Emergency Department Planning and Resource Guidelines

The purpose of this policy is to provide an outline of, as well as references concerning the resources and planning needed to meet the emergency medical care needs of the individual and the community.

Emergency departments must possess the staff and resources necessary to evaluate all individuals presenting to the emergency department (ED). Emergency departments must also be able to provide or arrange treatment necessary to attempt to stabilize emergency patients who are found to have an emergency medical condition. Because of the unscheduled and episodic nature of health emergencies and acute illnesses, experienced and qualified physician, nursing, and ancillary personnel must be available 24 hours a day to serve those needs.

Emergency departments also provide treatment for individuals whose health needs are not of an emergent nature, but for whom EDs may be the only accessible or timely entry point into the broader health care system. EDs provide evaluation to anyone who believes they have an emergency condition under the prudent layperson standard and in accordance with EMTALA. Accessing an ED for care is an option exercised by patients seeking available high-quality services.

The American College of Emergency Physicians (ACEP) believes that:

- Emergency medical care must be available to all members of the public.
- Access to appropriate emergency medical and nursing care must be unrestricted.
- A smooth continuum should exist among prehospital providers, ED providers, and providers of definitive follow-up care.
- Evaluation, management, and treatment of patients must be appropriate and expedient.
- Resources should exist in the ED to accommodate each patient from the time of arrival through evaluation, decision-making, treatment, and disposition.

* These guidelines are intended to apply to either hospital-based or free-standing emergency departments open 24 hours a day.
• EDs should have policies and plans to provide effective administration, staffing, facility design, equipment, medication, and ancillary services.
• The emergency physicians, emergency nurse, and additional medical team members are the core components of the emergency medical care system. These ED personnel must establish effective working relationships with other health care providers and entities with whom they must interact. These include emergency medical services (EMS) providers, ancillary hospital personnel, other physicians, and other health care and social service resources.

Policy sections include:
I. Resources and Planning
   A. Responsibilities and Public Expectations
   B. Necessary Elements
      1. Administration
      2. Staffing
      3. Facility
      4. Equipment and Supplies (See also Figure 1)
      5. Pharmacologic/Therapeutic Drugs and Agents (See also Figure 2)
      6. Ancillary Services (See also Figures 3 and 4)
   C. Relationships and Responsibilities
II. Figures
   A. Suggested Equipment and Supplies for EDs
   B. Suggested Pharmacological/Therapeutic Drugs for EDs
   C. Radiological, Imaging, and other Diagnostic Services
   D. Suggested Laboratory Capabilities
   E. References

I. Resources and Planning
   A. Responsibilities and Public Expectations
      1. EDs should be staffed by qualified personnel with knowledge and skills sufficient to evaluate and manage those who seek emergency care. EDs should be designed and equipped to facilitate this work.
      2. Timely emergency care by an emergency physician and emergency nursing staff physically present in the ED must be continuously available 24 hours a day, seven days a week.
      3. Emergency patient evaluation and stabilization must be provided to each individual who presents for such care. Consistent with applicable standards and regulations, the patient or applicable guarantor is financially responsible for the charges incurred in the course of this care.
      4. EDs should participate in an active public education program that details the intended scope of services provided at the facility.
      5. EDs should support existing EMS systems and provide medical direction where appropriate.

   B. Necessary Elements
      This section of the guidelines outlines elements of administration, staffing, design, and materials needed for the delivery of emergency care.

      1. Administration
         a. The emergency facility must be organized and administered to meet the health care needs of its patient population. A written organizational plan for the ED consistent with hospital
bylaws and similar to the organizational plan of other clinical departments in the hospital should exist.

b. Operation of the ED must be guided by written policies and procedures.

c. The medical director of an ED, in collaboration with the director of emergency nursing and with appropriate integration of ancillary services, must ensure that quality, safety, and appropriateness of emergency care are continually monitored and evaluated. The ED medical director should have oversight over all aspects of the practice of emergency medicine in an ED.

d. All new staff members working in an ED should receive a formal orientation program that addresses the mission of the institution, standard operating procedures of the ED, and the responsibilities of each member of the ED staff.

e. All emergency care personnel must maintain and enhance their professional knowledge and skills, with the goal of providing optimal care to patients.

f. The duties and responsibilities of physicians, nurses, and ancillary staff members in the ED must be defined in writing. The ED quality assurance program should provide for the evaluation and monitoring of each member of the emergency care team at regular intervals.

