Table 4-2 Summary of Different Types of Shock

Shock Type	Physiologic Insult	Common Causes	Treatment
Hypovolemic	Volume loss	Hemorrhage Gastroenteritis (vomiting, diarrhea) Burns Prolonged poor fluid intake	Rapid transport IV fluid boluses
Distributive	Decreased vascular tone	Sepsis Anaphylaxis Drug overdose Spinal cord injury (neurogenic shock)	Rapid transport Fluid administration Epinephrine for anaphylaxis Dopamine or epinephrine for septic shock
Cardiogenic	Heart failure	Congenital heart disease Cardiomyopathy Dysrhythmia Drug overdose	Rapid transport Cautious crystalloid fluid administration, 10 mL/kg Consider a vasopressor like dopamine, dobutamine, or epinephrine
Obstructive	Obstructed blood flow	Pericardial tamponade Pneumothorax	Rapid transport Needle thoracostomy Fluid administration

myocardial function, and vascular stability are all determinants of effective systemic cardiovascular function. If any one of these factors is impaired by illness or injury, the body will attempt to compensate and normalize perfusion through modification of other physiologic components. This is reflected in the clinical signs of decreased perfusion, such as tachycardia, vasoconstriction, and increased myocardial contraction.

There are four general classes of shock—hypovolemic, distributive, cardiogenic, and obstructive (**Table 4-2**)—reflecting impairment of the three major functional components of circulation: the blood volume, the vascular system, and the heart. Studies of hypovolemia—the most common type of pediatric shock—have allowed researchers to describe the clinical signs that characterize the progression of shock from a compensated state (adequate systolic blood pressure) to an uncompensated state (hypotension). However, the clinical signs characterizing the progression of distributive, cardiogenic, or obstructive shock are less well defined. This reflects the complex physiology of these other forms of shock.

Hypovolemic Shock

Hypovolemia (loss of fluid) is the most common cause of shock in children in the out-of-hospital setting. Bleeding from blunt injuries such as falls or vehicle collisions with the child as a pedestrian, bicyclist, or passenger is the most frequent cause of hypovolemia. Vomiting and diarrhea from gastroenteritis is a second common cause.

The signs and symptoms of hypovolemic shock vary with the amount, duration, and timing of fluid loss. As intravascular volume is further compromised by ongoing fluid losses (such as profuse diarrhea), the child may progress from compensated to decompensated shock.

Early (Compensated) Hypovolemic Shock

Children who lose bodily fluids through minor blood loss or dehydration from gastroenteritis usually show no clinically significant effects on circulation. However, if fluid losses are more than about 5% of body weight, the body compensates for decreased blood flow by predictable adjustments in cardiovascular physiology. This is compensated shock. Signs of compensated hypovolemic shock are tachycardia and peripheral vasoconstriction. Vasoconstriction causes the signs of abnormal circulation to skin: delayed capillary refill time, and decreased pulse strength, poor skin color (pallor or mottling),