

**NATURAL HISTORY OF CORONARY STENTS:
LONG TERM FOLLOW-UP OF CONSECUTIVE HUNDRED
PATIENTS AFTER CORONARY STENTING WITH DRUG
ELUTING STENTS AND BARE METAL STENTS**

Dr. WALSE ROHIT SUNIL

D.M. TRAINEE

A THESIS SUBMITTED FOR THE DEGREE OF DM CARDIOLOGY



DEPARTMENT OF CARDIOLOGY

**SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES
AND TECHNOLOGY, THIRUVANANTHAPURAM**

AUGUST 2021

DECLARATION

I, Dr. Walse Rohit Sunil, hereby declare that the project in this book titled
"NATURAL HISTORY OF CORONARY STENTS: LONG TERM FOLLOW-UP OF
CONSECUTIVE HUNDRED PATIENTS AFTER CORONARY STENTING WITH
DRUG ELUTING STENTS AND BARE METAL STENTS " was undertaken by me
under the supervision of the faculty, Department of Cardiology, Sree Chitra Tirunal Institute
for Medical Sciences and Technology.

Thiruvananthapuram

Date: 09/08/2021



Dr. Walse Rohit Sunil

DM Trainee

CERTIFICATE

I, hereby certify that the work in this dissertation titled "**NATURAL HISTORY OF CORONARY STENTS: LONG TERM FOLLOW-UP OF CONSECUTIVE HUNDRED PATIENTS AFTER CORONARY STENTING WITH DRUG ELUTING STENTS AND BARE METAL STENTS**" is a certified record of original research work undertaken by Dr. Walse Rohit Sunil done in the Department of Cardiology, in partial fulfilment of the requirement for the purpose of award of D.M. cardiology degree.

Forwarded

The candidate, **Dr. Walse Rohit Sunil**, has carried out the minimum required project.

Dr. Harikrishnan S

Professor and Incharge Head,

Department of Cardiology

Sree Chitra Tirunal Institute for Medical Sciences and Technology

Thiruvananthapuram.

CERTIFICATE

I, hereby certify that the work in this dissertation titled "**NATURAL HISTORY OF CORONARY STENTS: LONG TERM FOLLOW-UP OF CONSECUTIVE HUNDRED PATIENTS AFTER CORONARY STENTING WITH DRUG ELUTING STENTS AND BARE METAL STENTS**" is a certified record of original research work undertaken by Dr. Walse Rohit Sunil done in the Department of Cardiology, in partial fulfilment of requirement for the purpose of award of D.M. cardiology degree under my supervision and care.

Guide:

Dr. V.K. Ajit Kumar, MD, DM

Professor Senior Grade

Dept of Cardiology

Sree Chitra Tirunal Institute for Medical Sciences and Technology

Thiruvananthapuram- 695011



Co-Guide:

Dr. Krishna Kumar M., MD, DM

Associate Professor of Cardiology

Sree Chitra Tirunal Institute for Medical Sciences and Technology

Thiruvananthapuram- 695011



TITLE

**"NATURAL HISTORY OF CORONARY STENTS: LONG TERM FOLLOW-UP OF
CONSECUTIVE HUNDRED PATIENTS AFTER CORONARY STENTING WITH
DRUG ELUTING STENTS AND BARE METAL STENTS"**

Primary Investigator:

Dr. Walse Rohit Sunil, MD

Senior Resident

Department of Cardiology, SCTIMST.



Guide:

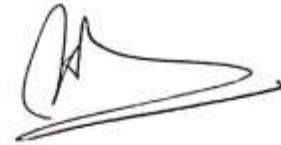
Dr. V.K. Ajit Kumar, MD, DM

Professor Senior Grade

Dept of Cardiology

Sree Chitra Tirunal Institute for Medical Sciences and Technology

Thiruvananthapuram- 695011



Co-Guide:

Dr. Krishna Kumar M., MD, DM

Associate Professor of Cardiology

Sree Chitra Tirunal Institute for Medical Sciences and Technology

Thiruvananthapuram- 695011



CONTENTS

ACKNOWLEDGMENTS	i
ABBREVIATIONS	ii-iii
SYNOPSIS	iv-v
INTRODUCTION	1-2
AIMS AND HYPOTHESIS	3
REVIEW OF LITERATURE	4-15
MATERIALS AND METHODS	16-23
OBSERVATIONS AND RESULTS	24-36
DISCUSSION	37-41
LIMITATIONS	43
CONCLUSIONS	44
REFERENCES	45-50
APPENDIX	51-98

ACKNOWLEDGMENTS

It is with deep sense of gratitude, satisfaction and with the divine blessings of GOD that I submit this dissertation. I take this opportunity with much pleasure to thank all who contributed in many ways for the success of this study.

I am greatly indebted to my guide and supervisor **Dr. V.K. Ajit Kumar** for the idea of conducting such a research, continued support and advice he has extended to me throughout my work towards this thesis.

I am grateful to **Dr. Krishnamoorthy K.M.**, Professor and Head, Department of Cardiology, SCTIMST for his support during the entire work.

I would like to express my deep sense of thanks and gratitude to my co-guide **Dr. Krishna Kumar M.** for providing valuable contributions and constant encouragement that helped me to make the study better.

I would also like to sincerely thank all the faculty members of Department of Cardiology, SCTIMST for all the support. I have no words to express my heartfelt gratitude and love to my family, who provided the most precious support.

I would like to thank **Dr. Sankara Sarma** and **Dr. Jissa V.T.** for guidance in the statistical analysis and for constantly supporting me all the time in my work.

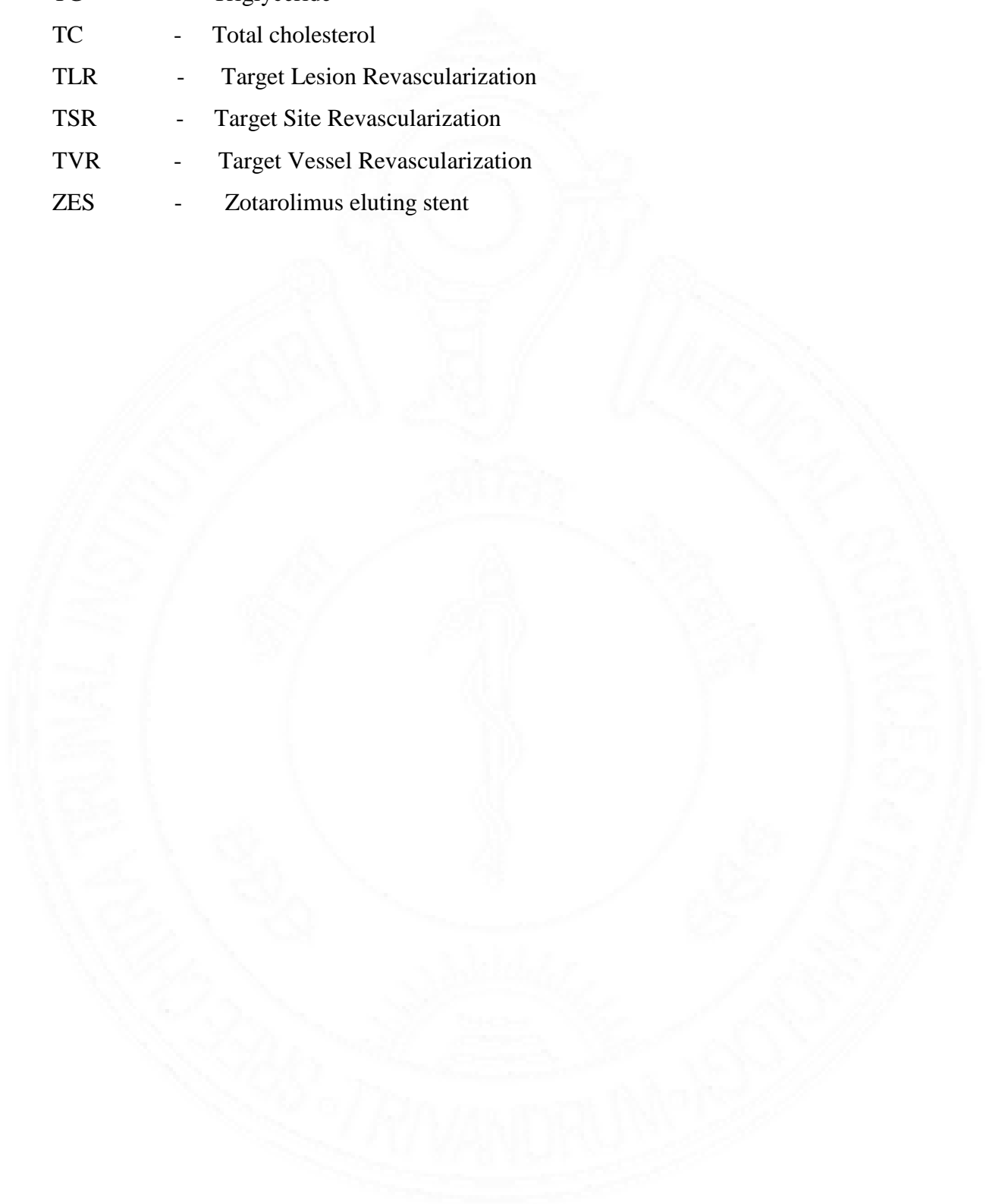
Finally, I want to thank the technical staff and the nursing staff of SCTIMST for their friendly support and helping hands.

Dr. Walse Rohit Sunil

ABBREVIATIONS

ACT	-	Activated clotting time
BMS	-	Bare metal stent
CABG	-	Coronary artery bypass grafting
CAD	-	Coronary Artery Disease
CAG	-	Coronary Angiography
CoCr	-	Cobalt Chromium
Creat	-	Creatinine
CSA	-	Chronic stable angina
DES	-	Drug eluting stent
DM	-	Diabetes Mellitus
DLP	-	Dyslipidemia
ECG	-	Electrocardiogram
EES	-	Everolimus eluting stent
EF	-	Ejection fraction
FBS	-	Fasting blood sugar
F/H/O CAD	-	Family history of Coronary artery disease
Hb	-	Haemoglobin
HDL	-	High density lipoprotein
HTN	-	Hypertension
ISR	-	In-stent restenosis
LAD	-	Left anterior descending coronary artery
LCX	-	Left circumflex coronary artery
LDL	-	Low density lipoprotein
MACCE	-	Major adverse cardiovascular and cerebrovascular events
MI	-	Myocardial Infarction
NSTEMI	-	Non ST elevation Myocardial Infarction
NYHA	-	New York Heart Association
PCI	-	Percutaneous Coronary Intervention
PES	-	Paclitaxel eluting stent
POBA	-	Plain Old Balloon Angioplasty
PTCA	-	Percutaneous Transluminal Coronary Angioplasty
RCA	-	Right coronary artery

- ST - Stent thrombosis
- STEMI - ST elevation Myocardial Infarction
- TG - Triglyceride
- TC - Total cholesterol
- TLR - Target Lesion Revascularization
- TSR - Target Site Revascularization
- TVR - Target Vessel Revascularization
- ZES - Zotarolimus eluting stent



SYNOPSIS

Background:

Several randomized trials with 1-year follow-up have demonstrated the effectiveness of drug-eluting stents (DES) in reducing the rate of repeat revascularization at one year compared with BMS. Few studies have reported longer follow-up and have delivered conflicting results regarding the late occurrence of death or stent thrombosis. Since there is a paucity of data regarding very long term follow up of patients receiving DES and BMS, we planned to evaluate the same in our study.

Aim:

To assess the long term clinical outcome after coronary artery stenting with drug eluting stents (DES) and bare metal stents (BMS).

Methods:

This is a retrospective cohort study, including 100 consecutive patients with Coronary Artery Disease (CAD) who underwent successful percutaneous intervention (PCI) with implantation of drug eluting stents and contemporary 100 patients who underwent PCI with implantation of bare metal stent (BMS) in the year 2005 and 2006 at our center. Patients with history of acute (7 days from onset) myocardial infarction, those who underwent primary PCI and those with any prior procedure in the past were excluded. These patients were subsequently followed up till April 2021 and outcomes were analysed.

Results:

In our retrospective analysis including a total of 200 patients (consecutive 100 patients each receiving drug eluting stents (DES) and bare metal stents (BMS)], the baseline characteristics were largely comparable. Over a median follow up of 170 months, the primary

composite outcome of major adverse cardiovascular and cerebrovascular events (MACCE) was found to be similar in both the groups [37 in DES group and 36 in BMS group; p value = 0.88]. At 1 year of follow up, the incidence of MACCE was significantly higher with BMS group than DES group. [DES-3; BMS-10, P value = 0.04]; but the benefit vanishes beyond 1 year of follow up. Other parameters like all cause death (p value = 0.52), cardiovascular death (p value = 0.57), myocardial infarction (p value = 0.80), in stent restenosis (p value = 0.47), target lesion revascularization (p value = 0.82), target vessel revascularization (p value = 0.67), any other vessel revascularization (p value = 0.83) and stroke (p value = 0.47) were similar in both the groups. The incidence of very late stent thrombosis in our study population was similar in either of the groups (p value = 0.13). Obesity and creatinine of > 1.4 mg/dl were found to be associated with higher incidence of all cause death [(HR-6.02, 95% CI- 1.92-18.52, p value = 0.002) and (HR-7.34, 95% CI- 2.39-22.55, p value < 0.001) respectively].

Conclusion:

In patients with coronary artery disease, the composite endpoint of MACCE for the first year after stenting was significantly lower in patients receiving DES than those receiving BMS; however, beyond 1 year, the event rates were similar. The occurrence of very late stent thrombosis was nearly similar with DES when compared to BMS over a long term follow up.

INTRODUCTION:

Coronary angioplasty with stent implantation is currently one of the established modalities for invasive treatment of patients with symptomatic coronary artery disease (CAD)¹. Percutaneous transluminal coronary angioplasty (PTCA) was introduced into clinical practice more than 20 years ago. Coronary artery stents have improved the safety and efficacy of percutaneous coronary interventions (PCIs)². However, abrupt vessel closure, complicating 6% to 8% of balloon angioplasty procedures, was associated with a 40% rate of myocardial infarction (MI), 40% rate of emergency coronary artery bypass grafting and a 5% mortality³. Stents significantly reduced these adverse events⁴. The decrease in restenosis rates afforded by bare metal stents (BMS) was modest (30% to 40%), but repeat revascularization still occurred in 15% to 20% of cases⁵. Drug-eluting stents (DES) with antiproliferative drugs attached via polymers on the stent surface to minimize smooth muscle proliferation have reduced restenosis and rates of target lesion revascularization by 50% to 70% compared with BMS across nearly all lesion and patient subsets⁶. Few years after introduction of DES, safety concerns were raised, particularly about late stent thrombosis (ST)^{1,7,8}.

In 2006, incomplete neointimal coverage was identified as the cause of such increased risk of stent thrombosis (ST) with DES, as reported from pathoanatomical studies⁹, randomized trials⁸ and registries¹⁰. Although short term trials had showed safety and efficacy of DES over BMS in terms of repeat revascularization & stent thrombosis¹¹, long term studies reported that the lower rate of stent thrombosis (ST) with DES in comparison to BMS was limited during the first-year post-stenting, and after 1 year, DES and BMS were associated with similar ST rates¹². NORSTENT trial showed that, there were no significant differences between the patients receiving drug-eluting stents and those receiving bare-metal stents in the composite outcome of death from any cause and nonfatal spontaneous myocardial infarction at a median follow up of 5 years, however the rates of repeat revascularization were significantly lower in the group receiving DES¹³. Yin et al¹⁴ also reported that the use of DES in large coronary arteries is associated with significant reductions in the risks of TLR and TVR at 9-year long-term follow-up compared to BMS and there is no significant difference in all-cause mortality, MI, and thrombosis between DES and BMS groups. To date, the longest follow-up study by Vale et al¹⁵ showed a potential survival

benefit of first-generation sirolimus-eluting stents versus bare-metal stents at 10 years of follow up.

With the development of newer generation DES with lower strut thickness, there is improved survival benefit and reduced target vessel revascularization especially in patients of ST segment elevation myocardial infarction (STEMI), however very long term data comparing clinical outcomes following PCI with DES and BMS is lacking. We planned to evaluate outcomes of DES and contemporary BMS over further long term follow up.



AIM AND HYPOTHESIS

AIM:

To assess the long term clinical outcome after coronary artery stenting with drug eluting stents (DES) and bare metal stents (BMS).

HYPOTHESIS:

Long term follow up of patients with drug eluting stents (DES) has similar outcomes as that of bare metal stents (BMS).

REVIEW OF LITERATURE:

Percutaneous transluminal coronary angioplasty (PTCA) is very useful in the treatment of symptomatic patients with coronary artery disease¹⁶. Percutaneous endovascular stenting was conceived almost two decades ago^{17,18} as a way to prevent acute occlusion as well as late restenosis after catheter intervention, but the initial clinical reports of coronary artery stenting in 1987 were troubled by high (>20%) acute and subacute thrombosis¹⁹.

Long-term benefits of coronary balloon angioplasty are limited by the possibility of restenosis of the treated segment, which occurs in approximately 30-50% of the patients²⁰⁻²². Intracoronary stents offer an alternative to balloon angioplasty by (i) reducing elastic recoil²³, (ii) by sealing the intimal flaps and (iii) by serving as a scaffolding for the vascular wall, allowing greater vessel expansion¹⁶. Coronary stenting has been shown to optimize the geometry of the artery lumen after balloon angioplasty²³, which lead to reduction in the procedural complications^{24,25} and late restenosis^{26,27}. Restenosis after balloon angioplasty can be caused by several factors, including elastic recoil of the dilated artery, proliferation of smooth muscle cells, platelet-mediated thrombus formation and vascular remodelling²¹. When restenosis develops, it is most often associated with recurrent myocardial ischemia that makes additional revascularization procedures necessary²⁸.

Two landmark randomized trials-the STent RE Stenosis (STRESS) Study²⁵ and the Belgian Netherlands STENT (BENESTENT) study²⁴ compared balloon angioplasty with stenting in primary focal lesions. These trials clearly demonstrated the efficacy of the Palmaz-Schatz stent in the reduction of the rate of angiographically detected restenosis, with a reduction in major clinical end points in the BENESTENT trial at 1-year follow-up²⁹⁻³¹.

In the STRESS study²⁵, the patients who underwent stenting were found to have a higher rate of procedural success than those who underwent standard balloon angioplasty (96.1 % vs 89.6%, $p = 0.011$), a larger immediate increase in the diameter of the lumen (1.72 ± 0.46 vs. 1.23 ± 0.48 mm, $p < 0.001$) and a larger luminal diameter immediately after the procedure (2.49 ± 0.43 vs. 1.99 ± 0.47 mm, $p < 0.001$). Even at six months, the patients with stented lesions continued to have a larger luminal diameter (1.74 ± 0.60 vs. 1.56 ± 0.65 mm, $p = 0.007$) and a lower rate of restenosis (31.6 % vs. 42.1 %, $p = 0.046$) than those treated with balloon angioplasty. There were no coronary events (death; myocardial infarction; coronary-artery bypass surgery; vessel closure, including stent thrombosis; or repeated angioplasty) in

80.5% of the patients in the stent group and 76.2% of those in the angioplasty group ($P = 0.16$). Revascularization of the original target lesion because of recurrent myocardial ischemia was performed less frequently in the stent group than in the angioplasty group (10.2% vs. 15.4%, $p = 0.06$)²⁵.

In another landmark trial comparing bare metal stents to angioplasty, published in the same year (1992)- BENESTENT trial- 52 patients in the stent group (20%) and 76 patients in the angioplasty group (30%) reached a primary clinical end point (death, the occurrence of cerebrovascular accident, myocardial infarction, the need for coronary-artery bypass surgery, or a second percutaneous intervention involving the previously treated lesion), either at the time of the initial procedure or during the subsequent seven months) (relative risk, 0.68; 95% confidence interval, 0.50 to 0.92; $p = 0.02$). The difference in clinical-event rates was explained mainly by reduced need for a second coronary angioplasty in the stent group (relative risk, 0.58; 95% confidence interval, 0.40 to 0.85; $p = 0.005$). The mean (\pm SD) minimal luminal diameters immediately after the procedure was 2.48 ± 0.39 mm in the stent group and 2.05 ± 0.33 mm in the angioplasty group; at follow-up, the diameters were 1.82 ± 0.64 mm in the stent group and 1.73 ± 0.55 mm in the angioplasty group ($p = 0.09$), which correspond to rates of restenosis (diameter of stenosis, \sim 50%) of 22 and 32%, respectively ($p = 0.02$). Peripheral vascular complications necessitating surgery, blood transfusion, were more frequent and the mean hospital stay longer in the stent group than in the angioplasty group²⁷.

Driven largely by the favourable results of the above trials^{25,27} and previous reports, in 1994 Food and Drug Administration (FDA) approval of the Palmaz-Schatz stent for elective primary coronary artery revascularization in selected patients represented a milestone in the percutaneous treatment of coronary artery disease³².

However, both trials had a relatively short (7 to 8 months) follow-up period. In the editorial accompanying the publication of the results of these trials, issues regarding the longer-term results of stenting, with specific concerns about the potential for late migration, metal fatigue, endarteritis, late restenosis and other late complications of prosthetic devices implanted in coronary arteries were raised³³.

By 1996, 2 groups independently came out with the late results of bare metal stenting. In the study by Laham et al³⁴, clinical follow-up of over 4 to 6 years showed an overall

survival rate of 95.4%, 87.9% and 86.7%, respectively, at 1, 3 and 5 years. This reflected a 3%/year mortality rate typical of coronary artery disease. The most common late event was repeat revascularization, whose cumulative probability was 24.3%, 39% and 41.2% respectively at 1, 3 and 5 years. However, the probability of repeat intervention on the stented site (TSR) was thus 8.73% at 6 months and 14.91% at one year, reaching a plateau at 17.1% to 19.8% over 2 to 5 years. Late (>1 year) TSR was driven by in-stent restenosis in only three patients (1.7% of the stented cohort), with most other late revascularisations being performed on mild "innocent bystander" lesions during procedures aimed primarily at treatment of other segment(s)³⁴. Kimura et al found similar results in their study on follow-up of Palmaz Schatz stents and they concluded that during follow-up of approximately 3 years, majority of adverse events and stent-site revascularizations occurred early after stenting, and disease progression in nonstented vessels accounted for the majority of late revascularization events. Clinical predictors of worse long-term outcome included diabetes mellitus, higher angina score at follow-up, smaller stent deployment balloon size and greater number of stents at implantation³⁵. Kiemeneij et al³⁶ agreed that the original 10% absolute difference in target lesion revascularization (TLR) in favour of the stent group remained unchanged at five years, emphasizing the long-term stability of the stented target site.

In the study by Choussat et al³⁷, the 8-year event-free survival (freedom from death, freedom from death / MI / target-stented site revascularization, and freedom from death / MI / any coronary revascularization) was (mean + SE) 0.86 + 0.01, 0.62 + 0.03, and 0.47 + 0.02, respectively. Unstable angina, lower left ventricular ejection fraction, and saphenous vein graft stenting were found to be independent predictors of death during follow-up. Hypertension, unstable angina, multivessel disease, and multiple stent implantations were found to be independent predictors of the composite of death / MI /any coronary revascularization during follow-up³⁷. This study provided a useful assessment of long term event-free survival, and predictors of major cardiac events 8 to 10 years after Palmaz -Schatz stent implantation.

With more people surviving late after bare metal stenting, long term outcome and the possible predictors of outcome started to generate much interest. Reports of late survival (> 10 years) after bare metal stenting are available in only a few studies¹⁵.

Fuji et al, analysed 10 year follow-up data for 125 serial patients (aged 62 ± 9 years, 104 males) in whom a BMS was successfully implanted. The early angiographic restenosis

rate was 21.7%, and early (~ 2 years) target lesion revascularization was performed in 17 patients (13.6%) using PCI after a mean period of 0.6 ± 0.2 years. Cardiac death (n=16 [12.8%]), including sudden cardiac death (n=9 [7.2%]), non-cardiac death (n=17 [13.6%]) and nonfatal acute myocardial infarction (n=16 [12.8%]) were documented. At 10 years, cumulative probabilities of target and non-target lesion revascularization were 20.5% and 41.5%, respectively, and only 39.2% of the patients were free from cardiac events (cardiac death/myocardial infarction/unplanned revascularization). Age and left ventricular ejection fraction (LVEF) were significant predictors of total death, and LVEF and the use of diuretics were predictors of cardiac events. They concluded that stabilization of the initial stented site was relatively good and the majority of cardiac events might have originated in non-target lesions. Hence prevention of systemic arteriosclerosis progression is important for patients with CAD, even after successful PCI³⁸.

P Rajesh muralidharan et al³⁹ studied natural history of bare metal stents from India and reported 9% all-cause mortality and 16% in-stent restenosis over a 12 year follow up. In-stent restenosis was more frequent in the first year after stenting and 7 years after stenting suggesting a need for further long term studies. They also found that older age, male sex, diabetes on presentation, low ejection fraction, and multivessel disease on presentation were predictors of major adverse cardiac events on follow-up.

Although with growing use of stents, the results of percutaneous coronary revascularization have improved, in-stent restenosis continues to limit the long-term success of this approach^{2,3}. In a randomized comparison of coronary-artery bypass surgery and stenting in patients with multivessel disease, additional revascularization procedures were performed within one year in 21% of patients who had undergone stenting, as compared with 3.8% of patients treated surgically³.

