

DTB Strategies of STEMI

- Taiwan Experience

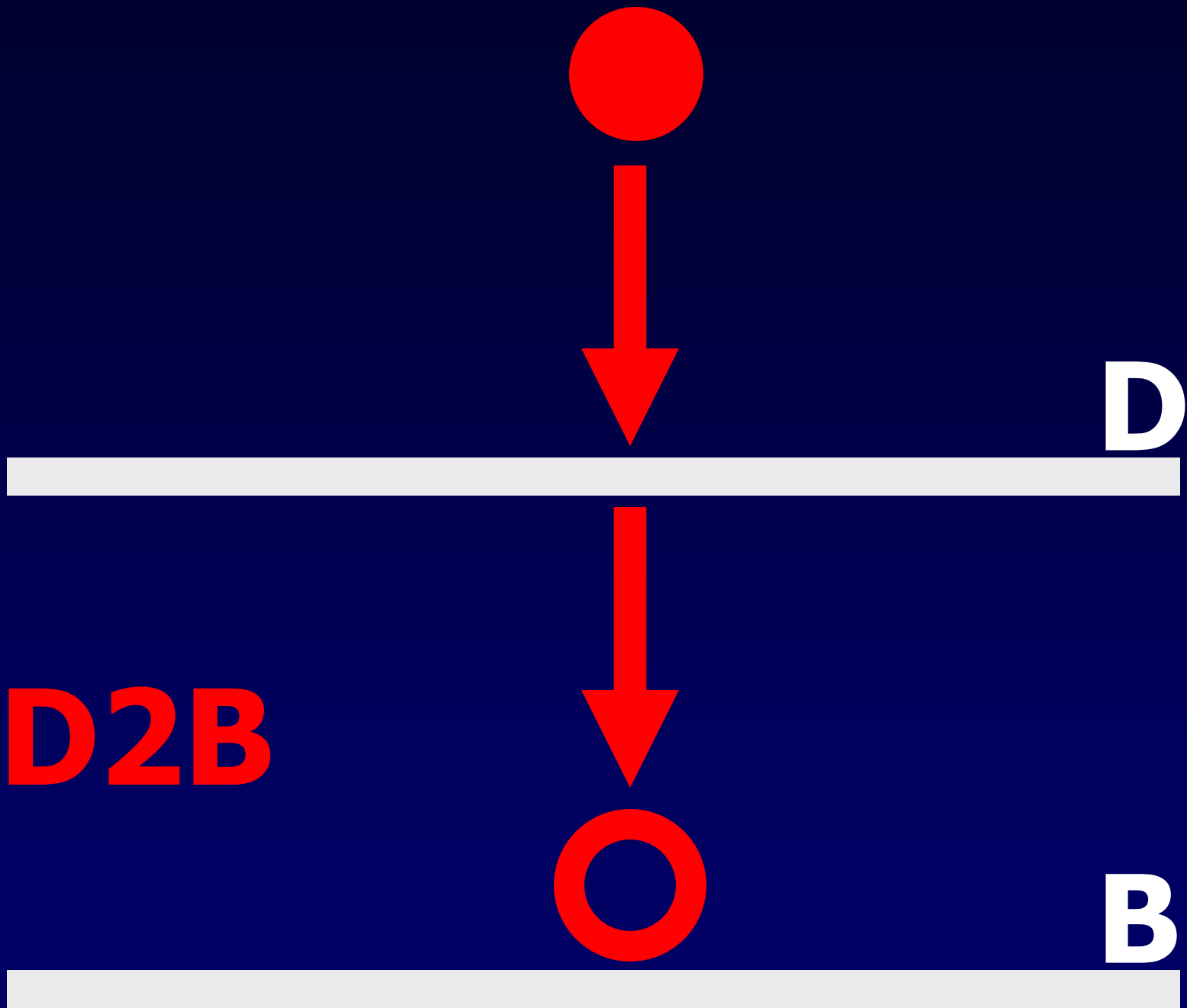
JUN-JACK CHENG M.D., PhD

Shin Kong Hospital, Taipei, Taiwan

President of Taiwan Society of Cardiovascular Interventions

Acute myocardial infarction

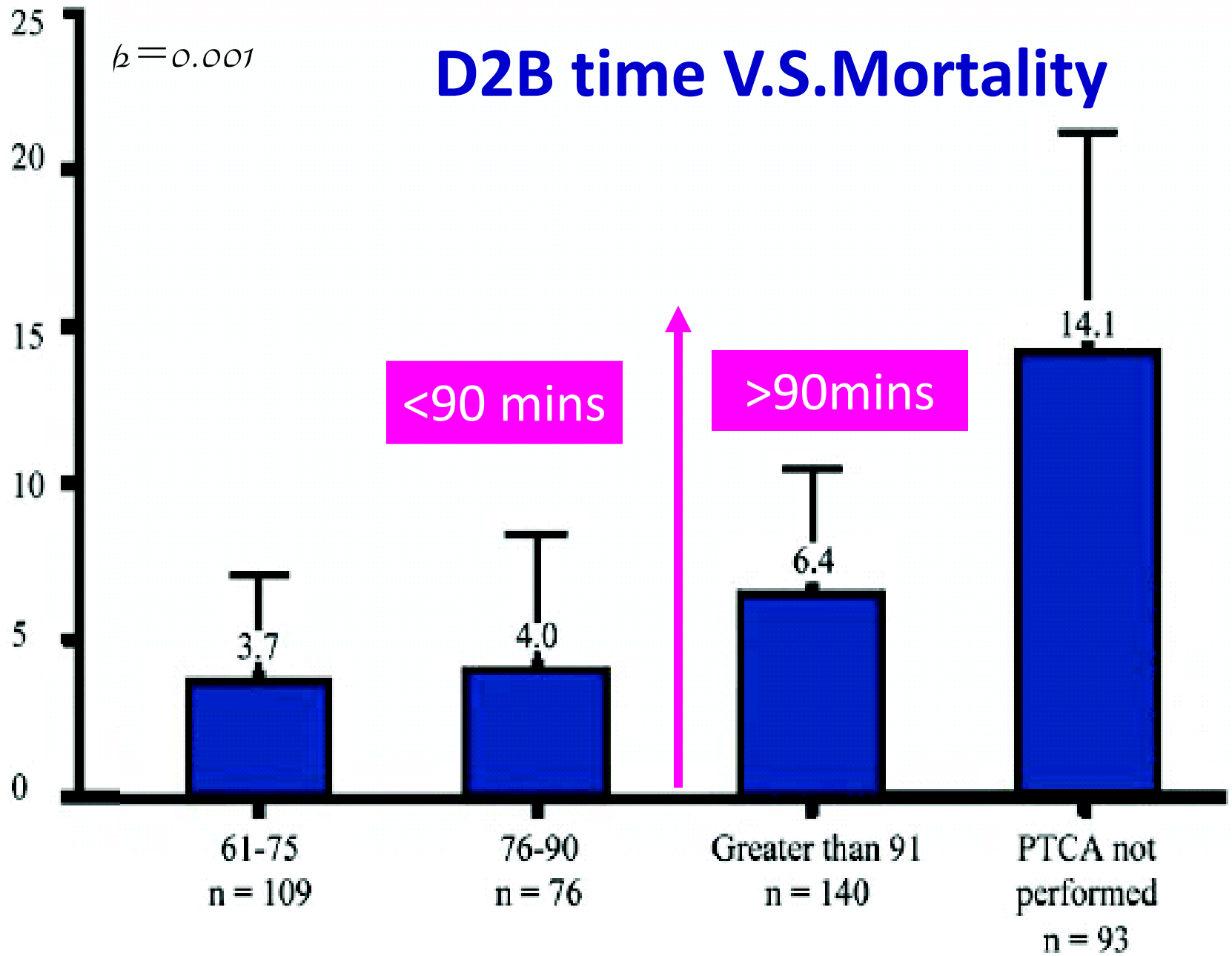
- AMI is one of the most important cardiovascular diseases.
- Primary PCI with door-to-balloon time < 90 min becomes the preferred initial treatment for ST segment elevation MI (STEMI).
- Evidence-based medications, including dual antiplatelet therapy (DAPT), beta blocker, renin-angiotensin system (RAS) blocker and statin improve the clinical outcomes of AMI.



D2B time V.S.Mortality

$p = 0.001$

30 day mortality (%)



What is the Goal in D2B?

Median D2B \leq 90 Minutes

OR

75% of Patients with D2B \leq 90 Minutes

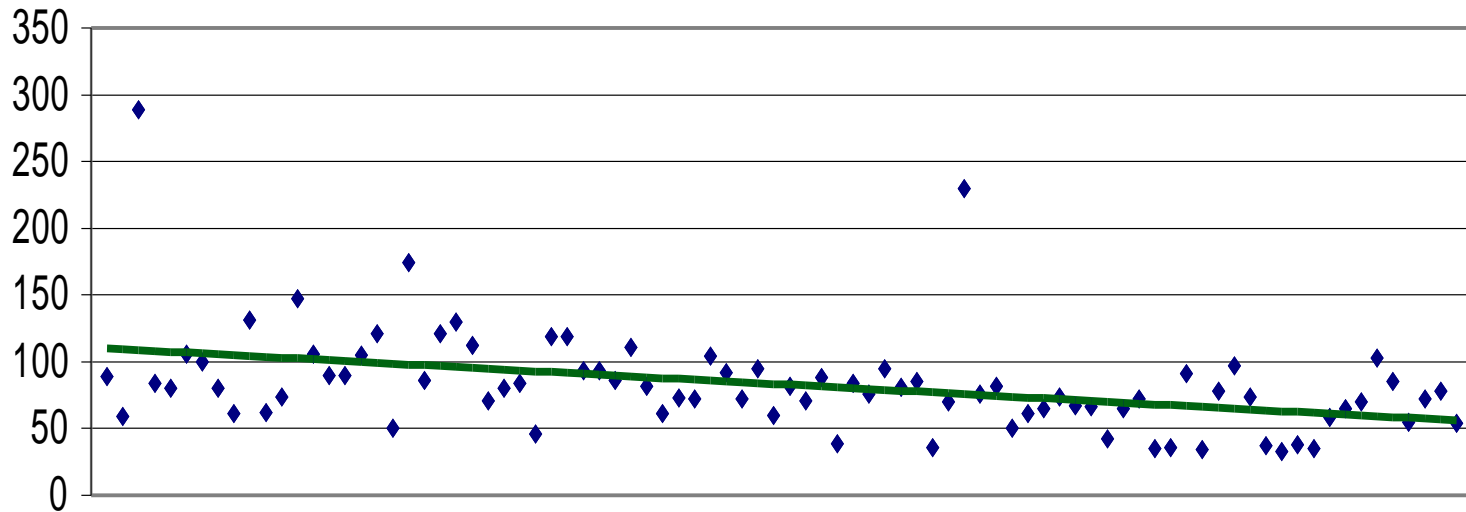
*(AHA / ACC / Aust Heart Foundation / ESC
/ SCAI guidelines, ACC D2B Alliance 2010)*

D2B Alliance

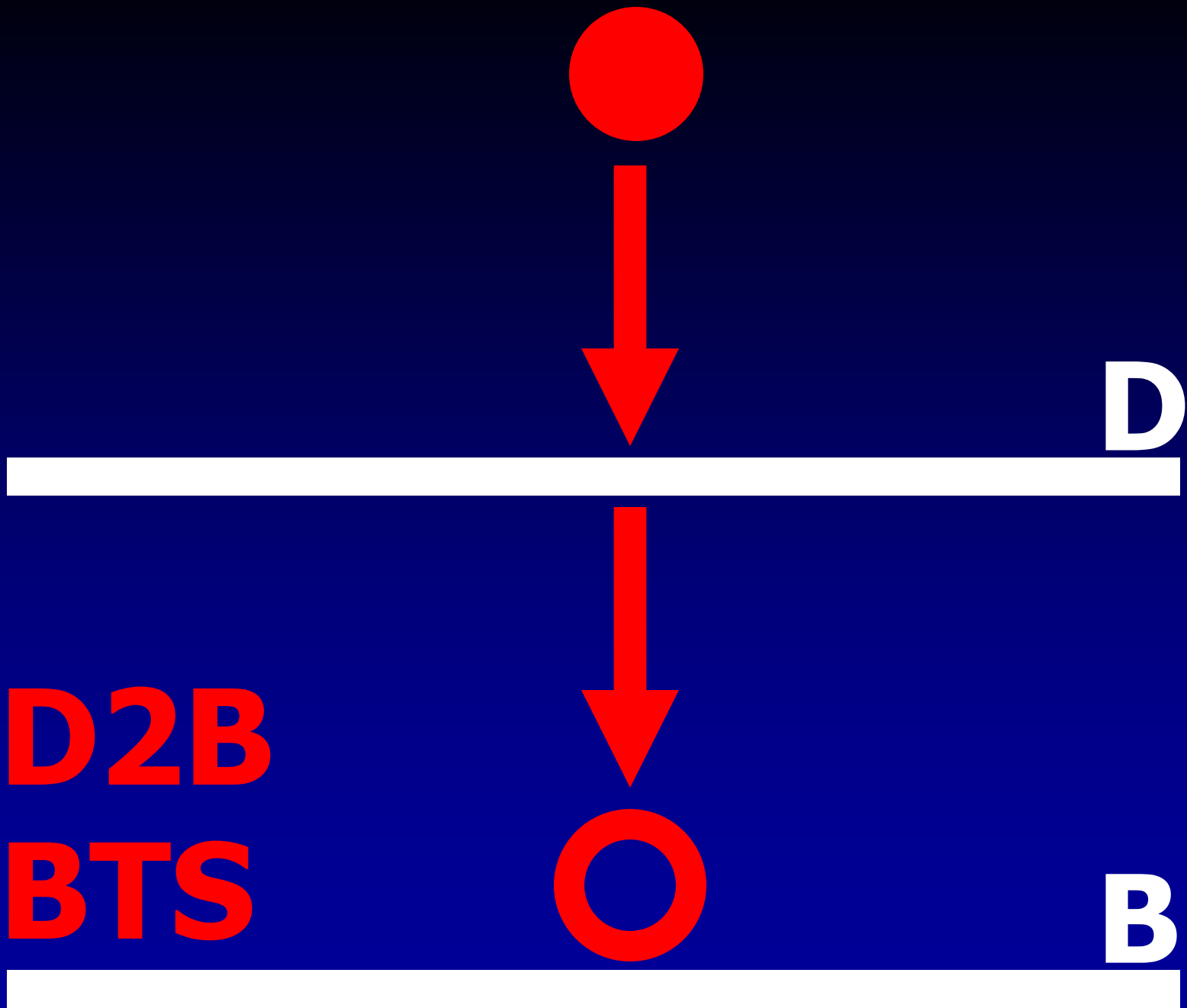
- (1) ED physician activates cath lab
- (2) One call activates the cath lab
- (3) Cath team ready in 20-30 minutes
- (4) Prompt data feedback
- (5) Senior management commitment
- (6) Team-based approach

