CHAPTER 4: PROCEDURAL DETAILS

4.1 PROCEDURAL SETTINGS

Azmee Mohd Ghazi[1]
Syahidah Syed Tamin[1]
Rosli Mohd Ali[1]

4.2 LESION CHARACTERISTICS

Chee Kok Han[2]
Imran Zainal Abidin[2]
Chong Wei Peng[2]
Ramesh Veriah Singh[2]
Wan Azman Wan Ahmad[2]

[1]Department of Cardiology, Institut Jantung Negara
[2]Department of Cardiology, University Malaya Medical Centre

4.1 PROCEDURAL SETTINGS

This chapter summarizes the procedural settings and treatment of patients who underwent PCI in 2007 based on our PCI registry.

In total, 3920 PCIs were performed in 2007. The majority of the PCIs were performed as Elective case (90.1%; n=3533). Urgent case which comprises both NSTEMI and Unstable Angina accounted for 4.8% (n=190). The remaining 4.6% were Rescue PCI (n=76) and Primary PCI (n=104).

About eighty seven percent (86.7%; n=3397) of PCIs were performed during the same laboratory visit as the diagnostic coronary angiogram (ad-hoc). Comparatively, STEMI and NSTEMI, PCIs were performed as ad-hoc procedures in 90.6% and 91.8% of the cases respectively.

Analysing the different approaches of percutaneous entry for PCI, femoral approach accounted for 59.4% (n=2330) and 33.8% (n=1325) were of Radial approach. The remaining 1.8% was distributed between Brachial and multiple sites.

The size of percutaneous access was measured based on the French size. 73.9% (n=2897) of patients had a size 6 French, 20.3% (n=797) size 7 French and 1.3% (n=50) size 8 French.

As for the methods of closure for percutaneous entry, the majority of cases (91.8%; n=3599) were manually compressed (manually or using device). The remaining methods were Seal (2.1%; n=82) and Suture (1%; n=38).

Looking at the extent of coronary artery disease, 55.3% (n=2167) of PCIs were performed in multiple vessel disease, 43.4% (n=1702) in single vessel disease and the remaining were grafts 1 %(n=38) and Left Main disease 0.9% (n=36).

The mean fluoroscopy time was 22.08minutes (SD 22.16), median was 15.7min (2.2-180). The average dose of radiation was 618.38mGy (SD 2659.22), median dose was 122mGy (3.2m-max 47351). The reason for the great disparity between the minimum and maximum fluoroscopy time and dose of radiation is due to the reason that PCIs can be performed in

simple Type A lesions to more complicated ones such as Type C and others, the longer procedural time being associated with higher dosage of radiation.

Most of the contrasts used for these procedures were non-ionic i.e. 75.7% (n=2966). Only 4% (n=156) were ionic. The mean contrast volume was 179.72 mls (SD 71.63), median 165 mls (25-500). The higher contrast load reflects the more complicated PCI cases.

Treatment of patients undergoing PCI

In STEMI, 32.4% (n=107) of patients undergoing PCI received thrombolytic treatment prior to the procedure. 21.5% (n=23) of them received thrombolysis more than 7 days before the procedure, 21.5% (n=23) within 12-24 hours and 15.9% (n=17) received within less than 3 hours. The remaining cases were, 11.2% (n=12) within 3-6 hours, 10.3% (n=11) 6-12 hours and 12.1% (n=13) within 1-7 days.

About six percent (6.3%; n=245) of patients undergoing PCI received GP IIb/IIIa blocker, and out of this group, 40.0% (n=98) of them received prior to PCI, 39.2% (n=96) received during and 9.0% (n=22) received after the procedure.

Nearly all of them (99.5 %; n=3899) who underwent PCI received intravenous unfractionated Heparin and in the majority of cases (65.5%; n=2437), Heparin were given during the procedure but in 17.2% (N=672) of them it was given prior to the procedure.

About five percent (5.2%; n=203) of patients received LMWH. The majority of these patients, (78.8%; n=160) received prior to procedure, 4.9% (n=10) received during procedure and 8.4% (n=17) received after procedure.

Aspirin and Clopidogrel were the two most common choice of antiplatelet therapy used in PCI. Ticlopidine was used only in 3.9% (n=152) of cases. Nearly all of them (95.5%; n=3742) were on Aspirin and the majority of them (90.6%; n=3390) received aspirin prior to the procedure. Similarly, Clopidogrel usage was recorded as 97.6% (n=3824) and the majority of these patients (92.1; n=3520) received Clopidogrel prior to the procedure. The most common loading dose for Clopidogrel was 300mg (46.9%; n=1795) and only 7.2% of them (n=277) received 600mg. About thirty four percent (33.8%; n=1291) received only 75mg

prior to the PCI (these patients had been on long term Clopidogrel therapy, prior to procedure).

Following PCI, the duration of Clopidogrel would depend on the clinical setting and the type of stents implanted. About 25.7% (n=1007) of the cases were planned for one month of Clopidogrel, 6.8% (n=267) for three months, 21.3% (n=836) for six months, 22.0% (n=861) for 12 months and 13.9% (n=546) for longer than one year. In cases where BMS was implanted, 44% (n=1030) of the cases were planned for one month duration and for the rest were between three months to more than one year. In cases with DES, 29.7% (n=710) were planned for six months, 34.8% (n=831) planned for 12 months and 20.4% (n=488) planned for more than one year of Clopidogrel.

Summary points

1. The majority of PCIs performed in Malaysia in 2007 were Elective cases and in most cases PCIs were performed as ad-hoc.
2. Femoral access remains the most common percutaneous entry followed by Radial and in the majority of patients the closure percutaneous access was compressed manually or using device.
3. Clopidogrel and Aspirin remains the two most common antiplatelet therapy for patients undergoing coronary intervention and most commonly used in combination.
4. In cases where DES was implanted, Clopidogrel was planned for 6months in 29.7%, 12months in 34.8% and more than 1 year in 20.4% of the cases.

