# **Reversing Sudden Unexpected Death (Out-of-Hospital Cardiac Arrest)**

Jim Christenson, Brian Grunau

**Priority Goals:** 

all events in BC.

Establish a BC OHCA Reg-

Broaden registry to include

Link registry with outcome

Complete extra-corporeal

CPR study and expand the

capability to other regions,

Establish a Resuscitation

Research Centre in BC.

data in cardiac interven-

tions, VS, ICU database,

pharmanet and MSP.

if positive.

istry within the CanROC

registry infrastructure.

#### **Situation:**

Sudden out-of-hospital cardiac arrest (OHCA) afflicts 3,000 people/ year in BC. Survival to discharge in medium and large BC cities doubled from 2006 to 2014. This can be further improved. BC is one of 3 primary research sites in the newly funded Canadian Resuscitation Outcomes Consortium (CanROC) and will play a leadership role in planning and executing research in resuscitation.

## Vision:

The best survival rates in the world for out-of-hospital sudden unexpected death.

### **Stakeholders:**

Cardiac arrest victims and families; BCEHS executive, call takers, dispatchers, paramedics, 1st responders; Municipal Agencies; PHSA Cardiac Services; PHC Resuscitation Research Group, UBC DEM, FOM and CHEOS; Cardiac Outcomes Group; HSF-BCY; ICRH; Defibrillator Manufacturers; SPOR SU; emergency physicians, intensivists, cardiologists, cardiac surgeons; BC Health Authorities; CanROC

## Inputs

BCEHS data on each response, including ECG tracings from each defibrillator used

Data from other jurisdictions in Canada and from published reports globally

Linked data for VS, medications, hospital ICU care procedures, survival status

1st responder time data, defibrillation data from each event

Dispatch-assisted CPR data

Detailed post-arrest care data

Inclusion in clinical trials within the CanROC and SIREN research group

Engage scientists in parallel research to further understand mechanisms of resuscitation and post-care

Defined cohort data in intervention and control regions

### Activities

Collection of patient care records and ECG tracings related to the response to each case of cardiac arrest

Identification of opportunities for improvement and testing implementation strategies

Engage all emergency responders in the out-of-hospital and in-hospital phase

Engage all EPs, cardiologists, intensivists, paramedics and firefighter first responders in BC

Analysis of OHCA care process and outcome data, including neuro function

Analyze post-care data to understand current post-arrest care

Collection of data on of advanced invasive resuscitative therapies, including cerebral oximetry, extracorporeal therapies, and other mechanical support devices

### Outputs

Annual reports to BCEHS outlining interventions and survival outcomes, comparison of regions within BC, as well as of BC with other jurisdictions in Canada and globally

Refine definitions of quality CPR via observation and ROC data analysis in manuscripts

Quarterly reports on quality of CPR opportunities

Incorporate and analyze dispatcher-assisted CPR data for frequency, quality and non-use in OHCA events. Make recommendations for improvement of BCEHS dispatch-assisted CPR

Implementation/publication of controlled trials

Increased interdisciplinary research collaboration; more efficient/effective trials with increased impact

Use further knowledge of effects of cardiac arrest treatments and care processes to define metrics for best practice (arrest and post-arrest)

Track cerebral performance category of survivors

### Outcomes

Short Term (<1 yr)

Long Term (2-3yrs)

**Anticipated Impact** 

Maintenance or increase of current survival to discharge in current footprint (14%)

Inclusion of all cases in urban and rural BC

Establish new treatment guidelines and collaborate with BCEHS to promote

Change in post-arrest practice

Increase capacity for local investigator-driven clinical trials

Increased collaboration between providers of OHCA care Increase in survival year by year

Increase in survival in patients who arrive at hospital with a pulse

Increased survival in patients who receive ECPR who otherwise would have died

Improved quality of CPR

ID and engage resuscitation researcher collaborators and initial planning of Resuscitation Research Center

Improved survival to discharge with normal or near normal function

Increased hospital survival in patients with return of circulation

Improved rates of dispatcher assisted CPR

Growth and recognition of world-class Resuscitation Research Centre

Facilitation of locally conducted world-class research by a Resuscitation Research Center

Transformational change in the paradigm of OHCA to include advanced circulation support

### **Significant Challenges:**

Collection of survival data in small rural hospitals, downloading of patient care records and ECGs from virtually all cases, changing behaviour in paramedics and 1st responders when necessary, ensuring paramedics and 1st responders follow research protocols without deviating, engaging other scientists from cardiology, intensive care and basics science in investigation.