



CHAPTER 2 :
CLINICAL PRESENTATIONS & INVESTIGATIONS

Zubin Ibrahim¹ • Sazzli Kasim¹ • Lee Chuey Yan²

1 Faculty Of Medicine, University Technology MARA, Selangor

2 Hospital Sultanah Aminah, Johor



CLINICAL PRESENTATIONS & INVESTIGATIONS

Zubin Ibrahim¹, Sazzli Kasim¹, Lee Chuey Yan²

¹ Faculty of Medicine, Univeristy Technology MARA, Selangor

² Hospital Sultanah Aminah, Johor

Summary

1. Heart rate, blood pressure and rhythm remains similar for the six years (2007- 2012).
2. The majority of patients who underwent PCI had normal eGFR, with similar trends from 2007-2012. However, almost 10% had CKD stage 3-5.
3. The majority of 2010-2012 patients (80.8%) had a low TIMI risk index.
4. There is a low percentage of ischemic testing done prior to PCI of elective patients.
5. In 2010-2012, 34.8% of PCIs were in patients with ACS, and 59.6% of these were STEMI PCIs. Anterior STEMI (55.2%) remains the predominant presentation for STEMI patients.
6. In 2010-2012 there are more patients who presented with Killip Class II and IV. The use of IABP has increased (1.8% in 2007-2009 to 3.0% in 2010-2012).
7. The median door-to-balloon time was consistent at 90 minutes from the years 2007-2012, however symptom-to-door and transfer time remain high.

This topic will deal with the clinical presentation and relevant investigations at the time of PCI for patients enrolled in the registry between 2007-2012. Overall, there were 11621 procedures in 2007-2009 and 14862 in 2010-2012.

Heart rate and blood pressure were recorded at the start of each procedure. TIMI risk index (TRI) were analyzed between low, intermediate and high (<30, 30-70 and >70) respectively. This index is predictive of 30-day and long-term mortality in acute coronary syndrome (ACS). Functional ischemia relates to information obtained from either stress testing or imaging pre-procedure. Time to treatment follows current practice standards.

Heart rate (HR) and blood pressure differs little over the six years with 81.0% of patients having a presenting HR of less than 90 in 2007-2009 and 80.0% in 2010-2012. [Table 3.1] When compared of heart rate according to PCI status there is a difference between those going for elective PCI compared to NSTEMI/UA and AMI. From the years 2010-2012, HR less than 60 is highest in patient going for elective PCI (21.5%) compared to patients going for AMI PCI (7.2%). In contrast patients undergoing AMI PCI, 17.8% had a HR greater than 100 compared to 2.6% for elective PCI. This trend is similar for the 2007-2009 periods. [Table 3.3]

The mean systolic blood pressure for the years 2010-2012, was 134.8mmHg (SD 24), and mean diastolic blood pressure was 75.8mmHg (SD 12). [Table 3.1]

The majority of our patients during the two periods had a low TIMI Risk Index (TRI) (84.1 vs. 80.8% respectively). Most of the PCI performed in our NCVD-PCI registry were in patients with a low 30-day and long-term mortality. [Table 3.1]

Baseline ECG shows that majority of patients were in sinus rhythm (87.0% vs. 86.2% respectively). Atrial fibrillation remains at 1.0% of all rhythms recorded for 2007-2012. This is certainly lower than the 6.2-7.9% of patients with atrial fibrillation seen in the GRACE registry¹. [Table 3.1]

Renal function recorded shows a similar profile from 2007 to 2012. The median eGFR for STEMI was 76.9mls/min/1.73m² (SD 4.1-212.5), NSTEMI 76.1mls/min/1.73m² (SD 2.8-172.1) and elective PCI of 74.8mls/min/1.73m² (SD 0.6-207.4) for the year 2007-2012. [Table 3.13] When the renal function is subdivided into stages: there were 10,011 (67.4%) with a GFR of greater and equal to 60ml/min (normal renal function), 1690 (11.4%) 45 to 60ml/min, 665 (4.4%) 30 to 45 ml/min, 296 (2%) 15 to 30 ml/min and 404 (2.7%) less than 15ml/min (stage 5 of Chronic Kidney Disease) respectively, in patients who underwent PCI during the years 2010-2012. Collectively, our data show that in almost 10.0% of all subjects, PCI is performed in patients with CKD stage 3 to 5. These trends were similar in patients during the earlier 2007-2009 registry data. [Table 3.1]