Table 4.1.1 Characteristics of PCI procedures performed, NCVD-PCI Registry, 2007

	Total No. of Procedures =3920	
	n	%
PCI Status, no. (%)		
Elective	3533	90.1
Urgent(NSTEMI/UA)	190	4.8
Rescue	76	1.9
Primary	104	2.7
Not Available	17	0.4
Staged PCI, no. (%)		
Yes	766	21.7
No	1754	49.7
Not Available	1012	28.7
Ad-hoc PCI, no. (%)		
Yes	3397	86.7
No	471	12
Not Available	52	1.3
Percutaneous entry, no. (%)		
Brachial	28	0.7
Radial	1325	33.8
Femoral	2330	59.4
Multiple site	43	1.1
Not Available	194	4.9
French size, no. (%)		
5	15	0.4
6	2897	73.9
7	797	20.3
8	50	1.3
Others	2	0.1
Not Available	159	4.1
Closure device, no. (%)		
No	3599	91.8
Seal	82	2.1
Suture	38	1
Others	6	0.2
Not Available	195	5
Extent of Coronary disease, no. (%)		
Single vessel disease	1702	43.4
Multiple vessel disease	2167	55.3
Graft	38	1
Left main	36	0.9

	Total No. of Procedures =3920	
	n	**%**
Fluoroscopy time, minutes		
N	3142	
Mean(SD)	22.08 (22.16)	
Median(min,max)	15.7 (2.2,180)	
Not Available	778	19.8
Total dose, mGy		
N	1469	
Mean(SD)	618.38 (2659.22)	
Median(min,max)	122 (3.2,47351)	
Not Available	2451	62.5
Contrast type, no. (%)		
Ionic	156	4
Non-ionic	2966	75.7
Not Available	798	20.4
Contrast volume, ml		
N	3212	
Mean(SD)	179.72 (71.63)	
Median(min,max)	165 (25,500)	
Not Available	708	18.1
Thrombolytics, no. (%) (only in STEMI)		
Yes	107	32.4
No	219	66.4
Not Available	4	1.2
Thrombolytics given, no. (%)		
<3 hrs	17	15.9
3-6 hrs	12	11.2
6-12 hrs	11	10.3
12-24 hrs	23	21.5
1-7 days	13	12.1
>7 days	23	21.5
Not Available	8	7.5
Adjunctive pharmacotherapy		
IIb/IIIa Blockade, no. (%)		
Yes	245	6.3
No	3642	92.9
Missing	33	0.8

	Total No. of Procedures =3920	
	n	%
IIb/IIIa Blockade given, no. (%)		
Prior	98	40
After	22	9
During	96	39.2
Not Available	29	11.8
Heparin, no. (%)		
Yes	3899	99.5
No	0	0
Not Available	21	0.5
Heparin given, no. (%)		
Prior	672	17.2
After	8	0.2
During	2437	62.5
Not specified	782	20.1
LMWH, no. (%)		
Yes	203	5.2
No	3658	93.3
Not Available	59	1.5
LMWH given, no. (%)		
Prior	160	78.8
After	17	8.4
During	10	4.9
Not specified	16	7.9
Ticlopidine, no. (%)		
Yes	152	3.9
No	3727	95.1
Not Available	41	1
Ticlopidine given, no. (%)		
Prior	130	85.5
After	2	1.3
During	2	1.3
Not Available	18	11.8
Aspirin, no. (%)		
Yes	3742	95.5
No	162	4.1
Not Available	16	0.4

	Total No. of Procedures=3920	
	n	**%**
Aspirin given, no. (%)		
Prior	3390	90.6
After	40	1.1
During	63	1.7
Not Available	249	6.7
Clopidogrel, no. (%)		
Yes	3824	97.6
No	88	2.2
Not Available	8	0.2
Clopidogrel given, no. (%)		
Prior	3520	92.1
After	72	1.9
During	103	2.7
Not Available	129	3.4
Prior, no. (%)		
<6 hrs	570	16.2
6-12 hrs	1171	33.3
>34-72 hrs	313	8.9
>72 hrs	1158	32.9
Not Available	308	8.8
First starting dose, no. (%)		
75 mg	1291	33.8
300 mg	1795	46.9
600 mg	277	7.2
>=1200 mg	1	0
Not Available	460	12
Planned duration of Clopidogrel/Ticlopidine, no. (%)		
1 month	1007	25.7
3 months	267	6.8
6 months	836	21.3
12 months	861	22
>12 months	546	13.9
Not Available	403	10.3
Clopidogrel/ Ticlopidine Usage, no. (%)		
Ticlopidine only	51	1.3
Clopidogrel only	3723	95.0
Ticlopidine and Clopidogrel	101	2.6
None given	45	1.1

