International Multi-Center Controlled Trial of Dispatcher-Assisted Cardio-Pulmonary Resuscitation Intervention Package

Pan-Asian Resuscitation Outcomes Study Phase 2

Introduction

- Difficulties in improving Bystander CPR (BCPR) rates
- Dispatcher Assisted Cardio-Pulmonary Resuscitation (DA-CPR)- Effective ?
  - Can double BCPR rates
  - Bystander CPR-Increase survival x2
  - But implementation is currently rare in Asia

Barriers to Implementation

- Callers usually anxious with fears and misconceptions
- Dispatchers are usually not medical personnel and not trained to communicate in life or death situations
- Dispatchers have reluctance and inhibitions under such circumstances.
- Cultural and mindset issues may hinder a layperson to assist in a cardiac arrest.

Overall/Progam Aim

- PAROS phase 1 (2010 to 2013): outcomes registry to understand OHCA in Asia and test hypotheses on relative cost-effectiveness of OHCA interventions.
- PAROS phase 2: To improve OHCA survival by increasing the bystander CPR rates in the Asia-Pacific

- Specific aim 1
  - To assess the impact of a step-up, system-level dispatcher-assisted CPR (DA-CPR) package on bystander CPR rates and on survival for OHCA using a phased, mixed-methods, before-after, difference of differences type analysis in Singapore and the Asia-Pacific.
- Specific aim 2
  - To assess the incremental cost-effectiveness of a DA-CPR package on survival to discharge compared to current models of alternative interventions (widespread community based CPR training, public access defibrillation, reducing ambulance response times, introducing advanced life support (ALS) ambulances and developing hospital-based post resuscitation care) in Singapore, developed in PAROS phase 1 study.
  - To assess the impact of a comprehensive DA-CPR package on neurologically intact (Cerebral Performance Category 1 or 2) survival for OHCA using a mixed-methods, before-after, difference of differences type analysis in Singapore.

Importance

- Little evidence for DA-CPR from RCTs
- International, multi-centre implementation trial
  - Large sample size
  - Can generalise results internationally
- To assess the clinical impact of a low-cost, community-level EMS intervention
- Good potential for survival (public health concern)

Methods

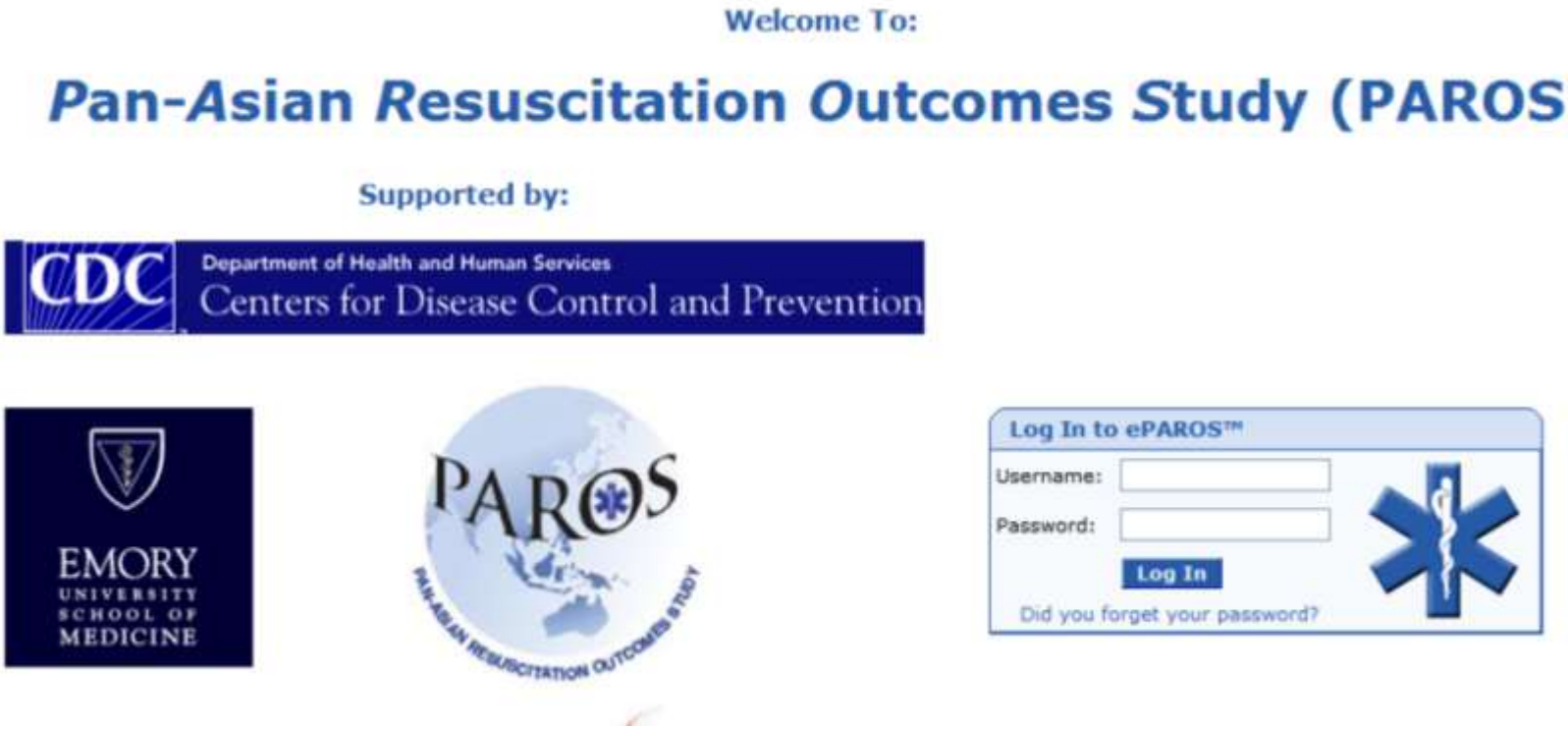
- Study design
  - A prospective, international, population-based, community-level, controlled implementation trial in an emergency medical services (EMS) setting.
  - Mixed-methods, before-after, difference of differences type analysis comparing outcomes in 3 groups: comprehensive package, basic package and no intervention.