During the years 2010-2012 functional ischemia testing was positive in 19.3% of patients who underwent elective PCI. A similar trend was seen for the years 2007-2009 with 18.9% having a positive ischemic testing prior to elective PCI. For the years 2007-2012, less than 25.0% of elective PCI recorded prior ischemic testing. This is lower than a published report and recommendations from international guidelines^{2,4}. [Table 3.16]

PCI in patients with ACS was 34.8% in 2010-2012 compared to 43.6% in 2007-2009. Of the ACS subtypes, STEMI PCI predominates with an increasing trend, from 51.8% in 2007-2009 to 59.6% in 2010-2012, a difference of almost six percents between the two groups, giving a six-year average of 54.8%. Of these, 55.2% were anterior STEMI in 2010-2012. There is more PCI for UA patients in 2010-2012 at 12.4% compared to 9.8% in 2007-2009. There is a reducing trend for NSTEMI at 27.0% for 2010-2012 compared to 37.6% for 2007-2009. [Table 3.1]

The proportion of STEMI patients in Killip class I was similar during the two periods (33.8% in 2010-2012 vs. 38.1% in 2007-2009). There is a doubling of patients in Killip class II from 22.1% in 2007-2009 to 43.8% in 2010-2012. [Table 3.1]

For STEMI PCIs with recorded time to treatment, the median symptom-to-door time for 2010-2012 was 205 minutes and for 2007-2009 was 195 minutes. Median door-to-balloon time was consistent at 90 minutes for both 2007-2009 and 2010-2012. [Table 3.1]

Overall recorded transfer time for patients presenting to a non-cardiac centre remains long. In patients transferred in 2007-2009, the median time was 180 minutes. Those in 2010-2012 had a median time of 220 minutes. There was no improvement in symptom to door time in those patients transferred to a PCI centre, with 260 minutes in 2007-2009 and 271 minutes in 2010-2012. [Table 3.2.1]



References

1. Rajendra H. Mehta, Omar H. Dabbous, Christopher B. Granger, PolinaKuznetsova, Eva M. Kline-Rogers, Frederick A. Anderson, Jr, Keith A.A. Fox, Joel M. Gore, Robert J. Goldberg, Kim A. Eagle. Comparison of Outcomes of Patients With Acute Coronary Syndromes With and Without Atrial Fibrillation. *Am J Cardiol* 2003;92:1031–1036
2. Grace A Lin, RA Dudley, FR Lucas, David J Malenka, Eric Vittinghoff, Rita F Redberg. Frequency of stress testing to document ischemia prior to elective percutaneous coronary intervention. *JAMA* 2009;300(15):1765-1773
3. Guideline for the diagnosis and management of patients with stable ischemic heart disease: A report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines, and the American College of Physicians, American Association for Thoracic Surgery, Preventive Cardiovascular Nurses Association, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons. *Circulation* 2012; 126: e354-e471
4. ESC guidelines on the management of stable coronary artery disease: The Task Force on the management of stable coronary artery disease of the European Society of Cardiology. *European Heart Journal* 2013;34:2949–3003

Table 3.1 Patient clinical status at time of PCI procedure, NCVD-PCI Registry, 2007-2012

