

First Responder



NOVEMBER '07 Newsletter

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Compression only CPR - the way to go !

Chest compression only CPR - the discussion has been raging for the last year or so. A 2007 study published in the medical journal "Lancet" revealed that there is no evidence that artificial ventilations are helpful, at least in the first few minutes of a cardiac arrest.

This was a prospective, multicenter observational study of patients who had out-of-hospital cardiac arrest. On arrival at the scene, paramedics assessed the technique of bystander resuscitation. The primary endpoint was favourable neurological outcome 30 days after cardiac arrest. 4,068 adult patients who had out-of-hospital cardiac arrest witnessed by bystanders were included; 439 (11%) received cardiac- only resuscitation from bystanders, 712 (18%) received conventional CPR, and 2,917 (72%) received no bystander CPR. Any resuscitation attempt was associated with a higher proportion having favourable neurological outcomes than no resuscitation. Cardiac-only resuscitation resulted in a higher proportion of patients with favourable neurological outcomes than conventional CPR in patients with apnoea (6.2% vs. 3.1%) shockable rhythms (19.4% vs. 11.2%), and with resuscitation that started within four minutes of arrest (10.1% vs. 5.1%). **However, there was no evidence for any benefit from the addition of mouth-to-mouth ventilation in any subgroup.**



Interpretation-Cardiac-only resuscitation by bystanders is the preferable approach to resuscitation for adult patients with witnessed out-of-hospital cardiac arrest, especially those with apnoea, shockable rhythms or short periods of untreated arrest.

The authors compared bystander performance of cardiac-only CPR with standard CPR in a real-world community setting. For patients with shockable rhythms (VT or VF) or who had CPR started within four minutes of collapse, the survival with compression only-CPR was double that of those who had conventional CPR. For many groups the survival was marginally increased, and for no group was the survival better with conventional CPR.

There are many reasons for this finding. Ventilations delay the start of, and create long pauses in, chest compressions. They raise intrathoracic pressure, which squeezes blood out of the chest and further reduces brain circulation. And there is no evidence that artificial ventilations are helpful, at least for the first few minutes of a cardiac arrest, as there is a large amount of oxygen already in the blood, and early and effective chest compressions will prolong agonal gasps and continue the supply of oxygen.

Curiously, in Dr. William B. Kouwenhoven's first published study in 1960, he described his success in using only chest compressions to resuscitate a number of patients. Soon thereafter, and perhaps unfortunately, he and Dr. Peter Safar added mouth-to-mouth ventilations to create modern CPR.

It may very well be time to go back to Kouwenhoven's original method of compression only CPR - At least in the first few minutes of CPR !!!!!

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Is this the Army Medic of the future ??

A remote controlled robot that will rescue injured soldiers from the battlefield, without putting the lives of medics and fellow soldiers at risk, is being developed for the US army.

The 1.8 metre tall "Battlefield Extraction-Assist Robot (BEAR) will be able to travel over bumpy terrain and squeeze through doorways whilst carrying an injured soldier in its arms.

It has the ability to lift more than 135 kgs with one arm and can climb up and down stairs carrying its casualty.

BEAR is able to do things humans can't, such as carry heavy loads over considerable distances without tiring and carry an injured soldier whilst kneeling or lying down enabling it to stay under cover from the enemy. It is fitted with accelerometers to monitor the movement of its torso and gyroscopes to detect any rotation of its body that might indicate its about to lose its balance and computer controlled monitors adjust the position of the lower body accordingly to prevent BEAR toppling over.

As well as making the Army Medic's role much safer BEAR can be deployed for other tasks requiring muscle. We should see it ready for actual field testing in 5 years.



Should we give CPR before defibrillation as a standard rule???

In the critical moments after a heart stops, should paddle-wielding rescuers shock fast? Or slow?

That's the life-or-death question a new, North America-wide study of nearly 15,000 emergency patients will try to answer.

Researchers are examining the benefits of defibrillating victims within 30 seconds of their collapse in cardiac arrest, versus first performing three minutes of cardiopulmonary resuscitation, or CPR, before the shock.

St. Michael's Hospital is one of 43 Ontario hospitals participating in the \$15-million undertaking that involves 11 major centres and their myriad emergency-care services.

