



**Joint Pilot Scheme  
between FSD and Queen Mary Hospital  
on Pre-hospital 12-lead ECG for  
Primary Percutaneous Coronary Intervention**

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# Outline

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- Introduction
- Details of the Trial
- Preliminary Result
- Future Development



# Introduction

# Introduction

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<http://www.scmp.com/news/hong-kong/health-environment/article/1995947/hong-kong-women-and-men-enjoy-worlds-longest-life>

# Introduction

## □ Hong Kong People long life Span



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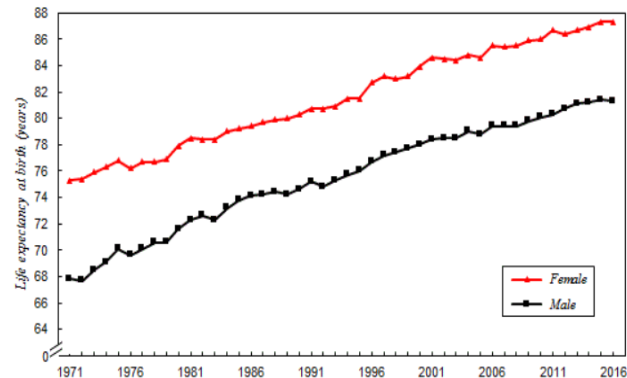
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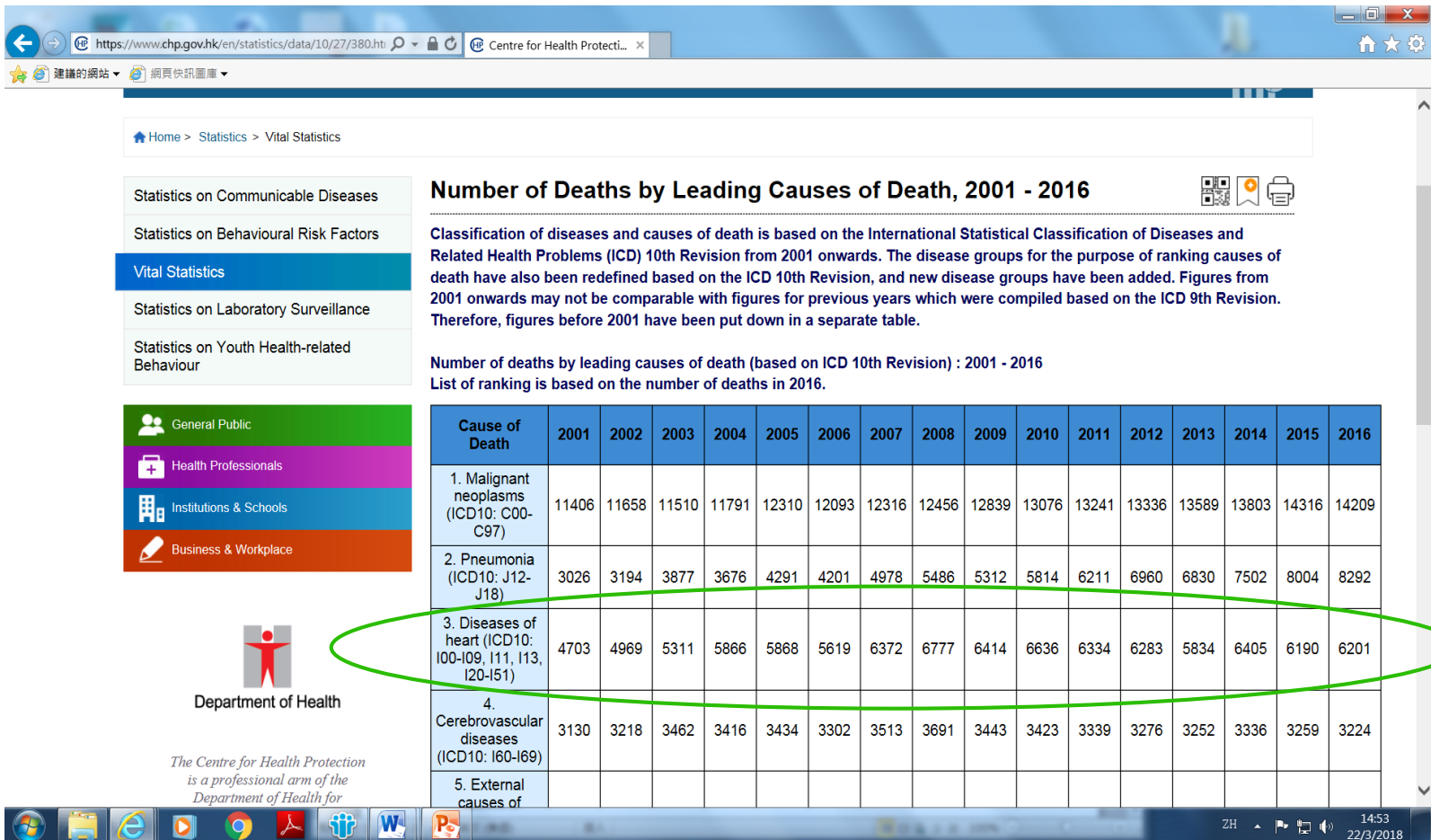
### Life Expectancy at Birth (Male and Female), 1971 - 2016

The life expectancies at birth for both sexes have steadily increased during the past 46 years, from 67.8 years for males and 75.3 years for females in 1971 to 81.3 years and 87.3 years respectively in 2016.



# Introduction

## □ Diseases of Heart - 3<sup>rd</sup> Killer



Home > Statistics > Vital Statistics

Statistics on Communicable Diseases  
Statistics on Behavioural Risk Factors  
**Vital Statistics**  
Statistics on Laboratory Surveillance  
Statistics on Youth Health-related Behaviour

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### Number of Deaths by Leading Causes of Death, 2001 - 2016

Classification of diseases and causes of death is based on the International Statistical Classification of Diseases and Related Health Problems (ICD) 10th Revision from 2001 onwards. The disease groups for the purpose of ranking causes of death have also been redefined based on the ICD 10th Revision, and new disease groups have been added. Figures from 2001 onwards may not be comparable with figures for previous years which were compiled based on the ICD 9th Revision. Therefore, figures before 2001 have been put down in a separate table.

Number of deaths by leading causes of death (based on ICD 10th Revision) : 2001 - 2016  
List of ranking is based on the number of deaths in 2016.

Cause of Death	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
1. Malignant neoplasms (ICD10: C00-C97)	11406	11658	11510	11791	12310	12093	12316	12456	12839	13076	13241	13336	13589	13803	14316	14209
2. Pneumonia (ICD10: J12-J18)	3026	3194	3877	3676	4291	4201	4978	5486	5312	5814	6211	6960	6830	7502	8004	8292
3. Diseases of heart (ICD10: I00-I09, I11, I13, I20-I51)	4703	4969	5311	5866	5868	5619	6372	6777	6414	6636	6334	6283	5834	6405	6190	6201
4. Cerebrovascular diseases (ICD10: I60-I69)	3130	3218	3462	3416	3434	3302	3513	3691	3443	3423	3339	3276	3252	3336	3259	3224
5. External causes of																

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22/3/2018

# Introduction

https://www.chp.gov.hk/en/statistics/data/10/27/340.html Centre for Health Protection

Statistics on Communicable Diseases  
 Statistics on Behavioural Risk Factors  
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## Number of Deaths by Leading Causes of Death by Sex by Age in 2016

Cause of Death*			Age Group							Unknown
			All Ages	0	1 - 4	5 - 14	15 - 44	45 - 64	65 & above	
1	Malignant neoplasms (ICD10: C00-C97)	Male	8447	0	3	5	216	2394	5829	0
		Female	5762	2	3	3	254	1744	3756	0
		Total	14209	2	6	8	470	4138	9585	0
2	Pneumonia (ICD10: J12-J18)	Male	4393	0	1	0	34	318	4039	1
		Female	3899	0	3	1	23	116	3756	0
		Total	8292	0	4	1	57	434	7795	1
3	Diseases of heart (ICD10: I00-I09, I11, I13, I20-I51)	Male	3396	2	2	0	90	748	2553	1
		Female	2805	5	1	1	38	176	2583	1
		Total	6201	7	3	1	128	924	5136	2
4	Cerebrovascular diseases (ICD10: I60-I69)	Male	1666	3	0	0	46	265	1352	0
		Female	1558	3	0	0	25	140	1390	0
		Total	3224	6	0	0	71	405	2742	0

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Source: <https://www.chp.gov.hk/en/statistics/data/10/27/340.html>