Figure 4.1.1.1 PCI status of patients who underwent PCI, NCVD-PCI Registry, 2007

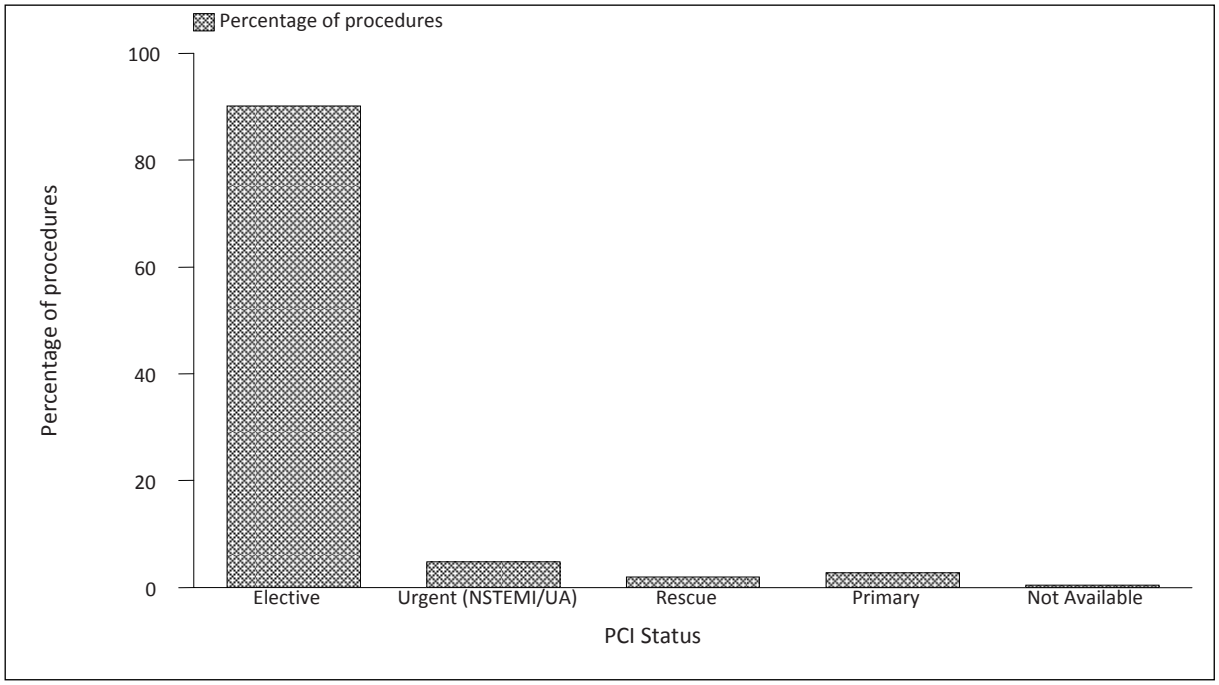


Figure 4.1.1.2 Distribution of patients who received ad-hoc PCI, NCVD-PCI Registry, 2007

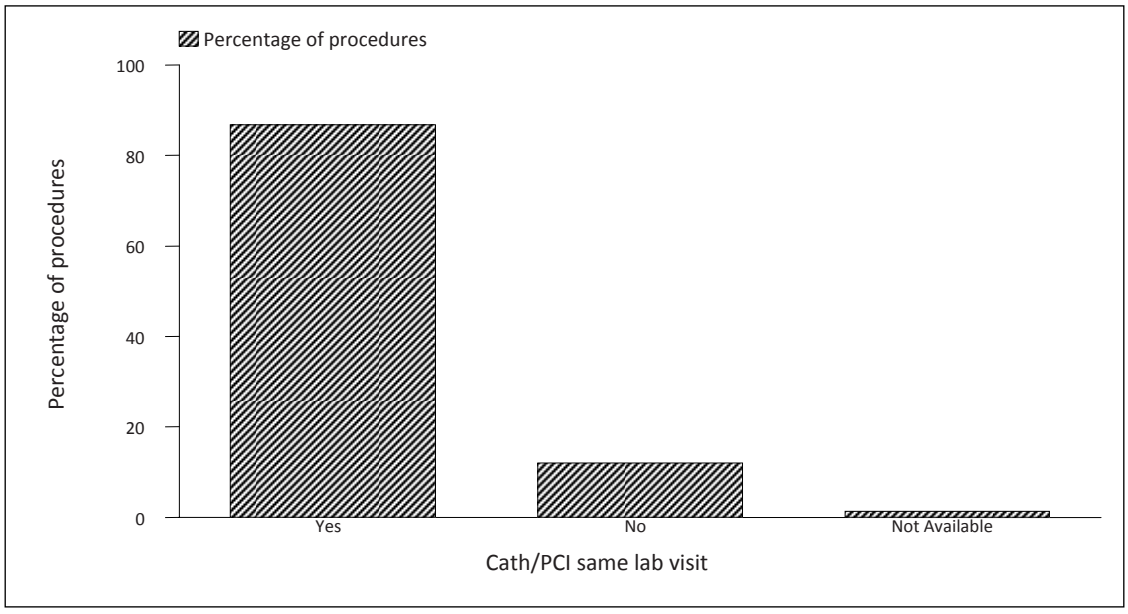


Figure 4.1.1.3 Type of percutaneous entry for patients who underwent PCI, NCVD-PCI Registry, 2007