Clinical examination	2007-2009		2010		2011		2012		2010-2012		2007-2012	
	Total no. of procedures = 11621	%	Total no. of procedures = 4462	%	Total no. of procedures = 4887	%	Total no. of procedures = 5513	%	Total no. of procedures = 14862	%	Total no. of procedures = 26483	%
Heart rate at presentation, beats/minute												
N	10732		4208		4399		4776		13383		24115	
Mean (SD)	71.6 (15.7)		71.1 (15.3)		71.0 (16.5)		71.0 (16.3)		71.0 (16.1)		71.3 (15.9)	
Median (min,max)	70.0 (25.0, 193.0)		69.5 (30.0, 175.0)		68.0 (29.0, 185.0)		68.0 (32.0, 188.0)		69.0 (29.0, 188.0)		69.0 (25.0, 193.0)	
Missing, No. (%)	889 (7.6)		254 (5.6)		488 (10.0)		737 (13.4)		1479 (10.0)		2368 (9.0)	
Heart rate at presentation, beats/minute, No. (%)												
<90	9404 (81.0)		3726 (83.6)		3917 (80.2)		4235 (76.8)		11878 (80.0)		21282 (80.4)	
≥90	1328 (11.4)		482 (10.8)		482 (9.8)		541 (9.8)		1505 (10.0)		2833 (10.6)	
Missing	889 (7.6)		254 (5.6)		488 (10.0)		737 (13.4)		1479 (10.0)		2368 (9.0)	
Systolic blood pressure, mmHg												
N	10678		4143		4302		4714		13159		23837	
Mean (SD)	138.4 (26.1)		137.3 (25.0)		133.9 (24.3)		133.3 (23.3)		134.8 (24.3)		136.4 (25.2)	
Median (min,max)	137.0 (60.0, 230.0)		135.0 (62.0, 227.0)		131.0 (61.0, 227.0)		131.0 (63.0, 226.0)		132.0 (61.0, 227.0)		134.0 (60.0, 230.0)	
Missing, No. (%)	943 (8.1)		319 (7.2)		585 (12.0)		799 (14.5)		1703 (11.5)		2646 (10.0)	



	2007-2009		2010		2011		2012		2010-2012		2007-2012	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Systolic blood pressure, mmHg, No. (%)												
<90	130	1.1	35	0.8	39	0.8	57	1.0	131	0.8	261	1.0
≥90	10548	90.8	4108	92.0	4263	87.2	4657	84.5	13028	87.7	23576	89.0
Missing	943	8.1	319	7.2	585	12.0	799	14.5	1703	11.5	2646	10.0
Diastolic blood pressure, mmHg												
N		10681		4128		4287		4702		13117		23798
Mean (SD)		76.9 (13.0)		76.1 (12.7)		75.6 (12.5)		75.7 (12.5)		75.8 (12.5)		76.3 (12.8)
Median (min,max)		78.0 (10.0, 120.0)		76.0 (20.0, 120.0)		75.0 (18.0, 120.0)		76.0 (21.0, 120.0)		76.0 (18.0, 120.0)		76.0 (10.0, 120.0)
Missing, No. (%)		940		334		600		811		1745		2685
TIMI risk index (TRI)												
N		10485		4125		4273		4659		13057		23542
Mean (SD)		17.6 (7.9)		18.2 (7.9)		18.6 (8.4)		18.8 (8.4)		18.5 (8.3)		18.1 (8.1)
Median (min,max)		16.1 (2.8, 90.1)		16.9 (2.8, 105.2)		17.1 (2.7, 97.7)		17.3 (2.1, 91.1)		17.1 (2.1, 105.2)		16.6 (2.1, 105.2)
Missing, No. (%)		1136		337		614		854		1805		2941
TRI classification, No. (%)												
Low <30		9772		3820		3924		4263		12007		21779
Intermediate 30-70		702		303		346		391		1040		1742
High >70		11		2		3		5		10		21
Missing		1136		337		614		854		1805		2941
				7.6		12.6		15.5		12.2		11.2