# Introduction

- Some figures about FSD ambulances





# Introduction

- Some figures about FSD ambulances

Calendar Year	2016	2017
No. of Cardiac Arrest cases handled by FSD (No. of patients)	6,197	6,325
No. of patients treated under Cardiac Chest Pain Protocol by FSD	17,705	19,430



# Details of Trial

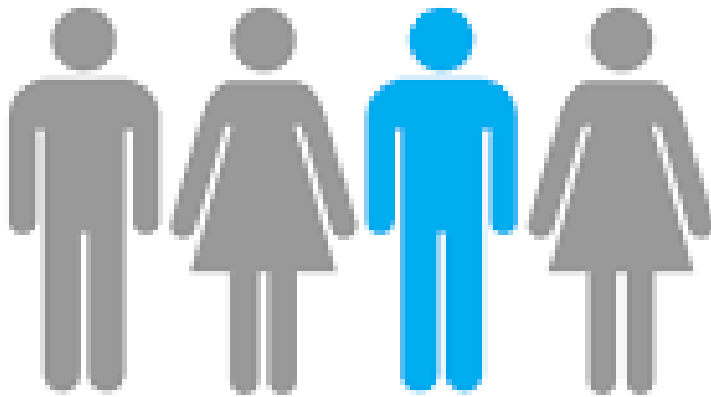
# Details of Trial

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- To enhance the pre-hospital care to identify the suspected myocardial infarction (M.I.) patients
- To strengthen cooperation between FSD & QMH:
  - ▣ To explore and streamline the procedures
  - ▣ To shorten the “Door-to-Balloon” time for suspected M.I. patients

# Details of the trial

- Period: 12.11.2015 to 5.11.2017 (about 2 years)
- Target Patients:
  - ▣ Cardiac Chest Pain / Discomfort
  - ▣ Within QMH Catchment Area



# Workflow

## 1) Ambulance crew will:

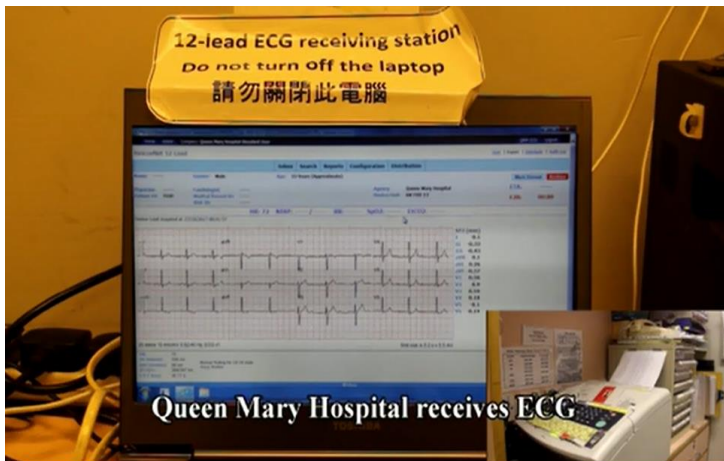
- ▣ capture a 12-lead ECG onboard/at scene
- ▣ send the 12-lead ECG data to A & E Department of QMH immediately (via mobile network)



# Workflow

## 2) Medical Staff will:

- ❑ Before patient arrives at Hospital
- ❑ Medical staff could have prior information of the respective patient (e.g. M.I.)
- ❑ mobilize necessary resources in advance to **speed up** :-
  - Diagnostic process **Coronary Angiogram** (coro) and provide prompt treatment; and
  - **Primary Percutaneous Coronary Intervention** (PPCI)



