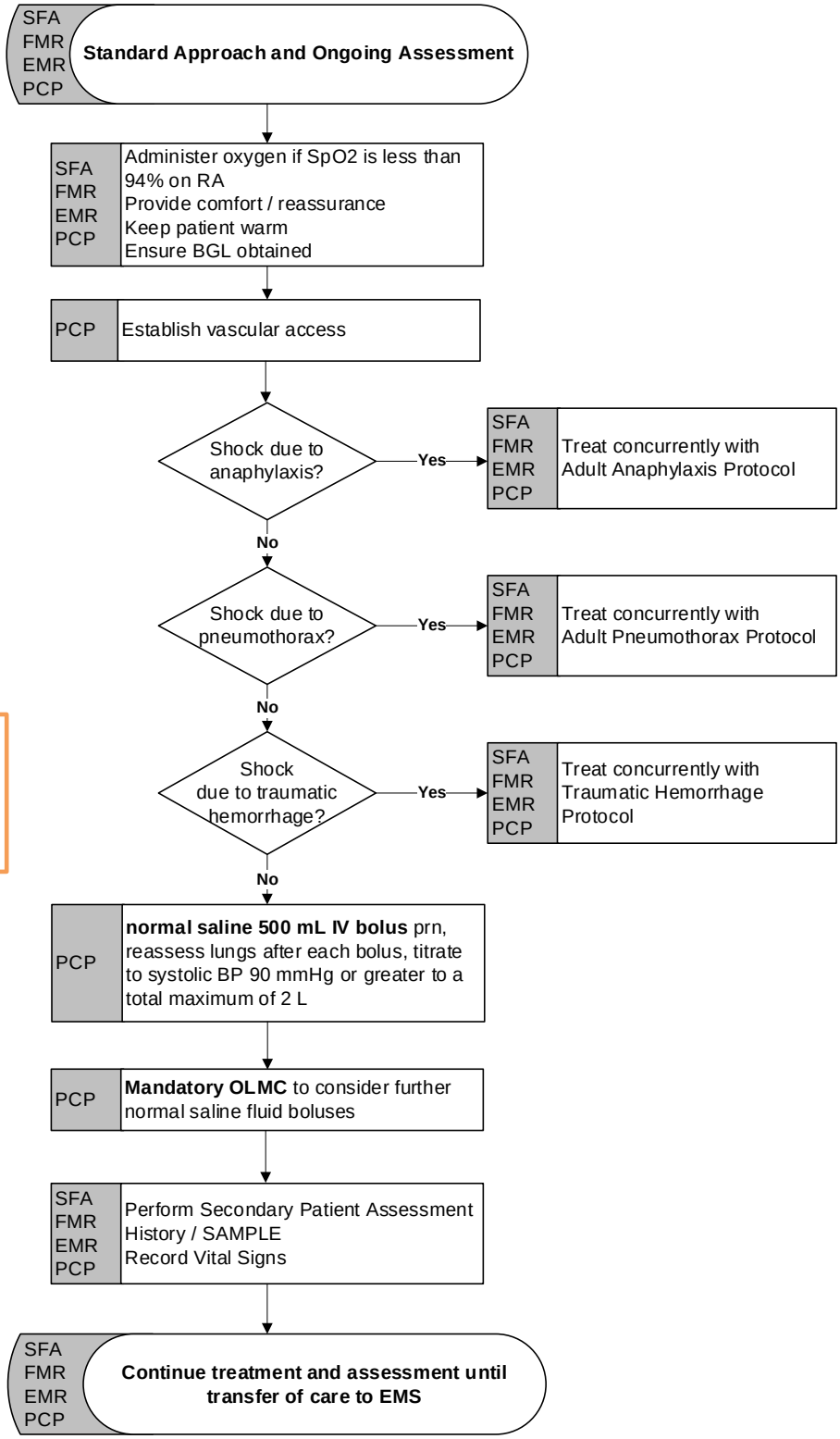
Adult Shock



Patient Safety Considerations

- Reassess patient continually for signs of fluid overload (i.e. crackles on lung auscultation) during fluid resuscitation

Etiology

Shock is any condition in which the circulatory system is unable to provide adequate tissue perfusion, with resultant hypotension. Initially shock is reversible, but in severe cases may lead to irreversible multi-organ failure and/or death.

Assessment of the mechanism of injury is helpful in determining the potential for the development of shock in trauma. It is also essential to quickly search for immediate life-threatening injuries, such as profuse external bleeding and to perform critical interventions.

Signs and symptoms of shock include:

Altered level of consciousness

Dyspnea

Tachycardia (unless underlying medications, spinal cord injury or extremes of ages)

Peripheral and / or central cyanosis (assess skin colour, temperature and strength of pulses)

Ischemic chest pain / dynamic ECG changes

Shock can be broken down into four broad categories:

1. Cardiogenic

    - Failure of the heart to pump effectively, resulting in loss of perfusing blood to body system, due to impaired left ventricular function
    - Usually occurs after myocardial infarction causing substantial left ventricular impairment and in resuscitated cardiac arrest (ROSC)

2. Obstructive

    - Physical obstruction of the heart or great vessels
    - May be caused by tension pneumothorax, pulmonary embolism, or cardiac tamponade

3. Hypovolemic

   a. Hemorrhagic
      - Diminished intravascular volume secondary to blood loss to the point where body function is interrupted.

   b. Non-hemorrhagic
      - Diminished intravascular volume from fluid losses, such as gastrointestinal (GI) sources, renal, skin (burns) and third spacing.

