

# E-CPR at Accident & Emergency Department nursing perspectives

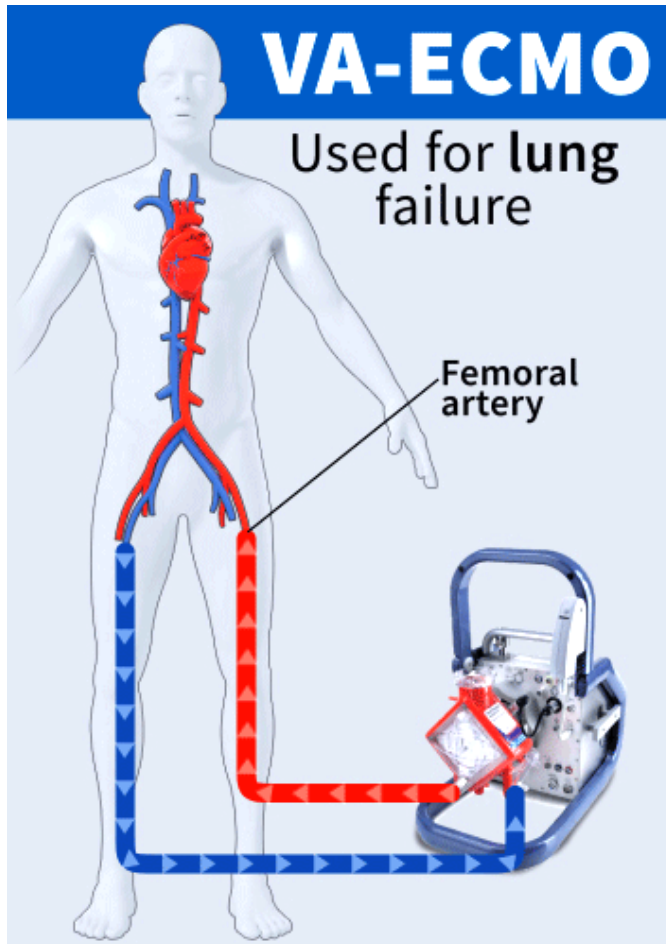
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16 May 2017  
HT Wong



# Veno-arterial ECMO

- Use venoarterial ECMO to help the arrested heart to maintain circulation and oxygen delivery to vital organs

