

# Strengthening the Chain of Survival in Sudden Cardiac Arrest

A white ECG waveform is centered on the slide, set against a background of red and blue gradients. The waveform shows a regular rhythm with a narrow QRS complex, followed by a period of irregular, wide QRS complexes, and then a return to a regular rhythm. The background features a dark blue vertical band on the left and a red gradient on the right, with a white horizontal band at the top and bottom.

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AHA Faculty/ Instructor for ACLS, BLS & PALS  
Clinical Educator for ACSI

**Disclosure:** Employed by Advanced Circulatory Systems, Inc.  
(manufacture of ITD technology)



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Phone: 1-877-ResQPOD

# Sudden Cardiac Arrest (SCA)

- **Prevalence**

  - 310,000 coronary heart disease deaths

  - 166,200 are sudden cardiac arrest

  - Nearly 450 per day

- **Survival has been dismal**

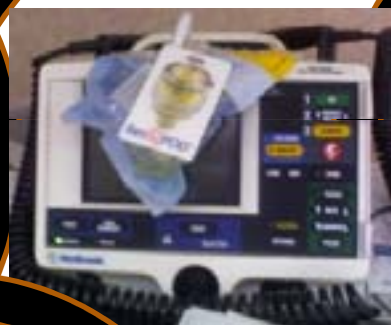
  - In-hospital:  $\approx$  20%**

  - Out-of-hospital: 5 - 10%**



**Source: [americanheart.org](http://americanheart.org)**

# *Strengthening the Chain of Survival*



# Increase knowledge of CPR

- **80% of cardiac arrests occur at home & witnessed by family member**
- **Survey done by AHA January 8 – 21, 2008 of 1,132 people**

**89% were willing & able to help a witnessed a medical emergency**

**<20% confident to perform CPR or use an AED**

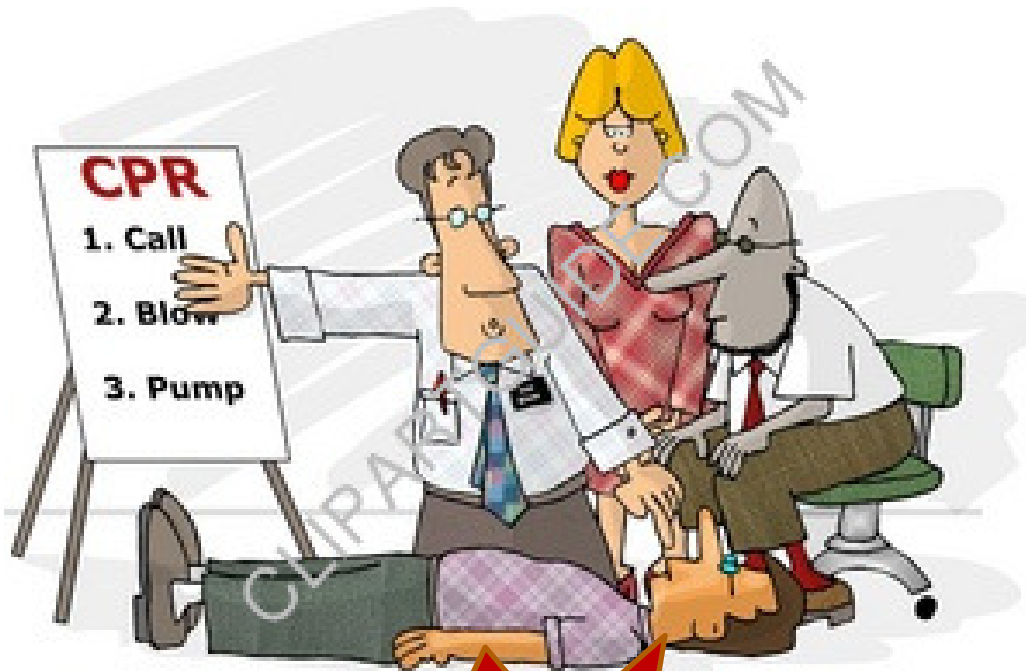
**Likely to perform CPR on adult (39%) or child (37%) they know.**

**<17% believe they are at risk for sudden cardiac arrest.**



**[www.americanheart.org](http://www.americanheart.org)**

# Hands Only CPR



Get non healthcare  
providers to do  
**SOMETHING !**

**American Heart Association**  
*Learn and Live*



## HANDS-ONLY CPR

The skills you learn in this course will prepare you to provide CPR to adults and children who are unresponsive and not breathing normally, regardless of the cause.

**For Adults:**

1. Tap and shout
2. Call 911
3. Check for normal breathing
4. Begin the breathe and push sequence of CPR

As part of learning these skills, you'll also be learning the skills needed to provide Hands-Only CPR, an easy and effective way to help adults who suddenly collapse.



1. Send someone to call 911 or, if alone, call 911 yourself

2. Push hard and fast in the middle of the chest

Whether an adult has collapsed suddenly or a person has experienced some other medical emergency and is not breathing normally that person will not get better without immediate help. This course will prepare you to give them the help they need.

So, why wait? You'll be surprised how easy CPR can be!

For more information on Hands-Only CPR, go to: [americanheart.org/handsonlycpr](http://americanheart.org/handsonlycpr)

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# Mechanical CPR:



Available only outside of USA



**ACD: Activite Chest Decompression**

# Device Features

## Ventilation Port

### 2 Timing Assist Lights

Promote proper ventilation & compression rate

### Timing Assist Lights

**ON/OFF Switch**  
Turns timing assist lights on & off

### Atmospheric Pressure

**Sensor System**  
Provides selective impedance to inspiratory air flow

**Safety Check Valve**  
Enables inspiration @ -10 cmH<sub>2</sub>O with spontaneous respiration




## Patient Port





**Something to think about ...**

**Brain dies because of lack of  
perfusion and  
failure to ventilate  
– not failure to intubate.**



# Clinical Benefits

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## Impedance Threshold Device Therapy

Brand name: ResQPOD 10.0 ITD (Perfusion on Demand)

Animal and clinical studies have shown:

Doubles blood flow to the heart

Increases blood flow to the brain by 50%

Doubles systolic blood pressure

Increases survival

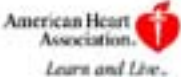


The generally cleared indication for the ResQPOD is for a temporary increase in blood circulation during emergency care, hospital, clinic and home use. Studies are ongoing in the United States to evaluate the long-term benefit of the ResQPOD for indications related to patients suffering from cardiac arrest, hypotension during dialysis and severe blood loss. The presentation of clinical data is not intended to imply specific outcome-based claims not yet cleared by the US Food and Drug Administration.