D2B Alliance

Sentara Leigh Hospital



January 1, 2006 thru September 30, 2007



D2B ALLIANCE — Taiwan Experience



醫策會

Taiwan Joint Commission on Hospital Accreditation

BTS





PPCI

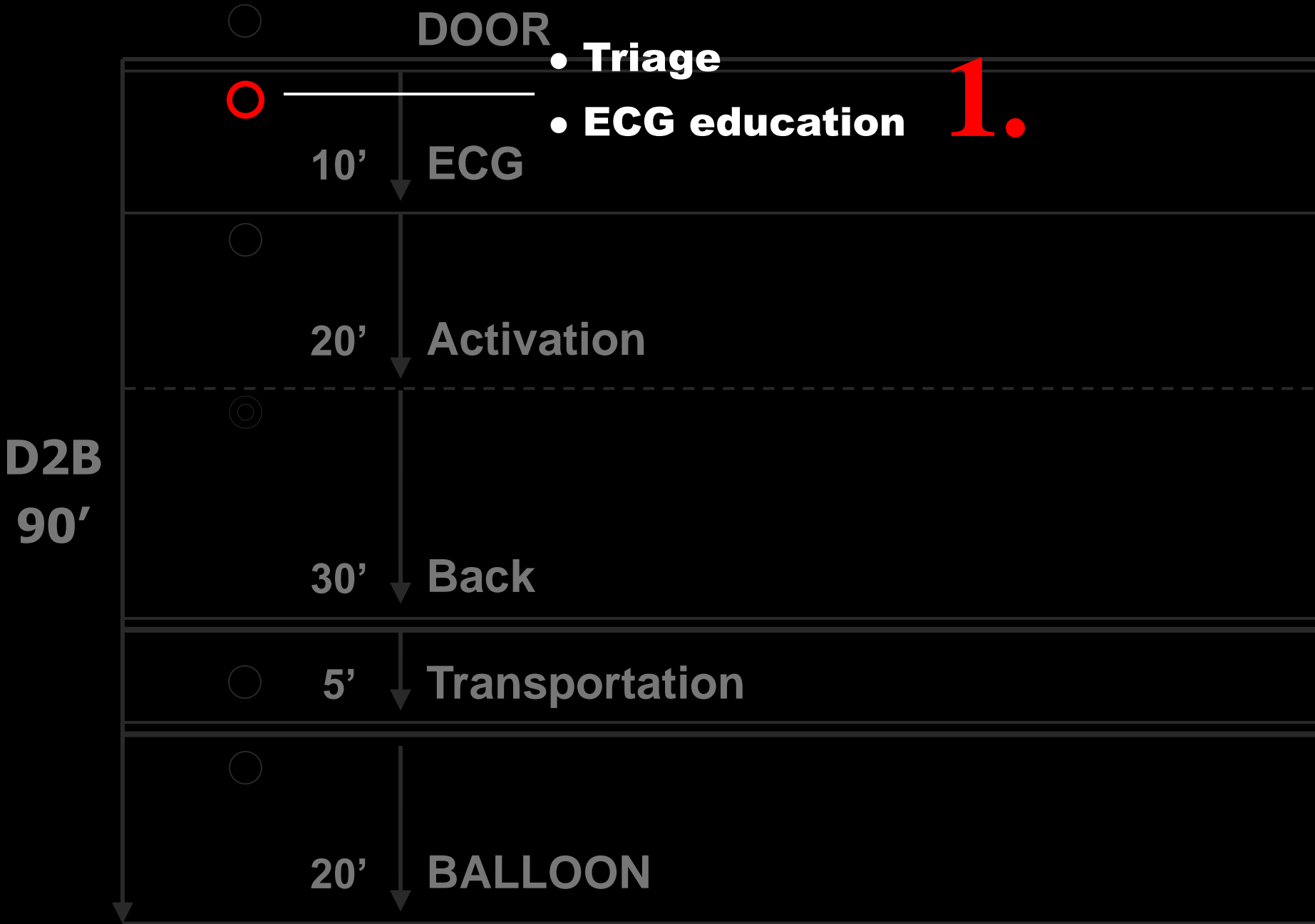
Impact of an Audit Program and Other Factors on Door-to-balloon Times in Acute ST-elevation Myocardial Infarction Patients Destined for Primary Coronary Intervention

Chao-Lun Lai, MD, Chieh-Min Fan, MD, Pen-Chih Liao, MD, Kuang-Chau Tsai, MD, Chi-Yu Yang, MD, Shu-Hsun Chu, MD, and Kuo-Liong Chien, MD, PhD

Table 2
Clinical Endpoints Specified by Groups

	Control Group (n = 104)	Intervention Group (n = 76)	p-Value
Door-to-balloon time, minutes			
Geometric mean (95% CI)	164.9 (150.3, 180.9)	141.9 (127.4, 158.2)	0.039
Median (IQR)	147.5 (114.5–204.5)	138.0 (110.5–181.0)	0.09
Door-to-balloon time less than 90 minutes, %	8.7	15.8	0.14
Length of hospitalization, days			
Median (IQR)	6.0 (5.0–8.0)	6.0 (5.0–8.0)	0.69
In-hospital mortality rate, /10 ³ person-days	5.41	3.28	0.50*

IQR = interquartile range; CI=confidence interval
*By log-rank test.



Broken Heart Score

	Score	Patient
≥ 30 y/o, Typical chest pain	2	
Epigastralgia	1	
Cold Sweating	1	
Dyspnea	1	
Total score:		

- Total score ≥ 3 → **ECG !**
- Total score = 2 → **Fast tract: ECG First**
- Total score = 1 → **Routine Triage**
- **No inclusion, No check**

AMI Drugs Pack

D2B Alliance

96.5
改善前RPN
240-700(I-II級)

標竿學習：歐美準則Guideline

- 由心臟內科依美國暨歐洲心臟科醫學會治療準則
- 制訂心肌梗塞處方集
- 當急救間醫師遇到心肌梗塞病人
- 則立即開立 heparin 4000 unit

各位同事：

當接到 MER999 之審核

藥：Tapal 3#, Clopidogrel

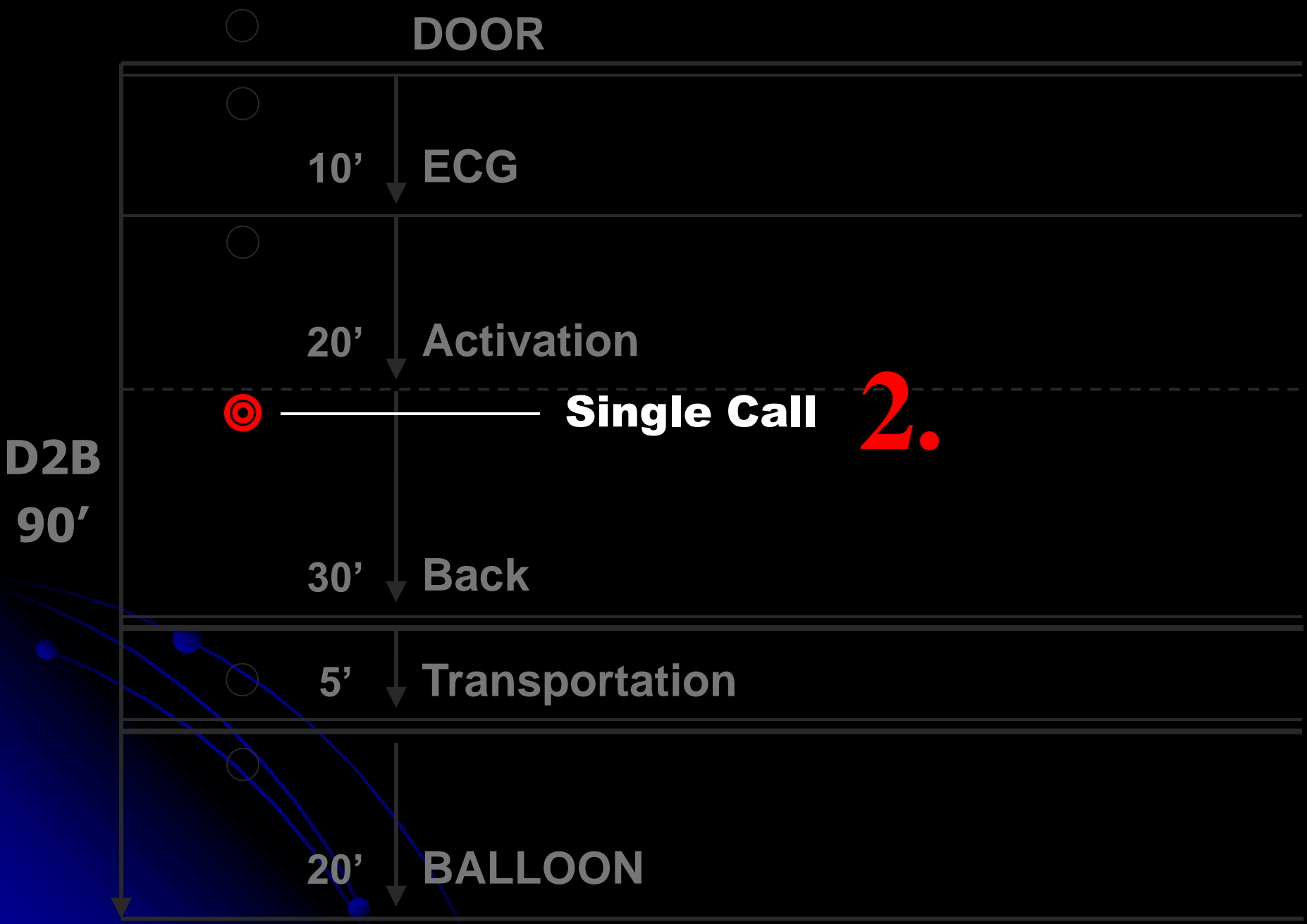
後再審即可--for 急作心

AMI DRUGS PACK
(內含 Clopidogrel 300mg, Aspirin 300mg)
主護至藥局立即領取
兩分鐘內給病人服用藥物

保桂通 Plavix
clopidogrel 75 mg

Acute STEMI Explanation

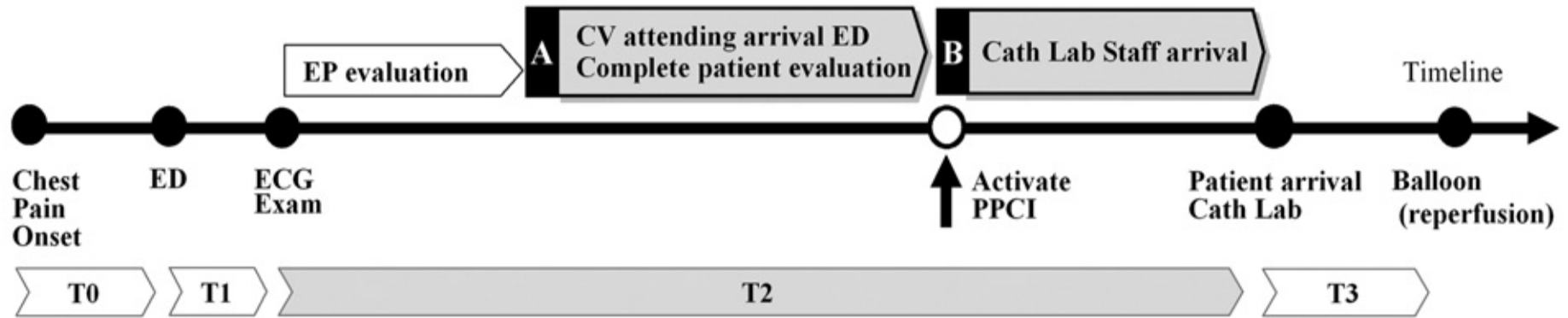




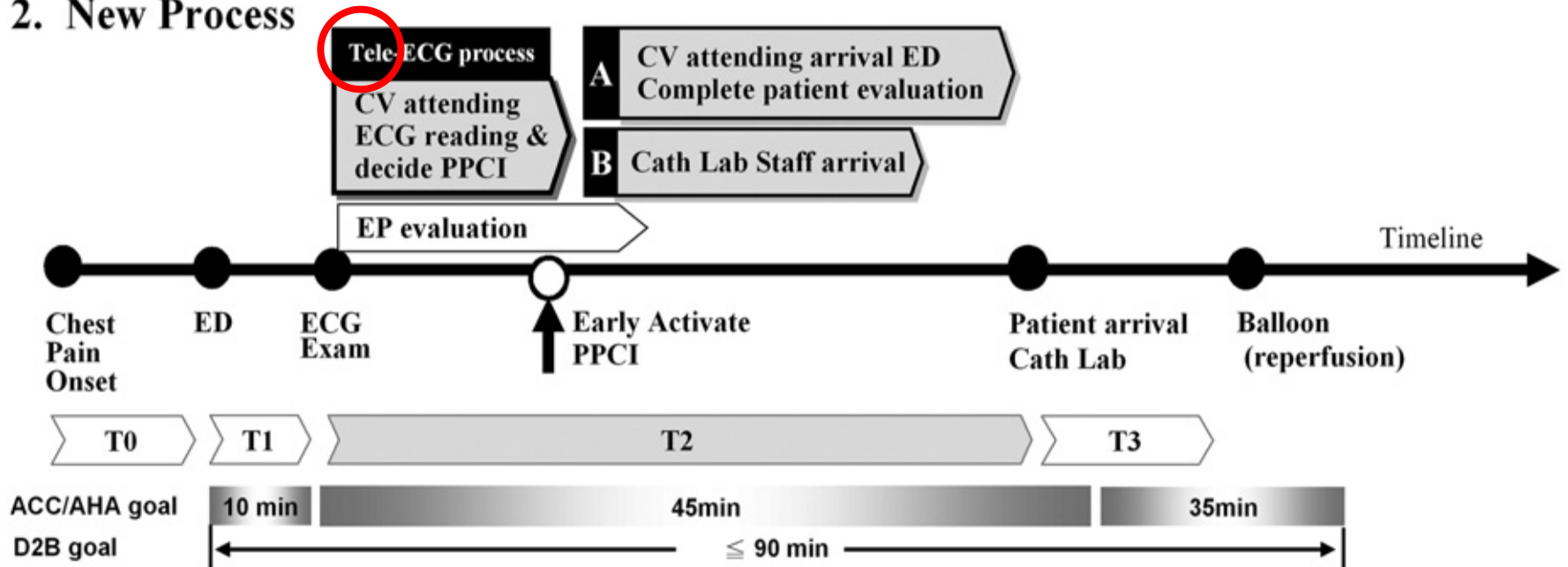
**Effect of Emergency Department In-Hospital
Tele-~~Electrocardiographic~~ Triage and Interventional
Cardiologist Activation of the Infarct Team on Door-to-Balloon
Times in ST-Segment-Elevation Acute Myocardial Infarction**

Kuan-Chun Chen, MD^{a,d}, David Hung-Tsang Yen, MD, PhD^{a,c}, Chen-De Chen, MD^e,
Mason Shing Young, MD^d, and Wei-Hsian Yin, MD, PhD^{b,d,*}

