

# ANY CHEETAH PATIENTS TODAY?

## ARE YOU GIVING FLUID?

- Shock States/Low Blood Pressure: Sepsis, Low Vascular Tone, Low Cardiac Output, Hypovolemia, Neurogenic Shock<sup>1</sup>
- Patients treated with Inotropes, Vasopressors or Vasodilators.<sup>1</sup>
- Surgical Patients: Perioperative Volume Management, Goal Directed Therapy, Enhanced Recovery After Surgery (ERAS)<sup>2</sup>
- Emergency/Trauma Patients<sup>3</sup>
- Other Critical Care Conditions: Acute Respiratory Distress (ARDS),<sup>4</sup> Sub-Arachnoid Hemorrhage (SAH),<sup>5</sup> Acute Kidney Injury (AKI),<sup>6</sup> and Congestive Heart Failure (CHF)<sup>7</sup>
- Patients undergoing Continuous Renal Replacement Therapy (CRRT) or patients undergoing hemodialysis<sup>8</sup>

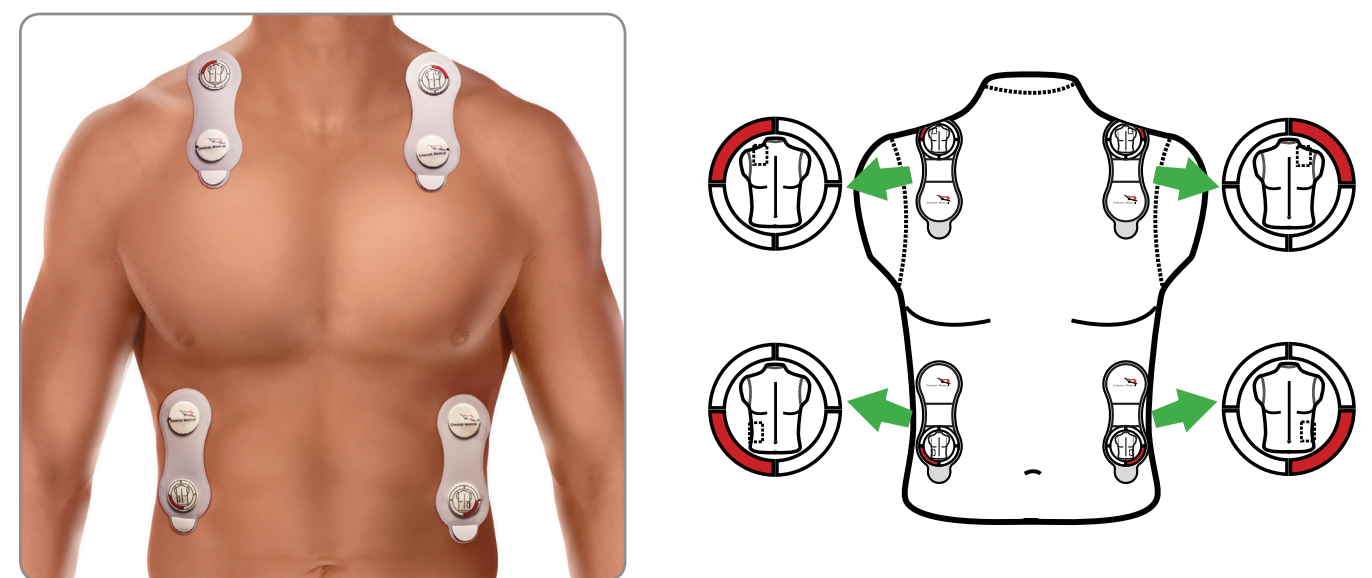
## CLINICAL SHOCK PATIENTS<sup>9,10</sup> with:

**<90** **>2** **<90**  
 SBP (mmHg) LACTATE (mmol/L) URINE (ml/2 hr)

**ONLY ~50% OF HEMODYNAMICALLY UNSTABLE PATIENTS WILL RESPOND TO FLUID BY INCREASING CARDIAC OUTPUT AND PERFUSION.<sup>11</sup>**

## BASIC SETUP INSTRUCTIONS

- Prep skin for sensor pad placement
- Use graphic for sensor placement. “Tabs to Toes”
- Upper sensors: above heart (3” above Pacemaker)
- Correctly enter ID, Age, Weight, Height, Sex
- Confirm all sensors firmly attached (Green Indicator)
- Minimize patient motion while calibrating