The mind-boggling logistics involve the co-operation and extra training of about 36,000 emergency medical service workers who will administer one of four combinations of treatment, including the pre-defibrillation 30-second or three-minute CPR. As well, the medical workers will also use a new device designed to increase blood flow during CPR - or a placebo - in the research.

"Most of us who do this kind of research are very excited, because (we'll be able to) answer questions we could never answer before," says Dr. Paul Dorian, a cardiologist at St. Mike's and one of the hospital's key investigators for the study.

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- * Stethoscope (Sprague)
- * Penlight torch
- * Paramedic shears
- * Sharps container
- * Stifneck Select Cervical Collar
- * Instructions for Use

Up to 20,000 Canadians suffer cardiac arrests outside of hospitals each year. Only about 5 per cent survive; most die en route to the hospital. Dorian cites the sheer numbers of study participants, both professionals and patients, as a key factor in the study's success. Ottawa and Vancouver, as well as nine U.S. centres, have signed on to take part in ROC-PRIMED (Resuscitation Outcomes Consortium - Prehospital Resuscitation Using an Impedance Valve and Early Versus Delayed Analysis Trial).

In Ontario, scientists and physicians have joined with emergency workers in Peel Region, Muskoka District and Toronto to launch the trial - a world first. The motivation for the study is straightforward and dramatic: elapsed time can be as critical as the treatment in saving someone who collapses with a suspected heart problem. Normally most victims of sudden cardiac arrests would be defibrillated as a priority. "Research now suggests maybe this isn't the right thing, maybe you shouldn't shock them right away; you should wait three minutes and be doing CPR," Dorian says, indicating recent studies in Seattle and Norway. "It turns out that when somebody has been unconscious for more than a couple of minutes and you shock their heart right away, the heart may not be ready to receive this electrical shock," he says. "The way to prime (the heart) is to do some minutes of CPR before you give the shock, so the heart ... will start to beat more effectively. "But we don't know which is right," Dorian adds.

Small, targeted studies of longer, pre-paddle defibrillation have had surprising outcomes, showing better survival rates. The results have made the large and random effort of PRIMED more important.

All patients will continue to get the best care currently available, researchers promise. New EMS guidelines for cardiac arrest and CPR are already improving survival rates for victims which, after they were treated and released from Toronto hospitals, climbed to 5.6 per cent from 3.8 per cent - and to 19 per cent from 13 per cent for patients with an erratic or disorganised heart rhythm - in 2006 and 2007. In addition to the pre-shock CPR, the study will test the new ResQPOD -Impedance Threshold Device (ITD), which is attached to the face mask or tube used for collapse victims, and increases the vacuum-like effect of CPR.

For the study, every paramedic will add a valve to the treatment of an emergency patient - half will be placebos. Also determined at random, half of collapse patients will be treated with the current 30 seconds of CPR and half will receive CPR for three minutes before defibrillation. The treatments have been refined to cause no added risk to patients. Permission for participation in the study is acquired after the emergency treatment.

"Most of the time the sudden cardiac death is caused by a rapidly life-threatening cardiac rhythm called ventricular fibrillation," Dorian explains. "It's an electrical problem, if you will, that kills people. "These are generally individuals who have a history of heart disease, but they don't even know it ... Despite getting relatively prompt treatment, it is often that these individuals die anyway."



The ResQPOD which is being used in the study



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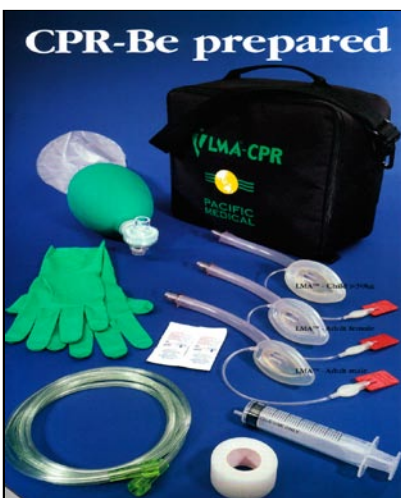
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Two years ago cardiologists, emergency doctors and doctors who work with paramedics conceived the Resuscitation Outcomes Consortium. It involves public safety agencies, regional hospitals, community health care institutions, medical centres and emergency medical support workers in the 11 locations. Peel Region was the first to get rolling in June, followed by Muskoka District. The rest of the GTA is to begin within the next three months. It was the high level of collaboration among emergency medical services in the GTA that made it first out of the starting gate, Dorian says.