1. Conventional Process



2. New Process

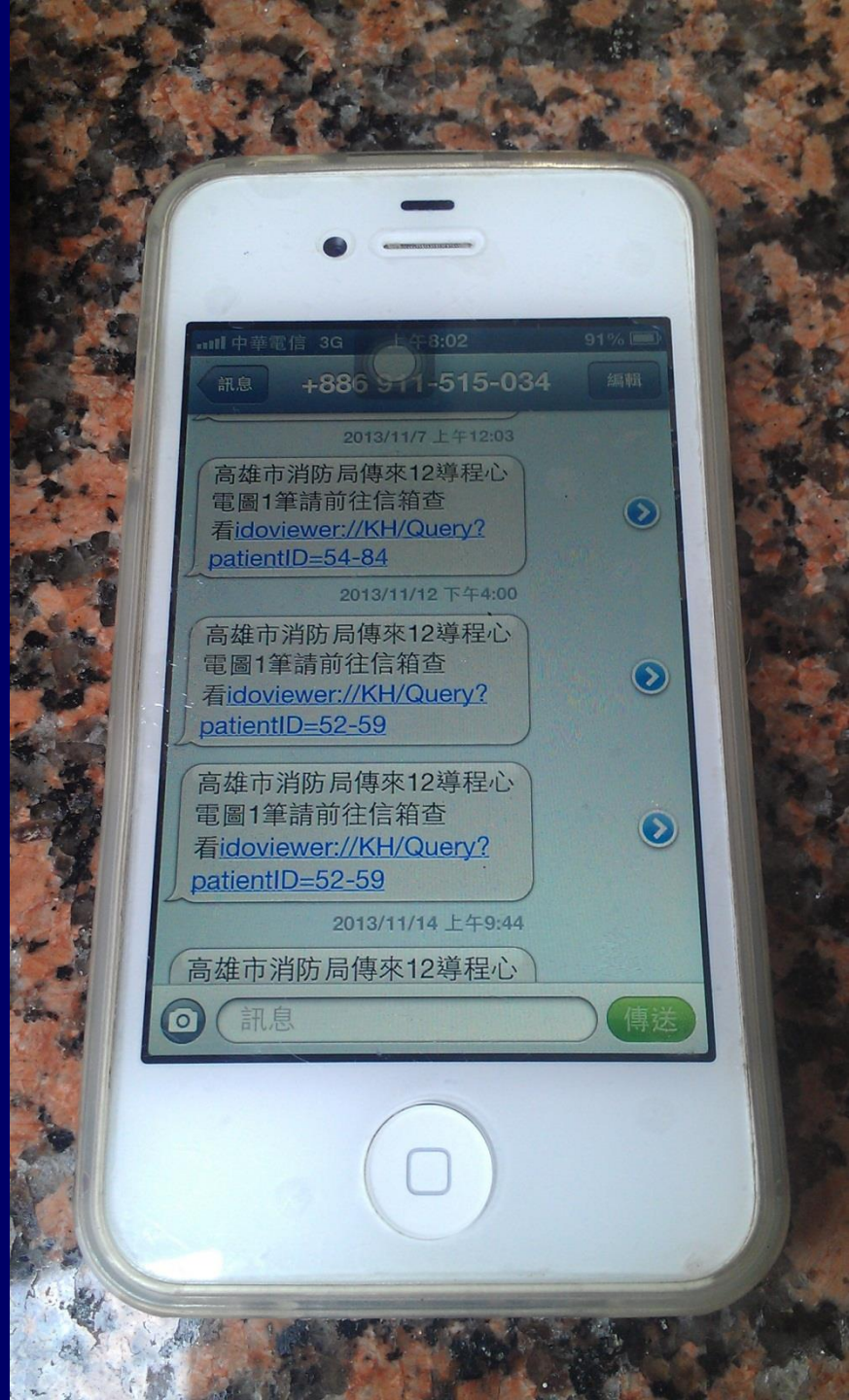
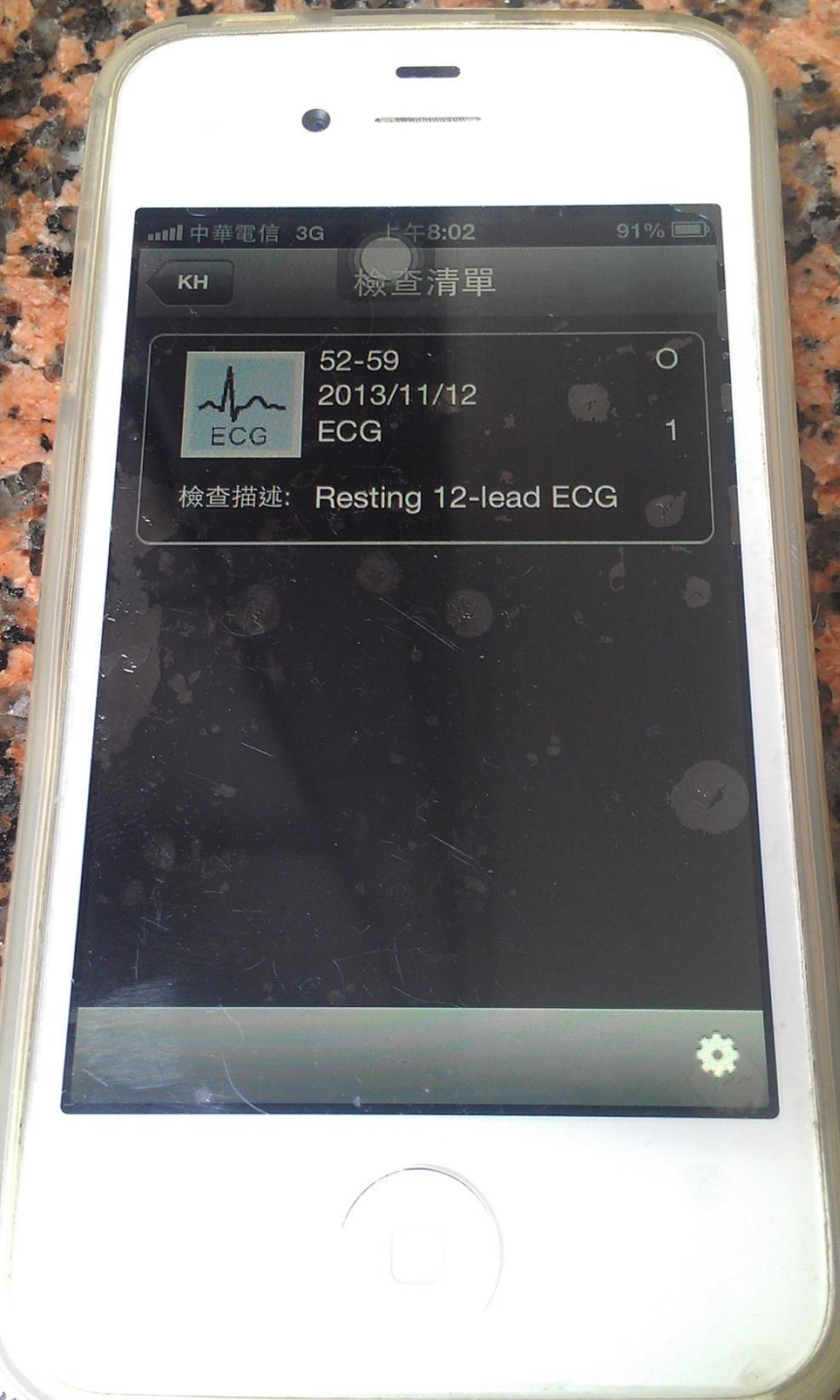


Effect of Emergency Department In-Hospital Tele-Electrocardiographic Triage and Interventional Cardiologist Activation of the Infarct Team on Door-to-Balloon Times in ST-Segment-Elevation Acute Myocardial Infarction

Kuan-Chun Chen, MD^{a,d}, David Hung-Tsang Yen, MD, PhD^{a,c}, Chen-De Chen, MD^e, Mason Shing Young, MD^d, and Wei-Hsian Yin, MD, PhD^{b,d,*}

Table 2
Intervals before and after introduction of tele-electrocardiographic protocol

	Tele-ECG Group (n = 51)	Control Group (n = 54)	Median Difference	p Value
Prehospital on-scene time (hours)	2.6 (1–9)	4.8 (1–8)	–2.2	0.191
Door-to-balloon time (minutes)	86 (75–95)	125 (90–127)	–39	<0.0001
Door-to-balloon time <90 minutes (%)	76	44	33	0.0001
Door-to-electrocardiography time (minutes)	6 (2–8)	9 (5–11)	–3	0.005
Electrocardiography-to-infarct team activation time (minutes)	7 (4–12)	25 (11–45)	–18	<0.0001
Infarct team activation time to catheter laboratory time (minutes)	42 (31–50)	44 (35–60)	–2	0.018
Catheter laboratory-to-balloon time (minutes)	31 (23–38)	35 (25–50)	–4	0.011



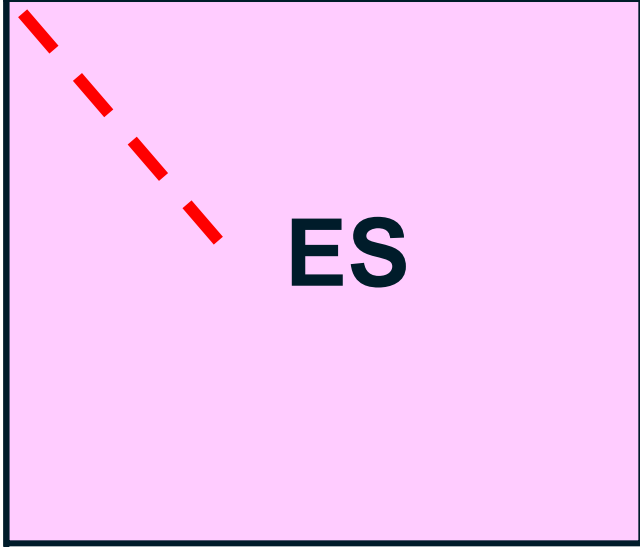
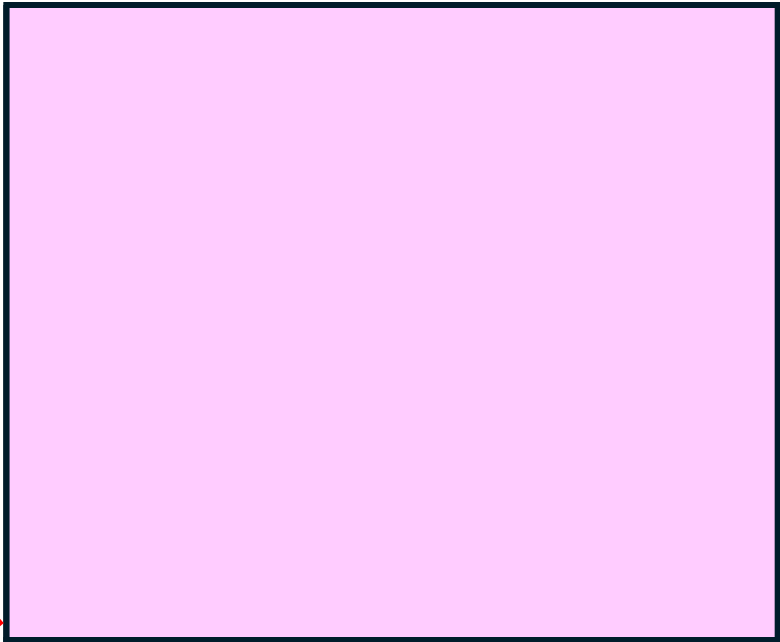
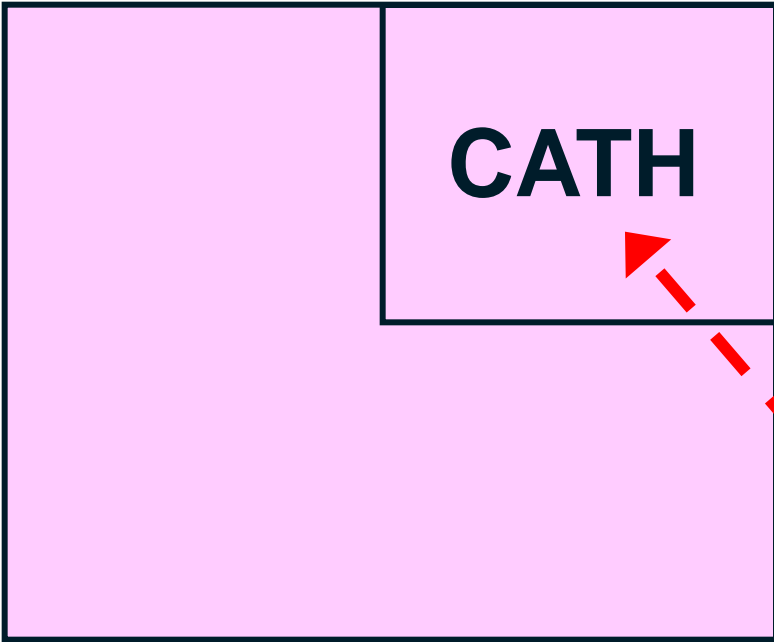


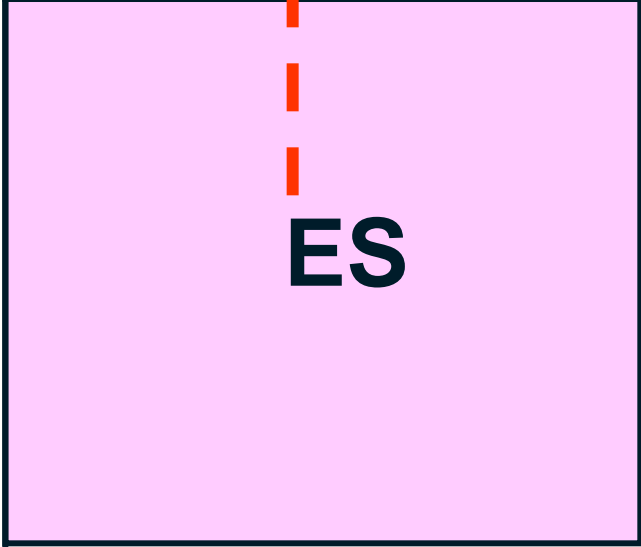
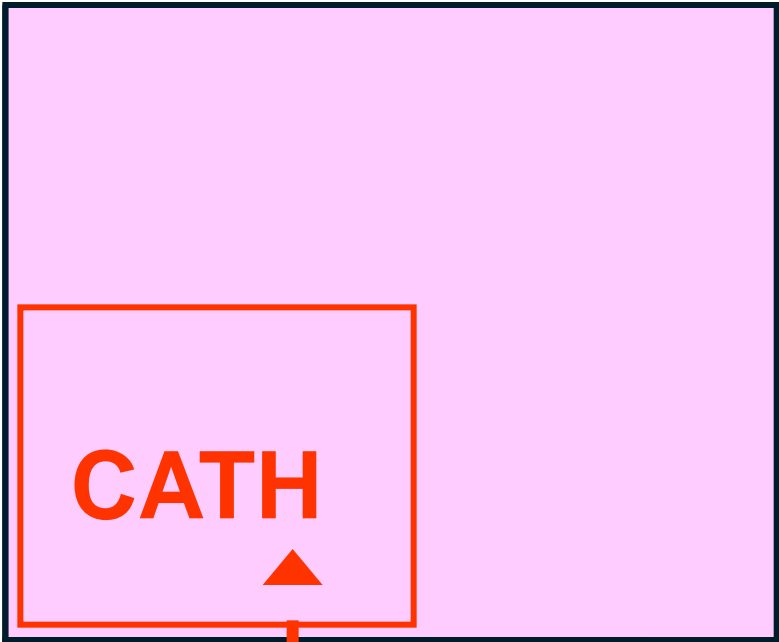
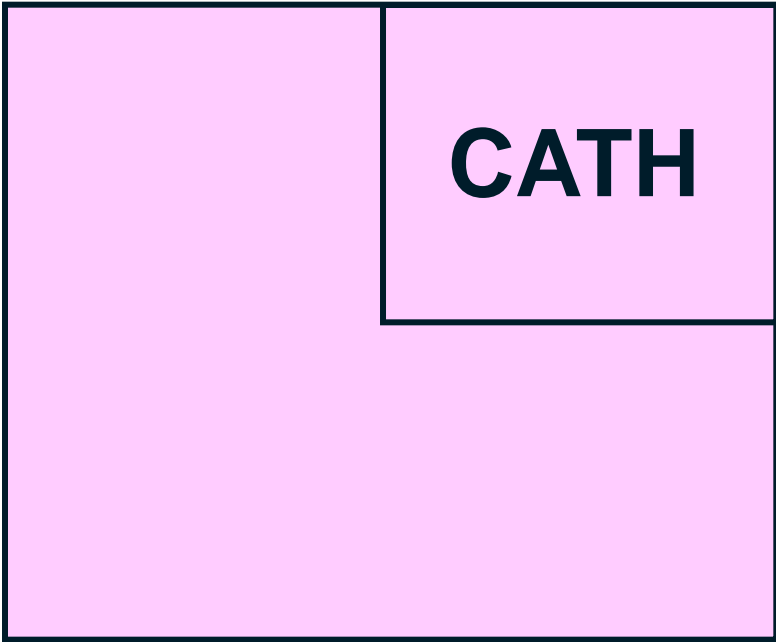