Methods

Setting

- Phase 2 of the Pan-Asian Resuscitation Outcomes Study (PAROS) which is an ongoing OHCA registry
- Singapore, Korea, Japan, Taiwan, UAE, Thailand, China, Pakistan, Indonesia and Malaysia
- Cost-effectiveness analysis for this study will be focused on Singapore's EMS system

ePAROS



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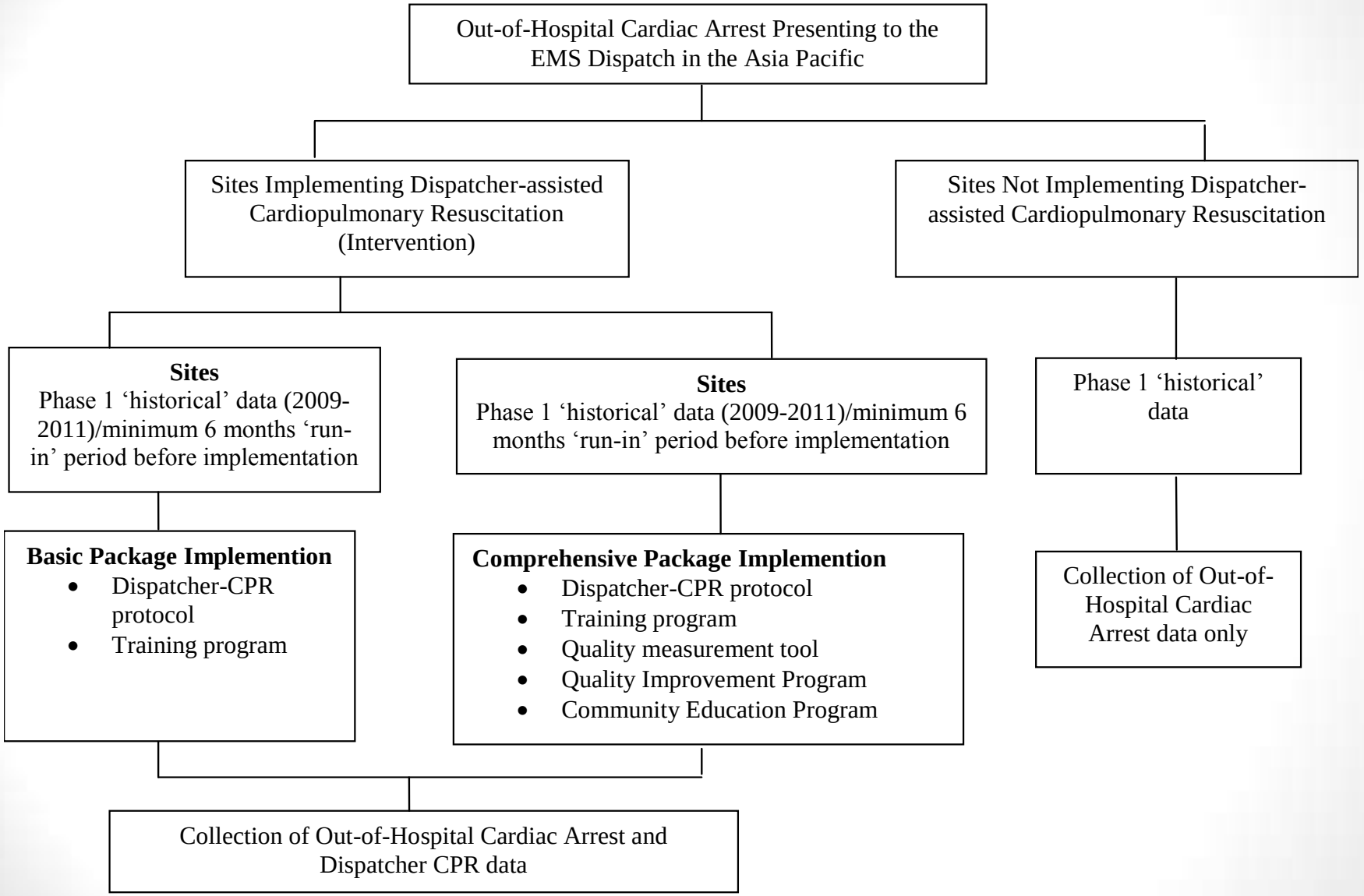
Web-based Electronic Data Capture