# QMH Catchment Area

Amb (Day) :4  
Amb (Night) :1



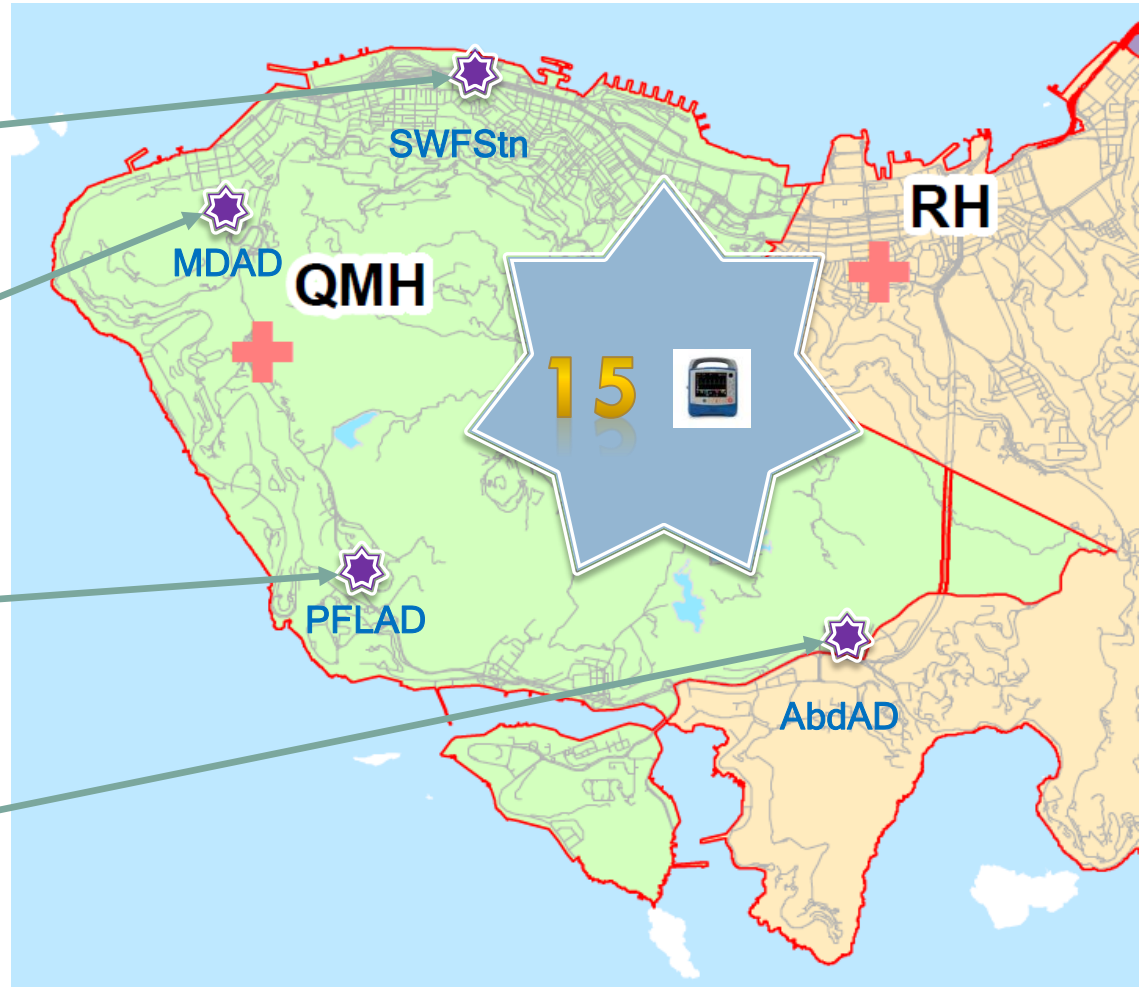
Amb (Day) :4  
Amb (Night) :2



Amb (Day) :4  
Amb (Night) :3



Amb (Day) :4  
Amb (Night) :2



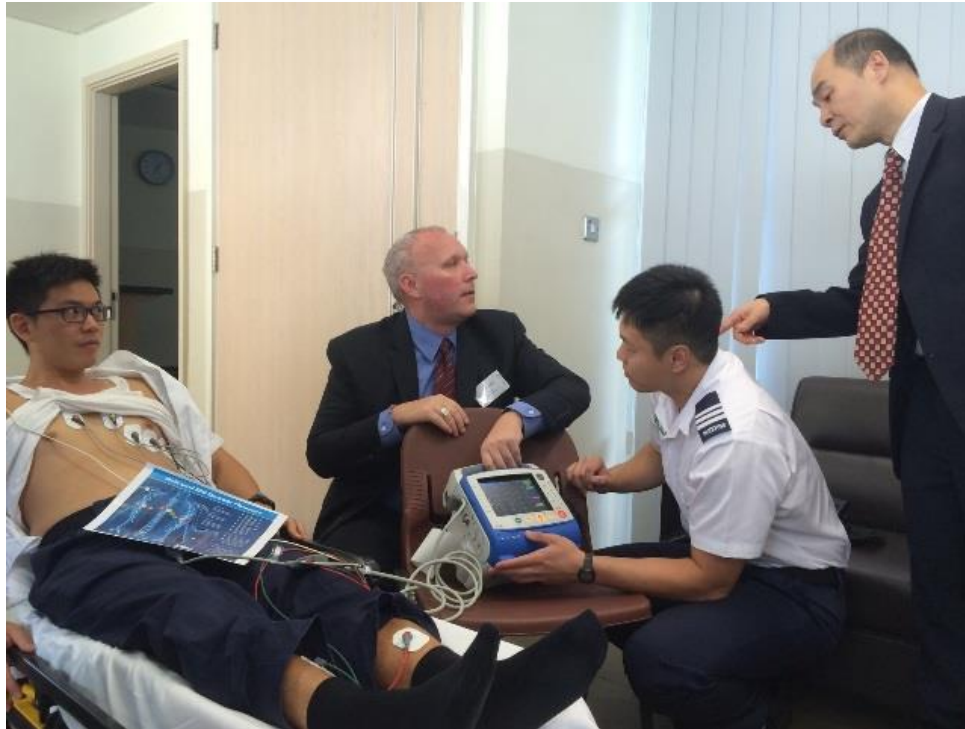


# Phases

- Phase 1 (12.11.2015 - 31.12.2016)
- Phase 2 enhancement (1.1.2017 - 5.11.2017) and (1.7.2017 - 5.11.2017)



# Pre-trial Preparation



**Mock Training on 15.9.2015**

# Pre-trial Preparation

- ▣ Joint Parties Meeting:
  - FSD representatives
  - QMH representatives
  - 12-lead ECG Machine Supplier
- ▣ Fine-tuning on Training Material



# Timeline of the Pilot Scheme



# Phases

- **1<sup>st</sup> Phase** (12.11.2015 - 31.12.2016)
- **2<sup>nd</sup> Phase** (1.1.2017 - 5.11.2017) and  
enhancement (1.7.2017 - 5.11.2017)

# Cardiac Chest Pain Form

心胸痛病人表格 Cardiac Chest Pain Patient Form

(處理 12 歲或以上前往瑪麗醫院急症室的心胸痛病人時, 必須填寫此表格 Filling this form for cardiac chest pain patient aged ≥12 to QMH A&E)

日期/召喚時間 Date/Time of call	到達病人時間 Patient side time	心電圖時間 ECG time	單位/救護車編號 Unit/Amb. No.
------------------------------	-----------------------------	-------------------	---------------------------

步驟 Step	在現場依照消防處救護車心胸痛指引施救	FSD Ambulance Cardiac Chest Pain Protocol followed at scene
1		
2	<ul style="list-style-type: none"> <li>✓ 病人上救護車</li> <li>✓ 根據下列各點決定病人是否適合在救護車上進行心電圖</li> <li>✓ 若病人年齡為 12-17 歲(未成年), 必須得到父母/監護人之同意, 方可進行心電圖。(若父母/監護人不在場, 將不會進行心電圖)</li> <li>✓ 進行以下步驟期間, 任何情況轉差, 不能阻延施救, 立即執行消防處救護車心胸痛指引</li> </ul>	<ul style="list-style-type: none"> <li>✓ Load patient on ambulance</li> <li>✓ Check the following steps for patient's suitability for ambulance 12-lead ECG.</li> <li>✓ Only apply the 12-lead ECG to aged 12-17 patient with his/her parents' / guardians' consent. (If in the absence of his/her parents/ guardian, NO 12-lead ECG would be applied.)</li> <li>✓ During the following steps, in case of any deterioration, cause NO delay to implement the FSD Cardiac Chest Pain Protocol immediately.</li> </ul>

檢查 行數 Action

- Step 1: Execute Existing Chest Pain Protocol at scene
- Step 2: Check the suitability for ambulance 12 lead ECG:
  - ✓ Patient on Amb
  - ✓ Age ≥ 12
    - ✓ (12-17 Get Consent from Parents / Guardian)
  - ✓ No delay on applying protocol to patient

3	<ul style="list-style-type: none"> <li>✓ 病人 是 心臟驟停 Patient in Cardiac Arrest</li> <li>✓ 病人 不是 心臟驟停 Patient NOT in cardiac arrest</li> </ul>	到最近醫院 Go to Nearest Hospital <input type="checkbox"/> → 步驟 4 Step 4 <input type="checkbox"/>
4	病人的氣道及/或呼吸 Patient's Airway &/or Breathing	
	<ul style="list-style-type: none"> <li>✓ 不能 有效地處理 CANNOT be managed</li> <li>✓ 能 有效地處理 Can be managed</li> </ul>	到最近醫院 Go to Nearest Hospital <input type="checkbox"/> → 步驟 5 Step 5 <input type="checkbox"/>
5	生理性範疇 Physiological Criteria	
	(A) 格拉斯哥昏迷等級評分≤13 或 VPU 等級/不完全清醒	GCS ≤13 or VPU not completely alert <input type="checkbox"/>
	(B) 收縮血壓<90mmHg 或毛細管血液回流灌注時多於兩秒	Systolic BP <90mmHg or Capillary refill >2sec <input type="checkbox"/>
	(C) 每分鐘呼吸頻率 <10 或 >29	Respiratory Rate <10 or >29 per minute <input type="checkbox"/>
	<ul style="list-style-type: none"> <li>✓ 符合以上 5(A)-5(C) 任何一種或多於一種的生理性範疇</li> <li>✓ 不符合以上 5(A)-5(C) 任何一種的生理性範疇</li> </ul>	到最近醫院 Go to Nearest Hospital <input type="checkbox"/> → 步驟 6 Step 6 <input type="checkbox"/>
6	取得病人同意進行心電圖 Obtain patient's verbal consent for ECG	
	我(救護員)將會幫你(病人)在救護車上做心電圖, 並傳送給瑪麗醫院急症室醫生作即時診治用途。 如果心電圖有急性心肌梗塞迹象, 醫生可以及早安排俗稱通波仔的治療, 及/或即時處方副底藥給你。 做心電圖需時數分鐘(+/-出示附圖), 你是否同意做心電圖? I (Ambulanceman) will perform ECG for you (Patient) on ambulance, which will be transmitted to QMH A&E doctor for immediate diagnostic purpose. If ECG showed sign of acute myocardial infarction, doctor may arrange percutaneous coronary intervention for treatment early, and/ or immediately prescribe TNG for you. Performing ECG takes a few minutes (+/-show attached diagram). Do you agree for ECG?	
	同意 → 進行及傳送心電圖 → 離開現場, 到瑪麗醫院急症室 Consent → Perform & Transmit ECG → Rapid transport to QMH A&E	
	如心電圖機分析為懷疑心肌梗塞, 需要知會消防通訊中心/ 瑪麗醫院急症室 (電話: 22553007) If ECG machine analysis: STEMI suspicious, notify FSCC / QMH A&E (Phone: 22553007)	
	如果上壓≥100mmHg, 致電瑪麗醫院急症室醫生以決定是否處方副底藥劑, 如予處方, 劑量: 給予一次副底藥劑 0.4 毫克 → 如五分鐘後心胸痛未消除及上壓≥100mmHg, 可再給予副底藥劑(最多使用三次) For SBP≥100mmHg, phone QMH A&E doctor to decide prescribe TNG or not. If verbally prescribed, dosage: One TNG spray 0.4mg. May repeat TNG spray every 5 minutes if chest pain not resolved and SBP>100mmHg (Maximum 3 doses)	
	不同意 → 離開現場, 到瑪麗醫院急症室 → 步驟 5 NO consent → Rapid transport to QMH A&E → Step 5 不同意原因 Reason for not consent:	
7	繼續執行消防處救護車心胸痛指引 送瑪麗醫院急症室途中緊密監察病人	FSD Ambulance Cardiac Chest Pain Protocol continued with close monitoring enroute to QMH A&E



# Cardiac Chest Pain Form

心胸痛病人表格 Cardiac Chest Pain Patient Form

(處理 12 歲或以上前往瑪麗醫院急症室的心胸痛病人時, 必須填寫此表格 Filling this form for cardiac chest pain patient aged ≥12 to QMH A&E)

日期/召喚時間 Date/Time of call	到達病人時間 Patient side time	心電圖時間 ECG time	單位/救護車編號 Unit/Amb. No.
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## ● Step 3-5: Check the Patient **NOT** in Critical Conditions

- Cardiac Arrest?
- Cannot maintain airway?
- GCS ≤ 13?
- SBP ≤ 90mmHg?
- RR < 10 or > 29 per minute ?

