0	1	0	12-07-2019	0
20	20	28-Sep-19 CABG + EV	1	57 F	1	71	34	0	0	4	0	13.5	0.68	0.76	1	0	1	0	02-02-2019	0
21	21	06-May-19 CABG	1	67 M	1	71	34	0	0	4	0	12.4	1.24	1.41	2	1	8 Klebsiella	11-05-2019	0	
22	22	28-Sep-19 CABG	1	59 M	1	71	38	0	0	3	0	14.9	0.8	1.17	1	0	1	0	24-09-2019	0
23	23	05-Sep-19 CABG	1	86 M	1	71	39	0	0	3	0	11.4	0.86	1.51	4	0	1	0	11-09-2019	0
24	24	20-Sep-19 CABG+EV+	1	52 M	1	72	37	0	0	3	0	14.7	1.03	1.2	4	0	1	0	26-09-2019	0
25	25	18-May-19 CABG	1	50 M	1	72	41	0	0	3	0	14.8	0.91	1.94	2	0	1	0	22-05-2019	0
26	26	30-Aug-19 CABG	1	51 M	1	72	42	0	0	4	0	15.8	1.02	1.11	2	0	1	0	04-09-2019	0
27	27	21-May-19 CABG	1	59 F	1	72	41	0	0	3	0	13.4	1.06	0.8	1	0	1	0	26-05-2019	0
28	28	28-Aug-19 CABG	1	85 M	1	73	44	0	0	5	0	11.8	1.29	1.15	4	0	1	0	03-09-2019	0
29	29	21-Jan-19 CABG	1	44 M	1	73	46	0	0	3	0	11.4	0.99	1.2	2	0	1	0	26-01-2019	0
30	30	03-Jan-19 CABG	1	81 M	1	74	39	0	0	4	0	16.1	1.12	1.47	2	0	1	0	09-06-2019	0
31	31	26-Sep-19 CABG	1	59 M	1	74	41	0	0	4	0	12.8	1.17	1.66	2	0	1	0	01-10-2019	0
32	32	12-Aug-19 CABG	1	52 M	1	74	42	0	0	3	0	12.6	1.28	1.79	1	0	1	0	17-08-2019	0
33	33	02-Apr-19 CABG	1	52 M	1	75	38	0	0	3	0	14.5	1.31	1.63	1	0	1	0	07-04-2019	0
34	34	30-Sep-19 CABG	1	47 M	1	76	38	0	0	3	1	14	1.41	1.49	2	0	1	0	05-10-2019	0
35	35	28-Nov-19 CABG	1	67 F	1	76	39	0	0	3	0	11.8	1.08	1.12	1	0	1	0	04-12-2019	0
36	36	11-Mar-19 CABG	1	63 M	1	76	40	0	0	3	0	15	1.23	1.76	1	0	1	0	17-03-2019	0
37	37	23-Sep-19 CABG	1	45 M	1	76	43	0	0	8	0	15.5	1.01	1.18	1	0	1	0	28-09-2019	0
38	38	26-Mar-19 CABG	1	59 M	1	76	45	0	0	5	0	13.3	0.92	1.15	2	0	1	0	31-03-2019	0
39	39	24-Jan-19 CABG	1	56 M	1	77	39	0	0	4	0	13.7	0.99	1.31	1	0	1	0	29-01-2019	0
40	40	23-Sep-19 CABG+EV+	1	86 M	1	77	35	0	0	2	0	12.4	1.16	1.26	1	0	1	0	30-09-2019	0
41	41	04-Jun-19 CABG	1	53 F	1	77	41	0	0	4	0	13.6	0.92	1.29	2	0	1	0	09-06-2019	0
42	42	01-Nov-19 CABG+EV+	1	62 F	1	78	38	0	0	3	0	13	1.6	2.49	2	0	1	0	07-11-2019	0
43	43	08-Apr-19 CABG	1	80 M	1	78	40	0	0	4	0	13.8	1.17	1.88	1	0	1	0	13-04-2019	0
44	44	27-May-19 CABG	1	45 M	1	79	42	0	0	4	0	13.8	1.28	1.25	1	0	1	0	02-06-2019	0
45	45	18-Jan-19 CABG	1	83 M	1	79	52	0	0	3	0	14.8	1.11	1.35	2	0	1	0	24-01-2019	0
46	46	28-Oct-19 CABG+EV+	1	42 M	1	79	41	0	0	4	0	13.9	1	1.23	1	0	1	0	02-11-2019	0

47	47	17-Jan-19 CABG	1	63 M	1	80	43	0	0	4	0	15.4	1.4	1.38	4	0	1	0	12-06-2019	0
48	48	11-Feb-19 CABG	1	83 M	1	80	39	0	0	4	0	13.7	0.95	0.95	1	0	1	0	18-02-2019	0
49	49	06-Jan-19 CABG	1	47 M	1	80	60	0	0	3	0	14.9	1.19	1.17	3	0	1	0	11-06-2019	0
50	50	07-Feb-19 CABG + EV	1	64 M	1	81	54	0	0	3	0	13.8	1.23	1.33	2	0	1	0	14-02-2019	0
51	51	15-Jan-19 CABG	1	67 M	1	81	48	0	0	4	0	13.4	1.38	1.28	1	0	1	0	11-01-2019	0
52	52	18-Jan-19 CABG	1	88 M	1	81	48	0	0	3	0	12.2	1.89	2.52	3	0	1	0	25-06-2019	0
53	53	29-Feb-19 CABG	1	82 M	1	81	39	0	0	4	0	13.7	1.28	1.74	3	0	1	0	25-02-2019	0
54	54	10-Apr-19 CABG	1	60 M	1	81	44	0	0	4	0	13.3	1.45	1.65	2	0	1	0	06-05-2019	0
55	55	06-May-19 CABG	1	70 M	1	82	38	0	0	4	0	11.8	1.18	1.24	2	1	6 E.coli-leg	22-05-2019	0	
56	56	24-Sep-19 CABG	1	63 M	1	82	37	0	0	3	0	13.2	1.24	1.4	2	0	1	0	29-08-2019	0
57	57	29-May-19 CABG	1	67 M	1	82	40	0	0	4	0	12.7	0.99	1.04	4	0	1	0	25-05-2019	0
58	58	28-Jan-19 CABG	1	67 F	1	82	49	0	0	3	0	11.3	1.31	1.58	2	0	1	0	02-02-2019	0
59	59	11-Jan-19 CABG	1	75 M	1	82	36	0	0	4	0	12.4	1.17	1.8	2	0	1	0	17-01-2019	0
60	60	02-Jan-19 CABG	1	58 M	1	83	48	0	0	3	0	12.9	1	1.38	1	0	1	0	07-01-2019	0
61	61	11-Feb-19 CABG	1	61 M	1	83	51	0	0	4	0	14.6	0.75	1.05	2	0	1	0	18-02-2019	0
62	62	08-Aug-19 CABG	1	61 M	1	83	45	0	0	3	0	14.1	0.89	1.06	1	0	1	0	16-08-2019	0
63	63	03-Oct-19 CABG	1	86 M	1	83	42	0	0	4	0	13	1.03	1.58	1	0	1	0	08-10-2019	0
64	64	16-Apr-19 CABG+EV+	1	74 M	1	83	46	0	0	4	0	13.8	1.13	1.15	1	0	1	0	12-04-2019	0
65	65	13-May-19 CABG + EV	1	43 M	1	83	55	0	0	3	0	14	0.99	1.11	1	0	1	0	18-05-2019	0
66	66	24-Feb-19 CABG	1	50 M	1	84	49	0	0	4	0	14	1.06	1.25	2	0	1	0	22-02-2019	0
67	67	09-Jan-19 CABG	1	88 M	1	84	41	0	0	4	0	13.6	1.03	1.52	1	0	1	0	14-01-2019	0
68	68	07-May-19 CABG	1	72 M	1	84	45	0	0	4	0	13.3	1.11	1.11	1	0	1	0	18-05-2019	0
69	69	22-Apr-19 CABG	1	67 M	1	84	55	0	0	2	0	13.8	0.98	1.15	4	0	1	0	28-04-2019	0
70	70	09-May-19 CABG	1	60 F	1	84	41	0	0	4	0	13.7	0.9	1.07	2	0	1	0	15-05-2019	0
71	71	27-Sep-19 CABG	1	62 M	1	85	38	0	0	4	0	15.6	1.29	1.48	3	0	1	0	02-10-2019	0
72	72	29-Oct-19 CABG	1	64 M	1	85	52	0	0	4	0	15.1	1.02	1.29	2	1	7 Klebsiella	07-11-2019	0	
73	73	25-Jan-19 CABG	1	80 M	1	85	47	0	0	4	0	13.1	0.97	1.26	1	0	1	0	28-01-2019	0
74	74	30-Jan-19 CABG	1	61 M	1	85	40	0	0	3	0	14	1.12	1.11	4	0	1	0	05-02-2019	0
75	75	26-Nov-19 CABG+EV+	1	58 M	1	85	42	0	0	4	0	14.2	1.85	2.48	2	0	1	0	01-12-2019	0
76	76	17-Jan-19 CABG	1	56 F	1	85	57	0	0	3	0	13.4	0.98	1.13	1	0	1	0	22-06-2019	0
77	77	01-Aug-19 CABG	1	74 M	1	86	50	0	0	4	0	15.3	1.18	1.53	2	0	1	0	07-08-2019	0
78	78	13-Jul-19 CABG	1	41 M	1	86	48	0	0	3	0	14.4	1.04	1.09	1	0	1	0	29-07-2019	0
79	79	08-Nov-19 CABG +EV+	1	73 F	1	86	42	0	0	4	0	11.2	0.83	1.01	1	1	5 MRSA + stre	16-12-2019	0	
80	80	03-Jan-19 CABG	1	52 M	1	86	54	0	0	3	0	14.8	1.13	1.58	2	1	5 Staph aure	08-01-2019	0	
81	81	18-Sep-19 CABG	1	48 M	1	87	46	0	0	4	0	14.5	1.34	1.3	1	1	53 Staph aure	26-09-2019	0	
82	82	19-Jun-19 CABG+EV+	1	63 M	1	87	43	0	0	4	0	14.7	0.8	1	1	0	1	0	24-06-2019	0
83	83	22-Mar-19 CABG	1	71 M	1	87	42	0	0	4	0	13.8	1.27	1.68	2	0	1	0	29-03-2019	0
84	84	12-May-19 CABG	1	66 M	1	87	45	0	0	4	0	13.8	1.16	1.29	1	0	1	0	29-05-2019	0
85	85	17-Jan-19 CABG	1	58 M	1	87	51	0	0	3	0	12.3	1.19	1.96	4	0	1	0	23-01-2019	1
