

UNIFORM TREATMENT PROTOCOLS

FINAL REPORT

November 1996

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1540 Market Street, Suite 220
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PREAMBLE

This document represents the efforts of the California State Uniform Treatment Protocols Project. This project was funded under a Federal Block Fund grant administered by the California State Emergency Medical Services Authority and awarded to the Emergency Medical Services Agency of the City and County of San Francisco Department of Public Health. It was staffed by a multidisciplinary group of prehospital care professionals, including physicians, paramedics, nurses, and educators that represented the diversity of California demographics, geography and EMS system design.

These guidelines are not offered as a standard of care. They are presented to the California EMS community as a template for discretionary use by local Emergency Medical Services Agencies as they undertake the often daunting task of drafting and revising patient management guidelines or “protocols.” This document is not intended to replace nor supersede the treatment protocols approved by local EMS medical directors, nor should it be interpreted as establishing a “standard of care” for prehospital practice within the State of California. The members of the project group recognize that some differences of opinion may exist regarding some of the therapies discussed. The contents of this document may be edited, modified and restructured to meet the local standards within the medical community. Only medical management issues are addressed. System administrative and operational policies and procedures are beyond the scope of these guidelines. The project team members wish to emphasize that not all patients will fit the guidelines and that, like medicine, the practice of prehospital care is an art that involves training, judgment and experience.

The project team developed these guidelines with the following principles in mind:

- The guidelines should be structured to assist in the physiologic support of adult patients, recognizing that not all patients will fit into the categories presented.
- Protocols or guidelines can never substitute for training, experience, common sense, good judgment, and strong involvement from the medical community.
- The guidelines, at the time of publication, should be scientifically correct.
- The guidelines will include all optional scope of practice medications and procedures approved at the time of publication, but should not be seen as recommending expansion or restriction of the scope of practice in any local EMS system. Specifically drugs such as procainamide, magnesium, adenosine, are not in the basic scope but are included here.
- The guidelines will encompass both ALS and BLS adult patient management, so as to emphasize the importance of the continuum of care that our EMS systems should provide.

- The guidelines will not include specific points at which on-line medical consultation (base contact) should be established or transport initiated. These should be determined by the local EMS Medical Director.

We hope that these guidelines assist the California EMS community as it strives to provide quality, compassionate prehospital care. We believe this should be a living document, changing and growing to reflect the changes in science and clinical practice, while always respecting the diversity of California EMS.

The California Uniform Treatment Protocols Project Team

INTRODUCTION

The need to develop EMS treatment protocols, consistent regardless of geographical boundaries, is a long-standing concern among EMS professionals. Local EMS Agencies staff committees specifically for addressing protocol needs. LEMSAs are responsible for educating EMS personnel to specific county protocols. Individuals applying for local accreditation may not have received the same training in a neighboring county. EMTs and Paramedics who choose to practice in another jurisdiction, or who are employed by a provider who serves multiple areas often need to be retrained.

San Francisco EMS Agency recognized the need to develop Uniform Treatment Protocols which could be adapted throughout the State of California.

OBJECTIVES

Objective 1: To develop committee.

- 1.1 Contact EMDAC members and other organizations for member recommendations.
- 1.2 Contact recommended individuals to determine willingness to participate and meeting availability.
- 1.3 Schedule first meeting.

Objective 2: To establish protocol template.

- 2.1 Establish objectives for the project re: ALS vs. BLS or continuous, algorithm vs. narrative, maximum vs. minimum scope of practice, prehospital emergencies vs. all out-of-hospital settings, target audience.
- 2.2 Design actual template and formatting to be used in UTP.

Objective 3: To review other jurisdictions' protocols.

- 3.1 Review multiple protocols for commonalties and conventions used effectively.
- 3.2 Review of additional protocols, national standard scope of practice, and medical literature as needed to ensure comprehensiveness and appropriateness of draft protocols.

Objective 4: To secure approval and assistance in protocol development from appropriate statewide, professional organizations.

- 4.1 Identify appropriate professional organizations for assistance and participation (see 1.1).
- 4.2 Obtain comments and suggestions on draft protocols from identified organizations through appropriate mailings, e-mail, and other means.

Objective 5: To coordinate protocol development with other pertinent projects.

- 5.1 Identify other projects which impact UTP Project.
- 5.2 Coordinate joint meeting(s) with other current projects as needed.

Objective 6: To develop prehospital treatment protocols for pediatric and adult populations for use throughout California (5 or 6 meetings).

- 6.1 Develop master list of protocols to be drafted.
- 6.2 Complete initial draft of protocols.
- 6.3 Revise protocols as needed.
- 6.4 Submit final draft protocols to State EMS Authority.