檢查	行動 Action																		
3	<table border="1"> <tr> <td>✓ 病人 是 心臟驟停 Patient in Cardiac Arrest</td> <td>到最近醫院 Go to Nearest Hospital</td> <td><input type="checkbox"/></td> </tr> <tr> <td>✓ 病人 不是 心臟驟停 Patient NOT in cardiac arrest</td> <td>→ 步驟 4 Step 4</td> <td><input type="checkbox"/></td> </tr> </table>	✓ 病人 是 心臟驟停 Patient in Cardiac Arrest	到最近醫院 Go to Nearest Hospital	<input type="checkbox"/>	✓ 病人 不是 心臟驟停 Patient NOT in cardiac arrest	→ 步驟 4 Step 4	<input type="checkbox"/>												
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✓ 符合以上 5(A)-5(C) 任何一種或多於一種的生理性範疇 >1 of the above 5(A)-5(C) physiological criteria met	到最近醫院 Go to Nearest Hospital	<input type="checkbox"/>																	
✓ 不符合以上 5(A)-5(C) 任何一種的生理性範疇 None of the above 5(A)-5(C) physiological criteria met	→ 步驟 6 Step 6	<input type="checkbox"/>																	
6	<p>取得病人同意進行心電圖 Obtain patient's verbal consent for ECG</p> <p>我(救護員)將會幫你(病人)在救護車上做心電圖, 並傳送給瑪麗醫院急症室醫生作即時診治用途。 如果心電圖有急性心肌梗塞跡象, 醫生可以及早安排俗稱通波仔的治療, 及/或即時處方副底藥給你。 做心電圖需時數分鐘(+/-出示附圖), 你是否同意做心電圖?</p> <p>I (Ambulance) will perform ECG for you (Patient) on ambulance, which will be transmitted to QMH A&amp;E doctor for immediate diagnostic purpose. If ECG showed sign of acute myocardial infarction, doctor may arrange percutaneous coronary intervention for treatment early, and/ or immediately prescribe TNG for you. Performing ECG takes a few minutes (+/-show attached diagram). Do you agree for ECG?</p> <table border="1"> <tr> <td>同意 → 進行及傳送心電圖 → 離開現場, 到瑪麗醫院急症室 Consent → Perform &amp; Transmit ECG → Rapid transport to QMH A&amp;E</td> <td><input type="checkbox"/></td> </tr> <tr> <td>如心電圖機分析為懷疑心肌梗塞, 需要知會消防通訊中心/ 瑪麗醫院急症室 (電話: 22553007) If ECG machine analysis: STEMI suspicious, notify FSCC / QMH A&amp;E (Phone: 22553007)</td> <td><input type="checkbox"/></td> </tr> <tr> <td>如果上壓≥100mmHg, 致電瑪麗醫院急症室醫生以決定是否處方副底藥劑, 如予處方, 劑量: 給予一次副底藥劑 0.4 毫克 → 如五分鐘後心胸痛未消除及上壓≥100mmHg, 可再給予副底藥劑(最多使用三次) For SBP≥100mmHg, phone QMH A&amp;E doctor to decide prescribe TNG or not. If verbally prescribed, dosage: One TNG spray 0.4mg. May repeat TNG spray every 5 minutes if chest pain not resolved and SBP&gt;100mmHg (Maximum 3 doses)</td> <td><input type="checkbox"/></td> </tr> <tr> <td>不同意 → 離開現場, 到瑪麗醫院急症室 → 步驟 5 NO consent → Rapid transport to QMH A&amp;E → Step 5</td> <td><input type="checkbox"/></td> </tr> <tr> <td>不同意原因 Reason for not consent:</td> <td><input type="checkbox"/></td> </tr> </table>	同意 → 進行及傳送心電圖 → 離開現場, 到瑪麗醫院急症室 Consent → Perform & Transmit ECG → Rapid transport to QMH A&E	<input type="checkbox"/>	如心電圖機分析為懷疑心肌梗塞, 需要知會消防通訊中心/ 瑪麗醫院急症室 (電話: 22553007) If ECG machine analysis: STEMI suspicious, notify FSCC / QMH A&E (Phone: 22553007)	<input type="checkbox"/>	如果上壓≥100mmHg, 致電瑪麗醫院急症室醫生以決定是否處方副底藥劑, 如予處方, 劑量: 給予一次副底藥劑 0.4 毫克 → 如五分鐘後心胸痛未消除及上壓≥100mmHg, 可再給予副底藥劑(最多使用三次) For SBP≥100mmHg, phone QMH A&E doctor to decide prescribe TNG or not. If verbally prescribed, dosage: One TNG spray 0.4mg. May repeat TNG spray every 5 minutes if chest pain not resolved and SBP>100mmHg (Maximum 3 doses)	<input type="checkbox"/>	不同意 → 離開現場, 到瑪麗醫院急症室 → 步驟 5 NO consent → Rapid transport to QMH A&E → Step 5	<input type="checkbox"/>	不同意原因 Reason for not consent:	<input type="checkbox"/>								
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如心電圖機分析為懷疑心肌梗塞, 需要知會消防通訊中心/ 瑪麗醫院急症室 (電話: 22553007) If ECG machine analysis: STEMI suspicious, notify FSCC / QMH A&E (Phone: 22553007)	<input type="checkbox"/>																		
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不同意 → 離開現場, 到瑪麗醫院急症室 → 步驟 5 NO consent → Rapid transport to QMH A&E → Step 5	<input type="checkbox"/>																		
不同意原因 Reason for not consent:	<input type="checkbox"/>																		
7	<p>繼續執行消防處救護車心胸痛指引 送瑪麗醫院急症室途中緊密監察病人</p> <p>FSD Ambulance Cardiac Chest Pain Protocol continued with close monitoring enroute to QMH A&amp;E</p>																		



# Cardiac Chest Pain Form

## 心胸痛病人表格 Cardiac Chest Pain Patient Form

(處理 12 歲或以上前往瑪麗醫院急症室的心胸痛病人時，必須填寫此表格 Filling this form for cardiac chest pain patient aged  $\geq 12$  to QMH A&E)

日期/召喚時間 Date/Time of call	到達病人時間 Patient side time	心電圖時間 ECG time	單位/救護車編號 Unit/Amb. No.

步驟 Step	在現場依照消防處救護車心胸痛指引施救	FSD Ambulance Cardiac Chest Pain Protocol followed at scene
1		
2	<ul style="list-style-type: none"> <li>✓ 病人上救護車</li> <li>✓ 根據下列各點決定病人是否適合在救護車上進行心電圖</li> <li>✓ 若病人年齡為 12-17 歲(未成年)，必須得到父母/監護人之同意，方可進行心電圖。(若父母/監護人不在場，將不會進行心電圖)</li> <li>✓ 進行以下步驟期間，任何情況轉差，不能阻延施救，立即執行消防處救護車心胸痛指引</li> </ul>	<ul style="list-style-type: none"> <li>✓ Load patient on ambulance</li> <li>✓ Check the following steps for patient's suitability for ambulance 12-lead ECG.</li> <li>✓ Only apply the 12-lead ECG to aged 12-17 patient with his/her parents' / guardians' consent. (If in the absence of his/her parents/ guardian, NO 12-lead ECG would be applied.)</li> <li>✓ During the following steps, in case of any deterioration, cause NO delay to implement the FSD Cardiac Chest Pain Protocol immediately.</li> </ul>

	檢查	行動 Action
3	<ul style="list-style-type: none"> <li>✓ 病人是心臟驟停 Patient in Cardiac Arrest</li> <li>✓ 病人不是心臟驟停 Patient NOT in cardiac arrest</li> </ul>	到最近醫院 Go to Nearest Hospital <input type="checkbox"/> → 步驟 4 Step 4 <input type="checkbox"/>
4	病人的氣道及/或呼吸 Patient's Airway &/or Breathing	<ul style="list-style-type: none"> <li>✓ 不能有效地處理 CANNOT be managed</li> <li>✓ 能有效地處理 Can be managed</li> </ul> 到最近醫院 Go to Nearest Hospital <input type="checkbox"/> → 步驟 5 Step 5 <input type="checkbox"/>
5	生理性範疇 Physiological Criteria	到最近醫院 Go to Nearest Hospital <input type="checkbox"/> → 步驟 6 Step 6 <input type="checkbox"/>