	2007-2009		2010		2011		2012		2010-2012		2007-2012	
	Total no. of procedures = 11621	No.	Total no. of procedures = 4462	No.	Total no. of procedures = 4887	No.	Total no. of procedures = 5513	No.	Total no. of procedures = 14862	No.	Total no. of procedures = 26483	
Baseline ECG, No. (%)												
Sinus rhythm	10103	87.0	3997	89.6	4181	85.6	4626	84.0	12804	86.2	22907	86.4
Atrial fibrillation	107	1.0	59	1.4	36	0.8	54	1.0	149	1.0	256	1.0
2 nd /3 rd AVB	65	0.6	20	0.4	12	0.2	14	0.2	46	0.4	111	0.4
LBBB	58	0.4	23	0.6	9	0.2	17	0.4	49	0.4	107	0.4
RBBB	92	0.8	38	0.8	10	0.2	15	0.2	63	0.4	155	0.6
NYHA, No. (%)												
Total no. of procedures among patients with heart failure	464	100	192	100	178	100	135	100	505	100	969	100
NYHA I	133	28.6	64	33.4	60	33.8	49	36.3	173	34.2	306	31.6
NYHA II	224	48.3	105	54.6	82	46.0	52	38.7	239	47.4	463	47.8
NYHA III	76	16.5	18	9.4	24	13.4	12	8.8	54	10.6	130	13.4
NYHA IV	19	4.0	4	2.0	6	3.4	6	4.4	16	3.2	35	3.6
Not available	10	2.2	1	0.6	6	3.4	16	11.8	23	4.6	33	3.4
Missing	2	0.4	0	0	0	0	0	0	0	0	2	0.2
Functional ischaemia, No. (%)												
Positive	2088	18.0	754	16.9	741	15.2	1101	19.9	2596	17.5	4684	17.7
Negative	221	2.0	49	1.0	73	1.4	97	1.8	219	1.5	440	1.6
Equivocal	118	1.0	56	1.2	49	1.0	53	1.0	158	1.0	276	1.0
Not applicable	8997	77.4	3585	80.5	3959	81.0	4175	75.7	11719	78.8	20716	78.3
Missing	197	1.6	18	0.4	65	1.4	87	1.6	170	1.2	367	1.4



	2007-2009		2010		2011		2012		2010-2012		2007-2012	
	Total no. of procedures = 11621		Total no. of procedures = 4462		Total no. of procedures = 4887		Total no. of procedures = 5513		Total no. of procedures = 14862		Total no. of procedures = 26483	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Canadian cardiovascular score (CCS), No. (%)												
CCS 1	4140	35.6	1081	24.1	950	19.3	1364	24.8	3395	22.9	7535	28.4
CCS 2	4489	38.6	2363	53.0	2443	50.0	1945	35.2	6751	45.4	11240	42.4
CCS 3	548	4.8	286	6.4	251	5.2	255	4.6	792	5.4	1340	5.0
CCS 4	316	2.8	104	2.4	136	2.8	244	4.4	484	3.2	800	3.0
Asymptomatic	1357	11.6	505	11.3	661	13.5	688	12.4	1854	12.5	3211	12.2
Not available	527	4.6	72	1.6	299	6.2	790	14.4	1161	7.8	1688	6.4
Missing	244	2.0	51	1.2	147	3.0	227	4.2	425	2.8	669	2.6
Intra-aortic balloon pump (IABP), No. (%)												
Yes	211	1.8	103	2.4	166	3.4	168	3.1	437	3.0	648	2.4
No	11283	97.1	4328	97.0	4610	94.4	5231	94.8	14169	95.3	25452	96.2
Missing	127	1.1	31	0.6	111	2.2	114	2.1	256	1.7	383	1.4
Acute coronary syndrome (ACS), No. (%)												
Yes	5076	43.6	1691	37.8	1870	38.2	1619	29.4	5180	34.8	10256	38.7
No	6458	55.6	2771	62.2	3017	61.8	3894	70.6	9682	65.2	16140	60.9
Missing	87	0.8	0	0	0	0	0	0	0	0	87	0.4