In controlled trials, several pharmaceutical agents were tested, but many of them failed to inhibit restenosis after coronary interventions. Few examples include-Sirolimus, Everolimus, Biolimus A9, and Zotarolimus all of which bind to the FKBP12 binding protein, which subsequently binds to the mammalian target of rapamycin (mTOR) and thereby blocks the cell cycle mainly of the smooth muscle cell from the G1 to S phase⁴⁰ (Figure: 1).

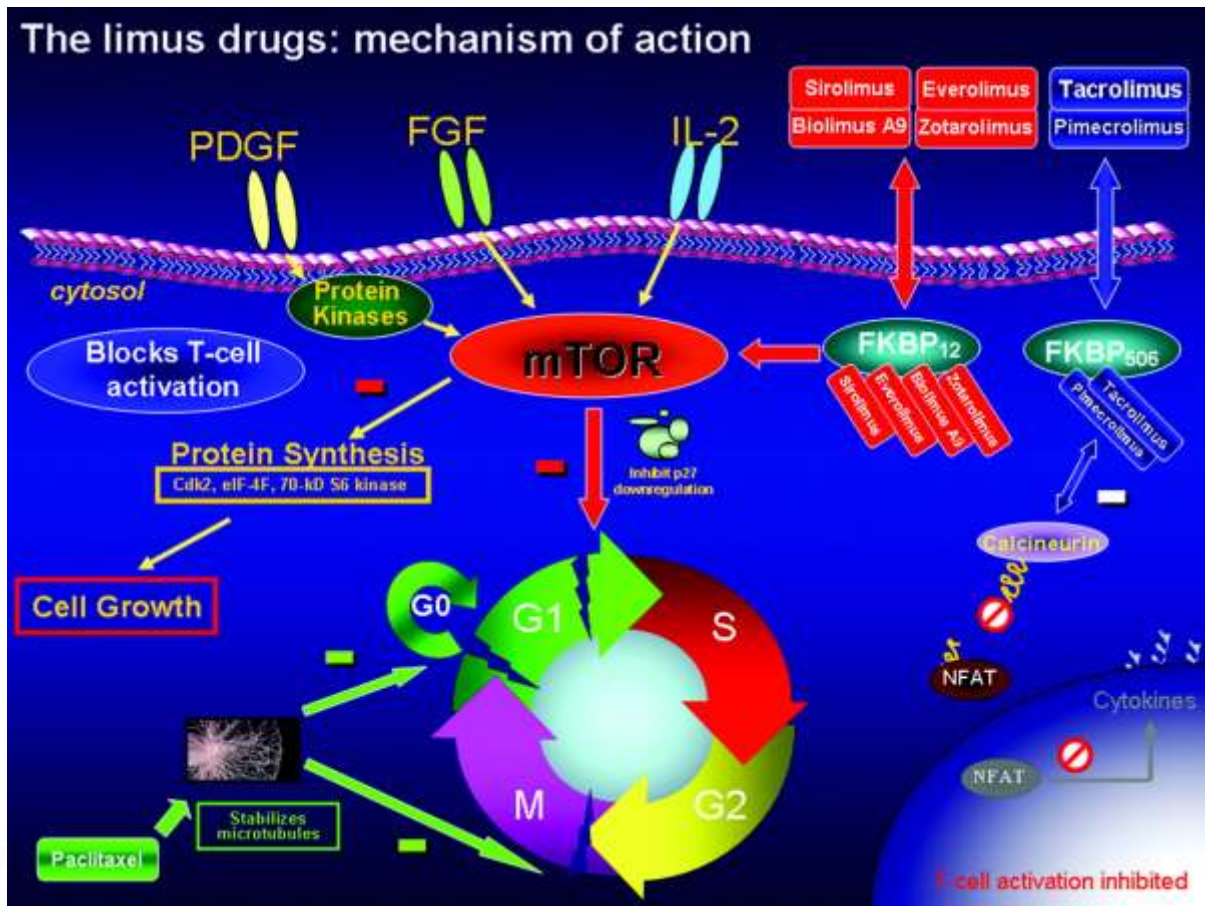


Figure 1: Mechanisms of action of sirolimus, everolimus, Biolimus A9, zotarolimus, tacrolimus, and pimecrolimus. PDGF indicates platelet-derived growth factor; FGF, fibroblast growth factor; FKBP, FK binding protein; G, growth; M, mitosis; S, synthesis; and NFAT⁴⁰.

In contrast, the systemic and local delivery of sirolimus (rapamycin), a macrocyclic lactone that inhibits cytokine-mediated and growth-factor mediated proliferation of lymphocytes and smooth-muscle cells, reduced neointimal proliferation in studies in animals and in small clinical studies. Subsequently randomized studies to compare the performance of a coronary stent, that slowly releases sirolimus with standard uncoated stent began to show better results with regards to target lesion revascularization⁶. In one of those pivotal trials, RAVEL study, at six months, the degree of neointimal proliferation, manifested as late luminal loss, was significantly lower in the sirolimus stent group (0.01 ± 0.33 mm) than in the standard stent group (0.80 ± 0.53 mm, $P < 0.001$). None of the patients in the sirolimus-stent group as compared with 26.6% of those in the standard-stent group, had restenosis of 50% or more of the luminal diameter ($P < 0.001$). There were no episodes of stent thrombosis. During a follow-up period of up to one year, the overall rate of major cardiac events was 5.8% in the

sirolimus-stent group and 28.8% in the standard-stent group ($P < 0.001$). The difference was due entirely to a higher rate of revascularization of the target vessel in the standard-stent group⁴¹.

Subsequent trials established the efficacy of sirolimus eluting stents in preventing restenosis in more complex subsets. In SIRIUS⁴² randomized clinical trial involving patients with complex coronary lesions, the use of a sirolimus-eluting stent had a consistent treatment effect, reducing the rates of restenosis and associated clinical events. In C-SIRIUS trial⁴³, that included patients with long lesions in small coronary vessels, SES dramatically reduced the risk of restenosis at eight months, translating into an excellent clinical outcome at nine months.

Concurrently, another promising modality to inhibit restenosis, controlled release of paclitaxel from coronary stents, was developed. Paclitaxel interferes with microtubule function, affecting mitosis and extracellular secretion, and thereby interrupts the restenotic cascade at multiple levels (Figure: 1). Results from animal models showed reduced neointimal responses after local paclitaxel delivery to the vessel. A vascular compatible polymer was developed that provides early, controlled release of paclitaxel⁴⁴.

In TAXUS 1 trial⁴⁵, the first in-human clinical evaluation of a polymer-based paclitaxel-eluting stent in a randomized, multicenter trial compared the TAXUS NIRx stent with bare metal NIR (control) stents (both from Boston Scientific Corp). In this feasibility trial, the TAXUS slow-release stent was well tolerated and showed promise for treatment of coronary lesions, with significant reductions in angiographic and intravascular ultrasound measures of restenosis.

In TAXUS III trial⁴⁶, Paclitaxel-eluting stent implantation is considered safe and potentially efficacious in the treatment of ISR. Subsequently, TAXUS IV⁴⁷ reaffirmed the efficacy of this breakthrough technology of drug eluting stents. In this placebo-controlled (bare metal stents) trial of 1,314 patients, the paclitaxel-eluting stents decreased the nine-month clinical endpoint of target lesion revascularization (TLR) from 11.3% to 3.0% or target vessel revascularization (any reintervention in the same vessel) from 12.0% to 4.7%. Major complications in terms of 30-day major adverse cardiac events were no different between the two groups. Stent thrombosis rate up to nine months was low in both groups (0.6% vs. 0.8%). Patients with diabetes had a TLR rate of 5.2% with a control TLR of 16.0.

Drug eluting stents were approved for use in Europe in 2002. Based on the results of RAVEL, SIRIUS, C-SIRIUS, E-SIRIUS, TAXUS I, TAXUS II, TAXUS IV, TAXUS V, TAXUS VI trials, in the United States, the FDA granted expedited review of both DES, and approved sirolimus-eluting stents (Cypher(R), Cordis Corporation) for use in April 2003 while paclitaxel-eluting stents (Taxus (R), Boston Scientific) were approved in March 2004^{6,40}(Figure 2).

Manufacturer	Name	Drug	Stent material	Polymer	Status
Cordis/J&J	Cypher Select	Sirolimus	Stainless steel	Durable	FDA/CE Mark
Boston Scientific	Taxus Liberté	Paclitaxel	Stainless steel	Durable	FDA/CE Mark
Medtronic	Endeavor	Zotarolimus	Cobalt chromium	Durable	CE Mark
Abbott	ZoMaxx	Zotarolimus	Tantalum/stainless steel	Durable	trial
Abbott	Xience V	Everolimus	Cobalt chromium	Durable	CE Mark
Biosensors	BioMatrix	Biolimus-A9	Stainless steel	Bioabsorbable	CE Filed
Conor	CoStar	Paclitaxel	Cobalt chromium	Bioabsorbable	CE Mark
Sahajanand	Supralimus	Sirolimus	Stainless steel	Bioabsorbable	CE Mark
Sahajanand	Infinium	Paclitaxel	Stainless steel	Bioabsorbable	CE Mark
Terumo	Nobori	Biolimus-A9	Stainless steel	Bioabsorbable	trial
Sorin	Janus	Tacrolimus	Stainless steel	None	CE Mark
Orbus Neich	Genous	EPC capture	Stainless steel	Durable	CE Mark
Biotronik	?	AVT-03	Absorbable metal (Mg)	-	trial
Abbott	-	Everolimus	Biodegradable	-	trial

Figure 2: Various drug eluting stents with type of polymer, stent material and their status of FDA approval⁴⁰.

Initial approval was based on the results of randomized controlled trials with carefully selected patient populations. These trials demonstrated the superior ability of both sirolimus-DES and paclitaxel-DES to reduce neointimal hyperplasia, restenosis, and re-intervention at 6-12 months when compared with BMS. At 2-yr follow-up using angiography and intravascular ultrasound, the clinical safety of DES was further established with minimal late lumen loss observed in both sirolimus-DES and paclitaxel-DES. Both types of DES have shown continued efficacy in preventing restenosis (74% reduction) when studied 4 years after initial deployment.

With major randomized DES trials on two different agents available, it is natural to compare the results of TAXUS to the previous "gold standard" of SIRIUS and sparked off the debate between sirolimus eluting stents and paclitaxel eluting stents. In the largest study of

sirolimus-eluting stents versus paclitaxel-eluting stents, the REALITY trial⁴⁸ (Prospective Randomized Multicenter Head-to-Head Comparison of the Sirolimus-Eluting Stent [Cypher] and the Paclitaxel-Eluting Stent [Taxus]) with 1353 patients and 92 percent angiographic follow-up, greater late loss was observed in the group that had paclitaxel-eluting stents, but this loss was not associated with a higher rate of target-lesion revascularization. Subsequently many studies comparing sirolimus eluting stent with paclitaxel eluting stent became available with contradictory results. A meta-analysis of randomized trials comparing paclitaxel-DES with sirolimus-DES revealed significantly higher restenosis rates with the former ($P = 0.001$), clinical outcomes (death and MI) were similar in both groups. In 2005, at the height of clinical enthusiasm, 85% of all stents implanted in the United States and Europe were DES.

Despite the effectiveness of DES in reducing restenosis, concerns about stent thrombosis plague these devices. The current firestorm regarding DES was ignited by the findings of two meta-analyses presented at the American College of Cardiology's 55th Annual Scientific Session in March 2006⁴⁶ and the European Society of Cardiology/World Congress of Cardiology meeting in September 2006⁴⁹. These studies confirmed that late stent thrombosis occurs more frequently than reported in randomized controlled trials. The Basel Stent Kosten Effektivitats Trial-Late Thrombotic Events (BASKET-LATE)⁷ study presented in March 2006 sought to determine the true incidence of late stent thrombosis, MI, and death in 746 patients randomized to receive DES or BMS who had remained on dual antiplatelet therapy for 6 months. The patients had not experienced an adverse cardiac event during that period. At 6 months, clopidogrel was stopped and patients were followed up for an additional 12 months. In addition to a 19% mortality rate and an 88% composite rate of death or MI, the researchers found the following: (1) late stent thrombosis-related events (death and MI) occurred two to three times more frequently in patients with DES than those with BMS, (2) late stent thrombosis carried a four times higher risk of cardiac death/MI ($P < 0.0001$); and (3) late stent thrombosis and its complications occurred up to 1 year after clopidogrel discontinuation. The authors concluded that while DES use in 100 patients avoids five target lesion revascularization events at 6 months, it unfortunately leads to 3.3 late deaths or MI. Camenzind et al¹ presented in September 2006 a meta-analysis of all company-supported randomized trials (RAVEL, SIRIUS, ESIRIUS, C-SIRIUS, and TAXUS I-VI) comparing sirolimus-DES and paclitaxel-DES with BMS controls for an average 3-yr follow-up. Sirolimus DES were associated with a 60% relative increase in death or MI ($P = 0.03$), whereas paclitaxel-DES demonstrated a statistically insignificant 15% increase. The authors

concluded that late stent thrombosis and discontinuation of antiplatelet therapy caused the higher rates of death and MI.

The overall incidence of stent thrombosis in DES is reportedly between 0.5% and 3.1%. When stent thrombosis occurs, it is catastrophic. Fatality and MI rates associated with stent thrombosis have ranged from 45% to 75% and 25% to 65%, respectively. Of the 1% angiographic incidence of late stent thrombosis observed by Ong et al⁵⁰, 75% of these patients presented with a MI, and 12% died. The pivotal clinical trials reported similar early (acute and subacute) stent thrombosis rates for DES and BMS (<1%) and attributed this complication to mechanical factors. Late (30 days to 12 months) and very late (beyond 1 year) stent thrombosis also occur with BMS and DES, but the pathophysiology differs between these devices. In DES, late stent thrombosis presents as primary thrombosis. It is affected by the degree of endothelial coverage and the intensity of antiplatelet therapy. In contrast, BMS thrombosis is related to target lesion revascularization, and carries a 0.4%-0.8% incidence. Research continues to elucidate the pathophysiology of stent thrombosis. Experimental models of BMS demonstrated complete endothelialization at 28 days, whereas at 6 months, DES uniformly revealed incomplete healing, fibrin deposition, and inflammatory cells, indicating a hypersensitivity reaction. In late 2003⁹, the FDA notified physicians of possible hypersensitivity reactions to sirolimus or the polymer as associated with stent thrombosis. In autopsy studies of DES implanted 1-4 years, Virmani et al. found eosinophilic inflammation, thrombus, impaired vessel healing, persistent fibrin deposition and poor endothelialization in 45% of the stents. Both sirolimus and paclitaxel has been shown to enhance the expression of endothelial cell tissue factor, creating a prothrombogenic environment. Sirolimus has also been shown to directly activate platelets, induce local platelet aggregation, and contribute to local thrombus formation at the stent site. The most powerful histological predictor of stent thrombosis has been incomplete endothelial coverage. Acute coronary syndrome, left ventricular ejection fraction <30%, bifurcation treatment, renal insufficiency, diabetes, small reference vessel diameter, complex lesions, and premature or standard discontinuation of antiplatelet therapy, non-compliance with antiplatelet drugs, improper physician dosing or poor intestinal absorption or decreased receptor binding secondary to drug interactions of antiplatelet agents have been reported as predictors of stent thrombosis⁵¹.

The polymer-based sirolimus (CYPHER) and paclitaxel (TAXUS) drug-eluting stents (DES) have been placed in several million patients since their approval by the US Food and Drug Administration in 2003 and 2004, respectively. Each has been studied in randomized clinical trials compared with bare metal stent (BMS) controls, with a pooled patient level analysis of 9 such trials (4 CYPHER, 1748 patients; 5 TAXUS, 3513 patients) by Stone et al⁵² showing a 0.7% to 0.9% incidence of stent thrombosis within the first year for each DES and its BMS control. After 1 year, depending on the definitions used, both CYPHER and TAXUS show a slight but statistically significant numerical excess in very late stent thrombosis by roughly 1 event per 500 patient-years compared with their respective BMS controls. Despite this finding, there were no significant differences between DES and its BMS control in cumulative rates of death or myocardial infarction through 4 years, with both CYPHER and TAXUS stents markedly reducing the incidence of angiographic target lesion revascularization compared with BMS for the indications studied in these clinical trials. However, post approval data suggest a higher risk of both early and late stent thrombosis plus death and myocardial infarction under "off-label use" conditions than in the narrower conditions studied in the randomized trials.

Concurrently, newer stent platforms, drugs and drug delivery systems were developed. Studies at that time have demonstrated that the use of a different metal alloy, other than 316L stainless steel, or a thinner-strut design is associated with better long-term angiographic and clinical outcome. It was also suggested that in-stent restenosis (ISR) is triggered by a contact allergy to certain metals which are included in the composition of 316L stainless steel, such as nickel or molybdenum. Stents fabricated from L605 Cobalt Chromium (CoCr) alloy, which contains less nickel and no molybdenum subsequently became available. Due to favourable mechanical properties, the use of L605 Co-Cr alloys allow reduction of stent strut thickness (<90µm) without any compromise in stent radial forces and radiopacity. Such enhancements enable the reduction of endoprotheses profile, increase their flexibility, and consequently facilitate stent implantation into tortuous vascular segments or in case of severe obstructive lesion. These stents were subsequently found to be effective and safe in clinical trials^{53,54}.

The Driver bare metal stent (Medtronic, Santa Rosa, Calif) received European CE Marking in November 2002 and approval from the US Food and Drug Administration in October 2003 for the treatment of coronary lesions. This cobalt-alloy stent has a low profile,

with a strut thickness of 0.0036 inch (91 μm), designed to improve tracking and crossing in tortuous anatomy. A prospective multicenter registry study of 297 patients confirmed the good performance of the Driver stent. The Endeavor stent system (Medtronic) consists of the same bare metal stent coated with phosphorylcholine, from which 10 μg zotarolimus per 1 mm stent length is eluted. The polymer phosphorylcholine coating is a synthetic copy of the predominant phospholipid in the outer membrane of red blood cells and shows high biovascular compatibility. In animal studies, phosphorylcholine-coated stents have demonstrated significantly less platelet adhesion compared with uncoated stents. A phosphorylcholine coating also was used by the BiodivYsio stent (Biocompatibles Ltd, Farnham, UK) and was found safe and effective in the Study of Phosphorylcholine Coating on Stents (SOPHOS) trial. Zotarolimus a Rapamycin analogue, block activation of the mammalian target of rapamycin (mTOR). This blockage keeps smooth muscle cells from advancing from the G1 phase of cell cycle activity into DNA synthesis and cell division. The drug and polymer are asymmetrically distributed on the stent surface by a proprietary coating technique, so the drug is localized mainly on the abluminal arterial wall side of the stent.

In ENDEAVOR II trial⁵³, the primary end point of target vessel failure at 9 months was reduced from 15.1% with the bare metal stent to 7.9% with the Endeavor ($P < 0.0001$), and the rate of major adverse cardiac events was reduced from 14.4% with the bare metal stent to 7.3% with the Endeavor ($P < 0.0001$). Target lesion revascularization was 4.6% with ENDEAVOR compared with 11.8% with the bare metal stent ($P < 0.0001$). The rate of stent thrombosis was 0.5% with the ENDEAVOR, which was not significantly different from 1.2% with the bare metal stent. In 531 patients submitted to angiographic follow-up, the rate of in-segment restenosis was reduced from 35.0% to 13.2% with Endeavor ($P < 0.0001$). There was no excessive edge stenosis, aneurysm formation, or late acquired malapposition by intravascular ultrasound imaging. Differences in clinical outcome were maintained at 12 and 24 months.

In ENDEAVOR III⁵⁴ trial, angiographic in-segment late lumen loss was significantly higher among patients treated with Zotarolimus eluting stent (ZES) compared with Sirolimus eluting stent (SES) (0.34 ± 0.44 mm vs. 0.13 ± 0.32 mm, respectively; $p < 0.001$). In-hospital major adverse cardiac events were significantly lower among patients treated with ZES (0.6% vs. 3.5%, $p < 0.04$). In-segment binary angiographic restenosis was also higher in the ZES

cohort (11.7% vs. 4.3%, $p < 0.04$). Total (clinically and non-clinically driven) target lesion revascularization rates at 9 months were 9.8% and 3.5% for the ZES and SES groups, respectively ($p < 0.04$). However, neither clinically driven target lesion revascularization (6.3% zotarolimus vs. 3.5% sirolimus, $p = 0.34$) nor target vessel failure (12.0% zotarolimus vs. 11.5% sirolimus, $p = 1.0$) differed significantly. The study concluded that compared with SES, treatment with a phosphorylcholine polymer-based ZES is associated with significantly higher late lumen loss and binary restenosis at 8-month angiographic follow-up.

Palhais et al⁵⁵ in a 10 year follow up study of Sirolimus eluting stents, reported that the cumulative 10-year MACE rate was 47% with all-cause death of 20%, cardiac death of 9%, myocardial infarction of 7%, TLR and target-vessel revascularization of 8% and 11% respectively. Academic Research Consortium–defined “definite and probable” stent thrombosis-rate was 2.5%. TLR risk was maximal between 3 to 6 years. A 9 year follow up study of DES vs BMS by Yin et al stated that in patients with larger coronary arteries, treated with BMS were associated with higher risk of TLR (HR: 2.55, 95%CI: 1.520–4.277, $P = 0.0004$) and TVR (HR: 1.889, 95%CI: 1.185–3.011, $P = 0.0075$), but the rates of death/MI and MACE were not statistically different. Stent thrombosis at 9-year were comparable in the two groups¹⁴. Very recently the longest reported 10 year follow up study by Vale et al¹⁵, showed a potential survival benefit of first-generation sirolimus-eluting stents versus bare-metal stents, supporting prior observations on their sustained efficacy and safety relative to contemporary BMS. Overall five- and 10-year all-cause mortality was 9.6% ($n=110$) and 22.7% ($n=272$), respectively. The adjusted HR for 10-year mortality in patients undergoing PCI with SES was 0.74 (95% CI 0.58- 0.94; $p=0.013$), corresponding to a relative risk reduction of 19.8%. Other than PCI with BMS, older age, chronic kidney disease, chronic obstructive pulmonary disease and lower ejection fraction were independent predictors of 10-year mortality.

MATERIALS AND METHODS:

Study design:

Single center retrospective cohort study.

Selection of patients:

We included consecutive hundred patients with Coronary Artery Disease (CAD), who underwent successful percutaneous intervention (PCI) with implantation of drug-eluting stents (DES) and contemporary hundred patients who underwent PCI with implantation of bare-metal stent (BMS) at the department of Cardiology, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum, India. The period of treatment was between January 2005 and July 2006. The patients were subsequently followed up till April 2021. The protocol was approved by the Institutional Ethics Committee (SCT/IEC/1487).

Inclusion Criteria:

The consecutive 100 patients of coronary artery disease each receiving drug-eluting stents (DES) and bare-metal stents (BMS) from the year 2005 onwards were included in the study.

Exclusion Criteria:

- (1) patients with history of acute (<7 days from onset) myocardial infarction,
- (2) patients who underwent primary PCI,
- (3) those who had any procedure done in the past (e.g. plain old balloon angioplasty {POBA}, stenting, etc).

Collection of data and follow-up:

The baseline characteristics and procedural details were collected from the medical records. The follow-up data was collected from the medical records for those patients who continued to be under regular follow-up. The follow-up data for the others was collected by telephonic contact or in person or by a mailed questionnaire. The routine protocol for follow-up of patients after stent implantation is to have first review after 3 weeks, then at two months. Subsequently they were reviewed at intervals of 6 months to 1 year. The follow-up was done more frequently if the condition of the patient warranted. Patients who were symptomatic in the interim were evaluated and treated at the discretion of the treating physician. These patients underwent repeat angiogram when clinically indicated; as perceived

by the treating physician. Follow-up data was collected with regards to total deaths (cardiovascular or non-cardiovascular), myocardial infarction, occurrence of inducible ischemia on stress testing, repeat coronary angiogram, target lesion and target vessel revascularization and instant restenosis. The data on interventions to other vessels was also obtained. The follow-up data on risk factor profile and medical treatment was not available in all patients and was hence not subject to analysis. The patients underwent stenting of the coronary lesion which the operator deemed as most likely to be the cause for his symptoms. In patients with multivessel disease, the need for intervention to the other vessel(s) was at the discretion of the operator. Drug eluting stents and bare metal stents from various manufacturers were used based on availability. The stenting procedure was done according to the accepted techniques at that time. Post dilatation of the intra coronary stents by balloon angioplasty was done at the discretion of the operator. All patients received Aspirin 300 mg atleast 2 hours prior to the procedure and 150 mg daily thereafter indefinitely. Inj Unfractionated Heparin 10,000 units bolus followed by infusion 12-18 U/kg/hour for 18-24 hours and ACT was maintained at 300 seconds. The patients were continued on Aspirin life-long unless they had contraindications or drug intolerance. Tab. Clopidogrel 600 mg was given 24 hours prior to the procedure and then 75 mg OD thereafter for at least 12 months.

OUTCOMES:

Primary Outcome-

- MACCE (major adverse cardiovascular & cerebrovascular events)

Secondary Outcomes-

- All cause death
- Cardiovascular (CVS) death
- Myocardial Infarction (MI)
- In-stent restenosis (ISR)
- Target lesion revascularization (TLR)
- Target vessel revascularization (TVR)
- Any other vessel revascularization
- Stroke

Definitions of Terms⁵⁶:

Major adverse cardiovascular and cerebrovascular events (MACCE): The composite of all-cause mortality, cardiovascular mortality, myocardial infarction, in-stent restenosis, target vessel revascularization, target lesion revascularization, any other vessel revascularization and stroke.