6	取得病人同意進行心電圖 Obtain patient's verbal consent for ECG 我(救護員)將會幫你(病人)在救護車上做心電圖，並傳送給瑪麗醫院急症室醫生作即時診治用途。 如果心電圖有急性心肌梗塞跡象，醫生可以及早安排俗稱通波仔的治療，及/或即時處方副底藥給你。 做心電圖需時數分鐘(+/-示附圖)，你是否同意做心電圖？	I (Ambulanceman) will perform ECG for you (Patient) on ambulance, which will be transmitted to QMH A&E doctor for immediate diagnostic purpose. If ECG showed sign of acute myocardial infarction, doctor may arrange percutaneous coronary intervention for treatment early, and/ or immediately prescribe TNG for you. Performing ECG takes a few minutes (+/-show attached diagram). Do you agree for ECG?
	同意 → 進行及傳送心電圖 → 離開現場，到瑪麗醫院急症室 Consent → Perform & Transmit ECG → Rapid transport to QMH A&E	如心電圖機分析為懷疑心肌梗塞，需要知會消防通訊中心/ 瑪麗醫院急症室 (電話: 22553007) If ECG machine analysis: STEMI suspicious, notify FSCC / QMH A&E (Phone: 22553007)
	如果上壓 $\geq 100$ mmHg，致電瑪麗醫院急症室醫生以決定是否處方副底藥劑。如予處方，劑量：給予一次副底藥劑 0.4 毫克 → 如五分鐘後心胸痛未消除及上壓 $\geq 100$ mmHg，可再給予副底藥劑(最多使用三次) For SBP $\geq 100$ mmHg, phone QMH A&E doctor to decide prescribe TNG or not. If verbally prescribed, dosage: One TNG spray 0.4mg. May repeat TNG spray every 5 minutes if chest pain not resolved and SBP $\geq 100$ mmHg (Maximum 3 doses)	<input type="checkbox"/>
	不同意 → 離開現場，到瑪麗醫院急症室 → 步驟 5 NO consent → Rapid transport to QMH A&E → Step 5 不同意原因 Reason for not consent:	<input type="checkbox"/>
7	繼續執行消防處救護車心胸痛指引 送瑪麗醫院急症室途中緊密監察病人	FSD Ambulance Cardiac Chest Pain Protocol continued with close monitoring enroute to QMH A&E

## ● Step 6:

- Obtain patient's verbal consent for ECG

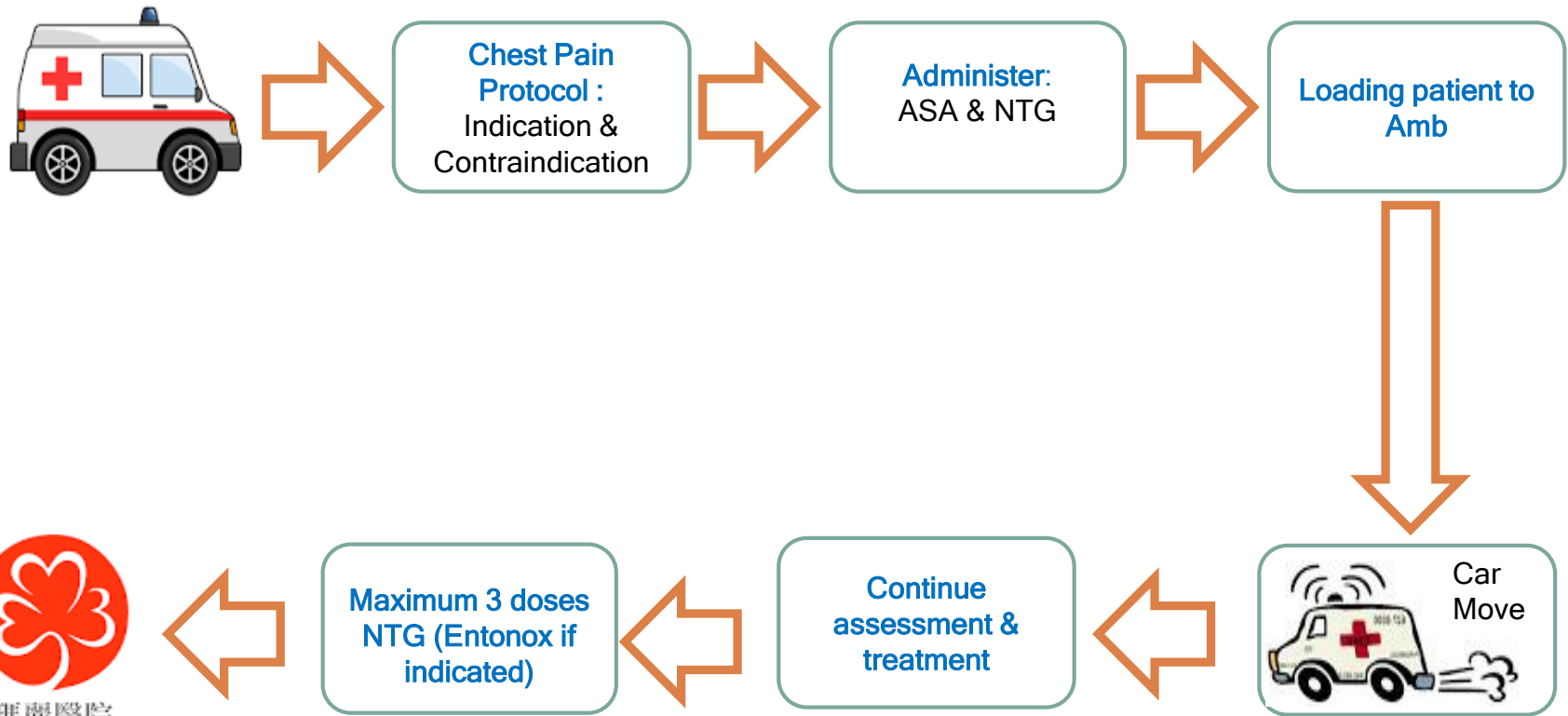
I (Ambulanceman) will perform ECG for you (Patient) on ambulance, which will be transmitted to QMH A&E doctor for immediate diagnostic purpose. If ECG showed sign of acute myocardial infarction, doctor may arrange percutaneous coronary intervention for treatment early, and/ or immediately prescribe TNG for you. Performing ECG takes a few minutes (+/-show attached diagram). Do you agree for ECG?

- Perform & Transmit ECG
- Rapid transport to QMH A&E

## ● Step 7:

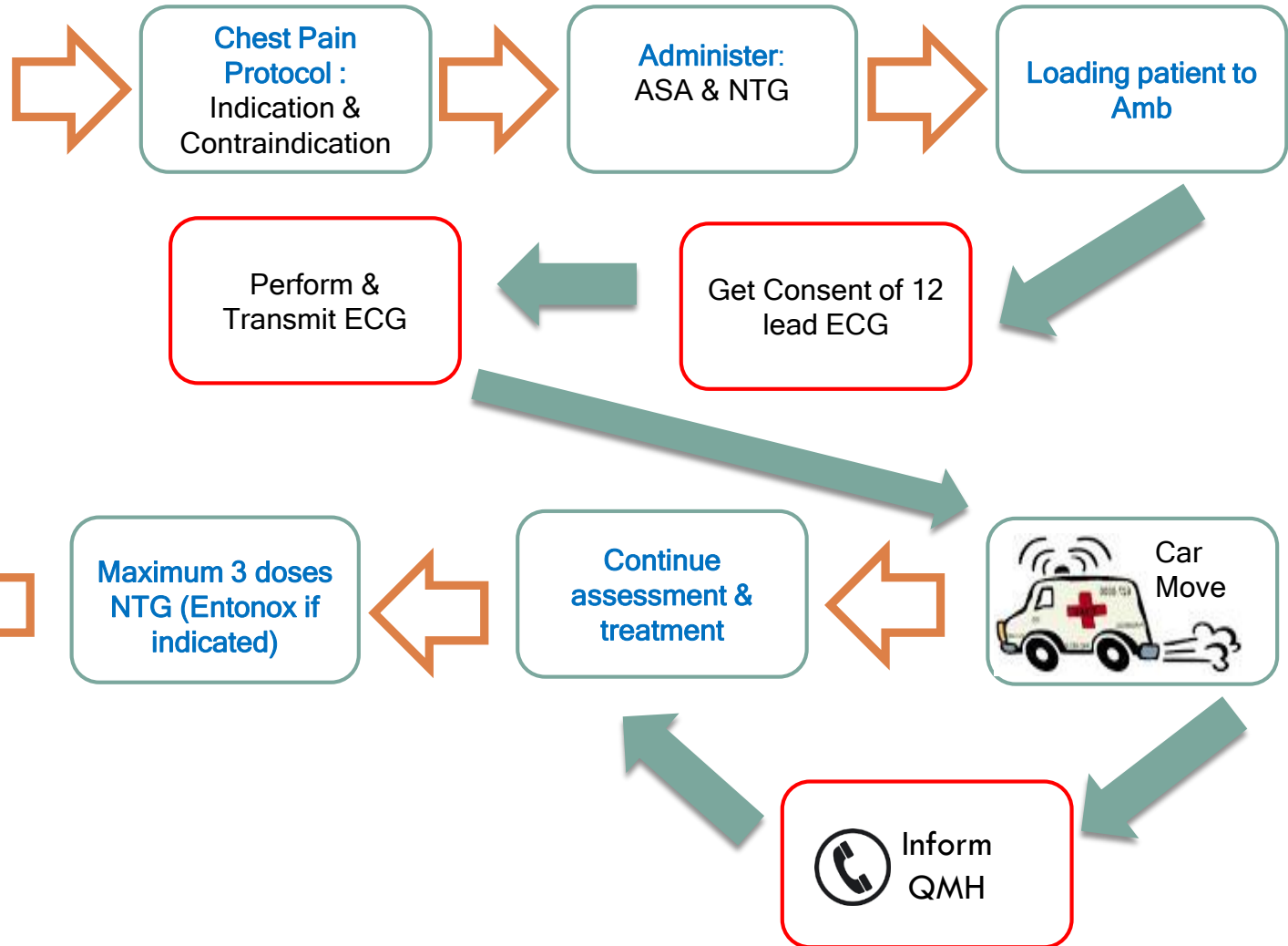
- Continue Protocol
- Close monitoring patient enroute to A&E

