

Table 9.2 Stages of Hemorrhage

Stage	Vascular response	Signs and symptoms
Stage 1 ($\leq 15\%$ blood loss; equivalent to donating a pint of blood)	Vasoconstriction to maintain blood pressure	Normal blood pressure Normal or slightly elevated pulse Normal respirations Normal skin color and temperature
Stage 2 (15% to $<30\%$ blood loss; equivalent to 1-2 pints)	Vasoconstriction Shunting of blood to vital organs (brain, heart, lungs) and away from extremities, skin, and intestines	Confusion, anxiety, or restlessness Pale, cool, dry skin Narrow pulse pressure (systolic pressure unchanged, diastolic pressure \uparrow) Weak and rapid pulse (>100 bpm) Increased respirations Delayed capillary refill Reduced urine output
Stage 3 (30-35% blood loss)	Loss of vasoconstriction Decreased cardiac output Decreased tissue perfusion	Increased confusion, restlessness, and anxiety Rapid pulse (>120 bpm) and respirations (>30 /minute) Decreased systolic pressure Cool, clammy, and pale skin
Stage 4 ($>35\%$ to 40% blood loss)	Vascular collapse Lack of adequate blood flow to brain and other vital organs	Pulse and respirations remain elevated Pulse pressure narrows further Lethargy, drowsiness, stupor Increasingly abnormal vital signs Organ failure Death

From B.Q. Hafen, K.J. Karren, and K.J. Frandsen, 1999, *First aid for colleges and universities*, 7th ed. (Boston: Allyn and Bacon), 95; and N.L. Caroline, 1995, *Emergency care in the streets*, 5th ed. (Boston: Little, Brown), 194.

From S. Shultz, P. Houglum, and D. Perrin, 2016. *Examination of musculoskeletal injuries*, 4th ed. (Champaign, IL: Human Kinetics).