g. In accordance with applicable laws, regulations, and standards, the triage and screening of each patient who enters the facility seeking care must be performed by a physician, or by a specially trained registered nurse, nurse practitioner, or physician assistant, in accordance with the Emergency Medical Treatment and Active Labor Act (EMTALA) policies delineated in the medical staff bylaws or by the hospital board of trustees. Policy guidelines should be developed collaboratively by the medical director of emergency services and the director of emergency nursing.

h. Immediate evaluation and stabilization, to the degree reasonably possible, must be available for each patient who presents with an emergency medical condition.

i. The emergency physician is responsible for the medical care provided in the ED. This includes the medical evaluation, diagnosis, and recommended treatment and disposition of the emergency patient, as well as the direction and coordination of all other care provided to the patient. Medical care responsibility for a particular patient in the ED may be transferred to another physician if said responsibility has been assumed unambiguously. A registered nurse is responsible for the nursing care of each emergency patient to include assessment, planning, and evaluation of response to interventions.

j. The ED must maintain a control register or “log” identifying each individual who presents to the facility seeking emergency care. An electronic health record that captures and records this data is encouraged.

k. A legible and appropriate medical record must be established for every individual who presents for emergency care. This record must be retained as required by law and should remain promptly available to the emergency staff when needed.

†Where appropriate in this document, the term “chair, or chief, of the department of emergency medicine” may be substituted for the title “medical director of the emergency department.”

2. Staffing

a. Appropriately educated and qualified emergency care professionals, including a physician and a registered nurse, shall staff the ED during all hours of operation.

b. An emergency medical director shall direct the medical care provided in the ED. The medical director of the ED should:
   • Be certified by the American Board of Emergency Medicine, the American Osteopathic Board of Emergency Medicine or possess comparable qualifications as established through the privilege delineation policy.
• Possess competence in management and administration of the clinical services in an ED.
• Be a voting member of the executive committee of the hospital’s medical staff.
• Be knowledgeable about EMS operations and the regional EMS network.
• Be responsible for assessing and making recommendations to the hospital’s credentialing body related to the qualifications of emergency physicians with respect to the clinical privileges granted to them.
• Ensure that the emergency staff is adequately qualified and appropriately educated.

c. All physicians who staff the ED, including the medical director, should be subject to the hospital’s customary credentialing process and must be members of the hospital medical staff with clinical privileges in emergency medicine. Emergency physicians should have the same rights, privileges, and responsibilities as any other member of the medical staff, as outlined in the organized medical staff's various categories of medical staff membership.

d. Each physician should be individually credentialed by the hospital medical staff department in accordance with criteria contained in ACEPs policy on physician credentialing. All emergency physicians who practice in an ED must possess training, experience, and competence in emergency medicine sufficient to evaluate and initially manage and treat all patients who seek emergency care, consistent with the physician’s delineated clinical privileges.

e. The nursing care provided in the ED shall be directed by a registered nurse. The director of emergency nursing services should:
• Demonstrate evidence of substantial education, experience, and competence in emergency nursing. The Certified Emergency Nurse (CEN) credential is an excellent benchmark.
• Show evidence of competence in management and administration of the clinical services in an ED.
• Ensure that the nursing and support staff are appropriately educated and qualified.

f. Each nurse working in the ED should:
• Provide evidence of adequate previous ED or critical care experience or have completed an emergency care education program. The CEN credential is an excellent benchmark.
• Demonstrate evidence of the knowledge and skills necessary to deliver nursing care in accordance with the Standards of Emergency Nursing Practice.

g. The medical director of the ED and the director of emergency nursing must assess staffing needs on a regular basis. Patient census, injury/illness severity, arrival time, and availability of ancillary services and support staff are factors to be considered in the evaluation of emergency scheduling and staffing needs. Staffing patterns should accommodate the potential for the unexpected arrival of additional critically ill or injured patients. A plan should exist for the provision of additional nursing, physician assistant, advanced practice registered nurse, and physician support in times of disaster.

3. Facility
a. The ED should be designed to provide a safe environment in which to render care and should enable convenient access for all individuals who present for care.

b. The ED should be designed to protect, to the maximum extent reasonably possible consistent with medical necessity, the right of the patient to visual and auditory privacy.

c. Radiological, imaging, and other diagnostic services such as those outlined in Appendix 3 must be available within a reasonable period of time for individuals who require these services.
d. Laboratory services such as those outlined in Appendix 4 must be available within a reasonable period of time for the provision of appropriate diagnostic tests for individuals who require these services.

e. Appropriate signs consistent with the applicable regulations and laws should indicate the direction of the ED from major thoroughfares and whether the facility is designated as a specialized emergency care center.

f. Adequate provisions for the safety of the ED staff, patients, and visitors must be designed and implemented.

g. In accordance with regulations, translation and communication capabilities should exist for foreign languages and for the hearing impaired.