	2007-2009		2010		2011		2012		2010-2012		2007-2012	
	Total no. of procedures = 11621		Total no. of procedures = 4462		Total no. of procedures = 4887		Total no. of procedures = 5513		Total no. of procedures = 14862		Total no. of procedures = 26483	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
ACS type, No. (%)												
STEMI	2632	51.8	965	57.0	1157	61.8	968	59.8	3090	59.6	5722	55.8
NSTEMI	1912	37.6	489	29.0	526	28.2	381	23.6	1396	27.0	3308	32.2
UA	495	9.8	231	13.6	177	9.4	237	14.6	645	12.4	1140	11.2
Not available	27	0.6	6	0.4	10	0.6	33	2.0	49	1.0	76	0.8
Missing	10	0.2	0	0	0	0	0	0	0	0	10	0.0
STEMI, No. (%)												
Anterior	1429	54.2	585	60.6	638	55.1	485	50.2	1708	55.2	3137	54.8
Non-anterior	845	32.2	329	34.0	405	35.0	337	34.8	1071	34.7	1916	33.5
Not available	90	3.4	7	0.8	22	1.9	20	2.0	49	1.7	139	2.5
Missing	268	10.2	44	4.6	92	8.0	126	13.0	262	8.4	530	9.2
Ejection fraction (EF) status												
N		4139		2038		1578		1875		5491		9630
Mean (SD)		51.8 (12.9)		51.7 (12.4)		51.2 (12.8)		51.5 (12.4)		51.5 (12.5)		51.6 (12.7)
Median (min,max)		53.0 (10.0, 80.0)		53.0 (15.0, 80.0)		53.0 (18.0, 79.0)		53.0 (14.0, 80.0)		53.0 (14.0, 80.0)		53.0 (10.0, 80.0)
Not available, No. (%)		7112		2233		2983		3276		8492		15604
Missing, No. (%)		370		191		326		362		879		1249



	2007-2009		2010		2011		2012		2010-2012		2007-2012	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Ejection fraction (EF) status, No. (%)												
<30	186	1.6	88	2.0	74	1.6	75	1.4	237	1.6	423	1.6
30-<45	955	8.2	491	11.0	386	7.9	426	7.8	1303	8.8	2258	8.6
45-<55	1103	9.4	515	11.6	386	7.9	498	9.0	1399	9.4	2502	9.3
≥55	1895	16.4	944	21.2	732	15.0	876	15.8	2552	17.1	4447	16.7
Not available	7112	61.2	2233	50.0	2983	61.0	3276	59.4	8492	57.1	15604	59.0
Missing	370	3.2	191	4.2	326	6.6	362	6.6	879	6.0	1249	4.8
Killip class, No. (%)												
<i>Total no. of procedures among patients with STEMI</i>												
I	2632	100	965	100	1157	100	968	100	3090	100	5722	100
II	1003	38.1	266	27.6	346	30.0	431	44.6	1043	33.8	2046	35.9
III	582	22.1	522	54.0	583	50.3	250	25.8	1355	43.8	1937	33.9
IV	61	2.3	18	1.8	13	1.2	25	2.6	56	1.8	117	2.0
Not applicable/Not available	88	3.3	63	6.6	106	9.1	101	10.4	270	8.8	358	6.2
Missing	869	33.0	95	9.8	102	8.8	151	15.6	348	11.2	1217	21.2
	29	1.2	1	0.2	7	0.6	10	1.0	18	0.6	47	0.8