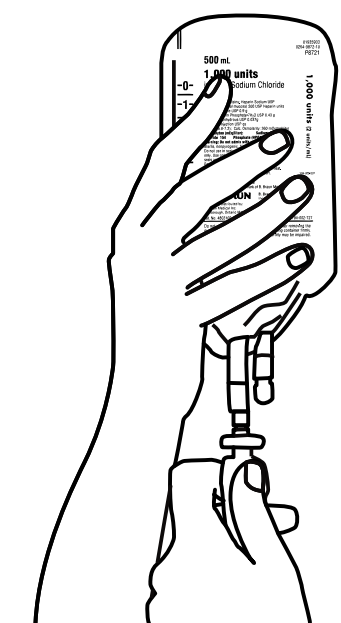
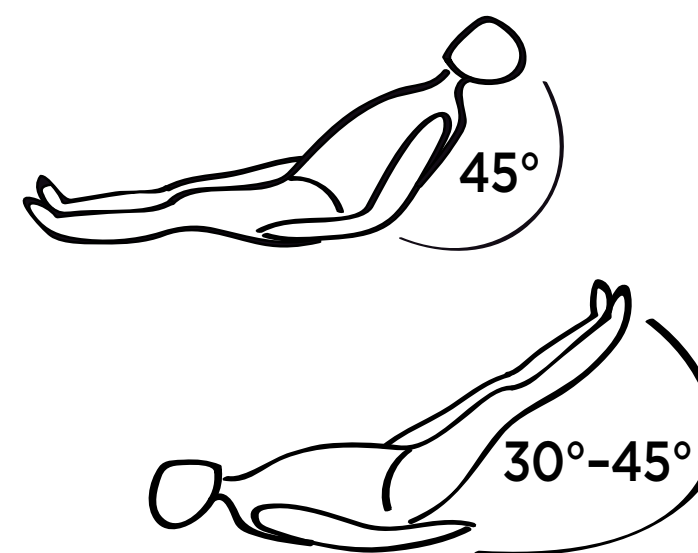


## ASSESS FLUID RESPONSIVENESS

- Select Protocol from menu
- Perform DYNAMIC ASSESSMENT:
  - PLR or Fluid Bolus Challenge
- Collect 3 minutes Stable Baseline
- Bolus = 250cc < 5 minutes<sup>12</sup>
- $\geq 10\%$   $\Delta$ SVI is likely a Fluid Responder<sup>13</sup>
- Trend  $\Delta$ SVI to monitor fluid needs
- Repeat PLR/BOLUS as needed

### Passive Leg Raise (PLR)

### Fluid Bolus Challenge



Cheetah monitors have not been tested on congenital heart disease patients with complex intra-cardiac shunts or patients with continuous flow LVAD 's.



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**References:** 1. Marik P et al. The use of bioreactance and carotid Doppler to determine volume responsiveness and blood flow redistribution following passive leg raising in hemodynamically unstable patients. Chest 2013; 143:364-370. 2. Waldron N et al. A prospective comparison of a noninvasive cardiac output monitor versus esophageal Doppler monitor for goal directed fluid therapy in colorectal surgery patients. Anesth Analg 2014; 118:966-75. 3. Dunham, CM et al. Emergency department noninvasive (NICOM) cardiac outputs are associated with trauma activation, patient injury severity and host conditions and mortality. J Trauma Acute Care Surg. 2012; 73:479-85. 4. National Heart, Lung, and Blood Institute Acute Respiratory Distress Syndrome (ARDS) Clinical Trials Network. Comparison of two fluid management strategies in acute lung injury. New Engl J Med 2006; 254:2564-2575. 5. Mittal M et al. Management of catecholamine-induced stunned myocardium — a case report. J Clin Anesth 2015; 27:527-30. 6. Grams ME et al. Fluid balance, diuretic use, and mortality in acute kidney injury. Clin J Am Soc Nephrol 2011; 6:966-973. 7. Maurer MM et al. A multicenter study of noninvasive cardiac output by bioreactance during symptom-limited exercise. J Card Fail 2009; 15:689-99. 8. Kossari N et al. Bioreactance: a new tool for cardiac output and thoracic fluid content monitoring during hemodialysis. Hemodial Int 2009; 13:512-7. 9. Vincent JL, De Backer D. Circulatory Shock. N Engl J Med 2013;369:1726-34. 10. Dellinger et al. Surviving Sepsis Campaign: International Guidelines for Management of Severe Sepsis and Septic Shock. Intensive Care Med (2013) 39:165-228, 2012. 11. Michard F and Teboul JL. Predicting Fluid Responsiveness in ICU patients: a critical analysis of the evidence. Chest. 2002; 121:2000-2008. 12. Cecconi M et al. What is a fluid challenge? Curr Opin Crit Care 2011;17:290-295. 13. Cannesson et al. Assessing the diagnostic accuracy of pulse contour variations for the prediction of fluid responsiveness. Anesthesiology 2011; 115:231-241.