Cardiac death: Any death due to proximate cardiac cause (eg: myocardial infarction(MI), low-output failure, fatal arrhythmia), unwitnessed death and death of unknown cause, and all procedure-related deaths, including those related to concomitant treatment, were classified as cardiac death.

Vascular death: Death caused by non-coronary vascular causes, such as cerebrovascular disease, pulmonary embolism, ruptured aortic aneurysm, dissecting aneurysm, or other vascular diseases.

Noncardiovascular death: Any death not covered by the above definitions, such as death caused by infection, malignancy, sepsis, pulmonary causes, accident, suicide, or trauma.

*Myocardial Infarction(MI)*⁵⁷

Universal definitions of myocardial injury and myocardial infarction

Criteria for myocardial injury

The term myocardial injury should be used when there is evidence of elevated cardiac troponin values (cTn) with at least 1 value above the 99th percentile upper reference limit (URL).

The myocardial injury is considered acute if there is a rise and/or fall of cTn values.

Criteria for acute myocardial infarction (types 1, 2 and 3 MI)

The term acute myocardial infarction should be used when there is acute myocardial injury with clinical evidence of acute myocardial ischemia and with detection of a rise and/or fall of cTn values with at least 1 value above the 99th percentile URL and at least 1 of the following:

- Symptoms of myocardial ischemia;
- New ischemic ECG changes;

- Development of pathological Q waves;
- Imaging evidence of new loss of viable myocardium or new regional wall motion abnormality in a pattern consistent with an ischemic etiology;
- Identification of a coronary thrombus by angiography or autopsy (not for types 2 or 3 MIs). Postmortem demonstration of acute atherothrombosis in the artery supplying the infarcted myocardium meets criteria for type 1 MI.

Evidence of an imbalance between myocardial oxygen supply and demand unrelated to acute atherothrombosis meets criteria for type 2 MI. Cardiac death in patients with symptoms suggestive of myocardial ischemia and presumed new ischemic ECG changes before cTn values become available or abnormal meets criteria for type 3 MI.

<p><i>Criteria for coronary procedure–related myocardial infarction (types 4 and 5 MI)</i></p>

Percutaneous coronary intervention (PCI)–related MI is termed type 4a MI.

Coronary artery bypass grafting (CABG)–related MI is termed type 5 MI.

Coronary procedure–related MI ≤ 48 hours after the index procedure is arbitrarily defined by an elevation of cTn values >5 times for type 4a MI and >10 times for type 5 MI of the 99th percentile URL in patients with normal baseline values. Patients with elevated preprocedural cTn values, in whom the preprocedural cTn level are stable ($\leq 20\%$ variation) or falling, must meet the criteria for a >5 or >10 fold increase and manifest a change from the baseline value of $>20\%$. In addition with at least 1 of the following:

- New ischemic ECG changes (this criterion is related to type 4a MI only);
- Development of new pathological Q waves;
- Imaging evidence of loss of viable myocardium that is presumed to be new and in a pattern consistent with an ischemic etiology;
- Angiographic findings consistent with a procedural flow-limiting complication such as coronary dissection, occlusion of a major epicardial artery or graft, side-branch occlusion-thrombus, disruption of collateral flow or distal embolization.

Isolated development of new pathological Q waves meets the type 4a MI or type 5 MI criteria with either revascularization procedure if cTn values are elevated and rising but less than the prespecified thresholds for PCI and CABG.

Other types of 4 MI include type 4b MI stent thrombosis and type 4c MI restenosis that both meet type 1 MI criteria.

Postmortem demonstration of a procedure-related thrombus meets the type 4a MI criteria or type 4b MI criteria if associated with a stent

Any 1 of the following criteria meets the diagnosis for prior or silent/unrecognized MI:

- Abnormal Q waves with or without symptoms in the absence of nonischemic causes.
- Imaging evidence of loss of viable myocardium in a pattern consistent with ischemic etiology.
- Patho-anatomical findings of a prior MI.

Instent Restenosis: Greater than 50% diameter stenosis at the stent site on follow-up angiography at any time after implantation.

Target lesion revascularization (TLR): Any repeat percutaneous intervention of the target lesion or bypass surgery of the target vessel performed for restenosis or other complication of the target lesion. The lesions in the segment from 5 mm proximal to the stent and to 5 mm distal to the stent were considered as involving the target lesion.

Clinically indicated revascularization: The decision for TLR was clinically indicated for the complete duration of the study. No protocol catheterization was planned for the duration of the study.

A revascularization is considered clinically indicated if any one of the following occurs:

1. (a) a positive history of recurrent angina pectoris, presumably related to the target vessel;

(b) objective signs of ischemia at rest (ECG changes) or during exercise test (or equivalent), presumably related to the target vessel

and

the repeat CAG shows a diameter % stenosis of > 50% by QCA

or

2. A diameter stenosis of 70% in the treated segment even in the absence of the above-mentioned ischaemic signs or symptoms in the treated territory when coronary angiogram (CAG) was performed to assess lesions in other vessels.

Target Vessel Revascularisation: Any repeat percutaneous intervention or surgical bypass of any segment of the target vessel. The target vessel is defined as the entire major coronary vessel proximal and distal to the target lesion, which includes upstream and downstream branches and the target lesion itself.

Stent Thrombosis:

Definite stent thrombosis

Angiographic confirmation of stent thrombosis

The presence of a thrombus that originates in the stent or in the segment 5 mm proximal or distal to the stent and presence of at least 1 of the following criteria within a 48-hour time window:

- Acute onset of ischemic symptoms at rest
- New ischemic ECG changes that suggest acute ischemia
- Typical rise and fall in cardiac biomarkers (definition of spontaneous MI)

Nonocclusive thrombus

Intracoronary thrombus is defined as a (spheric, ovoid, or irregular) noncalcified filling defect or lucency surrounded by contrast material (on 3 sides or within a coronary stenosis) seen in multiple projections, or persistence of contrast material within the lumen, or a visible embolization of intraluminal material downstream.

Occlusive thrombus

TIMI 0 or TIMI 1 intrastent or proximal to a stent up to the most adjacent proximal side branch or main branch (if originates from the side branch).

OR

Pathological confirmation of stent thrombosis: Evidence of recent thrombus within the stent determined at autopsy or via examination of tissue retrieved following thrombectomy.

Probable stent thrombosis

Clinical definition of probable stent thrombosis is considered to have occurred after intracoronary stenting in the following cases:

Any unexplained death within the first 30 days.

Irrespective of the time after the index procedure, any MI that is related to documented acute ischemia in the territory of the implanted stent without angiographic confirmation of stent thrombosis and in the absence of any other obvious cause.

Possible stent thrombosis

Clinical definition of possible stent thrombosis is considered to have occurred with any unexplained death from 30 days after intracoronary stenting until end of the study follow-up.

Classification of Stent Thrombosis : Timing

Acute stent thrombosis*	0 to 24 hours after stent implantation
Subacute stent thrombosis	>24 hours to 30 days after stent implantation
Late stent thrombosis	>30 days to 1 year after stent implantation
Very late stent thrombosis	>1 year after stent implantation

Stroke

Stroke was defined as the new onset of focal or global neurological deficit caused by ischemia or hemorrhage within or around the brain and lasting for more than 24 hours. Any new onset focal or global neurological deficit caused by ischaemia or hemorrhage within and around brain and lasting for less than 24 hours was classified as transient ischaemic attack (TIA).

STATISTICAL ANALYSIS:

The data analysis was performed using the SPSS Statistics software for Windows Version 25. Descriptive statistics for all variable comparisons were performed using appropriate univariate hypothesis tests. Categorical variables were expressed as with-in group percentages and compared for independent samples using either the Pearson's test or Fisher's exact test. Continuous variables were expressed as either mean standard deviation or median depending on the overall variable distribution. Independent sample, single-factor analysis of variance was used for parametric data comparisons, whereas the Mann Whitney *U* test was used for all nonparametric data comparisons.

Potential risk factors for outcomes were evaluated using a regression model and multiple regression analysis was performed for outcomes with P values less than 0.05. Kaplan Meier analysis was done to analyze the incidence of various outcomes in relation to time. The data will be stored in the personal computer of the principal investigator for a period of three years, maintaining confidentiality.

OBSERVATIONS AND RESULTS:

We conducted a retrospective analysis including a total of 200 patients, consecutive 100 patients each receiving drug eluting stents (DES) and bare metal stents (BMS) at our institute in the year 2005-2006. This time period was intentionally chosen to eliminate initial stent related issues and have a better comparison between the groups when both DES & BMS have been implanted in equal frequency. The Drug eluting stents used in our population included Paclitaxel eluting stents (COSTAR, INFINIUM), Sirolimus eluting stents (CYPHER, MAGIC, PRONOVA, S FLEX) and Zotarolimus eluting stent (ENDEAVOR). Contemporary bare metal stents (ANGSTROM, ARTHOS, DRIVER, LEKTON, PROKINETIC, PROLINK, PENTA, MINIVISION, HELI, FLEXMASTER, PIXEL, TITAN2, S-7, S-670, TSUNAMI GOLD) were used in the BMS group. The complete follow up was available for 85% of patients. The mean follow up duration for the study group was 141.56 months (median follow up -170 months). Baseline clinical, angiographic and procedural characteristics are shown in **Table 1**. The risk factor profiles of the 2 groups were largely comparable.

Table 1: Baseline clinical, angiographic and procedural characteristics.

Baseline Characteristics n (%)	Overall (200)	DES (100)	BMS(100)	P Value
AGE (yrs)	52.42±8.93	52.07±9.15	52.78±8.74	0.57
Gender (M)	179 (89.5)	88	91	0.48
Obesity	29 (14.5)	16	13	0.54
DM	84 (42)	45	39	0.39
HTN	93 (46.5)	45	48	0.67
DLP	151 (75.5)	75	76	0.86
F/H/O CAD	65 (32.5)	37	28	0.17

SMOKING	102 (51)	44	58	0.048
Diagnosis				
STEMI	86 (43)	44	42	0.77
NSTEMI	51 (25.5)	27	24	0.62
CSA	63 (31.5)	29	34	0.44
Functional class				
n (%)				
-I	11 (5.5)	3	8	0.21
-II	164 (82)	85	79	0.26
-III	25 (12.5)	12	13	0.83
EF (%)	65.94±10.29	66.93±9.93	64.95±10.59	0.17
Hb (g/dl)	14.14±1.45	14.11±1.52	14.17±1.38	0.76
Creat (mg/dl)	1.13±0.2	1.14±0.2	1.12±0.2	0.65
FBS (mg/dL)	123.55±58.97	127.58±65.73	119.28±50.9	0.34
TC (mg/dL)	168.35±40.69	162.34±39.94	174.36±40.79	0.05
TG (mg/dL)	153.78±68.49	152.42±67.01	155.14±70.31	0.79
HDL (mg/dL)	35.81±8.53	34.31±7.27	37.30±9.43	0.02
LDL (mg/dL)	102.61±36.82	99.11±37.21	106.03±36.34	0.1
No. of vessel involved:				
1	108 (54)	55	53	0.77
2	73 (36.5)	34	39	0.46
3	19 (9.5)	11	8	0.46
Dominant Circulation:				
Right	175 (87.5)	85	90	0.28
Left	9 (4.5)	5	4	0.73
Co-dominant	16 (8)	10	6	0.29
Vessel Involvement:				
LAD	123 (61.5)	68	55	0.059
LCX	90 (45)	47	43	0.57

RAMUS	4 (2)	1	3	0.31
RCA	91 (45.5)	39	52	0.06
Type of lesion:				
A	76 (38)	39	37	0.77
B1	67 (33.5)	29	38	0.17
B2	39 (19.5)	17	22	0.37
C	18 (9)	15	3	0.003
Vessel Treated:				
LAD	99 (49.5)	56	43	0.066
LCX	50 (25)	27	23	0.51
RAMUS	3 (1.5)	0	3	NA
RCA	66 (33)	26	40	0.035
No. of stents:				
1	161 (80.5)	84	77	0.21
2	36 (18)	16	20	0.46
3	3 (1.5)	0	3	-

(Abbreviations-M- males, DM-Diabetes mellitus, HTN- Hypertension, DLP- Dyslipidemia, F/H/O CAD- family history of coronary artery disease, STEMI- ST elevation myocardial infarction, NSTEMI- Non ST elevation myocardial infarction, CSA- Chronic stable angina, EF- Ejection fraction, Hb- Haemoglobin, Creat- Creatinine, FBS- fasting blood sugar, TC- total cholesterol, TG- triglycerides, HDL-high density lipoprotein, LDL-low density lipoprotein, No.- number, LAD- left anterior descending coronary artery, LCX- left circumflex coronary artery, RCA- right coronary artery)

The mean age of patients was 52.07 ± 9.15 years in DES group whereas 52.78 ± 8.74 years in BMS group (p value= 0.57). Male predominance was observed in either of the groups. [DES- 88%; BMS- 91% (p value = 0.48)]. Risk factors like obesity, diabetes, hypertension, dyslipidemia and family history of coronary artery disease were largely comparable in both the study groups. Percentage of smokers was significantly higher in BMS group as compared to DES group (p value = 0.048). Both the groups had similar number of patients with ST elevation myocardial infarction (STEMI), non ST elevation myocardial infarction (NSTEMI) and chronic stable angina (CSA). All these patients did not have any prior procedure in the past and all the interventions done were elective. Functional class of patients in either of the study groups was comparable. The mean ejection fraction as measured by M-Mode echocardiography was $66.93 \pm 9.93\%$ in DES group and $64.95 \pm 10.59\%$ in the BMS group. Haemoglobin, creatinine, fasting blood sugar, total cholesterol, triglycerides and LDL cholesterol levels were similar in both the groups. HDL cholesterol was significantly higher in BMS group when compared to DES group. The number of vessels

involved, dominant circulation, type of vessel involved and the number of stents implanted were comparable in both the groups. Type C lesions were found to be significantly higher in DES group (p value = 0.003) and significantly higher RCA lesions were treated in BMS group (p value = 0.035).

Table 2 : Stent characteristics

Stent Characteristics	Overall (247)	DES (120)	BMS(127)	P Value
Length (mm)	19.00 ± 5.51	20.42 ± 6.53	17.65 ± 3.90	0.006
Diameter (mm)	2.82 ± 0.35	2.82 ± 0.30	2.82 ± 0.39	0.81
Pressure (atm)	12.96 ± 2.34	12.90 ± 2.03	13.02 ± 2.64	0.88
Time (sec)	21.14 ± 5.30	21.14 ± 5.52	21.13 ± 5.13	0.89

(Abbreviations: DES- drug-eluting stent, BMS- bare-metal stent)

A total of 247 stents were implanted. Mean number of stents per patient in DES group was 1.20 and in the BMS group was 1.27 (p value = 0.18). The mean length was significantly higher in the DES group than BMS group. [20.42±6.53 mm in DES vs 17.65±3.9 mm in BMS group (p value 0.006)]. Diameter of the stents, pressure and time used for expansion of the stents were comparable in both the groups (**Table 2**).

Table 3: Outcomes of DES and BMS over total follow up.

Outcomes N (%)	Overall (200)	DES (100)	BMS(100)	P Value
MACCE	73 (36.5)	37	36	0.88
All cause death	25 (12.5)	11	14	0.52
CVS death	14 (7)	6	8	0.57
MI	19 (9.5)	10	9	0.80
ISR	38 (19)	21	17	0.47
TLR	22 (11)	11	11	0.82
TVR	26 (13)	12	14	0.67
Any other vessel revascularization	27 (13.5)	13	14	0.83
Stroke	8 (4)	3	5	0.47

(Abbreviations: DES-drug-eluting stents, BMS-bare-metal stents, MACCE- major adverse cardiovascular & cerebrovascular events, CVS death- Cardiovascular death, MI- myocardial infarction, ISR-in-stent restenosis, TLR-target lesion revascularization, TVR- target vessel revascularization)

Over a median follow up of 170 months (**Table 3**), the primary composite outcome of major adverse cardiovascular and cerebrovascular events (MACCE) was similar in both the groups [37 in DES group and 36 in BMS group; p value = 0.88]. Individual outcome analysis revealed all cause death, cardiovascular death, myocardial infarction, in stent restenosis, target lesion revascularization, target vessel revascularization, any other vessel revascularization and stroke were similar in both the groups.

Table 4: Stent thrombosis rates in DES and BMS groups.

Stent Thrombosis	ACUTE	SUBACUTE	LATE	VERY LATE
DES	0	0	1	12
BMS	0	0	1	6
P value	-	-	1.0	0.13

(Abbreviations: DES-drug-eluting stents, BMS-bare-metal stents)

Our study did not have any incidences of acute or subacute stent thrombosis. The occurrence of late thrombosis was found to be equal in either of the groups (p value = 1.0). Though the incidence of very late stent thrombosis in the study population was numerically higher in DES group (12%) than BMS group (6%), it was not statistically significant (p value = 0.13) [**Table 4**].

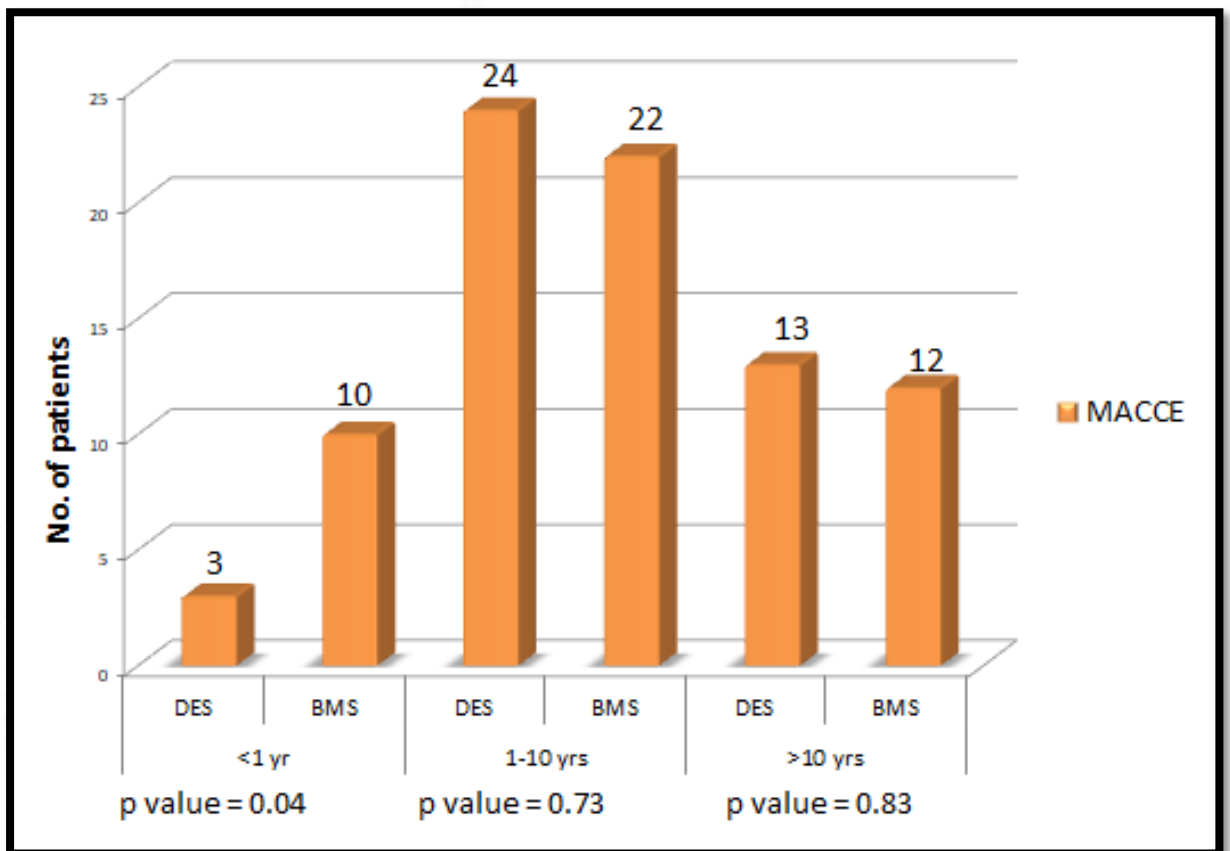


Figure 3: Cumulative major adverse cardiovascular and cerebrovascular events within 1 year, 1-10 years and > 10 years of follow up. MACCE- major adverse cardiovascular and cerebrovascular events, DES-Drug eluting stent, BMS- Bare metal stent, yr- year.

Further detailed analysis of the outcomes (**Figure 3**) showed that within 1 year of follow up, the incidence of MACCE was significantly lower with DES group than BMS group. [DES-3%; BMS-10%, P value = 0.04]. Later on, between 1-10 years [DES-24%; BMS-22% (p value = 0.73)] and >10 years of follow up [DES-13%; BMS-12% (p value = 0.83)], the events were found to be similar in both the groups.

Table 5: Follow-up duration wise analysis of secondary outcomes in DES and BMS groups, viz. less than 1 year, 1-10 years and more than 10 years of follow-up

Duration	<1 year			1-10 years			>10 years		
	DES	BMS	P value	DES	BMS	P value	DES	BMS	P value
All cause death	0	0	-	8	9	0.79	4	4	1.0
CVS DEATH	0	0	-	5	6	0.75	1	2	0.56
MI	1	2	0.56	5	3	0.47	4	4	1.0
ISR	2	7	0.08	12	8	0.34	7	2	0.08
TLR	2	6	0.14	6	4	0.51	3	1	0.31
TVR	2	6	0.14	6	5	0.75	4	3	0.7
Any other v R	0	3	-	7	9	0.6	6	2	0.14
Stroke	0	1	-	3	1	0.31	0	3	-

(Abbreviations: DES-drug-eluting stents, BMS-bare-metal stents, MACCE- major adverse cardiovascular & cerebrovascular events, CVS death- Cardiovascular death, MI- myocardial infarction, ISR-in-stent restenosis, TLR-target lesion revascularization, TVR- target vessel revascularization, Any other V R- any other vessel revascularization)

This 1 year benefit of DES was not found to be significant when the outcomes were analysed individually. Majority of the events were found in 1-10 year follow up period after stenting in either of the groups and were statistically insignificant. At >10 years follow up, the event rates were similar in both the groups. [Table 5].

Table 6: 5 year outcomes of DES vs BMS groups:

Outcomes n (%)	Overall (200)	DES (100)	BMS(100)	P Value
MACCE	30	13	17	0.42
All cause death	9	4	5	0.73
CVS death	5	2	3	0.65
MI	6	3	3	1.00
ISR	21	10	11	0.81
Revascularization	16	6	10	0.29
Stroke	2	1	1	1.00

(Abbreviations: DES-drug-eluting stents, BMS-bare-metal stents, MACCE- major adverse cardiovascular & cerebrovascular events, CVS death- Cardiovascular death, MI- myocardial infarction, ISR-in-stent restenosis, Revascularization-composite of target lesion revascularization or target vessel revascularization or any other vessel revascularization)

At the end of 5 years (**Table 6**), the occurrence of MACCE was still comparable in either of the groups (13% in DES group vs 17% in BMS group [p value = 0.42]). Individual outcomes of all cause death (p value = 0.73), cardiovascular death (p value = 0.65), Myocardial infarction (p value = 1.0), in-stent restenosis (p value = 0.81), revascularization (p value = 0.29) and stroke (p value = 1.0) were also comparable in both the groups.

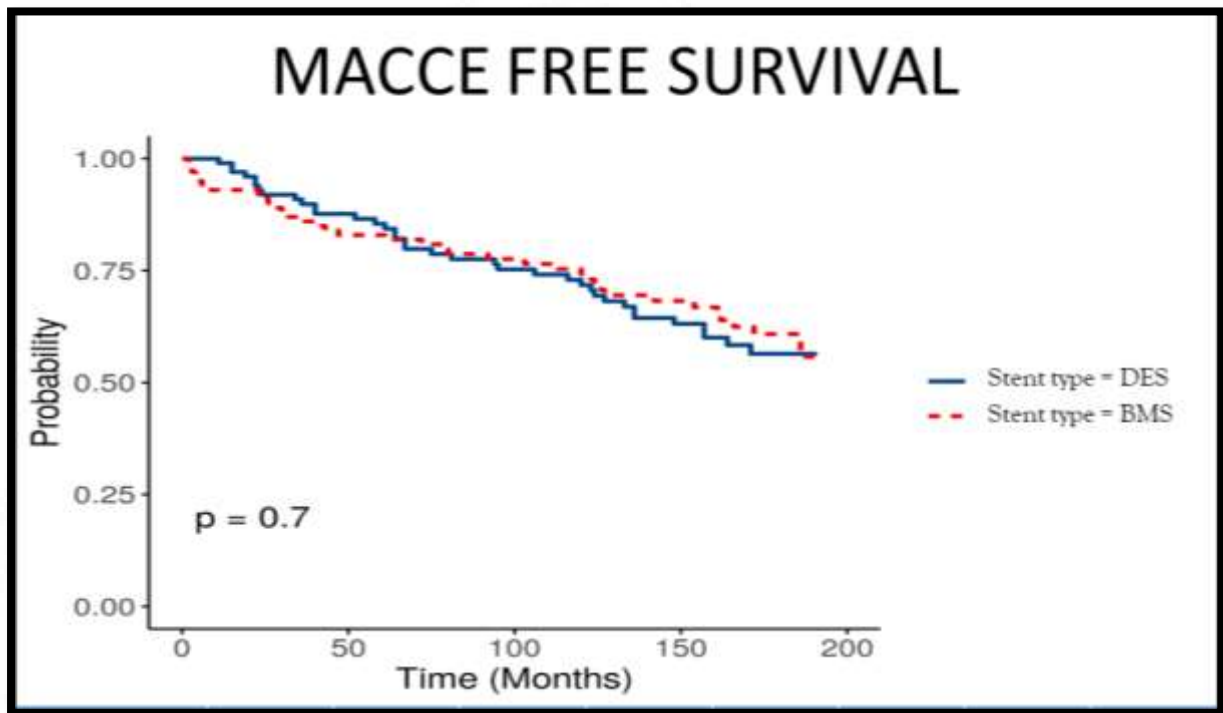


Figure 4: Cumulative survival free of major cardiovascular and cerebrovascular events (MACCE). DES-Drug eluting stents; BMS-Bare metal stents.