	2007-2009		2010		2011		2012		2010-2012		2007-2012	
	Total no. of procedures = 11621		Total no. of procedures = 4462		Total no. of procedures = 4887		Total no. of procedures = 5513		Total no. of procedures = 14862		Total no. of procedures = 26483	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
STEMI : Time-to-treatment analysis												
*Symptom-to-door time, minutes												
N	333		106		88		160		354		687	
Mean (SD)	258.1 (205.9)		268.6 (232.9)		326.9 (242.9)		265.5 (231.5)		281.7 (235.6)		270.3 (221.8)	
Median (min,max)	195.0 (10.0,1000.0)		177.5 (10.0, 1070.0)		252.5 (30.0, 1040.0)		190.5 (13.0, 1350.0)		205.0 (10.0, 1350.0)		197.0 (10.0, 1350.0)	
Negative/zero, No. (%)	56 (16.5)		18 (5.2)		15 (3.1)		24 (4.3)		57 (1.6)		113 (3.1)	
Not available, No. (%)	2243 (66.5)		841 (74.2)		1054 (91.1)		784 (86.7)		2679 (86.7)		4922 (86.0)	
*Door-to-balloon time, minutes												
N	322		113		84		147		344		666	
Mean (SD)	134.4 (138.8)		128.7 (124.7)		136.5 (133.3)		161.3 (190.7)		144.5 (158.3)		139.6 (149.2)	
Median (min,max)	90.0 (5.0,870.0)		90.0 (11.0, 785.0)		93.5 (3.0, 754.0)		88.0 (11.0, 963.0)		90.0 (3.0, 963.0)		90.0 (3.0, 963.0)	
Negative/zero, No. (%)	40 (12.4)		9 (2.6)		14 (3.3)		14 (3.1)		37 (10.7)		77 (11.4)	
Not available, No. (%)	2270 (70.6)		843 (74.2)		1059 (91.5)		807 (83.4)		2709 (87.7)		4979 (87.0)	
*Door-to-balloon time, minutes, No. (%)												
<90	159 (49.4)		54 (47.8)		39 (46.4)		75 (83.4)		168 (48.8)		327 (49.1)	
≥90	163 (50.6)		59 (52.2)		45 (53.6)		72 (81.6)		176 (50.2)		339 (50.9)	
Negative/zero, No. (%)	40 (12.4)		9 (2.6)		14 (3.3)		14 (3.1)		37 (10.7)		77 (11.4)	
Not available	2270 (70.6)		843 (74.2)		1059 (91.5)		807 (83.4)		2709 (87.7)		4979 (87.0)	



	2007-2009		2010		2011		2012		2010-2012		2007-2012	
	Total no. of procedures = 11621	No.	Total no. of procedures = 4462	No.	Total no. of procedures = 4887	No.	Total no. of procedures = 5513	No.	Total no. of procedures = 14862	No.	Total no. of procedures = 26483	No.
*Transfer time	%		%		%		%		%		%	
N	93		24		34		49		107		200	
Mean (SD)	263.5 (236.7)		221.4 (165.8)		273.2 (182.4)		250.9 (165.2)		251.4 (170.4)		257.0 (203.5)	
Median (min,max)	180.0 (15.0, 1260.0)		138.0 (42.0, 556.0)		242.0 (15.0, 940.0)		213.0 (25.0, 682.0)		220.0 (15.0, 940.0)		201.5 (15.0, 1260.0)	
Negative/zero, No. (%)	50 (4.3)	1.9	9 (0.2)	0.9	22 (0.5)	1.9	40 (0.7)	4.1	71 (0.5)	2.3	121 (0.4)	2.1
Not available, No. (%)	2489 (21.4)	94.6	932 (20.9)	96.6	1101 (22.5)	95.2	879 (15.8)	90.8	2912 (19.6)	94.2	5401 (20.0)	94.4
Glomerular filtration rate (GFR), MDRD, No. (%)												
<15	368 (3.2)	3.2	118 (2.6)	2.6	143 (2.9)	2.8	143 (2.6)	2.6	404 (2.7)	2.7	772 (2.9)	2.9
15-<30	237 (2.0)	2.0	99 (2.2)	2.4	86 (1.8)	1.8	111 (2.0)	2.1	296 (2.0)	2.0	533 (2.0)	2.0
30-<45	620 (5.3)	5.3	247 (5.5)	5.5	196 (4.0)	4.0	222 (4.0)	4.0	665 (4.4)	4.4	1285 (4.9)	4.9
45-<60	1763 (15.2)	15.2	576 (12.9)	12.9	541 (11.1)	11.1	573 (10.4)	10.4	1690 (11.4)	11.4	3453 (13.0)	13.0
≥60	8068 (69.4)	69.4	3072 (68.8)	68.8	3321 (68.0)	68.0	3618 (65.6)	65.6	10011 (67.4)	67.4	18079 (68.3)	68.3
Missing	565 (4.9)	4.9	350 (7.8)	7.8	600 (12.3)	12.3	846 (15.3)	15.3	1796 (12.1)	12.1	2361 (8.9)	8.9