# Incorporating ITD into AHA Curriculum

August 2007

ECC



**American Heart Association**  
*Learn and Live.*

National Center  
7272 Greenville Avenue  
Dallas, Texas 75221-4709  
Tel: 214 (271) 6200  
www.heart.org

**Marketing Product Announcement**

**New ECC Product:** Airway Management DVD

**Product Code:** 80-1455

**Price:** \$65.00

**Product Supersedes another?** No.

**Brief Description:** The American Heart Association's adult Airway Management DVD includes five individual modules that can be taught together as a course or used as add-ons to a BLS for Healthcare Providers or an ACLS Course. Modules are designed for facilitator led, small-group interaction using the video and small-group skills testing stations. Teaching all modules will take about 4 hours.

**Module topics are:**

1. Bag-Mask Ventilation and Airway Adjuncts	}	must be taught as a foundation before any of the other modules
2. Laryngeal Mask Airway		
3. Esophageal-Tracheal Combitube	}	optional based on need and scope of practice
4. Endotracheal Tube		
5. Impedance Threshold Device		

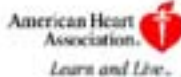
The DVD is 70 minutes. Closed captioned.

**Purpose/Intended Audience:** For those teaching an Airway Management, a BLS for Healthcare Providers, or an ACLS Course.

**Date at distributor:** August 30, 2007

**Attached:** Updated ECC Educational and Training Materials list

ECC



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**Product Announcement**

**New ECC Product:** Airway Management Student Guide

**Product Code:** 80-1464

**Price:** \$12.95

**Product Supersedes another?** No.

**Brief Description:** The American Heart Association's adult Airway Management Course includes five individual modules that can be taught together as a course or used as add-ons to a BLS for Healthcare Providers or an ACLS Course.

The Airway Management Student Guide is designed for use by students before, during, and after the course as a resource. The text, 8 1/2" x 11" and ~40 pages, contains colorful illustrations of airway anatomy and airway skills. The guide also contains Skills Station Competency checklists for the 5 airway modules:

1. Bag-Mask Ventilation and Airway Adjuncts
2. Laryngeal Mask Airway
3. Esophageal-Tracheal Combitube
4. Endotracheal Tube
5. Impedance Threshold Device

The modules cover basic and advanced adult airway skills but are not for students who require airway skills for rapid sequence intubation or surgical procedures. Modules are designed for facilitator-led, small-group interaction using the video and small-group skills testing stations.

**Purpose/Intended Audience:** The modules in this course are designed for out-of-hospital and in-hospital healthcare providers.

**Date at distributor:** August 30, 2007

**Attached:** Updated ECC Educational and Training Materials list



# 2005 AHA CPR Guidelines

Device/Drug	Class Recommendation
Impedance Threshold Device	IIa
Hypothermia	IIa
Vest CPR	IIb
Epinephrine	IIb
Amiodarone	IIb
Vasopressin	Indeterminate
Lidocaine	Indeterminate
Atropine	Indeterminate

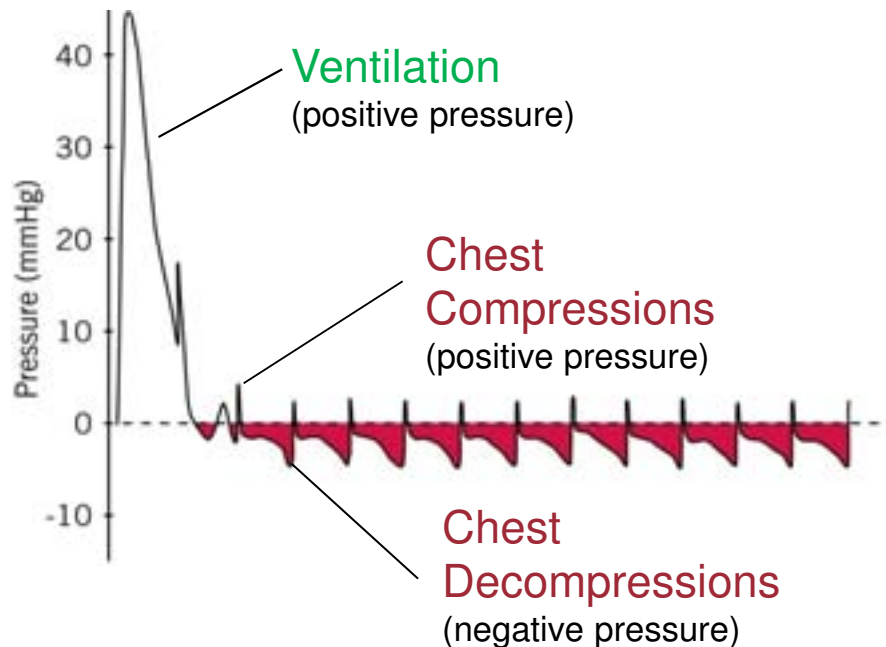


Source: 2005 AHA Guidelines for CPR and Emergency Cardiac Care; Part 6. Circulation 2005;112:IV-48