# Chest Pain Protocol (Without pre-hospital ECG)



瑪麗醫院  
Queen Mary Hospital

# Chest Pain Protocol (With pre-hospital ECG)



瑪麗醫院  
Queen Mary Hospital

# Phases



- 1<sup>st</sup> Phase (12.11.2015 - 31.12.2016)
- 2<sup>nd</sup> Phase (1.1.2017 - 5.11.2017) with enhancement (1.7.2017 - 5.11.2017)

# Cardiac Chest Pain Form (revised)

## 心胸痛病人表格 Cardiac Chest Pain Patient Form

(處理 12 歲或以上前往瑪麗醫院急症室的心胸痛病人時,必須填寫此表格 Filling this form for cardiac chest pain patient aged ≥12 to QMH A&E)

日期/召喚時間 Date/Time of call	到達病人時間 Patient side time	心電圖時間 ECG time	單位/救護車編號 Unit/Amb. No.

### Change 1

Collect 12-lead ECG at scene or on ambulance

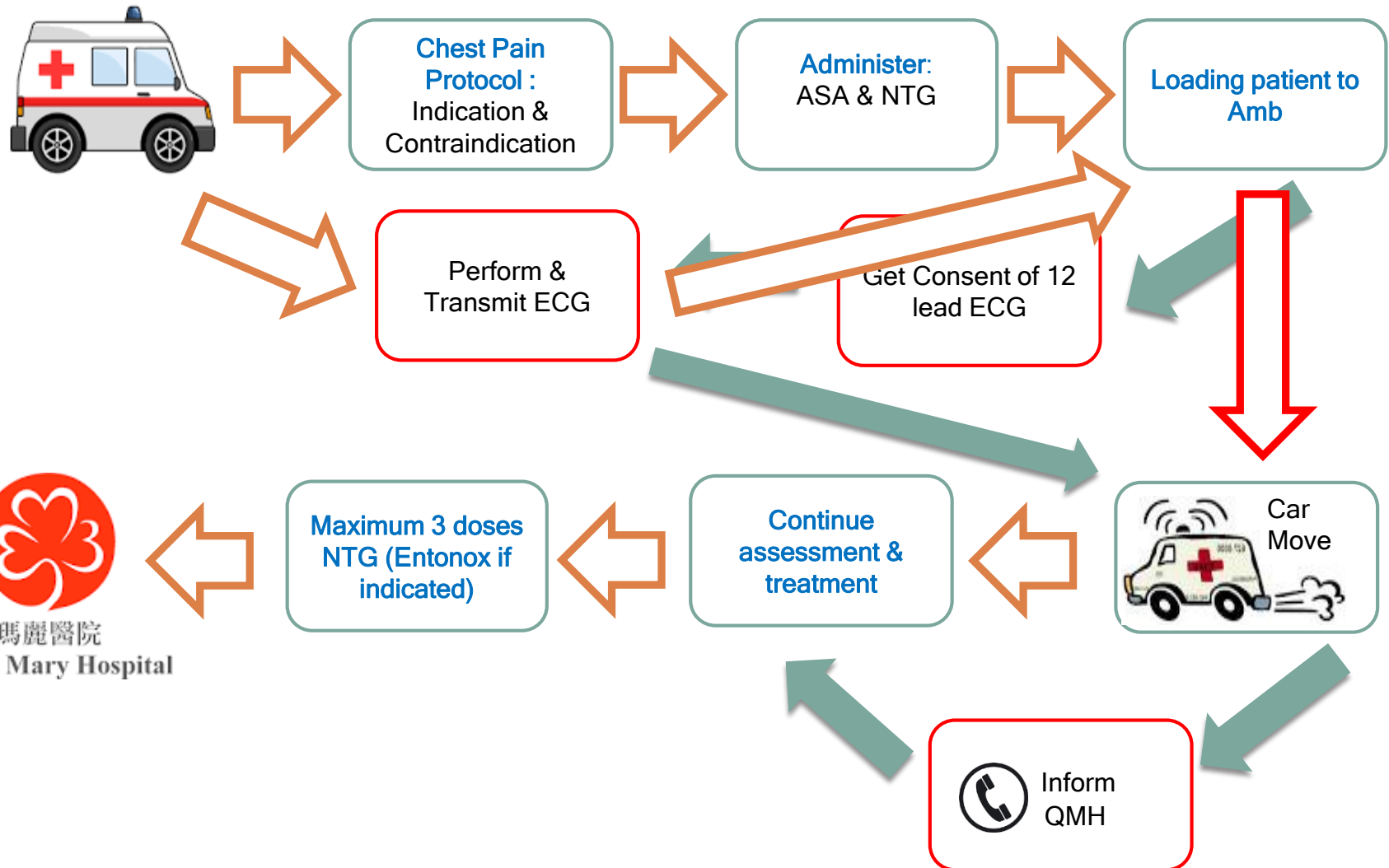
步驟 Step	依照消防處救護車心胸痛指引施救	FSD Ambulance Cardiac Chest Pain Protocol followed
1		
2	✓ 在 (S) 現場 <input type="checkbox"/> / (A) 救護車上 <input type="checkbox"/> , 根據下列各點決定病人是否適合進行院前心電圖 ✓ 進行以下步驟期間, 任何情況轉差, 不能阻延施救, 立即執行消防處救護車心胸痛指引	✓ At (S) Scene <input type="checkbox"/> / (A) on Ambulance <input type="checkbox"/> , check the following steps for patient's suitability for prehospital 12-lead ECG. ✓ During the following steps, in case of any deterioration, cause <b>NO</b> delay to implement the FSD Cardiac Chest Pain Protocol immediately.
檢查 Check		行動 Action
3	✓ 病人 是 心臟驟停 Patient in <b>Cardiac Arrest</b> ✓ 病人 不是 心臟驟停 Patient <b>NOT</b> in cardiac arrest	到最近醫院 Go to Nearest Hospital <input type="checkbox"/> → 步驟 4 Step 4 <input type="checkbox"/>
4	病人的 氣道 及/或 呼吸 Patient's Airway &/or Breathing ✓ 不能 有效地處理 <b>CANNOT</b> be managed ✓ 能 有效地處理 <b>Can</b> be managed	到最近醫院 Go to Nearest Hospital <input type="checkbox"/> → 步驟 5 Step 5 <input type="checkbox"/>
5	生理性範疇 Physiological Criteria (A) 格拉斯哥昏迷等級評分<13 或 VPU 等級/不完全清醒 GCS <13 or VPU/ not completely alert <input type="checkbox"/> (B) 收縮血壓<90mmHg 或毛細管血液回流灌注需時多於兩秒 Systolic BP <90mmHg or Capillary refill >2sec <input type="checkbox"/> (C) 每分鐘呼吸頻率 <10 或 >29 Respiratory Rate <10 or >29 per minute <input type="checkbox"/>	到最近醫院 Go to Nearest Hospital <input type="checkbox"/> → 步驟 6 Step 6 <input type="checkbox"/>
6	告知病人將會進行院前心電圖 Inform patient for performance of prehospital ECG 我(救護員)將會幫你(病人)做心電圖 (+/-出示附圖), 並傳送到瑪麗醫院急症室醫生作即時診治用途。如果心電圖有急性心肌梗塞迹象, 醫生可以及早安排俗稱通波仔的治療。 I (Ambulance man) will perform ECG for you (Patient) (+/-show attached diagram), which will be transmitted to QMH A&E doctor for immediate diagnostic purpose. If ECG showed sign of acute myocardial infarction, doctor may arrange percutaneous coronary intervention for treatment only.	到最近醫院 Go to Nearest Hospital <input type="checkbox"/> → 步驟 6 Step 6 <input type="checkbox"/>
無拒絕 → 進行及傳送心電圖 → 離開現場, 到瑪麗醫院急症室 → 致電瑪麗醫院急症室 (22553007) 並提供病人之香港身份證號碼 No refusal → Perform & Transmit ECG → Rapid transport to QMH A&E → Phone QMH A&E (22553007) to provide patient's HKID number.		
拒絕 → 離開現場, 到瑪麗醫院急症室 → 步驟 7 Refusal → Rapid transport to QMH A&E → Step 7 拒絕原因 Reason for refusal: _____		
7	繼續執行消防處救護車心胸痛指引 送瑪麗醫院急症室途中緊密監察病人	FSD Ambulance Cardiac Chest Pain Protocol continued with close monitoring enroute to QMH A&E