4. Equipment and Supplies

a. Equipment and supplies must be of high quality and should be appropriate to the reasonable needs of all patients anticipated by the ED.

b. Necessary equipment and supplies such as those outlined in Appendix 1 must be immediately available in the facility at all times.

c. Evidence of the proper functioning of all reusable direct patient care medical equipment must be documented at regular intervals.

5. Pharmacologic/Therapeutic Drugs and Agents

Necessary drugs and agents such as those outlined in Appendix 2 must be immediately available. A mechanism must exist to identify and replace all drugs before their expiration dates.

6. Ancillary Services

a. Lab
b. Radiology
c. Anesthesia*
d. Respiratory Therapy*
e. Electrocardiography

*may not be applicable to freestanding EDs

C. Relationships and Responsibilities

1. Responsibilities for the Continuity of Patient Care

Emergency care begins in the prehospital setting, continues in the ED, and concludes when responsibility for the patient is transferred to another physician or the patient is discharged. To promote optimal care of emergency patients, this transfer of responsibility should be accomplished in an effective, orderly, and predictable manner. This section describes the relationships that should exist between facilities and providers for proper continuity of care.

a. Prehospital Setting
   - Prehospital emergency care should be provided consistent with the ACEP policy, “Medical Direction of Emergency Medical Services.”
   - EDs must be a designated part of the EMS and community disaster plans and must have roles defined by the local EMS/disaster coordinating body. Protocols and procedures should be in place defining the EDs interface with the EMS system.
   - Patients should be transported to the nearest appropriate ED in accordance with applicable laws, regulations, and guidelines.
• When ambulance services are used to transport patients to an ED, a communication system such as a two-way radio, cellular phone, or other appropriate means should be available to permit notice of arrival or advance information concerning critically ill or injured patients.

• Transport personnel should provide complete written or electronic clinical documentation of all prehospital care provided to the patient. A copy of the document should be immediately available on transfer of care to the staff of the ED and should be included in the patient’s permanent emergency medical record.

b. Emergency Facility

• ED personnel must be familiar with medical care protocols used by the prehospital providers in their community.

• All individuals with potentially lethal or disabling illnesses or injuries or other potential emergency medical conditions who present or are brought to the facility must be evaluated promptly. Appropriate measures must be initiated to stabilize and manage these patients.

c. Patient Disposition

• Appropriately qualified physicians who will accept responsibility for the care of patients must be identified in advance by the hospital and its medical staff for patients requiring admission or transfer to an inpatient bed or observation/holding unit. Consistent with applicable laws and regulations, the hospital and its medical staff must provide to the ED a list of appropriate “on-call” specialists who are required to respond to assist in the care of emergency patients within reasonable established time limits.

• Patients admitted or transferred to an observation/holding unit should be managed in a manner consistent with guidelines specified in ACEP’s related policies.

• Appropriately qualified physicians or other appropriate and qualified health care professionals practicing within the scope of their licensure who will accept follow-up responsibility for patients discharged from the ED should be identified in advance by the hospital and its medical staff. The hospital and its medical staff must provide the ED with a list of appropriate on-call specialists or other appropriate referral services who will render follow-up services to ED patients within a reasonable period of time after discharge.

• All patients discharged or transferred from an ED must have specific, printed, or legibly written aftercare instructions.

d. Transfer

• When patient transfer is indicated, the emergency facility must have a written plan for transferring patients in a vehicle with appropriate patient care capabilities including life support (e.g., ambulance, advanced life support, basic life support, fixed-wing, and rotor). When necessary, means should be available to provide nursing or physician staffing of transfer vehicles. Medical records necessary for ongoing care must accompany the patient; if these are not available at the time of transfer, they must be expeditiously provided to the receiving facility (e.g., by fax transmission) in accordance with EMTALA.

• Patients with potentially lethal or disabling conditions or other emergency medical conditions must not be transferred from an emergency facility unless appropriate evaluation and stabilization procedures have been initiated within the capability of the facility. Transfer of patients to a facility with greater capability and resources should be
arranged as necessary.

- All transfers must comply with local, state, and federal laws and be consistent with ACEP policies related to patient transfer.