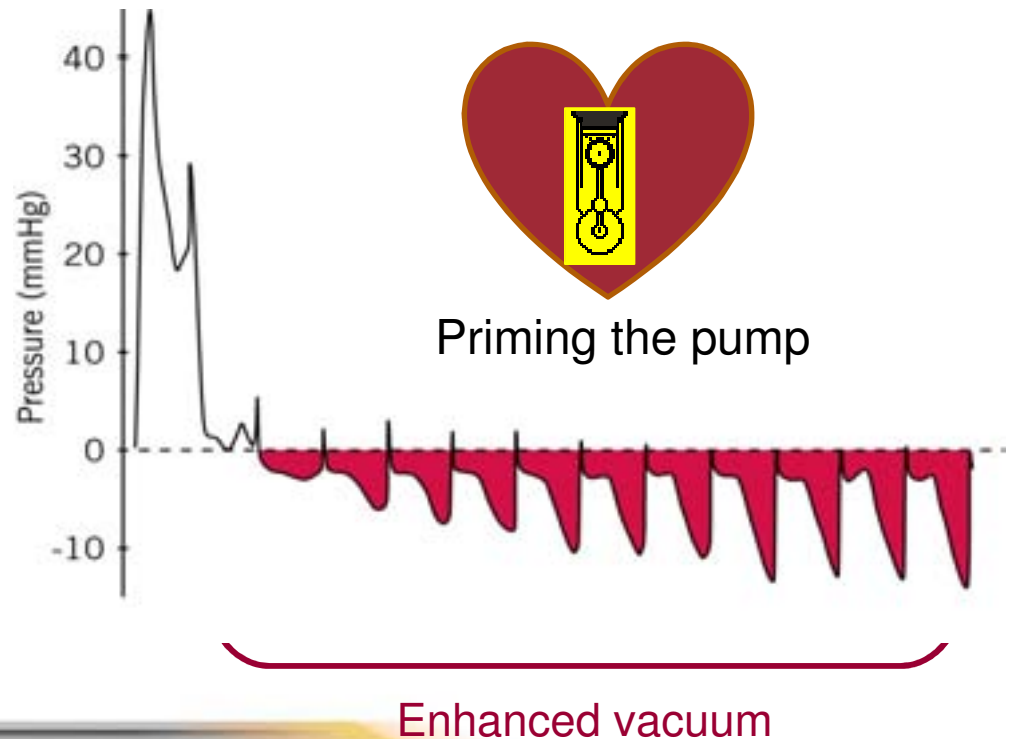
# Impedance Threshold Device 10.0 (ResQPOD)

Enhancing greater vacuum (negative pressure) in the chest during chest decompressions

