

## Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA)

Patients in shock due to hemorrhage below the diaphragm are potential candidates for REBOA as a bridge to definitive hemorrhage control.

### Contraindications:

- Suspicion for intrathoracic hemorrhage
- Hypotension or cardiac arrest not due to hemorrhage
- Caution in non-adult patients

### Insertion:

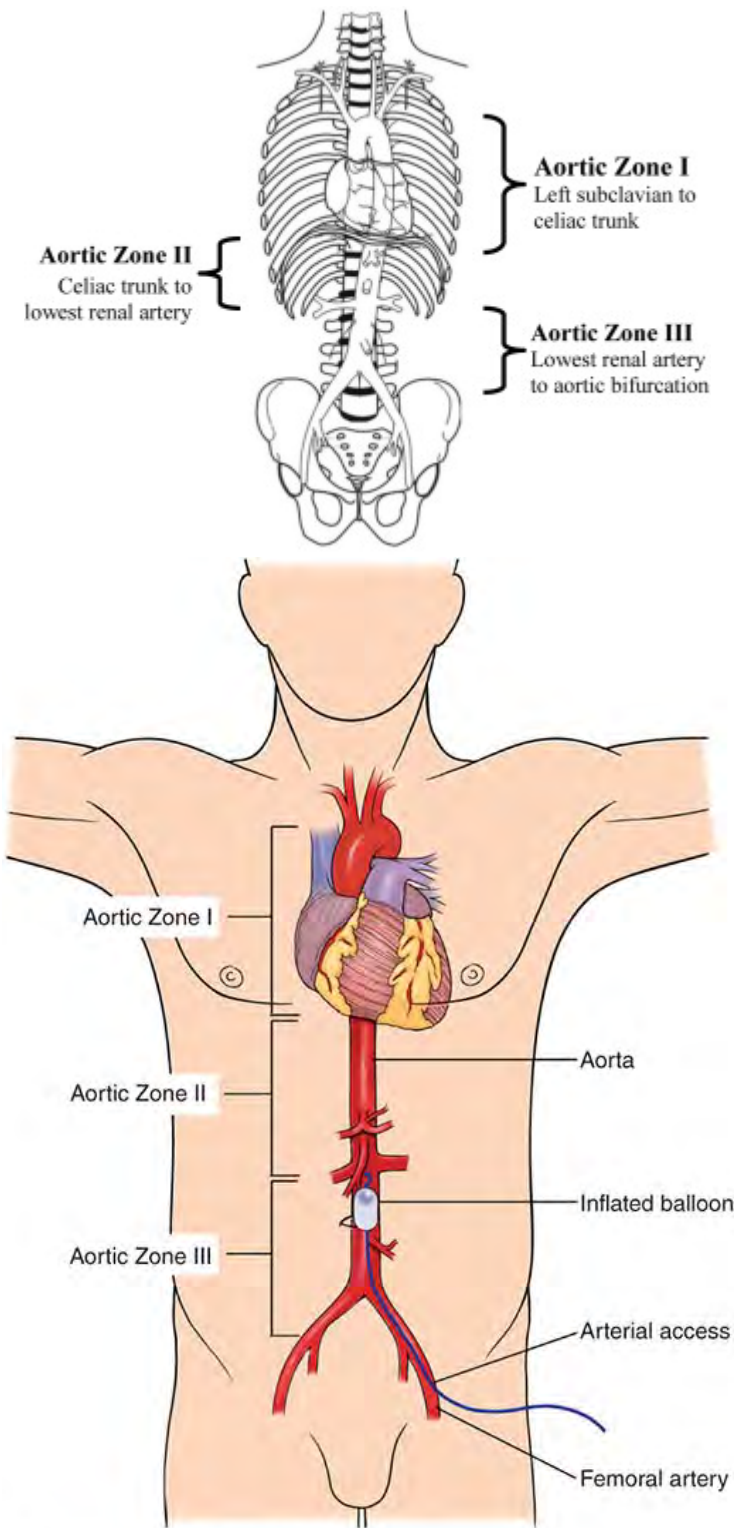
- Place a 4 Fr micropuncture line in all patients requiring femoral access for arterial monitoring
- Place a 7 Fr sheath if REBOA is imminent
- Follow the steps in the attached reference guide for REBOA placement
- Place REBOA in Zone 1 for suspected abdominal or retroperitoneal hemorrhage (sternal notch or approximately 46 cm, inflate with 8ml initially and assess for response)
- Place REBOA in Zone 3 for suspected pelvic, junctional, or proximal lower extremity hemorrhage (xiphoid process or approximately 28 cm, inflate with 2 ml initially and assess for response)
- Consider an abdominal x-ray to verify placement