86	86	25-Mar-19 CABG + EV	1	73 M	1	87	47	0	0	4	0	14.5	1.29	1.42	2	0	1	0	31-05-2019	0
87	87	14-Oct-19 CABG	1	67 M	1	88	44	0	0	4	0	12.3	1.19	1.58	1	0	1	0	19-10-2019	0
88	88	29-Apr-19 CABG	1	52 M	1	88	48	0	0	4	0	10.8	2.48	2	2	1	1	0	25-04-2019	0
89	89	25-Jan-19 CABG	1	66 M	1	88	57	0	0	4	0	14.3	1.08	1.27	4	0	1	0	39-01-2019	0
90	90	02-Oct-19 CABG	1	61 M	1	88	43	0	0	4	0	13.4	1.47	2.15	1	0	1	0	06-11-2019	0
91	91	07-Mar-19 CABG+EV+	1	64 M	1	88	51	0	0	4	0	13.3	1.11	1.46	1	0	1	0	13-03-2019	0
92	92	20-Jun-19 CABG	1	57 F	1	88	44	0	0	4	0	11.8	0.93	0.75	1	0	1	0	26-06-2019	0
93	93	18-Aug-19 CABG+EV+	1	77 M	1	89	46	0	0	3	0	15.4	1.21	1.62	2	0	1	0	24-08-2019	0

94	94	15-May-19 CARG	1	38 M	1	89	53	0	0	3	0	15.3	0.78	1.18	1	0	1	0	21-05-2019	0
95	95	28-May-19 CARG	1	47 M	1	89	47	0	0	4	0	17.1	1.06	1.16	2	0	1	0	02-06-2019	0
96	96	11-Apr-19 CARG	1	54 M	1	89	49	0	0	4	0	13.3	0.91	1.27	1	1	4 E Col	16-04-2019	0	
97	97	30-Oct-19 CARG+EV	1	61 M	1	90	47	0	0	4	0	14.4	0.85	0.94	2	0	1	0	04-11-2019	0
98	98	05-Mar-19 CARG	1	61 M	1	90	47	0	0	4	0	11.9	1.46	2.79	2	0	1	0	10-05-2019	0
99	99	22-Apr-19 CARG	1	56 F	1	90	40	0	0	4	0	11.8	1.19	1.47	2	0	46 Readmore	19-05-2019	0	
100	100	27-Feb-19 CARG	1	56 M	1	90	40	0	0	4	0	15.5	1.13	1.2	2	0	1	0	09-05-2019	0
101	101	03-May-19 CARG	1	67 M	1	90	53	0	0	4	0	12.4	0.83	1.38	1	0	1	0	09-05-2019	0
102	102	14-Sep-19 CARG+EV	1	49 M	1	91	43	0	0	3	0	15.8	1.47	2.01	2	0	1	0	30-09-2019	0
103	103	14-Nov-19 CARG	1	44 M	1	91 NA	0	0	0	3	0	14.9	1.11	1.51	2	0	1	0	21-11-2019	0
104	104	26-Feb-19 CARG	1	66 M	1	91	46	0	0	4	0	14.1	0.99	1	1	0	1	0	09-05-2019	0
105	105	18-Jan-19 CARG	1	50 F	1	91	58	0	0	3	0	12.1	1.03	1.23	2	1	1	0	23-01-2019	0
106	106	01-Oct-19 CARG+/-	1	63 M	1	91	58	0	0	4	0	14	1.18	1.72	2	0	1	0	07-10-2019	0
107	107	14-Jul-19 CARG+EV	1	67 M	1	91	41	0	0	3	0	13.2	1.16	1.8	2	0	1	0	30-07-2019	0
108	108	11-Mar-19 CARG	1	59 M	1	91	55	0	0	4	0	12.5	1.1	1.36	2	0	1	0	16-05-2019	0
109	109	28-Feb-19 CARG	1	61 M	1	92	48	0	0	4	1	14.3	1.68	1.95	1	0	6	0	06-09-2019	0
110	110	09-Jul-19 CARG+EV	1	61 M	1	92	40	0	0	4	0	14	1.04	1.06	1	0	1	0	14-07-2019	0
111	111	14-Jan-19 CARG	1	71 M	1	92	53	0	0	4	0	13	1.04	1.14	1	0	1	0	19-01-2019	0
112	112	28-Apr-19 CARG	1	59 M	1	92	46	0	0	5	0	14.1	1.3	1.87	1	1	5 South auro	02-05-2019	0	
113	113	12-Feb-19 CARG	1	53 M	1	92	51	0	0	4	0	15.8	1.41	1.65	4	0	1	0	17-02-2019	0
114	114	12-Apr-19 CARG	1	54 M	1	92	51	0	0	4	0	11.8	1.2	1.8	2	0	1	0	17-04-2019	0
115	115	21-May-19 CARG	1	49 F	1	92	55	0	0	3	0	13.2	1.08	1.11	1	0	1	0	26-05-2019	0
116	116	20-Mar-19 CARG	1	63 M	1	93	43	0	0	4	0	14.5	1.51	1.41	4	0	1	0	25-09-2019	0
117	117	15-Sep-19 CARG	1	67 M	1	93	58	0	0	4	0	13.9	1.22	1.71	2	0	1	0	30-09-2019	0
118	118	29-May-19 CARG+EV	1	59 F	1	93	52	0	1	4	0	13.5	1.06	1.15	2	0	1	0	08-06-2019	0
119	119	18-Feb-19 CARG	1	67 M	1	93	51	0	0	4	1	13.2	1.22	1.52	2	0	1	0	25-02-2019	0
120	120	15-Nov-19 CARG	1	62 M	2	93 BEATING	0	0	1	3	0	13.2	1.35	1.64	3	0	1	0	20-11-2019	0
121	121	25-Apr-19 CARG	1	70 M	1	93	49	0	0	5	1	11.4	1.29	1.52	2	1	7 Spatum Ki	30-04-2019	0	
122	122	17-Oct-19 CARG	1	77 M	1	93	45	0	0	3	0	10.4	1.56	1.65	1	1	7 Spatum Ki	24-10-2019	0	
123	123	14-May-19 CARG+EV	1	64 M	1	93	40	0	0	3	0	12.2	0.85	1.66	2	0	1	0	20-05-2019	0
124	124	15-Jul-19 CARG	1	47 M	1	93	49	0	0	4	1	14.9	1.12	1.24	4	0	1	0	20-07-2019	0
125	125	08-Nov-19 CARG+EV	1	59 M	1	93	36	1	0	3	0	11	1.62	2.31	1	0	1	0	11-11-2019	0
126	126	29-Apr-19 CARG+EV	1	76 M	1	94	60	0	0	4	0	14.6	1.16	2.53	2	0	1	0	06-05-2019	0
127	127	31-Jan-19 CARG	1	59 M	1	94	45	0	0	4	0	13	1.18	1.23	3	0	1	0	05-02-2019	0
128	128	08-Aug-19 CARG	1	72 M	1	94	54	0	0	2	1	12.2	0.86	1.71	2	0	1	0	19-08-2019	0
129	129	15-Jan-19 CARG+/-	1	53 M	1	94	54	0	0	4	0	10.5	1.17	1.35	3	0	1	0	21-02-2019	0
130	130	23-May-19 CARG	1	54 M	1	94	47	0	0	4	0	13.8	1.47	1.79	2	0	1	0	28-05-2019	0
131	131	16-Jul-19 CARG	1	50 F	1	94	49	0	0	3	0	13.3	0.76	0.76	4	0	1	0	21-07-2019	0
132	132	22-May-19 CARG	1	62 M	1	95	48	0	0	5	0	14.7	1.13	1.05	1	0	1	0	21-02-2019	0
133	133	25-Feb-19 CARG	1	74 M	1	95	50	0	0	4	0	14.1	0.87	1.08	2	0	1	0	03-03-2019	0
134	134	18-May-19 CARG+EV	1	51 F	1	95	60	0	0	2	0	13.4	0.77	1.01	2	0	1	0	25-05-2019	0
135	135	26-Nov-19 CARG+EV	1	36 M	1	95	51	0	0	4	0	13.1	0.66	1.34	2	1	4 UTI - E Col	19-11-2019	0	
136	136	29-Apr-19 CARG	1	65 M	1	95	53	0	0	4	0	12.5	1.38	2.88	3	0	1	0	06-05-2019	0
137	137	07-Mar-19 CARG	1	72 M	1	95	45	0	0	4	0	12.1	1.61	2.23	2	0	1	0	14-05-2019	0
138	138	29-May-19 CARG	1	58 M	1	95	40	0	0	3	0	12.6	1.8	2.23	1	0	1	0	04-06-2019	0
139	139	04-Feb-19 CARG	1	65 F	1	95	45	0	0	4	0	11.5	1.03	1.08	2	1	6 Pseudomon	10-02-2019	0	
140	140	25-Sep-19 CARG	1	56 M	1	95	54	0	0	3	0	11.8	1.03	1.26	1	0	1	0	30-09-2019	0

141	141	11-Oct-19 CARG	1	66 M	1	96	53	0	1	4	0	16.3	1.57	1.9	3	1	4 UTI on POI	21-10-2019	0	
142	142	29-Apr-19 CARG	1	67 M	1	96	45	0	0	3	0	14.5	1.89	3.32	17	1	7 Spatum -	13-05-2019	0	
143	143	25-Oct-19 CARG+EV	1	54 M	1	96	45	0	1	4	0	13.5	1.11	1.48	2	0	1	0	05-11-2019	0
144	144	15-Jul-19 CARG	1	61 M	1	96	52	0	0	4	0	16.4	1.14	1.21	1	0	1	0	30-07-2019	0
145	145	27-Jun-19 CARG	1	62 M	1	96	57	0	0	4	0	15.4	0.96	1.45	2	0	1	0	02-07-2019	0
146	146	13-May-19 CARG	1	68 M	1	96	50	0	0	3	0	15.2	1.08	1.34	2	0	1	0	18-05-2019	0
147	147	10-Apr-19 CARG	1	62 F	1	96	50	0	0	4	0	14.7	1.07	1.17	1	0	1	0	09-05-2019	0
148	148	22-May-19 CARG+/- A	1	60 F	1	96	47	0	0	4	0	13.1	1.3	1.55	1	0	1	0	25-05-2019	0