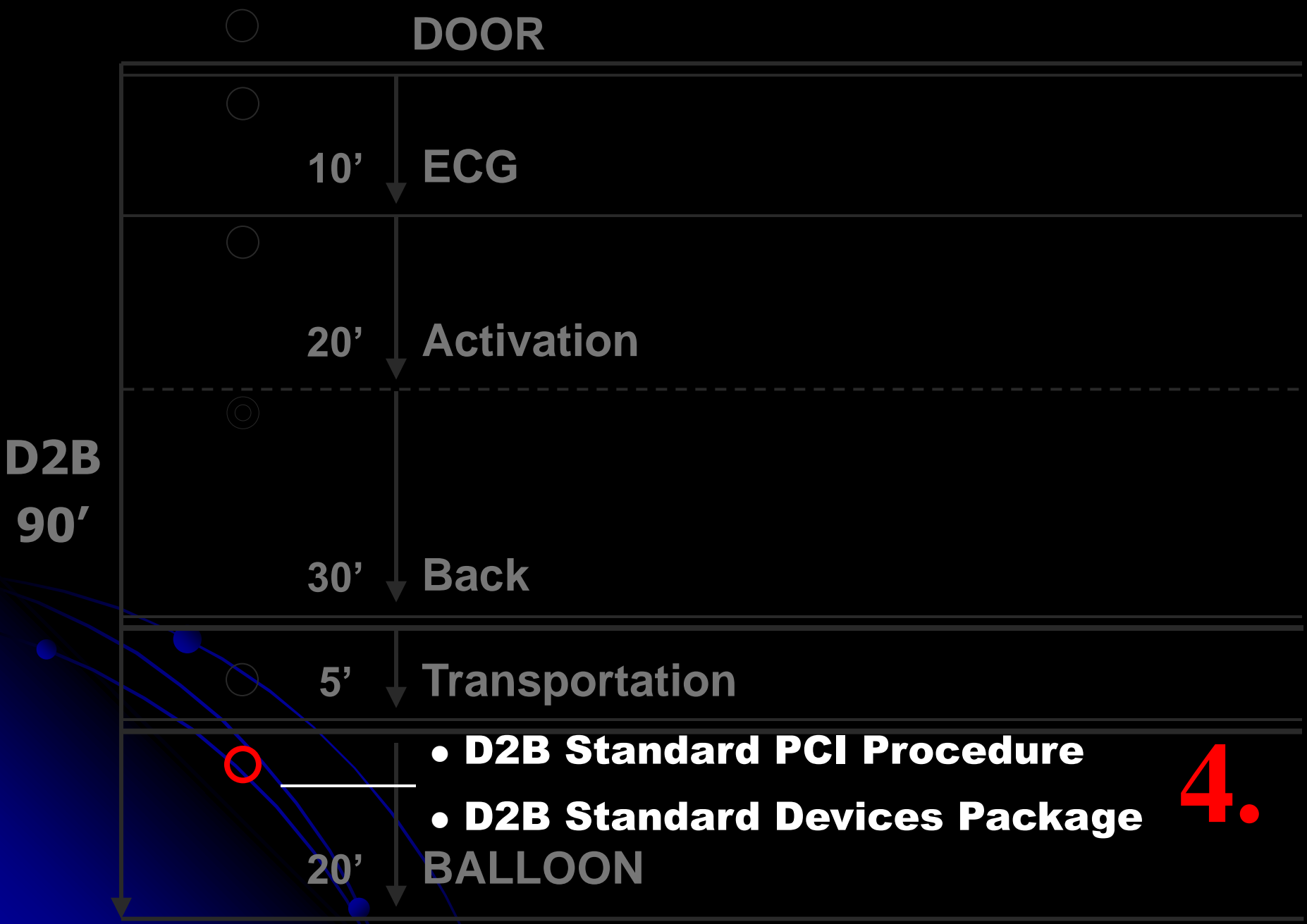
CATH



ES







4.

AMI Catheter Pack

項	目	數	量
1.	5cc空針	1	支
2.	10cc空針	2	支
3.	30cc空針	1	支
4.	18號 puncture needle	1	支
5.	7 Fr SHEATH	1	付
6.	Manifold	2	個
7.	Presssure line	4	條
8.	Diagnostic catheter JLA/6 JR46	各	1支
9.	Contrast		100cc
10.	Guiding catheter JLA/6 or JR46	各	1支

After

AMI CATH PACK



1st Edition Device Pack



2nd Edition Device Pack 高榮



DOOR



10' ECG



20' Activation



D2B
90'

30' Back

5' Transportation

20' BALLOON

- Immediate Feed Back
- Routine Conference



5.

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目標

(一) 提升 EDI (English, IT and Innovation) 小學師範生
(具體：70%)

- 1. 提高學生對 EDI 的認識及參與 EDI 活動，以促進其一生及持續的學習及個人發展。

(二) 提升學生對 EDI 的認識及參與 EDI 活動，以促進其一生及持續的學習及個人發展。

- 1. 學生了解 EDI 的意義及重要性。
- 2. 學生了解 EDI 的意義及重要性。

監測中之主要指標

- 1. 學生對 EDI 的認識及參與 EDI 活動。
- 2. 學生對 EDI 的認識及參與 EDI 活動。
- 3. 學生對 EDI 的認識及參與 EDI 活動。

成果 (2016/07-2016/12)

...
...
...
...



改善措施

- 1. 提高學生對 EDI 的認識及參與 EDI 活動。
- 2. 提高學生對 EDI 的認識及參與 EDI 活動。

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未來發展中心

...

未來發展中心

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續口語化學習

...

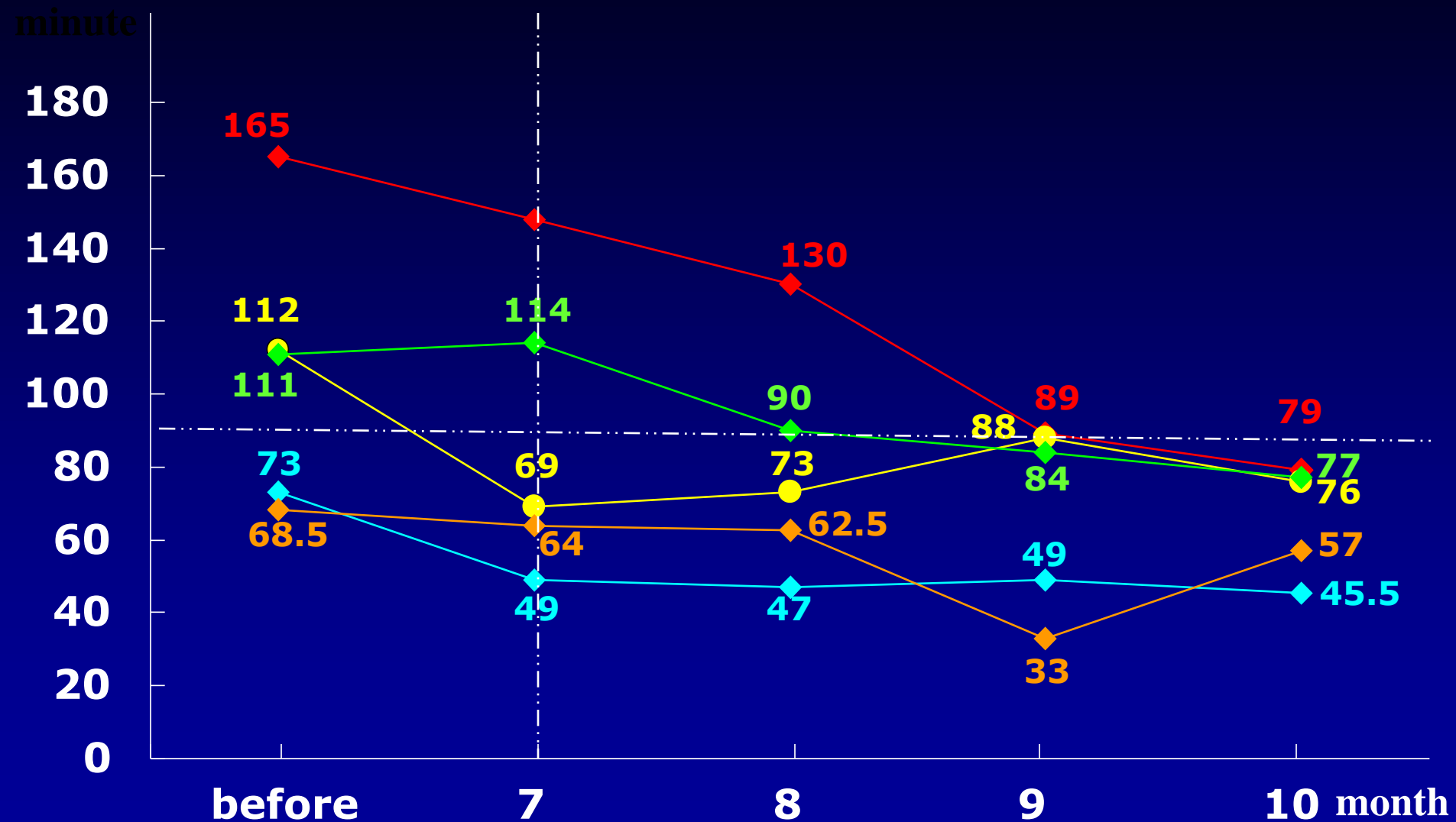
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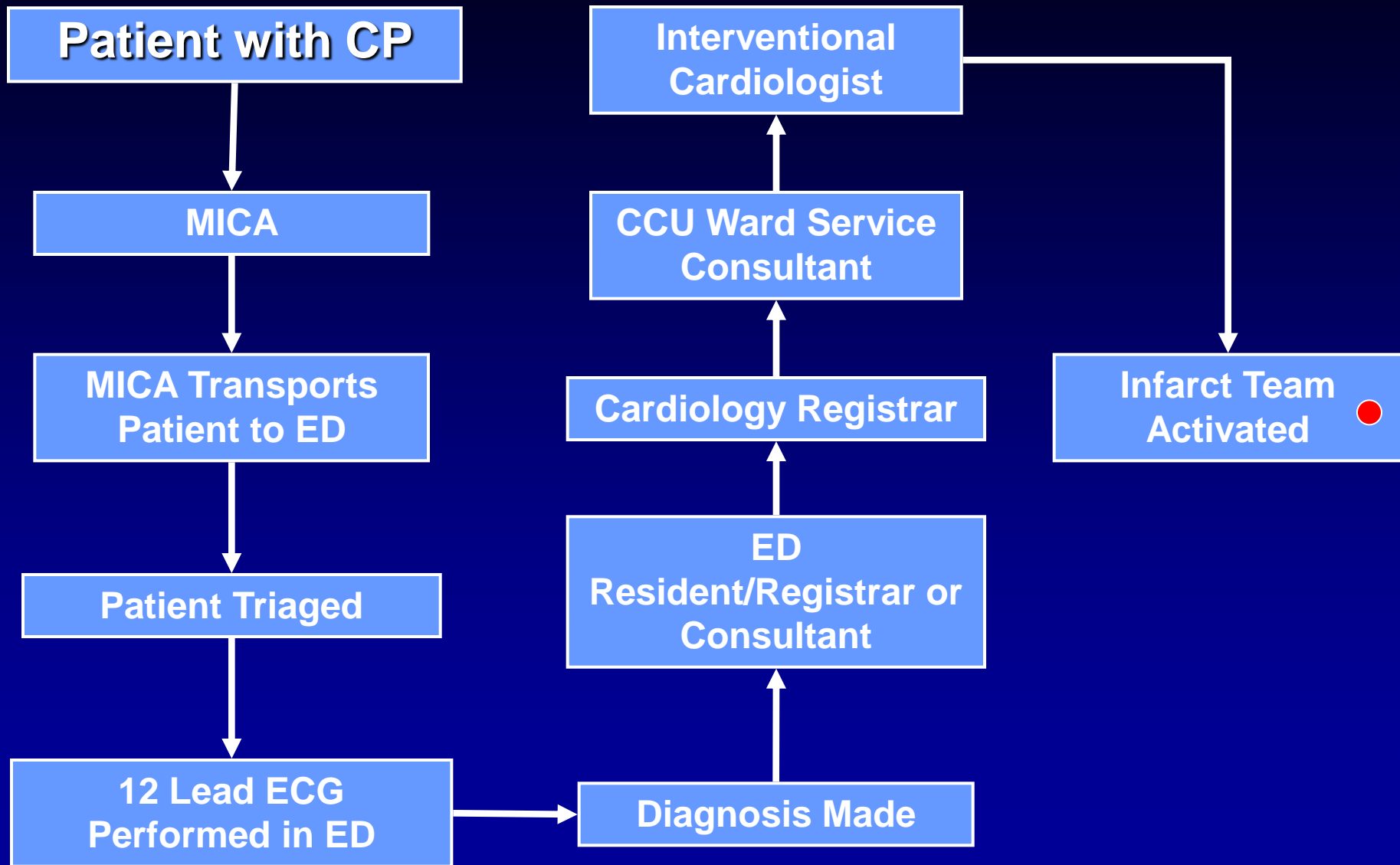
Fishbone Diagram

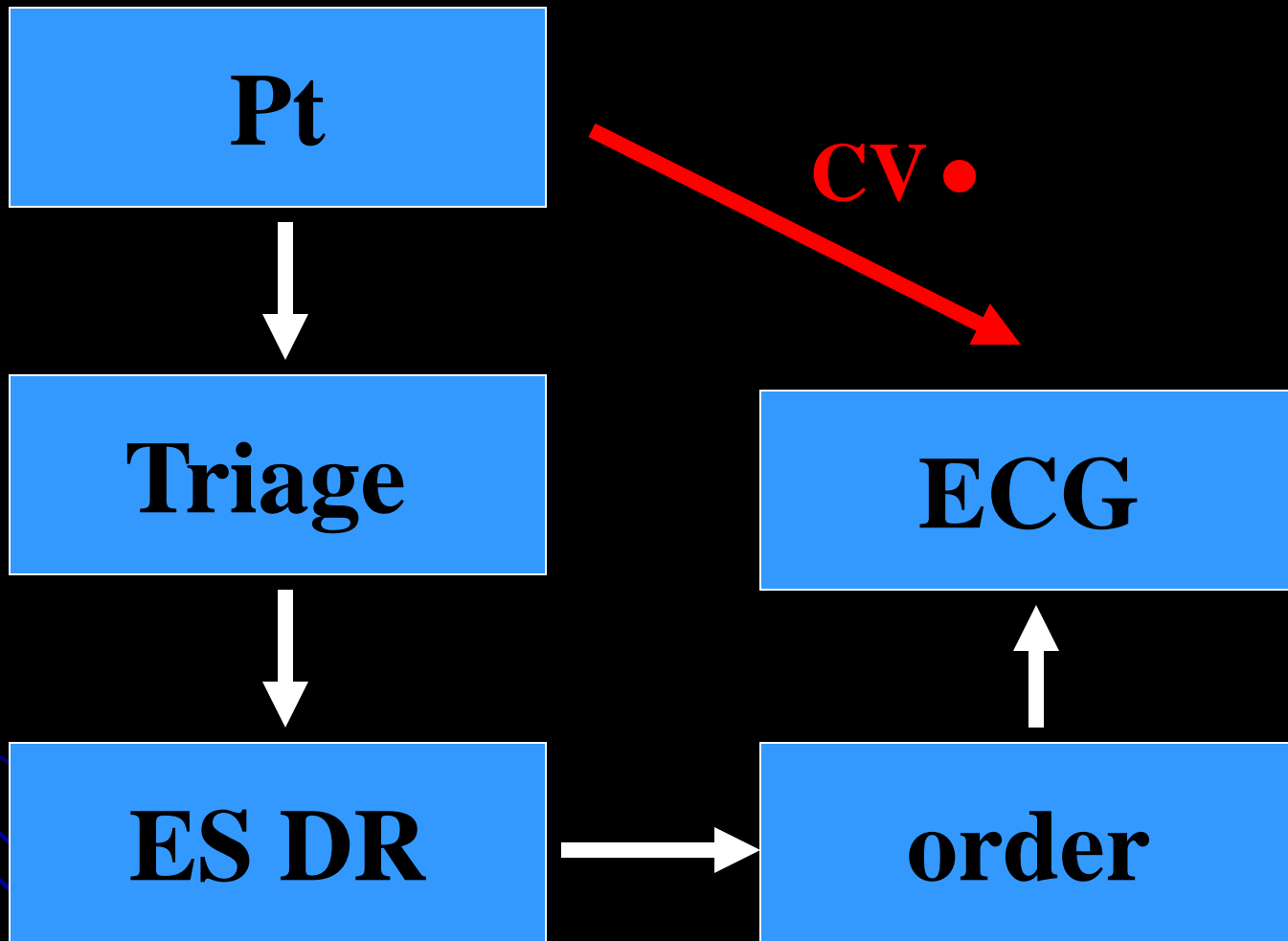


TW09' D2B



TRADITIONAL AMI COMMUNICATION STRATEGY





TAIWAN Chest Pain Center (2010)

Cardiology

- ECG
- Ativate
- Transport
- PPCI
- Care

TAIWAN Chest Pain Center (2010)