Kaplan Meier analysis revealed that there were no significant difference between the two study groups in terms of MACCE (p value = 0.7) (**Figure 4**). The survival curve for DES group crosses over the BMS group curve at around 5 years but the difference remains statistically non-significant.

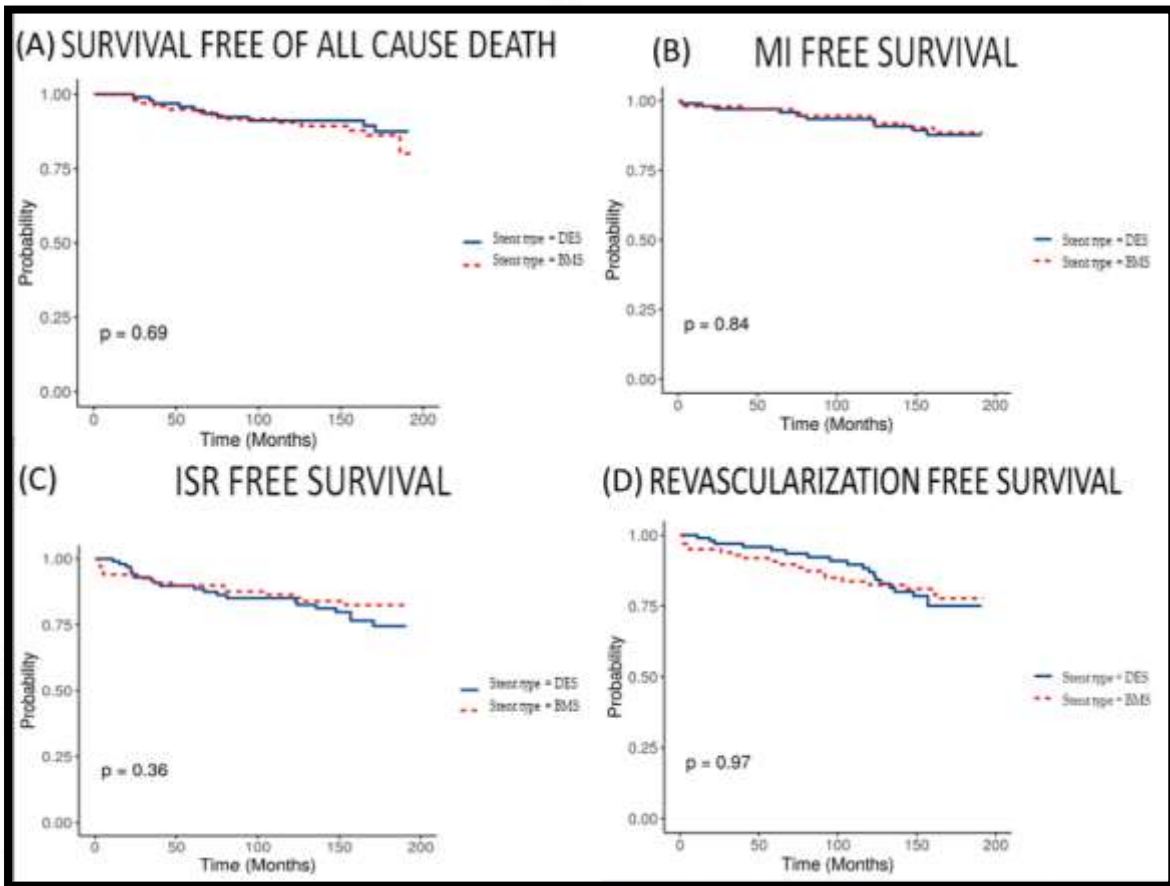


Figure 5: Cumulative survival free of cardiovascular death (A), Myocardial infarction free survival (B), In stent restenosis free survival (C) and repeat revascularization free survival (D). DES-Drug eluting stent, BMS- Bare metal stent.

Secondary outcome analysis also showed that there were no significant differences between the two groups in terms of all cause death (p value = 0.69), myocardial infarction (p value = 0.84), in-stent restenosis (p value = 0.36) and overall revascularization (p value = 0.97) over a long term follow up (**Figure 5**).

Table 7: Multivariate regression analysis of predictors of MACCE, all cause death, ISR

	HR (adjusted)	95% CI	P value
MACCE			
Ejection fraction >60%	0.59	0.34-1.041	0.069
FBS >125 mg/dl	1.95	1.13-3.38	0.016
HDL >40 mg/dl	0.37	0.15-0.89	0.028
No of vessels involved			
1			
2	1.68	0.94-3.02	0.077
3	2.74	1.21-6.19	0.015
All Cause Death			
Obesity	6.02	1.92-18.52	0.002
Ejection fraction >60%	0.30	0.11-0.76	0.012
Creatinine >1.4 mg/dl	7.34	2.39-22.55	<0.001

	HR (adjusted)	95% CI	P value
In Stent Restenosis (ISR)			
Ejection fraction >60%	0.42	0.20-0.84	0.016
FBS >125 mg/dl	2.27	1.12-4.57	0.022

(Abbreviations: MACCE-major adverse cardiovascular and cerebrovascular events, FBS-fasting blood sugar, HDL-high density lipoprotein, ISR-in-stent restenosis, HR-hazard ratio, CI-confidence interval)

Predisposing factor analysis (**Table 7**) by multivariate regression showed a fasting blood sugar level of >125 mg/dl was significantly associated with MACCE (HR 1.95, 95% CI-1.13-3.38, p value = 0.016). HDL level of >40 mg/dl was associated with lesser incidence of MACCE [HR 0.37, 95% CI-0.15-0.89, p value = 0.028)]. Triple vessel disease was associated with higher incidence of MACCE (HR 2.74, 95% CI-1.21-6.19, p value =0.015). Obesity and creatinine of > 1.4 mg/dl were found to be associated with higher incidence of all cause death [(HR-6.02, 95% CI-1.92-18.52, p value = 0.002) and (HR-7.34, 95% CI- 2.39-22.55, p value < 0.001) respectively]. An ejection fraction of >60% was found to be protective for all cause death (HR-0.30, 95% CI-0.11-0.76, p value =0.012). In stent restenosis was found to be significantly higher with FBS level >125 mg/dl (HR-2.27, 95% CI-1.12-4.57, p value = 0.022). However, an ejection fraction of >60% was found to have lesser incidence of in stent restenosis (HR-0.42, 95% CI-0.20-0.84, p value = 0.016).

Despite having significantly higher number of Type C lesions in DES group and significantly higher number of RCA lesions treated in BMS group, these variables were not found to be associated with higher event rates.

DISCUSSION:

We have described the long term clinical outcomes of a heterogeneous patient population undergoing stent implantation according to the prevailing clinical practice between 2005 and 2006. This study cannot be compared to clinical trials, which include only selected patients and contemporary techniques. However, this study is among the few efforts that have addressed the long term effects of PCI with drug eluting stents (DES) and contemporary bare metal stents (BMS) in the "real-world" scenario. We could not find any data on the long term follow-up of coronary stenting comparing drug eluting stents and bare metal stents from Indian patients.

Baseline characteristics:

The mean age of our study population in DES group was 52.07 ± 9.15 years and 52.78 ± 8.74 years in BMS group, which was comparable to a 9 year follow up study by Yin et al¹⁴ (57.50 ± 10.51 years in DES group vs 57.03 ± 11.78 years in BMS group). However ours was a relatively younger population when compared to studies by Bonaa et al¹³ (62.6 years in DES and BMS groups) and Sung et al⁵⁸ (65.9 ± 12.3 years in DES vs 65.8 ± 11.9 years in BMS group). Our study had a male predominant population with 88% males in DES group and 91% males in BMS group which was consistent with other studies by Yin et al¹⁴ (83.9% in DES group vs 85.2% in BMS group) and Bonaa et al¹³ (75% in DES and BMS groups). In our study, though the percentage of diabetic individuals was similar in both the groups, 45% in DES group and 39% in BMS group, it was much higher when compared to other studies by Yin et al¹⁴ (15.8% in DES group vs 18.5% in BMS group) and Bonaa et al¹³ (12.8% in DES group vs 12.2% in BMS group). Our study had significantly higher smokers in BMS group than DES group (58% vs 44%, p value = 0.04) whereas other studies had similar distribution of smokers in either of the groups. Other characteristics like obesity, hypertension, dyslipidemia, family history of coronary artery disease had similar distribution in both the groups.

Distribution of ST elevation myocardial infarction (STEMI) in our study was 44% in DES group and 42% in BMS group (p value = 0.77), which was comparatively higher as compared to NORSTENT trial by Bonaa et al¹³ (26.7% in DES group vs 26% in BMS group). Multivessel lesions in our study were 11% in DES group vs 8% in BMS group which was lesser compared to other studies by Bonaa et al¹³ (40.3% in DES group vs 39.2% in BMS

group) and comparable with study by Yin et al¹⁴ (16.7% in DES group vs 15.4% in BMS group). The distribution of complex lesions Type B2/C in our study was 32% in DES group vs 25% in BMS group (p value = 0.27) which was much lower when compared to studies by Yin et al¹⁴ which had 74.3% in DES group vs 76.8% in BMS group (p value = 0.08) and Bonna et al¹³ which had 49.4% in DES group vs 47% in BMS group (p value = 0.02).

Procedural characteristics:

Among the procedural characteristics, mean length of the stent was significantly longer in DES group (20.42 ± 6.53 mm) vs BMS group (17.65 ± 3.90) [p value = 0.006]. This finding was consistent with NORSTENT trial by Bonna et al¹³, where length of stent was 28.5 ± 18.2 mm in DES group vs 26.9 ± 17.1 mm in BMS group (p value < 0.001) and also with the study by Vale et al¹⁵ 18.5 ± 8.2 mm in DES group vs 15.96 ± 6.10 mm in BMS group (p value < 0.001). However in the study by Yin et al¹⁴, mean length of the stent was similar in both the groups (25.09 ± 11.38 mm in DES group vs 25.12 ± 12.78 mm in BMS group) [p value = 0.96]. Yin et al¹⁴ studied only large coronaries with mean reference vessel diameter (RVD) of 3.61 ± 0.37 mm in DES group vs 3.64 ± 0.32 mm in BMS group; however our study included consecutive patients with varying vessel diameters requiring mean stent diameter of 2.82 ± 0.35 mm in DES group and 2.82 ± 0.30 mm in BMS group (p value = 0.81). The study by Vale et al¹⁵ had significantly lesser mean stent diameter in the DES group (2.84 ± 0.38 mm) than in the BMS group (3.19 ± 0.49 mm) [p value < 0.001] whereas the study by Varenhorst et al¹² had mean stent diameter of 2.7 ± 0.50 mm in old generation DES group, 2.97 ± 0.52 mm in the new generation DES group and 3.1 ± 0.53 mm in the BMS group.

Outcomes:

After a median follow up of 170 months, we observed that the primary composite outcome of major adverse cardiovascular and cerebrovascular events (MACCE) was similar in both the groups (37% in DES group vs 36% in BMS group [p value = 0.88]). Further sub-analysis revealed that MACCE was significantly lower with DES group than BMS group (3% in DES group vs 10% in BMS group [p value = 0.04]) at 1 year of follow up and subsequently became comparable between 1-10 years (24% in DES group vs 22% in BMS group [p value = 0.73]) and also beyond 10 years (13% in DES group vs 12% in BMS group [p value = 0.83]). MACCE incidence in BMS group of our study was comparable to that of R. Muralidharan et al³⁹ where it was reported to be 43% at 12 years of follow up. Yin et al¹⁴

in a 9 year follow up study including 514 patients with DES and 514 patients with BMS, reported similar incidence of MACE (13% in DES group vs 17.3% in the BMS group [p value =0.057]). The study also stated significant benefit of DES over BMS at 1 year of follow up (MACE – 4.5% in DES group vs 9.3% in BMS group; p value = 0.0016). Our study findings were also similar with the NORSTENT¹³ trial, which had 4504 patients in DES group and 4509 patients in BMS group, revealed that at the end of 6 years, the primary outcome was similar in both the groups, (16.6% in DES group vs 17.1% in BMS group [p value = 0.66]).

All-cause mortality in our study population at the end of 170 months of follow up was 11% in DES group vs 14% in BMS group (p value =0.52). This was much lower when compared to long term study by Vale et al¹⁵ where 10 year mortality in DES group was 20.1% and in the BMS group was 25.4% (p value =0.015). Despite of a longer follow up, the lower mortality rates in our study was probably due to younger population and exclusion of patients with prior interventions (POBA/PCI/CABG). Vale et al¹⁵ also showed mortality benefit of Sirolimus eluting stents over contemporary bare metal stents over a follow up of 10 years (p value = 0.015). However, our study showed that the mortality rates were similar in both the groups at the end of 170 months (p value =0.506). 5 year mortality rates in our study population were 4% in DES group and 5% in BMS group (p value =0.73) which were comparable with NORSTENT¹³ trial where mortality rate was 8.5% in DES group and 8.4% in BMS group (p value = 0.22) at the end of 6 years. EXAMINATION trial however demonstrated mortality benefit of Everolimus eluting stents (EES) over bare metal stents (9% in EES group vs 12% in BMS group [p value =0.047]) at the end of 5 years. Mortality rates at 10 year in our study were 10% in DES group and 13% in BMS group (p value =0.50). Similar findings were demonstrated at a follow up of 9 years by Yin et al¹⁴ where mortality rates were 7% in DES group and 5.3 % in BMS group [p value = 0.25]).

In our study, the occurrence of myocardial infarction (MI) was 10% in DES group and 9% in BMS group over a median follow up of 170 months (p value =0.80). The MI frequency at 1 year of follow up was (1% in DES group and 2 % in BMS group [p value = 0.56]). Such similar rates were also reported in the EXAMINATION⁵⁹ trial comparing Everolimus eluting stents (EES) with bare metal stents (1% in EES group vs 2 % in BMS group [p value = 0.14]) at the end of 1 year. However Yin et al¹⁴ reported significantly lower incidence of MI in DES group (1%) as compared to BMS group (7% [p value = 0.03]) at the

end of 1 year; but this benefit was not seen beyond first year of follow up. At 9 years of total follow up the occurrence of MI was similar and comparable to our study (7% in DES group vs 10% in BMS group [p value =0.46]). Our study showed that the MI rates were similar even at 5 years (3% in DES group and 3% in BMS group) and also at 10 years (6% in DES group & 5% in BMS group [p value =0.75]); same has been demonstrated in NORSTENT¹³ trial (11.4% in DES group vs 12.5% in BMS group [p value =0.14]) at a follow up of 6 years and in EXAMINATION⁵⁹ trial (5% in EES group vs 4% in BMS group [p value = 0.35]) at a follow up of 5 years.

In our study population in stent restenosis (ISR) was observed to be similar (21% in DES group vs 17% in BMS group [p value =0.47]) at the end of 170 months of total follow up. The ISR rate in BMS group was similar to the R. Muralidharan study³⁹ where it was reported to be 16% at 12 years of follow up. At 5 years of follow up this ISR rate was observed to be 10% in DES group and 11% in BMS group (p value = 0.81). Stent thrombosis as per Academic Research Consortium (ARC), was found to be statistically non-significant in both the groups (13% in DES group vs 7% in BMS group [p value = 0.15]) over a follow up of 170 months. The incidence of very late stent thrombosis, was also found to be non-significant in both the groups (12% in DES group vs 6% in BMS group [p value = 0.13]). This finding was not consistent with other studies which have clearly demonstrated benefit of drug eluting stents over bare metal stents in terms of stent thrombosis. The EXAMINATION trial⁵⁹ reported significantly lower stent thrombosis rates with EES (1%) over BMS (3%) [p value = 0.02] at 1 year of follow up but the benefit vanishes on further follow up (2% in DES group vs 3% in BMS group at 5 years) [p value = 0.18]. Yin et al¹⁴ also reported similar benefit of drug eluting stents (1%) over bare metal stents (8%) at 1 year of follow up [p value = 0.01] and similar stent thrombosis rates thereafter (9% in DES group vs 12% in BMS group [p value =0.65] at the end of 9 years). Data from Swedish coronary angiography and angioplasty registry (SCAAR) by Varenhorst et al¹² reported similar lower risk of stent thrombosis with drug eluting stents (both old & newer generation) when compared to bare metal stents (p value <0.001) upto 1 year of follow up but beyond 1 year, old generation stents are in-fact associated with significantly higher risk of stent thrombosis (adjusted RR=1.82 (1.47-2.25 [p value <0.001])). NORSTENT trial¹³ however assessed only definite stent thrombosis and showed consistent benefit of drug eluting stents (0.8%) over bare metal stents (1.2%) [p value = 0.049] at 6 years of follow up.

Overall revascularization was found to be similar in both the groups (19%, p value = 1.0) at 170 months of follow up. This finding was different from other trials^{13,14} which have demonstrated a clear benefit of drug eluting stents over bare metal stents in terms of repeat revascularization. 5 year follow up of EXAMINATION trial⁵⁹ showed overall revascularization was similar in EES (12%) and BMS (16%) groups [p value = 0.06]; but significant benefit of drug eluting stents over bare metal stents in terms target lesion revascularization (p value = 0.012) and target vessel revascularization (p value = 0.009). Our study had more number of revascularizations in BMS group (10%) than DES group (6%) at the end of 5 years but it was statistically not significant (p value = 0.29). Lower percentage of revascularization rates was probably due to heterogeneous population with relatively stable coronary lesions.

Predictors:

In our study, we found fasting blood sugar level of >125mg/dl at presentation and triple vessel disease as independent predictors for major adverse cardiovascular and cerebrovascular events (MACCE) & obesity and creatinine of >1.4 mg/dl at presentation as predictors of all cause death. Similarly Vale et al¹⁵ in a 10 year follow up study reported age, CKD and COPD persisted as independent predictors of all-cause death. We also found that high fasting blood sugar level (>125 mg/dl) was significantly associated with occurrence of in stent restenosis (ISR). R. Muralidharan et al³⁹ had reported in his 12 year follow up study that older age, male sex, diabetes on presentation, low ejection fraction, and multivessel disease on presentation were predictors of major adverse cardiac events on follow-up. Wilson et al⁶⁰ reported following independent predictors of long-term mortality- (i) age (hazard ratio 1.05, 95% confidence interval 1.04 to 1.06), (ii) cardiogenic shock (4.58, 3.60 to 5.83), (iii) renal failure (3.14, 2.58 to 3.82), (iv) previous heart failure (1.97, 1.60 to 2.41), (v) STEMI (1.79, 1.47 to 2.18), (vi) peripheral vascular disease (1.72, 1.4 to 2.11), (vii) non-STEMI (1.58, 1.32 to 1.90), (viii) multivessel disease (1.47, 1.24 to 1.74), (ix) current smoking (1.39, 1.12 to 1.71), (x) diabetes (1.36, 1.16 to 1.59), and (xi) cerebrovascular disease (1.33, 1.06 to 1.60, p <0.01 for all comparisons).

In our study the benefit of drug eluting stents in terms of various event rates was probably masked due to more number of type C lesions, older generation drug eluting stents with larger strut size, stainless steel platform and larger stent length leading to comparable number of events as bare metal stents. However we believe that newer generation improved

drug eluting stents with Cobalt chromium platform, thinner struts, biodegradable polymer would certainly prove better over bare metal stents and do not recommend reconsidering bare metal stents for clinical practise. Our study is the only study in Indian literature which serves as a reference for very long term follow-up of drug eluting stents and bare metal stents stating their natural history in patients with coronary artery disease.



LIMITATIONS:

The observational study design is an inherent limitation of the study. The investigators did not have any control on the patient selection, procedural characteristics or follow-up angiographic study. The data was incomplete with regards to the medications, the risk factor profile and control, either because of improper documentation, patient unawareness or insensitiveness. Because of the small sample size in each group the study might have been underpowered to detect statistically significant differences in events. All the procedural angiograms could not be analyzed as the recordings on films had been irretrievably lost in the perils of time. Considerable advances in pharmacotherapy have occurred in the past decade which might have influenced the final results. The better stent designs, delivery systems and adjuvant pharmacologic agents that have become part of the standard practice of angioplasty in the present day was not available to these patients.

CONCLUSIONS:

- The composite endpoint of MACCE for the first year after stenting was significantly lower in patients receiving DES (3%) than those receiving BMS (10%) [P value = 0.04].
- During the later follow up after 1 year, the event rates were similar in patients receiving DES & BMS.
- Over a long term follow up of 14 years, the incidence of very late stent thrombosis group was similar in either of the groups
- Fasting blood sugar level of >125mg/dl on presentation and triple vessel disease were found to be independent predictors for major adverse cardiovascular and cerebrovascular events (MACCE).
- Obesity and creatinine of >1.4 mg/dl on presentation were predictors of all cause death.
- Our results may serve as the historical reference data for the long term follow-up of BMS & DES in this era of drug eluting stents.

