



# CENTRAL IOWA EMS DIRECTORS Synergy

Summer 2013

BRIDGING THE  
GAP BETWEEN  
HOSPITALS  
AND EMS

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## STROKE ALERT Mercy Medical Center

**T**ime is brain! With that in mind, the multi-disciplinary stroke team at Mercy Medical Center designed a “stroke alert” system for the immediate management of acute ischemic stroke.

Although patients in the community are educated and strongly encouraged to utilize 911 when experiencing stroke symptoms, many delay seeking medical assistance. Patients should call EMS immediately upon identifying stroke symptoms. Approximately 45% of these patients still arrive at the hospital by private vehicle. This requires rapid identification of potential stroke patients in the Emergency Department triage area as well as an alert team receiving patients from our EMS partners.

Once a patient is identified as a potential stroke in progress, the Emergency Department staff rapidly call a “stroke alert” via our in-house dispatch service. This call goes out to members of the stroke team as well as alerting radiology of the need for a stat head CT. The patient is evaluated by the team (consisting of a neurologist, a stroke team nurse, and the emergency department staff). If the patient meets criteria for treatment with the thrombolytic medication tissue plasminogen activator (t-PA) a “clot box” containing the medication, order sets, evaluation and documentation tools, is brought to the bedside. This allows for medication preparation and administration in a rapid fashion which decreases the time to treat significantly. When brain tissue is at risk seconds literally count so these time saving steps make a difference in the outcomes a patient may experience.

If the patient does not meet criteria for traditional therapies, other novel approaches are considered. A patient may be appropriate for intervention via intra-arterial t-PA or mechanical clot disruption. Additionally, Mercy Medical Center participates actively in a number of research trials that allow us to consider patients who may not qualify for IV t-PA.

The stroke alert system has created an opportunity to lower our door to needle times to a current average time to treat of 54 minutes. This is below the expected time of 60 minutes and we continue to strive for ways of further reducing this time to treat.



The stroke alert system has been a very effective mechanism for reducing times to treat and ensuring that stroke patients are rapidly evaluated for any opportunities available to ensure tissue salvage and a reduction in both mortality and morbidity.



# Enhancing Circulation in Hypotension and CPR with an Impedance Threshold Device (ITD)

*The following article was provided by Advanced Circulatory, makers of the ResQPod and ResQGuard. Many services are now using these, and they are making appearances in the hospitals as well. As always, check with your medical director regarding current science and practice as it applies to your protocols. –Synergy*

## What is an Impedance Threshold Device?

Many people are familiar with CPAP (continuous positive airway pressure), which increases pressure in the chest to force fluids out of the heart and air into the lungs. An Impedance Threshold Device (ITD) acts in the opposite way; it enhances the negative pressure (vacuum) in the chest by providing therapeutic resistance to the influx of air, thereby drawing more blood back to the heart (i.e. increasing preload).

Studies have shown that cardiac output and circulation are enhanced when negative pressures in the chest are regulated to increase this intrathoracic vacuum. In addition, this regulation of pressures in the chest lowers intracranial pressure and improves blood flow to the brain. This mechanism of optimizing the relationship between the respiratory, circulatory and nervous systems to enhance circulation is the basis for how an ITD can be used to treat states of mild to profound hypotension (e.g. cardiac arrest).

*Figure 1 (See page 3)*

**illustrates how an ITD works.**

## Enhancing Circulation in CPR with the ResQPOD Sudden Cardiac Arrest

Even when performed correctly, CPR provides only about 20 – 30% of normal blood flow to the brain, and 10 – 20% of normal blood flow to the heart. It is inefficient for two reasons:

1. As the chest wall recoils, air rushes in through an open airway and wipes out the vacuum that is critical for returning blood to the heart.
2. Despite training, many caregivers do not compress and ventilate at the proper rate. Compressing and ventilation too slow or too fast has a direct impact on survival.



Placed on a facemask or advanced airway during CPR, the ResQPOD helps correct the inefficiencies of CPR by preventing air from being drawn in during chest wall recoil (which enhances the vacuum in the chest), and by providing timing lights that guide ventilations and compressions at the proper rates.

