UNIT TERMINAL OBJECTIVE
4-2 At the completion of this unit, the EMT-Enhanced student will be able to utilize the assessment findings to formulate a field impression and implement the treatment plan for the patient with hemorrhage or shock.

COGNITIVE OBJECTIVES
At the completion of this unit, the EMT-Enhanced student will be able to:

4-2.1 Describe the epidemiology, including the morbidity, mortality and prevention strategies for shock and hemorrhage. (C-1)
4-2.2 Discuss the various types and degrees of hemorrhage and shock. (C-1)
4-2.4 Discuss the assessment findings associated with hemorrhage and shock. (C-1)
4-2.5 Identify the need for intervention and transport of the patient with hemorrhage or shock. (C-1)
4-2.6 Discuss the treatment plan and management of hemorrhage and shock. (C-1)
4-2.7 Discuss the management of external and internal hemorrhage. (C-1)
4-2.8 Differentiate between controlled and uncontrolled hemorrhage. (C-3)
4-2.9 Differentiate between the administration rate and amount of IV fluid in a patient with controlled versus uncontrolled hemorrhage. (C-3)
4-2.37 Synthesize assessment findings and patient history information to form a field impression for the patient with hemorrhage or shock. (C-3)
4-2.38 Develop, execute, and evaluate a treatment plan based on the field impression for the hemorrhage or shock patient. (C-3)

AFFECTIVE OBJECTIVES
None identified for this unit.

PSYCHOMOTOR OBJECTIVES
At the completion of this unit, the EMT-Enhanced student will be able to:

4-2.40 Demonstrate the assessment of a patient with signs and symptoms of hypovolemic shock. (P-2)
4-2.41 Demonstrate the management of a patient with signs and symptoms of hypovolemic shock. (P-2)
DESCRIPTIVE

1) Pathophysiology, assessment, and management of hemorrhage
   a) Hemorrhage
      i) Epidemiology
         (1) Incidence
         (2) Morbidity/ mortality
         (3) Prevention strategies
      ii) Pathophysiology
         (1) Location
            (a) External
               (i) Controlled
               (ii) Uncontrolled
            (b) Internal
               (i) Trauma
               (ii) Non-trauma
                  1. Common sites
                  2. Uncommon sites
                  (iii) Controlled
                  (iv) Uncontrolled
         (2) Anatomical type
            (a) Arterial
            (b) Venous
            (c) Capillary
         (3) Timing
            (a) Acute
            (b) Chronic
         (4) Severity
            (a) Amounts of blood loss tolerated by
               (i) Adults
               (ii) Children
               (iii) Infants
         (5) Physiological response to hemorrhage
            (a) Clotting
            (b) Localized vasoconstriction
      (6) Assessment
         (a) Early or compensated
            (i) Tachycardia
            (ii) Pale, cool skin
            (iii) Diaphoresis
            (iv) Level of consciousness
               1. Normal
               2. Anxious or apprehensive
            (v) Blood pressure maintained
            (vi) Narrow pulse pressure
               1. Pulse pressure is the difference between the systolic and diastolic pressures, i.e., pulse pressure = systolic - diastolic
               2. Pulse pressure reflects the tone of the arterial system and is more sensitive to changes in perfusion than the systolic or diastolic alone
(vii) Positive orthostatic tilt test
(viii) Dry mucosa
(ix) Complaints of thirst
(x) Weakness
(xi) Possible delay of capillary refill

(b) Late or progressive ( Decompensated)
(i) Extreme tachycardia
(ii) Extreme pale, cool skin
(iii) Diaphoresis
(iv) Significant decrease in level of consciousness
(v) Hypotension
(vi) Dry mucosa
(vii) Nausea
(viii) Cyanosis with white waxy-looking skin

iii) Assessment
(1) Bright red blood from wound, mouth, rectum, or other orifice
(2) Coffee ground appearance of vomitus
(3) Melena
(4) Hematochezia
(5) Dizziness or syncope on sitting or standing
(6) Orthostatic hypotension
(7) Signs and symptoms of hypovolemic shock

iv) Management
(1) Airway and ventilatory support
(2) Circulatory support
   (a) Bleeding from nose or ears after head trauma
      (i) Refrain from applying pressure
      (ii) Apply loose sterile dressing to protect from infection
   (b) Bleeding from other areas
      (i) Control bleeding
         1. Direct pressure
         2. Elevation if appropriate
         3. Pressure points
         4. Tourniquet
         5. Splinting
         6. Packing of large gaping wounds with sterile dressings
         7. PASG
      (ii) Apply sterile dressing and pressure bandage
   (c) Transport considerations
   (d) Psychological support/ communication strategies

2) Pathophysiology, assessment, and management of shock
   a) Shock
      i) Management
         (1) Airway and ventilatory support
            (a) Ventilate and suction as necessary
            (b) Administer high concentration oxygen
            (c) Reduce increased intrathoracic pressure in tension pneumothorax
         (2) Circulatory support
            (a) Hemorrhage control
            (b) Intravenous volume expanders
(i) Types
1. Isotonic solutions
2. Hypertonic solutions
3. Synthetic solutions

(ii) Rate of administration
1. External hemorrhage that can be controlled
2. External hemorrhage that cannot be controlled
3. Internal hemorrhage
   a. Blunt trauma
   b. Penetrating trauma

(c) Pneumatic anti-shock garment (PASG)

(i) Effects
1. Increased arterial blood pressure above garment
2. Increased systemic vascular resistance
3. Immobilization of pelvis and possibly lower extremities
4. Increased intra-abdominal pressure

(ii) Mechanism
1. Increases systemic vascular resistance through direct compression of tissues and blood vessels
2. Negligible autotransfusion effect

(iii) Indications
1. Hypoperfusion with unstable pelvis
2. Conditions of decreased SVR not corrected by other means
3. As approved locally, other conditions characterized by hypoperfusion with hypotension
4. Research studies

(iv) Contraindications
1. Advanced pregnancy (no inflation of abdominal compartment)
2. Object impaled in abdomen or evisceration (no inflation of abdominal compartment)
3. Ruptured diaphragm
4. Cardiogenic shock
5. Pulmonary edema

(d) Recognize the need for Needle chest decompression of tension pneumothorax to improve impaired cardiac output

(e) Recognize the need for expeditious transport of suspected cardiac tamponade for pericardiocentesis

(3) Fluid Management

- Controlled external bleeding with signs & symptoms of shock
- Uncontrolled externaland/or/internal bleed with signs & symptoms of shock
- Traumatic Cardiac Arrest

(4) Non-pharmacological interventions

(5) Transport considerations
   (a) Indications for rapid transport
   (b) Indications for transport to a trauma center
   (c) Considerations for air medical transportation

(6) Psychological support/ communication strategies