Figure 1  SUGGESTED EQUIPMENT AND SUPPLIES FOR EDs

The rooms, equipment, instruments, and supplies listed below are only suggested. Each of the items should be located in or immediately available to the area noted. This list does not include routine medical/surgical supplies such as adhesive bandages, gauze pads, and suture material. Nor does it include routine office items such as paper, desks, paper clips, and chairs.

** Entire Department

- Central station monitoring capability
- Physiological monitors
- Blood flow detectors
- Defibrillator with monitor and battery
- Thermometers
- Pulse oximetry
- Nurse-call system for patient use
- Portable suction regulator
- Infusion pumps to include blood pumps
- IV poles
- Bag-valve-mask respiratory and adult and pediatric size mask
- Portable oxygen tanks
- Blood/fluid warmer and tubing
- Nasogastric suction supplies
- Nebulizer
- Gastric lavage supplies, including large-lumen tubes and bite blocks
- Urinary catheters, including straight catheters, Foley catheters, Coude catheters, filiforms and followers, and appropriate collection equipment
- Intraosseous needles and placement equipment
- Lumbar puncture sets (adult and pediatric)
- Blanket warmer
- Tonometer
- Slit lamp
- Wheel chairs
- Medication dispensing system with locking capabilities
- Separately wrapped instruments (specifics will vary by department)
- Availability of light microscopy for emergency procedures
- Weight scales (adult and infant)
- Tape measure
- Ear irrigation and cerumen removal equipment
- Vascular Doppler
- Anoscope
- Adult and Pediatric “code” cart
- Suture or minor surgical procedure sets (generic)
- Portable sonogram equipment
• EKG machine
• Point of care testing
• X-ray viewing capabilities
• Chart rack
• Computer system
• Internet capabilities
• Patient tracking system
• Access to electronic health record
• Radio or other device for communication with ambulances
• Patient discharge instruction system
• Patient registration system/ Information services
• Intradepartmental staff communication system- pagers, mobile phones
• ED charting system for physician, nursing, and attending physician documentation equipment
• Reference materials including toxicology resource information
• Personal protective equipment- gloves, eye goggles, face mask, gowns, head and foot covers
• Linen (pillows, towels, wash cloths, gowns, blankets)
• Patient belongings or clothing bag
• Security needs –including restraints and wand-type or free standing metal detectors as indicated
• Equipment for adequate housekeeping

General Examination Rooms

• Examination tables or stretchers appropriate to the area. (For any area in which seriously ill patients are managed, a stretcher with capability for changes in position, attached IV poles, and a holder for portable oxygen tank should be used. Pelvic tables for GYN examinations.)
• Step stool
• Chair/stool for emergency staff
• Seating for family members or visitors
• Adequate lighting, including procedure lights as indicated
• Cabinets
• Adequate sinks for hand-washing, including dispensers for germicidal soap and paper towels
• Wall mounted oxygen supplies and equipment, including nasal cannulas, face masks, and venturi masks.
• Wall mounted suction capability, including both tracheal cannulas and larger cannulas
• Wall-mounted or portable otoscope/ophthalmoscope
• Sphygmomanometer/stethoscope
• Televisions
• Reading material for patients
• Biohazard-disposal receptacles, including for sharps
• Garbage receptacles for non-contaminated materials

Resuscitation Room

All items listed for general examination rooms plus:
• Access to adult and pediatric “code cart” to include appropriate medication charts
• Capability for direct communication with nursing station, preferably hands free
• Radiography equipment
• Radiographic viewing capabilities
• Airways needs
  Big-valve-mask respirator (adult, pediatric, and infant)
  Cricothyroidotomy instruments and supplies
  Endotracheal tubes, size 2.5 to 8.5 mm
  Fiberoptic laryngoscope, video laryngoscope or alternative rescue intubation equipment
  Laryngoscopes, straight and curved blades and stylets
  Laryngoscopic mirror and supplies
  Laryngeal Mask Airway (LMA)
  Oral and nasal airways
  Tracheostomy instrument and supplies

• Breathing
  Noninvasive Ventilation System (BIPAP/CPAP)
  Closed-chest drainage device
  Chest tube instruments and supplies
  Emergency thoracotomy instruments and supplies
  End-tidal CO2 monitor
  Nebulizer
  Peak flow meter
  Pulse oximetry
  Volume cycle ventilator