Cardiology



Superman

— ECG

— Ativate

— Transport

— PPCI

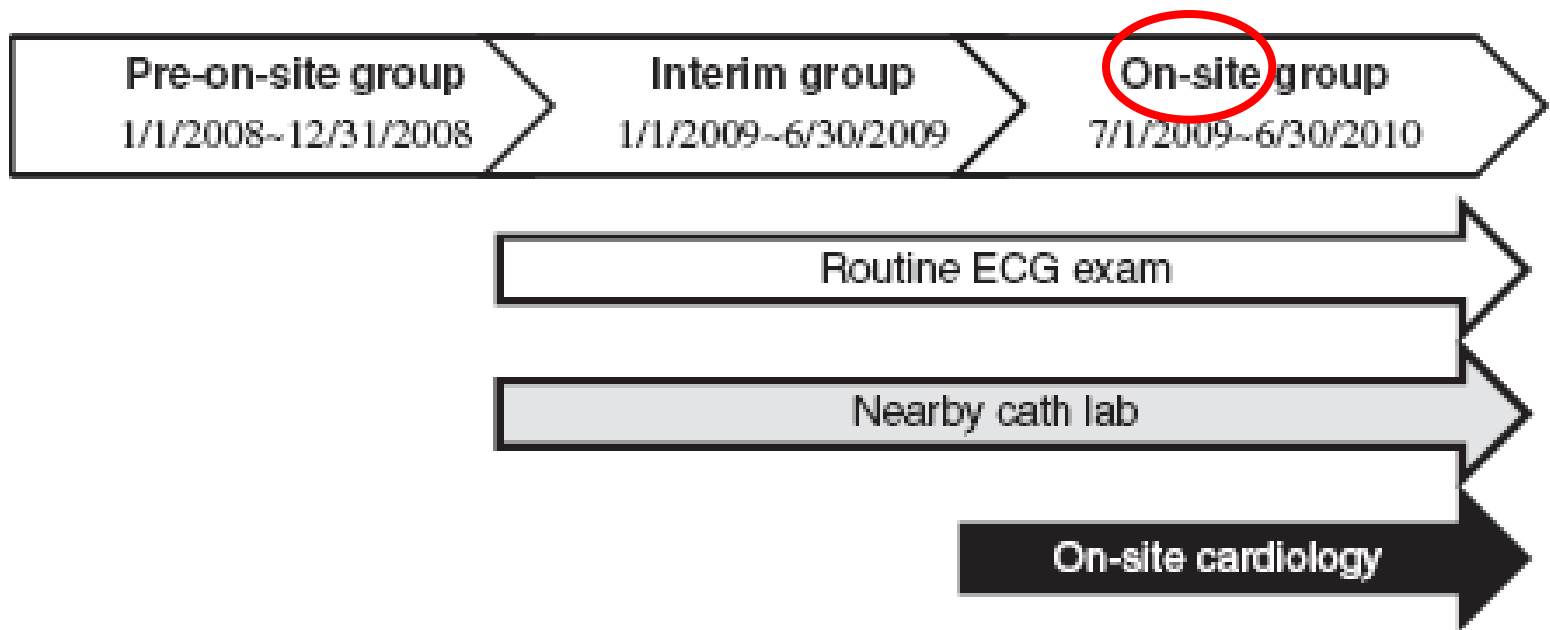
— Care

ORIGINAL PAPER

 THE INTERNATIONAL JOURNAL OF
CLINICAL PRACTICE

Reduced door-to-balloon times in acute ST-elevation myocardial infarction patients undergoing primary percutaneous coronary intervention

Y.-C. Wang,^{1,2} P.-H. Lo,¹ S.-S. Chang,^{1,2} J.-J. Lin,¹ H.-J. Wang,¹ C.-P. Chang,¹ L.-C. Hsieh,¹
Y.-P. Chen,¹ W.-K. Chen,³ C.-H. Chen,² K.-C. Chang,^{1,2}, J.-S. Hung¹



On-site group (1-July 2009~30 Jun 2010):

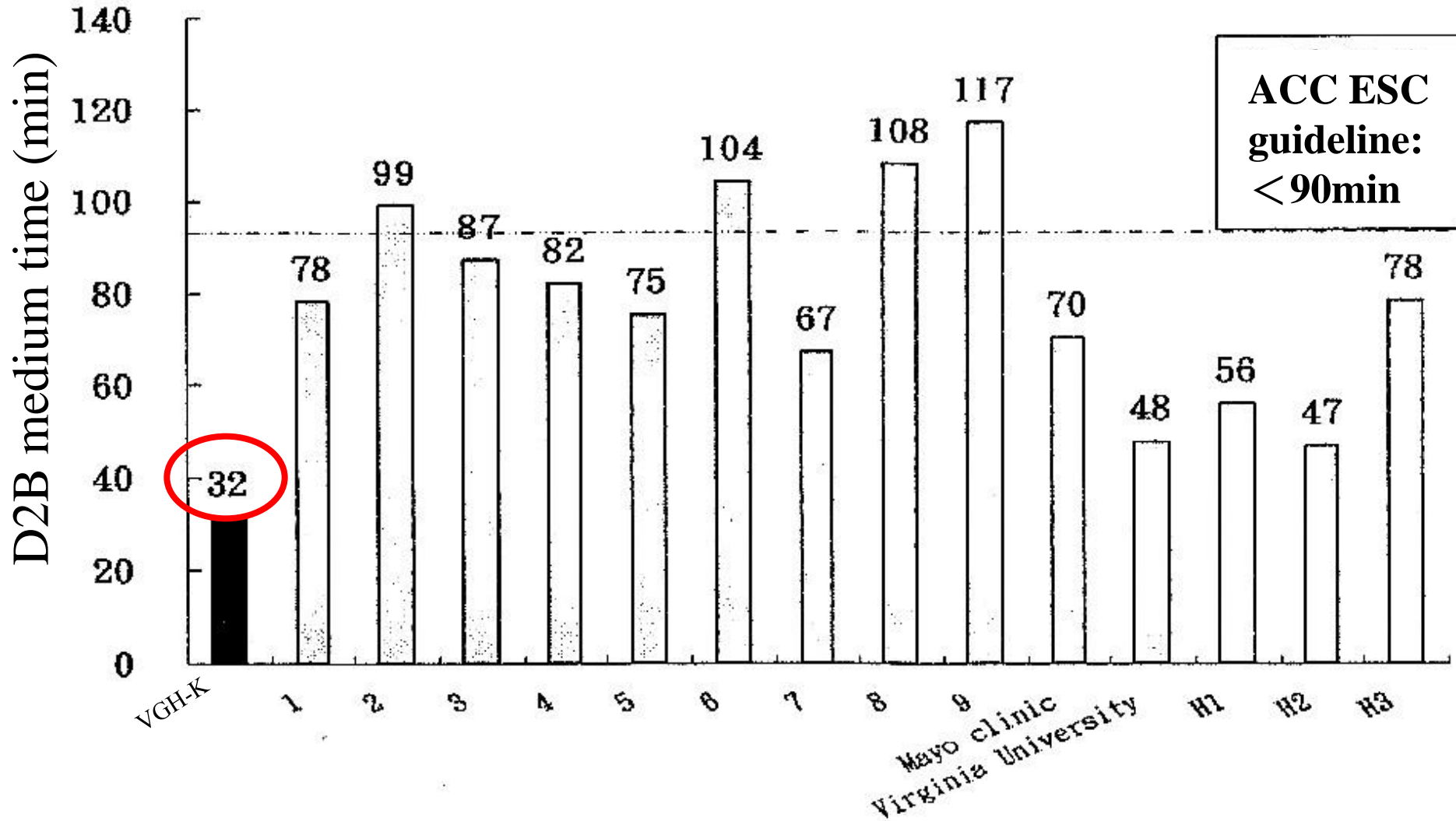
Patients received a routine ECG examination and underwent primary PCI in the cath room **one floor beneath the ED** after implementation of the on-site cardiology team-based strategy.

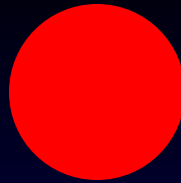
Table 2 Individual components of D2B time and clinical outcomes

	Pre-on-site group (N = 147)	Interim group (N = 90)	On-site group (N = 146)	p value
Primary Outcomes				
D2B time (min)	107 (83, 138)	72 (56, 87)	47 (39, 56)	< 0.001
D2B time < 90 min	50 (34)	70 (78)	140 (96)	< 0.001
Secondary outcomes				
Door to ECG time (min)	4 (3, 12)	3 (1, 5)	2 (1, 5)	< 0.001
Cath lab activation time (min)	28 (19, 56)	15 (10, 26)	7 (3, 11)	< 0.001
Cath lab preparing time (min)	15 (5, 28)	15 (5, 25)	8 (2, 14)	< 0.001
ED transfer time (min)	21 (15, 35)	12 (8, 20)	9.5 (5, 13)	< 0.001
LVEF (%)	52 (44, 60)	51 (45, 58)	53 (45, 60)	0.589
Hospitalization cost	\$6581 (\$5592, \$8976)	\$5999 (\$5222, \$7500)	\$5944 (\$5350, \$7486)	0.008
Hospital stay (days)	4 (3, 8)	4 (3, 6)	4 (3, 6)	0.463
In-hospital MACE	12 (8.2)	6 (6.7)	9 (6.2)	0.789
In-hospital total mortality	9 (6.1)	2 (2.2)	7 (4.8)	0.387

All values are expressed as median (25th and 75th percentiles) or *n* (%). Data were compared among the three groups using the Kruskal–Wallis test for continuous variables and using χ^2 for categorical variables. D2B, door to balloon; cath, catheterization; lab, laboratory; LVEF, left ventricular ejection fraction; SD, standard deviation; MACE, major adverse cardiovascular event. Other abbreviation as in Table 1.

D2B medium time

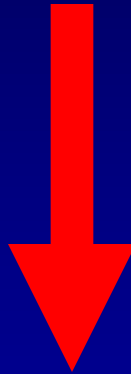




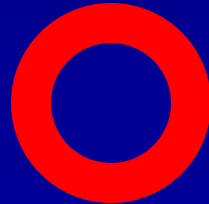
D



D2B



Alliance



B



Improvement in Door-to-Balloon (D2B) Time in Acute ST-Elevation Myocardial Infarction Through the D2B Alliance

– Experience of 15 Primary Percutaneous Coronary
Intervention Centers in Taiwan –

Su-Kiat Chua, MD; Jun-Jack Cheng, MD, PhD; Kou-Gi Shyu, MD, PhD;
Jen-Yuan Kuo, MD; Yu-Lin Ko, MD; Chun-Chieh Wang, MD;
Kuan-Cheng Chang, MD; Po-Ming Ku, MD; Shih-Huang Lee, MD, PhD

minute

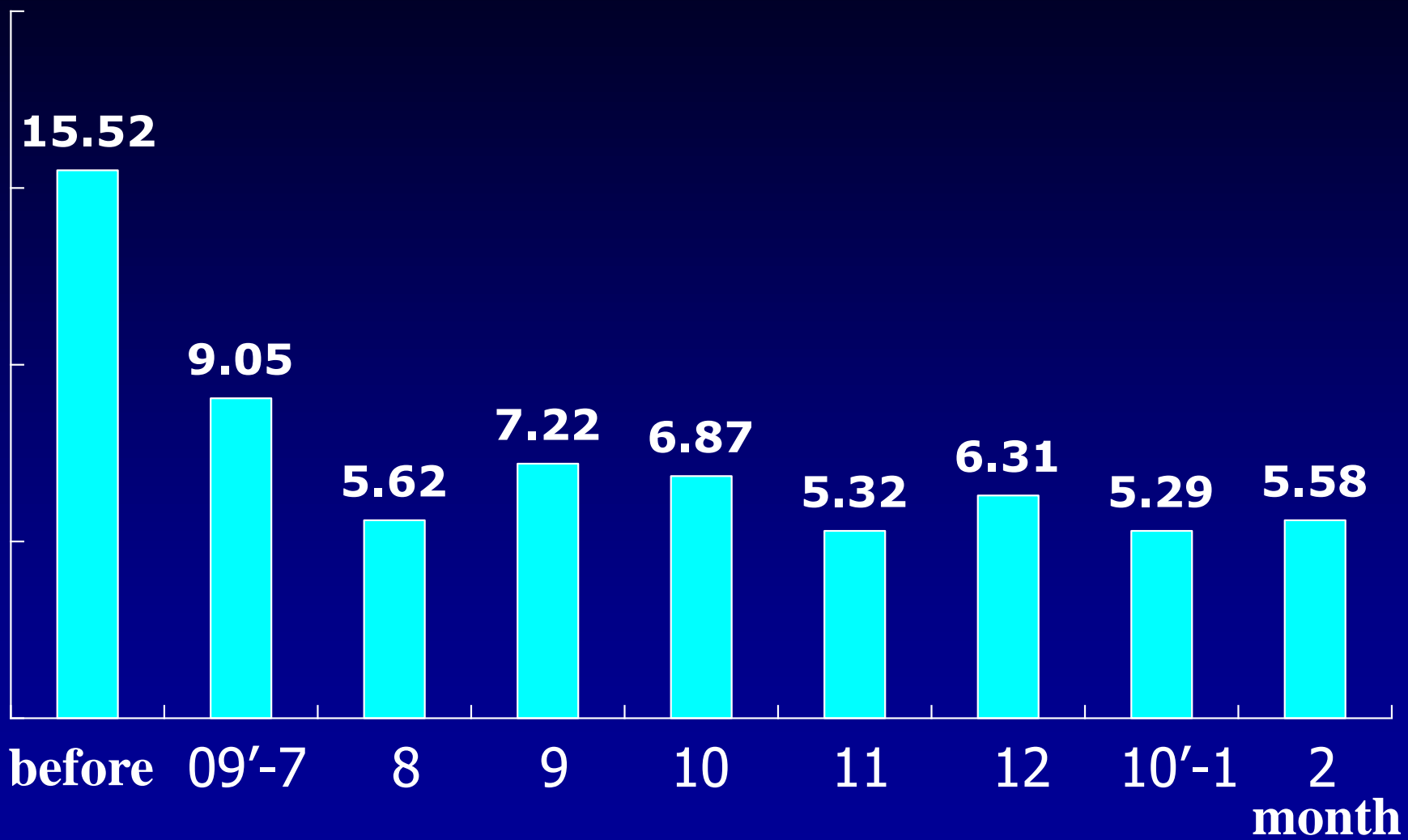
20

15

10

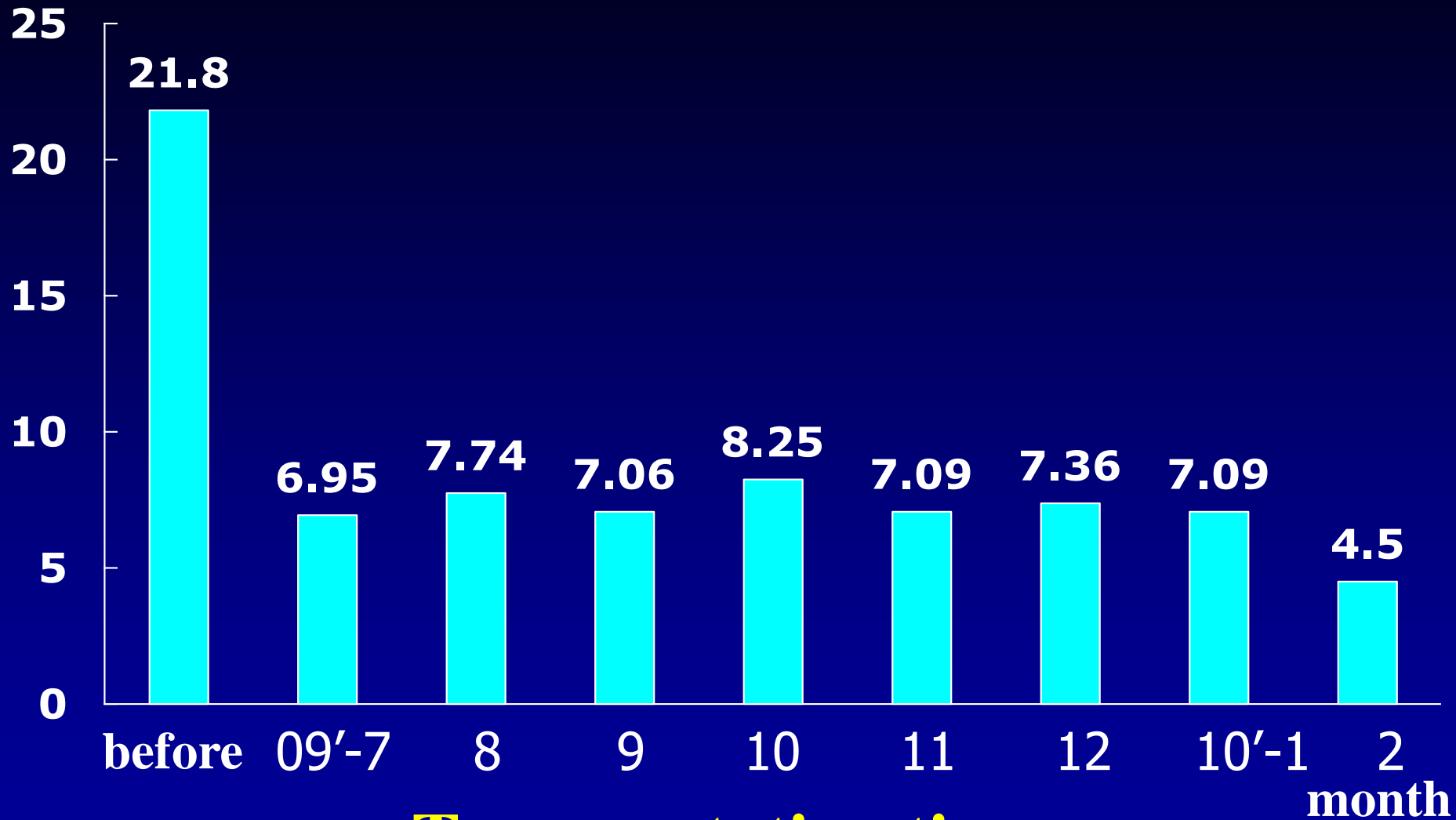
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0



