$$SV \alpha (Preload \times Contractility)/SVR$$

In this equation, preload refers to the myocardial fiber length before contraction (the ventricular end-diastolic volume). Contractility refers to the ability of the ventricle to contract independent of preload and afterload. The SVR represents the afterload, or the force against which the ventricle must contract.

The CaO_2 is composed of oxygen carried by convection with hemoglobin and oxygen dissolved in blood, given as

$$CaO_2 = (Hb \times 1.39 \times SaO_2) + (PaO_2 \times 0.03)$$

A disease process that affects these variables (HR, preload, contractility, SVR, SaO_2, or Hb) has the potential to reduce oxygen delivery and cause cellular hypoxia. Each of the shock types described below has a distinctive physiologic hemodynamic profile corresponding with alterations in one of the variables affecting oxygen delivery described above.

CLASSIFICATION OF SHOCK

While there is a heterogeneous list of specific conditions that can cause shock, it is helpful to categorize these processes into four major shock types based on the primary physiologic derangement leading to reduced oxygen delivery and cellular hypoxia. The four major shock types are distributive, cardiogenic, hypovolemic, and obstructive. **Table 303-1** outlines these major shock types as well as specific disease processes that can result in that physiologic derangement. Each shock type has a distinct hemodynamic profile **(Table 303-2)**. Familiarity with the major shock types and their unique hemodynamic profile is essential so that when evaluating a patient presenting with shock, the clinician can use the history, physical examination, and diagnostic testing to determine the type of shock present and promptly begin appropriate initial therapy to restore oxygen delivery.

TABLE 303-1 Physiologic Classification of Shock