## Conventional CPR

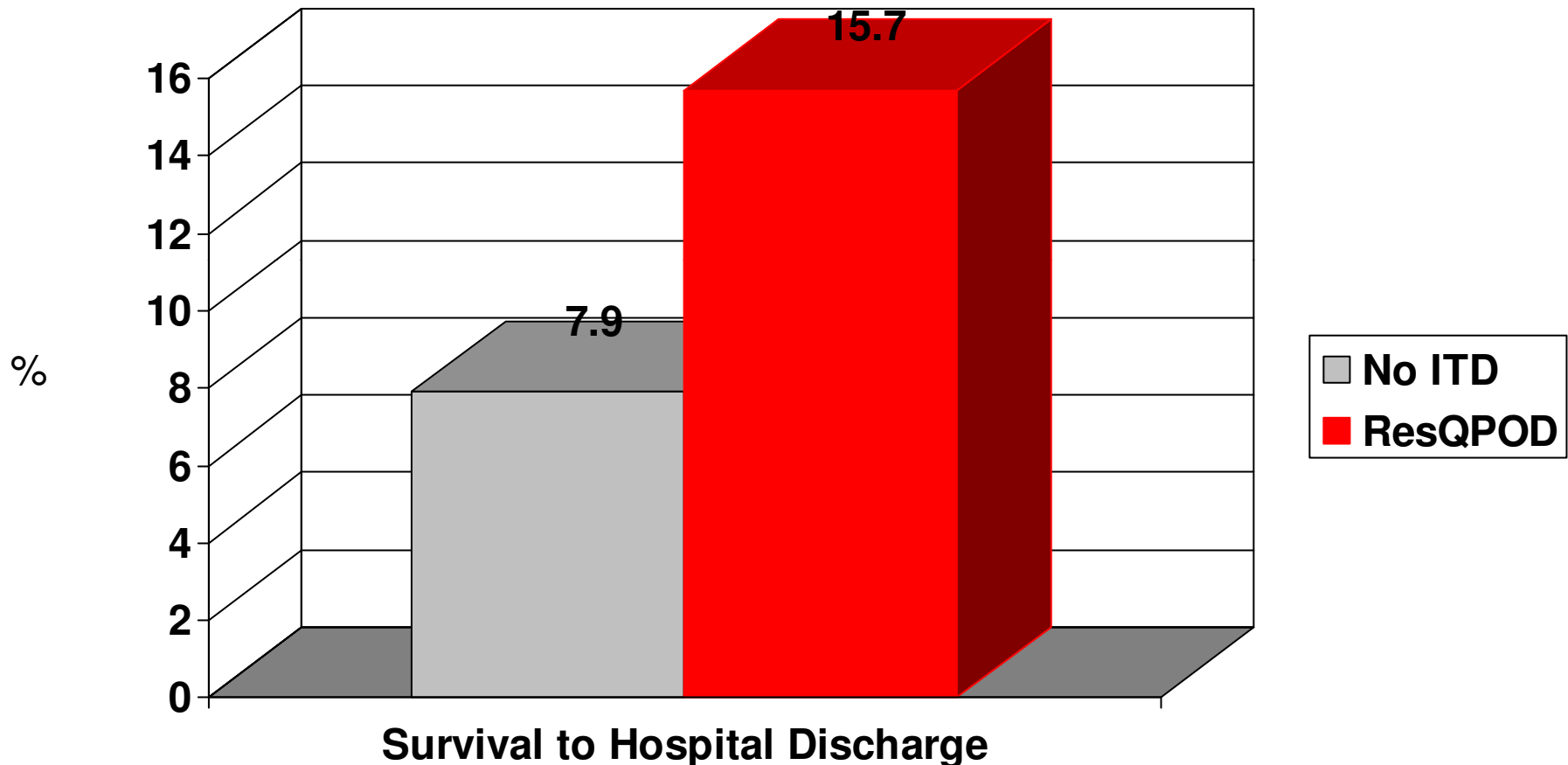


## Conventional CPR w/ ResQPOD



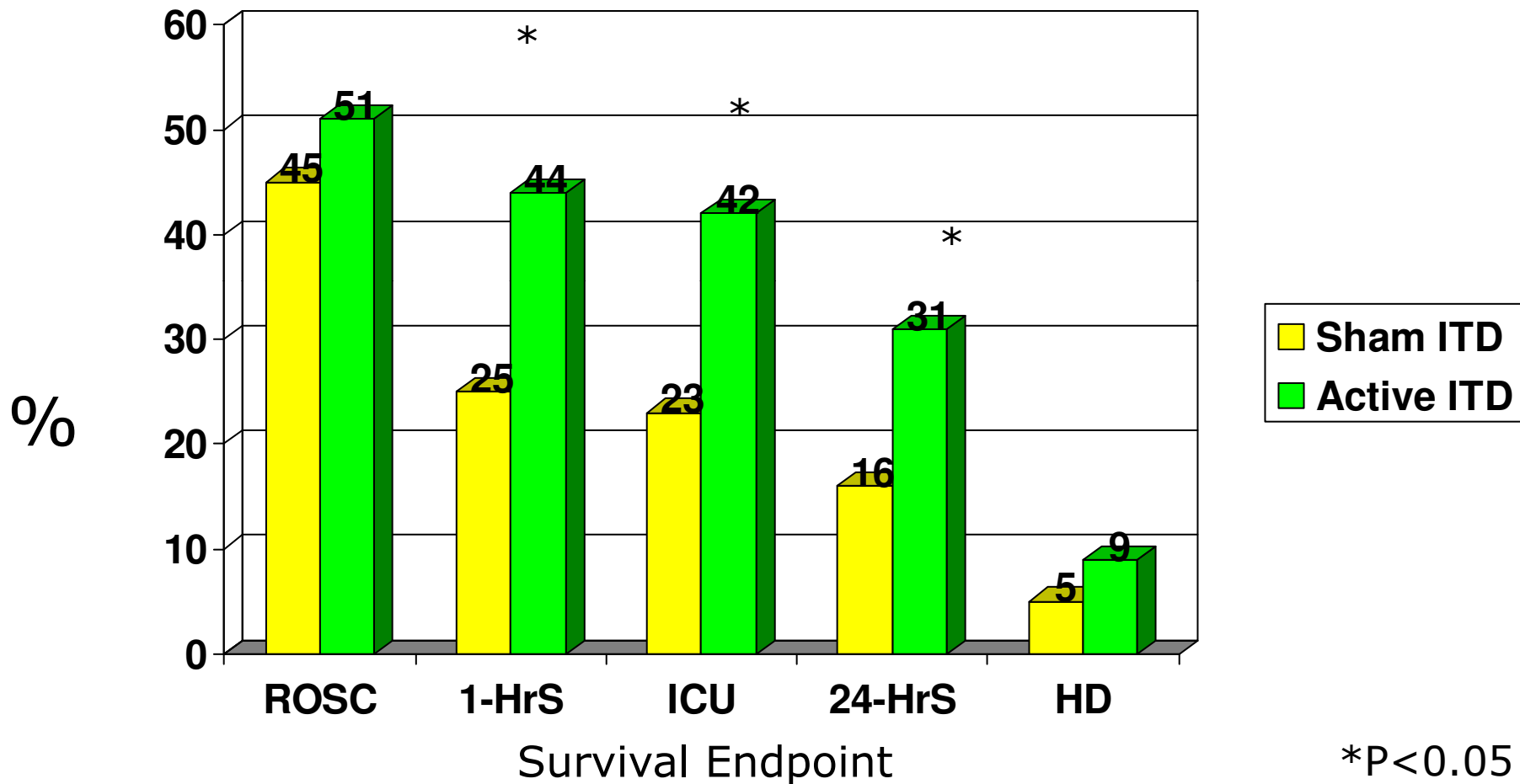
# Tale of Seven EMS Systems

Allina Medical (Anoka county, MN), Cypress Creek EMS, TX,  
Madison Fire Dept. (Madison, WI), Medical College of Wisconsin (Milwaukee, WI),  
Omaha Fire Dept. (Omaha, NE), Pinellas County EMS (Largo, FL)  
Wake County EMS (North Carolina)