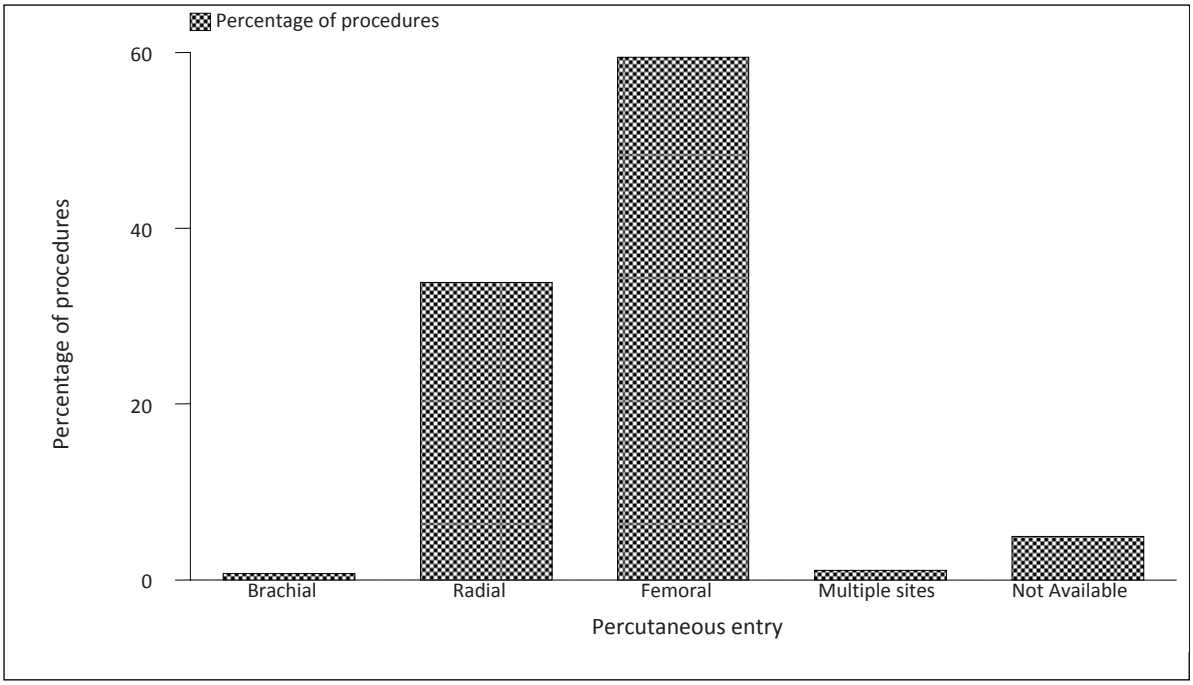


Figure 4.1.1.4 Distribution of French size for patients who underwent PCI, NCVD-PCI Registry, 2007

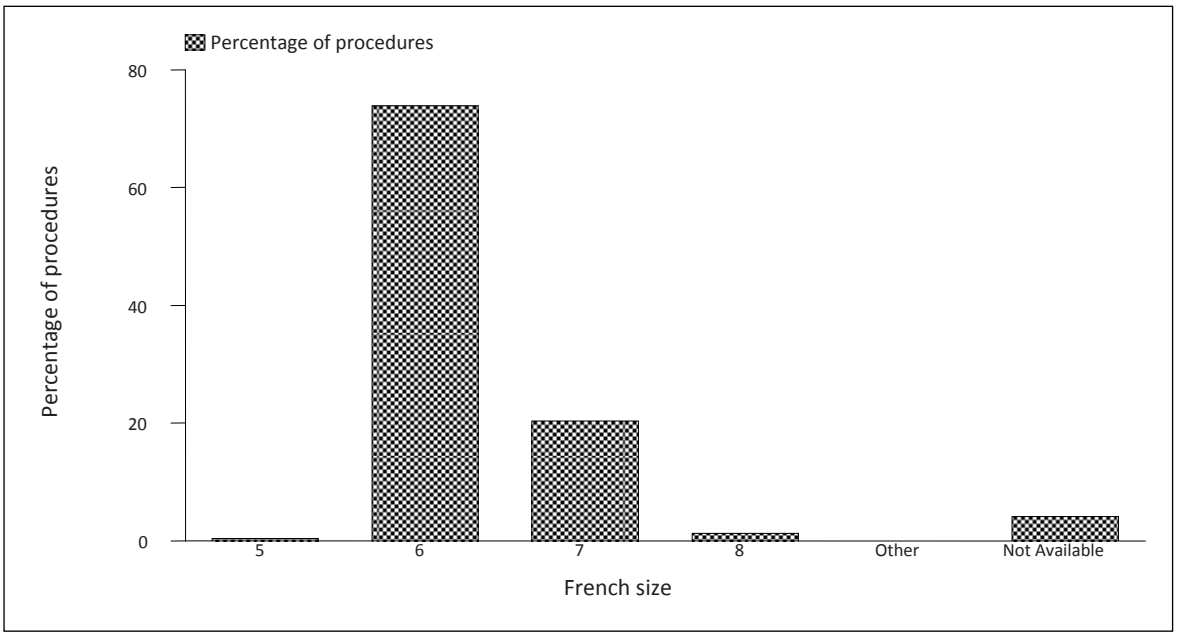


Figure 4.1.1.5 Distribution of contrast type for patients who underwent PCI, NCVD-PCI Registry, 2007