Door - ECG

minute



Transportation time

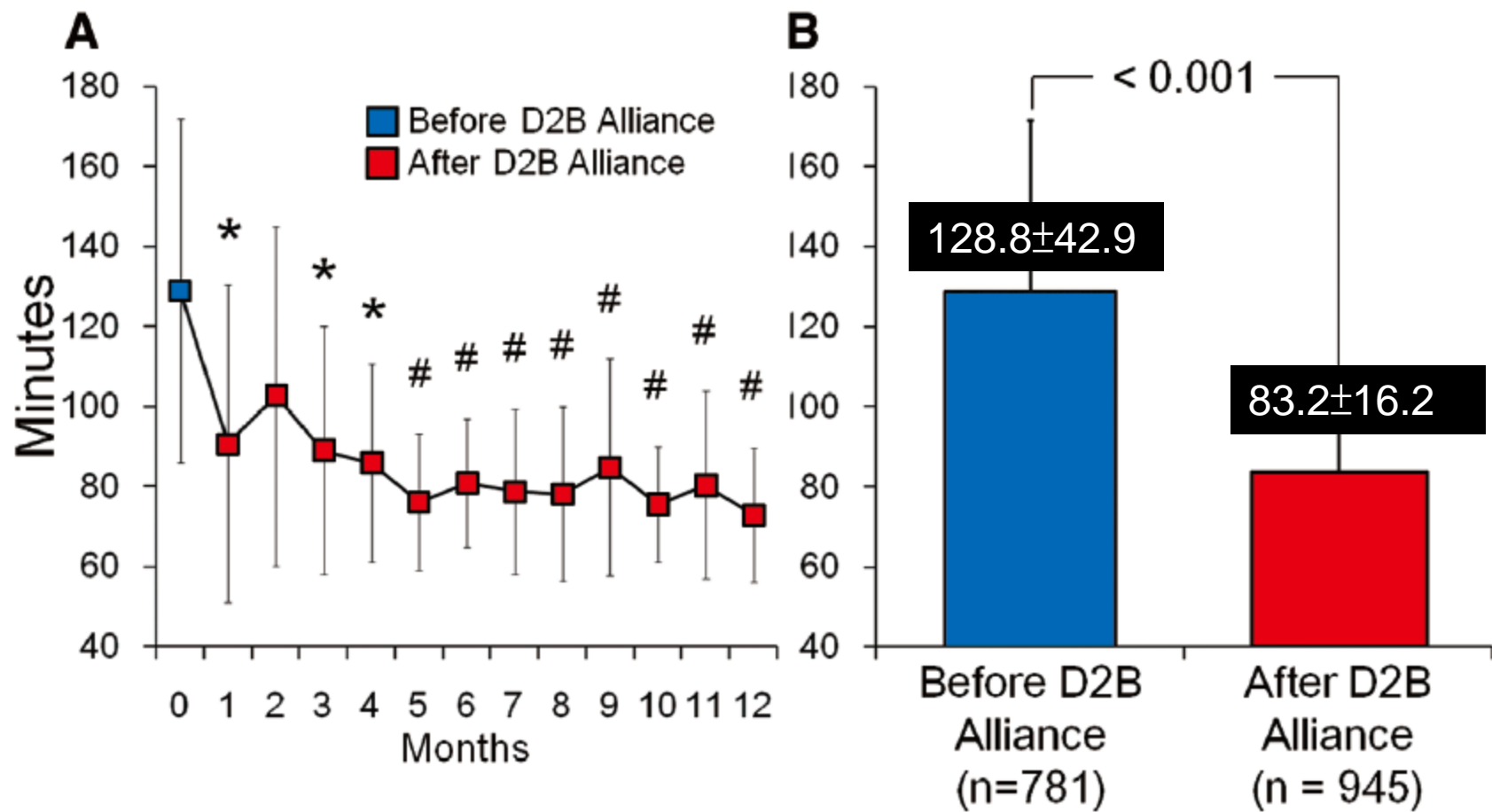


Figure 4. (A) Tracking of the average door-to-balloon (D2B) times recorded over the year after forming the D2B Alliance. (B) Contrast of the average D2B times before and after forming the D2B Alliance. *P<0.05 when examined alongside the interval before forming the D2B Alliance; #P<0.001 when examined alongside the interval before forming the D2B Alliance.

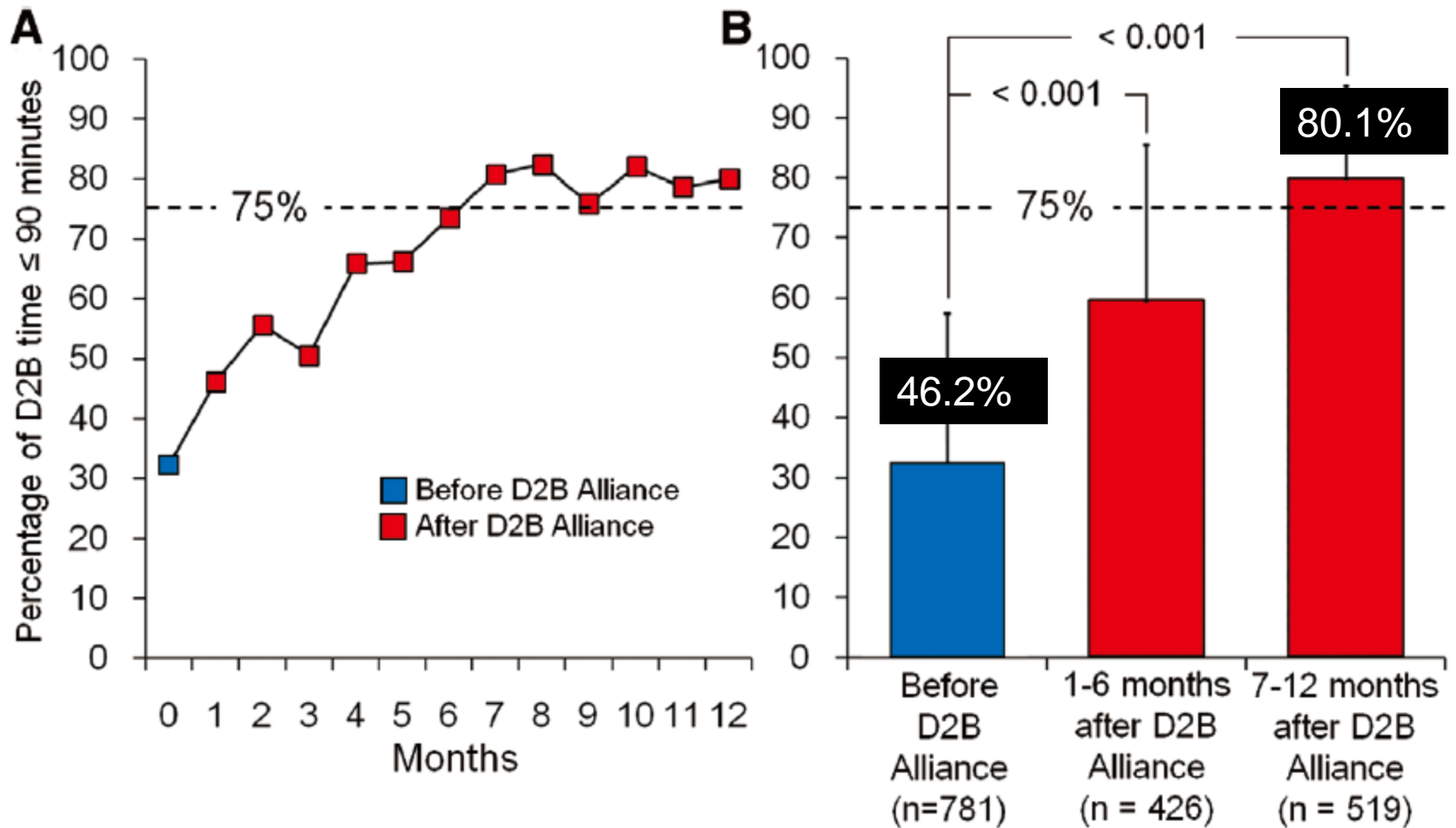
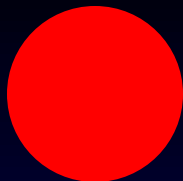


Figure 5. (A) Tracking of the percentage of ST-elevation myocardial infarction patients with door-to-balloon (D2B) times under 90min before and 1 year after forming the D2B Alliance; (B) Contrast of D2B times of less than 90min before, 1–6 months after, and 7–12 months after forming the D2B Alliance.

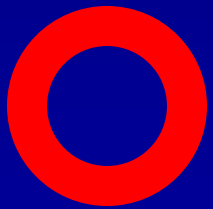
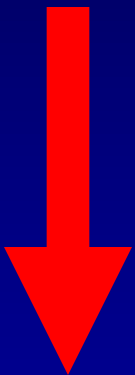
ITB