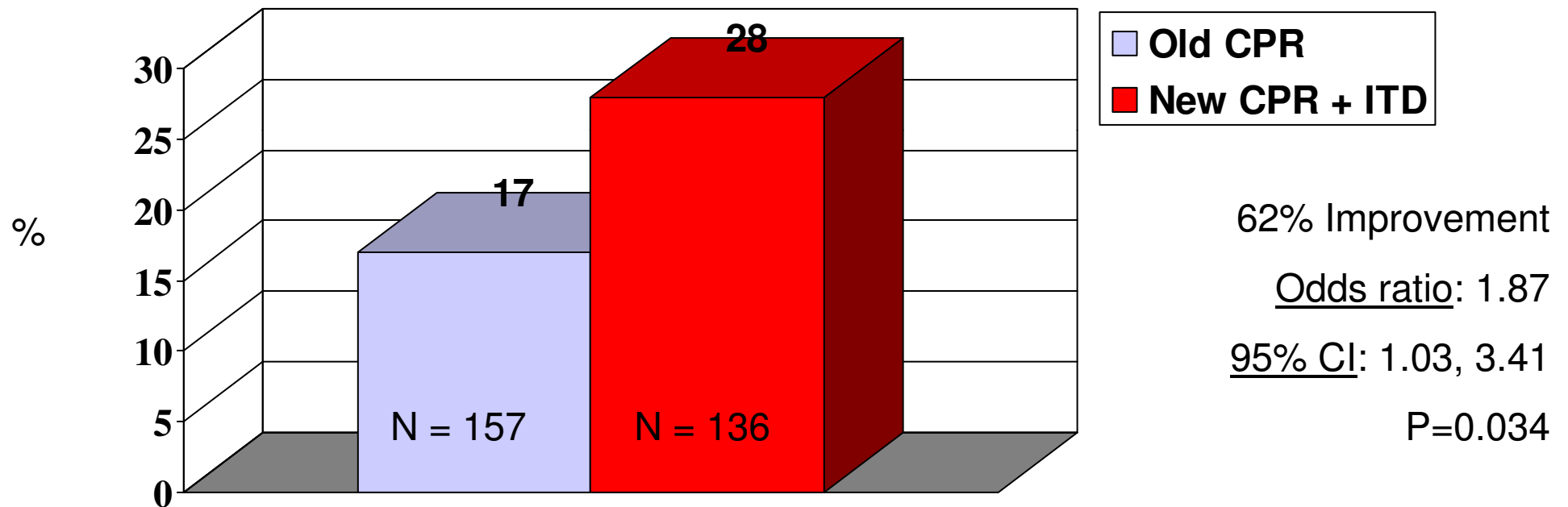
Aufderheide et al. Circulation 2007;Suppl II;116(16):II-936

# Any Electrical Activity Initially (VF/VT/PEA) (n = 111)



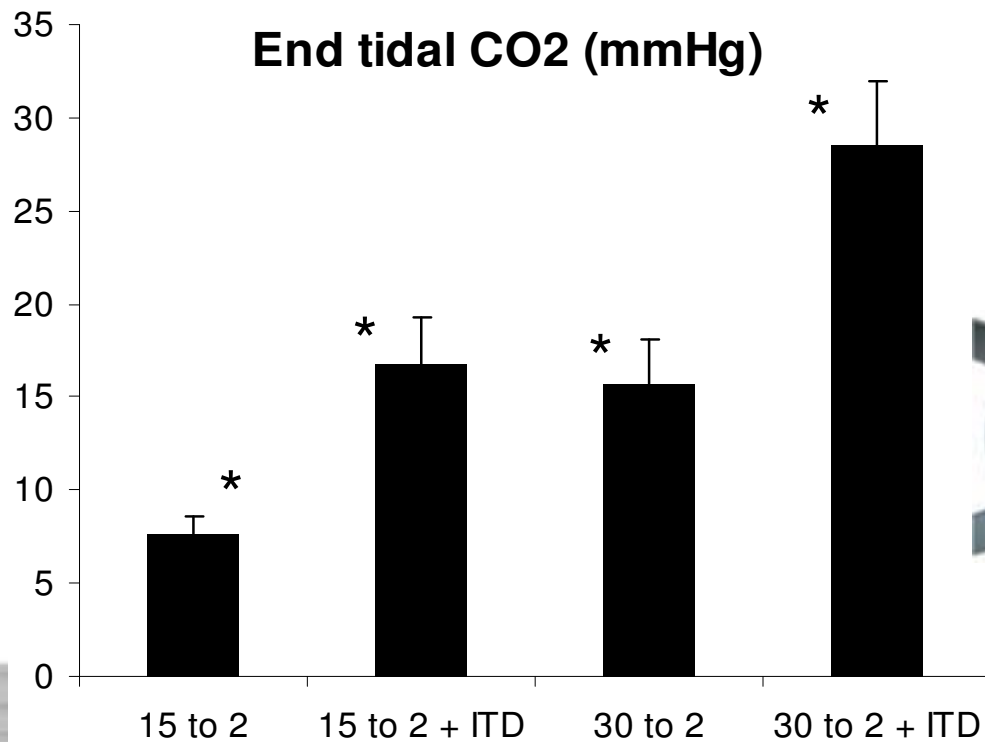
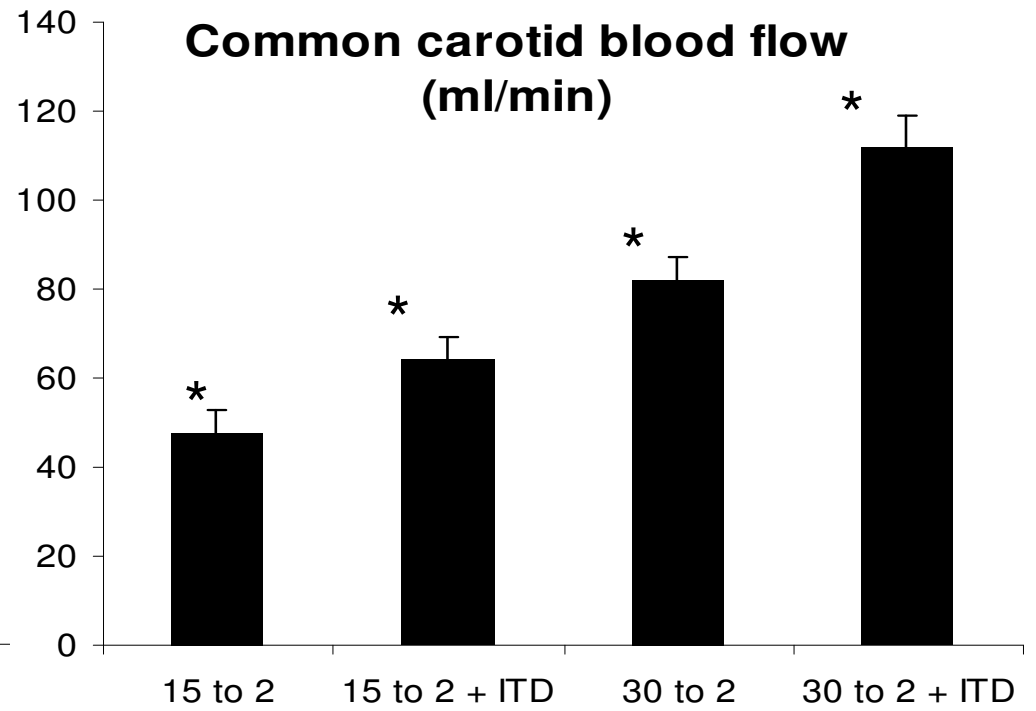
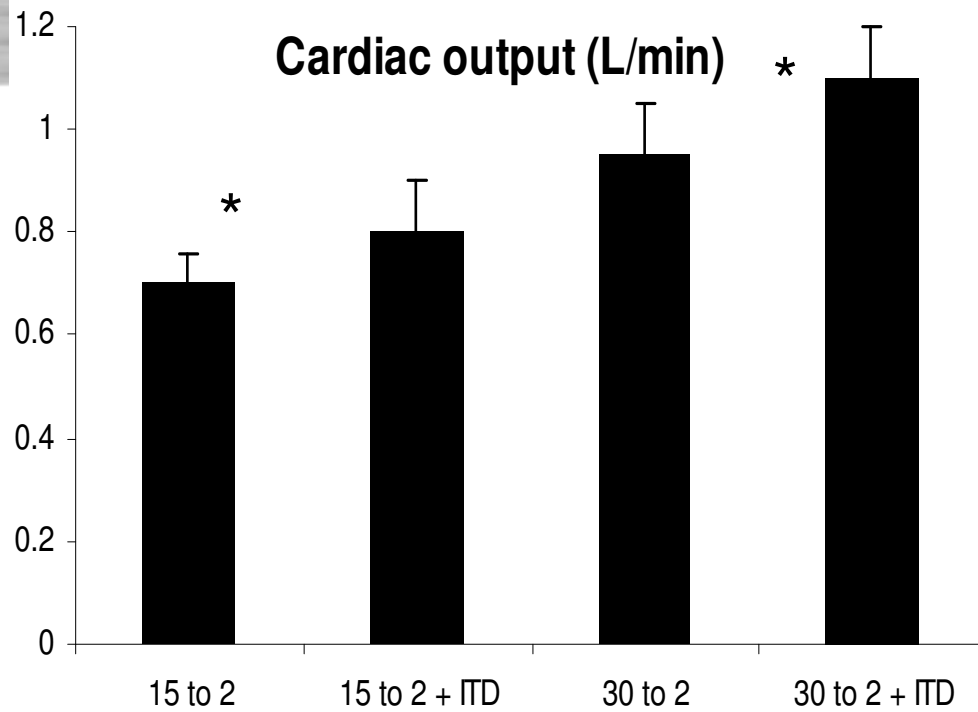
# In-hospital Cardiac Arrest