### Management:

- After placement, immediately plan definitive hemorrhage control, ideally within 15 minutes for Zone 1 placement, with a goal total occlusion time of less than 30 minutes
- Move from Zone 1 to Zone 3 once abdominal bleeding isolated to pelvis
- Deflate the balloon as soon as possible once hemorrhage control is achieved
- Remove the catheter and sheath as soon as possible. Hold point pressure for at least 30 minutes and maintain bedrest for six hours following removal of 7Fr sheath.
- Hourly neurovascular checks hourly to the lower extremity should begin at sheath insertion and continue for 24 hours following sheath removal.

### Complications:

- Total Zone I occlusion time >30 minutes may lead to spinal cord injury
- Over-inflation of the balloon may lead to rupture
- Iliac rupture may occur due to unintended inflation in the iliac artery
- Ischemic injuries due to prolonged occlusion time may result in organ failure and death
- Access complications may occur such as: arterial disruption, dissection, pseudoaneurysms, hematoma, thromboemboli, and extremity ischemia
- Aortoiliac injuries may occur including: intimal tear, dissection, thrombosis, or rupture



Source: Ernest E. Moore, David V. Feliciano, Kenneth L. Mattox: Trauma, Eighth Edition  
www.AccessSurgery.com  
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## References

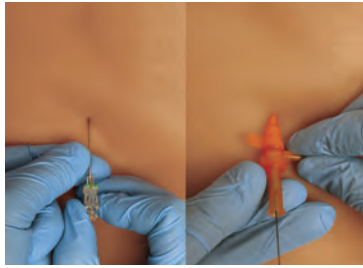
Brenner M et al. J Am Coll Surg 2018;226:730-740. doi: 10.1016/j.jamcollsurg.2018.01.0144

Brenner M et al. Trauma Surg Acut Care Open 2018;3:1-3. doi:10.1136tsaco-2017-000154

# The ER-REBOA™ Catheter Quick Reference Guide

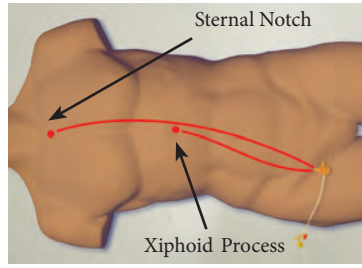
## 6 REBOA Steps: ME-FIIS (Pronounced 'Me-Fiz')

### Get Early CFA Access



Obtain access using standard techniques

### 1. Measure



**Placement depth**<sup>1,2,3,4,5,6</sup>

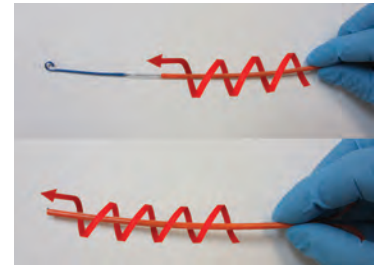
- Zone 1: ~ 46 cm
- Zone 3: ~ 28 cm

### 2. Empty



**Deflate balloon**

- Ensure balloon is fully deflated
- Hold vacuum for **5 seconds** and close stopcock



**Advance & twist peel-away to cover P-tip®**

- Corkscrew twist to wrap balloon tightly
- Ensure the balloon and P-tip® are captured

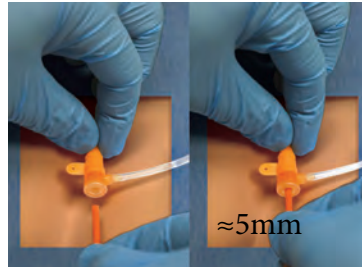
### 3. Flush



**Attach & flush arterial line**

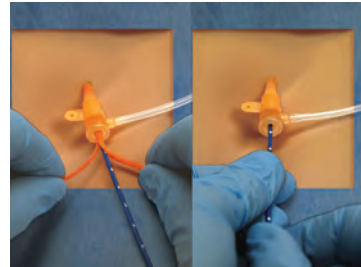
- Use standard techniques
- Ensure all air is purged