* Only applicable to STEMI patients

Table 3.2.1 Time to treatment for STEMI, with transfer, by years, NCVI-PCI Registry, 2007-2012

Year	With transfer										
	2007	2008	2009	2010	2011	2012					
Symptom- to -door time (minutes)											
N	50	37	32	23	46	68					
Mean (SD)	315.8 (219.9)	327.4 (246.4)	277.5 (188.3)	292.3 (221.6)	391.6 (260.3)	319.9 (270.7)					
Median (min,max)	267.5 (22.0, 881.0)	260.0 (44.0, 1000.0)	230.5 (13.0, 630.0)	210.0 (40.0, 720.0)	355.0 (45.0, 1040.0)	244.5 (13.0, 1350.0)					
Door- to -balloon time (minutes)											
N	42	32	32	27	40	67					
Mean (SD)	111.4 (110.9)	105.7 (153.0)	130.8 (166.0)	70.8 (57.1)	123.7 (146.7)	205.8 (249.2)					
Median (min,max)	86.5 (5.0, 542.0)	58.0 (17.0, 680.0)	77.5 (10.0, 842.0)	60.0 (14.0, 316.0)	73.0 (10.0, 754.0)	88.0 (11.0, 963.0)					
Transfer- to -PCI centre time (minutes)											
N	34	28	31	24	34	49					
Mean (SD)	304.4 (277.3)	248.9 (213.1)	231.7 (207.8)	221.4 (165.8)	273.2 (182.4)	250.9 (165.2)					
Median (min,max)	237.0 (15.0, 1260.0)	177.5 (15.0, 840.0)	155.0 (30.0, 855.0)	138.0 (42.0, 556.0)	242.0 (15.0, 940.0)	213.0 (25.0, 682.0)					
Symptom- to -balloon time (minutes)											
N	40	32	29	20	35	80					
Mean (SD)	409.9 (196.7)	366.3 (210.0)	376.9 (257.0)	321.8 (223.5)	454.4 (270.5)	431.7 (311.1)					
Median (min,max)	389.0 (90.0, 806.0)	333.5 (63.0, 868.0)	265.0 (41.0, 967.0)	213.0 (90.0, 840.0)	390.0 (60.0, 1140.0)	332.5 (63.0, 1412.0)					



Table 3.2.2 Time to treatment for STEMI, without transfer, by years, NCVS-PCI Registry, 2007-2012

Year	Without transfer									
	2007	2008	2009	2010	2011	2012				
Symptom- to -door time (minutes)										
N	43	55	88	74	32	65				
Mean (SD)	223.1 (183.4)	245.0 (194.0)	241.5 (206.2)	264.9 (243.6)	257.2 (191.0)	225.2 (203.7)				
Median (min,max)	152.0 (22.0, 955.0)	191.0 (30.0, 802.0)	172.5 (10.0, 890.0)	170.0 (10.0, 1070.0)	233.5 (30.0, 690.0)	135.0 (15.0, 840.0)				
Door- to -balloon time (minutes)										
N	39	52	96	76	34	52				
Mean (SD)	126.6 (90.9)	162.5 (162.8)	135.2 (126.4)	142.4 (114.7)	160.6 (130.4)	147.8 (127.8)				
Median (min,max)	104.0 (30.0, 498.0)	110.5 (7.0, 870.0)	94.0 (24.0, 639.0)	103.5 (13.0, 660.0)	130.5 (3.0, 608.0)	101.5 (30.0, 650.0)				
Symptom- to -balloon time (minutes)										
N	36	44	83	68	31	57				
Mean (SD)	313.9 (167.6)	350.3 (209.4)	343.5 (216.9)	387.6 (257.0)	413.3 (233.8)	348.8 (195.1)				
Median (min,max)	294.0 (84.0, 719.0)	301.0 (32.0, 945.0)	284.0 (43.0, 974.0)	323.5 (2.0, 1175.0)	375.0 (90.0, 1080.0)	285.0 (98.0, 873.0)				