## Survival to Hospital Discharge



Thigpen et al. ACEP's ICEM in April 2008





15:2 vs 30:2 +/- ITD in pigs

Yannopoulos et al Critical Care Medicine, 2006



# Keys to Optimal CPR



- Begin performing chest compressions as soon as cardiac arrest is confirmed.
- Ventilate over 1 second (until chest rise) for both facemask and advanced airway.
- Use 2 hands to help maintain a facemask seal at all times.
- Assure complete chest wall recoil.
- Rotate duties frequently to avoid fatigue.
- DO NOT hyperventilate.
- Avoid unnecessary delays or interruptions in chest compressions; ideally no more than 5 – 10 seconds.

# Take Heart<sup>™</sup> ♥ America

## Sudden Cardiac Arrest Survival Initiative

A 3 Phase Demonstration Project deploying recent advances in resuscitation science to significantly increase resuscitation rates after cardiac arrest.

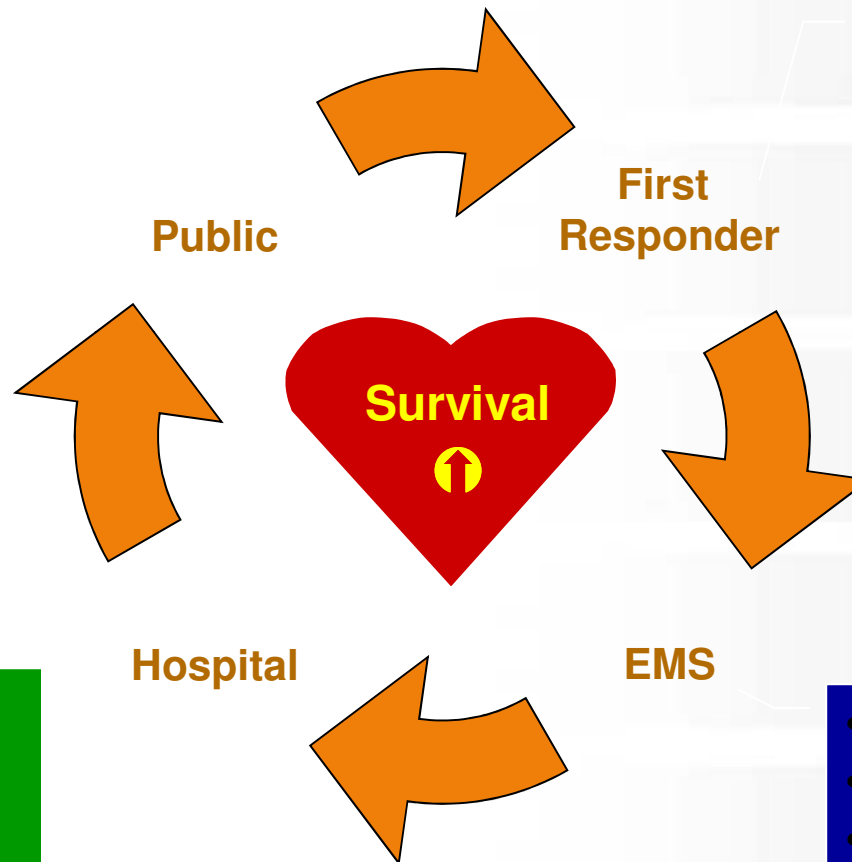
Phase I: St. Cloud MN and Anoka County MN  
(complete).