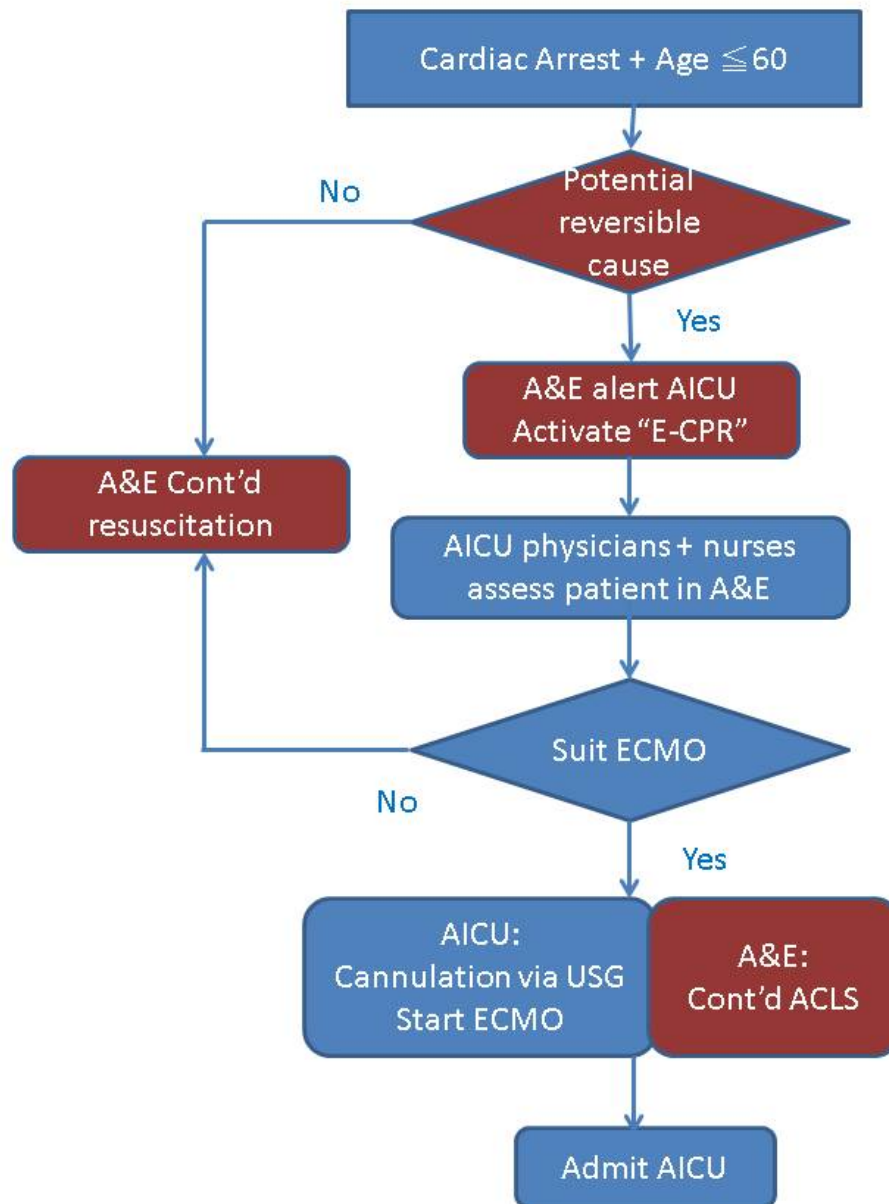


Source: [www.smh.com.au](http://www.smh.com.au)



ECMO + CPR (E-CPR): Model simulation

# Flow of E-CPR



# To make it happen . . . . .

First meeting was held on 25.4.2015

## Mangers Meeting

- Feasibility
- Workflow
- Logistics
- Equipment

## Training

- 23 teaching sessions by NC AICU



# To make it happen . . . . .

## Mangers Meeting

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First meeting was held on 25.4.2015