• Circulation
  Automatic physiological monitor, noninvasive
  Blood/fluid infusion pumps and tubing
  Cardiac compression board
  Central venous catheter setups/kits
  Central venous pressure monitoring equipment
  Cutdown instruments and supplies
  Intraosseous needles
  IV catheters, sets, tubing, poles
  Monitor/defibrillator with pediatric paddles, internal paddles, appropriate pads and other supplies
  Pericardiocentesis instruments
  Rapid infusion equipment
  Temporary external pacemaker
  Transvenous and/or transthoracic pacemaker setup and supplies
  12-Lead ECG machine

Trauma and miscellaneous resuscitation

• Blood salvage/autotransfusion device
• Emergency obstetric instruments and supplies
• Hypothermia thermometer
• Infant warming equipment
• Peritoneal lavage instruments and supplies
• Spine stabilization equipment to include cervical collars, short and long boards
• Therapeutic hypothermia modalities
• Warming/cooling blanket
Other Special Rooms

All items listed for general examination rooms plus:

- **Orthopedic**
  - Cast cutter
  - Cast and splint application supplies and equipment
  - Crutches
  - Extremity splinting and stabilization devices
  - Halo traction or Gardner-Wells/Trippe-Wells traction
  - Radiographic viewing capabilities
  - Traction equipment, including hanging weights and finger traps

- **Eye/ENT**
  - Eye chart
  - Ophthalmic tonometry device (applanation, Schiotz, or other)
  - Other ophthalmic supplies as indicated, including eye spud, rust ring remover, cobalt blue light
  - Slit lamp
  - Ear irrigation and cerumen removal equipment
  - Epistaxis instrument and supplies, including balloon posterior packs
  - Frazier suction tips
  - Headlight
  - Laryngoscopic mirror
  - Plastic suture instruments and supplies

- **OB-GYN**
  - Fetal Doppler and ultrasound equipment
  - Obstetrics/Gynecology examination light
  - Vaginal specula in various sizes
  - Sexual assault evidence-collection kits (as appropriate)
  - Suture material

**Figure 2  SUGGESTED PHARMACOLOGICAL/THERAPEUTIC DRUGS FOR EDs**

*These classes of drugs and agents are only suggested and will evolve as new therapies become available. The medical director of the ED and a pharmacy representative should develop a formulary of specific agents for use in an individual hospital's ED.*

- Analgesics
  - Narcotic and non-narcotic
- Anesthetics
  - Topical, infiltrative, general
- Anticonvulsants
- Antidiabetic agents
- Antidotes
  - Antivenins
  - Antihistamines
  - Anti-infective agents
  - Systemic/topical/post-exposure prophylaxis
- Anti-inflammatories
  - Steroidal/non-steroidal
- Bicarbonates
- Blood Modifiers
- Anticoagulants, including thrombolytics
- Hemostatics
  - Systemic
  - Topical
  - Plasma expanders/ extenders
  - Burn Preparations
<table>
<thead>
<tr>
<th>Cardiovascular agents</th>
<th>Hormonal agents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ace inhibitors</td>
<td>Oral contraceptives</td>
</tr>
<tr>
<td>Adrenergic blockers</td>
<td>Steroid preparations</td>
</tr>
<tr>
<td>Adrenergic stimulants</td>
<td>Thyroid preparations</td>
</tr>
<tr>
<td>Alpha/Beta blockers</td>
<td>Hypocalcemia and hypercalcemia management</td>
</tr>
<tr>
<td>Antiarrhythmia agents</td>
<td></td>
</tr>
<tr>
<td>Calcium channel blockers</td>
<td></td>
</tr>
<tr>
<td>Digoxin antagonist</td>
<td></td>
</tr>
<tr>
<td>Diuretics</td>
<td></td>
</tr>
<tr>
<td>Vasodilators</td>
<td></td>
</tr>
<tr>
<td>Vasopressors</td>
<td></td>
</tr>
<tr>
<td>Cholinesterase Inhibitors</td>
<td></td>
</tr>
<tr>
<td>Diagnostic agents</td>
<td>Narcotic antagonist</td>
</tr>
<tr>
<td>Blood contents</td>
<td>Nasal preparation</td>
</tr>
<tr>
<td>Stool contents</td>
<td>Neuromuscular blocking agents</td>
</tr>
<tr>
<td>Testing for myasthenia gravis</td>
<td>Ophthalmologic preparations</td>
</tr>
<tr>
<td>Urine contents</td>
<td>Otic preparations</td>
</tr>
<tr>
<td>Electrolytes</td>
<td>Oxygen and tocolytics</td>
</tr>
<tr>
<td>Cation exchange resin</td>
<td></td>
</tr>
<tr>
<td>Electrolyte replacements, parenteral and oral</td>
<td>Respiratory agents</td>
</tr>
<tr>
<td>Fluid replacement solutions</td>
<td>Antitussives</td>
</tr>
<tr>
<td>Gastrointestinal agents</td>
<td>Bronchodilators</td>
</tr>
<tr>
<td>Antacids</td>
<td>Decongestants</td>
</tr>
<tr>
<td>Anti-diarrheals</td>
<td>Leukotriene antagonist</td>
</tr>
<tr>
<td>Emetics and Anti-emetics</td>
<td>Rh(D) immune globulin</td>
</tr>
<tr>
<td>Anti-flatulent</td>
<td>Salicylates</td>
</tr>
<tr>
<td>Anti-spasmodics</td>
<td>Sedatives and Hypnotics</td>
</tr>
<tr>
<td>Bowel evacuants/laxatives</td>
<td>Vaccinations</td>
</tr>
<tr>
<td>Histamine receptor antagonists</td>
<td>Vitamin and minerals</td>
</tr>
<tr>
<td>Proton pump inhibitors</td>
<td></td>
</tr>
<tr>
<td>Glucose elevating agents</td>
<td></td>
</tr>
</tbody>
</table>