There are significant data that suggest that the ITD works. The ResQPOD ITD has been evaluated in more than 50 animal and clinical studies using both conventional and active compression decompression CPR (ACD-CPR). According to research, the ResQPOD not only increases survival rates from cardiac arrest by 25% or more, it also:

- Doubles blood flow to the heart
- Increases blood flow to the brain by 50%
- Lowers intracranial pressure
- Doubles systolic blood pressure
- Provides benefit in all cardiac arrest rhythms (V-fib, PEA, asystole)

In addition, new data are emerging from a study published in the New England Journal of Medicine by the Resuscitation Outcomes Consortium (ROC) that initially showed neutral results vs. a sham ITD. Data presented by Ahamed Idris at AHA and NAEMSP in 2011 showed that survival was directly linked to compression rates. Idris presented data in 2012 that showed that when compressions were performed at AHA-recommended rates, the highest survival rates were achieved when the ITD was used.

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Perhaps the strongest evidence that the ITD can make a difference in bringing people back “whole” comes from the lives that have been saved. Wayne Schneider, a paramedic from Hennepin County, went into cardiac arrest while on a call in mid-December 2012. After 68 minutes of CPR using the ITD and the LUCAS device to ensure good CPR, Wayne was resuscitated with no neurologic deficit. He returned to work just after the New Year.

### Buying Time During Hemodynamic Compromise with the ResQGARD

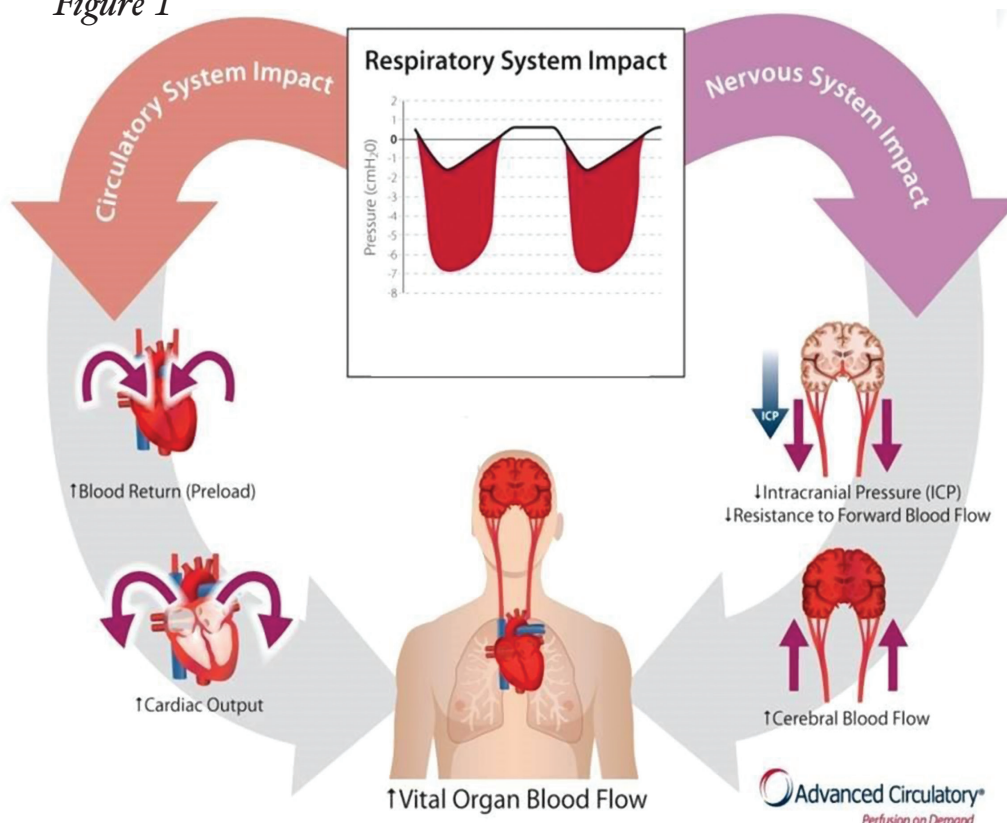
The consequences of hypotension or shock are serious, increasing the threat of sudden and unexpected death. It is important for EMS teams to treat hypotension rapidly and stabilize the patient until they can be transported to the hospital for treatment of their underlying condition.