Objective 7: To make available protocols on software for use by local EMS Agencies.

- 7.1 Select appropriate software for development, distribution and ongoing revision of protocols.
- 7.2 Produce final draft of protocols in selected software format.
- 7.3 Produce basic user's manual for software package.

Objective 8: To establish a mechanism, process and registry for periodic update.

8.1 Establish network of interested EMS professionals and organizations to recommend and evaluate proposed changes to the Uniform Treatment Protocols.

8.2 Update software with changes approved by State EMSA Medical Director and distribute to local EMSAs.

8.3 Establish registry and feedback mechanism on UTP updates.

METHODOLOGY

Recognizing different opinions exist regarding prehospital treatment, Dr. Terry Fotre, Project Director convened a task force representative of the various health professions and LEMSAs. Each task force member had a stake in the protocols developed in California. The task force decided to develop protocols which fully utilize all procedures and medications in the California scope of practice for Paramedics. They believe this will make it easier for those who wish to use all of these skills in their local area.

The task force reviewed the content and decision making format of existing protocols from other states and throughout California. They considered advantages and disadvantages of an algorithm, a narrative or an outline decision making format. The task force selected the format used by the Denver EMS system which recognizes four components of the clinical decision making process: 1) Information Needed, 2) Objective Findings, 3) Treatment, and 4) Precautions and Comments.

Each draft protocol developed was sent out for public comment. Members of the EMS community submitted recommendations for changes and revisions to the protocols. Final drafts were reviewed and approved by the Emergency Medical Director's Association (EMDAC).

PROBLEMS/CHALLENGES

Two difficulties identified and resolved during this project were: 1) selecting the decision making format/process and 2) integrating with the Pediatric protocols. One problem remains unresolved; that is, the identification of ongoing funding for updating these protocols.

Selecting the Format

The task force looked at the many different decision making formats used in developing treatment protocols. The different protocol formats reflected the diversity in the decision making process. In the end, the task force selected the basic format used by the Denver EMS system and made modifications. A key goal in selecting a format was task force members to create protocols which were easy to use and provided adequate guidance for making sound clinical decisions.

Ongoing Funding for Updates and Changes

The Task Force was not able to identify a lead agency or a method for evaluating, maintaining, or enhancing these protocols. The California Emergency Medical Services Authority will post the final product on their home page of the World Wide Web (<http://www.emsa.cahwnet.gov>). There is not an established mechanism for making updates and changes. (See Next Steps.)

Pediatric Protocols

Because pediatric protocols were being reviewed in a parallel process by the Emergency Medical Services for Children Project, the UTP Task force did not draft Uniform Treatment Protocols for pediatric patients. Pediatric protocols should be revised into this new format.

RESULTS

The UTP Task Force, under the direction of Dr. Terry Fotre, completed forty (40) adult treatment protocols which are available on diskette (WP5.1 format) and hard copy. All medication and procedures allowable in the scope of practice to date in California are included. Some LEMSAs will edit these protocols for local use.

IMPLEMENTATION SCHEDULE

The objectives in this project were fully accomplished. Enclosed are five (5) copies of the protocols on diskette (WP5.1 format), and five (5) hard copies. Responsibility for distribution and implementation is forwarded to the California EMS Authority along with this report.

NEXT STEPS

The Uniform Treatment Protocols are now ready for distribution. Ideally, these protocols will be piloted in a system or systems which have the capacity to design a monitoring and evaluation mechanism as they are implemented. Many counties may find these protocols useful in their current form and or may make minor modifications. In any case, the UTP Task Force recommends, at a minimum, that the California State EMS Authority sponsor several workshops to introduce the new protocols and assist in implementing the vision of creating a standard of care for EMS in California.

PROJECT PERSONNEL

Dr. Terry Fotre Project Leader and Lann Wilder, EMT-P Project Coordinator, were the chief contributors to this project. They were instrumental in keeping the group focused and motivated. The UTP Task Force consisted of a multidisciplinary group of prehospital care professionals, including physicians, paramedics, nurses, and educators that represented the diversity of California demographics, geography and EMS system design. We thank them for their work and their efforts.

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The UTP Task Force members gratefully acknowledges the origin and impetuous for this project, former SF EMS Agency Medical Director, Dr. James Pointer.

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PREHOSPITAL PATIENT ASSESSMENT PRIMARY SURVEY

The purpose of the primary survey is to identify and immediately correct life-threatening problems.