REFERENCES:

1. Edoardo Camenzind, MD; P. Gabriel Steg, MD; William Wijns, M. CONTROVERSIES IN Stent Thrombosis Late After Implantation of First-Generation. *Circ. J.* **115**, 1440–1455 (2007).
2. Windecker, S., Meier, B. & Meier, B. Intervention in coronary artery disease. *Heart* **83(4)**:, 481–490 (2000).
3. Detre, K. *et al.* Clinical Investigation One-Year Follow-up Results of the 1985-1986 National Heart , Lung , and Blood Institute ' s Percutaneous Transluminal Coronary Angioplasty Registry. 421–428 (1989).
4. Roubin, G. S. *et al.* Intracoronary Stenting for Acute and Threatened Closure Complicating Percutaneous Transluminal Coronary Angioplasty. 6–9 (1991).
5. James M. Brophy, MD, PhD; Patrick Belisle, MSc; and Lawrence Joseph, P. Evidence for Use of Coronary Stents A Hierarchical Bayesian Meta-Analysis. *Ann. Intern. Med.* 777–787 (2003).
6. Serruys, P. W., Kutryk, M. J. B. & Ong, A. T. L. Coronary-Artery Stents. *new Engl. J. of Med.* **354**, 483–495 (2006).
7. Pfisterer, M. *et al.* Late Clinical Events After Clopidogrel Discontinuation May Limit the Benefit of Drug-Eluting Stents. *J. Am. Coll. Cardiol.* **48**, (2006).
8. Bavry, A. A., Kumbhani, D. J., Helton, T. J. & Borek, P. P. Late Thrombosis of Drug-Eluting Stents : A Meta-Analysis of Randomized Clinical Trials. *Am. J. Med.* **119**, 1056–1061 (2006).
9. Virmani, R. *et al.* Localized Hypersensitivity and Late Coronary Thrombosis Secondary to a Sirolimus-Eluting Stent: Should We Be Cautious? *Circulation* **109**, 701–705 (2004).
10. Daemen, J. *et al.* Early and late coronary stent thrombosis of sirolimus-eluting and paclitaxel-eluting stents in routine clinical practice: data from a large two-institutional cohort study. *Lancet* **369**, 667–678 (2007).
11. Sabaté, M. *et al.* The EXAMINATION trial (everolimus-eluting stents versus bare-

- metal stents in st-segment elevation myocardial infarction): 2-year results from a multicenter randomized controlled trial. *JACC Cardiovasc. Interv.* **7**, 64–71 (2014).
12. Varenhorst, C. *et al.* Stent thrombosis rates the first year and beyond with new- and old- generation drug-eluting stents compared to bare metal stents. *Clin. Res. Cardiol.* **107**, 816–823 (2018).
 13. Bønaa, K. H. *et al.* Drug-Eluting or Bare-Metal Stents for Coronary Artery Disease. *N. Engl. J. Med.* **375**, 1242–1252 (2016).
 14. Yin, D. *et al.* Nine-year clinical outcomes of drug-eluting stents vs. bare metal stents for large coronary vessel lesions. *J. Geriatr. Cardiol.* **14**, 35–41 (2017).
 15. Vale, N. *et al.* Ten-year survival of patients undergoing coronary angioplasty with first-generation sirolimus-eluting stents and bare-metal stents. *Rev. Port. Cardiol.* **39**, 639–647 (2020).
 16. Kimura, T. *et al.* Three-Year Follow-up after Implantation of Metallic Coronary-Artery Stents. *N. Engl. J. Med.* **334**, 561–567 (1996).
 17. Dotter, C. T. Transluminally-placed Coilspring Endarterial Tube Grafts. *Investigative Radiology* **4**, 329–332 (1969).
 18. Palmaz, C., Windeler, A., Sibbitt, R. & Reuter, R. Atherosclerotic Rabbit Aortas: Expandable Intraluminal Grafting. *Radiology* 723–726 (1986).
 19. Ulrich Sigwart, Jacques Puel, Velimir Mirkovitch, F. J. and L. K. Intravascular stents to prevent occlusion and restenosis after transluminal angioplasty. *NEJM* **316**, 701–706 (1987).
 20. Nobuyoshi, M. *et al.* Restenosis After Successful Percutaneous Transluminal Coronary Angioplasty: Serial Angiographic Follow-Up of 229 Patients. *J. Am. Coll. Cardiol.* **12**, 616–623 (1988).
 21. Gruentzig, Andreas R., Spencer King, M. S. and W. S. Long term follow up after percutaneous transluminal coronary angioplasty. *NEJM* **316**, 1127–1132 (1987).
 22. Holmes, D. R. *et al.* Restenosis after percutaneous transluminal coronary angioplasty (PTCA): A report from the PTCA registry of the national heart, lung, and blood

- institute. *Am. J. Cardiol.* **53**, 77–81 (1984).
23. Kimura, T., Nosaka, H., Yokoi, H., Iwabuchi, M. & Nobuyoshi, M. Serial angiographic follow-up after palmaz-schatz stent implantation: Comparison with conventional balloon angioplasty. *J. Am. Coll. Cardiol.* **21**, 1557–1563 (1993).
 24. George, C. J. *et al.* One-year follow-up of the stent restenosis (STRESS I) study. *Am. J. Cardiol.* **81**, 860–865 (1998).
 25. Fischman L., Leon Martin B, Donald Baim, Richard Schatz, Michael Savage, Ian Penn, Kathrine Detre, Lisa Veltri, Donald Ricci, Masakiyo Nobuyoshi, Michael Clemanm Richard Heuser, D. A. *et al.* A Randomised comparison of coronary-stent placement and balloon angioplasty in the treatment of coronary artery disease. *N Engl J Med* **327**, 313–18 (1992).
 26. Macaya, C. *et al.* Continued benefit of coronary stenting versus balloon angioplasty: One-year clinical follow-up of Benestent trial. *J. Am. Coll. Cardiol.* **27**, 255–261 (1996).
 27. Serruys, Patrick W., Peter Jaegerere, Ferdinand Kiemenij, Carlos Macaya, Wolfgang Rutsch, Guy Heyndrickx, Hakan Emanuelsson, Jean Marco, Victor Legrand, P. M. *et al.* A comparison of Balloon -expandable-stent implantation with balloon angioplasty in patients with coronary artery disease. *N Engl J Med* **327**, 313–18 (1992).
 28. Palmaz, J. C., Sibbitt, R. R., Reuter, S. R., Tio, F. O. & Rice, W. J. Expandable intraluminal graft: A preliminary study. *Radiology* **156**, 73–77 (1985).
 29. Topol Eric J., Ferdinand Leva, Cassa a. Pinkerton, Patrick L. Whitlow, Berthold Hofling, Charles A. Simonton, Ronald Masden, Patrick Serruys, Martin Leon, David Williams, Spencer King, III, *et al* for the C. study group. A comparison of directional atherectomy with coronary angioplasty in patients with coronary artery disease. *N. Engl. J. Med.* **329**, 1318–1327 (1993).
 30. Waller, B. F. ‘Crackers, breakers, stretchers, drillers, scrapers, shavers, burners, welders and melters’-the future treatment of atherosclerotic coronary disease? A clinical-morphologic assessment. *J. Am. Coll. Cardiol.* **13**, 969–987 (1989).
 31. Bittl, J. A. *et al.* Clinical success, complications and restenosis rates with excimer laser

- coronary angioplasty. *Am. J. Cardiol.* **70**, 1533–1539 (1992).
32. Savage, M. P. *et al.* Long-term angiographic and clinical outcome after implantation of a balloon-expandable stent in the native coronary circulation. *J. Am. Coll. Cardiol.* **24**, 1207–1212 (1994).
 33. Topol, E. J. Caveats about elective coronary stenting. *N Engl J Med* **331**, 539–541 (1994).
 34. Laham, R. J. *et al.* Long-term (4- to 6-year) outcome of Palmaz-Schatz stenting: Paucity of late clinical stent-related problems. *J. Am. Coll. Cardiol.* **28**, 820–826 (1996).
 35. Klugherz, B. D. *et al.* Three-year clinical follow-up after Palmaz-Schatz stenting. *J. Am. Coll. Cardiol.* **27**, 1185–1191 (1996).
 36. Kiemeneij, F. *et al.* Continued benefit of coronary stenting versus balloon angioplasty: Five-year clinical follow-up of Benestent-I trial. *J. Am. Coll. Cardiol.* **37**, 1598–1603 (2001).
 37. Choussat, R. *et al.* Long-term (≥ 8 years) outcome after Palmaz-Schatz stent implantation. *Am. J. Cardiol.* **88**, 10–16 (2001).
 38. Noriyuki Fujii, Ryuta Asano, Masatoshi Nagayama, Tetsuya Tobaru, Kazuhiko Misu, Eriko Hasumi, Yumiko Hosoya, Nobuo Iguchi, Masaru Aikawa, Hiroyuki Watanabe, J. U. and T. S. Long-Term Outcome of First-Generation Metallic Coronary Stent Implantation in Patients With Coronary Artery Disease. *Circ. J.* **71**, 1360–1365 (2007).
 39. Rajesh Muralidharan, P., J. T. *Natural History of Bare Metal Stents: 12 year follow-up of our first hundred patients after coronary stenting.* <http://dspace.sctimst.ac.in/jspui/handle/123456789/1376> (2009).
 40. Daemen, J. & Serruys, P. W. Drug-eluting stent update 2007: Part I: A survey of current and future generation drug-eluting stents: Meaningful advances or more of the same? *Circulation* **116**, 316–328 (2007).
 41. Morice, M., Patrick Serruys, Eduardo S., Jean F., Ernesto B., Marco P., Antonio C., G. Schuler, Paul B., G. Guagliumi, F. M. and R. F. for the R. study group. A randomized comparison of a Sirolimus-eluting stent with a standard stent for coronary

- revascularization. *N. Engl. J. Med.* **346**, 1773–1780 (2002).
42. Weisz, G. *et al.* Five-Year Follow-Up After Sirolimus-Eluting Stent Implantation. Results of the SIRIUS (Sirolimus-Eluting Stent in De-Novo Native Coronary Lesions) Trial. *J. Am. Coll. Cardiol.* **53**, 1488–1497 (2009).
 43. Schampaert, E. *et al.* The Canadian study of the sirolimus-eluting stent in the treatment of patients with long de novo lesions in small native coronary arteries (C-SIRIUS). *J. Am. Coll. Cardiol.* **43**, 1110–1115 (2004).
 44. Heldman, A. W. *et al.* Paclitaxel stent coating inhibits neointimal hyperplasia at 4 weeks in a porcine model of coronary restenosis. *Circulation* **103**, 2289–2295 (2001).
 45. Grube, E. *et al.* Six- and twelve-month results from a randomized, double-blind trial on a slow-release paclitaxel-eluting stent for de novo coronary lesions. *Circulation* **107**, 38–42 (2003).
 46. Tanabe, K. *et al.* TAXUS III trial: In-stent restenosis treated with stent-based delivery of paclitaxel incorporated in a slow-release polymer formulation. *Circulation* **107**, 559–564 (2003).
 47. Stone Gregg W., Ellis Stephen G, Cox David A., Hermiller James, Shaughnessy, C. O. *et al.* A Polymer-Based, Paclitaxel-Eluting Stents in Patients with Coronary Artery Disease. *NEJM* **350**, 221–231 (2004).
 48. Morice, M. C. *et al.* Sirolimus- vs paclitaxel-eluting stents in de novo coronary artery lesions - The REALITY trial: A randomized controlled trial. *J. Am. Med. Assoc.* **295**, 895–904 (2006).
 49. Nordmann, A. J., Briel, M. & Bucher, H. C. Mortality in randomized controlled trials comparing drug-eluting vs. bare metal stents in coronary artery disease: A meta-analysis. *Eur. Heart J.* **27**, 2784–2814 (2006).
 50. Ong, A. T. L. *et al.* Late Angiographic Stent Thrombosis (LAST) events with drug-eluting stents. *J. Am. Coll. Cardiol.* **45**, 2088–2092 (2005).
 51. Newsome, L. T., Kutcher, M. A. & Royster, R. L. Coronary artery stents: Part i. evolution of percutaneous coronary intervention. *Anesth. Analg.* **107**, 552–569 (2008).

52. Stone, G. W. *et al.* Offsetting impact of thrombosis and restenosis on the occurrence of death and myocardial infarction after paclitaxel-eluting and bare metal stent implantation. *Circulation* **115**, 2842–2847 (2007).
53. Fajadet, J. *et al.* Randomized, double-blind, multicenter study of the endeavor zotarolimus-eluting phosphorylcholine-encapsulated stent for treatment of native coronary artery lesions: Clinical and angiographic results of the ENDEAVOR II trial. *Circulation* **114**, 798–806 (2006).
54. Kandzari, D. E. *et al.* Comparison of Zotarolimus-Eluting and Sirolimus-Eluting Stents in Patients With Native Coronary Artery Disease. A Randomized Controlled Trial. *J. Am. Coll. Cardiol.* **48**, 2440–2447 (2006).
55. Palhais, N. *et al.* Ten-year clinical follow-up after sirolimus-eluting stent implantation. *Am. Heart J.* **167**, 893–899 (2014).
56. Cutlip, D. E. *et al.* Clinical end points in coronary stent trials: A case for standardized definitions. *Circulation* **115**, 2344–2351 (2007).
57. Thygesen, K. *et al.* *Fourth Universal Definition of Myocardial Infarction (2018)*. *Circulation* **138**, (2018).
58. Shih-Hsien Sung; Tzu-Ching Chen, Hao-Min Cheng, Jia-Chun Lee, Chen, Hui-Chu Lang, C.-H. Comparison of Clinical Outcomes in Patients Undergoing Coronary Intervention with Drug-Eluting Stents or Bare-Metal Stents : A Nationwide Population Study. *Acta Cardiol Sin* **33**, 10–19 (2017).
59. Sabaté, M. *et al.* Clinical outcomes in patients with ST-segment elevation myocardial infarction treated with everolimus-eluting stents versus bare-metal stents (EXAMINATION): 5-year results of a randomised trial. *Lancet* **387**, 357–366 (2016).
60. Wilson, W. M. L. *et al.* Long-term predictors of mortality after percutaneous coronary intervention in the era of drug-eluting stents. *Am. J. Cardiol.* **108**, 936–942 (2011).

PROFORMA

“NATURAL HISTORY OF CORONARY STENTS: LONG TERM FOLLOW-UP OF CONSECUTIVE HUNDRED PATIENTS AFTER CORONARY STENTING WITH DRUG ELUTING STENTS AND BARE METAL STENTS”

Serial No:

Age :

Sex:

Date of PCI:

Duration of follow up:

RF: DM/HTN/DLP/SMOKING/F/H/O
CAD

DIAGNOSIS:

PRIOR MI:

ECHO-

Hb

Creat

TC

TG

HDL

CAG:

NO. OF VESSELS INVOLVED:

NO. OF VESSELS TREATED:

PRIOR INTERVENTION:

PERIOPERATIVE MI:

NO. OF STENTS:

TYPE:

Length

Diameter

Pressure

Time of inflation

Follow up duration

TMT

Time to MACCE

MACCE

Death (All cause):

CVS deaths:

MI:

CAG:

ISR:

TVR:

TLR:

ANY OTHER VESSEL

REVASCLARIZATION:

STROKE:

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

SCT/IEC/1487 /NOVEMBER-2019

19.11.2019

Dr. Walse Rohit Sunil
Resident
Department of Cardiology
SCTIMST, Thiruvananthapuram

Dear Dr. Walse Rohit Sunil,

The Institutional Ethics Committee reviewed and discussed your application to conduct the study entitled "NATURAL HISTORY OF CORONARY STENTS: LONG TERM FOLLOW-UP OF CONSECUTIVE HUNDRED PATIENTS AFTER CORONARY STENTING WITH DRUG ELUTING STENTS AND BARE METAL STENTS (IEC/1487)" on 5th November, 2019.

The following documents were reviewed:

Original submission

1. Covering Letter addressed to the Chairperson, IEC, SCTIMST dated 25.09.2019 with checklist
2. TAC Approval Letter
3. IEC Application Form
4. Forwarding Letter from the HOD
5. Project Proposal
6. Proforma
7. CV of Principal Investigator and Co-Principal Investigators

Revised submission

1. Covering Letter addressed to the Chairperson, IEC, SCTIMST
2. TAC Approval Letter
3. IEC Application Form
4. Forwarding Letter from the HOD
5. Project Proposal
6. Proforma
7. CV of Principal Investigator and Co-Principal Investigators

Page 1 of 2

The following members of the Ethics Committee were present at the meeting held on 5th November, 2019 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. Kala Kesavan. P	MBBS, MD	Female	Basic Medical Scientist	No
3.	Dr. K R S Krishnan	M.E., Ph.D.	Male	Medical Technology	Yes
4.	Dr. Harikrishna Varma PR	Ph.D(Materials Science)	Male	Medical Technology	Yes
5.	Dr. S S Giri Sankar	LL.M. Ph.D.	Male	Legal Expert	No
6.	Dr. V. Raman Kully	M D, M Phil, M P H	Male	Health Sciences Expert/Clinician	Yes
7.	Dr. Aneesh V Pillai	BA. LLB (Hons.), LL.M, Ph. D. SET (Law)	Male	Legal Expert	No
8.	Smt. Sathi Nair	MA (English Literature)	Female	Lay Person	No
9.	Dr. P. Manickam	BSMS, MSc (Epid).PhD	Male	Health Science Expert/ Social Scientist	No
10.	Dr. Harikrishnan S	MD, DM (Cardiology) DNB (Cardiology)	Male	Clinician	Yes
11.	Mr. Satheesh Chandran	MSW, PGDPM	Male	Lay person/ NGO/ Social Scientist	No
12.	Dr. Christina George	MD Psychiatry	Female	Clinician	No
13.	Dr. Mala Ramanathan	PhD	Female	Social Scientist (Member Secretary)	Yes

IEC Decision

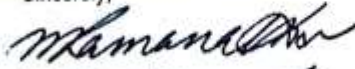
The IEC approved the conduct of the study in the present form.

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

NATURAL HISTORY OF CORONARY STENTS: LONG TERM FOLLOW-UP OF CONSECUTIVE HUNDRED PATIENTS AFTER CORONARY STENTING WITH DRUG ELUTING STENTS AND BARE METAL STENTS

by Rohit Walse

General metrics

95,552	14,605	1222	58 min 25 sec	1 hr 52 min
characters	words	sentences	reading time	speaking time

Score



This text scores better than 61% of all texts checked by Grammarly

Writing Issues

1054	577	477
Issues left	Critical	Advanced

Plagiarism



37 sources

9% of your text matches 37 sources on the web or in archives of academic publications

Sr No	Cath No	Date of PCI	Age	Sex	WT	HT	Obesity	DM	HTN	DLP	F/H CAD	Smoking	Diagnosis	Diagnosis in detail	RVMI	FC	Prior MI	MI DURATION (MONTHS)	EF	RWMA	Hb	Creat	ESR
1	33776	15-01-2005	48	1	50	158	0	1	1	1	0	1	3	CSA		2	0		60	0	15.4	0.9	4
2	33736	11-01-2005	51	1	78	171	1	1	1	1	0	1	3	CSA		2	0		62	0	14.9	1.2	23
3	33797	18-01-2005	40	1	77	178	1	0	0	1	0	1	1	IWMI	0	2	1	6	62	0	15.8	1.2	8
4	34254	01-04-2005	48	1			0	0	1	0	0	0	3	CSA		3	0		65	0	14.2	1	8
5	33943	12-02-2005	63	1	71	168	1	0	0	1	0	0	1	IPWMI	0	2	1	4	60	1	15.4	1.1	5
6	33795	11-01-2005	44	1			0	0	1	1	0	0	3	CSA		3	0		70	0	13.2	1.1	12
7	33706	07-01-2005	53	0			0	1	1	1	0	0	1	IWMI	1	2	1	5	67	1	13.8	1	41
8	33716	08-01-2005	62	1	55	155	0	0	0	1	0	1	1	AWMI		3	1	1	52	1	17	1.1	2
9	33714	08-01-2005	49	1	58	161	0	0	0	1	0	1	1	IWMI	1	2	1	1	72	1	15.4	1.22	38
10	33680	07-01-2005	51	1			0	0	0	1	0	1	1	IWMI	1	2	1	1	67	1	16.1	0.9	3
11	33808	19-01-2005	54	1			0	1	0	1	0	1	1	IPWMI	0	3	1	2	71	1	13.8	1.2	35
12	33986	22-05-2005	48	1			0	1	0	1	0	1	1	AWMI		1	1	1	66	1	15.6	1	8
13	33804	19-01-2005	48	1	69	163	1	0	1	1	0	1	1	AWMI		2	1		63	1	15.4	1.1	3
14	33786	17-01-2005	44	1			0	0	1	1	1	0	1	AWMI		2	1	0.566666667	67	1	13.9	1.3	12
15	34230	29-03-2005	38	1			0	1	0	0	0	0	3	CSA		2	0		73	1	16.7	0.9	7
16	33782	17-01-2005	50	1	65	168	0	0	0	1	1	0	1	AWMI		2	1	1	57	1	14	1.1	16
17	34199	28-03-2005	56	0	46	153	0	1	0	1	0	0	3	CSA		1	0		80	0	14	1	20
18	33978	21-02-2005	53	1	63	160	1	1	0	1	1	1	1	AWMI		2	1	1	66	1	8.2	0.5	83
19	34198	22-03-2005	53	1	73	172	1	0	0	1	0	0	3	CSA		2	0		81	0	13.1	1.1	15
20	34221	28-03-2005	54	1			0	1	0	1	0	0	3	CSA		2	0		72	0	14.2	1	16

21	34170	18-03-2005	38	1			0	0	0	1	1	1	2	ACS		2	0	0.4	70	0	18.5	1	2
22	34229	05-04-2005	61	0			0	0	0	1	1	0	1	AWMI		2	1	0.433333333	63	1	14	0.9	25
23	34376	19-04-2005	52	0	54	156	0	0	0	1	0	0	3	CSA		3	0		74	0	12.9	0.7	21
24	34328	11-04-2005	46	1	55	168	0	0	0	1	0	1	1	AWMI		2	1	3	58	1	13.3	0.9	2
25	34515	10-05-2005	45	0	45	146	0	0	1	1	1	0	3	CSA		2	0		58	0	12.4	0.8	53
26	34305	08-04-2005	47	1			0	0	0	1	0	1	3	CSA		3	0		64	1	15.3	1.3	15
27	34398	22-04-2005	42	1	70	160	0	0	1	1	1	0	3	CSA		2	0		62	0	14.9	1	2
28	34952	12-07-2005	49	1	77	173	1	0	1	0	0	1	3	CSA		2	0		68	0	14.9	1.2	15
29	34380	20-04-2005	71	1			0	0	1	1	0	0	3	CSA		2	0		58	1	14	1.4	30
30	34893	04-07-2005	50	1	58	163	0	1	1	1	0	0	1	AWMI		2	1	24	60	1	15.3	1.4	4
31	34586	20-05-2005	46	1	83	177	1	1	1	1	0	1	1	AWMI		3	1	1	38	1	16.2	1.3	1
32	34737	10-06-2005	69	0	46	150	0	1	1	1	1	0	3	CSA		2	0		60	0	13.9	0.9	17
33	34736	10-06-2005	45	0			0	0	1	1	1	0	1	IWMI	1	2	1	1	64	1	12.2	1.1	8
34	34831	24-06-2005	54	0			0	1	1	1	0	0	3	CSA		3	0		62	0	13.1	1	15
35	34899	04-07-2005	69	1			1	1	1	1	1	1	3	CSA		2	0		68	0	13.7	1.2	10
36	34959	13-07-2005	39	1			0	0	1	1	0	0	1	AWMI		2	1	1	62	1	14.2	1.1	30
37	34927	08-07-2005	50	1			0	1	0	1	0	0	1	IWMI	0	2	1	1	59	0	14.9		12
38	34908	06-07-2005	36	1			0	0	1	1	0	1	1	AWMI		2	1	1	68	1	13.1	1.6	38
39	34900	05-07-2005	58	1			0	1	1	1	0	1	2	ACS		2	0		76	0	15.1	1.5	5
40	34970	15-07-2005	43	1			0	0	0	0	0	0	2	ACS		2	0		69	0	15.9	1.1	9
41	33703	07-01-2005	49	1			0	0	0	1	0	0	3	CSA		2	0		61	0	14.8	1.2	6
42	34171	18-03-2005	55	1			0	1	1	0	0	0	3	CSA		2	0		62	0	15	1.03	13
43	35791	16-11-2005	49	1	59	157	0	1	0	1	0	1	3	CSA		2	0		65	0	14.2	0.8	8
44	35854	25-11-2005	54	1	71	166	1	1	0	0	1	1	2	ACS		2	1	4	63	1	14.2	1.5	14
45	35498	03-10-2005	49	0	53	147	0	1	1	1	1	0	3	CSA		3	0		65	0	12.6	0.8	15
46	35046	29-07-2005	45	1			0	0	0	1	0	1	3	CSA		2	0		67	0	13.4	1.1	12

47	35192	19-08-2005	44	1	57	156	0	0	1	1	0	1	2	ACS		2	1	7	39	1	13.6	1.3	16
48	34349	15-04-2005	60	1			1	1	1	1	0	0	2	ACS		3	0		60	0	13.2	1.2	12
49	34560	17-05-2005	49	1			0	0	1	0	1	0	3	CSA		2	0		75	0	13.8	1.3	20
50	34509	10-05-2005	64	1			0	0	1	1	0	1	3	CSA		2	0		60	0	13.5	1.1	10
51	35260	30-08-2005	74	1			0	1	1	1	0	0	2	ACS		2	0		66	0	11.2	1.3	74
52	34997	19-07-2005	33	1	49	164	0	0	0	1	0	1	3	CSA		2	0		72	1	13.9	1	5
53	34564	17-05-2005	57	1			0	1	1	0	0	1	2	ACS		2	1	2	71	0	13.7	1.6	1
54	35290	02-09-2005	56	1			0	1	0	1	1	1	1	AWMI		1	1	4	58	1	14.4	1	3
55	35505	05-09-2005	67	1			0	0	0	0	0	1	3	CSA		1	0		72	0	11.6	1.2	5
56	35024	26-07-2005	49	1			0	1	1	1	0	1	1	IWMI	0	2	1	6	67	0	15.6	0.9	5
57	35057	01-08-2005	43	1			0	0	1	1	0	1	2	ACS		2	0		70	0	16.2	1.2	11
58	35127	10-08-2005	59	1			0	1	1	1	1	1	1	IPWMI	0	2	1	5	60	1	15.4	0.8	14
59	34836	29-06-2005	55	1	55	157	0	1	1	1	0	1	2	ACS		3	0	1	62	0	16.4	1	5
60	35148	17-08-2005	44	1	49	155	0	0	1	0	0	0	1	IPWMI	0	2	1	7	70	0	14.6	1.7	9
61	35034	27-07-2005	38	1	86	156	1	0	0	1	0	1	2	ACS		2	0		78	0	15.7	0.94	6
62	35000	19-07-2005	51	1			0	0	0	0	0	1	2	ACS		3	0		76	0	15.2	1.1	2
63	35402	23-09-2005	55	1			0	0	1	0	0	0	1	IWMI	0	2	1	4	68	1	13.3	1.2	25
64	35027	27-07-2005	58	1			0	0	1	0	0	1	1	AWMI		2	1	48	30	1	14.7	1.1	3
65	35312	06-09-2005	50	1			0	0	1	1	0	1	3	CSA		2	0		60	0	12.8	1.3	16
66	35395	20-09-2005	67	1	58	161	0	1	1	1	0	0	1	IPWMI	0	2	1	5	48	0	15.6	1.1	1
67	35153	24-08-2005	50	1			0	0	0	1	0	1	1	IWMI	0	2	1	2	62	0	14.4	1.1	13
68	35242	27-08-2005	65	1	62	168	0	0	0	0	0	0	2	ACS	0	2	1	1	56	1	13.2	1.3	18
69	35391	20-09-2005	52	1			0	0	0	1	1	1	2	ACS		2	0	2	76	0	14	1.1	19
70	35448	27-09-2005	57	1	60	157	1	1	0	1	1	1	1	IWMI	0	1	1	3	80	1	13.8	1	5
71	35302	05-09-2005	56	1	60	168	0	1	0	1	0	0	1	AWMI		2	1	2	64	1	14.8	1.1	7
72	35886	29-11-2005	50	1	55	161	0	0	1	1	1	0	1	AWMI		1	1	39	68	1	13	1.1	5
73	35394	20-09-2005	47	1			1	0	0	0	0	1	2	ACS		3	1	24	70	0	13.7	1.3	4