## Training

- 23 sessions from  
NC AICU

## Drill

-7 May 2015

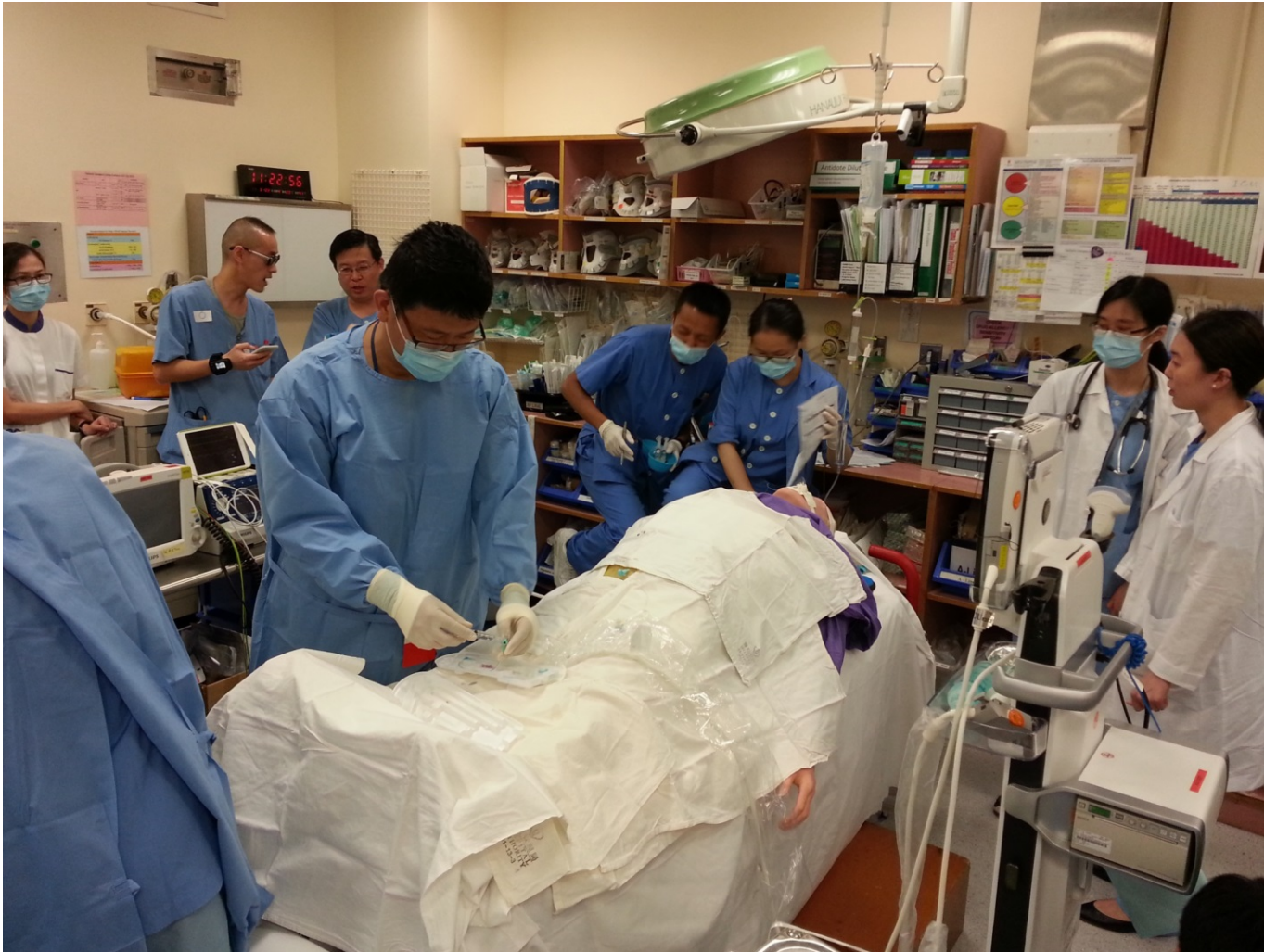
# Interdepartmental Drill 1<sup>st</sup> drill – 7.5.2015