Phase II: Columbus OH and Austin TX (in process).

Phase III: 20 US Cities and 3 States (Minn, Tex, Miss)  
(initial planning stages)

# Multi-Level Focus and Translational Effort

- Widespread CPR Training (e.g. *CPR Anytime*)
- AEDs
- Public Education



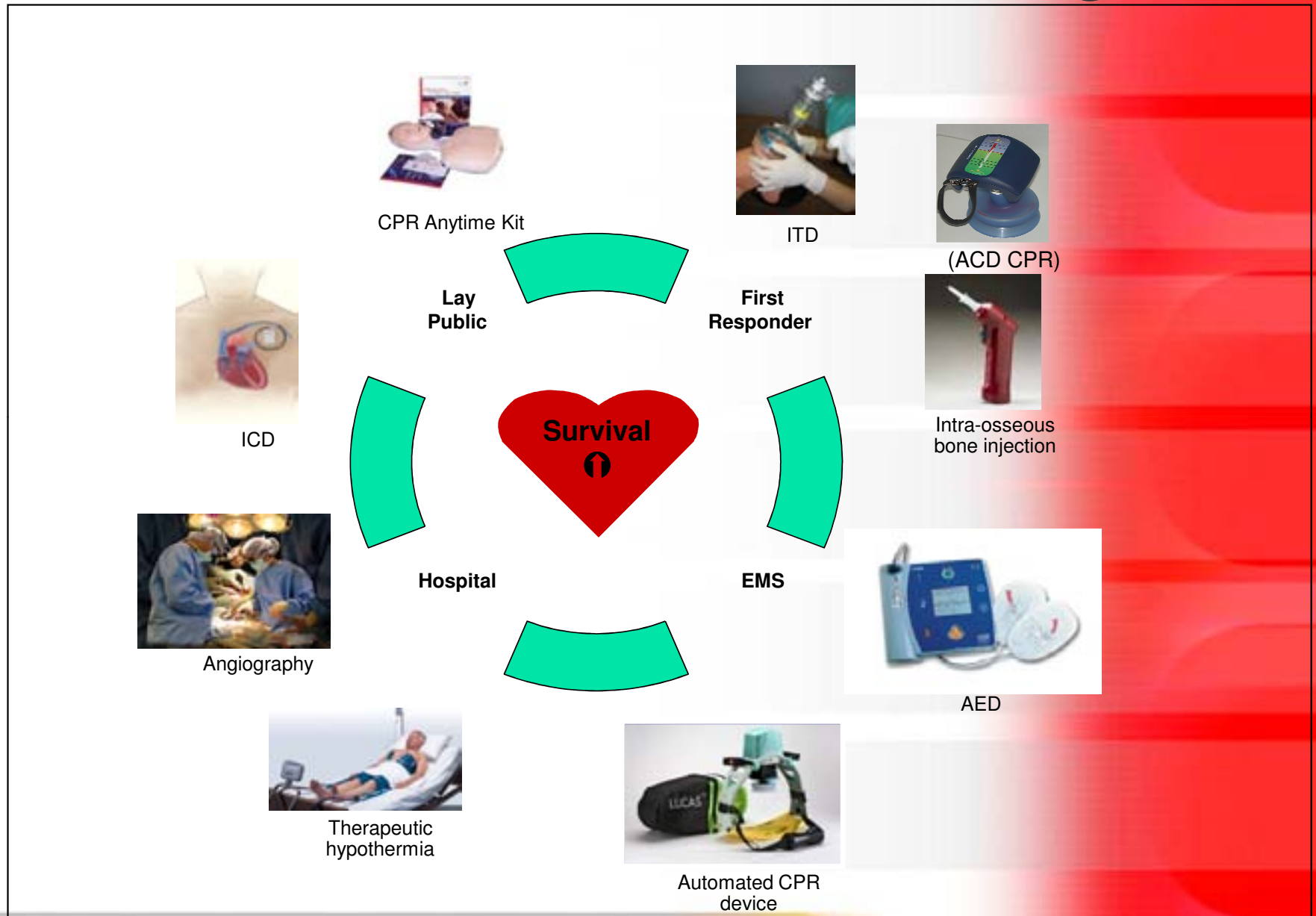
- Rapid Response
- Start CPR immediately
- Rapid AED application
- High Quality CPR
- ITD (ResQPOD)

## Resuscitation Centers of Excellence

- Hypothermia
- 24/7 cath lab
- CPR to cath lab
- EP/ICDs

- High Quality CPR
- IO drug delivery prn
- ITD (e.g. ResQPOD)
- Automated CPR Devices (LUCAS)

# Transformative technologies



## Take Heart St. Cloud and Anoka Outcomes

- From 2006-2007 in the two MN sites, >12,000 people were trained in CPR, bystander CPR rates increased by ~5%, all CPR interventions and the ResQPOD deployed, three Level One Cardiac Arrest Centers were established.
- **Survival in all patients following OHCA improved from 9.3% in 2005 (historical control) to 17% (P=0.03) in 2007 in these two sites.**

# Take Heart<sup>TM</sup>

# ♥ America

## Sudden Cardiac Arrest Survival Initiative

A 3 Phase Demonstration Project:

Phase I: St. Cloud MN and Anoka County MN (complete).

Phase II: Columbus OH and Austin TX (in progress).