The ResQGARD ITD is a non-invasive option for treating hypotension that has been shown in studies to rapidly increase blood pressure by up to 30% without fluids or drugs. Placed on a facemask or mouthpiece, the ITD provides therapeutic resistance during inhalation, enhancing the vacuum in the chest, which draws more blood into the heart and increases circulation. The ResQGARD can be used alone or with other therapies (e.g. IV fluids), and it complements a permissive hypotension approach in trauma.

The ResQGARD can be used by BLS or ALS professionals to treat hypotensive patients when IV or IO access is not practical or possible. It is generally indicated for the same patient population who would be candidates for fluid therapy.

Used extensively in the field by the US Military, the ResQGARD has also been implemented by several EMS systems to treat hypotensive patients as a bridge until definitive therapy can be provided.

Figure 1



## Class III Scheduled / Controlled Substance

*Ketamine is a non-paralytic agent used by some Des Moines area ambulance services for patients being intubated and also for continued sedation.*

### Generic Name:

Ketamine

### Brand Name:

Ketalar

### Class:

Nonbarbituate anesthetic

### Actions:

Blocks afferent transmissions associated with pain perception. Produces short-acting amnesia without muscular relaxation.

### Onset:

Within 30 seconds.

### Duration:

5-10 minutes.

**Indications:** Pain control, adjunct to nitrous oxide.

**Contraindications:** CVA, increased ICP, hypertension, cardiac decompensation, hypersensitivity, renal failure.

### Side Effects:

Hypertension, tachycardia, hallucinations, hypotension, bradycardia, & respiratory depression.

### Interactions:

None significant.

### Administration Routes:

IM, IV, IO



## NEW SMART TRIAGE TAG

All Ambulances and hospitals in the Central Iowa Area have now switched to the SMART Triage Tag pictured below. The new tag more easily identifies the priority of the patient and allows you to change that priority without having to obtain a new tag. While the Triage Tag has changed, START and JUMP START continue to be the preferred triage method and can be used with this tag.



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## State of the art EMS

# MECHANICAL CPR DEVICES

by David Edgar

Over the past few years mechanical CPR devices have been working their way into ambulances and Emergency Departments in the Des Moines Metro Area. There are several reasons that these mechanical devices are becoming more prevalent.

First, the American Heart Association has been promoting proper, consistent CPR with minimal delays between compressions and ventilations. Research would show that consistent and proper CPR aids in perfusion to the vital organs. In theory a mechanical CPR Device will provide this consistent CPR with minimal interruptions.

Second, the mechanical devices eliminate fatigue and reduce the chance of injury while performing CPR. Anyone who has ever tried to perform CPR in a moving ambulance know that it is difficult at best and puts you in positions which may cause back injuries.

Third, the devices aid in provider safety by reducing the number of people necessary to care for the patient in the back. In addition it does not require a person to be standing unrestrained performing CPR in the back of a moving Ambulance.

There are two main types of devices used in the Des Moines

Metro Area. The Autopulse is made by Zoll Medical and involves a backboard type platform with a compressing band. The Lucas Device is manufactured by Physio-Control and utilizes a piston type device to compress the chest. More devices are starting to make their way into the market as the use of these types of devices becomes more common.

One area that the Central Iowa EMS Directors Association has been involved in relates to the return of these devices when on a patient in the ED and the patient is pronounced deceased. At times crews have been told by the Emergency

Departments that the Medical Examiner Investigators will not allow the devices to be removed until they arrive and evaluate the patient. We received confirmation through the Polk County Medical Examiner's representative at our meetings that Dr. Schmunk will allow this piece of equipment to be removed so it can be placed back into service with the ambulance service.

In addition to ambulances carrying these devices several Emergency Departments are also starting to use these for cardiac arrests within the hospital setting.