149	149	10-Jul-19 CARG	1	54 M	1	96	58	0	0	3	0	10.5	1.02	1.71	1	0	1	0	06-09-2019	0
150	150	30-Oct-19 CARG	1	61 M	1	96	51	0	0	4	0	15.2	1.12	1.41	2	0	1	0	05-11-2019	0
151	151	29-May-19 CARG	1	65 M	1	96	55	0	0	5	0	12.7	1.09	1.57	2	0	1	0	29-05-2019	0
152	152	28-Aug-19 CARG	1	43 M	1	96	51	0	0	4	0	25	0.82	1.03	2	0	1	0	31-08-2019	0
153	153	13-Jan-19 CARG+EV	1	50 M	1	96	49	0	0	4	0	0.97	14.7	1.48	2	0	1	0	18-05-2019	0
154	154	07-Jun-19 CARG	1	56 M	1	97	58	0	0	3	0	14.8	1.96	1.45	1	0	1	0	14-06-2019	1
155	155	13-Aug-19 CARG	1	62 M	1	97	52	0	0	4	0	16.8	1.1	1.64	2	0	1	0	21-08-2019	0
156	156	06-Mar-19 CARG+EV	1	65 M	1	97	50	0	0	5	0	14.6	1.4	1.3	3	0	1	0	11-03-2019	0
157	157	04-Feb-19 CARG	1	63 M	1	97	46	0	0	5	0	13.6	0.99	1.38	4	0	1	0	08-02-2019	0
158	158	20-Nov-19 CARG	1	68 M	1	97	58	0	0	3	0	13.5	0.97	1.14	1	0	1	0	27-11-2019	0
159	159	14-Mar-19 CARG+EV	1	66 F	1	97	45	0	0	4	0	13.2	1.08	1.73	2	0	1	0	21-03-2019	0
160	160	18-Feb-19 CARG+EV	1	69 M	1	97	54	0	0	4	0	13	1.8	1.18	2	0	1	0	25-02-2019	0
161	161	10-Aug-19 CARG	1	65 F	1	97	50	0	0	4	0	11.8	0.82	1.24	2	0	1	0	27-08-2019	0
162	162	14-Aug-19 CARG	1	66 M	1	97	51	0	1	5	0	10.8	1.4	1.84	2	1	7 R KO HSE	25-08-2019	0	
163	163	01-Feb-19 CARG	1	57 F	1	97	51	0	0	4	0	14.2	1.11	1.26	1	0	1	0	08-02-2019	0
164	164	09-May-19 CARG	1	49 F	1	97	54	0	0	3	0	13.3	0.73	1.02	4	0	1	0	14-05-2019	0
165	165	22-May-19 CARG	1	64 M	1	98	57	0	0	4	0	12.8	1.13	1.09	1	0	1	0	27-05-2019	0
166	166	15-Oct-19 CARG+EV	1	63 M	1	98	47	0	0	5	0	16.7	0.9	1.01	2	0	1	0	20-10-2019	0
167	167	20-Jun-19 CARG	1	58 M	1	98	54	0	0	4	1	16.8	1.08	1.25	1	0	1	0	25-06-2019	0
168	168	08-Sep-19 CARG	1	56 M	1	98	41	1	0	5	0	18.2	1.02	1.07	4	0	1	0	11-09-2019	0
169	169	30-May-19 CARG	1	62 M	1	100	52	0	0	4	0	17.7	1.05	1.35	7	0	1	0	11-09-2019	0
170	170	10-May-19 CARG	1	62 M	1	100	47	0	0	4	0	17.2	1.2	1.85	5	0	1	0	18-05-2019	0
171	171	17-Jan-19 CARG	1	58 M	1	100	69	0	0	4	0	15.1	1.14	1.63	2	0	1	0	24-01-2019	0
172	172	25-Jun-19 CARG	1	69 M	1	100	60	0	0	4	0	14.4	0.79	1.19	2	0	1	0	30-06-2019	0
173	173	15-Jul-19 CARG	1	71 M	1	100	55	0	0	4	0	13.6	0.85	1.58	2	0	1	0	28-07-2019	0
174	174	10-Apr-19 CARG	1	51 M	1	100	50	0	0	3	0	12.8	1.61	2.09	4	0	1	0	08-05-2019	0
175	175	10-Jan-19 CARG	1	56 M	1	100	56	0	0	4	0	12.3	1.28	1.34	4	0	1	0	17-01-2019	0
176	176	10-Jun-19 CARG	1	60 F	1	100	59	0	0	4	0	12.6	0.87	0.87	4	0	1	0	15-06-2019	0
177	177	02-Jul-19 CARG	1	66 M	1	100	57	0	0	4	0	13.8	1.07	1.28	1	0	1	0	07-07-2019	0
178	178	16-Jul-19 CARG	1	48 M	1	100	50	0	0	5	0	14.5	1	1	1	0	1	0	21-07-2019	0
179	179	29-Mar-19 CARG	1	52 M	1	100	46	0	0	5	0	14.4	1	1.08	1	0	1	0	20-03-2019	0
180	180	11-Nov-19 CARG	1	57 M	1	100	50	0	0	5	0	13.4	1.33	1.31	1	0	1	0	28-03-2019	0
181	181	01-Jan-19 CARG	1	62 M	1	102	47	0	0	4	0	15.7	1.18	1.51	2	0	1	0	07-01-2019	0
182	182	15-Aug-19 CARG	1	71 M	1	102	51	0	0	7	0	13.3	1.2	1.46	2	0	1	0	08-06-2019	0
183	183	02-May-19 CARG	1	59 F	1	102	56	0	0	3	0	13.9	0.79	0.9	1	0	1	0	08-05-2019	0
184	184	22-Jul-19 CARG	1	62 M	1	102	55	1	0	7	1	17.2	1.03	3.87	2	0	1	0	13-07-2019	0
185	185	24-Jun-19 CARG	1	58 M	1	102	69	0	0	3	0	15.3	1.3	1.71	1	0	1	0	01-07-2019	1
186	186	01-Feb-19 CARG	1	52 M	1	102	60	0	0	4	0	16.7	1.05	1.52	1	0	1	0	06-02-2019	0
187	187	14-Jan-19 CARG	1	59 M	1	102	48	0	0	5	0	16.7	1.13	1.27	2	0	1	0	19-01-2019	0

288	288	04-Jun-19	CARG	1	51 M	1	102	48	0	0	5	0	16.1	1.07	1.47	2	0	1	0	12-07-2019	0
289	289	21-Nov-19	CARG	1	61 M	1	102	58	0	0	8	0	15.9	0.94	1.11	2	0	1	0	29-11-2019	0
290	290	09-Apr-19	CARG	1	53 M	1	102	54	0	0	4	0	13.4	1.52	1.77	2	0	1	0	09-04-2019	0
291	291	06-Jun-19	CARG	1	63 M	1	102	55	0	0	5	0	13	1.05	1.5	2	0	1	0	12-06-2019	0
292	292	18-Jun-19	CARG	1	53 M	1	102	52	0	0	5	0	16.8	0.94	1.09	2	0	1	0	19-06-2019	0
293	293	11-May-19	CARG	1	52 M	1	102	55	0	0	3	0	15.6	1.14	1.18	1	0	1	0	05-06-2019	0
294	294	06-Nov-19	CARG	1	57 F	1	102	52	0	0	5	0	12.8	0.81	0.91	4	0	1	0	19-09-2019	0
295	295	28-Feb-19	CARG	1	51 F	1	102	65	0	0	5	0	12.8	0.68	0.85	4	0	1	0	05-03-2019	0
296	296	01-Nov-19	CARG	1	73 M	1	105	48	0	0	3	1	14.2	1.9	1.91	2	0	1	0	06-11-2019	0
297	297	22-Nov-19	CARG	1	60 F	1	105	54	0	0	3	0	12.8	0.9	0.94	2	0	1	0	29-11-2019	0
298	298	24-Oct-19	CARG	1	66 M	1	105	49	0	0	4	0	11.7	0.95	1.43	2	0	1	0	29-10-2019	0
299	299	13-Jun-19	CARG	1	60 M	1	105	64	0	0	3	0	10.7	2.31	1.35	3	1	7	Spunaro	20-06-2019	0
300	300	05-Nov-19	CARG + EV	1	57 M	1	105	57	0	0	3	0	14.6	0.92	1.25	1	0	1	0	10-11-2019	0
301	301	21-Nov-19	CARG	1	58 M	1	105	66	0	0	3	0	13.8	0.87	1.13	2	0	1	0	26-03-2019	0
302	302	26-Feb-19	CARG	1	58 M	1	105	55	0	0	3	0	13	0.85	1.18	8	0	1	0	03-03-2019	0
303	303	19-Sep-19	CARG	1	88 M	1	104	58	0	0	4	0	12.2	0.89	1.57	3	1	3	Kelsoe	31-10-2019	0
304	304	04-Oct-19	CARG	1	54 M	1	104	59	0	0	5	0	14.2	1.58	1.15	2	0	1	0	10-10-2019	0
305	305	03-Jan-19	CARG	1	57 F	1	104	57	0	0	3	0	12.9	0.82	1.06	1	0	1	0	08-01-2019	0
306	306	12-Nov-19	CARG	1	55 M	1	104	62	0	0	3	0	16.3	1.05	1.14	2	0	1	0	17-03-2019	0
307	307	02-Aug-19	CARG	1	60 M	1	104	56	0	0	5	0	15.3	1.05	1.49	2	0	1	0	07-08-2019	0
308	308	11-Jul-19	CARG	1	46 M	1	104	64	0	0	4	0	14.8	1	1.1	2	0	1	0	16-07-2019	0
309	309	01-Jan-19	CARG	1	66 M	1	105	53	0	0	5	0	14.8	1.37	1.71	1	0	1	0	06-01-2019	0
310	310	27-Aug-19	CARG	1	67 M	1	105	47	0	0	4	0	15.2	0.85	1.5	4	0	1	0	01-09-2019	0
311	311	13-Apr-19	CARG	1	70 M	1	105	62	0	0	4	0	15.4	0.96	0.98	1	0	1	0	16-04-2019	0
312	312	04-Sep-19	CARG	1	62 M	1	105	52	0	0	4	0	12.5	0.82	1.25	2	0	1	0	12-09-2019	0
313	313	18-Apr-19	CARG	1	65 M	1	105	65	0	0	3	0	15.5	1.27	1.17	3	0	1	0	22-04-2019	0
