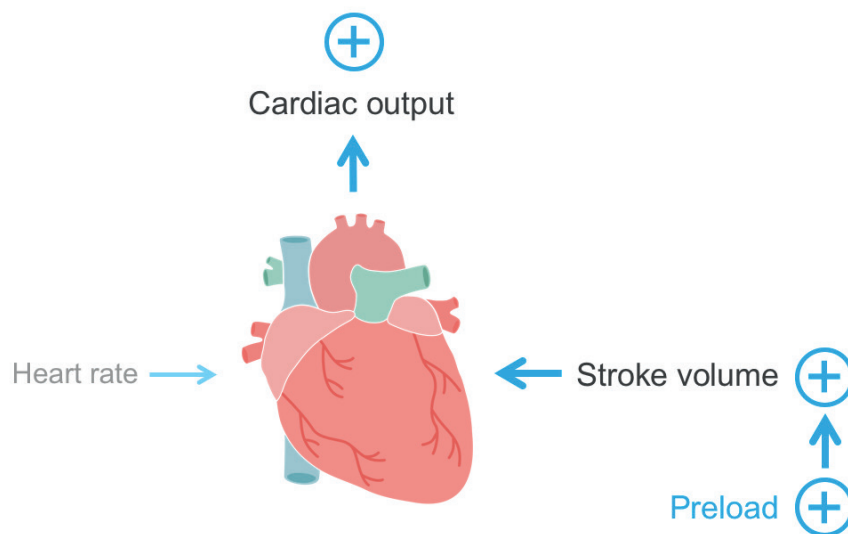


## Volume status and fluid responsiveness

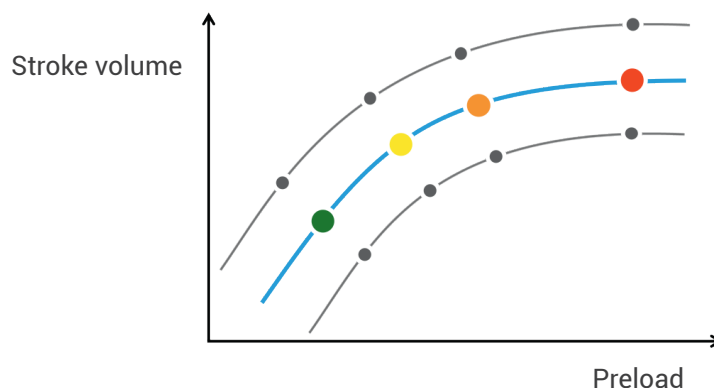
# EVALUATING VOLUME STATUS WITH ULTRASOUND

The goal of administering intravenous (IV) fluid in hemodynamically unstable patients is to increase cardiac output by increasing preload and stroke volume. Patients who can increase their stroke volume with IV fluid are said to be volume or fluid responsive.



About 50% of unstable patients are not volume responsive. Clinical examination does not allow accurate prediction of who will be responsive to IV fluid. Unnecessary IV fluid is harmful to the critically ill.

The Frank-Starling curve illustrates the relationship between stroke volume and preload. The curve can be shifted left or right with changes in contractile function of the heart. A patient on the steep portion of the curve (green dot) has the potential to respond to IV fluid. A patient on the plateau of the curve (red dot) will not increase stroke volume in response to fluid.



Ultrasound allows a noninvasive assessment of volume status and can be used to predict whether a patient will be fluid responsive.