Data Related Issues

Data Collection Period and Progress – Phase 2

Country	Medical Director/ Contact Person	Intervention	Pre-intervention period (e.g. Jan 2012 - Dec 2013) *minimal of 6 months' data	Post-intervention period (e.g. Jan 2014 onwards)	DA-CPR / OHCA data as of Sep 2014
Singapore	Ng Yih Yng	Comprehensive	01/04/2010 to 31/12/2012	Jan 2013 onwards	869 (760 actual DA-CPR)
Korea					
Seoul	Kim Joo Yong/ Yu Jin	Comprehensive	01/01/2011 to 31/08/2013	Sep 2013 onwards	83 (50 actual DA-CPR)
Daegu	Hyun Wook Ryoo	Comprehensive		Sep 2013 onwards	22 (17 actual DA-CPR)
Gwangju	Hyun Ho Ryu	Basic		Sep 2013 onwards	-
Taiwan					
Taipei	Patrick Ko	Comprehensive	01/06/2010 to 31/12/2012	Jan 2013 onwards	Nil
Tainan	Lin Chih-Hao	OHCA data collection only		NA	-
Taoyuan	Kuo Chan-Wei	Comprehensive		Jan 2015 onwards	Nil
Malaysia					
Sungei Buloh	Sarah Karim	Comprehensive	01/06/2010 to 31/08/2014	1 Sep 2014 onwards	106 (14 actual DA-CPR)
Kuala Lumpur	Mawar Ayub	Comprehensive	01/06/2010 to 31/08/2014	1 Sep 2014 onwards	253 (60 actual DA-CPR)
Kelantan	Nik Hisamuddin	Basic	01/06/2010 to 30/11/2014	Dec 2014 onwards	-
Penang	Darin Wong	Comprehensive	01/06/2010 to 31/10/2014	1 Nov 2014 onwards	143 (2 actual DA-CPR)
Johor Bahru	Mohd Amiin Bin Mohidin	Basic			-
Miri	Chia Kan Ooi	OHCA data collection only	Started from 01/01/2014	NA	159
Dubai	Omer Ahmed Al Sakaf	Comprehensive	01/03/2011 to 31/12/2012		577 OHCA data (nil DA-CPR data)
Thailand					
Rajavithi (Bangkok)	Nalinas Khunkhlai	Basic	01/08/2010 to 01/09/2012		Nil
Songkla	Thammapad Piyasiwanikul	OHCA data collection only	01/08/2010 to 01/09/2012		Nil
Japan					
Fukuoka city,Fukuoka	Dr Kanna+Shishima EMT	Comprehensive			Nil
Aichi Local,Aichi	Dr Nakagawa+Dr Takyu+Kaneko EMT	Comprehensive	01/01/2009 to 31/12/2010		
Aichi Entire	Dr Nakagawa+Dr Takyu+Kaneko EMT	Basic	01/01/2009 to 31/12/2010		
Fujisawa City, Kanagawa	Dr Anan+Kitagoya EMT	Comprehensive			
Shimada City,Shizuoka	Dr Matsuoka	Comprehensive			
Nara	Dr Fukushima	Comprehensive			
Tokyo Eitire	Dr Tanaka+Dr Takyu+Kaneko EMT	Basic	01/01/2009 to 31/12/2010		
Kiryu City, Gunmma	Dr Tanaka+Kimura EMT	Basic			
Soka city, Saitama	Dr Tanaka+Matsuyama EMT	Basic			
Toyonaka, Osaka	Dr Shimamto+Dr Iwami	Comprehensive	01/01/2009 to 31/12/2010		
Osaka Entire	Dr Nishiuchi	Basic	01/01/2009 to 31/12/2010		

Data Collection Period– Phase 2

PAROS Associate Countries

Country	Medical Director/ Contact Person	Intervention	State starting date of data collection (e.g. from Aug 2013 onwards)	Post-Intervention period (e.g. Jan 2014 onwards)	OHCA data as of Sep 2014
Turkey					
Izmir	Ridvan Atilla	OHCA data collection only		NA	Nil
China					
Hangzhou	Cai Wenwei	OHCA data collection only	1 Nov 2014 onwards	NA	50
Qatar	Robert Owen	Basic			Nil
Indonesia					
Malang	Ali Haedar	OHCA data collection only		NA	Nil
Pakistan					
Karachi	Junaid	Basic			Nil
Philippines					
Manila	Faith Joan Mesa-Gaerlan	OHCA data collection only		NA	20
Vietnam					
Hanoi	Do Ngoc Son	OHCA data collection only	1 August 2014 onwards	NA	4
Hue	Hoang Trong Ai Quoc	OHCA data collection only	1 August 2014 onwards	NA	34
Ho Chi Minh	Ton Thanh Tra	OHCA data collection only	1 August 2014 onwards	NA	17
Abu Dhabi	Nathan Puckeridge/ Fergal Cummins	Basic			92 (only prehospital information)

Timelines

- Prospective data: require to match OHCA data with DA-CPR data for Japan, Korea and Taiwan
- 6 monthly period