314	314	05-Oct-19	CARG	1	58 F	1	105	57	0	0	3	0	12.7	0.76	0.88	2	0	1	0	06-10-2019	0
315	315	29-Nov-19	CARG	1	56 M	1	105	52	0	0	3	0	14.8	0.92	1.19	1	0	1	0	02-04-2019	0
316	316	12-Jun-19	CARG	1	47 M	1	105	54	0	0	5	0	14.5	1.23	1.34	2	0	1	0	17-06-2019	0
317	317	01-Apr-19	CARG	1	59 M	1	105	58	0	0	4	0	12.2	0.92	1.05	4	0	1	0	06-04-2019	0
318	318	20-Sep-19	CARG	1	52 M	1	106	64	0	0	5	0	17.3	1.28	1.79	1	0	1	0	20-09-2019	0
319	319	10-Jul-19	CARG	1	88 M	1	106	55	0	0	3	0	15	0.85	1.18	1	0	1	0	15-07-2019	0
320	320	22-Oct-19	CARG+EV	1	49 M	1	106	57	0	1	4	0	15.5	1.21	1.99	3	0	1	0	02-11-2019	0
321	321	26-Aug-19	CARG	1	63 F	1	106	57	0	0	4	0	13.3	1.08	1.25	2	0	1	0	02-08-2019	0
322	322	20-Apr-19	CARG	1	77 M	1	106	59	0	0	5	1	12.2	1.05	1.08	1	1	8	Puendoma	25-04-2019	0
323	323	14-Jul-19	CARG	1	54 M	1	106	61	0	0	3	0	15.3	1.29	1.81	2	0	1	0	29-07-2019	0
324	324	12-Jun-19	CARG	1	53 M	1	106	58	0	0	4	0	15.1	1.15	1.26	1	0	1	0	17-06-2019	0
325	325	15-Feb-19	CARG	1	59 M	1	106	65	0	0	4	0	12.7	1.22	1.67	2	0	1	0	20-02-2019	0
326	326	28-Feb-19	CARG + EV	1	64 M	1	107	56	0	0	4	0	12.8	1.19	1.66	3	0	1	0	05-03-2019	0
327	327	07-Jan-19	CARG	1	55 M	1	107	52	0	0	3	0	12.8	0.87	1.27	2	0	1	0	13-01-2019	0
328	328	19-Feb-19	CARG	1	74 M	1	107	61	0	0	4	0	13.8	1.54	1.74	1	0	1	0	25-02-2019	0
329	329	01-Apr-19	CARG	1	59 M	1	107	57	0	0	4	0	13.6	1.08	1.39	1	0	1	0	06-04-2019	0
330	330	12-Jan-19	CARG	1	56 M	1	108	48	0	0	4	0	15.4	0.95	1.05	2	0	1	0	28-01-2019	0
331	331	29-Mar-19	CARG+EV	1	61 M	1	108	52	0	0	5	0	14.8	1.11	1.2	2	0	1	0	31-03-2019	0
332	332	21-Aug-19	CARG	1	61 M	1	108	65	0	0	8	0	13.6	1.04	1.22	2	0	1	0	26-08-2019	0
333	333	14-Jun-19	CARG	1	63 F	1	108	65	0	0	3	0	13.3	0.96	1.04	2	0	1	0	22-06-2019	0
334	334	05-Jun-19	CARG	1	72 M	1	108	56	0	0	5	0	13.2	1.12	2.1	2	0	1	0	10-06-2019	0
335	335	18-Jul-19	CARG	1	61 M	1	308	54	0	0	5	0	12.8	1.87	1.88	4	0	1	0	14-07-2019	0
336	336	04-Jun-19	CARG	1	60 M	1	308	53	0	0	5	0	14.6	0.85	1.51	1	0	1	0	09-06-2019	0
337	337	05-Sep-19	CARG	1	59 M	1	308	52	0	0	5	0	14.5	1.67	1.35	1	0	1	0	05-09-2019	0
338	338	09-Nov-19	CARG	1	46 F	1	309	53	0	0	4	0	11.3	1.7	0.85	2	0	1	0	13-11-2019	0
339	339	03-Jan-19	CARG	1	60 M	1	309	48	0	0	4	0	11.7	1.84	2.58	1	1	234	Kelsoe	19-02-2019	0
340	340	11-Jan-19	CARG	1	68 M	1	309	50	0	0	5	0	15.4	1.24	1.49	2	0	1	0	24-01-2019	0
341	341	19-Nov-19	CARG+EV	1	64 M	1	309	67	0	0	5	0	15.1	0.88	1.22	2	0	1	0	24-11-2019	0
342	342	04-Sep-19	CARG	1	65 M	1	309	51	0	0	8	0	15	1.22	1.5	1	0	1	0	10-09-2019	0
343	343	29-Mar-19	CARG	1	61 M	1	309	70	0	0	4	0	13.3	0.82	1.21	2	0	1	0	05-04-2019	0
344	344	27-Aug-19	CARG	1	68 F	1	309	54	0	0	4	0	13.1	0.86	1.82	2	0	1	0	02-09-2019	0
345	345	19-Aug-19	CARG	1	53 M	1	309	76	0	0	3	0	15.1	1.07	1.33	1	0	1	0	24-08-2019	0
346	346	11-Apr-19	CARG	1	56 M	1	309	52	0	0	5	0	13.9	1.05	1.89	2	1	6	Kelsoe	19-04-2019	0
347	347	15-Jul-19	CARG	1	49 M	1	309	58	0	0	5	0	13.8	1.14	1.96	2	0	1	0	20-07-2019	0
348	348	02-Aug-19	CARG	1	54 M	1	309	55	0	0	4	0	15.4	0.76	1.89	3	0	1	0	07-08-2019	0
349	349	22-Nov-19	CARG+EV	1	50 M	1	310	50	0	0	4	0	10.6	4.9	5.88	8	0	1	0	05-12-2019	0
350	350	16-Jun-19	CARG	1	60 M	1	310	50	0	0	4	0	16.3	1.42	2.59	2	0	1	0	05-07-2019	0
351	351	17-Oct-19	CARG+EV	1	51 M	1	310	45	0	0	4	0	13.1	1.01	1.06	1	0	1	0	23-10-2019	0
352	352	04-Jan-19	CARG	1	62 M	1	310	58	0	0	5	0	14.6	1.17	1.33	2	0	1	0	11-01-2019	0
353	353	24-May-19	CARG	1	56 M	1	310	49	0	0	4	0	14.2	1.12	1.84	1	0	1	0	31-05-2019	0
354	354	19-Nov-19	CARG	1	45 M	1	310	68	0	0	4	0	13.5	0.84	1.11	1	0	1	0	25-11-2019	0
355	355	09-Jun-19	CARG	1	39 F	1	310	61	0	0	8	0	9.1	0.61	0.92	2	0	1	0	08-06-2019	0
356	356	15-Jun-19	CARG	1	59 M	1	310	58	0	0	5	0	15.8	0.82	1.89	2	0	1	0	18-06-2019	0
357	357	09-Nov-19	CARG+EV	1	68 M	1	310	48	0	0	4	0	13.4	1.13	1.77	2	0	1	0	11-11-2019	0
358	358	29-Oct-19	CARG	1	43 M	1	311	68	0	0	4	0	15.6	1.01	1.39	1	0	1	0	07-11-2019	0
359	359	24-Apr-19	CARG	1	61 M	1	311	65	0	0	3	0	15.3	1.07	1.25	1	0	1	0	24-04-2019	0

282	282	29-Sep-19	CARG	1	69 M	1	125	50	0	0	5	0	15.4	1.31	1.57	2	1	8	Staph aure	24-09-2019	0
283	283	24-Feb-19	CARG	1	55 M	1	135	77	0	0	5	0	13.5	0.8	1.35	2	0	1	0	20-02-2019	0
284	284	04-Nov-19	CARG-EVH	1	57 M	1	125	54	0	0	5	0	14.9	1.04	1.24	8	0	1	0	09-11-2019	0
285	285	27-Mar-19	CARG	1	55 F	1	125	83	0	0	4	0	14	0.77	0.82	1	0	1	0	01-04-2019	0
286	286	16-Aug-19	CARG	1	46 M	1	128	55	0	0	4	0	14.6	1.12	1.42	2	0	1	0	02-08-2019	0
287	287	23-Aug-19	CARG	1	59 M	1	128	75	0	1	5	0	14.8	1.17	1.79	1	0	5	E Coli	03-08-2019	0
288	288	03-Jul-19	CARG	1	40 M	1	128	72	0	0	4	1	14.5	1.37	1.79	1	0	1	0	07-07-2019	0
289	289	04-Jun-19	CARG	1	67 M	1	138	48	0	0	3	1	19.9	1.21	1.86	1	0	1	0	11-06-2019	0
290	290	08-Mar-19	CARG-EVH	1	67 M	1	128	67	0	0	3	0	11.8	1.92	2.42	9	0	1	0	17-03-2019	0
291	291	08-Jul-19	CARG	1	49 M	1	138	58	0	0	0	0	14.2	0.81	1.43	2	0	1	0	13-07-2019	0
292	292	22-Nov-19	CARG	1	74 M	1	127	62	0	0	4	0	18.1	0.99	1.88	5	0	1	0	31-01-2019	0
293	293	23-Oct-19	CARG	1	58 M	1	127	30	0	0	4	0	14.8	1.08	1.2	4	0	1	0	27-10-2019	0
294	294	08-Mar-19	CARG	1	52 M	1	127	81	0	0	4	0	14.7	1.27	1.37	1	0	1	0	13-03-2019	0
295	295	12-Nov-19	CARG	1	35 M	1	127	68	0	0	4	0	15.4	0.89	1.09	2	0	1	0	18-11-2019	0
296	296	29-Oct-19	CARG-EVH	1	58 M	1	128	82	0	1	4	0	20	0.89	1.25	3	0	1	0	08-11-2019	0
297	297	26-Oct-19	CARG	1	75 M	1	128	52	0	0	4	0	15.2	1.05	2.13	4	0	6	Pseudomon	14-11-2019	0
298	298	22-Oct-19	CARG-EVH	1	81 M	1	128	56	0	0	0	0	14.8	1.28	2.15	2	0	1	0	27-10-2019	0
