My Patient’s Central Venous Oxygen Saturation Is Abnormal… Now What Do I Do?

1) What information do we get from the central venous oxygen saturation?
   The central venous oxygen saturation ($S_{cv}O_2$) is the oxygen saturation of venous blood drawn from a central line whose tip resides in the distal superior vena cava. It is a surrogate for the mixed venous oxygen saturation (drawn from the pulmonary circulation, $S_{v}O_2$) and is determined by the balance between oxygen delivery to the tissues (determined by hemoglobin concentration (Hgb), arterial oxygen saturation ($S_{a}O_2$), and cardiac output) and tissue oxygen consumption, which is determined by metabolic activity. The normal value for the $S_{cv}O_2$ is typically 65-70%.

2) Before you act on a measured value, confirm the location from which it was sampled.
   Blood gases drawn from peripheral IVs, veins in the arm or hand or the femoral vein cannot be used to assess a central venous saturation. Only if the sample was drawn from a central line should you proceed to the next steps.

3) Interpreting the $S_{cv}O_2$ and responding to deviations from normal

   - **Low** ($< 60\%$):
     - If $P_{a}O_2$ low, support oxygenation
     - If $Hgb < 7$ g/dL, transfuse PRBC
     - Evaluate for sources of low cardiac output
     - Echo with low EF
     - Dobutamine
   - **High** ($> 75-80\%$):
     - Strongly consider sepsis
     - Consider other less likely sources: Anaphylaxis, Cyanide intoxication
     - Hypovolemia
     - Fluid bolus

   **Call for Help!** if you are starting dobutamine

Critical Care Skills for Non-Critical Care Providers
Central Venous Oxygen Saturation