Phase III: 20 US Cities and 3 States (MN, TX, AL.)(initial planning stages)

# ResQGARD Kit Contents





# Device Features

## Patient / Inspiration Port

Connects to a mouthpiece  
or facemask.

## Atmospheric Pressure Sensing Valve

Provides therapeutic  
inspiratory resistance until  
the patient creates at least  
-7 cmH<sub>2</sub>O pressure with  
respiratory effort.



## Exhalation Port

## O<sub>2</sub> Port

Permits administration  
of up to 15 lpm  
supplemental oxygen

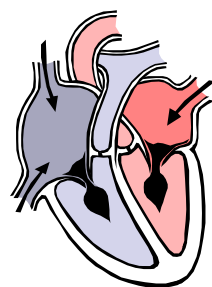
# Inspiratory Impedance Effect



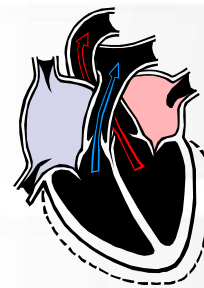
Inspiration  
through an  
ITD



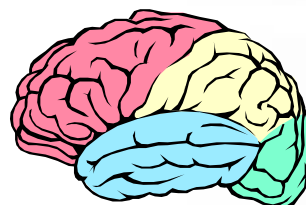
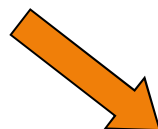
Greater  
Intrathoracic  
Vacuum



↑ Preload  
↑ Coronary Artery  
Perfusion  
↑ Cardiac Output



↑ **Blood Flow  
to Vital Organs**



↓ Intracranial Pressure  
↓ Resistance to  
Forward Blood Flow  
↑ Cerebral Blood Flow

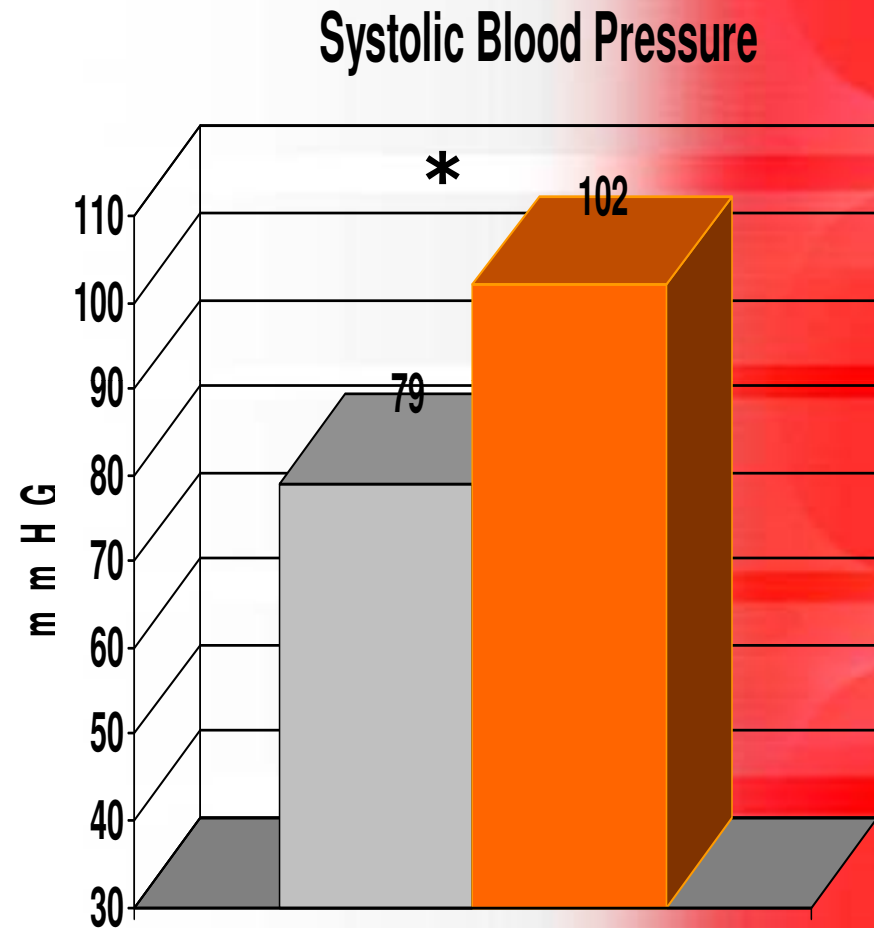


# Human Data: Blood Pressure

## Blood Pressure Response After Simulated Cardiovascular Collapse using LBNP

- Sham (placebo) ResQGARD
- Active (functional) ResQGARD (-7 cmH<sub>2</sub>O)

\*p<0.02



n = 9

# Clinical Features & Benefits

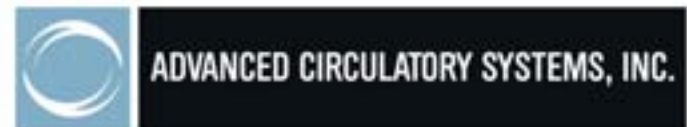
- Rapidly increases circulation non-invasively & without fluids or medications
- Can be used concomitantly with other therapies
  - e.g. IV fluids, vasopressors, patient positioning
- Easy to discontinue therapy
- Compatible with mouthpiece or facemask
- Latex free
- Single patient use

# Examples of Treatment Areas

- **Hospital/Acute Care**
  - Critical care units (e.g. CCU, ICU, SICU, MICU)
  - Dialysis units
  - Emergency department
  - Rapid response teams
  - Post anesthesia areas (e.g. PACU)
  - Cardiac exercise stress labs
  - Anywhere hypotension could present
- **Emergency Medical Services**
  - Basic and advanced life support units (e.g. civilian, military)
  - Critical care transport units (e.g. ground, aeromedical)
- **Home/Other**
  - Patients with orthostatic hypotension
  - Blood banks

# Questions?

Email: [ktalk@advancedcirculatory.com](mailto:ktalk@advancedcirculatory.com)



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