299	299	05-Aug-19	CARG	1	85 M	1	128	58	0	0	4	0	14.4	1.31	2.26	3	1	6	Klebsiella	13-08-2019	0
300	300	19-Jul-19	CARG	1	61 M	1	128	54	0	0	3	0	13.6	0.96	1.46	1	0	1	0	26-07-2019	0
302	302	17-Jul-19	CARG	1	70 M	1	128	52	0	0	4	0	15.9	1.96	1.99	1	0	1	0	23-07-2019	0
303	303	20-Aug-19	CARG	1	43 M	1	128	52	0	0	4	0	16.2	1.32	2.47	2	0	1	0	26-08-2019	0
304	304	18-Mar-19	CARG	1	52 M	1	128	65	0	0	4	0	15.1	1.04	1.19	6	0	1	0	23-03-2019	0
304	304	16-Aug-19	CARG	1	88 M	1	129	0	0	1	4	1	15.5	1.13	1.52	1	0	1	0	22-08-2019	0
305	305	22-Apr-19	CARG	1	47 M	1	128	89	0	0	4	0	14	1.59	1.49	2	0	1	0	17-04-2019	0
306	306	25-Nov-19	CARG	1	82 F	1	120	58	0	1	4	0	11.7	1.47	2.69	4	0	5	Stenotri	18-01-2020	0
307	307	23-Oct-19	CARG	1	59 M	1	120	87	0	0	4	0	14.1	1.77	2.34	1	0	1	0	30-10-2019	0
308	308	06-Aug-19	CARG	1	53 M	1	120	89	0	0	4	0	15.7	1.36	1.63	2	0	1	0	11-08-2019	0
309	309	09-Mar-19	CARG	1	43 F	1	120	72	0	0	4	0	14	1.07	1.35	2	0	1	0	08-03-2019	0
310	310	21-Jan-19	CARG-EVH	1	80 F	1	120	62	0	0	4	0	13.8	0.85	0.88	1	0	1	0	26-01-2019	0
311	311	26-Nov-19	CARG	1	58 M	1	121	59	0	0	5	0	15	0.76	0.91	4	0	1	0	06-12-2019	0
312	312	19-May-19	CARG	1	74 M	1	121	66	0	0	4	0	13.9	1.89	1.55	4	0	1	0	28-05-2019	0
313	313	24-Oct-19	CARG-EVH	1	58 M	1	121	59	0	0	5	0	13.8	1.06	1.45	1	0	1	0	30-10-2019	0
314	314	01-Apr-19	CARG	1	69 M	1	121	64	0	0	3	0	12.8	1.54	2.02	2	0	1	0	06-04-2019	0
315	315	14-Oct-19	CARG	1	55 F	1	121	70	0	0	4	0	12.8	0.89	1.22	2	0	1	0	21-10-2019	0
316	316	06-Mar-19	CARG	1	77 M	1	121	69	0	0	4	0	14.8	1.04	1.41	2	0	1	0	12-03-2019	1
317	317	30-Oct-19	CARG	1	65 F	1	121	69	0	0	4	0	13.5	0.99	1.03	2	0	1	0	05-11-2019	0
318	318	02-May-19	CARG	1	53 M	1	121	79	0	0	5	0	15.6	1.02	1.4	2	0	1	0	07-05-2019	0
319	319	27-Jun-19	CARG	1	39 M	1	121	68	0	0	3	0	12.4	0.59	0.98	4	0	1	0	02-07-2019	0
320	320	22-Aug-19	CARG	1	51 F	1	121	72	0	0	3	1	8.1	3.29	5.63	2	1	4	E Coli	27-06-2019	0
321	321	18-Oct-19	CARG-EVH	1	83 M	1	122	68	0	0	4	0	25	0.95	1.42	2	0	1	0	23-10-2019	0
322	322	19-May-19	CARG	1	47 M	1	122	57	0	0	4	0	14.5	1.53	1.7	2	0	1	0	15-05-2019	0
323	323	13-Jun-19	CARG	1	89 M	1	122	56	0	0	4	0	15.5	0.94	1.09	1	0	1	0	20-06-2019	0
324	324	15-Feb-19	CARG	1	44 F	1	122	83	0	0	4	0	11.3	0.79	0.89	2	0	1	0	24-02-2019	0
325	325	09-Oct-19	CARG	1	86 M	1	122	73	0	0	4	0	14	1.23	1.36	1	1	4	E Coli P80	18-10-2019	0
326	326	23-Nov-19	CARG	1	80 M	1	122	67	1	0	5	0	15.3	1.07	1.46	2	0	1	0	18-11-2019	0
327	327	03-Jul-19	CARG	1	67 M	1	123	79	0	0	4	0	14.3	1.13	1.55	2	0	1	0	04-07-2019	0
328	328	09-Oct-19	CARG	1	65 M	1	123	55	0	0	4	0	13.9	1.15	1.9	4	0	1	0	18-10-2019	0
329	329	20-Nov-19	CARG	1	39 M	1	123	74	0	0	5	0	15.2	0.86	1.12	1	0	1	0	25-11-2019	0
330	330	18-Mar-19	CARG	1	59 M	1	123	73	0	0	6	0	13.3	0.82	1.09	1	0	1	0	25-03-2019	0
331	331	14-Jan-19	CARG	1	41 M	1	124	56	0	0	5	0	14.6	1.18	1.29	2	0	1	0	10-01-2019	0
332	332	09-Nov-19	CARG	1	67 M	1	124	56	0	0	4	0	14.2	1.03	1.1	2	0	1	0	13-11-2019	0
333	333	05-Feb-19	CARG	1	58 M	1	125	74	0	0	4	0	14.9	0.94	1.08	2	0	1	0	10-02-2019	0
334	334	16-Jul-19	CARG	1	57 M	1	125	54	0	0	4	0	12.8	1.25	1.45	1	0	1	0	22-07-2019	0
335	335	04-Feb-19	CARG	1	64 M	1	125	70	0	0	4	0	13.6	0.94	1.07	2	0	1	0	10-02-2019	0
336	336	21-Nov-19	CARG	1	71 M	1	126	50	0	0	4	0	13.6	1.47	2.08	2	0	1	0	27-11-2019	0
337	337	17-Jul-19	CARG	1	52 F	1	126	87	0	0	4	0	13.1	0.96	0.96	1	0	1	0	22-07-2019	0
338	338	22-Jun-19	CARG	1	70 M	1	127	57	0	0	5	0	15.8	0.8	0.99	2	0	1	0	31-05-2019	0
339	339	20-Aug-19	CARG	1	64 M	1	127	73	0	0	4	0	14.5	1.18	1.38	2	0	1	0	25-08-2019	0
340	340	30-Aug-19	CARG	1	70 M	1	127	73	0	0	6	0	14.3	1.2	1.35	1	0	1	0	06-09-2019	0
341	341	16-Jan-19	CARG	1	56 F	1	128	89	0	0	3	0	12.9	1.37	1.61	1	0	1	0	21-01-2019	0
342	342	25-Nov-19	CARG	1	62 M	1	128	73	0	0	4	0	13.4	0.87	1.1	1	0	1	0	01-12-2019	0
343	343	23-May-19	CARG	1	66 F	1	128	70	0	0	4	0	12.7	1.3	2.11	3	0	1	0	29-05-2019	0
344	344	26-Mar-19	CARG	1	48 M	1	128	84	0	0	5	0	15.5	1.15	1.21	2	0	1	0	02-04-2019	0
345	345	09-Aug-19	CARG	1	53 F	1	128	75	0	0	4	0	12.1	0.65	1.1	2	0	1	0	18-08-2019	0
346	346	29-Apr-19	CARG	1	64 M	1	129	65	0	0	6	0	13.9	1.08	1.07	1	0	1	0	06-05-2019	0
347	347	17-Jul-19	CARG	1	65 M	1	129	71	0	0	6	0	14.1	1.18	1.38	2	0	1	0	23-07-2019	0
348	348	15-Jan-19	CARG	1	58 M	1	130	87	0	0	4	1	15.8	0.96	1.08	2	0	1	0	29-01-2019	0
349	349	10-Jul-19	CARG	1	50 M	1	130	73	0	0	3	0	13.3	0.99	1.53	2	0	1	0	15-07-2019	0
350	350	24-Apr-19	CARG	1	60 F	1	131	49	1	0	5	0	12.4	1	1.15	4	1	5	Klebsiella	02-05-2019	0
351	351	25-Feb-19	CARG	1	51 F	1	131	81	0	0	4	0	11.7	0.85	0.94	1	0	1	0	03-03-2019	0
352	352	02-May-19	CARG	1	70 F	1	131	72	1	0	4	0	14.5	1.25	1.17	2	0	1	0	06-05-2019	0
353	353	24-Jun-19	CARG	1	47 M	1	131	73	0	0	0	0	15	1.07	1.55	1	0	1	0	29-06-2019	

376	376	06-May-19	CABG	1	55 M	1	340	77	0	0	5	0	14.3	1.49	1.77	3	0	1	0	13-05-2020	0
377	377	24-Oct-19	CABG	1	55 M	1	340	82	0	0	4	0	14.1	0.8	1.05	2	0	1	0	29-10-2020	0
378	378	04-Jan-19	CABG	1	54 M	1	341	72	0	0	4	0	14.8	1.05	1.51	1	0	1	0	10-01-2020	0
379	379	24-May-19	CABG	1	47 M	1	341	57	1	0	5	0	13.3	1.53	1.88	1	0	1	0	30-05-2020	0
380	380	25-Jan-19	CABG	1	47 M	1	341	65	0	0	8	0	15.7	1.03	1.51	1	0	1	0	31-01-2020	0
381	381	01-Oct-19	CABG	1	49 M	1	342	78	0	0	6	0	16.2	1.02	1.08	2	0	1	0	06-10-2020	0
382	382	13-Mar-19	CABG	1	55 M	1	342	78	0	0	5	0	14.4	1.08	1.25	2	0	1	0	18-03-2020	0
383	383	12-Feb-19	CABG	1	41 M	1	343	85	0	0	4	0	13.7	1.12	1.34	1	0	1	0	18-02-2020	0
384	384	25-Jun-19	CABG	1	60 M	1	344	75	0	0	4	0	12.8	0.93	1.47	3	0	1	0	15-06-2020	0