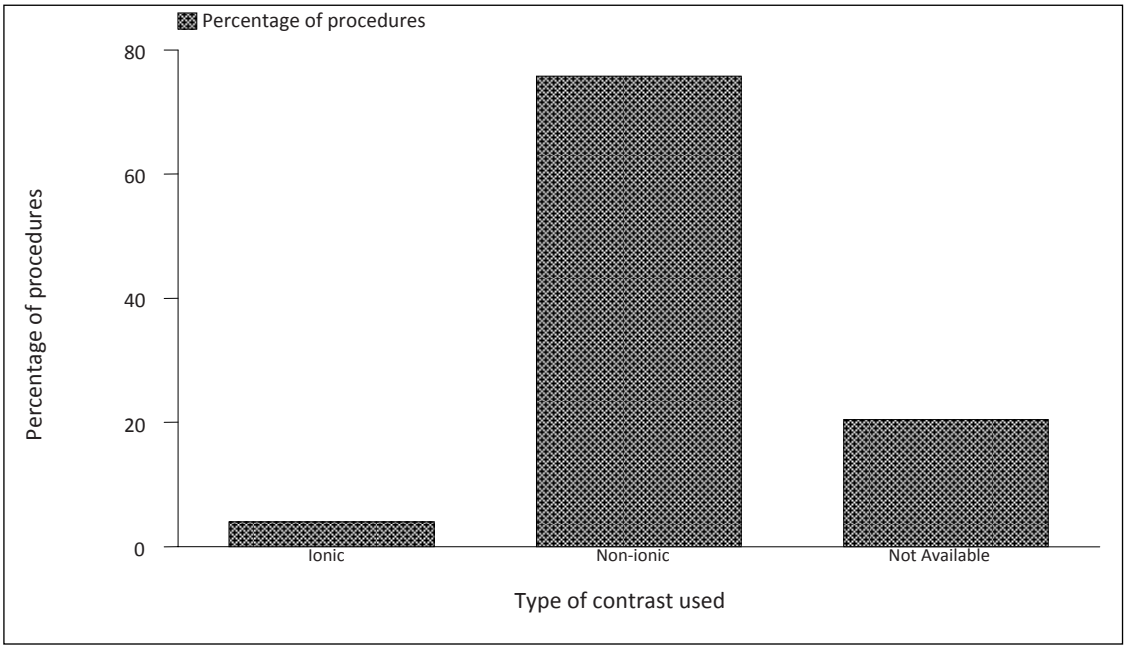


Figure 4.1.1.6 Distribution of adjunctive pharmacotherapy for patients who underwent PCI, NCVD-PCI Registry, 2007

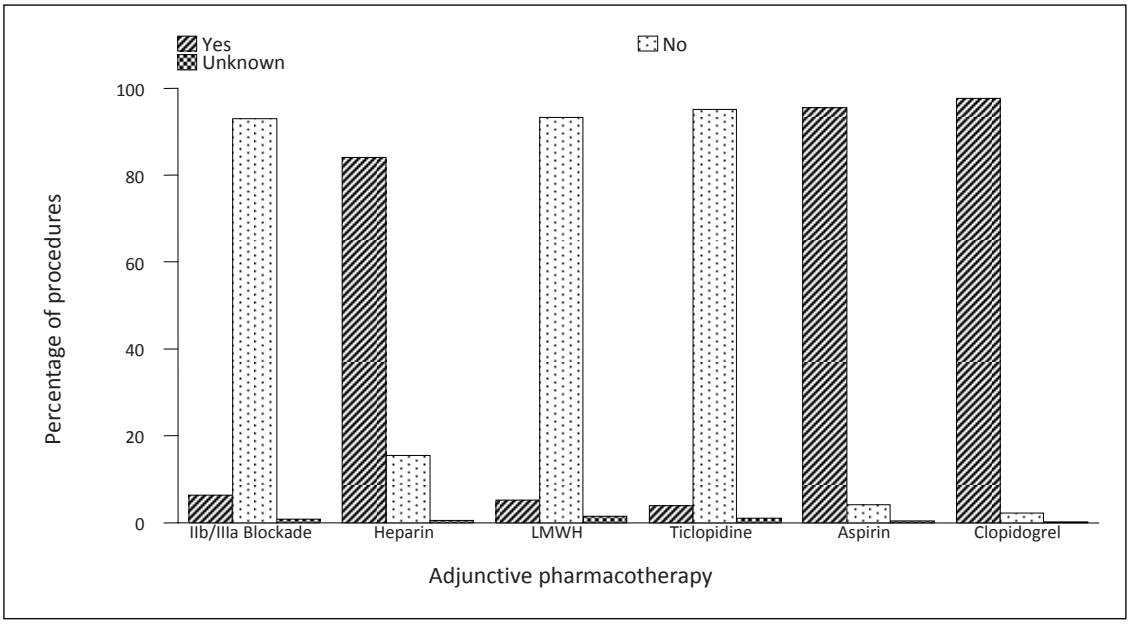


Table 4.1.2 Comparison of STEMI and NSTEMI patients who received ad-hoc PCI, NCVD-PCI Registry, 2007

Cath/PCI same lab visit	STEMI		NSTEMI	
	n	%	n	%
Yes	299	90.6	214	91.8
No	24	7.3	17	7.3
Not Available	7	2.1	2	0.9
Total	330	100	233	100

Table 4.1.3 Usage of thrombolytics in STEMI patients who underwent PCI, NCVD-PCI Registry, 2007

PCI status	STEMI						
	Thrombolytics						
	Yes		No		Missing		Total
	n	%	n	%	n	%	
Urgent	23	21.5	34	15.5	0	0	57
Rescue	50	46.7	16	7.3	1	25	67
Not Available	5	4.7	0	0	0	0	5
Total	107	100	219	100	4	100	330

Table 4.1.4 Patients who underwent PCI after thrombolytics therapy, NCVD-PCI Registry, 2007

Thrombolytics given	PCI Status					
	Urgent		Rescue		Not available	
	n	%	n	%	n	%
<3 hrs	5	17.9	11	20.8	1	16.7
3-6 hrs	1	3.6	11	20.8	0	0
6-12 hrs	4	14.3	7	13.2	1	16.7
12-24 hrs	11	39.3	9	17	2	33.3
1-7 days	1	3.6	9	17	0	0
>7 days	2	7.1	2	3.8	1	16.7
Not Available	4	14.3	4	7.5	1	16.7

Table 4.1.5 Duration of Thienopyridine in patients who underwent PCI, NCVD-PCI Registry, 2007

Duration of Clopidogrel/Ticlopidine	Intracoronary devices used					
	Balloon only		Drug Eluting Stent		Bare Metal Stent	
	n	%	n	%	n	%
1 month	132	29.7	35	1.5	1032	44
3 months	21	4.7	119	5	199	8.5
6 months	96	21.6	710	29.7	377	16.1
12 months	80	18	831	34.8	299	12.8
>12 months	49	11	488	20.4	239	10.2
Not Available	67	15.1	206	8.6	197	8.4
Total	445	100	2389	100	2343	100