"We are unbelievably lucky in Toronto, because the entire enterprise - from the paramedics, the firemen, the organization that runs the emergency medical, to the doctors (and researchers) who are involved - we have a fantastic culture of co-operation," Dorian says.

Verena Jones, educator for Peel's paramedics, says she was surprised at the passion for the project. "It shows their dedication and professionalism to their patients, and people in the region of Peel and the service itself," she says, crediting Peel's medical director, Dr. Sheldon Cheskes' personal interest and individual feedback to the paramedics for part of the enthusiasm. Since June, about 125 patients in Peel have been part of the study. Expected to wrap up next year, the study is being funded by the Canadian Institutes of Health Research and the U.S. National Institutes of Health, along with other foundations in both countries.

Reprinted from the Toronto Star

Footnote: Would we ever see trials such as described above being run in Australia ?

New guidelines for Stinger Treatment

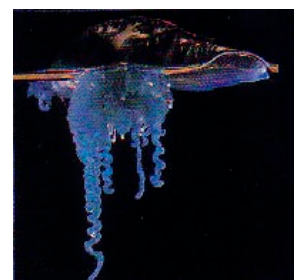
With summer almost upon us, it's important to revisit "stinger management". Last April we reported on the new treatment that was being suggested for "non tropical" bluebottle stings - immersion in hot water instead of the application of ice packs.

The Australian resuscitation Council (ARC) recently published its new guidelines for the treatment of jellyfish stings and has broadly divided the treatment into 3 categories:

1. Treatment for Tropical Jellyfish
2. Treatment for "Non Tropical" Jellyfish
3. Treatment for "Other Non Tropical" Jellyfish

Category 1 - Tropical jellyfish: - studies are ongoing to find the optimal treatment for these life threatening stingers such as the *Chironex fleckeri* box jellyfish but at present most agree that inhibition of nematocysts (stinging cells) by the application of vinegar is the main treatment.

carrukia barnsai
(*irukandji*)



Physalia sp. (bluebottle or Portuguese man-o-war)



Chironex Fleckeri
(*Box jellyfish*)



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ARC recommendation:

- * Rescue, restrain if necessary and call for help
- * Life Support as required
- * Liberally douse with vinegar to neutralise invisible stinging cells (do not wash with fresh water)
- * If vinegar not available, pick off any remnants of tentacles (this has not shown to harmful to the rescuer) and rinse the sting site well with sea water (not freshwater)

Category 2 - Non Tropical Bluebottle - recent studies and trials in NSW showed that immersion in hot water for the pain relief of stings from non tropical bluebottles was very effective. The studies concluded that "pain relief for stings by jellyfish of the *Physalia* sp. (bluebottle or Portuguese man-o'-war) can be effectively and safely provided by immersion of the affected area in water at 45 degrees Celsius for 20 minutes."



ARC recommendation:

- * Pick off any adherent tentacles with fingers (this has not shown to harmful to the rescuer) and rinse the sting site well with seawater (not freshwater)
- * Place the victim's stung area in hot water (no hotter than the rescuer can comfortably tolerate)
- * If local pain is unrelieved by heat, or if hot water is not available the application of cold packs or wrapped ice may be effective

Category 3 - Other Non Tropical Jellyfish - numerous jellyfish fall into this category and it is generally accepted that stings from these creatures do not produce life threatening situations, so the emphasis is on reduction of minor pain via the use of ice packs.

ARC recommendation:

- * Rest, reassure and observe the casualty
- * Do not allow rubbing of the sting area
- * Pick off any adherent tentacles with fingers (this has not shown to harmful to the rescuer) and rinse the sting site well with sea water (not freshwater)
- * Apply cold packs or wrapped ice for pain relief and seek assistance if generalised pain develops.

