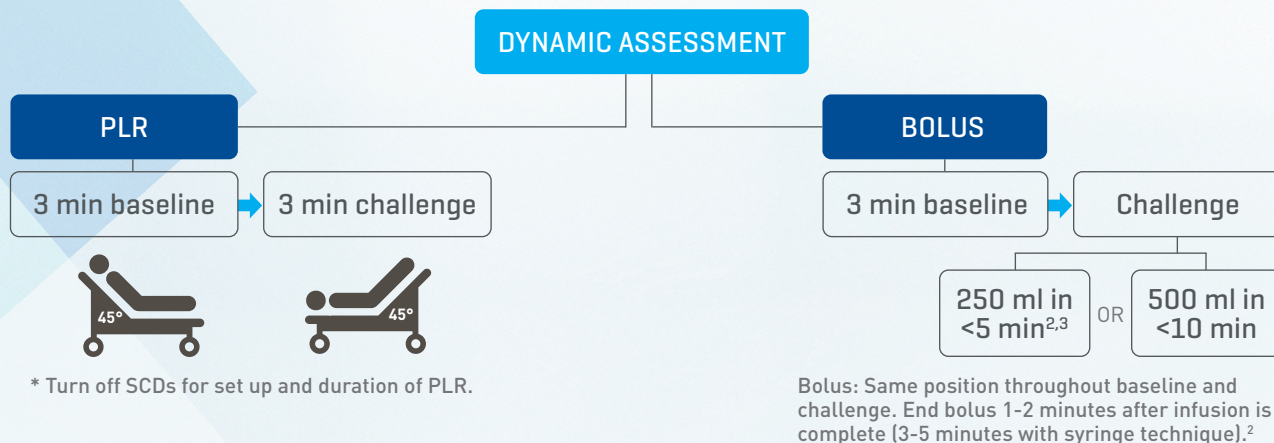


## TO INITIATE MONITORING, YOU NEED: **STARLING** MONITOR AND SENSORS

Power On > New Patient > Enter Patient ID/Age/Wt/Ht/Gender > Start Session > **Automatically Calibrates**

### DOES MY PATIENT HAVE A LOW BLOOD PRESSURE/MAP OR PERFUSION PROBLEM (I.E., LOW UOP/HIGH LACTATE)? DO I NEED TO GIVE FLUID?

(only ~50% of hemodynamically unstable patients are fluid responsive!)



**Results<sup>3</sup>:  $\geq 10\%$   $\Delta$ SVI patient is likely fluid responsive**

**$< 10\%$   $\Delta$ SVI (including negative numbers) patient is not likely fluid responsive**

**“Would you like to start immediately from the challenge stage?”** means “Can I use the last 3 minutes of SVI data as my baseline?” (i.e., no nursing interventions)

**“Baseline shows unstable results”** means the last 3 SVI readings have changed more than 10%. Consider repeating baseline.

# Baxter

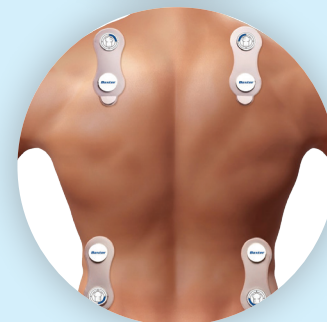
## Starling

FLUID MANAGEMENT  
MONITORING SYSTEM

### CALIBRATION VS. BASELINE:

**Calibration** = signal optimization occurs during initial pt. set-up.

**Baseline** = initial SVI readings of a dynamic assessment



### SENSORS:

- “Box in” the heart
- Red dashes indicate right/left and upper/lower
- White tabs point to toes
- Can be on front or back in any combination

### NEED TO RECALIBRATE:

(Session Controls > Recalibrate)

- If any or all sensors are moved or replaced
- Once a shift

Patient
• Shock States/Low Blood Pressure: Sepsis, Low Vascular Tone, Low Cardiac Output, Hypovolemia, Neurogenic Shock <sup>4</sup>
• Patients treated with Inotropes, Vasopressors or Vasodilators <sup>4</sup>
• Surgical Patients: Perioperative Volume Management, Goal Directed Therapy, Enhanced Recovery After Surgery (ERAS) <sup>5</sup>
• Emergency/Trauma Patients <sup>6</sup>
• Other Critical Care Conditions: Acute Respiratory Distress (ARDS), <sup>7</sup> Sub-Arachnoid Hemorrhage (SAH), <sup>8</sup> Acute Kidney Injury (AKI), <sup>9</sup> and Congestive Heart Failure (CHF) <sup>10</sup>
• Patients undergoing Continuous Renal Replacement Therapy (CRRT) or patients undergoing hemodialysis <sup>11</sup>
<b>ONLY ~50% of hemodynamically unstable patients will respond to fluid by increasing cardiac output and perfusion.<sup>1</sup></b>

Parameters	Normal Adult Range <sup>13</sup>	Cardiogenic Shock	Septic Shock	Hypovolemic Shock
BP (MAP)	> 65	↓	↓	↓
Heart Rate (HR)	60-100	↑	↑	↑
Cardiac Index (CI)	2.5–4.0 L/min/m <sup>2</sup>	↓	early late ↓	early late ↓
Total Peripheral Resistance Index (TPRI)	1970–2390 dynes • sec/cm <sup>5</sup> /m <sup>2</sup>	↑	↓	↑
Common Stroke Volume Response (ΔSVI) to Dynamic Assessment		ΔSVI <10%	ΔSVI ≥10%	ΔSVI ≥10%
ΔSVI ≥10% Predictive of 15% increase in CO with 500cc <sup>14</sup>				
<b>Dynamic Assessments Directly Challenge the Heart with Volume to Measure its Response:</b>				
Passive Leg Raise (PLR) Maneuver — Translocation of 250-300cc of blood from lower extremities into the heart <sup>3</sup> • Fluid Bolus Challenge (FB) — Rapid Infusion of 250cc of fluid over 3-5 minutes <sup>3</sup>				

Parameters	Equation	Normal adult range
Stroke Volume (SV)	CO/HR x 1000	60 – 100 mL/beat
Stroke Volume Index (SVI)	SV/BSA	33 – 47 mL/beat/m <sup>2</sup>
Δ Stroke Volume Index (ΔSVI)	Change in SV after Dynamic Assessment	≥10% Likely to be Fluid Responsive <sup>3</sup> <10% Unlikely to be Fluid Responsive <sup>3</sup>
Cardiac Output (CO)	HR x SV/1000	4.0 – 8.0 L/min
Cardiac Index (CI)	CO/BSA	2.5 – 4.0 L/min/m <sup>2</sup>
Mean Arterial Pressure (MAP)	(SBP + (2 x DBP))/3	70 – 105 mmHg
Total Peripheral Resistance (TPR)	80 x (MAP)/CO	800 – 1200 dynes • sec/cm <sup>5</sup>
Total Peripheral Resistance Index (TPRI)	80 x (MAP)/CI	1970 – 2390 dynes • sec/cm <sup>5</sup> /m <sup>2</sup>
ΔSVI ≥10% Predictive of 15% increase in CO with 500cc <sup>14</sup>		
<b>Dynamic Assessments Directly Challenge the Heart with Volume to Measure its Response:</b>		
Passive Leg Raise (PLR) Maneuver — Translocation of 250-300cc of blood from lower extremities into the heart <sup>3</sup> • Fluid Bolus Challenge (FB) — Rapid Infusion of 250cc of fluid over 3-5 minutes <sup>3</sup>		

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