Table 4.1.6 Access site of patients who underwent procedures, by PCI status, NCVD-PCI Registry, 2007

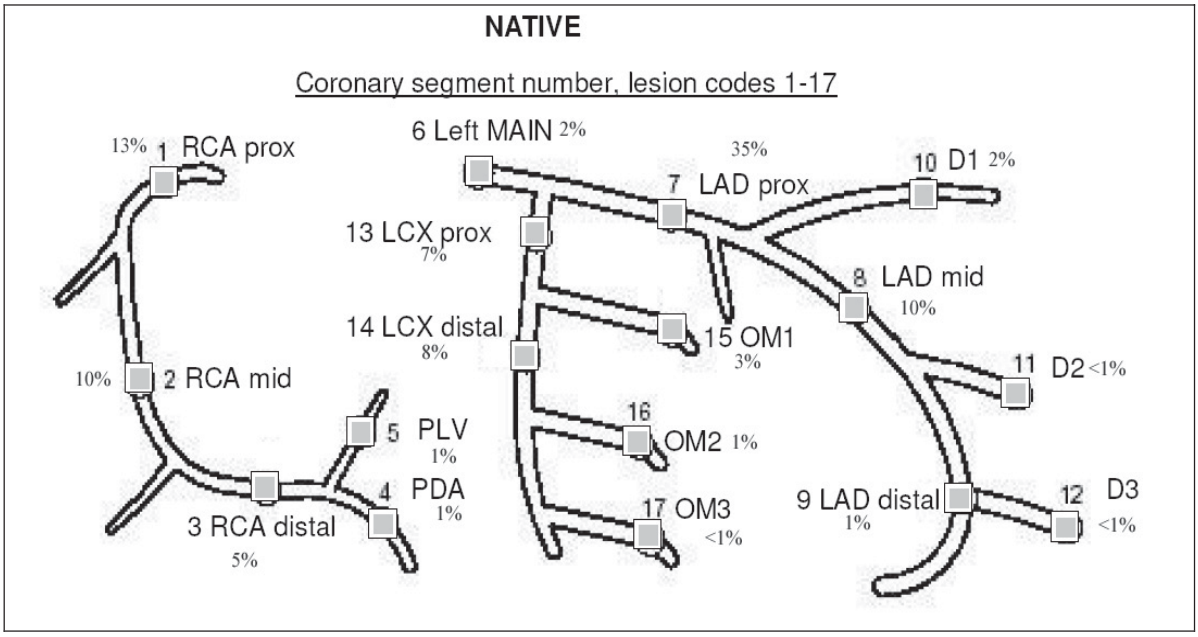
	Elective		Urgent		Rescue		Primary		Not Available	
	n	%	n	%	n	%	n	%	n	%
Brachial	28	0.8	0	0	0	0	0	0	0	0
Radial	1267	35.9	37	19.5	8	10.5	8	7.7	5	29.4
Femoral	2021	57.2	145	76.3	67	88.2	87	83.7	10	58.8
Multiple site	38	1.1	3	1.6	0	0	2	1.9	0	0
Not Available	179	5.1	5	2.6	1	1.3	7	6.7	2	11.8

4.2 LESION CHARACTERISTICS

In 2007, a total of 5512 lesions were treated with PCIs. On average, 1.50 lesions per patient were treated with PCI and 1.4 lesions were treated during each procedure.

Anatomical location of the lesion

Figure 4.2 Anatomical location of lesions treated with Percutaneous Coronary Intervention, NCVD-PCI Registry, 2007



Among the 5512 lesions treated with PCI, proximal left anterior descending artery was the most common site of lesion location (34.5%). This was followed by proximal right coronary artery (13.1%), mid right coronary artery (10.2%) and mid left anterior descending artery (9.7%). Left main stem PCI was performed in 1.8% of all PCIs. PCI to the graft was performed in 60 lesions. Among the graft lesions, one lesion was in the previous radial graft, seven were located within the LIMA graft while the remaining ones were in the saphenous vein graft.

Table 4.2.1 Summary of location of lesions treated with Percutaneous Coronary Intervention, NCVD-PCI Registry, 2007

Location of lesion	No.	%
Left Main Stem	**97**	**1.8**
Left Anterior Descending Artery (LAD)	**2643**	**48.0**
LAD proximal	1903	34.5
LAD mid	532	9.7
LAD distal	72	1.3
D1	125	2.3
D2	9	0.2
D3	2	0.0
Right Coronary Artery (RCA)	**1644**	**29.8**
RCA proximal	722	13.1
RCA mid	564	10.2
RCA distal	277	5.0
PDA	45	0.8
PLV	36	0.7
Left Circumflex Artery (LCx)	**996**	**18.0**
LCX proximal	387	7.0
LCX distal	410	7.4
OM1	154	2.8
OM2	35	0.6
OM3	10	0.2
Grafts	**60**	**1.0**
Saphenous Vein Graft	52	0.9
Left internal mammary artery graft	7	0.1
Radial artery graft	1	0.0

Lesion characteristics

Table 4.2.2 Characteristics of lesions treated by PCI, NCVD-PCI Registry, 2007

Lesion type	No.	%
De Novo	5115	92.8
Restenosis		
In-Stent restenosis	233	4.2
Restenosis (No prior stent)	12	0.2
Stent thrombosis	22	0.4

The majority of the lesions treated in the registry were de novo (5115 lesions, 92.8%). In-Stent Restenosis (ISR) constituted a total of 233 lesions (4.2%). Acute stent thrombosis was very rare in the registry.

The mean lesion length was 24.40 mm (SD ± 15.18mm). The mean pre-procedure lesion estimated stenosis was 84.41% (SD ± 12.14%).