74	35217	23-08-2005	62	1			0	1	0	0	0	1	2	ACS		2	0	1	73	0	12.4	1.1	36
75	35162	16-08-2005	45	1			0	0	0	0	0	1	1	AWMI		2	1	1	74	1	12.6	0.96	85
76	35237	27-08-2005	49	1			0	0	0	0	1	1	3	CSA		2	0		80	0	14.7	1	14
77	35271	31-08-2005	55	1			1	0	0	1	0	0	3	CSA		1	0		63	0	15.5	1.1	12
78	35171	17-08-2005	55	1			0	0	1	1	1	1	1	AWMI		2	1	1	69	1	13.5	1.1	52
79	35423	23-09-2005	43	1	65	178	0	1	0	0	1	1	1	AWMI		2	1	3	57	1	15	0.9	2
80	35284	02-09-2005	53	1	63	156	0	1	1	1	0	1	2	ACS		2	0	1	68	0	14.7	1.3	3
81	35541	10-10-2005	44	1	55	165	0	0	0	1	1	0	1	IWMI	0	2	1	3	73	1	13.2	1.1	5
82	35317	06-09-2005	70	1	61	163	0	0	0	1	1	1	1	IPWMI	0	2	1	1	70	1	14	1.5	13
83	35247	29-08-2005	52	1			0	0	1	1	0	0	1	IPWMI	0	2	1	4	45	1	14.9	1.3	2
84	35288	02-09-2005	53	1			0	0	0	1	0	1	1	AWMI		2	1	2	73	0	12.8	1.1	17
85	35335	09-09-2005	45	1			0	0	0	1	1	0	2	ACS	0	2	1	0.3333333333	76	1	14.8	1.2	11
86	35403	21-09-2005	33	1			0	1	0	0	0	1	1	IWMI	0	1	1	2	75	1	13.9	1	10
87	35387	21-09-2005	38	1			0	0	0	0	0	0	1	IWMI	0	2	1	1	67	1	13.6	1	15
88	35406	21-09-2005	54	1	66	172	0	1	1	0	0	0	3	CSA		2	0		81	0	14.4	1.2	4
89	35506	05-10-2005	59	1			0	0	0	0	1	1	2	ACS	0	2	1	48	61	1	12.1	1.2	6
90	35593	19-10-2005	56	1	75	167	1	1	1	1	0	0	2	ACS		2	0	2	71	0	15.4	1.1	35
91	35787	15-11-2005	55	1	61	159	0	0	0	0	0	1	1	AWMI		2	1	4	71	1	16.4	1	10
92	35579	17-10-2005	43	1	66	167	0	0	0	1	0	1	1	AWMI		2	1	5	81	0	13.6	0.7	5
93	35628	24-10-2005	55	1	68	166	0	0	0	0	0	1	1	AWMI		2	1	120	45	1	17.1	1.5	3
94	35704	04-11-2005	65	0			0	0	1	1	1	0	2	ACS		2	0	2	81	0	13.3	1.1	12
95	35650	26-10-2005	47	0	68	166	1	1	1	1	1	0	3	CSA		2	0		78	0	12.6	0.9	23
96	35943	07-12-2005	37	1			1	0	0	1	0	1	1	AWMI		1	1	36	62	1	14.3	0.9	11
97	35644	01-11-2005	58	1			0	0	1	1	1	0	2	ACS		2	0	3	70	0	15.1	1.2	25
98	35756	11-11-2005	49	1			0	1	0	1	1	0	2	ACS		2	0	2	71	0	12.6	1.5	14
99	35694	31-10-2005	53	1			0	0	0	1	0	1	3	CSA		2	0		74	0	16.3	1.4	6
100	35606	21-10-2005	71	1			0	0	1	1	0	1	3	CSA		2	0		77	0	13.6	1.2	4

101	35855	25-11-2005	65	1			0	1	0	0	0	1	2	ACS		3	0	7	76	0	12.3	1.1	13
102	35858	25-11-2005	55	1			0	1	0	1	0	0	2	ACS	0	2	1	6	68	0	14.5	1.4	6
103	35878	30-11-2005	45	1			0	0	1	1	0	1	2	ACS		2	1	4	73	1	13.7	1.4	96
104	35739	09-11-2005	52	1			1	1	1	1	0	0	2	ACS		2	0	2	66	0	13.3	1.1	10
105	35774	14-11-2005	45	1			0	1	1	0	1	1	3	CSA		2	0		78	0	15.1	0.8	3
106	36032	23-12-2005	61	1			0	1	0	0	0	1	2	ACS		2	1	3	74	1	15.1	1.2	11
107	35824	25-11-2005	63	1			0	0	1	1	1	0	3	CSA		2	0		71	0	12.3	0.9	50
108	35872	28-11-2005	50	1			0	0	0	0	0	1	1	IWMI	0	2	1	0.733333333	69	1	14	1.1	11
109	35072	02-08-2005	59	1			0	1	0	1	1	1	1	IWMI	0	3	1	2	67	0	13.3	1.1	18
110	35304	05-09-2005	63	1			1	1	1	1	0	0	3	CSA		2	1	132	71	1	13.5	1.3	4
111	35398	21-09-2005	64	1			0	1	0	0	0	0	3	CSA		2	1	60	60	1	10	1.5	20
112	35520	07-10-2005	47	1			1	0	0	1	0	1	1	IPWMI	0	1	1	2	60	1	14.2	1.4	18
113	33947	08-02-2005	50	1			0	0	1	1	1	1	1	IWMI	1	2	1	1	75	1	15.4	1.3	10
114	36546	07-03-2006	59	1			0	1	1	1	1	0	3	CSA		2	0		69	0	13.9	1.1	6
115	34903	05-07-2005	51	1			0	0	0	1	0	1	2	ACS		3	1	1	60	0	14.3	1.2	4
116	36090	03-01-2006	70	1			0	0	1	1	0	1	3	CSA		2	0		74	0	13.6	1.5	20
117	36119	06-01-2006	56	1			0	1	1	1	0	1	3	CSA		2	0		70	0	16.3	1.1	4
118	36038	17-01-2006	47	1			0	0	0	1	1	1	3	CSA		3	0		65	0	14.7	1.2	18
119	36007	02-01-2006	72	1			0	1	1	0	0	1	3	CSA		2	0		78	1	11.9	1.8	45
120	36183	20-01-2006	52	1			0	0	0	0	1	1	3	CSA		2	0		80	0	13.6	1.1	8
121	35940	04-01-2006	48	1	66	154	0	1	0	0	1	0	2	ACS		3	0	1	59	1	11	1.2	12
122	36136	09-01-2006	52	1	61	174	0	0	0	1	0	1	3	CSA		2	0		60	0	16.5	1	10
123	36176	16-01-2006	43	1	63	160	0	1	1	1	1	1	1	AWMI		2	1	3	69	1	13.6	1.1	11
124	36104	04-01-2006	53	1			0	0	1	0	0	0	1	AWMI		2	1	0.566666667	60	1	14	1.1	29
125	36194	18-01-2006	50	1			0	1	0	1	0	0	1	LWMI		2	1	5	60	0	14.9	0.9	8
126	36222	23-01-2006	60	1			0	0	0	1	0	1	1	IWMI	0	2	1	1	72	1	15.4	1.2	27
127	36521	03-03-2006	45	1			0	0	1	0	0	0	1	AWMI		2	1	2	80	1	14.6	1.2	13

128	36768	06-04-2006	43	1	60	172	0	1	0	1	1	0	1	AWMI		2	1	24	33	1	12.5	1	9
129	36812	12-04-2006	60	1			0	1	0	1	0	1	3	CSA		2	0		74	0	11.5	1.1	4
130	36765	03-04-2005	68	0			1	1	1	1	0	0	2	ACS		2	0	4	60	0	10.3	0.7	45
131	36689	27-03-2006	56	0			0	0	1	1	1	0	3	CSA		2	0		60	0	12.6	0.8	36
132	36811	12-04-2006	47	1			0	0	0	1	0	1	1	IPWMI	0	2	1	4	60	1	14.1	1	17
133	36669	24-03-2006	60	0	62	149	1	1	1	1	1	0	3	CSA		2	0		60	0	11.2	0.9	4
134	36738	03-04-2006	73	1	75	163	1	1	1	1	0	0	2	ACS		2	0	2	73	0	14.1	1.4	7
135	36745	03-04-2006	43	1	59	168	0	1	1	0	1	1	1	AWMI		2	1	2	45	1	14.9	0.9	43
136	36790	10-04-2006	47	1	71	161	0	0	0	1	1	0	2	ACS		3	0	2	60	0	15.6	1.2	6
137	36793	10-04-2006	53	1	63	155	0	0	1	1	0	0	3	CSA		3	0		72	1	14.5	1.2	13
138	36687	27-03-2006	55	1			0	1	0	1	1	0	1	AWMI		2	1	1	56	1	15.2	1.2	28
139	36789	10-04-2006	54	1	61	160	0	0	0	1	0	0	3	CSA		2	0		64	1	13.7	1.3	23
140	36778	18-04-2006	67	0			0	1	1	0	0	0	1	AWMI		2	1	1	38	1	11	1.3	18
141	36780	07-04-2006	44	1			0	1	1	1	0	1	2	ACS		2	0	4	60	0	16.1	1.3	4
142	36791	10-04-2006	68	1			0	1	0	1	0	0	1	AWMI		2	1	0.466666667	62	1	14.9	1.3	2
143	37633	31-03-2006	43	0			0	0	0	0	0	0	1	AWMI		2	1	2	76	1	16.3	0.9	10
144	36917	28-04-2006	51	1	66	166	0	0	0	0	1	0	3	CSA		2	0		74	0	14.5	1	9
145	36850	19-04-2006	59	1			0	1	1	0	0	0	2	ACS		2	0	0.533333333	60	0	12.5	1.4	20
146	36817	12-04-2006	60	0			1	0	1	0	0	0	1	IWMI	1	2	1	2	75	1	12	1.1	45
147	36911	28-04-2006	56	1			0	1	1	1	0	1	2	ACS		2	1	0.266666667	82	0	12.2	0.9	28
148	36970	08-05-2006	63	1	65	172	0	1	0	1	1	1	1	AWMI		2	1	2	50	1	12.7	1.3	8
149	36498	28-02-2006	44	1			0	0	0	1	0	0	2	ACS	0	2	1	0.233333333	60	0	15.8	0.8	6
150	36942	03-05-2006	43	1	60	161	0	0	0	1	1	1	1	IPWMI	0	2	1	3	60	1	16.8	0.9	
151	36739	03-04-2006	53	1			0	0	1	1	1	0	2	ACS		2	1	1	68	0		1	71
152	37006	12-05-2006	50	1			0	1	1	0	0	0	3	CSA		1	0		60	0	14.3	1.6	45
153	36992	10-05-2006	49	1	63	171	0	0	1	1	0	0	2	ACS		2	1	5	72	0	15.1	1.2	20
154	36986	10-05-2006	61	1			0	0	0	0	1	1	1	IWMI	0	2	1	2	35	1	15.2	1.1	6

155	37036	16-05-2006	37	1	70	165	0	0	0	1	1	0	1	AWMI		2	1	1	57	1	13.2	1.2	18
156	37039	16-05-2006	59	1			0	1	0	1	1	1	2	ACS		2	0	2	75	0	13.8	1.2	37
157	36987	10-05-2006	63	1			1	1	1	1	1	1	2	ACS		3	1	0.2333333333	65	1	13.7	1.3	60
158	37060	19-05-2006	44	1	60	173	0	0	0	1	0	0	1	IWMI	0	2	1	0.5333333333	63	1	15.8	1.1	10
159	37007	12-05-2006	72	1			0	1	1	1	0	0	2	ACS		2	0	3	65	0	12.7	1	3
160	37034	16-05-2006	71	1			0	0	0	1	0	0	2	ACS		2	0	0.2333333333	60	0	13.1	1.5	55
161	37044	17-05-2006	40	1			0	1	0	1	0	0	3	CSA		2	0		60	0	15	1.1	18
162	37070	20-05-2006	57	1			0	1	1	1	0	0	3	CSA		2	0		60	0	14.7	1.2	49
163	37996	15-05-2006	63	1			0	0	0	1	0	1	3	CSA		2	0		65	0	13.2	1.1	18
164	37002	15-05-2006	52	1			0	1	1	1	1	0	3	CSA		2	0		68	0	15.1	1.2	8
165	37099	24-05-2006	65	1			0	0	1	1	0	0	2	ACS		3	0	22	64	1	15.5	1.3	
166	37129	29-05-2006	49	1	54	157	0	0	0	1	0	1	3	CSA		2	0		84	0	14.5	1.1	4
167	37106	26-05-2006	43	1			0	0	0	1	0	0	3	CSA		2	0		66	0	14.7	1	17
168	37105	26-05-2006	53	1			0	0	0	1	0	1	1	IWMI	0	2	1	5	50	1	16.3	1.2	6
169	37191	02-06-2006	58	1	57	164	0	0	0	1	1	1	1	IWMI	1	2	1	5	73	0	14	1.1	6
170	37166	02-06-2006	41	1	77	108	0	1	0	0	1	1	1	AWMI		2	1	2	60	1	13.6	1.2	11
171	37175	05-06-2006	47	1			0	0	1	1	0	0	2	ACS		2	0	3	77	0	11.8	1.4	70
172	37136	31-05-2006	38	1			0	0	0	0	0	1	1	IWMI	0	2	1	1	54	1	17.2	1.2	6
173	37146	31-05-2006	49	0	65	161	1	1	1	1	0	0	2	ACS		2	0	1	70	0	13.4	1	54
174	37147	31-05-2006	44	1	77	177	1	0	1	1	1	0	2	ACS		2	0	2	60	0	17	1.2	6
175	37284	29-05-2006	54	1	60	160	0	0	0	1	1	0	3	CSA		2	0		81	0	12.5	1.2	6
176	37194	06-06-2006	40	1	59	171	0	0	0	1	0	0	1	AWMI		2	1	3	35	1	13.6	1	34
177	37112	26-05-2006	52	1	71	173	0	0	0	1	1	0	1	IWMI	0	2	1	0.6333333333	50	1	15	1.4	38
178	37090	23-05-2006	53	1	52	161	0	0	1	1	0	0	3	CSA		2	0		59	0	15.6	1.1	11
179	37192	06-06-2006	72	1	74	174	0	0	1	1	0	0	2	ACS		2	0	1	71	0	13.6	1.3	12
180	35882	02-12-2005	48	1			0	1	0	1	1	1	3	CSA		2	1	48	70	1	13.7	1	38
181	37236	12-06-2006	59	1			0	0	0	1	0	1	3	CSA		2	0		84	0	12.4	1.2	15

182	37223	13-06-2006	38	1			0	0	0	1	0	1	3	CSA		2	0		74	0	14.7	1.2	10
183	37238	12-06-2006	44	1			0	1	1	1	0	1	1	AWMI		2	1	5	45	1	14.6	1.3	3
184	37242	13-06-2006	38	1			0	1	0	1	0	1	1	IPWMI	0	2	1	6	60	1	14.7	1.3	13
185	37293	20-06-2006	51	1			0	0	0	1	1	1	1	AWMI		2	1	4	51	1	14	1.1	13
186	37276	20-06-2006	59	1			0	0	0	1	1	1	3	CSA		3	0		75	0	14.7	1	14
187	37235	12-06-2006	51	1			0	0	1	1	0	0	1	IWMI	0	3	1	2	58	1	14.4	1.2	1
188	37283	19-06-2006	59	1			0	1	0	1	0	1	1	AWMI		2	1	1	58	0	13.4	1.1	23
189	37176	05-06-2006	49	1			0	0	1	1	0	1	1	AWMI		2	1	1	75	1	14.9	1.4	23
190	37262	16-06-2006	60	1	57	155	0	1	0	1	1	1	1	IPWMI	0	2	1	2	84	1	12.4	1.2	34
191	37329	16-06-2006	63	0	52.5	154	0	1	0	1	0	0	1	AWMI		2	1	1	77	0	13.1	0.7	15
192	37277	17-06-2006	36	1			0	0	0	1	0	1	1	AWMI		2	1	0.233333333	53	1	14.8	1	38
193	37340	05-07-2006	39	1			0	0	1	0	0	0	2	ACS	0	2	1	60	83	1	15.5	0.9	6
194	37325	04-07-2006	49	0			0	1	1	1	0	0	1	AWMI		2	1	3	84	0	12.2	0.8	42
195	37376	10-07-2006	54	1			0	1	1	0	0	0	2	ACS		3	1	2	74	0	15	1.5	35
196	37351	07-07-2006	48	1	95	150	1	0	1	1	1	0	1	AWMI		2	1	8	86	0	13.2	0.8	8
197	37450	18-07-2006	49	1			0	0	0	0	0	1	1	AWMI		2	1	9	74	1	15.4	1.3	15
198	37354	07-07-2006	57	1	64	165	0	0	1	1	1	1	2	ACS		2	0	2	85	0	16.4	1.3	12
199	37320	03-07-2006	64	0			0	1	1	1	1	0	1	AWMI		2	1	2	60	1	12.2	0.9	7
200	37484	22-07-2006	40	1			0	1	0	0	0	1	1	AWMI		2	1	2	72	1	13.9	1.2	5

FBS	TC	TG	HDL	VLDL	LDL	No. of Vessels inv	Dominant circulation	LAD lesion	LCX lesion	Ramus lesion	RCA lesion	Type of lesion	No. of vessels treated	LAD treated	LCX treated	Ramus treated	RCA treated	No. of stents	Type 1	STENT NAME 1	Stainless steel	Cobalt Chromium	Length1
96	180	136	39	27.2	113.8	2	R	0	1	0	1	A	1	0	1	0	0	1	2	PIXEL	1	0	18
249				0	0	1	R	1	0	0	0	B1	1	1	0	0	0	1	2	LEKTON	1	0	20
93	185	138	43	27.6	114.4	1	R	0	0	0	1	A	1	0	0	0	1	1	2	S 670	1	0	15
94	263	164	46	32.8	184.2	1	R	1	0	0	0	B2	1	1	0	0	0	1	2	DRIVER	0	1	24
170	108	120	30	24	54	1	L	0	1	0	0	B2	1	0	1	0	0	1	2	DRIVER	0	1	24
109	261	94	35	18.8	207.2	1	R	0	0	0	1	A	1	0	0	0	1	1	2	TSUNAMI GOLD	1	0	15
133	155	90	47	18	90	2	R	1	0	0	1	B2	1	0	0	0	1	1	1	S FLEX	0	1	16
119				0	0	2	R	1	1	0	0	B1	2	1	1	0	0	2	2	ANGSTROM	1	0	19
176	139	82	54	16.4	68.6	2	R	0	1	0	1	B2	1	0	0	0	1	1	2	DRIVER	0	1	24
74	100	161	23	32.2	44.8	2	R	1	0	0	1	B2	1	0	0	0	1	3	2	DRIVER	0	1	18
299	151	261	32	52.2	66.8	1	R	0	1	0	0	A	1	0	1	0	0	1	1	S FLEX	0	1	16
249	148	97	38	19.4	90.6	1	R	1	0	0	0	B2	1	1	0	0	0	1	2	DRIVER	0	1	18
82	212	142	53	28.4	130.6	1	R	1	0	0	0	B1	1	1	0	0	0	1	2	DRIVER	0	1	18
58	133	173	31	34.6	67.4	1	R	1	0	0	0	B2	1	1	0	0	0	1	2	LEKTON	1	0	16
87	157	112	42	22.4	92.6	2	R	0	1	0	1	B1	1	0	1	0	0	1	1	INFINIUM	0	1	23
161	179	112	38	22.4	118.6	1	Co	1	0	0	0	A	1	1	0	0	0	1	1	INFINIUM	0	1	14
96	157	131	50	26.2	80.8	1	R	0	0	0	1	A	1	0	0	0	1	2	2	MINIVISION	0	1	15
540	161	105	68	21		1	R	1	0	0	0	B1	1	1	0	0	0	1	1	INFINIUM	0	1	19
	130	88	39	17.6	73.4	1	Co	1	0	0	0	B1	1	1	0	0	0	1	1	INFINIUM	0	1	19
107	119	117	36	23.4	59.6	1	R	1	0	0	0	A	1	1	0	0	0	1	2	MINIVISION	0	1	12
85	209	194	42	38.8	128.2	1	R	1	0	0	0	A	1	1	0	0	0	1	1	CYPHER	1	0	18
85	170	100	50	20	100	1	R	1	0	0	0	A	1	1	0	0	0	1	1	INFINIUM	0	1	16

88	254	195	38	39	177	1	R	0	1	0	0	B1	1	0	1	0	0	1	2	PIXEL	1	0	18
140	199	215	37	43	119	1	L	1	0	0	0	A	1	1	0	0	0	1	2	FLEX M	1	0	16
87	204	98	52	19.6	132.4	1	R	0	1	0	0	A	1	0	1	0	0	1	2	DRIVER	0	1	14
107	222	137	30	27.4	164.6	2	R	1	1	0	0	A	1	1	0	0	0	1	2	LEKTON	1	0	18
91	156	180	33	36	87	1	R	1	0	0	0	B2	1	1	0	0	0	1	1	PRONOVA	1	0	18
193	108	135	24	27	57	2	R	1	1	0	0	A	1	0	1	0	0	1	1	PRONOVA	1	0	18
186	175	105	32	21	122	1	R	1	0	0	0	B2	1	1	0	0	0	1	2	DRIVER	0	1	18
263	167	251	33	50.2	83.8	2	R	1	1	0	0	B1	1	1	0	0	0	1	2	FLEX M	1	0	23
157	109	441	28	88.2	-7.2	2	R	1	0	0	1	B2	1	1	0	0	0	2	1	INFINIUM	0	1	19
174	203	156	55	31.2	116.8	1	R	1	0	0	0	B1	1	1	0	0	0	2	2	DRIVER	0	1	12
105	326	160	29	32	265	1	R	0	0	0	1	B1	1	0	0	0	1	1	1	S FLEX	0	1	13
122	216	106	39	21.2	155.8	1	R	0	0	0	1	B1	1	0	0	0	1	1	2	S 670	1	0	18
150	182	148	38	29.6	114.4	1	R	0	0	0	1	B2	1	0	0	0	1	1	2	DRIVER	0	1	18
102	204	329	33	65.8	105.2	1	L	1	0	0	0	B1	1	1	0	0	0	1	1	PRONOVA	1	0	18
121				0	0	1	L	0	1	0	0	B1	1	0	1	0	0	1	1	INFINIUM	0	1	16
104	200	232	28	46.4	125.6	1	R	0	1	0	0	B1	1	1	0	0	0	1	2	FLEX M	1	0	15
152	147	183	35	36.6	75.4	1	R	0	1	0	0	A	1	0	1	0	0	1	2	DRIVER	0	1	12
94	174	106	46	21.2	106.8	1	R	0	0	0	1	B1	1	0	0	0	1	1	2	LEKTON	1	0	15
102				0	0	2	Co	1	0	0	1	B2	1	1	0	0	0	1	1	INFINIUM	0	1	33
105	183	241	32	48.2	102.8	2	Co	0	1	0	1	B2	2	0	1	0	1	3	2	PIXEL	1	0	13
330	269	239	35	47.8	186.2	2	R	0	1	0	1	B2	1	0	1	0	0	1	2	DRIVER	0	1	14
83	134	147	22	29.4	82.6	1	R	0	0	0	1	A	1	0	0	0	1	1	2	DRIVER	0	1	12
130	131	98	33	19.6	78.4	1	R	0	0	0	1	C	1	0	0	0	1	1	1	ENDEAVOR	0	1	30
90	186	163	42	32.6	111.4	1	R	1	0	0	0	A	1	1	0	0	0	1	2	FLEX M	1	0	14
139	245	324	50	64.8	130.2	1	R	1	0	0	0	B1	1	1	0	0	0	1	2	DRIVER	0	1	15
158	109	142	23	28.4	57.6	1	R	0	1	0	0	A	1	0	1	0	0	1	2	PENTA	1	0	13
106	178	116	30	23.2	124.8	3	R	1	1	1	0	B1	1	0	0	1	0	1	2	FLEX M	1	0	16
97	121	118	22	23.6	75.4	1	R	1	0	0	0	A	1	1	0	0	0	1	2	S 670	1	0	15
93	156	82	50	16.4	89.6	2	R	0	1	0	1	B1	1	0	0	0	1	2	2	DRIVER	0	1	14