ACLS by A&E team



# Interdepartmental Drill

Percutaneous sheath insertion with USG guided performed by AICU doctors



**1<sup>st</sup> drill – 7.5.2015**

# AICU nurses primed + manage ECMO



# A&E + AICU nurses: Maintain ACLS, ECMO Transfer Documentation



# Interdepartmental Drill

Transferral: by AICU + A&E nurses, AICU doctors, supporting staff



# Interdepartmental Drill

Transfer to AICU + handover



# To make it happen . . . . .

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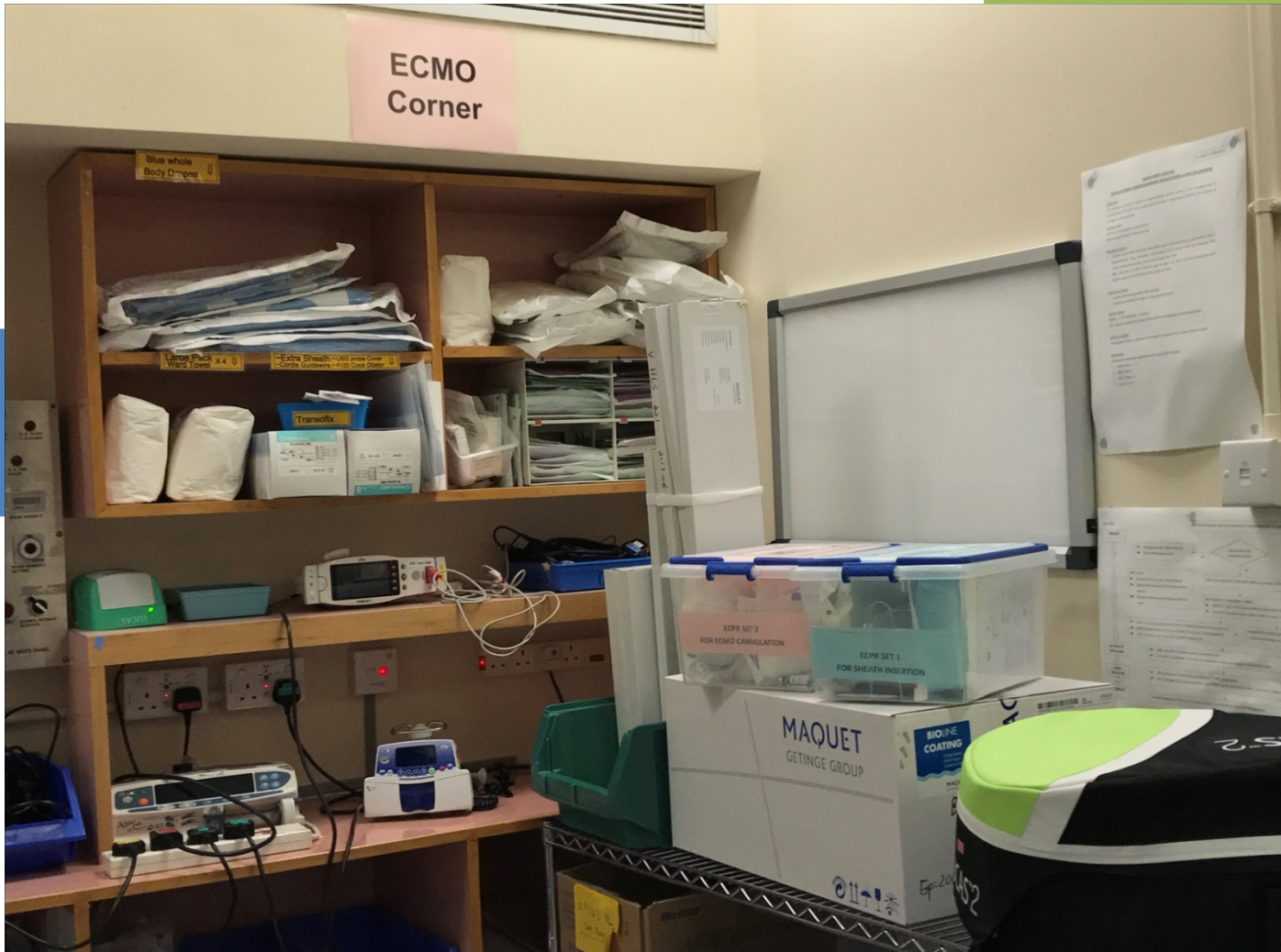
## Debriefing + Site visit

- Meeting
- Identify gaps
- Identify designated lift for transfer

# To make it happen . . . . .

## Setup Checklist

- ECMO corner



1<sup>st</sup> case on 28.4.2015



# Team Work



# Outcome

**Result:** Patients from 28.4.2015 to 31.12.2016 with E-CPR started in our A&E and data were analyzed.  
Mean Age = 45.5 (SD=15.1); range 20-73<sup>#</sup>.

Year	E-CPR in A&E QMH	Gender	Dead	Alive	Survival Rate
28/4 To 31/12/2015	9	M	6	1	22.2%
		F	1	1	
2016	8	M	4	2	37.5%
		F	1	1	

<sup>#</sup> First patient recruited to this E-CPR program, with unknown identity during resuscitation

# It works finally because. . . .

Mangers  
Meeting

Training

Drill

Debriefing +  
Site visit

Setup  
Checklist



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HEALTH

面對情況危急的傷者，救人工作爭分奪秒，尤其是送抵急症室時心跳已停止的病人，僅少數可幸運獲救，並能康復出院。有公立醫院為突破困局、提升病人存活率，率先於急症室引入「體外膜氧合心肺復甦術」(E-CPR)，及時挽回更多生命，當中有獲救病人曾停止心跳達50分鐘。