D



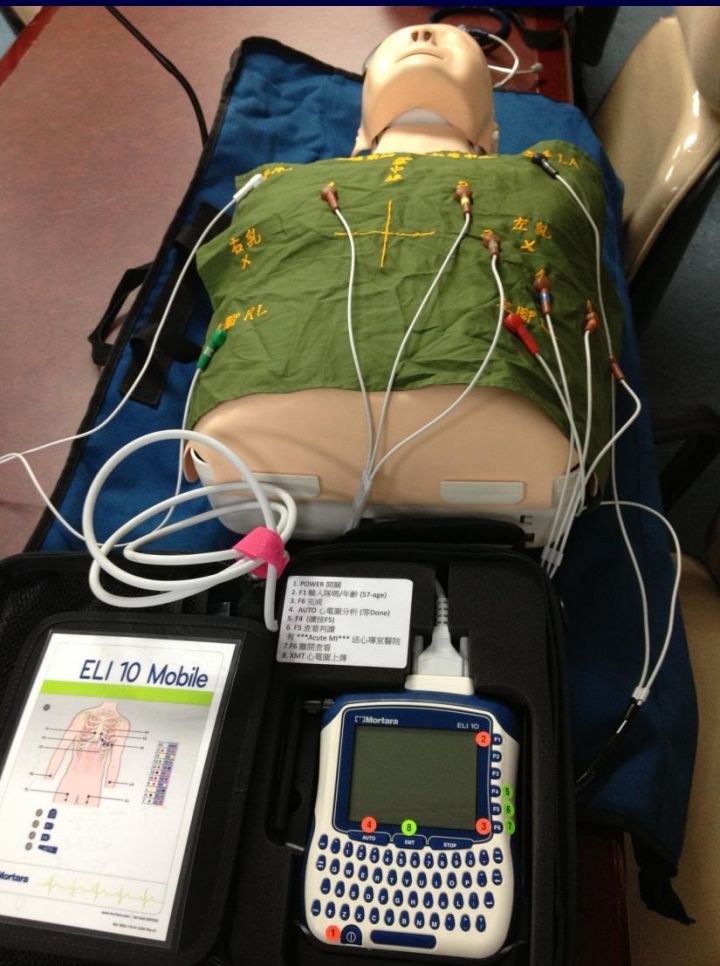
D2B



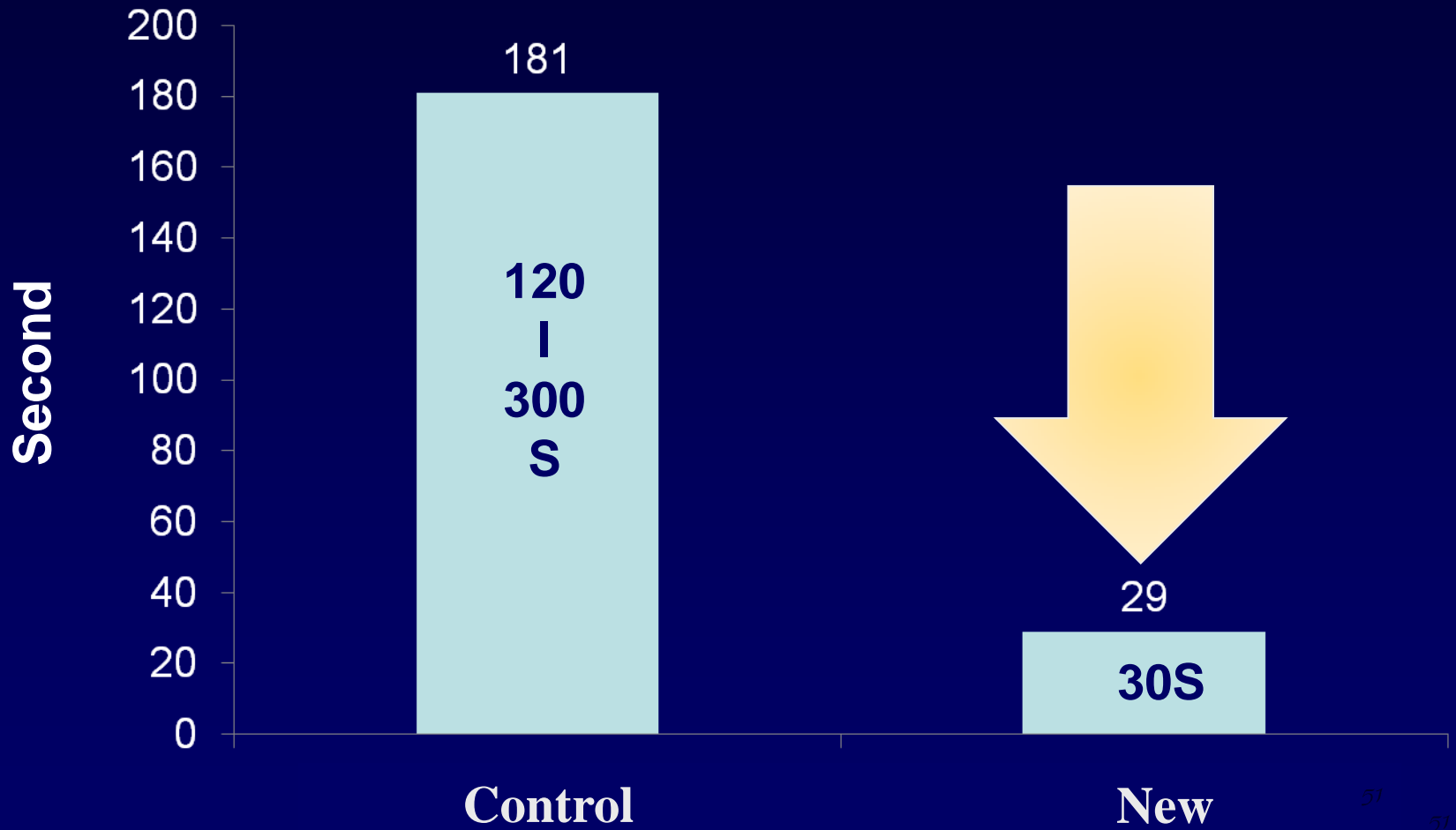
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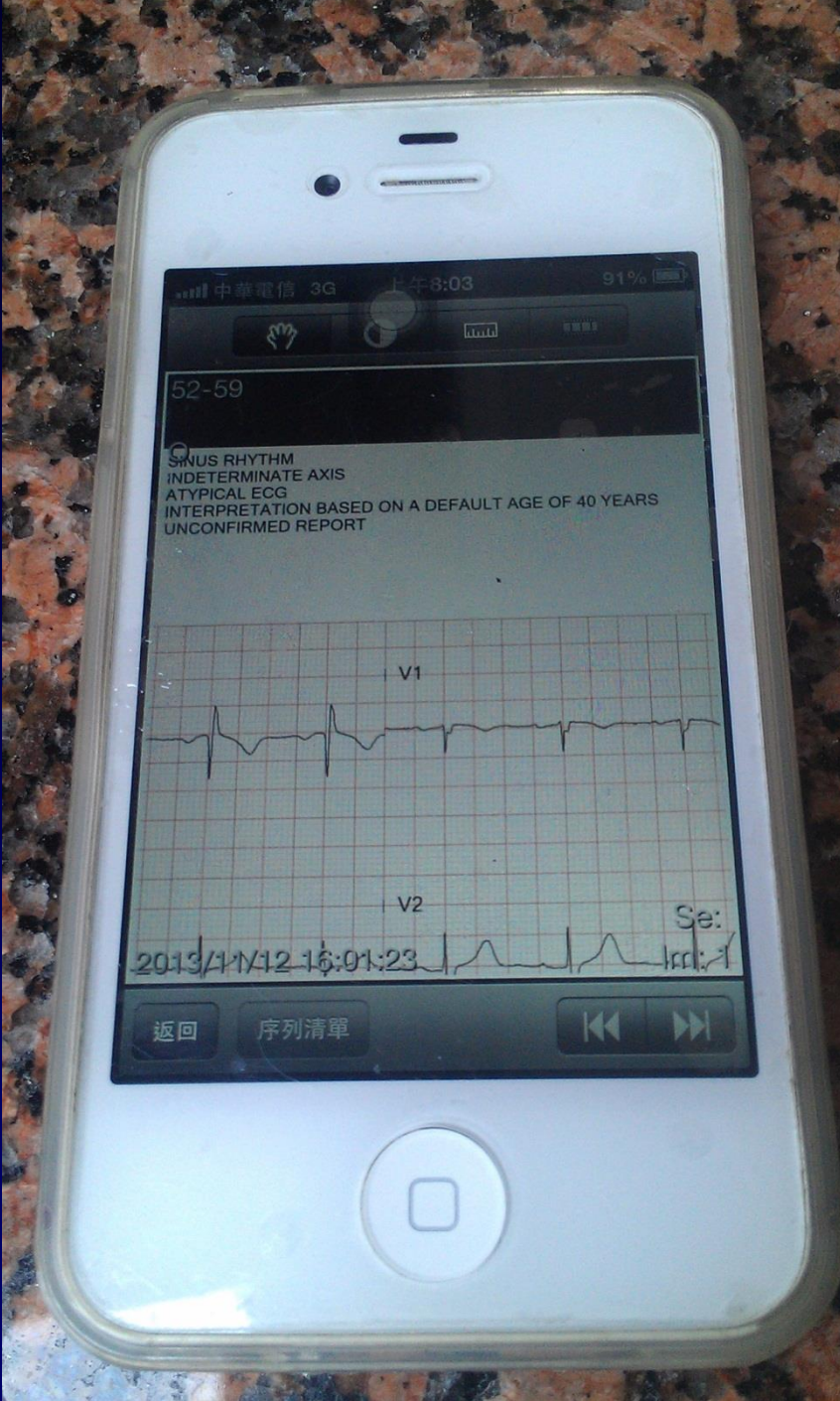
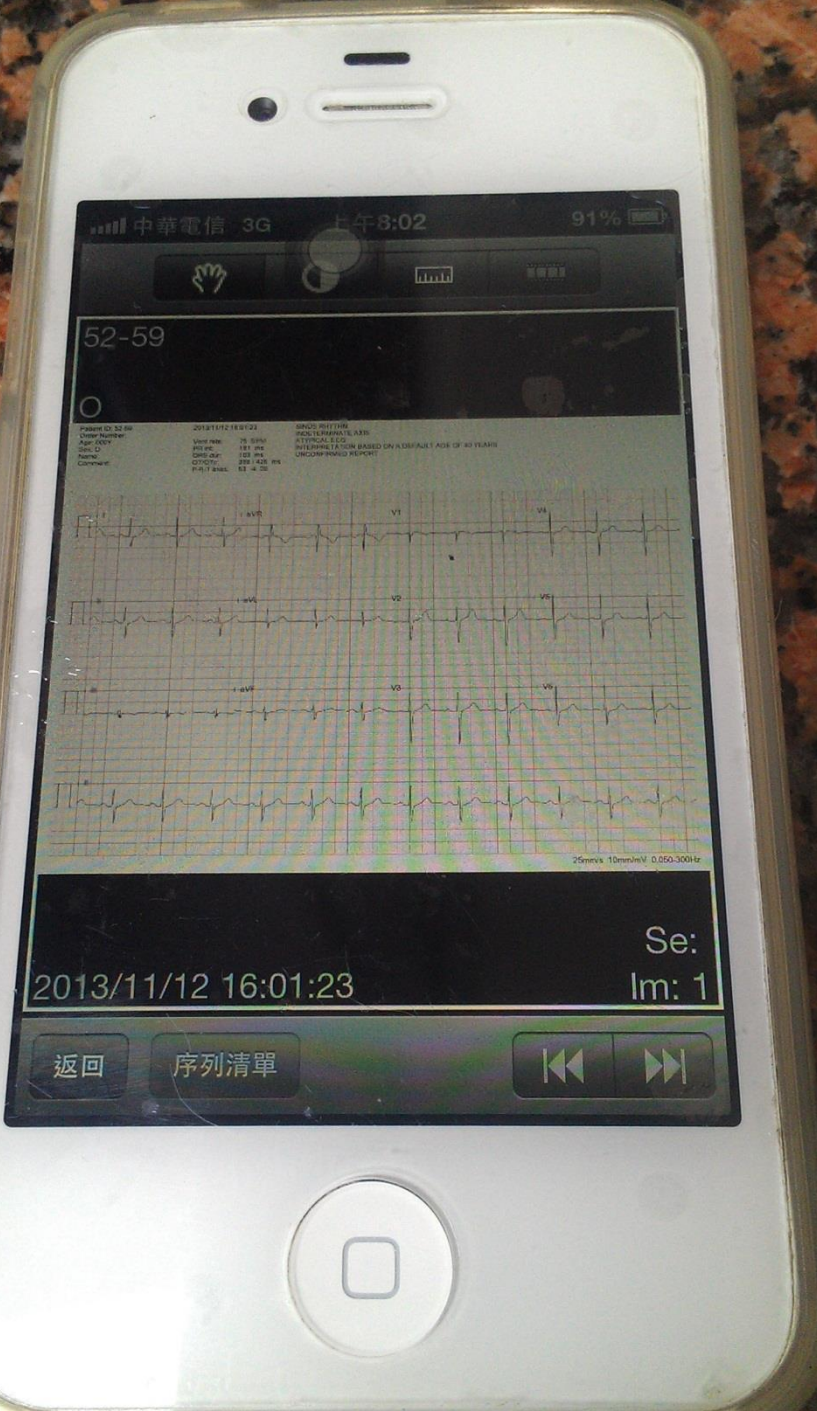


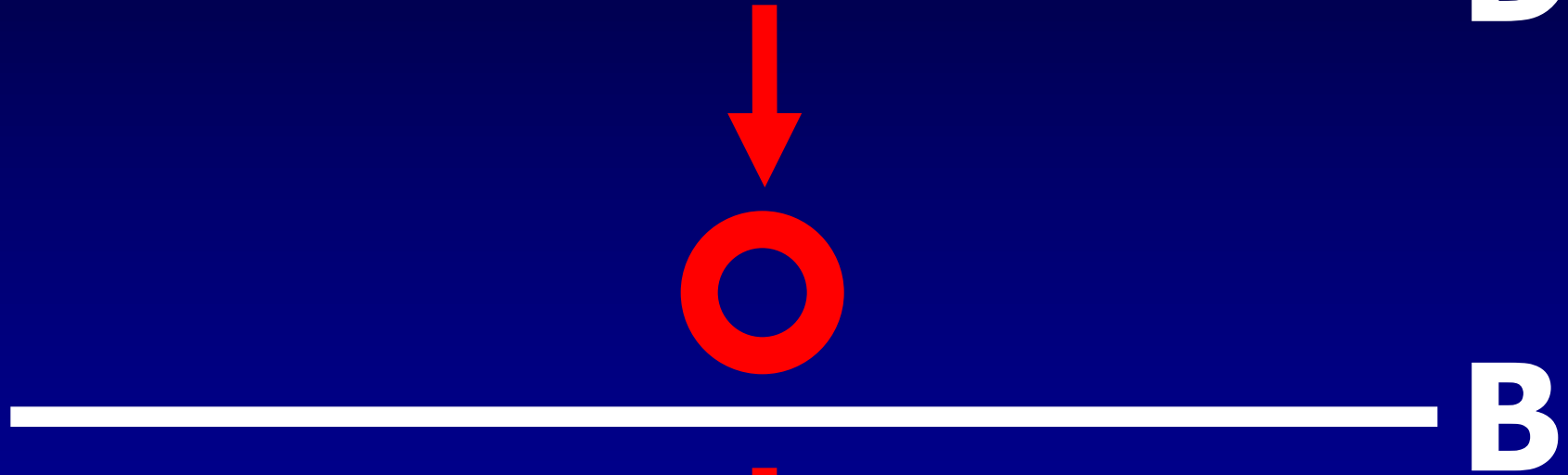
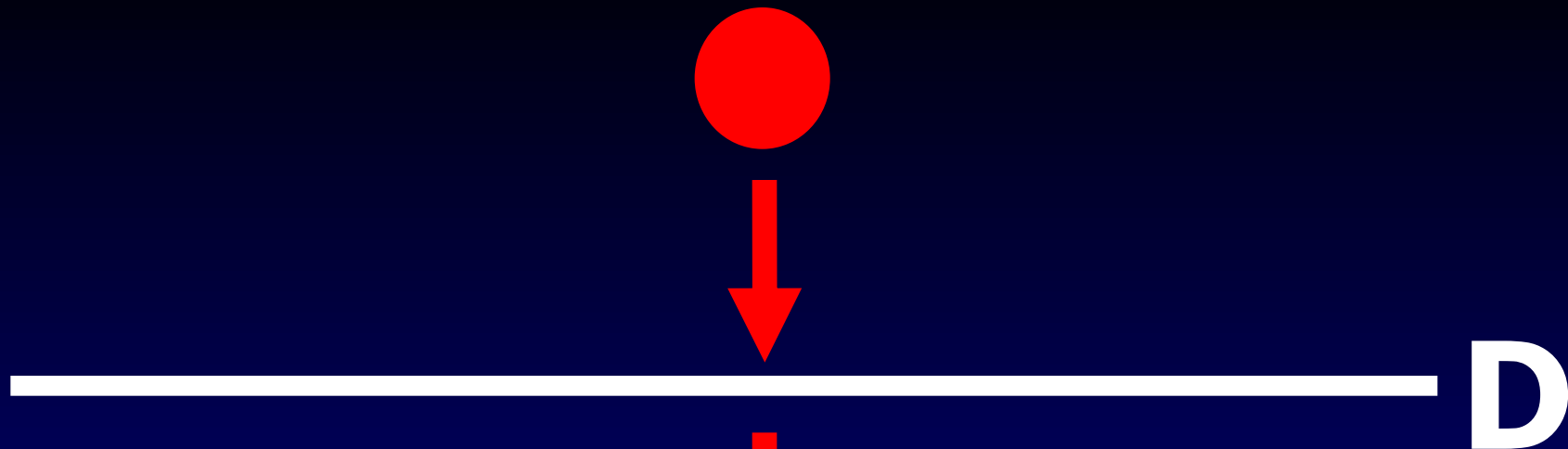




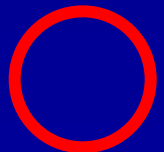
ITB







Accreditation





Taiwan Joint Commission on Hospital Accreditation

STEMI	D2B medium	< 90min	Critical Care Center	Medial Center
	D2B < 90min	$\geq 75\%$		
AMI	Diagnosis (Lab) Medications DAP Statin β blockers ARASE	$\geq 70\%$		
	Education Rehabilitation	$\geq 70\%$		

TAIWAN AMI ACCREDITATION

- ECG
- Cardiac enzymes
- LDL

DX

- DAP
- β -blocker
- PPCI
- RASI
- Statin

TX

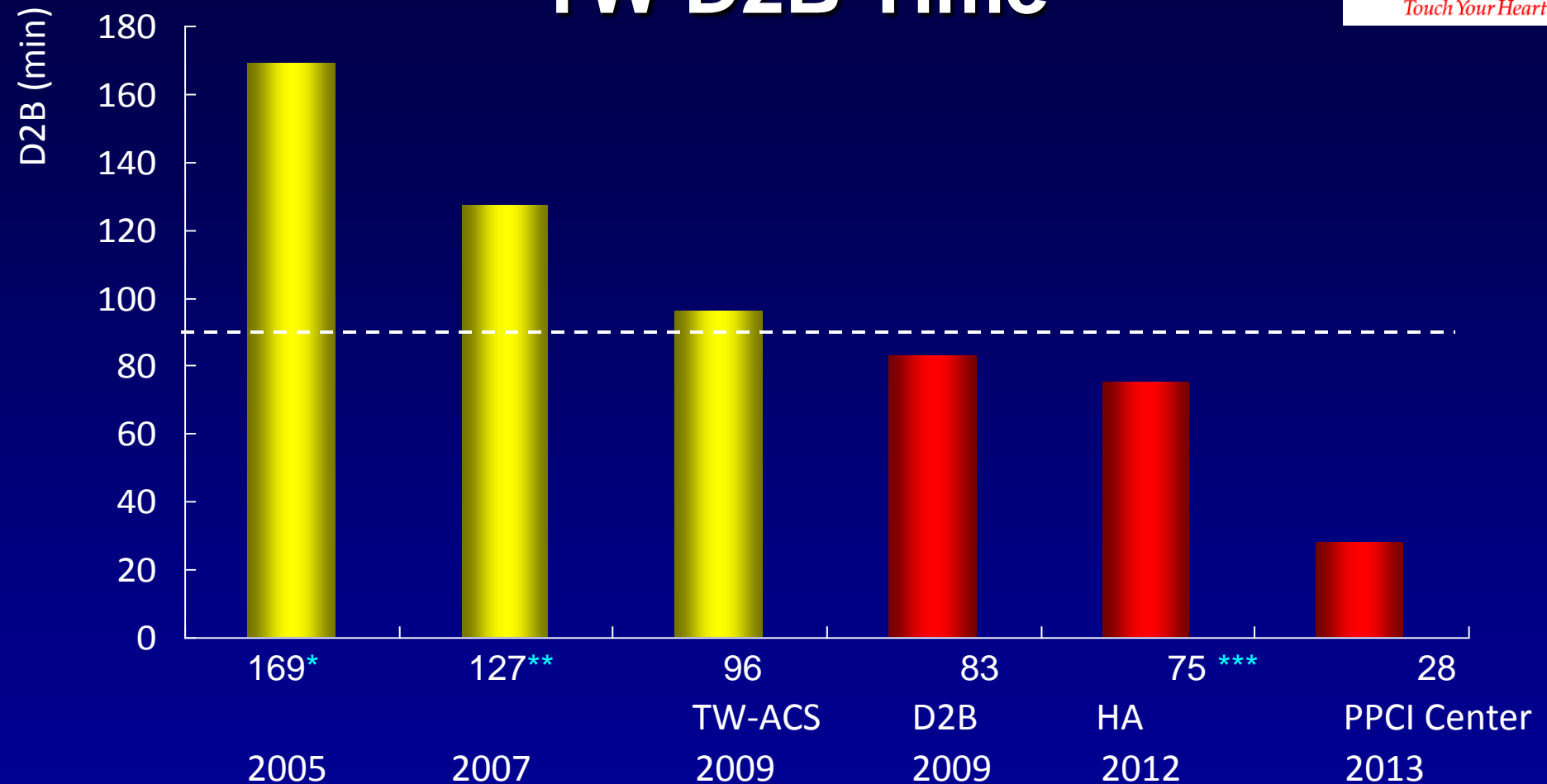
- In-Hospital Mortality
- Readmission (%)
- Return to ICU (24H)
- Return to ES (72H)

FU

ED

- Rehabilitation
- Mx education
- Smoking cessation

TW D2B Time



* Chest 2005: 128: 2593-2598

** Acta Cardiol Sin 2007: 23: 23: 225-33

*** HA: TW Hospital Accreditation

Taiwan D2B Strategies

- Measuring D2B is important, because it improve how we care for patients.
- BTS/ TCIP/ HA provided useful strategies to reduce D2B (From 100 to 70 mins).
- Multidiscipline team work could find individualized protocol.
- Additional further approaches will improve clinical outcomes with PPCI.