Figure 3  **RADIOLOGIC, IMAGING, AND OTHER DIAGNOSTIC SERVICES**

*The specific services available and the timeliness of availability of these services for emergency patients in an individual hospital's ED should be determined by the medical director of the ED in collaboration with the directors of the diagnostic services and other appropriate individuals.*

**The following should be readily available 24 hours a day for emergency patients:**

Standard radiologic studies of bony and soft-tissue structures

Emergency ultrasound services for the diagnosis of obstetric/gynecologic, cardiac and hemodynamic problems and other urgent conditions.
Cardiovascular services
  Doppler studies
  12-Lead ECGs and rhythm strips

Pulmonary services
  Arterial blood gas determination
  Peak flow determination
  Pulse oximetry

Fetal monitoring (nonstress test)/uterine monitoring in applicable facilities

The following services should be available on an urgent basis, provided by staff in the hospital or by staff to be called in to respond within a reasonable period of time:

Nuclear medicine

Radiographic
  Arteriography/venography
  Computed tomography or the ability to arrange for urgent CT scan
  Dye-contrast studies (intravenous pyelography, gastrointestinal contrast, etc.)
  Magnetic resonance imaging services or the ability to arrange for urgent MRI

Vascular/flow studies including impedance plethysmography

Figure 4  SUGGESTED LABORATORY CAPABILITIES

The medical director of the ED and the director of laboratory services should develop guidelines for availability and timeliness of services for an individual hospital's ED. The following laboratory capabilities are suggested for hospitals with 24-hour EDs. This list may not be comprehensive or complete. Point-of-care testing may be available for many of the below listed tests and may facilitate timely results.

Blood Bank
  Bank products availability
  Type and cross-matching capabilities

Chemistry
  Ammonia
  Amylase
  Anticonvulsant and other therapeutic drug levels
  Arterial blood gases
  Bilirubin (total and direct)
  B-type natriuretic peptide (BNP)
  Calcium
  Carboxyhemoglobin
  Cardiac enzymes (including creatine kinase- MB)
  Creatinine
  Electrolytes (blood, CSF, and urine)
  Ethanol
  Glucose (blood and CSF)
Lactate  
Lipase  
Liver-function enzymes (ALT, AST, alkaline phosphatase)  
Methemoglobin  
Osmolality  
Protein (CSF)  
Serum magnesium  
Urea nitrogen  

**Hematology**  
- Cell count and differential (blood, CSF, joint and other body fluid analysis)  
- Coagulation studies  
- Erythrocyte sedimentation rate  
- Platelet count  
- Reticulocyte count  
- Sickle cell prep  

**Microbiology**  
- Acid fast smear/staining  
- Chlamydia and gonorrhea testing  
- Counterimmune electrophoresis for bacterial identification  
- Gram staining and culture/sensitivities  
- Herpes testing  
- Strep screening  
- Viral culture  
- Wright stain  

**Other**  
- Hepatitis screening  
- HIV screening  
- CSF, joint and other body fluid analysis  
- Toxicology screening and drug levels  
- Urinalysis  
- Mononucleosis spot  
- Serology (syphilis, recombinant immunoassay)  
- Pregnancy testing (qualitative and quantitative)