385	385	25-Jun-19	CABG	1	67 M	1	345	66	0	0	4	0	13.4	1.01	1.32	2	0	1	0	30-07-2020	0
386	386	14-Nov-19	CABG	1	58 F	1	345	82	0	0	4	0	15	0.76	1.06	2	0	1	0	25-11-2020	0
387	387	17-Jun-19	CABG	1	59 M	1	345	82	0	0	5	0	15.5	1.1	1.52	2	0	1	0	22-06-2020	0
388	388	26-May-19	CABG	1	43 M	1	345	78	0	0	5	0	14.1	0.85	1.25	1	0	1	0	02-06-2020	0
389	389	03-Apr-19	CABG	1	45 M	1	346	70	0	0	5	0	14.3	1.21	1.35	1	0	1	0	09-04-2020	1
390	390	21-Jan-19	CABG	1	70 M	1	348	68	0	0	4	0	12.4	1.47	1.92	7	0	1	0	26-01-2020	0
391	391	06-May-19	CABG	1	59 M	1	348	85	0	0	5	0	18	1.02	1.54	2	0	1	0	12-05-2020	0
392	392	18-Nov-19	CABG+EVH	1	74 F	1	349	58	0	1	5	0	12.1	1.11	1.19	2	0	1	0	29-11-2020	0
393	393	09-Aug-19	CABG	1	61 M	1	350	88	0	0	4	0	15.7	0.96	1.51	2	0	1	0	14-08-2020	0
394	394	19-Jul-19	CABG	1	55 M	1	350	75	0	0	5	0	15.4	0.84	0.81	2	1	2	Presumed	25-07-2020	0
395	395	22-Jul-19	CABG	1	67 F	1	350	99	0	0	3	0	11.7	1.03	1.19	2	0	1	0	27-07-2020	0
396	396	19-Nov-19	CABG	1	68 M	1	350	71	0	0	5	0	13.7	1.17	1.38	1	0	1	0	19-11-2020	0
397	397	19-Nov-19	CABG+EVH	1	58 M	1	351	51	1	0	4	0	15	2.08	5.21	7	0	1	0	11-12-2020	0
398	398	17-Apr-19	CABG	1	89 M	1	352	88	0	0	5	0	15.1	1.02	1.54	1	0	1	0	24-04-2020	0
399	399	23-Oct-19	CABG	1	59 M	1	352	58	0	0	4	0	12.4	1.22	1.58	2	0	1	0	30-10-2020	0
400	400	11-Apr-19	CABG	1	67 F	1	352	88	0	0	4	0	11.2	1.04	0.97	1	0	1	0	16-04-2020	0
401	401	29-Jul-19	CABG	1	55 M	1	352	85	0	0	5	0	15.5	0.99	1.07	3	0	1	0	03-08-2020	0
402	402	19-Jul-19	CABG	1	55 M	1	352	92	0	0	5	0	12.7	1.25	1.22	1	0	1	0	24-07-2020	0
403	403	15-Mar-19	CABG	1	56 M	1	358	79	0	0	5	0	14.3	0.87	0.94	3	0	1	0	22-03-2020	1
404	404	30-Jul-19	CABG	1	66 M	1	358	91	0	0	4	0	15.9	1.28	2.07	2	0	1	0	05-08-2020	0
405	405	23-Oct-19	CABG	1	66 M	1	360	95	0	0	5	1	13.7	1.05	1.21	2	0	1	0	30-10-2020	0
406	406	27-May-19	CABG	1	66 M	1	361	97	0	0	6	0	14.5	1.22	1.57	1	0	1	0	02-06-2020	0
407	407	27-Feb-19	CABG	1	61 M	1	364	85	0	0	5	0	14	0.86	1.42	1	0	1	0	04-03-2020	0
408	408	25-Jun-19	CABG	1	68 M	1	366	91	0	0	4	1	15.1	1.37	1.54	2	0	1	0	30-06-2020	0
409	409	25-Oct-19	CABG	1	58 M	1	366	110	0	0	4	0	13.2	1.41	1.71	1	0	1	0	31-10-2020	0
410	410	18-Nov-19	CABG	1	59 M	1	368	85	0	0	5	0	14.6	1.22	1.18	1	1	7	Spurious M	29-11-2020	0
411	411	25-Aug-19	CABG	1	57 M	1	368	98	0	0	4	0	13.2	0.9	1.17	3	0	1	0	11-08-2020	0
412	412	07-Jan-19	CABG	1	59 M	1	370	40	1	0	4	0	16	0.94	1.2	2	0	1	0	12-01-2020	0
413	413	07-Jan-19	CABG	1	68 M	1	378	118	0	0	4	0	15.2	1	1.28	2	0	1	0	12-01-2020	0
414	414	05-Mar-19	CABG	1	63 M	1	380	89	0	0	6	0	14.2	0.98	1.04	2	0	1	0	13-03-2020	0
415	415	25-Sep-19	CABG	1	51 M	1	388	85	1	1	6	0	15	0.95	1.5	4	0	1	0	07-10-2020	0
416	416	18-Jul-19	CABG	1	69 M	1	390	70	0	0	4	0	13.2	1.33	2.22	2	1	5	Klebsiella	29-07-2020	0
417	417	06-Feb-19	OPCABG	1	50 M	2	operating	operating	operating	operating	4	0	14.5	1.22	1.72	1	0	1	0	12-02-2020	1
418	418	06-Jul-19	OPCABG	1	63 M	2	OPCABG	OPCABG	OPCABG	OPCABG	5	0	17	0.91	1.04	4	0	1	0	13-07-2020	0
419	419	14-Aug-19	OPCABG	1	51 M	2	OPCABG	OPCABG	OPCABG	OPCABG	3	0	15.7	1.19	1.87	2	0	1	0	30-08-2020	0
420	420	16-Sep-19	OPCABG	1	49 M	2	OPCABG	OPCABG	OPCABG	OPCABG	3	0	15.4	1.26	1.53	2	0	1	0	22-09-2020	0
421	421	14-Oct-19	OPCABG	1	66 M	2	OPCABG	OPCABG	OPCABG	OPCABG	4	0	15.1	1.03	1.54	1	0	1	0	22-10-2020	0
422	422	04-Nov-19	OPCABG	1	88 M	2	OPCABG	OPCABG	OPCABG	OPCABG	2	0	14.5	1	1.53	2	0	1	0	09-11-2020	0
423	423	06-Mar-19	CABG	1	62 M	2	OPCABG	OPCABG	OPCABG	OPCABG	3	0	14.2	1.48	2.01	2	0	1	0	11-03-2020	0
424	424	13-Feb-19	OPCABG	1	62 M	2	OPCABG	OPCABG	operating	operating	2	0	14	0.99	1.11	2	0	1	0	18-02-2020	0
425	425	10-Apr-19	OPCABG	1	70 M	2	OPCABG	OPCABG	OPCABG	OPCABG	3	0	14	1.03	1.4	2	0	1	0	16-04-2020	0
426	426	19-Mar-19	OPCABG	1	68 M	2	OPCABG	OPCABG	OPCABG	OPCABG	3	0	14	0.94	1.62	1	0	1	0	18-03-2020	0
427	427	21-Oct-19	OPCABG	1	63 M	2	OPCABG	OPCABG	OPCABG	OPCABG	3	0	14	0.93	1.55	1	0	1	0	28-10-2020	0
428	428	15-Oct-19	OPCABG	1	64 M	2	operating	operating	operating	operating	1	0	13.9	0.95	1.22	2	0	1	0	20-10-2020	0
429	429	11-Jan-19	operating	1	51 M	2	operating	operating	operating	operating	4	0	15.9	0.99	1.45	1	0	1	0	24-01-2020	0
430	430	27-Mar-19	OPCABG	1	44 M	2	OPCABG	OPCABG	OPCABG	OPCABG	3	0	15.7	1.07	1.15	3	0	1	0	03-04-2020	0
431	431	02-Sep-19	OPCABG	1	62 F	2	OPCABG	OPCABG	OPCABG	OPCABG	4	0	13.7	0.92	0.98	2	0	1	0	29-09-2020	0
432	432	14-Mar-19	OPCABG	1	70 M	1	OPCABG	OPCABG	OPCABG	OPCABG	1	0	13.4	1.26	1.24	4	0	1	0	29-03-2020	0
433	433	11-Jun-19	OPCABG	1	54 M	2	OPCABG	OPCABG	OPCABG	operating	3	0	13.2	1.23	1.3	2	0	1	0	17-06-2020	0
434	434	09-Aug-19	OPCABG	1	55 M	2	OPCABG	OPCABG	OPCABG	operating	1	0	12.7	0.91	1.29	2	0	1	0	15-08-2020	0
435	435	20-Mar-19	OPCABG	1	50 F	2	OPCABG	OPCABG	OPCABG	OPCABG	3	0	12.8	1.05	0.91	2	0	1	0	38-03-2020	0
436	436	09-Jul-19	CABG	1	54 F	2	OPCABG	OPCABG	OPCABG	operating	2	0	12.2	1.47	1.84	1	0	1	0	15-07-2020	0
437	437	24-Jan-19	OPCABG	1	67 M	2	OPCABG	OPCABG	OPCABG	OPCABG	1	0	11.9	1.79	2.1	1	0	1	0	02-02-2020	0
438	438	30-Sep-19	OPCABG	1	65 F	2	OPCABG	OPCABG	OPCABG	OPCABG	2	0	11.4	1.09	1.72	2	0	1	0	07-10-2020	0
439	439	08-Apr-19	OPCABG	1	50 M	2	OPCABG	OPCABG	OPCABG	OPCABG	2	0	9.9	0.92	4.76	3	0	2	Klebsiella	17-04-2020	0
440	440	16-Oct-19	OPCABG	1	45 M	2	OPCABG	OPCABG	OPCABG	OPCABG	3	0	15	1.11	1.12	1	0	1	0	21-10-2020	0
441	441	24-Apr-19	OPCABG	1	58 M	2	OPCABG	OPCABG	OPCABG	OPCABG	2	0	14.6	1.25	1.33	2	0	1	0	29-04-2020	0
442	442	29-Jun-19	OPCABG	1	55 M	2	operating	operating	operating	operating	3	0	14.7	0.94	1.07	2	0	1	0	02-07-2020	0