### 4. Insert



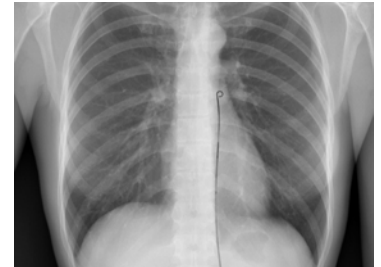
**Insert peel-away into valve**

- Approximately 5 mm



**Advance catheter to desired depth**

- Hold orange peel-away
- Advance blue catheter
- Pull peel-away back after balloon passes valve



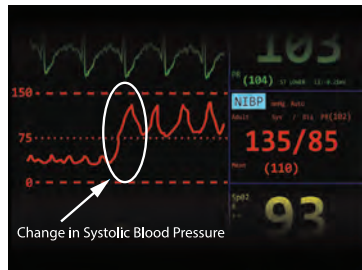
**Position catheter**

If available, use x-ray or fluoroscopy to confirm position using radiopaque markers

### 5. Inflate<sup>1,2,3,4,5,6</sup>

Inflation Volume

|               |                 |
|---------------|-----------------|
| <b>Zone 1</b> | Start with 8 cc |
| <b>Zone 3</b> | Start with 2 cc |



**Monitor arterial waveform feedback**

- Look for increase in blood pressure above balloon
- Feel for loss of contralateral pulse
- **Mark time of inflation**

### 6. Secure



**Secure Catheter close to the introducer sheath**

### Provide Definitive Treatment



**Provide definitive hemorrhage control**

- The clock is ticking!
- Move quickly to definitive control

**“Start 2, Start 8, Don’t Overinflate.”**

**Start small, then check**

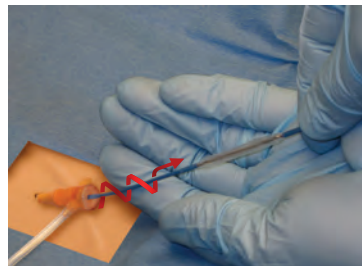
### Deflate



**Deflate slowly**

- Prepare team for potential rebound hypotension

### Remove



**Fully deflate balloon**

- Hold vacuum for **5 seconds** and close stopcock
- Corkscrew twist the catheter to facilitate removal
- If necessary, remove catheter and introducer sheath as a unit

### Caution



**Check for full and equal pulse in each leg using your standard technique**

The REBOA Company™

www.prytimemedical.com

This instruction is not a replacement for the instruction for use (IFU). The ER-REBOA™ Catheter IFU should be read in its entirety before using the device

1. Joint Trauma System Clinical Practice Guideline (JTS CPG) REBOA for Hemorrhagic Shock (CPG ID: 38)
2. Peay P, Flaris AN, Prut NJ, Cotton F, Lundberg PW, Callot JL, David JS, Voiglio E. Fixed-Distance Model for Balloon Placement During Fluoroscopy-Free Resuscitative Endovascular Balloon Occlusion of the Aorta in a Civilian Population. JAMA Surg. 2016 Dec 14.
3. Linnebur M, Inaba K, Halmesmeyer T, Rasmussen TE, Smith J, Mendelsohn B, Grabo D, Demetriades D. Emergent non-image-guided resuscitative endovascular balloon occlusion of the aorta (REBOA) catheter placements: A cadaver-based study. J Trauma Acute Care Surg. 2016 Sep;81(3):453-7.
4. McTaggart JN, Foulson ME, Akhtar M, Saas A, Tharson K, Phillips W, Deyagova AS, Kamensky AV. Morphometric roadmaps to improve accurate device delivery for fluoroscopy-free resuscitative endovascular balloon occlusion of the aorta. J Trauma Acute Care Surg. 2016 Jun;80(6):941-6.
5. Morrison JJ, Starnard A, Midwinter MJ, Sharon DJ, Eliason JL, Rasmussen TE. Prospective evaluation of the correlation between torso height and aortic anatomy in respect of a fluoroscopy-free aortic balloon occlusion system. Surgery. 2014 Jun;156(6):1044-51.
6. Starnard A, Morrison JJ, Sharon DJ, Eliason JL, Rasmussen TE. Morphometric analysis of torso arterial anatomy with implications for resuscitative aortic occlusion. J Trauma Acute Care Surg. 2013 Aug;75(2 Suppl):215169-72.