Most of the lesions were of type C (44.2%) followed by type B (41.3%). Among the lesions treated by PCI, about 28.3% were of high risk characteristics (such as ostial, bifurcation, totally occluded and thrombus). The cardiac centres involved in the registry were treating high risk lesions with PCI.

Table 4.2.3 Prevalence of lesions according to American College of Cardiology (ACC) classifications, NCVD-PCI Registry, 2007

Lesion type	No.	%
A	631	11.4
B1	1239	22.5
B2	1038	18.8
C	2436	44.2

Table 4.2.4 Prevalence of high risk lesion type, NCVD-PCI Registry, 2007

Lesion type	No.	%
Ostial	359	6.5
Bifurcation	441	8.0
CTO<3mo	161	2.9
CTO>3mo	430	7.8
Thrombus	170	3.1

Most of the lesions (90.9%) achieved TIMI 3 flow after the intervention (as shown in the Table 4.2.5).

Table 4.2.5 Comparison of TIMI flow grade before and after procedure, NCVD-PCI Registry, 2007

TIMI flow grade	Pre-Procedure (%)	Post Procedure (%)
TIMI-0	712 (12.9)	114 (2.1)
TIMI-1	245 (4.4)	32 (0.6)
TIMI-2	755 (13.7)	69 (1.3)
TIMI-3	3528 (64.0)	5013 (90.9)

Types of Stents Used

Table 4.2.6 Types of stents used, NCVD-PCI Registry, 2007

Type of stent	No.	%
Drug Eluting Stent	3453	53.6
Bare Metal Stent	2735	42.5
Antibody stent	109	1.7
Bio-absorbable stent	2	0.0

A total of 6299 stents were used in 5512 lesions treated with PCI. An average of 1.23 stents was used per lesion treated. Drug eluting stents were used in 53.6% of PCIs while bare metal stents were used in 42.5% of PCIs. About 19.4% of patients were treated with direct stenting. Balloon only angioplasty (POBA) without stenting was performed in 445 (8.1%) patients.

The mean stent length was 22.75mm (standard deviation ± 7.28mm). The mean stent diameter was 2.99mm (SD ± 0.46mm). Drug eluting stents were more commonly used in both longer lesions (mean 24.97 mm SD±7.01) as well as smaller (shorter) ones (mean 2.89 mm SD±0.39) as compared to bare metal stents which was, mean 20.26mm; SD±6.66, in longer lesions and mean 2.89 mm; SD±0.39 in smaller (shorter) ones.

Lesion Complications during PCI

Table 4.2.7 Types of post procedure complications, NCVD-PCI Registry, 2007

Type of complication	No.	% of procedure (n=3920)
Dissection	216	3.9
No reflow	80	1.5
Transient	50	
Persistent	20	
Non-specified	10	
Acute closure	24	0.4
Perforation	16	0.3

The most common complication arising during PCI was vessel dissection. PCI failed in about 3.9% of lesions treated. Perforation and acute closure were rare occurrences during PCI.

Additional Devices used during PCI

Other devices were not commonly used during PCIs. The two most common additional devices used during PCIs were cutting balloon and intravascular ultrasound.

Table 4.2.8 Types of devices used during Percutaneous Coronary Intervention, NCVD-PCI Registry, 2007

Device	No.	%
Cutting balloon	112	2.0
IVUS	136	2.5
Rotablator	36	0.7
Distal Embolic Protection	12	0.2
Other Intracoronary devices	201	3.6

In- stent restenosis (ISR)

A total of 233 (4.2% of all lesions treated) In-Stent Restenosis (ISR) were noted in the 2007 registry. Nearly all of the reported ISR occurred in the native coronary artery (97%). ISR within the saphenous vein graft occurred in seven cases. No ISR was reported in the LIMA graft. The majority of the ISR (123 lesions, 52.8%) occurred in the previous bare metal stent (BMS) implantation. Seventy three percents (31.3%) of ISR occurred in the previous drug eluting stent (DES) implantation.

Table 4.2.9 Types of prior stents used in In- Stent Restenosis, NCVD-PCI Registry, 2007

Type of prior stent	No.	%
Bare Metal Stent	123	52.8
Drug Eluting Stent	73	31.3
Others	7	3.0

The mean estimated length of the lesions was 23.61 (SD ±15.53) mm. Among all the ISR, 12.9% of cases was of TIMI 0 flow. TIMI 3 flow was seen only in 58.8% of cases prior to intervention. Nearly all (93.1%) achieved TIMI 3 flow after the intervention.

A total of 39 cases of ISR presented as acute coronary syndrome (ACS). Unstable angina (59%) was the most common presentation among those who were presented with ACS, followed by Non ST elevated myocardial infarct (25.6%) and acute ST elevated myocardial infarct (15.4%).

Balloon angioplasty (including cutting balloon) without stenting was performed in 85 (36.5%) of the cases. A total of 170 of ISR cases were stented. Most (75.3%) of the ISRs were treated with drug eluting stents. Bare metal stents were used in 19.4% of the ISRs. The mean stent diameter was 3.04 (SD ±0.45) mm. The mean length of stents used was 24.08 (SD ± 7.41) mm. Direct stenting was not used as frequent as in naïve coronary artery lesion. Only eleven cases (4.7%) were treated with direct stenting. PCI was unsuccessful in only six cases (2.6%) while no data was available on four cases.

Table 4.2.10 Types of stents used in the In-Stent Restenosis, NCVD-PCI Registry, 2007

Type of stent used in the ISR	No.	%
Drug eluting stent	128	75.3
Bare metal stent	33	19.4
Antibody coated stent	2	1.2
Bio-absorbable stent	1	0.6
Other stents	6	3.5

Cutting balloon was used more frequently among patients with ISR. A total of 19.7% of cases used cutting balloon in the intervention. Intravascular ultrasound (IVUS) guidance was used in about 10.3% of cases.