## 心跳停50分鐘獲救 E-CPR提升存活率

據本地研究顯示，逾八成於院外心跳停止的病人均會不幸在急症室離世，當中獲救後、再經治療後康復並成功出院的比率只有0.86至1.25%，即每100人僅1人可最終幸運獲救，較住院病人的存活率(5%)低。有見及此，瑪麗醫院由今年5月起，在急症室引入「體外膜氧合心肺復甦術」(E-CPR)，並編製完整流程，成功提升病人存活率達33%。

E-CPR指在大腿上方分別插入靜脈和動脈插管，配置體外膜氧合(人工肺)，代替已停頓的心臟，以維持循環系統及其他重要器官的供氧，一般待5至7日，期間以不同藥物讓心臟回復跳動，慢慢恢復功能；此技術常用於接受常規心肺復甦術後，如人工心外壓及注射強心針等藥物均無效，心跳停頓30分鐘的病人。

該院成人深切治療部副顧問醫生魏振威指，此技術過往只常限於住院病人，而新計劃則首次與急症室及心臟科醫生、作三方團隊合作，將技術編入急症室，作分派病人的新機制。他解釋，每當獲悉有心臟停頓病人從院外送往急症室，便會安排進行心導管手術。

張樂雯(20歲)3月尾因急性心肌梗塞送院，曾命懸一線，心跳停頓歷時50至55分鐘，以E-CPR技術奇蹟挽回生命，其腦部功能目前亦可回復至病前水平，未損認知能力，惟左腳部分位置，因當時插管令神經線受損，暫未恢復知覺。她對「死過翻生」，表示會更珍惜家人，而此事亦令在場醫護人員鼓舞。

魏振威指，此計劃多見於急性心肌梗塞及冠狀動脈阻塞等心臟病人，當中以較年輕、患低溫症及遇溺時間不長等可逆轉病

# Acknowledgement



- All AED / Cardiology / ICU doctor , nurses and supporting staff
- Hospital Authority for extra resources
  - ECMO hardware : oxygenator, cannula