TAIWAN TRANSCATHETER THERAPEUTICS

LIVE COURSE

January 11-12, 2014

NTUH International Convention Center

Taipei, Taiwan

Course Directors

Jun-Jack Cheng, MD
President, TSCI

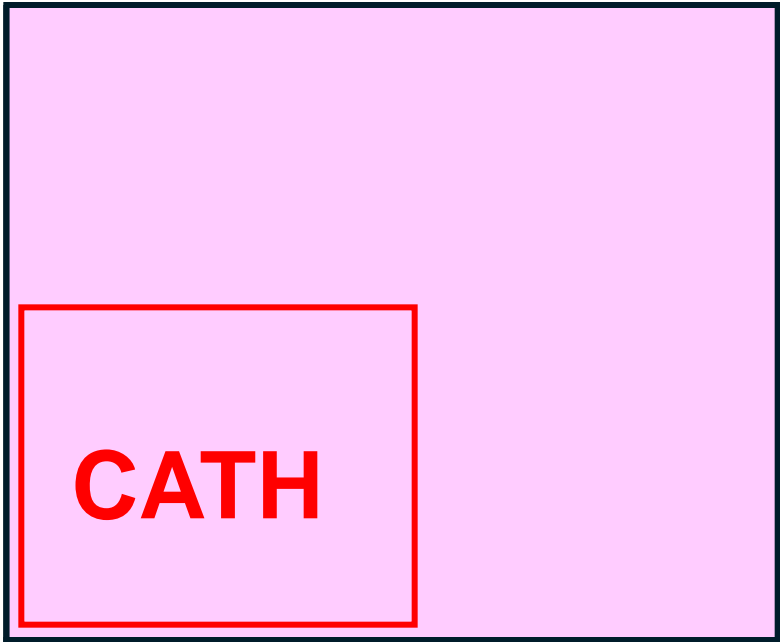
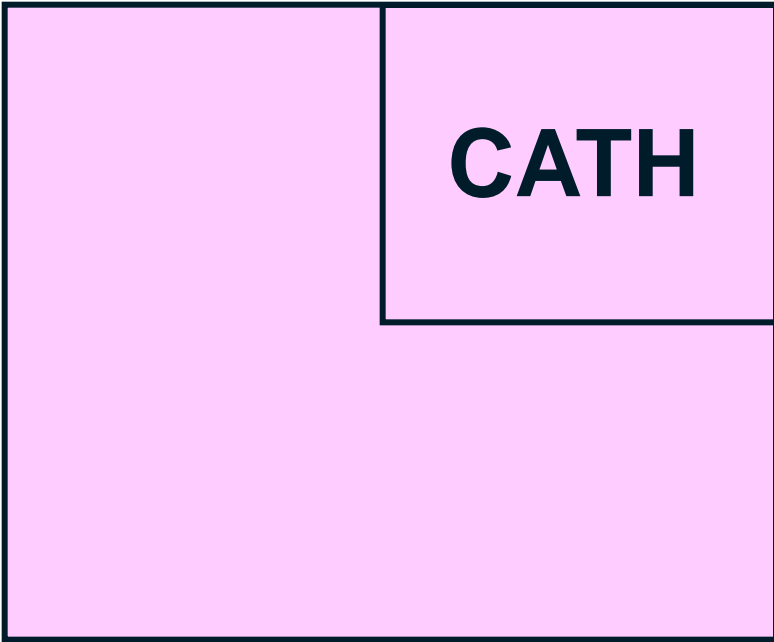
I-Chang Hsieh, MD
Chairman, Scientific Committee, TSCI

Wen-Lieng Lee, MD
Secretary General, TSCI

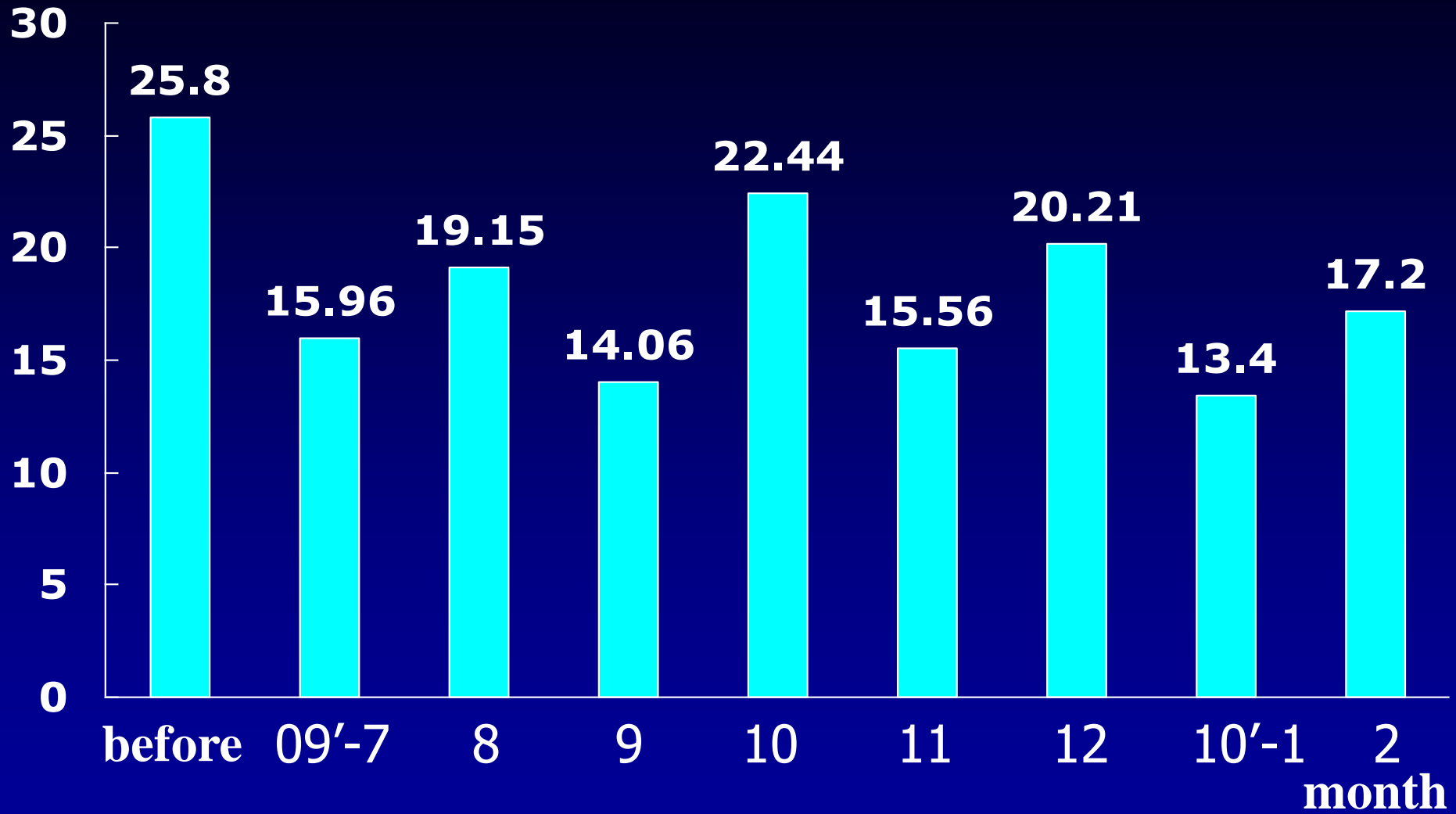




Thank You



minute



Cath. team arrival time

New Strategy

D2B Standard Order

- (1) O2 3-4/L
- (2) Aspirin : 100mg×3#
- (3) Plavix : 75mg×4#
- (4) Heparin : Bolus – 60u/kg , max – 4000u
• IVF – 12u/kg/hr , max – 1000u/hr
- (5) Morphine : 2-4mg iv push
- (6) NTG/Isoket : 50 mg + NS(150/200cc) =250cc iv drip
• if BP >90mmHg systolic or no RV infarction
- (7) Aggrastat : 領送cath room p. r. n

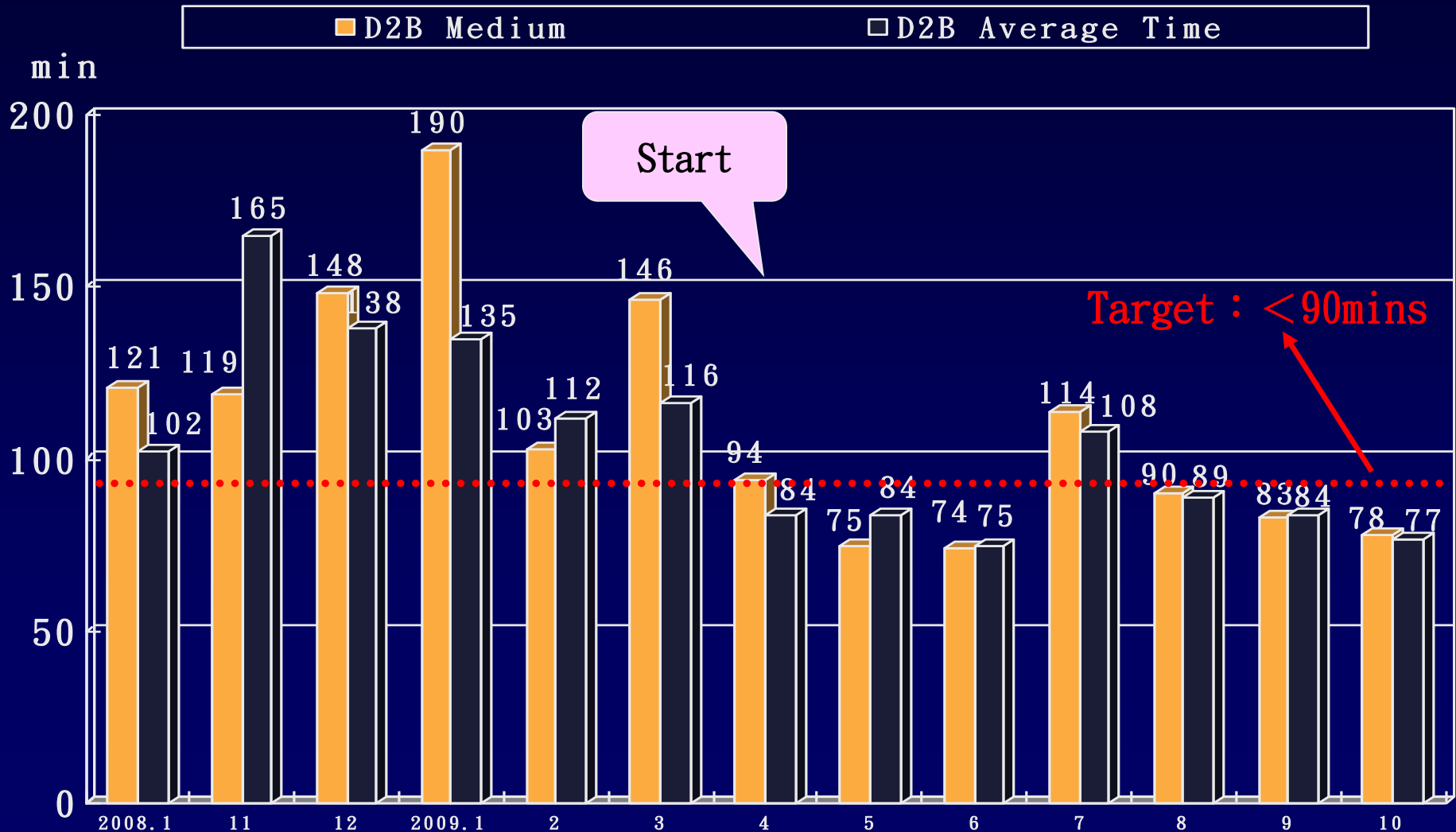
EFFECT (二)

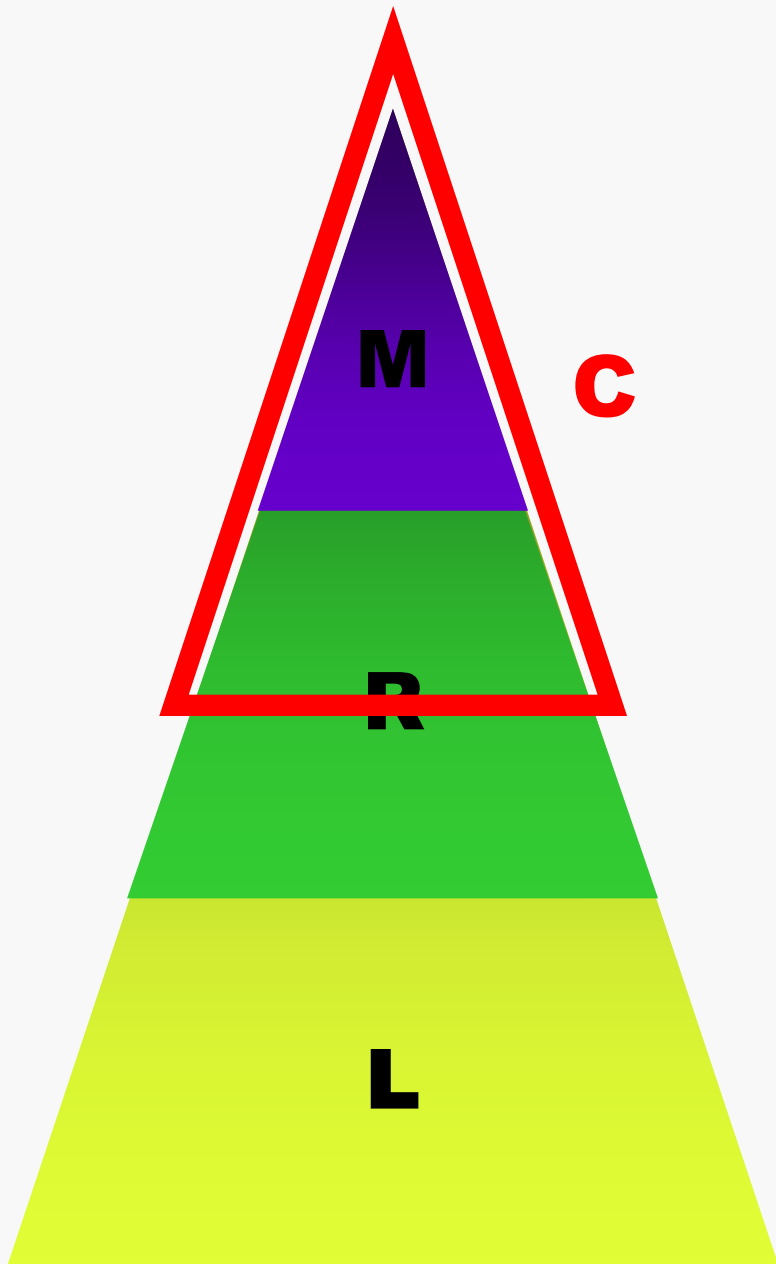
D2B<90mins Percentage for 2008.10-2009.10



EFFECT

D2B Time /month for 2008.10~2009.10





M - Medical Center

C – Critical Care Center

R – Regional Teaching Hospital

L – Local Hospital

ANALYSIS