Issues

OHCA Data

1. Duplicate cases were detected in PAROS 1 dataset – request sites to provide unique identifiers for all cases in the future
2. Illogical dates and timings were detected and corrected in the merged dataset, hence PAROS 1 dataset will be re-issued to sites
3. If cardiac arrest witnessed by EMS, bystander CPR and bystander AED/defib should be "No"
4. No. of survived to admission must be greater than (>) no. of survived to discharge/alive at 30th day post arrest
5. Died in ED or hospital should have CPC/OPC = 5, not 1,2,3,or 4

Issues

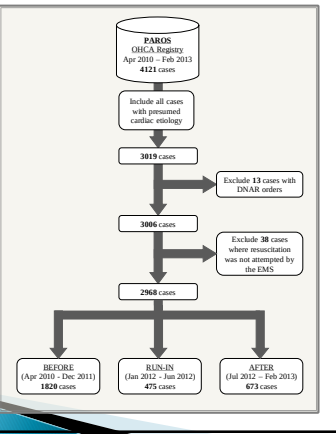
DA-CPR Data

1. Provide incident number for matching with OHCA data
2. 'Did Dispatch recognize need for CPR' should be selected as 'Yes' if time is provided for dispatcher to recognize need for CPR
3. Try not to leave blanks, select 'unknown' if information is not available
4. Use the comments box at the bottom of the form to highlight issues related to DA-CPR

Pilot Results of DA-CPR Intervention in Singapore

- DACPR intervention implemented in January 2012, consisting of:
  - a standardized dispatch protocol,
  - dispatcher's training package,
  - standardized measurement tool,
  - integrated quality improvement program and
  - community education
- A **before-after analysis** was conducted using:
  - OHCA cases retrieved from PAROS (Pan-Asian Resuscitation Outcomes Study) Registry and
  - DACPR information derived from audio recordings, ambulance resuscitation documents and medical records from the emergency department

Results



Results

- A total of **2968** cases included in analysis
- Mean age: **65.6 ± 15.7**
- Survival: **3.9%** (116/2968)
- Good functional recovery: **2.2%** (66/2968)

Results

Variable	Overall	Period		
		BEFORE (Apr '10 - Dec '11)	RUN-IN (Jan '12 - Jun '12)	AFTER (Jul '12 – Feb '13)
N	2968	1820	475	673
Age (mean ± SD)	65.6 ± 15.7	65 ± 15.5	66.1 ± 16.6	66.7 ± 15.8
Gender				
Male	2023 (68.2)	1261 (69.3)	324 (68.2)	438 (65.1)
Female	945 (31.8)	559 (30.7)	151 (31.8)	235 (34.9)
Race				
Chinese	1977 (66.6)	1203 (66.1)	309 (65.1)	465 (69.1)
Malay	454 (15.3)	276 (15.2)	81 (17.1)	97 (14.4)
Indian	349 (11.8)	227 (12.5)	49 (10.3)	73 (10.8)
Other	188 (6.3)	114 (6.3)	36 (7.6)	38 (5.6)
Medical History				
No known medical history	374 (12.6)	224 (12.3)	63 (13.3)	87 (12.9)
Heart Disease	1278 (43.1)	768 (42.2)	204 (42.9)	306 (45.5)
Diabetes	973 (32.7)	557 (30.6)	175 (36.8)	239 (35.5)
Hypertension	1591 (53.6)	932 (51.2)	274 (57.7)	385 (57.2)
Unknown	270 (9.1)	178 (9.8)	33 (6.9)	59 (8.8)
Other	1780 (60)	1059 (58.2)	291 (61.3)	430 (63.9)
Location				
Home Residence	2065 (69.6)	1290 (70.9)	333 (70.1)	442 (65.7)
Healthcare Facility	107 (3.6)	63 (3.5)	18 (3.8)	26 (3.9)
Nursing Home	94 (3.2)	59 (3.2)	14 (2.9)	21 (3.1)
In EMS/Private ambulance	63 (2.1)	45 (2.5)	9 (1.9)	9 (1.3)
Public/Commercial Building	305 (10.3)	158 (8.7)	51 (10.7)	96 (14.3)
Place of Recreation	58 (2)	33 (1.8)	12 (2.5)	13 (1.9)
Industrial Place	81 (2.7)	43 (2.4)	12 (2.5)	26 (3.9)
Street/Highway	118 (4)	79 (4.3)	15 (3.2)	24 (3.6)
Transport centre	38 (1.3)	25 (1.4)	4 (0.8)	9 (1.3)
Other	39 (1.3)	25 (1.4)	7 (1.5)	7 (1)