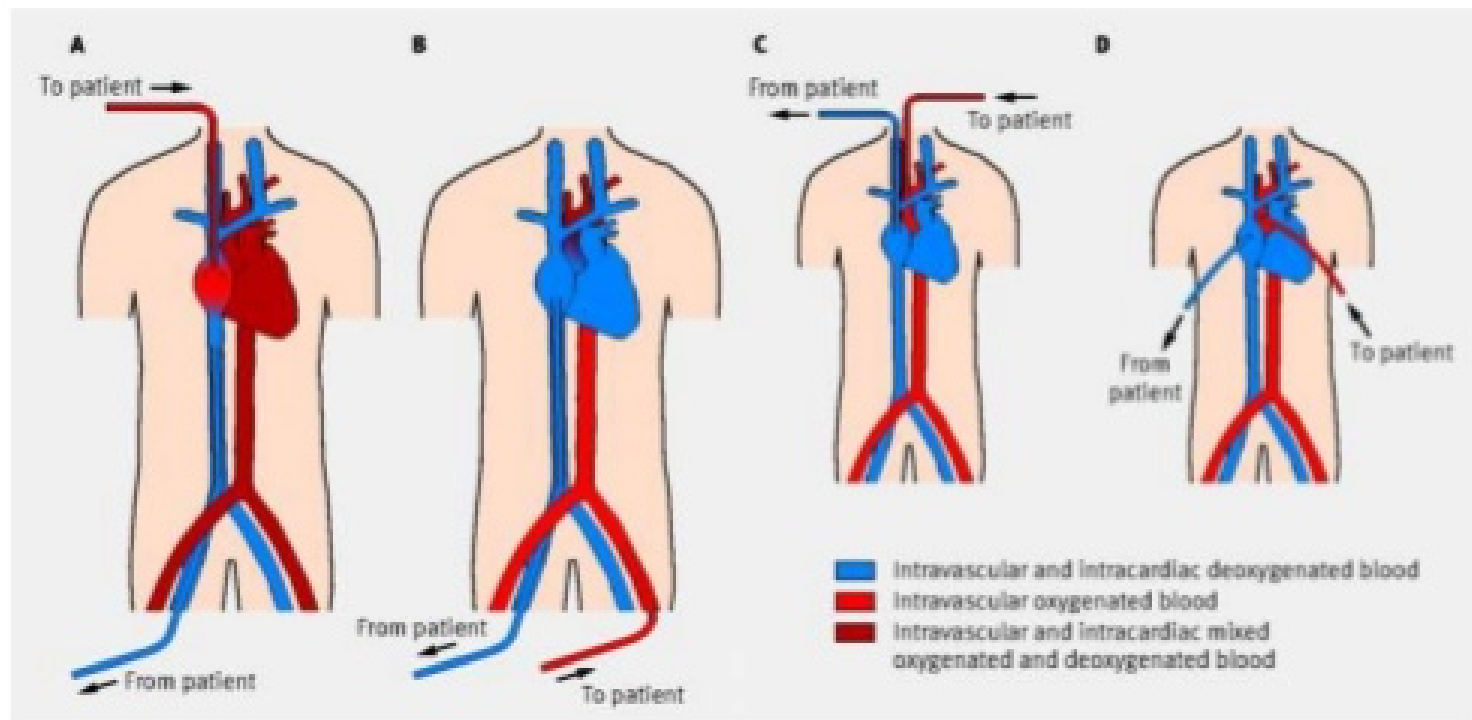
Dr Wallace C W NGAI  
Dr Simon W C SIN  
Mr Peter Lai

Dr TC Tsang  
Mr WK Chan  
Ms KY Lo

**THANK YOU**

# Configurations for ECMO

- **V**eno-**V**enous (Respiratory ECMO)
- **V**eno-**A**rterial (Cardiac and Respiratory ECMO)



	VA ECMO	VV ECMO
Cannulation site	Vein: <ul style="list-style-type: none"> <li>- Internal jugular</li> <li>- Femoral</li> </ul> Artery: <ul style="list-style-type: none"> <li>- Right common carotid</li> <li>- Axillary</li> <li>- Femoral</li> <li>- Aorta</li> </ul>	Single cannulation <ul style="list-style-type: none"> <li>- Internal jugular</li> <li>- Right atrium</li> </ul> Double cannulation <ul style="list-style-type: none"> <li>- Jugular-femoral</li> <li>- Femoro-femoral</li> <li>- Sapheno-saphenous</li> </ul>
Arterial PaO <sub>2</sub>	60–150 mmHg	45–80 mmHg
Indicators of O <sub>2</sub> sufficiency	<ul style="list-style-type: none"> <li>- Mixed venous oxygen saturation (mSvO<sub>2</sub>)</li> <li>- PaO<sub>2</sub></li> <li>- Calculated oxygen consumption</li> </ul>	<ul style="list-style-type: none"> <li>- SaO<sub>2</sub> and PaO<sub>2</sub></li> <li>- Cerebral venous saturation</li> <li>- Pre-membrane saturation trend</li> </ul>
Cardiac effects	Preload: decreased Afterload: increased Pulse pressure: lower CVP: varies Coronary O <sub>2</sub> : varies <ul style="list-style-type: none"> <li>- LV blood desaturated,</li> <li>- Cardiac Stun syndrome</li> </ul>	May reduce RV afterload Rest unaffected
O <sub>2</sub> delivery capacity	High	Moderate
Circulatory support	Partial to complete	No direct support, increased O <sub>2</sub> delivery to coronary and pulmonary circuit → improving cardiac output

VA: Veno-arterial, VV: Veno-venous, ECMO: Extracorporeal membrane oxygenation