### Change 2

Consent → No refusal

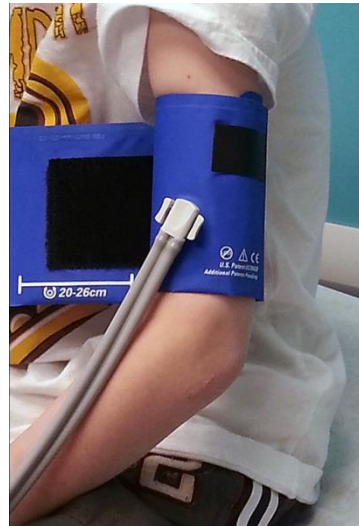
# Chest Pain Protocol

(Pre-hospital ECG in 2<sup>nd</sup> Phase)



# Phases

- 1<sup>st</sup> Phase (12.11.2015 - 31.12.2016)
- 2<sup>nd</sup> Phase (1.1.2017 - 5.11.2017) with enhancement (1.7.2017 - 5.11.2017)
  - ▣ Blood Pressure and Saturation of peripheral oxygen (SpO<sub>2</sub>)





# Video

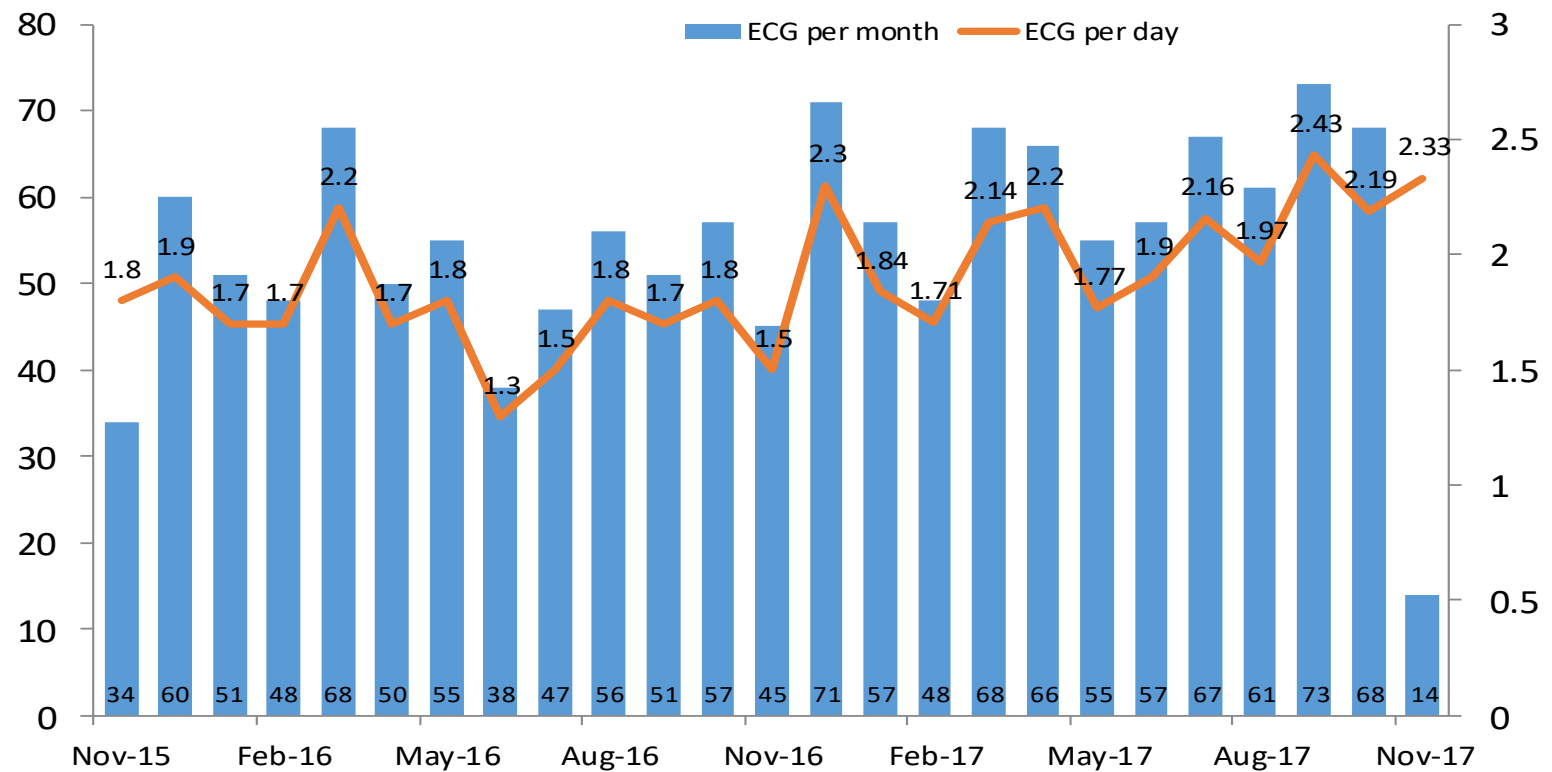




# Preliminary Result

# Result

## No. of patients with pre-hospital 12-lead ECG

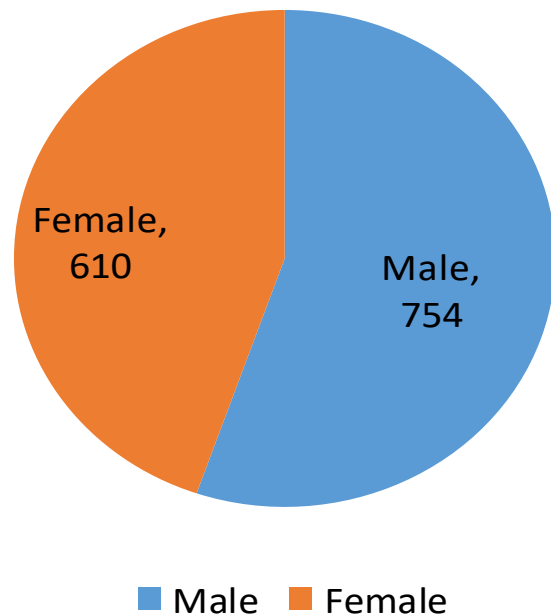


A total of 1,364 patients with pre-hospital 12-lead ECG collected

# Result

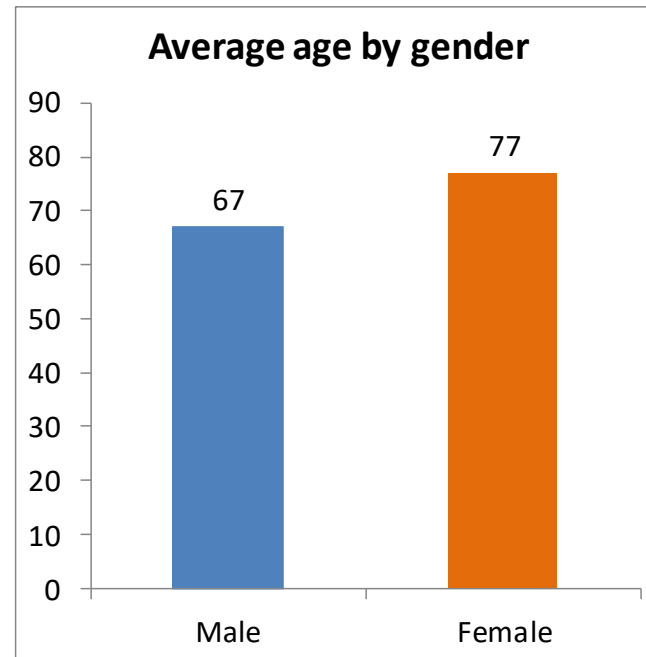
## Number of Patients by Gender and Average Age