Results

Variable	Overall	Period		
		BEFORE (Apr '10 - Dec '11)	RUN-IN (Jan '12 - Jun '12)	AFTER (Jul '12 – Feb '13)
N	2968	1820	475	673
Pre-Hospital factors				
Witnessed arrest	1698 (57.2)	1020 (56)	282 (59.4)	396 (58.8)
Initial shockable rhythm*	722 (24.3)	427 (23.5)	124 (26.1)	171 (25.4)
ROSC location				
Pre-hospital	167 (5.6)	92 (5.1)	30 (6.3)	45 (6.7)
In ED	663 (22.3)	390 (21.4)	108 (22.7)	165 (24.5)
Bystander AED applied	62 (2.1)	39 (2.1)	9 (1.9)	14 (2.1)
Response time†, minute (mean ± SD)	8.7 ± 4	8.5 ± 3.8	8.9 ± 3.9	9.3 ± 4.5
FRP dispatched	199 (6.7)	67 (3.7)	45 (9.5)	87 (12.9)
EMS factors				
Mechanical CPR device used	722 (24.3)	123 (6.8)	100 (21.1)	499 (74.1)
Pre-hospital defibrillation	901 (30.4)	526 (28.9)	158 (33.3)	217 (32.2)
Pre-hospital advanced airway	2516 (84.8)	1504 (82.6)	409 (86.1)	603 (89.6)
Pre-hospital drug administration	1482 (49.9)	900 (49.5)	248 (52.2)	334 (49.6)
Epinephrine	1480 (49.9)	899 (49.4)	248 (52.2)	333 (49.5)
Post resuscitation care				
PCI	115 (3.9)	62 (3.4)	18 (3.8)	35 (5.2)
CABG	0 (0)	0 (0)	0 (0)	0 (0)
Hypothermia therapy	37 (1.2)	15 (0.8)	6 (1.3)	16 (2.4)
ECMO therapy	1 (0)	1 (0.1)	0 (0)	0 (0)

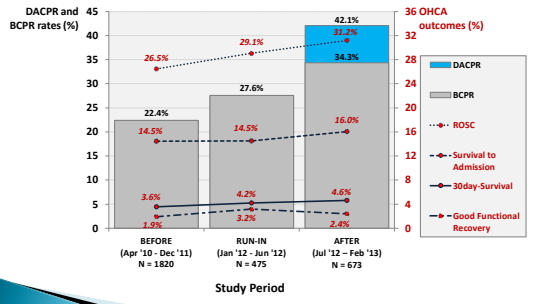
* ventricular fibrillation or pulseless ventricular tachycardia on the initial electrocardiogram (ECG)
† time from call received to ambulance arrival at the scene

Outcomes

Outcome	Overall	Period			Before vs After		
		BEFORE (Apr '10 – Dec '11)	RUN-IN (Jan '12 – Jun '12)	AFTER (Jul '12 – Feb '13)	*p*-value	OR (95%CI)	Adjusted* OR (95%CI)
N	2968	1820	475	673			
Bystander CPR (BCPR)	821 (27.7)	407 (22.4)	131 (27.6)	283 (42.1)	**< 0.001**	**2.52 (2.09,3.04)**	N/A
OHCA Outcome							
ROSC	830 (28)	482 (26.5)	138 (29.1)	210 (31.2)	**0.022**	**1.26 (1.04,1.53)**	1.29 (0.71,2.29)
Survival to admission	440 (14.8)	263 (14.5)	69 (14.5)	108 (16)	0.352	1.13 (0.89,1.44)	0.97 (0.70,1.34)
30Day-Survival	116 (3.9)	65 (3.6)	20 (4.2)	31 (4.6)	0.282	1.30 (0.84,2.02)	1.14 (0.88,1.48)
Good Functional Recovery	66 (2.2)	35 (1.9)	15 (3.2)	16 (2.4)	0.581	1.24 (0.68,2.26)	1.54 (0.69,3.23)

*OR was adjusted for the provision of BCPR, period of study, length of response time and use of mechanical CPR device

Trend across the study periods



DACPR vs BCPR vs No-BCPR

OHCA Outcome	Overall	CPR Status			DACPR vs BCPR		DACPR vs No-BCPR		BCPR vs No-BCPR	
		DA-CPR	BCPR	No-BCPR	*p*-value	OR (95%CI)	*p*-value	OR (95%CI)	*p*-value	OR (95%CI)
N	2968	52	769	2147						
ROSC	830 (28)	14 (26.9)	233 (30.3)	583 (27.2)	0.601	0.85 (0.45,1.60)	0.971	0.99 (0.53,1.84)	0.101	1.17 (0.98,1.40)
Survival to admission	440 (14.8)	7 (13.5)	139 (18.1)	294 (13.7)	0.358	0.71 (0.31,1.60)	0.962	0.98 (0.44,2.20)	**0.005**	**1.39 (1.12,1.74)**
30Day-Survival	116 (3.9)	1 (1.9)	48 (6.2)	67 (3.1)	**0.044**	0.30 (0.04,2.18)	0.544	0.61 (0.08,4.50)	**0.001**	**2.07 (1.41,3.02)**
Good Functional Recovery	66 (2.2)	0 (0)	32 (4.2)	34 (1.6)	**<0.001**	**NA**	**<0.001**	**NA**	**<0.001**	**2.70 (1.65,4.40)**

Conclusion

- A **significant increase** in **Bystander CPR** and **ROSC** was observed after the intervention.
- There was **a trend to suggest improved survival outcomes with the intervention** pending further results from the trial.
- BCPR from a trained bystander has the best outcomes, but **DACPR has potential to improve outcomes when an untrained bystander is present**, or there is reluctance to start CPR.