102	159	282	37	56.4	65.6	1	R	1	0	0	0	B1	1	1	0	0	0	1	1	INFINIUM	0	1	16
175	179	339	35	67.8	76.2	2	R	1	1	0	0	B1	1	1	0	0	0	1	2	LEKTON	1	0	20
72	171	141	32	28.2	110.8	1	R	1	0	0	0	B1	1	1	0	0	0	2	2	FLEX M	1	0	16
95	226	112	42	22.4	161.6	2	R	1	0	0	1	B1	1	0	0	0	1	1	2	ARTHOS	0	1	14
113	137	96	48	19.2	69.8	2	R	1	1	0	0	B1	2	1	1	0	0	2	2	DRIVER	0	1	18
123	151	173	40	34.6	76.4	1	R	0	1	0	0	B1	1	0	1	0	0	1	1	INFINIUM	0	1	23
	115	138	31	27.6	56.4	2	R	0	1	0	1	B2	1	0	0	0	1	1	2	PENTA	1	0	23
169	169	226	32	45.2	91.8	1	R	1	0	0	0	B1	1	1	0	0	0	1	2	DRIVER	0	1	18
114	127	157	30	31.4	65.6	1	Co	0	0	1	0	B1	1	0	0	1	0	1	2	FLEX M	1	0	16
	150	124	34	24.8	91.2	1	R	0	0	0	1	B1	1	0	0	0	1	1	1	PRONOVA	1	0	23
99	169	89	46	17.8	105.2	1	R	0	0	0	1	B1	1	0	0	0	1	1	2	FLEX M	1	0	19
82	168	97	40	19.4	108.6	1	R	0	0	0	1	B1	1	0	0	0	1	2	2	FLEX M	1	0	16
99				0	0	2	R	1	0	0	1	B1	1	0	0	0	1	1	2	S 670	1	0	24
170	199	198	34	39.6	125.4	2	Co	1	1	0	0	A	1	1	0	0	0	1	2	PROLINK	1	0	10
300	127	151	38	30.2	58.8	3	R	1	1	0	1	B2	1	0	1	0	0	1	2	DRIVER	0	1	18
71				0	0	1	R	0	0	0	1	C	1	0	0	0	1	1	2	S 7	1	0	30
176	104	76	26	15.2	62.8	2	R	0	1	0	1	B2	1	0	0	0	1	1	1	INFINIUM	0	1	33
98	195	124	48	24.8	122.2	1	R	0	1	0	0	B1	1	0	1	0	0	1	2	FLEX M	1	0	16
122	166	162	39	32.4	94.6	2	R	1	0	0	1	B2	1	0	0	0	1	3	2	LEKTON	1	0	20
192	132	218	26	43.6	62.4	2	R	1	1	0	0	B1	2	1	1	0	0	2	1	INFINIUM	0	1	14
68	173	142	36	28.4	108.6	1	Co	1	0	0	0	A	1	1	0	0	0	1	1	MAGIC	0	1	15
105	145	175	40	35	70	3	R	1	1	0	1	B2	2	1	0	0	1	1	1	ENDEAVOR	0	1	18
99	113	81	28	16.2	68.8	2	R	1	0	0	1	B1	1	1	0	0	0	1	2	S 670	1	0	18
	212	84	39	16.8	156.2	2	R	1	1	0	0	B1	1	1	0	0	0	1	2	ANGSTROM	1	0	19
68	195	203	44	40.6	110.4	1	R	0	1	0	0	A	1	0	1	0	0	1	2	ANGSTROM	1	0	19
84	151	101	45	20.2	85.8	1	R	0	0	0	1	A	1	0	0	0	1	1	2	MINIVISION	0	1	15
102	159	132	37	26.4	95.6	1	R	1	0	0	0	B1	1	1	0	0	0	1	2	LEKTON	1	0	20
115	235	200	35	40	160	1	R	1	0	0	0	B1	1	1	0	0	0	1	1	PRONOVA	1	0	18
263	169	84	52	16.8	100.2	1	Co	0	0	0	1	B2	1	0	0	0	1	1	1	PRONOVA	1	0	13

102	172	87	33	17.4	121.6	2	R	0	1	0	1	B1	1	0	0	0	1	1	2	FLEX M	1	0	16
85	125	95	26	19	80	2	R	0	1	0	1	B1	1	0	0	0	1	1	1	PRONOVA	1	0	23
171				0	0	2	R	0	1	0	1	B1	1	0	0	0	1	1	2	LEKTON	1	0	15
79	160	86	35	17.2	107.8	1	R	1	0	0	0	A	1	1	0	0	0	1	2	FLEX M	1	0	16
68	165	158	23	31.6	110.4	1	R	0	1	0	0	A	1	0	1	0	0	1	1	INFINIUM	0	1	11
127	115	127	26	25.4	63.6	1	R	0	0	0	1	A	1	0	0	0	1	1	1	PRONOVA	1	0	13
101	170	169	33	33.8	103.2	2	R	1	0	0	1	C	2	1	0	0	1	2	2	S 670	1	0	30
	180	98	76	19.6	84.4	2	R	0	1	0	1	B1	1	0	1	0	0	1	2	FLEX M	1	0	23
	147	100	30	20	97	1	R	0	0	1	0	B1	1	0	0	1	0	1	2	DRIVER	0	1	24
73	159	169	35	33.8	90.2	2	Co	1	0	1	0	C	1	1	0	0	0	1	1	ENDEAVOR	0	1	30
80	131	104	31	20.8	79.2	1	R	1	0	0	0	A	1	1	0	0	0	1	1	PRONOVA	1	0	18
117	167	133	32	26.6	108.4	1	R	0	1	0	0	B1	1	0	1	0	0	1	1	PRONOVA	1	0	23
139	137	122	40	24.4	72.6	1	R	1	0	0	0	A	1	1	0	0	0	1	1	PRONOVA	1	0	18
98	155	90	31	18	106	1	R	0	1	0	0	A	1	0	1	0	0	1	1	ENDEAVOR	0	1	15
99	161	114	29	22.8	109.2	1	Co	1	0	0	0	A	1	1	0	0	0	1	2	FLEX M	1	0	19
94	114	243	27	48.6	38.4	1	R	1	0	0	0	B1	1	1	0	0	0	1	2	ARTHOS	0	1	16
251	107	114	32	22.8	52.2	3	Co	1	1	0	1	B2	1	0	1	0	0	1	1	ENDEAVOR	0	1	24
137	184	93	36	18.6	129.4	3	Co	0	1	0	0	B1	1	0	1	0	0	1	1	ENDEAVOR	0	1	24
106	188	150	42	30	116	1	R	1	0	0	0	B1	1	1	0	0	0	1	1	PRONOVA	1	0	18
104	133	234	39	46.8	47.2	1	R	0	0	0	1	A	1	0	0	0	1	1	1	ENDEAVOR	0	1	14
75	103	97	27	19.4	56.6	2	R	1	1	0	0	B1	1	0	1	0	0	1	1	ENDEAVOR	0	1	18
204	181	230	41	46	94	3	R	1	1	0	1	B1	2	1	0	0	1	1	1	ENDEAVOR	0	1	18
126	103	78	29	15.6	58.4	3	R	1	0	0	0	B1	1	1	0	0	0	1	2	ANGSTROM	1	0	19
261	187	133	29	26.6	131.4	1	R	1	0	0	0	B1	1	1	0	0	0	2	1	PRONOVA	1	0	18
195				0	0	3	R	1	1	0	1	B1	1	0	1	0	0	1	1	ENDEAVOR	0	1	12
115	164	105	35	21	108	3	R	1	1	0	1	A	1	0	1	0	0	1	1	S FLEX	0	1	16
90	178	127	37	25.4	115.6	2	R	0	1	0	1	B1	1	0	0	0	1	1	1	ENDEAVOR	0	1	24
90				0	0	1	R	0	0	0	1	B1	1	0	0	0	1	1	2	PROKINETIC	0	1	18
				0	0	2	R	1	0	0	1	A	1	0	0	0	1	1	2	ANGSTROM	1	0	16

				0	0	2	R	1	0	0	1	B1	1	0	0	0	1	2	2	DRIVER	0	1	24
				0	0	2	R	0	1	0	1	B2	1	0	1	0	0	2	1	PRONOVA	1	0	18
				0	0	2	R	1	0	0	1	B2	1	0	0	0	1	1	1	PRONOVA	1	0	23
				0	0	2	Co	1	0	0	1	A	1	0	0	0	1	1	2	LEKTON	1	0	15
				0	0	3	R	1	1	0	1	B2	2	1	0	0	1	2	1	CYPHER	1	0	28
				0	0	3	R	1	1	0	1	B2	1	1	0	0	0	1	2	FLEX M	1	0	16
				0	0	2	R	1	0	0	1	B1	1	0	0	0	1	1	2	PROKINETIC	0	1	18
132	188	134	39	26.8	122.2	2	R	1	0	0	1	B1	1	1	0	0	0	1	1	PRONOVA	1	0	18
85	216	193	25	38.6	152.4	1	R	1	0	0	0	A	1	1	0	0	0	1	1	PRONOVA	1	0	18
112	139	128	29	25.6	84.4	2	R	0	1	0	1	A	1	0	1	0	0	1	1	PRONOVA	1	0	13
				0	0	1	R	1	0	0	0	C	1	1	0	0	0	2	2	DRIVER	0	1	14
88	218	111	31	22.2	164.8	3	R	1	1	0	1	C	1	1	0	0	0	1	1	ENDEAVOR	0	1	30
79	235	117	44	23.4	167.6	1	R	0	0	0	1	B2	1	0	0	0	1	2	2	PROKINETIC	0	1	22
102	155	81	37	16.2	101.8	1	R	1	0	0	0	A	1	1	0	0	0	1	1	ENDEAVOR	0	1	15
89				0	0	2	R	1	0	0	1	A	1	1	0	0	0	1	1	ENDEAVOR	0	1	14
168				0	0	1	R	1	0	0	0	B2	1	1	0	0	0	1	1	ENDEAVOR	0	1	30
96	136	87	31	17.4	87.6	1	R	0	1	0	0	A	1	0	1	0	0	1	1	PRONOVA	1	0	13
99	188	84	48	16.8	123.2	1	R	1	0	0	0	C	1	1	0	0	0	1	1	ENDEAVOR	0	1	30
84	228	183	39	36.6	152.4	1	R	1	0	0	0	B2	1	1	0	0	0	1	2	FLEX M	1	0	26
177	115	63	41	12.6	61.4	3	R	1	1	0	1	B2	1	0	0	0	1	1	2	MINIVISION	0	1	23
134	204	104	34	20.8	149.2	3	R	1	1	0	1	B2	2	1	0	0	1	2	2	PENTA	1	0	23
91	177	156	41	31.2	104.8	2	R	0	1	0	1	A	1	0	1	0	0	1	2	HELI	1	0	13
74	135	134	29	26.8	79.2	1	R	0	0	0	1	A	1	0	0	0	1	1	1	MAGIC	0	1	15
206	139	210	25	42	72	2	R	0	1	0	1	B1	2	0	1	0	1	2	1	MAGIC	0	1	23
75	158	141	43	28.2	86.8	2	R	1	0	0	1	B1	1	0	0	0	1	2	1	PRONOVA	1	0	18
77	189	115	32	23	134	2	R	1	1	0	0	A	1	1	0	0	0	1	2	TITAN	1	0	19
85	133	270	32	54	47	2	R	1	1	0	0	A	2	1	1	0	0	1	2	TITAN	1	0	16
90	246	204	34	40.8	171.2	2	R	1	0	0	1	A	1	1	0	0	0	1	1	PRONOVA	1	0	18
91	205	128	47	25.6	132.4	3	R	1	1	0	1	A	2	1	0	0	1	2	2	ARTHOS	0	1	18

134	99	107	28	21.4	49.6	2	R	1	1	0	0	B1	1	1	0	0	0	1	1	PRONOVA	1	0	18
102	141	134	31	26.8	83.2	1	R	1	0	0	0	B1	1	1	0	0	0	1	2	TITAN	1	0	19
98	162	138	38	27.6	96.4	2	R	0	1	0	1	B2	1	0	0	0	0	1	2	PIXEL	1	0	18
96	218	127	31	25.4	161.6	2	R	1	1	0	0	A	1	1	0	0	0	1	1	PRONOVA	1	0	18
126				0	0	2	R	1	1	0	0	B1	1	1	0	0	0	1	1	MAGIC	0	1	27
98	119	98	25	19.6	74.4	1	R	0	1	0	0	A	1	0	1	0	0	1	1	ENDEAVOR	0	1	12
134	115	123	27	24.6	63.4	1	R	1	0	0	0	B1	1	1	0	0	0	1	1	ENDEAVOR	0	1	18
100				0	0	1	R	0	0	0	1	B1	1	0	0	0	1	1	1	ENDEAVOR	0	1	15
118	167	149	41	29.8	96.2	1	L	0	1	0	0	B1	1	0	1	0	0	1	2	PIXEL	1	0	18
73	140	118	26	23.6	90.4	2	L	1	1	0	0	C	1	1	0	0	0	1	1	PRONOVA	1	0	33
85	287	330	39	66	182	2	R	1	0	0	1	B2	1	1	0	0	0	1	2	ANGSTROM	1	0	24
84	172	181	50	36.2	85.8	2	R	0	1	0	1	B1	1	0	0	0	1	2	2	ARTHOS	0	1	16
85	171	129	29	25.8	116.2	1	Co	1	0	0	0	A	1	1	0	0	0	1	1	ENDEAVOR	0	1	15
114				0	0	2	R	1	1	0	0	A	1	0	1	0	0	1	2	DRIVER	0	1	12
112	195	175	39	35	121	1	R	0	1	0	0	A	1	0	1	0	0	2	2	TITAN	1	0	15
97	102	139	25	27.8	49.2	2	R	1	0	0	1	B1	1	0	0	0	1	1	1	ENDEAVOR	0	1	24
126	200	378	37	75.6	87.4	1	R	1	0	0	0	A	1	1	0	0	0	1	1	PRONOVA	1	0	14
140	187	151	34	30.2	122.8	2	R	0	1	0	1	C	1	0	0	0	1	2	1	PRONOVA	1	0	33
207	173	101	34	20.2	118.8	1	R	0	1	0	0	C	1	0	1	0	0	1	1	ENDEAVOR	0	1	30
100	205	288	31	57.6	116.4	2	R	1	0	0	1	A	2	1	0	0	1	2	2	TITAN	1	0	19
101	165	155	41	31	93	1	R	0	0	0	1	A	1	0	0	0	1	1	2	MINIVISION	0	1	18
111	237	186	22	37.2	177.8	1	R	0	0	0	1	A	1	0	0	0	1	1	2	PROKINETIC	0	1	15
125	190	276	27	55.2	107.8	1	R	0	0	0	1	A	1	0	0	0	1	1	1	PRONOVA	1	0	18
87	110	158	34	31.6	44.4	1	L	1	0	0	0	B2	1	1	0	0	0	2	1	PRONOVA	1	0	23
81	181	244	32	48.8	100.2	1	R	0	1	0	0	A	1	0	1	0	0	1	1	PRONOVA	1	0	13
127	193	165	45	33	115	1	R	1	1	0	0	C	1	1	0	0	0	2	1	PRONOVA	1	0	33
104	177	101	29	20.2	127.8	2	R	1	0	0	1	A	1	1	0	0	0	1	2	TITAN	1	0	16
94	172	253	28	50.6	93.4	1	R	0	0	0	1	B1	1	0	0	0	1	1	2	PROKINETIC	0	1	22
94	215	159	30	31.8	153.2	1	R	0	1	0	0	A	1	0	1	0	0	1	1	PRONOVA	1	0	18

148	135	122	23	24.4	87.6	2	R	0	1	0	1	A	1	0	1	0	0	2	2	PROKINETIC	0	1	15
162	171	145	38	29	104	2	R	1	0	0	1	B2	2	1	0	0	1	2	2	FLEX M	1	0	16
144	104	129	32	25.8	46.2	2	R	1	1	0	0	C	2	1	1	0	0	2	1	COSTAR	0	1	33
87	109	118	36	23.6	49.4	2	R	1	1	0	0	B2	1	1	0	0	0	1	1	ENDEAVOR	0	1	24
77	155	185	55	37	63	1	R	0	1	0	0	A	1	0	1	0	0	1	2	TITAN	1	0	19
183	217	200	43	40	134	3	R	1	1	0	1	B2	1	0	1	0	0	2	1	PRONOVA	1	0	23
99	117	147	26	29.4	61.6	3	R	1	1	0	1	B2	1	0	0	0	1	1	1	PRONOVA	1	0	28
113	181	190	33	38	110	3	R	1	1	0	1	B1	2	1	0	0	1	2	1	PRONOVA	1	0	28
89	164	179	28	35.8	100.2	1	R	1	0	0	0	A	1	1	0	0	0	2	1	PRONOVA	1	0	18
95				0	0	2	R	0	1	0	1	A	1	0	1	0	0	1	2	PIXEL	1	0	13
90	262	113	35	22.6	204.4	2	R	0	1	0	1	C	2	0	1	0	1	2	1	PRONOVA	1	0	33
159	143	140	36	28	79	1	R	0	0	0	1	A	1	0	0	0	1	1	1	PRONOVA	1	0	18
208	147	104	48	20.8	78.2	3	R	1	1	0	1	A	1	0	0	0	1	2	2	FLEX M	1	0	16
93				0	0	2	R	1	0	0	1	A	2	1	0	0	1	2	2	LEKTON	1	0	15
79	157	114	35	22.8	99.2	1	R	1	0	0	0	A	1	1	0	0	0	1	1	ENDEAVOR	0	1	18
104	166	243	34	48.6	83.4	2	R	1	1	0	0	A	1	1	0	0	0	1	1	PRONOVA	1	0	18
175	125	105	35	21	69	2	R	1	1	0	0	C	1	0	1	0	0	1	1	PRONOVA	1	0	33
98	190	89	42	17.8	130.2	2	R	1	1	0	0	A	1	1	0	0	0	1	1	ENDEAVOR	0	1	12
93				0	0	2	R	0	1	0	1	A	1	0	0	0	1	1	1	PRONOVA	1	0	18
75	177	252	34	50.4	92.6	1	R	1	0	0	0	A	1	1	0	0	0	1	1	PRONOVA	1	0	18
126	141	146	30	29.2	81.8	2	R	1	1	0	0	B2	2	1	1	0	0	2	1	PRONOVA	1	0	23
77	149	155	39	31	79	1	R	1	0	0	0	A	1	1	0	0	0	1	1	ENDEAVOR	0	1	18
154	221	487	28	97.4	95.6	1	Co	0	1	0	0	A	1	0	1	0	0	1	2	PROKINETIC	0	1	13
96	185	83	41	16.6	127.4	1	Co	1	0	0	0	C	1	1	0	0	0	1	1	ENDEAVOR	0	1	30
51	149	165	20	33	96	1	L	1	0	0	0	B2	1	1	0	0	0	1	2	DRIVER	0	1	24
73	163	88	33	17.6	112.4	1	R	0	0	0	1	A	1	0	0	0	1	1	2	PROKINETIC	0	1	15
84	203	102	35	20.4	147.6	2	R	1	1	0	0	A	1	1	0	0	0	1	1	PRONOVA	1	0	18
188				0	0	1	L	1	0	0	0	C	1	1	0	0	0	1	1	PRONOVA	1	0	33
87				0	0	1	R	1	0	0	0	C	1	1	0	0	0	1	1	PRONOVA	1	0	38

60				0	0	1	R	1	0	0	0	A	1	1	0	0	0	1	1	PRONOVA	1	0	18
150	159	103	31	20.6	107.4	1	R	1	0	0	0	A	1	1	0	0	0	1	1	PRONOVA	1	0	18
192	176	208	31	41.6	103.4	1	R	1	0	0	0	A	1	1	0	0	0	1	1	PRONOVA	1	0	13
267				0	0	1	R	1	0	0	0	C	1	1	0	0	0	1	1	PRONOVA	1	0	33

Diameter1	Pressure1	Time1	Type 2	STENT NAME 2	Length2	Diameter2	Pressure2	Time2	Type 3	STENT NAME 3	Length3	Diameter3	Pressure3	Time3	F/U months	DAPT Duration (yr)	Pseudoaneurysm	Hematoma	Overall all cause death	Time to overall all cause death	CVS mortality Overall	Time to overall CVS mortality
2.25	10	15													176	4	0	0	0		0	
2.75	11														191	10	0	0	0		0	
3.5	16	20													181	10	0	0	0		0	
3															174	6	0	0	0		0	
3															175	10	0	0	0		0	
3	10	15													176	6	0	0	0		0	
3	10	25													176	8	0	0	0		0	
2.5			2	FLEXMASTER	16	3	12	20							151	3	0	0	0		0	
3	14	20													180	15	0	0	0		0	
3	12		2	DRIVER	15	3.5	12		2	LEKTON	25	3.5	12		172	10	0	0	0		0	
2.75	12	20													176	8	0	0	0		0	
2.75	12	30													172	8	0	0	0		0	
3	14														176	10	0	0	0		0	
3	10	20													176	5	0	0	0		0	
3	14	30													174	8	0	0	0		0	
3															174	6	0	0	0		0	
2.2			2	PIXEL	13	2.5									174	5	0	0	0		0	
2.75															76	6	0	0	1	75	1	75

3	10														172	14	0	0	0		0	
2.5	12	30													182	10	0	0	0		0	
3	14														187	6	0	0	0		0	
2.75	12														191	10	0	0	0		0	
2.25	12	30													185	11	0	0	0		0	
3	11	13													154	6	0	0	1	154	1	154
2.75	16														113	2	0	0	1	113	1	113
3															192	2	0	0	0		0	
2.75															191	16	1	0	0		0	
3.5	12	20													184	13	0	0	0		0	
2.5															131	9	0	0	0		0	
2.75	11	20													171	14	0	0	0		0	
2.75	12	20	1	S FLEX	13	2.75	16	15							34	1	0	0	1	34	1	34
2.5			2	MINIVISION	15	2.5									189	1	0	0	0		0	
2.75															158	10	0	0	0		0	
3	11	25													179	15	0	0	0		0	
3.5	16														24	1	0	0	1	24	0	
2.75	11														34	3	0	0	0		0	
2.75	10														189	15	0	0	0		0	
2.75	14														54	4	0	0	0		0	
2.25	14	20													188	9	0	0	0		0	
2.5	12	20													56	4	0	0	0		0	
3.5	14														178	12	0	0	0		0	
2.25	12		2	DRIVER	15	3	14		2	PIXEL	18	2.5	16		179	10	0	0	0		0	
2.25	10														140	10	0	0	0		0	
3.5	18														176	14	0	0	0		0	
2.5	12	40													185	6	0	0	0		0	
2.5	15														188	3	0	0	0		0	
3															84	2	0	0	0		0	

2.75															172	14	0	0	0		0	
2.75	14														39	3	0	0	0		0	
3.5	16														177	15	0	0	0		0	
2.75	14	25	2	FLEXMASTER	19	3	20	20							133	10	0	0	0		0	
2.75	14	20													28	2	0	0	0		0	
3	8														72	2	0	0	1	72	0	
3.5	20		2	LEKTON	15	3.5	18								179	10	0	0	0		0	
3	7	20													144	10	0	0	0		0	
3	16	20	1	INFINIUM	19	3	14	20							87	7	0	0	0		0	
2.5															18	1	0	0	0		0	
3.5	14	20													166	5	0	0	1	166	0	
3															188	6	0	0	0		0	
3.5	14	20													186	5	0	0	1	186	0	
3.5	12														185	15	0	0	0		0	
3.5	12	20													188	5	0	0	0		0	
3	14		2	LEKTON	20	3									186	3	0	0	0		0	
3.5	12	30													126	6	0	0	1	126	1	126
2															138	12	0	0	0		0	
2.5	14	20													134	10	0	0	0		0	
3	10	20													186	15	0	0	0		0	
3	10	20													81	5	0	0	0		0	
3	18	20													136	8	0	0	0		0	
3	12	20	2	DRIVER	24	3.5	14	20	2	FLEX M	12	3.5	14	20	80	6	0	0	1	80	1	80
2.75	12	20	2	FLEXMASTER	16	2.5	10	20							156	10	0	0	0		0	
3	10	20													135	10	0	0	0		0	
3	14	20	2	DRIVER	15	4	14	20							171	10	0	0	0		0	
3	11														6	1	0	0	0		0	
2.75	12	15													170	14	0	0	0		0	
2.5	10	20													187	2	0	0	0		0	

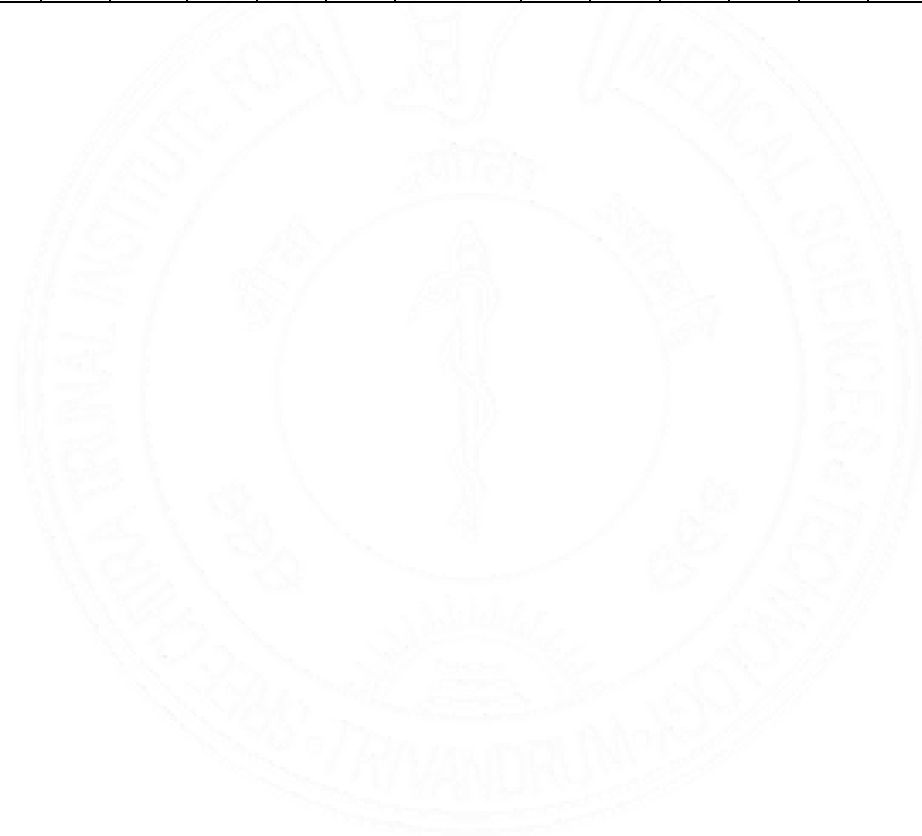
2.5	12	20													62	4	0	0	0		0	
2.75	12	20													131	10	0	0	0		0	
3	10														131	11	0	0	0		0	
2.5															165	10	0	0	0		0	
2.5	12	20													175	9	0	0	0		0	
2.75	10	20													44	3	0	0	0		0	
2.5	8	20													114	7	0	0	0		0	
2.75															179	10	0	0	0		0	
2.5	14	20													185	8	0	0	0		0	
3	11	40													66	5	0	0	0		0	
3.5	10	40	1	S FLEX	16	3	14	20							171	11	0	0	0		0	
2.5	11														186	10	0	0	0		0	
2.75	15	40													186	2	0	0	0		0	
2.75	14														121	5	0	0	0		0	
2.75	11														167	14	0	0	0		0	
2.5	10	20													180	15	0	0	0		0	
3	10	20													110	8	0	0	0		0	
3	14														164	14	0	0	0		0	
2.75	15	20													180	10	0	0	0		0	
2.75	20	12													183	6	0	0	0		0	
2.75	14														182	8	0	0	0		0	
3.5	16														170	12	0	0	0		0	
3	12	20													185	10	0	0	0	1	185	0
2.5	14	40													64	5	0	0	0		0	
3.5	18														184	4	0	0	0		0	
3	11		2	DRIVER	18	3.5			1	MAGIC	13	3			49	4	0	0	0		0	
2.75															170	15	0	0	0		0	
3	10	20	1	PRONOVA	18	2.5	12	20							159	14	0	0	0		0	
2.75	10	20													180	15	0	0	0		0	