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One of the most vital functions of the human body is providing sufficient oxygen to all its parts. If it is disrupted, there is a danger of respiratory distress and exhaustion. The non-invasive process of Pulse Oxymetry is used to monitor the oxygen concentration in hemoglobin and thereby the oxygen supply to the body. Because it is non-invasive, pulse oxymetry makes the drawing of blood and related risks completely unnecessary and also requires less medical expertise of the user. Our pulse oximeter displays arterial oxygen saturation (SaO₂), pulse rate and the plethysmogram – quickly and effectively. This proven 20-year-old process is one of the most important parameters in patient monitoring and is therefore used in anaesthesia, intensive care units and emergency medical services.

Pulse Oxymetry permits the so-called "spot check" and provides an uninterrupted display of the parameter. The quality of the parameter is improved by compensating for movement and other factors which could influence the measurement. To ensure the best positioning of the sensor on the patient and thereby the best measurement results possible, we offer sensors for all patient groups and for different application locations, including finger, Velcro® and universal **Y-shaped sensors**. smartOx allows the non-invasive measurement of oxygen saturation in all patients from infants to adults by simply changing the device sensor. This proven technology fits in any coat pocket. It is effective, fast and, of course, very precise.



CT-6 Femoral Leg Traction Splint

The CT-6 from Faretec is a new development in the use of Carbon fibre in emergency traction, helping not only to make the product lightweight (weighs less than 455g) but also gives it strength. It has a 4:1 ratio tension for easy

infinite adjustment and quick cleat design for securing. The modular design allows for use with an Adult or Paediatric patient. The CT-6 Splint comes in a bag no bigger than 25cm x 10cm.

How does this splint differ from others already on the market - all one piece - no components to go missing - no need to figure out which piece goes where - more economical (under \$300.00)

The Last Word

Just can't wait until 2010 for the next review of International Resuscitation Guidelines. By then I imagine that much evidence will have been collected giving direction on what we should be doing in regards to improving outcomes of Sudden Cardiac Arrest (SCA).

We are seeing rapid changes in techniques and equipment available now, which enable improved blood flow during CPR never before being possible. Devices such as the ResQPOD, Autopulse, Defibrillators giving real time CPR feedback, allowing analysis during compressions along with better techniques to reduce interruptions during CPR, will produce significantly improved results in the survival of SCA.

*Charles Makray
Managing Director*

“ The ResQPOD® is the only impedance threshold device on the market. ”



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The ResQPOD is an impedance threshold device (ITD) that provides Perfusion on Demand (POD) by regulating pressures in the thorax during states of hypotension.

Animal and clinical studies* have shown that during CPR, the ResQPOD:

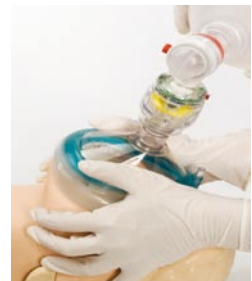
- Doubles blood flow to the heart
- Increases blood flow to the brain by 50%
- Doubles systolic blood pressure
- Increases survival rates
- Increases the likelihood of successful defibrillation
- Provides benefit in all arrest rhythms
- Circulates drugs more effectively

The American Heart Association (AHA), in their 2005 guidelines, designated the impedance threshold device (e.g., ResQPOD) a Class IIa recommendation for increasing blood flow and immediate survival rates in patients in cardiac arrest. It is the most highly recommended CPR adjunct in the new guidelines and carries a higher recommendation than any medication used to increase circulation in adults in cardiac arrest. The ResQPOD is the only impedance threshold device on the market.

The ResQPOD is easy to use. It provides a unique way to increase circulation during CPR by refilling the heart after each chest compression. In addition, timing assist lights on the ResQPOD provide guidance on the proper compression and ventilation rates.

How It Works

The ResQPOD prevents unnecessary air from entering the chest during CPR. As the chest wall recoils, the vacuum (negative pressure) in the thorax is greater. This enhanced vacuum pulls more blood back to the heart, doubling blood flow during CPR. Studies have shown that this mechanism increases cardiac output, blood pressure and survival rates. Patient ventilation and exhalation are not restricted in any way.



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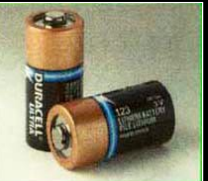
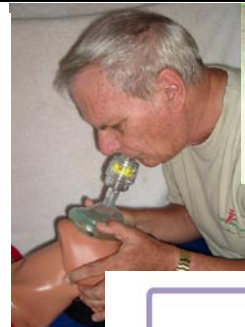


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