Caregiver Guide

ResQGARD®

Buys time during hemodynamic compromise

Advanced Circulatory®

Perfusion on Demand

What is the ResQGARD?

The ResQGARD is an impedance threshold device (ITD) that provides a safe, simple and convenient way to treat hypotension in patients who are spontaneously breathing. By optimizing the relationship between the respiratory, circulatory and nervous systems, it enhances circulation during states of poor perfusion. Studies have shown that using the ResQGARD can increase blood pressure by up to 30% in patients with hypotension from a variety of causes, including, for example: [1-7]

- Blood loss or blood transfusion
- Dehydration
- Early sepsis
- Drug overdose
- Heat shock
- Renal dialysis
- Orthostatic intolerance
- Anesthesia and analgesia

Preventing hypotensive episodes can reduce mortality. By increasing the blood pressure non-invasively, caregivers at all levels can provide a bridge therapy until the cause of the hypotension can be identified and definitively treated.

The ResQGARD provides therapeutic benefit as soon as a patient begins to breathe through it. It is ideally suited for treating hypotension in hospitals, EMS systems (BLS and ALS), renal dialysis and blood donation centers, and military settings.

Research

The ResQGARD has been evaluated in over 30 animal and clinical studies in hypovolemia, intradialytic hypotension, orthostatic intolerance, heat shock, sepsis and other etiologies. One recent prehospital study found that use of the ResQGARD increased systolic blood pressure (BP) in hypotensive patients by 30%,[1] (Figure 1) and even patients without IV therapy benefitted.

Research has shown that the ResQGARD:[1-7]

- **Increases systolic and diastolic BP by up to 30%**
- Complements a permissive hypotension approach in trauma without exceeding pressures typically associated with "popping the clot"
- Increases stroke volume, cardiac output and cerebral blood flow
- Lowers intracranial pressure during inspiration
- Is well tolerated by most patients
- Does not compromise oxygen saturation or reduce hematocrit
- "Buys time" until definitive therapy can be provided

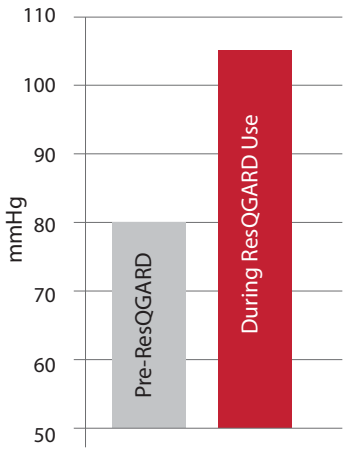


Figure 1. Systolic Blood Pressure

The Problem: Hypotension

- During normal inhalation the chest expands and the diaphragm moves down, creating a slight negative pressure (or vacuum) inside the chest (approx -1.5 cmH_2O). This vacuum pulls air into the chest and helps return some blood back to the heart.
- During exhalation, the chest comes in and the diaphragm moves up, creating a slight positive pressure (approx 0.5 cmH_2O) that forces air out of the chest.

As shock develops, eventually the body is no longer able to compensate and the blood pressure drops.