4. Distributive
   Decrease in peripheral vascular resistance, can be caused by:

   a. Anaphylaxis
      - Histamine release causes peripheral vasodilation and a shift of fluid from intravascular spaces into interstitial space.
      - Epinephrine is the first line vasopressor for anaphylaxis.

   b. Neurogenic
      - Spinal cord injury results in unopposed vagal tone.
      - Characterized by bradycardia and hypotension with warm, dry skin.

   c. Sepsis –Refer to Appendix A for detailed information
      - Life-threatening organ dysfunction from a dysregulated host response to infection which is defined as:
        - Temperature less than 36° degrees or greater than 38° degrees Celsius
        - Heart rate greater than 90 bpm
        - Tachypnea greater than 20 respirations / minute

   d. Endocrine
      - A life-threatening clinical syndrome that involves the failure of multiple endocrine organs. This can cause dysregulation of multiple body systems including the CNS, cardiovascular, immune and metabolic systems. Results in adrenal, hyper/hypoglycemia and severe acidosis / alkalosis. Early steroid replacement is first line treatment.

   e. Drug / Toxin
      - Includes both accidental and intentional overdoses of medications that can cause impaired tissue perfusion

Interventions

In the initial evaluation of a patient presenting in shock, your role is to determine the underlying cause of shock. It may be possible that the exact underlying etiology of shock is not known or may include more than one type of shock.

Oxygen Administration

Refer to Standard Approach and Ongoing Assessment protocol to determine when oxygen administration is appropriate for patients

The management of a patient presenting in shock should follow these steps:

1. Focused history

2. Physical exam: conserve body warmth, a baseline set of vitals is important in determining changes in the patient's status. Vitals should be repeated frequently.

3. If the patient is hypoxic or presents with an altered level of consciousness that impairs their ability to protect their airway, then consider concurrent use of the Adult Airway Basic Protocol

4. Elevation of lower extremities should be done only if there is no risk of spinal injury or fractures of the legs. Patients who are secured on a spine board and are in shock can have the lower end of the board elevated slightly. Use caution if cardiogenic shock is suspected.

5. Review of investigations (ECG, blood glucose, vitals)

6. Based on the type of shock, refer to the appropriate protocol

   Cardiogenic:
   If pulmonary edema is present refer to the Adult Dyspnea Protocol

   Obstructive:
   Treat shock due to tension pneumothorax concurrently with the Adult Pneumothorax Protocol

   Hypovolemic shock:
   Control any external hemorrhage; refer to the Traumatic Hemorrhage Control Protocol if shock is due to traumatic hemorrhage

   Distributive:
   Treat shock due to anaphylaxis concurrently with the Adult Anaphylaxis Protocol
   Shock due to poisoning/toxic ingestion refer to the Poisoning Protocol

7. Fluid resuscitation after an identified cause has been treated, if applicable:
   Normal saline 500 mL IV bolus prn, reassess lungs after each bolus, titrate to systolic BP 90 mmHg or greater to a total maximum of 2 L

8. Mandatory OLMC after a maximum of 2 L has been reached and further normal saline boluses are being considered

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Infection Prevention and Control (IP&C) Considerations

Consider the following isolation precautions:

- Pneumonia - Droplet precautions
- Urinary Tract Infection (UTI) - Contact precautions
- Acute abdominal infection - Contact precautions

Appendix A – Adult Sepsis

Sepsis is the clinical syndrome that results from a dysregulated host response to an infection. This infection is commonly a result of an infection at another site in the body, such as:

1. Pneumonia
2. Urinary tract infection
3. Acute abdominal infection
4. Meningitis
5. Skin / soft tissue infection
6. Bone / joint infection
7. Wound infection
8. Infection from catheter
9. Endocarditis
10. Implantable device infection

Patients with a **high risk** for developing infections include:

- Post-operative
- Diabetic
- Extremes of age (e.g. infants less than 3 months and the elderly)
- Immunocompromised (e.g. Splenectomy, Active Chemotherapy, transplant patients, HIV, autoimmune disorders, etc)
- Chronic illness (e.g. COPD, substance abuse, renal failure)
- Postpartum
- IVDU (Intravenous Drug Use) / Chronic Alcoholics

Systemic Inflammatory Response Syndrome (SIRS Criteria) is used to identify sepsis (when infection is suspected) and is satisfied when 2 or more criteria are present:

1. Temperature less than 36°Celsius or greater than 38° Celsius
2. Heart rate greater than 90 beats / minute
3. Tachypnea greater than 20 respirations / minute