2.5	11														180	10	0	0	0		0		
2.75	16		2	PENTA	18	3	14								152	13	0	0	0		0		
3	11	20													184	1	0	0	0		0		
2.5	10	20													38	3	0	0	0		0		
3	12	20	2	LEKTON	20	3	12	20							28	2	0	0	1	28	1	28	
2.5	8	15	1	PRONOVA	23	2.75	10	20							24	1	0	0	1	24	1	24	
3.5	16														185	12	0	0	0		0		
2.5															61	3	0	0	1	61	1	61	
2.75	14		2	DRIVER	28	2.75	9								148	12	0	0	0		0		
2.5															189	3	0	0	0		0		
3															125	10	0	0	0		0		
2.5															127	9	0	0	0		0		
3	16														164	8	0	0	0		0		
2.5															171	5	0	0	1	171	1	171	
2.5	10	20	1	PRONOVA	18	3	14	20							179	15	0	0	0		0		
3	12	26													52	2	0	0	1	52	0		
3			2	TITAN 2	22	3									148	8	0	0	0		0		
3	16	20													180	6	0	0	0		0		
2.75	12	18													67	1	0	0	1	67	0		
2.75	14														152	12	0	0	0		0		
2.75	12	20													163	13	0	0	0		0		
2.75	12														151	7	0	0	0		0		
2.75	12														164	6	0	0	0		0		
3	14	20													103	0	0	0	0		0		
2.75	12		2	FLEXMASTER	24	2.5	12								37	1	0	0	1	37	1	37	
2.5	14														177	5	0	0	0		0		
2.5	12	20													173	14	0	0	0		0		
3	13		2	PIXEL	13	2.25	14								94	3	0	0	1	94	0		
2.5	14		1	PRONOVA	15	2.75	14								25	2	0	0	0		0		

3	12														33	3	0	0	0		0	
2.5	14	20	2	PIXEL	13	2.5	14	20							151	9	0	0	0		0	
2.5	14	20													156	13	0	0	0		0	
3	14	20	1	ENDEAVOUR	18	2.75	12	20							178	8	0	1	0		0	
3.5	12	20													124	10	0	0	0		0	
2.75	11	20													127	10	0	0	0		0	
2.25															159	13	0	0	0		0	
2.5	14	20													178	15	0	0	0		0	
2.5	14														130	10	0	0	0		0	
3	14														178	5	0	0	0		0	
2.75	16														175	11	0	0	0		0	
3	14														27	2	0	0	0		0	
2.25	14														143	10	0	0	0		0	
2.75	12														179	2	0	0	0		0	
2.5															23	1	0	0	1	23	0	
2.5	12		1	PRONOVA	28	3	14								74	6	0	0	0		0	
3.5	14	20													178	14	0	0	0		0	
3.5	18														43	1	0	0	1	43	1	43
2.5	11														176	12	0	0	0		0	
3.5	12														179	3	0	0	0		0	
2.75	14														178	3	0	0	0		0	
2.75	14	20	1	PRONOVA	18	3	12	20							178	4	0	0	0		0	
2.75	12														34	3	0	0	0		0	
2.75			1	PRONOVA	18	2.5									118	10	0	0	0		0	
2.5	12														176	14	0	0	0		0	
3	14		2	PROKINETIC	18	3.5	16								169	10	0	0	0		0	
3.5	16														169	14	0	0	0		0	
3	14	8	1	PRONOVA	13	2.5	8								178	5	0	0	0		0	
2.5	14														179	4	0	0	0		0	

2.5			2	HELI	13	3	18							156	13	0	0	0		0	
2.5	14													163	13	0	0	0		0	
2.75	10	20												178	11	0	0	0		0	
2.5	14													155	9	0	0	0		0	
2.5	14		2	ANGSTROM	15	2.5	12							130	12	0	0	0		0	
2.75	12		1	PRONOVA	33	2.75	12							177	6	0	0	0		0	
2.5	14		1	CYPHER	33	2.5								177	5	0	0	0		0	
2.75	12	20												153	9	0	0	0		0	
3	16													157	10	0	0	0		0	
2.5	10		1	PRONOVA	28	3	10							100	8	0	0	0		0	
3.5	14													177	8	0	0	0		0	
2.75	15		1	ENDEAVOUR	18	2.5	14							178	4	0	0	0		0	
3			2	S FLEX	13	2.5								61	3	0	0	1	61	1	61
2.25														177	13	0	0	0		0	
3	16		2	DRIVER	18	2.5	18							37	3	0	0	0		0	
2.5	11													145	3	0	0	0		0	
2.5	12		1	S FLEX	16	2.75	12							119	1	0	0	0		0	
3	10	20	1	PRONOVA	13	2.75	14	20						169	14	0	0	0		0	
2.5	12													175	14	0	0	0		0	
2.5	14	20												177	7	0	0	0		0	
2.5	14	20												75	6	0	0	0		0	
3	11	20												177	3	0	0	0		0	
3.5	16	20												48	4	0	0	0		0	
2.5	16	20												171	10	0	0	0		0	
2.5	11	20	2	HELI	19	2.5	10	20						173	9	0	0	0		0	
3.5	12	20												157	13	0	0	0		0	
2.25														69	6	0	0	0		0	
2.5	16													177	7	0	0	0		0	
2.5	12													173	5	0	0	0		0	

2.5	14														172	10	0	0	0		0	
2.75	16	20													171	13	0	0	0		0	
2.5	11														36	2	0	0	1	36	1	36
2.5	12														136	10	0	0	0		0	
3	14														24	2	0	0	0		0	
2.5	14														176	4	0	0	0		0	
2.5															174	15	0	0	0		0	
2.75	16														176	3	0	0	0		0	



ISR Overall	Time to overall ISR	MACCE OVERALL	Time to overall MACCE	REVASCLARIZATION Overall	Time to revascularization Overall	MI overall	Time to MI	TMT 1	TIME TO MACE 1 (MONTHS)	MACCE 1	DEATH (ALL CAUSE) 1	CVS DEATHS 1	MI 1	CAG1	ISR 1	CSA 1	STROKE 1	TLR 1	TVR 1	ANY OTHER VESSEL REVASCU 1	CABG 1	TMT 2	TIME TO MACE 2	MACCE 2	DEATH (ALL CAUSE) 2	
0		1	127	1	90	0		1	6	0	0	0	0	1	0	1	0	0	0	0	0	1	90	1	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	40	0	0
0		0		0		0		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		1	40	0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	1	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	2		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		1	4	0		1	4	2	4	1	0	0	1	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
1	124	1	124	1	124	1	124	1	7	1	0	0	1	1	0	0	0	1	1	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
1	75	1	75	0		1	75	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	1	1	
0		0		0		0		2	0	0	0	0	0	0	0	0	0	0	0	0	0	2		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	

1	103	1	103	1	103	0		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	103	1	0
1	154	1	154	1	73	1	73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73	1	0	
0		1	113	0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	113	1	1	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	27	0	0	
1	191	1	191	1	191	1	191	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		1	106	1	106	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	106	1	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
1	34	1	34	0		0		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	1	1	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	2		0	0	
0		0		0		0		2	10	0	0	0	0	1	0	1	0	0	0	0	0	0		0	0	
0		1	24	0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	1	1	
0		0		0		0		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	27	0	0	
0		1	172	0		0		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		1	32	1	32	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	1	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		1	95	1	95	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	95	1	0	
0		0		0		0		1	1	0	0	0	0	1	0	1	0	0	0	0	0	0		0	0	
0		0		0		0		2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	13	0	0	
0		0		0		0		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
1	3	1	3	0		0		0	3	1	0	0	0	1	1	1	0	0	0	0	0					
0		1	142	1	142	1	142	1	4	0	0	0	0	1	0	1	0	0	0	0	0	0		0	0	
0		0		0		0		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	

1	11	1	11	1	11	1	2	0	2	1	0	0	1	1	1	0	0	1	1	0	0	0	11	1	0	
0		1	72	0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	1	1	
0		0		0		0		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		1	166	0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	6	0	0	0	0	1	0	1	0	0	0	0	0	0		0	0	
0		1	186	1	56	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	56	1	0	
1	157	1	157	1	157	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	36	0	0
0		0		0		0		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2		0	0
1	126	1	126	0		0		2	0	0	0	0	0	0	0	0	0	0	0	0	0	1		0	0	
1	5	1	120	1	120	0		1	5	1	0	0	0	1	1	1	0	1	1	0	0	1	120	1	0	
1	2	1	2	1	2	0		0	2	1	0	0	0	1	1	0	0	1	1	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
1	15	1	15	0		0		0	15	1	0	0	0	1	1	1	0	0	0	0	0	0		0	0	
0		0		0		0		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2		0	0
1	80	1	80	0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	1	1	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	35	0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		1	64	0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	1	0	
0		1	6	0		0		1	6	1	0	0	0	0	0	0	1	0	0	0	0					
0		1	162	1	162	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	17	0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	

0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	2		0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
1	19	1	19	1	19	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	19	1	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	171	0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	98	0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
0		1	185	0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
1	121	1	121	0		1	121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
1	136	1	136	1	136	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
0		1	58	1	58	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	58	1	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
0		1	2	1	2	1	2	0	2	1	0	0	1	1	1	0	0	1	1	0	0	0		0	0
0		1	26	1	26	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	26	1	0

1	123	1	123	1	123	1	123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		0		0		0		0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	30	1	30	0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	30	1	0
1	22	1	22	0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	22	1	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		1	116	1	116	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	116	1	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	2	1	23	1	2	0		0	2	1	0	0	0	1	1	1	0	1	1	1	1	0	23	1	1	1
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		1	43	0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43	1	1
0		1	92	1	92	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	92	1	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	157	1	157	1	157	1	157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	23	1	23	0		1	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	1	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	81	1	81	1	81	1	81	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81	1	0
0		1	133	1	133	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	40	1	40	1	40	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	40	1	0	
0		1	124	0		1	124	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

1	79	1	79	1	79	1	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	1	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		1	127	1	127	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
1	61	1	61	0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61	1	1	
0		1	161	1	161	1	161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	1	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
1	4	1	4	1	4	0		1	4	1	0	0	0	1	1	1	0	1	1	1	1	0		0	0	
0		1	41	1	41	1	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41	1	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
1	67	1	67	1	67	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67	1	0	
0		1	64	0		1	64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	1	0	
1	22	1	22	1	22	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	22	1	0
0		1	15	0		1	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	15	1	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	78	0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
1	47	1	47	0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47	1	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
0		0		0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	51	0	0	
1	36	1	36	0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	1	1	
0		1	136	0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	115	0	0	

CVS DEATHS 2	MI 2	CAG 2	ISR 2	CSA 2	STROKE 2	TLR 2	TVR 2	ANY OTHER VESSEL REVASCU 2	CABG 2	TMT 3	TIME TO MACCE 3	MACCE 3	DEATH (ALL CAUSE) 3	CVS DEATHS 3	MI 3	CAG 3	ISR 3	CSA 3	STROKE 3	TLR 3	TVR 3	ANY OTHER VESSEL REVASCU 3	CABG 3
0	0	1	0	1	0	0	0	1	1	0	127	1	0	0	0	0	0	0	1	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	0	1	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	1	167	0	0	0	0	1	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	1	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	124	1	0	0	1	1	1	0	0	0	0	1	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	0	1	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0

0	0	1	1	1	0	1	1	1	1	0		0	0	0	0	0	0	0	0	0	0	0	0
0	1	1	1	0	0	1	1	0	0	0	154	1	1	1	0	0	1	0	1	0	0	0	0
1	0	0	0	0	1	0	0	0	0														
0	0	0	0	1	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	191	1	0	0	1	1	1	0	0	0	1	1	0
0	0	1	0	1	0	0	0	1	1	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	0	1	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	0	172	1	0	0	0	0	0	0	1	0	0	0	0
0	0	0	0	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	0	1	0	0	0	1	1	0	140	0	0	0	0	0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	0	1	0	0	0	1	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	1	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	142	1	0	0	1	1	0	0	0	0	1	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0

0	0	1	1	1	0	1	1	0	1														
0	0	0	0	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	0	166	1	1	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	0	1	0	0	0	1	0	0	186	1	1	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	1	157	1	0	0	0	1	1	1	0	0	0	1	0
0	0	0	0	1	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	126	1	1	1	0	0	1	0	0	0	0	0	0
0	0	1	0	1	0	0	0	1	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	2	150	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	0	0	0	0	0														
0	0	0	0	1	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	1	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	162	1	0	0	0	1	1	0	0	1	1	1	0
0	0	0	0	1	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0

0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	2		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	1	1	0	1	1	1	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	1	0	0	0	0	0														
0	0	1	0	1	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	1	0	0	0	0	0	0	120	1	0	0	0	1	0	1	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	185	1	1	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0													
0	0	0	0	0	0	0	0	0	0	0	121	1	0	0	1	1	1	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	2	136	1	0	0	0	1	1	1	0	1	1	0	0
0	0	1	0	1	0	0	0	1	0	2	115	0	0	0	0	0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	152	0	0	0	0	0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	0	1	0	0	1	0	0														

1	0	0	1	0	0	0	0	0	0														
1	0	0	1	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	0	0	0	0	0	1	0														
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	0	1	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	120	1	0	0	0	1	0	1	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	171	1	1	1	0	0	1	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	1	152	0	0	0	0	0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0														
1	0	0	1	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0

0	0	0	0	0	0	0	0	0	0	0	123	1	0	0	1	1	1	0	0	1	1	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	1	1	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	1	1	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	1	0	0	175	1	1	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0														
0	0	1	0	1	0	0	0	1	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	157	1	0	0	1	1	1	1	0	1	1	0	0
0	1	1	1	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	1	1	1	0	0	1	1	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	133	1	0	0	0	1	0	1	0	0	0	1	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	1	1	0	1	1	1	1	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	124	1	0	0	1	1	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0

0	1	1	1	0	0	1	1	1	1	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0													
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	127	1	0	0	0	1	0	1	0	0	0	1	0
1	0	0	1	0	0	0	0	0	0														
0	0	1	0	1	0	0	0	1	0	0	161	1	0	0	1	1	0	0	0	0	1	0	0
0	0	0	0	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0														
0	1	1	0	0	0	1	1	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	1	0	0	1	1	1	1	0		0	0	0	0	0	0	0	0	0	0	0	0
0	1	1	0	0	0	0	0	0															
0	0	1	1	1	0	1	1	0	1	0		0	0	0	0	0	0	0	0	0	0	0	0
0	1	1	0	0	0	0	0	0	0														
0	0	0	0	1	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	148	0	0	0	0	0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	1	122	0	0	0	0	1	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	1	1	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	0	1	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	0	0	0	0	0	0														
0	0	1	0	1	0	0	0	0	0	0	136	1	1	0	0	0	0	0	0	0	0	0	0

0	0	0	0	0	0	0	0	0	0														
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	0	1	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0



Key to Master Chart

ACS Acute coronary syndrome

ANY OTHER VESSEL REVASCU1 Any other vessel revascularization within 1 year

ANY OTHER VESSEL REVASCU2 Any other vessel revascularization between 1-10 years

ANY OTHER VESSEL REVASCU3 Any other vessel revascularization after 10 years

AWMI Anterior wall myocardial infarction

Creat Creatinine

CSA Chronic stable angina

CVS DEATHS1 Cardiovascular deaths within 1 year

CVS DEATHS2 Cardiovascular deaths between 1-10 years

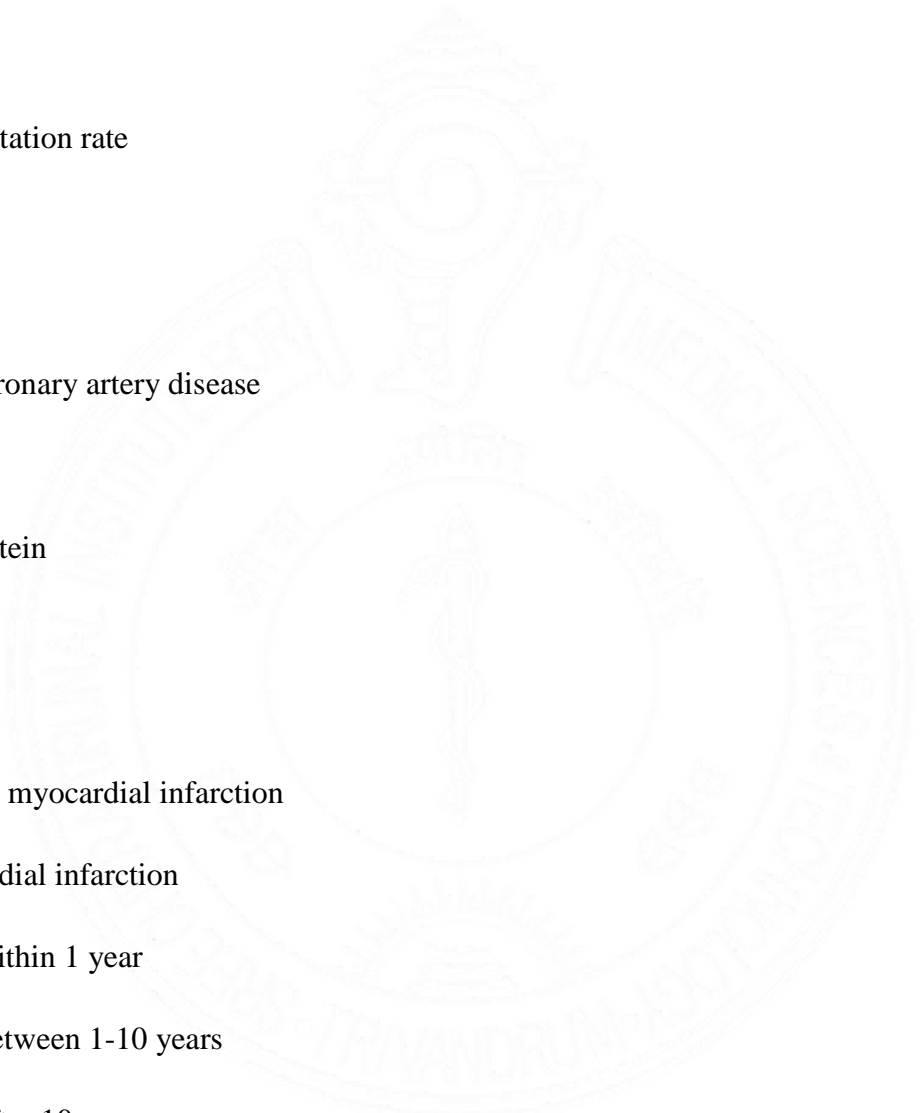
CVS DEATHS3 Cardiovascular deaths after 10 years

DEATH (ALL CAUSE)1 All cause deaths within 1 year

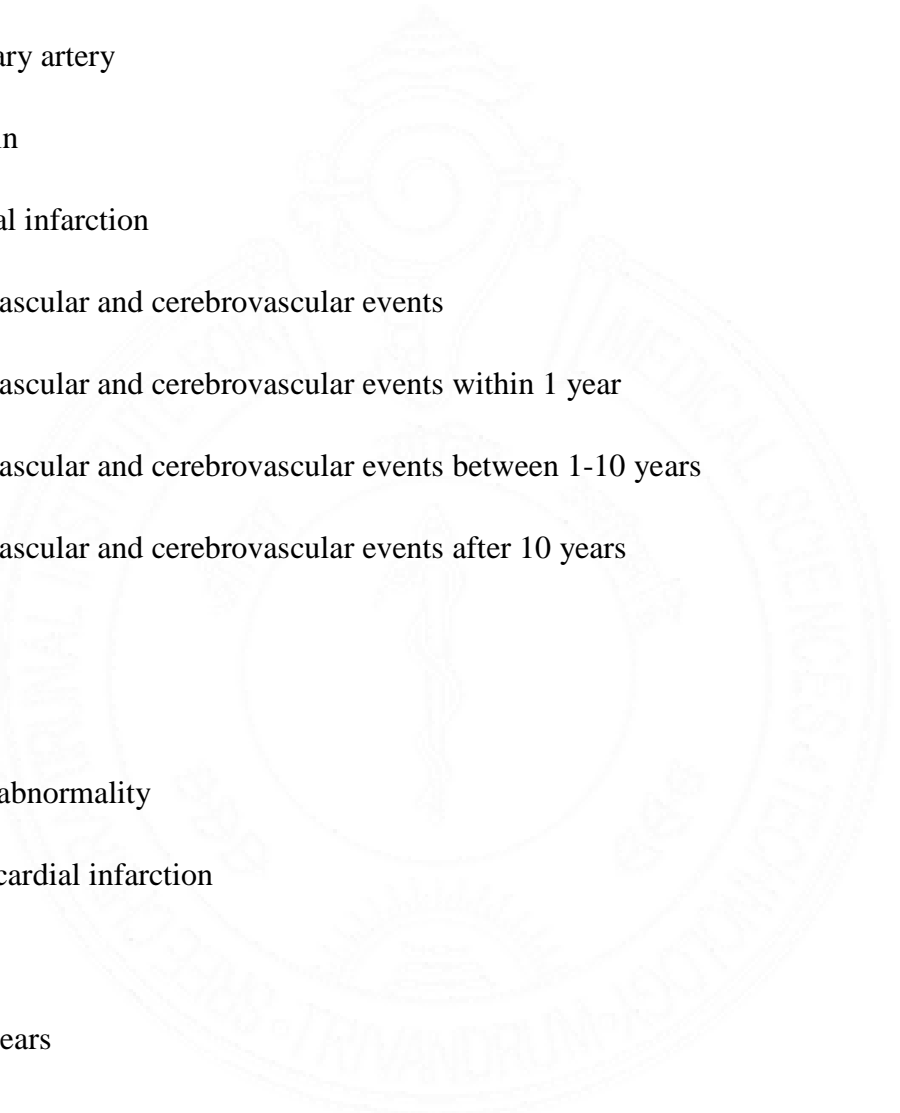
DEATH (ALL CAUSE)2 All cause deaths between 1-10 years

DEATH (ALL CAUSE)3 All cause deaths after 10 years

DLP Dyslipidaemia



DM	Diabetes Mellitus
EF	Ejection fraction
ESR	Erythrocyte sedimentation rate
FBS	Fasting blood sugar
FC	Functional class
F/H CAD	Family history of coronary artery disease
Hb	Haemoglobin
HDL	High density lipoprotein
HT	Height
HTN	Hypertension
IPWM	Infero-posterior wall myocardial infarction
IWMI	Inferior wall myocardial infarction
ISR1	In-stent restenosis within 1 year
ISR2	In-stent restenosis between 1-10 years
ISR3	In-stent restenosis after 10 years



LAD	Left anterior descending artery
LCX	Left circumflex coronary artery
LDL	Low density lipoprotein
LWMI	Lateral wall myocardial infarction
MACCE	Major adverse cardiovascular and cerebrovascular events
MACCE1	Major adverse cardiovascular and cerebrovascular events within 1 year
MACCE2	Major adverse cardiovascular and cerebrovascular events between 1-10 years
MACCE3	Major adverse cardiovascular and cerebrovascular events after 10 years
MI	Myocardial infarction
RCA	Right coronary artery
RWMA	Regional wall motion abnormality
RVMI	Right ventricular myocardial infarction
Stroke1	Stroke within 1 year
Stroke2	Stroke between 1-10 years
Stroke3	Stroke after 10 years

Sr. no.	Serial number
TC	Total cholesterol
TG	Triglyceride
TLR1	Target lesion revascularization within 1 year
TLR2	Target lesion revascularization between 1-10 years
TLR3	Target lesion revascularization after 10 years
TVR1	Target vessel revascularization within 1 year
TVR2	Target vessel revascularization between 1-10 years
TVR3	Target vessel revascularization after 10 years
WT	Weight