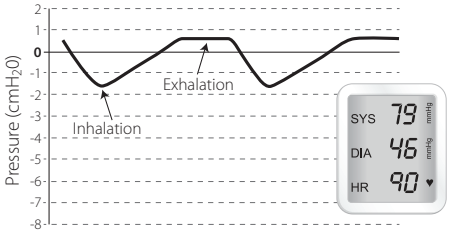


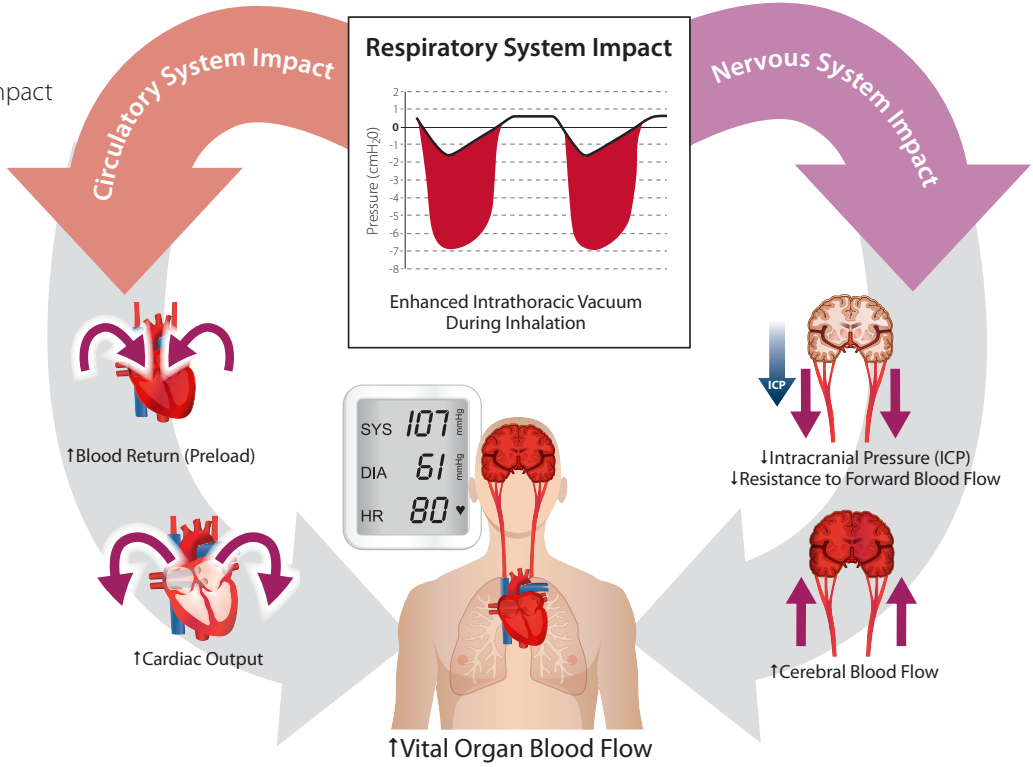
Figure 2. Normal Breathing

The Solution: ResQGARD

During states of poor perfusion, the ResQGARD ITD optimizes the relationship between the respiratory, circulatory and nervous systems to enhance circulation by creating a slight amount of therapeutic resistance only while the patient inhales (Figure 3). This enhanced vacuum:

- Draws more blood back to the heart. When preload is increased, it results in improved cardiac output on the subsequent contraction of the heart.
- Lowers intracranial pressure (ICP), which decreases resistance to forward blood flow to the brain, and results in increased cerebral blood flow.

Figure 3.
ResQGARD Impact



The net result of both of these mechanisms is improved blood flow to the vital organs.

Using the ResQGARD on a Facemask

1. Connect the ResQGARD to the facemask.
2. Explain to the patient that they will feel slight resistance when inhaling. This means that the device is working and helping to improve blood flow.
3. Hold the mask over the nose and mouth, maintaining a tight facemask seal. The ResQSTRAP can be used to hold the ResQGARD in place.
4. Breathe in slowly (over 2-3 secs) and deeply; exhale normally.
5. If supplemental oxygen is desired, connect the oxygen tubing to the port and deliver up to 15 lpm.
6. Monitor vital signs frequently.
7. Remove the ResQGARD when blood pressure rises to and stabilizes at an acceptable level or if patient does not tolerate.
8. Reapply if blood pressure drops again.
9. End tidal carbon dioxide ($ETCO_2$) sensors may be placed on the ResQGARD's expiratory port if $ETCO_2$ monitoring is desired.

Using the ResQGARD with a Mouthpiece

1. Connect the ResQGARD to the mouthpiece.
2. Explain to the patient that they will feel slight resistance when inhaling. This means that the device is working and helping to improve blood flow.
3. Place the mouthpiece into the mouth and maintain a tight seal with the lips.
4. Breathe in through the mouth only; an optional nose clip prevents breathing through the nose. Inhale slowly (over 2-3 secs) and deeply; exhale normally.

See 5-9 above.

[1] Smith et al. J Emerg Med 2011;41(5):549-558.
[2] Convertino et al. Respir Care 2011;56(6):846-857.
[3] Suresh et al. Prehosp Emerg Care 2012;16(1):173.
[4] Convertino et al. Crit Care Med 2007;35(4):1145-1152.
[5] Cook et al. J Trauma 2006;60(6):1275-1283.
[6] Metzger et al. Prehosp Emerg Care 2012;16:174.
[7] Yannopoulos et al. Crit Care Med 2006;34(12):S495-500.

The generally cleared indication for the ResQGARD is for a temporary increase in blood circulation during emergency care, hospital, clinic and home use. Research is ongoing to evaluate the benefit of the ResQGARD for indications related to specific etiologies. The studies listed here are not intended to imply specific outcome-based claims not yet cleared by the US FDA.

Advanced Circulatory®

1905 County Road C West
Roseville, MN 55113 USA
Phone: 651-403-5600
Toll-free: 877-737-7763

info@advancedcirculatory.com
AdvancedCirculatory.com

49-0594-000, 04