443	443	30-Jul-19	OPCABG	1	46 M	2	operating	operating	operating	operating	4	0	17.4	1.36	1.39	2	0	1	0	04-08-2020	0
444	444	21-Aug-19	CABG	1	55 M	2	operating	OPCABG	OPCABG	OPCABG	3	0	17.3	0.96	1.09	3	0	1	0	16-08-2020	0
445	445	30-Sep-19	OPCABG	1	43 M	2	operating	OPCABG	OPCABG	OPCABG	2	0	15.5	1.3	1.45	1	0	1	0	05-10-2020	0
446	446	03-Oct-19	OPCABG	1																	

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1	1	0	0	0	0	0	1	0	0	0	0	1	1	2	0	68	35	32 No proof	0	0	0	
1	1	0	0	0	0	0	0	1	0	1	0	2	1	2	1	59	32	26 No proof	0	0	0	
0	0	0	0	0	0	0	0	0	0	1	1	0	2	1	2	58	31	25 No proof	0	0	0	
1	0	0	0	0	0	1	0	1	2	1	1	0	6	1	2	62	33	33 proof	1	0	0	
0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	66	32	28 No proof	0	0	0	
0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	2	1	60	31	32 No proof	0	0	0
0	0	0	0	0	0	1	0	1	0	1	1	0	4	1	2	0	NA	NA	No proof	0	0	0
1	0	0	0	0	1	1	0	0	0	0	0	2	1	3	0	47	40	30 No proof	0	0	0	
1	1	0	0	0	0	1	1	0	1	0	0	4	1	2	1	27	32	33 No proof	0	0	0	
0	0	0	0	0	0	1	0	1	0	1	0	3	1	2	NA	68	34	36 No proof	0	0	0	
1	0	0	0	0	0	1	0	0	0	1	0	2	1	2	0	52	38	33 No proof	0	0	0	
0	0	0	0	0	0	1	0	1	2	1	1	0	6	1	2	0	60	40	29 No proof	1	0	0
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0	0	0	0	0	0	1	0	0	0	0	0	2	1	2	0	55	NA	NA	No proof	0	0	0
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1	1	0	0	0	1	0	0	0	0	0	0	3	0	2	1	44	32	31 No proof	0	0	0	
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0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	65	31	22 No proof	0	0	0	
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0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	65	31	22 No proof	0	0	0	
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0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	66	31	25 No proof	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	60	30	30 No proof	0	0	0	
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0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	65	31	22 No proof	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	64	37	28 No proof	0	0	0	
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0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	66	31	25 No proof	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	60	30	30 No proof	0	0	0	
1	1	0	0	0	0	1	0	1	0	1	0	0	3	1	2	1	48	30	27 No proof	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	65	31	22 No proof	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	64	37	28 No proof	0	0	0	
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1	0	0	0	0	0	1	0	0	0	0	0	0	1	1	2	0	65	43	36 No proof	0	0	0
0	0	0	0	0																		

0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	2	0	68	34	34 No proof	0	0	0	
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0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	2	0	55 NA	NA	No proof	0	0	0	
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0	0	0	0	0	0	0	0	1	0	0	0	0	1	2	1	1	0	82	35	28 No proof	0	0	0
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0	0	0	0	0	0	0	1	0	1	0	1	0	0	3	1	2	1	72	40	33 proof	1	0	0
1	0	0	0	0	0	1	1	0	1	0	1	0	0	4	1	3	0	NA	NA	No proof	1	0	0
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1	1	0	0	0	0	1	1	0	1	0	1	0	0	4	1	3	1	60	41	28 proof	1	0	0
0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	1	0	0	63	36	32 No proof	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	50 NA	NA	No proof	Death POC	0	0	0
1	0	0	0	0	0	0	1	1	0	0	0	0	0	3	1	2	0	55 NA	NA	No proof	Death POC	Death POC	Death POC
0	0	0	0	0	0	1	0	0	0	1	0	0	0	3	1	2	0	45	35	38 No proof	Death on f	Death on f	Death on f
1	0	0	0	0	0	0	0	0	1	0	0	0	1	2	1	2	1	71	50	26 No proof	Death on f	Death on f	Death on f
1	0	0	0	0	0	0	1	0	1	0	1	0	1	4	1	2	0	54	29	31 No proof	Death	Death	Death
0	0	0	0	0	0	1	1	0	1	0	1	0	1	5	1	3	0	40	33	27 proof	Death	Death	Death
0	0	0	0	0	0	1	0	0	0	0	0	1	2	0	2	NA	46	41	32 No proof	Death	Death	Death	

11

1	0	0	0	0	0	5	73	75	0	17	7	73	91	148	51.26205	1	70	127.1368	127.1368
1	0	0	0	0	0	6	48	3	0	42	4	46	45	49	0.453961	1	56.5	88.84627	88.84627
1	0	0	0	0	0	6	52	0	0	39	4	52	39	52	34.06593	1	59	77.442	77.442
1	0	0	0	0	0	7	45	78	0	37	7	45	115	123	10.58824	1	71.5	92.29575	92.29575
1	0	0	0	0	0	6	47	78	0	39	7	47	117	125	91.09589	1	68	51.1035	51.1035
1	0	0	0	0	0	6	259	249	0	39	25	259	288	508	25.52941	0.85	55	55.92157	55.92157
1	0	0	0	0	0	6	69	77	0	57	8	69	114	146	6.19469	1	86	86.51917	86.51917
1	0	0	0	0	0	6	94	54	0	42	8	94	96	148	46.25058	1	53	57.78076	57.78076
1	0	0	0	0	0	6	46	102	0	41	8	46	143	148	36.73469	1	79	67.92328	67.92328
1	0	0	0	0	0	6	57	75	0	56	10	57	141	172	36.05604	1	65	80.18519	80.18519
1	0	0	0	0	0	5	71	55	0	16	6	71	69	124	7.526802	1	65	71.83393	71.83393
1	0	0	0	0	0	6	49	77	0	41	7	49	118	126	19.41748	0.85	63.5	77.08311	77.08311
1	0	0	0	0	0	5	46	119	0	42	9	46	167	171	44.55762	1	60	55.92157	55.92157
1	0	0	0	0	0	6	46	105	0	39	8	46	144	151	57.95105	1	71	63.05699	63.05699
1	0	0	0	0	0	6	50	74	0	42	7	50	118	124	25.63636	1	71	72.61364	72.61364
1	0	0	0	0	0	6	40	11	0	0	2	40	11	53	16.07143	1	88	44.41158	44.41158
1	0	0	0	0	0	6	78	46	0	42	7	78	88	124	1.928077	1	55	58.02618	58.02618
1	0	0	0	0	0	5	48	77	0	45	7	48	120	125	9.615385	1	80	55.28946	55.28946
1	0	0	0	0	0	5	71	77	0	15	7	71	82	148	43.84615	1	85	56.25	56.25
1	0	0	0	0	0	7	70	50	0	40	7	70	90	120	17.02128	1	72.5	62.13061	62.13061
1	0	0	0	0	0	6	59	0	0	39	6	59	39	99	33.33333	1	69	67.68519	67.68519