Trial Flow Diagram



Methods

- Patients' inclusion criteria
  - All OHCA presenting to EMS universal dispatch
- Patients' exclusion criteria
  - No resuscitation attempt
- Intervention -2 level Implementation
  - Basic- Implementation of dispatcher CPR training program and protocol
  - Comprehensive- Implementation of training program, protocol, quality improvement process and public education
- Before-After controls
  - Minimum of 6 months historical data

Methods

- Intervention -Basic

1. Standardized dispatcher-assisted CPR protocol

- Developed with the assistance of Prof Bentley Bobrow, Arizona State Medical Director and current Chairman of the American Heart Association Basic Life Support Subcommittee

2. A training package for dispatchers

- 1 day intensive training course
- Online version of the training package, supported by the Clinton Global Initiative.

SAMPLE PROTOCOLS FOR IDENTIFYING CARDIAC ARREST AND PROVIDING TELEPHONE-ASSISTED CPR INSTRUCTIONS

Arizona Department of Health Services

The first task when handling a possible cardiac arrest call is to identify whether a cardiac arrest has occurred. Two vital questions should be asked as early in the call as possible:

1. Is the victim conscious or responsive?
2. Is the victim breathing normally?

These questions should be asked regardless of whether the victim is an adult, a child, or an infant. If the answer to both questions is no, use the protocols below as called for:

Protocol for Compression-Only CPR

For adult victims and children older than eight years, instructions should be for Compression-Only CPR, or CPR without rescue breathing. Be CALM and ASSERTIVE. If the caller reports that the victim is not conscious and not breathing normally, then proceed IMMEDIATELY to the following script. Tell the caller:

1. Bring the phone and get NEXT to the person if you can.

2. Listen carefully. I'll tell you what to do.

A. Place the victim FLAT on his back on the floor.

B. KNEEL by the victim's side.

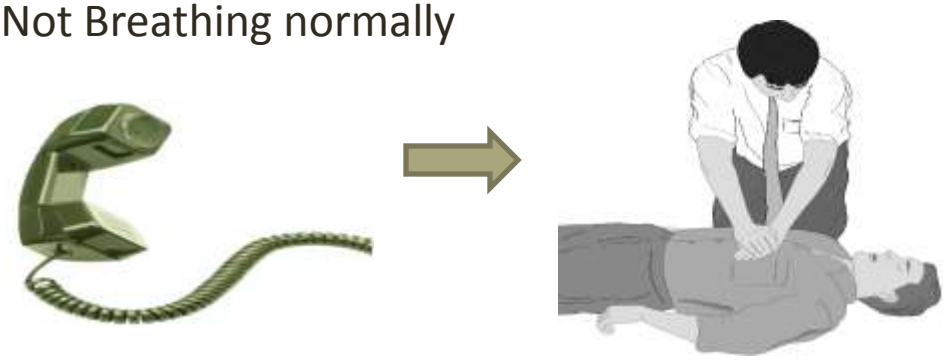
C. Put the HEEL of your HAND on the CENTER of the victim's CHEST.