Table 4.2.11 Types of devices used in the In-Stent Restenosis, NCVD-PCI Registry, 2007

Device	No.	% of all ISR cases
Cutting balloon	46	19.7
IVUS	24	10.3
Rotablator	2	0.9
Distal Embolic Protection	1	0.4
Other Intracoronary devices	8	3.4
Missing data	5	2.1

Complications were uncommon in the intervention of In-Stent Restenosis. Dissection was the most common complication. PCI was unsuccessful in seven patients.

Table 4.2.12 Types of complications in post In- Stent Restenosis, NCVD-PCI Registry, 2007

Type of complication	No.	% of Total No. of Procedures (n=216)
Dissection	7	3.2
Unsuccessful PCI	7	3.2
No reflow (transient)	1	0.5
Perforation	1	0.5

PCI of left main stem

Table 4.2.13 Types of lesions in left main stem procedure, NCVD-PCI Registry, 2007

Type of lesion	No.	%
De Novo	91	94
In-Stent Restenosis • Previous DES • Previous BMS • Missing	 2 1 1	4
Missing data	2	2

A total of 93 left main stem (LMS) PCIs were performed in 97 lesions in 2007. Most of the lesions were of de novo lesions and 4% were In-Stent Restenosis. The majority of the left main stem intervention was done on unprotected LMS. Indeed, only nine (9.7%) patients had had previous bypass surgery. Most of the interventions were performed using femoral approach (76.3%) but radial approach was not uncommon (16.1%).

Most of the LMS interventions were done as elective cases. About 18.3% of all LMS interventions were performed in patients presented with acute coronary syndrome.

Table 4.2.14 Clinical presentation of Left Main Stem, NCVD-PCI Registry, 2007

Clinical Presentation	No.	% of Total No. of procedures
Elective PCI	74	79.6
Acute Coronary Syndrome		
ST Elevation Myocardial Infarct/ STEMI	6	6.5
NSTEMI	6	6.5
Unstable Angina	5	5.3
Missing data	2	2.1

Mean pre-procedure lesion stenosis was 81.1% (SD ±13.65%). TIMI flow prior to PCI was presented in the table. The TIMI flow achieved TIMI 3 in all cases after the procedure.

Table 4.2.15 TIMI flow Prior to Intervention, NCVD-PCI Registry, 2007

TIMI flow Prior to Intervention	No.	%
TIMI-0	8	8
TIMI-1	7	7
TIMI-2	15	15
TIMI-3	63	65
Missing data	4	4

The mean length of the lesions was 33.04 mm (SD ±19.89). This long length is most likely due to the operator stenting across the left main stem either into the LAD or LCx. All lesions were stented. Direct stenting technique was used in six patients. Most of the lesions (89.2%) were stented with drug eluting stents. The mean stent length was 22.65 mm (SD ±7.5) and the mean stent diameter was 3.17 mm (SD ± 0.54).

Table 4.2.16 Types of stents, NCVD-PCI Registry, 2007

Type of stent	No.	%
Drug Eluting Stent (DES)	157	89.2
Bare Metal Stent (BMS)	18	10.2
Antibody Coated Stent	1	0.6
Missing data	0	0

LMS intervention with intravascular ultrasound (IVUS) was uncommon in this cohort of patients. Only 23.7% of the interventions were performed with IVUS guidance. Intra-aortic balloon pump support was used in 15.1% of patients undergoing LMS intervention.

Table 4.2.17 Types of devices used in Left Main Stem, NCVD-PCI Registry, 2007

Device	No.	% of all LMS cases
IVUS	23	23.7
Intraaortic balloon pump	14	15.1
Rotablator	5	5.2
Cutting balloon	4	4.1
Distal Embolic Protection	1	1

Most of the patients will be put on long term dual antiplatelet therapy. Indeed, about 80% of patients will be put on dual antiplatelet therapy for one year or more.

Table 4.2.18 Planned duration of dual antiplatelet therapy, NCVD-PCI Registry, 2007

Planned duration of dual antiplatelet therapy	No.	%
1 month	4	4
3 months	1	1
6 months	7	7
12 months	31	32
>12 months	47	48
Missing data	7	7

PCI to the Grafts

A total of 53 PCIs were performed in 60 lesions present in the bypass grafts. Most of the grafts were saphenous vein grafts (86.7%) and LIMA grafts (11.7%). Only one radial graft PCI was noted in the current registry.

Table 4.2.19 Lesion types, NCVD-PCI Registry, 2007

Lesion type	No.	%
De Novo	49	82
In-Stent Restenosis	7	12
Stent thrombosis	0	0
Restenosis (No prior stent)	0	0
Missing data	4	7

Most of the lesions were of de novo type. Among the seven cases of ISR, the previous stents used were drug eluting stent in six of the cases. The mean length of the lesions was 22.0 mm (SD±16.31). TIMI flow before and after PCI was shown in the table.

Table 4.2.20 TIMI flow grade, NCVD-PCI Registry, 2007

TIMI flow grade	Pre-Procedure	Post Procedure
TIMI-0	2	1
TIMI-1	6	0
TIMI-2	20	1
TIMI-3	30	56
Missing data	2	2

No complications were reported among these patients.

Most patients were discharged with long term dual antiplatelet therapy, about 50% of them for twelve months or more.

Table 4.2.21 Planned duration of dual antiplatelet therapy, NCVD-PCI Registry, 2007

Planned duration of dual antiplatelet therapy	No.	%
1 month	10	17
3 months	1	2
6 months	14	23
12 months	24	40
>12 months	6	10
Missing data	5	8