1	0	0	0	0	0	5	54	69	0	41	7	54	110	123	1.834862	0.85	54	64.6789	64.6789
1	0	0	0	0	0	5	73	51	0	39	7	73	90	124	7.653588	1	78	65.67684	65.67684
1	0	0	0	0	0	8	38	0	0	22	5	38	22	39	40.16393	1	85	54.01867	54.01867
1	0	0	0	0	0	8	95	146	0	41	11	95	187	241	8.490566	0.85	82	87.0283	87.0283
1	0	0	0	0	0	7	172	252	0	4	22	172	256	524	13.51351	1	62	29.11582	29.11582
1	0	0	0	0	0	6	77	0	0	41	5	77	41	77	21.48148	1	78	62.59259	62.59259
1	0	0	0	0	0	7	77	44	0	41	7	77	85	121	17.82946	1	58	45.71232	45.71232
1	0	0	0	0	0	5	118	54	0	39	9	118	93	172	21.32353	1	52	39.45588	39.45588
1	0	0	0	0	0	6	48	100	0	41	8	48	141	148	74.73684	1	58	64.44444	64.44444
1	0	0	0	0	0	6	46	78	49	0	7	95	78	124	10.71429	1	80	92.2619	92.2619
1	0	0	0	0	0	7	67	54	0	40	7	67	94	121	43.47826	1	89	48.21429	48.21429
1	0	0	0	0	0	8	91	0	0	44	6	91	44	81	118.1034	1	80	61.30268	61.30268
1	0	0	0	0	0	8	37	0	0	17	2	37	17	37	4.237288	1	90	85.80508	85.80508
1	0	0	0	0	0	6	48	72	88	354	23	136	426	120	74.4998	1	60	57.82313	57.82313
1	0	0	0	0	0	6	47	0	0	44	4	47	44	47	8.294931	1	56	35.9068	35.9068
1	0	0	0	0	0	5	76	47	0	38	7	76	85	123	21.76871	1	65	52.81557	52.81557
1	0	0	0	0	0	6	67	0	0	42	5	67	42	67	2.631579	0.85	64	105.2632	105.2632
1	0	0	0	0	0	6	51	0	0	37	4	51	37	51	7.07965	1	65	62.31563	62.31563
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1	0	0	0	0	0	7	70	99	0	18	8	70	117	169	31.16883	0.85	71	115.9791	115.9791
1	0	0	0	0	0	7	49	146	18	0	9	67	146	195	44.16605	1	72	120.9302	120.9302
1	0	0	0	0	0	6	118	53	0	41	9	118	94	171	19.66527	1	70	90.50907	90.50907
1	0	0	0	0	0	7	96	0	0	15	5	96	15	96	36.50932	1	69.5	40.7695	40.7695
1	0	0	0	0	0	6	69	0	0	39	5	69	39	69	25.88889	1	70	44.29012	44.29012
1	0	0	0	0	0	6	71	76	0	41	8	71	117	147	4.854369	0.85	53.7	54.90825	54.90825
1	0	0	0	0	0	6	47	77	0	38	7	47	115	124	22.3301	1	66	74.75728	74.75728

1	0	0	0	0	0	0	1	8	78	0	50	428	23	128	428	78	38.66613	1	61	45.76237	45.76237
1	0	0	0	0	0	0	0	4	210	0	0	48	11	210	48	210	181.4815	1	61.5	32.99162	32.99162
1	0	0	0	0	0	0	0	6	141	126	0	39	13	141	165	267	83.33333	1	68	73.17317	73.17317
1	0	0	0	0	0	0	0	6	48	78	0	18	6	48	96	126	6.140051	1	64	62.59844	62.59844
1	0	0	0	0	0	0	0	5	50	75	0	39	7	50	114	125	51.04167	1	68	75.73611	75.73611
1	0	0	0	0	0	0	0	6	69	51	0	17	8	69	68	120	14.81481	1	75.5	69.90741	69.90741
1	0	0	0	0	0	0	0	5	45	175	0	40	11	45	215	220	0.545794	0.85	63	63.78565	63.78565
1	0	0	0	0	0	0	0	6	54	0	0	41	4	54	41	54	19.23077	0.85	62	47.69233	47.69233
1	0	0	0	0	0	0	0	5	47	124	0	44	8	47	188	171	67.64706	1	69	80.80065	80.80065
1	0	0	0	0	0	0	0	7	46	101	0	37	8	46	138	147	25.89286	1	93.5	91.59846	91.59846
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1	0	0	0	0	0	0	0	7	44	80	0	41	7	44	121	124	27.16049	1	66	105.7737	105.7737
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1	0	0	0	0	0	0	0	8	97	73	0	39	9	97	114	172	17.32577	1	69	70.10309	70.10309
1	0	0	0	0	0	0	0	8	47	68	0	38	6	47	107	116	60.18519	0.85	48	45.67861	45.67861
1	0	0	0	0	0	0	0	5	55	1	0	38	4	55	39	56	36.25	1	89	51.15451	51.15451
1	0	0	0	0	0	0	0	8	93	80	0	41	9	93	121	173	100	0.85	44.5	74.76478	74.76478
1	0	0	0	0	0	0	0	5	49	118	0	41	9	49	159	167	31.41857	1	79	57.89608	57.89608
1	0	0	0	0	0	0	0	5	72	52	0	66	8	72	118	124	15.51351	0.85	56	58.15816	58.15816
1	0	0	0	0	0	0	0	6	46	77	0	63	8	46	140	123	39.73603	0.85	71	122.9262	122.9262
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1	0	0	0	0	0	0	0	5	70	26	0	41	6	70	67	96	57.29167	1	57.5	65.71904	65.71904	
1	0	0	0	0	0	0	0	7	95	44	0	41	8	95	85	139	-3.57143	1	47	66.05488	66.05488	
1	0	0	0	0	0	0	0	6	45	77	0	42	7	45	119	122	15.53398	0.85	58	57.09277	48.52886	
1	0	0	0	0	0	0	0	7	45	76	0	42	7	45	118	123	17.94872	1	70	61.49098	61.49098	
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1	0	0	0	0	0	0	0	7	48	75	0	40	7	48	115	123	-6.73077	0.85	56	54.59462	46.40491	
1	0	0	0	0	0	0	0	6	51	0	0	40	4	51	40	51	15.05376	1	56	71.08722	71.08722	
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1	0	0	0	0	0	0	0	13	146	157	0	18	13	146	155	285	15.2381	1	69	67.53968	67.53968	
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1	0	0	0	0	0	0	4	76	46	0	16	6	76	62	122	-1.5873	1	55	42.48827	42.48827	
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1	0	0	0	0	0	0	6	36	110	0	39	8	36	149	140	-11.6505	0.85	80	97.08738	82.52427	
1	0	0	0	0	0	0	5	49	101	0	42	8	49	143	150	-8.94354	0.85	78	63.57968	53.87188	
1	0	0	0	0	0	0	4	145	76	0	17	10	145	95	221	17.31844	1	58.4	35.07803	35.07803	
1	0	0	0	0	0	0	5	68	100	0	48	9	68	146	168	57.79817	0.85	65	62.11774	52.80006	
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1	0	0	0	0	0	0	5	37	87	0	39	7	37	126	124	0.900901	1	82	97.47247	97.47247	
1	0	0	0	0	0	0	5	51	71	0	39	7	51	110	122	8.4	1	75	88.35333	88.35333	
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1	0	0	0	0	0	0	5	53	72	0	19	6	53	91	125	-5.98291	1	64	66.09687	66.09687	
1	0	0	0	0	0	0	5	71	51	0	40	7	71	91	122	36.88932	1	65	79.75998	79.75998	
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1	0	0	0	0	0	0	4	43	75	0	45	7	43	120	118	24.69136	0.85	60	84.36214	71.70782	
1	0	0	0	0	0	0	5	47	0	0	44	4	47	44	47	12.5	1	67	64.36343	64.36343	
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1	0	0	0	0	0	0	8	248	0	0	42	12	248	42	248	515.7144	0.85	58.5	89.375	75.96875	
1	0	0	0	0	0	0	8	292	25	0	39	15	292	64	317	37.63441	0.85	58	66.69054	56.69205	
1	0	0	0	0	0	0	1	7	248	0	0	39	12	246	39	246	245.1923	0.85	57	59.375	50.48875
1	0	0	0	0	0	0	4	24	0	68	0	4	92	0	24	237.7049	0.85	69	144.5355	122.855	