D. Put your OTHER HAND ON TOP of THAT hand.

E. WITH YOUR ARMS STRAIGHT, PUSH DOWN AS HARD AS YOU CAN WITH THE HEELS OF YOUR HANDS. DO IT TEN TIMES AND COUNT WITH ME: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 (The rate should be corrected as needed. The ideal rate is 100 compressions per minute. If necessary, the caller should be told to come back to the phone.) KEEP GOING, PUSH HARD AND FAST AND COUNT OUT LOUD TO 10 OVER AND OVER AGAIN. I'LL STAY ON THE PHONE. KEEP DOING IT UNTIL HELP ARRIVES. (Encourage the caller. If the caller is tired, ask if they are keeping their arms straight. If necessary, suggest a short rest.)

Cardiac arrest identification and Dispatcher-assisted CPR

- Not Conscious/Responsive
- Not Breathing normally



Count 1,2,3,4,5,6,7,8,9,10
100 compressions/min

Keep going until the help arrives

Methods

- Intervention -Comprehensive

3. A measurement tool to collect data on Individual dispatcher and organizational-level performance through review of the audio dispatch recordings.

- Implemented in the ePAROS jointly developed with A/Prof Bryan Mcnally

4. Integrated quality improvement (QI) program

- Training in design and implementation of this QI program will be provided as part of the training package

5. Public education package

Telephone Assisted CPR QA Evaluation

For Quality Assurance Purposes Only. Not for General Distribution. Exempt from Discovery.

Date: _____ **Dispatch Agency:** _____ **Transfer Agency:** _____

Address: _____ **Case #:** _____

Dispatcher ID: _____ **Time of Call:** _____

Transfer Call? Yes ☐ No ☐

CPR instructions given? Yes ☐ No ☐

Victim	
9 or older	
8 or younger	
< 12 months	

Breathing Normally?			Patient Conscious?			Suspected Agonals reported or heard?	
Yes	No	Unk	Yes	No	Unk	Yes	No

Was caller the rescuer?		
Yes	No	Unk

CPR already in progress/ performed?		
Yes	No	Unk

Trained rescuer present?				
Yes	Pro	Lay	Unk	None

(Time) Need for CPR recognized by QI	(Time) Need for CPR recognized by dispatcher	Time dispatcher began instructions	Time of first compression	Time of first rescue breaths	Did patient status change?		
					Yes	Time	No

Dispatcher recognized need by conventional definition? Yes ☐ No ☐

QA recognized need for CPR by conventional definition? Yes ☐ No ☐

Dispatcher Assertive?		Rate Coaching			Depth Coaching		If multiple rescuers, coached to switch?	
Told	Asked	Yes	No	Counted?	Yes	No	Yes	No

Time breathing assessment began	Time breathing assessment ended

If CPR was delayed ☐ **or not given** ☐**, what was the reason?**

- ☐ Caller left the phone
- ☐ Caller not with patient
- ☐ Caller refused CPR
- ☐ Caller unable to perform CPR
- ☐ CPR already in progress
- ☐ Patient's status changed
- ☐ Dangerous Environment
- ☐ Didn't recognize CPR was needed
- ☐ Difficult Access
- ☐ DNR (Do Not Resuscitate)
- ☐ Language Barrier, if yes language was:
- ☐ Language Line Used
- ☐ Obvious 901H
- ☐ Unable to calm caller
- ☐ Unable to get patient to floor
- ☐ Other: _____

Coaching or compliments for dispatcher?	Research comments?

Methods

- Data collection
  - EMS dispatch, ambulance notes, Emergency Department (ED) and in-hospital records
  - Data management -Study Co-ordination Center (Singapore) -Electronic Data Capture (EDC)
- Variables
  - Primary outcome - OHCA survival
  - Secondary outcome - Bystander CPR rates

Methods

- Data analysis plan
  - Sample size -30,000 OHCA
  - Clinical effectiveness
    - Before-After Analysis
    - Difference of Differences
    - Adjusted for community, EMS and arrest characteristics

Methods

- Cost-effectiveness
  - Compare the intervention with 5 evidence-based competing strategies
    - Widespread community based CPR training
    - Public access defibrillation
    - Reducing ambulance response times
    - Introducing advanced life support (ALS) ambulances
    - Developing hospital-based post resuscitation care
  - Cost data
    - Direct
    - Indirect –societal perspective
  - Effectiveness data
    - Quality Adjusted Life Years (QALYs) saved

Benefits

- Robust scientific evidence
- Model for feasibility, implementation, cost-effectiveness and replication of system level intervention for OHCA
- Inform policy to improve pre-hospital emergency care
- Strengthen emergency treatment capability and research infrastructure
- Platform for low-cost community centered research
- Become leading international research center

Timeline

- May 2013 – rollout of pilot dispatch data collection tool using ePAROS, start training (workshops and e-learning)
- May-Aug 2013 - beta testing and refining data collection. Finalising dispatch protocols etc
- Aug-Oct 2013 – certification of sites for inclusion
- Oct 2013 – launch of trial