No. by gender



Female = 610 (45%)  
Male = 754 (55%)

Average age by gender



Male = 67 & Female = 77

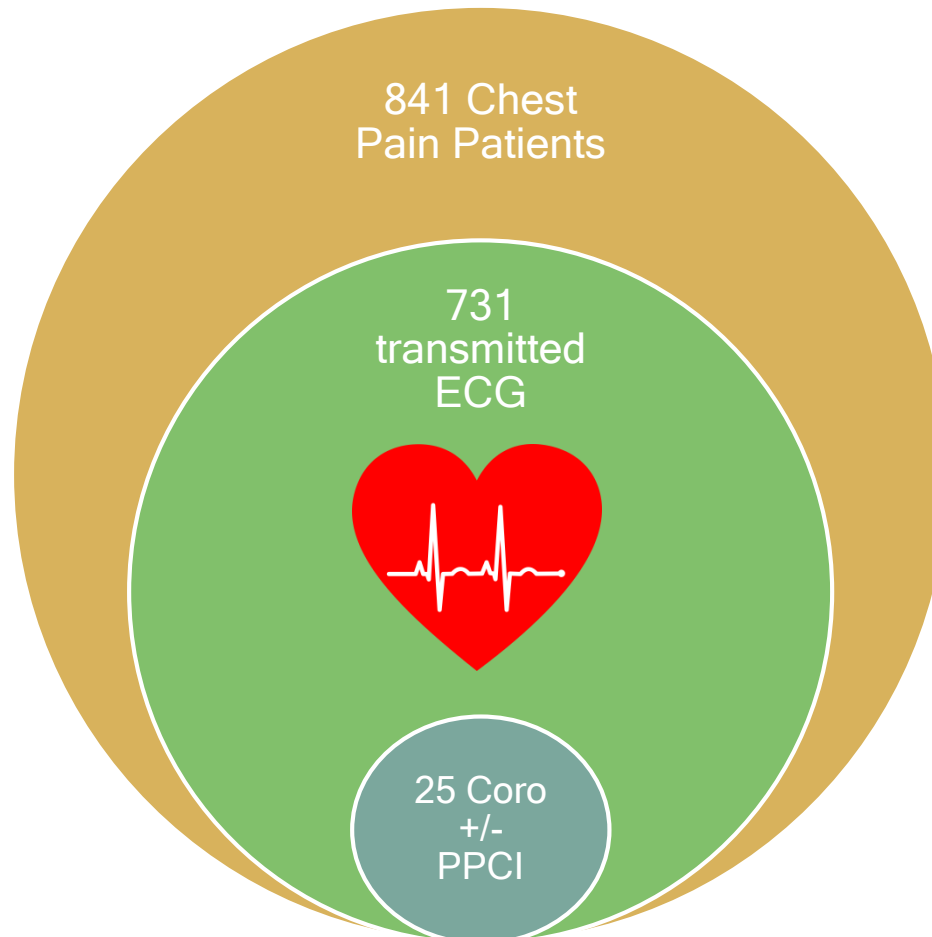
# Result

## No. of STEMI with pre-hospital ECG

	STEMI by 12-lead ECG Device	Not STEMI by 12-lead ECG Device	Total
STEMI by A&E doctor	28	23	51
Not STEMI by A&E doctor	18	1,295	1,313
Total	46	1,318	1,364

# Result

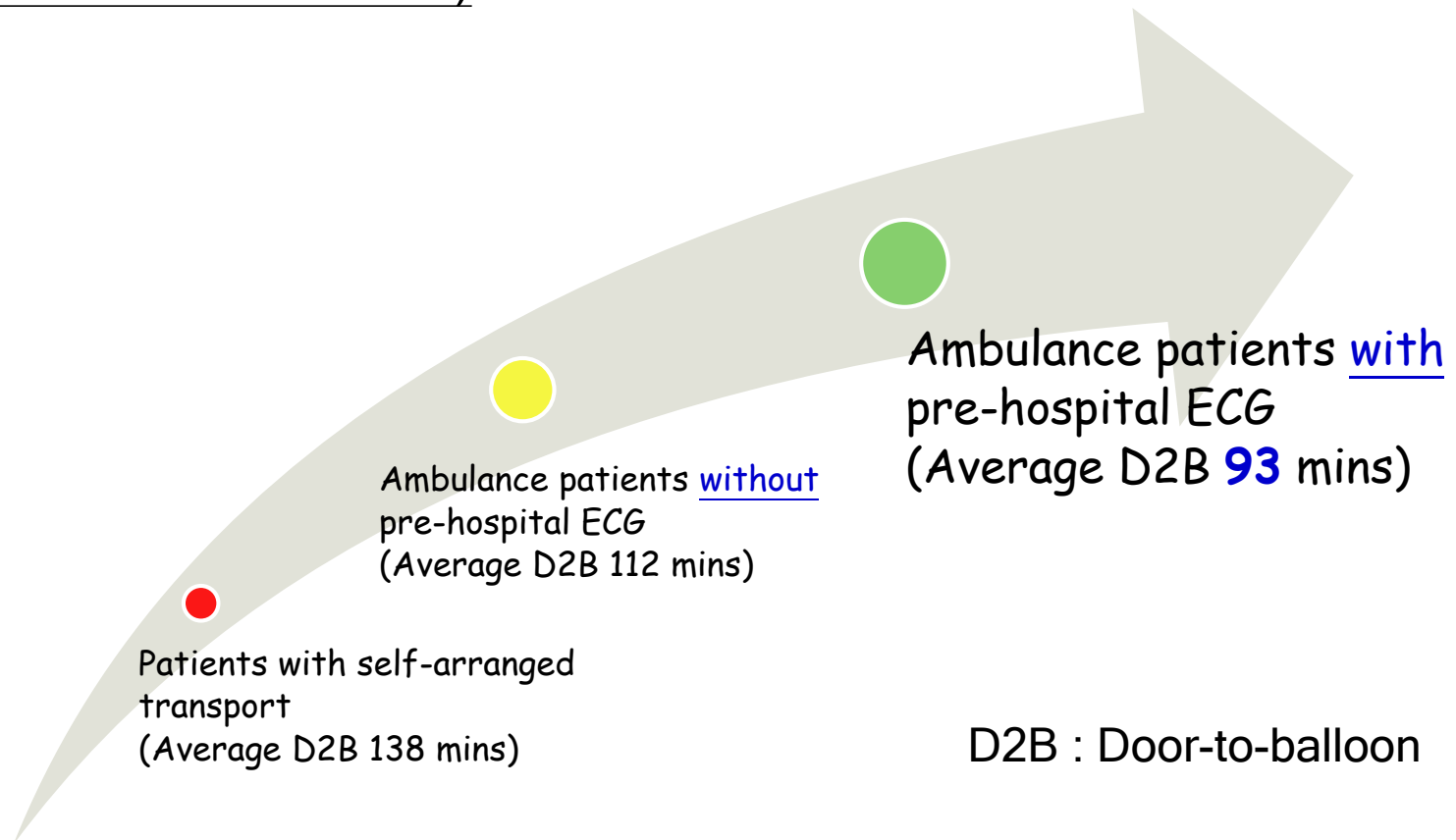
Result from QMH (12.11.2015 - 31.12.2016)



# Result

## Result from QMH

(12.11.2015 - 31.12.2016)





# Benefit of the Pilot scheme

- Benefit to patients (Shorten Door-to-balloon time)
- Strengthen working relationship with hospital
- Frontline Ambulancemen Welcome and Feedback is positive
- Enhance Development of Paramedic Ambulance Service



# Future Development

# Future Development

- Cardiac Chest Pain Form
  - ▣ Streamline the procedures
  - ▣ Facilitate statistics and research study
- On-going discussion with QMH to continue the pre-hospital ECG Scheme
- Identify most suitable pre-hospital 12-lead ECG device and extend the scheme of providing 12-lead ECG data to hospitals of other regions in future



THANK YOU