Environmental Assessment:

- recognize hazards to rescuers and secure a safe area for treatment
- apply appropriate universal precautions (gloves, eye protection, masks, etc.)
- recognize hazards to patient and protect from further injury
- identify number of patients and resources needed. Call for back-up, initiate ICS and triage system (e.g., “START”) as appropriate
- observe position of patient, mechanism of injury and surroundings
- attempt to preserve evidence at potential crime scene
- identify self to patient

Primary Survey:

Airway

- ensure open airway. (See **OBSTRUCTED AIRWAY guideline as needed**).
- protect spine from unnecessary movement in patients at risk for spinal injury. Ensuring airway patency supersedes spinal immobilization
- look for evidence of other upper airway problems and potential obstructions, such as vomitus, bleeding, loose or missing teeth or dentures, airway noise, facial trauma, etc.
- use appropriate adjuncts (OPA or NPA) as indicated to maintain open airway

Breathing

- assess ventilation and oxygenation:
- expose chest and observe chest wall movement
- note ventilatory rate (qualitative--absent, slow, normal or fast) and effort
- assess mentation
- obtain pulse oximetry reading if available
- treat inadequate ventilation and/or oxygenation with:
 - pocket mask or BVM
 - supplementary oxygen
 - intubation (endotrachea or nasal with confirmation of correct placement) after initial ventilation if indicated
- assess for other life-threatening respiratory problems (e.g., flail chest, sucking wound, etc.) and treat as needed (see **CHEST TRAUMA guideline**).

Circulation

- check for pulse and begin CPR if absent (See **CARDIAC ARREST guideline**)
- control severe hemorrhage with direct pressure
- palpate pulse and assess general quality (strong or weak), rate (slow, normal or fast) and regularity (regular or irregular and pattern, if any)

- assess perfusion and potential causes of inadequacy (pulse rate and quality, implied BP from location of palpable pulse, skin signs, mentation, capillary refill, EBL) and treat according to appropriate guideline

Responsiveness

- assess initial response to stimulus (AVPU scale)
- briefly note body position and extremity movement

Precautions and Comments:

- Many of the primary survey assessments can be performed concurrently
- Confirm correct placement of nasal or endotracheal tube with an esophageal detection device and/or an end-tidal CO₂ detector. Placement must be reconfirmed after each patient movement either with such a device or through direct visualization.
- Vital signs should be obtained after the primary survey. Immediate intervention for problems found with ABCs (e.g., inadequate ventilation or perfusion) should be initiated before numerical vital signs are taken.

PREHOSPITAL PATIENT ASSESSMENT SECONDARY SURVEY

The Secondary Survey is the systematic assessment and complaint-focused, relevant physical examination of the patient. The Secondary Survey may be done concurrently with the Patient History and should be performed after:

- Primary Survey (ABCs)
- initial treatment and stabilization of life-threatening airway, breathing and circulation difficulties
- spinal stabilization as needed
- beginning transport in the potentially unstable or critical trauma patient

The purpose of the secondary survey is to identify problems which though not immediately life- or limb-threatening, could increase patient morbidity and mortality. Exposure of the patient for the examination may be reduced or modified as indicated due to environmental factors.

Head and Face

- observe for wounds, bruising, discoloration, swelling, deformities, asymmetry of structure or movement, bleeding
- palpate for deformities, tenderness, swelling, crepitus
- recheck mouth for: potential airway obstructions (swelling, dentures, bleeding, loose or avulsed teeth, vomitus, malocclusion, absent gag reflex) and odors, altered voice or speech pattern and evidence of dehydration
- check eyes for: equality, responsiveness, movement and size of pupils, foreign bodies, discoloration, contact lenses, prosthetic eyes
- check nose and ears for: discharge, foreign bodies

Neck

- observe for wounds, bruising, bleeding, jugular venous distention, use of neck muscles for respiration, tracheal tugging or deviation, stoma and medical information medallions
- palpate for swelling, deformity, crepitus, tenderness and tracheal shift

Chest

- observe for wounds, scars, implanted devices (AICD or pacemaker), medication patches, chest wall movement, asymmetry, and accessory muscle use
- palpate for tenderness, wounds, deformities, crepitus and equality of expansion
- have patient take a deep breath if possible. Observe for signs of discomfort, asymmetry and air leak from any wounds
- auscultate chest for rales, wheezes, rhonchi, or decreased breath sounds

Abdomen

- observe for wounds, bruising, diaphragmatic breathing and distention
- palpate all four quadrants for tenderness masses and rigidity

Pelvis/Genito-Urinary

- observe for wounds, deformities, asymmetry, bruising, sacral edema, and as indicated for incontinence, priapism, blood at urinary meatus, sacral edema and presence of any other abnormalities
- palpate and compress lateral pelvic rims and symphysis pubis for tenderness, crepitus or instability
- palpate bilateral femoral pulses

Shoulders and Upper Extremities

- observe for wounds, deformities, asymmetry, skin color, capillary refill, edema and medical information bracelets
- palpate for tenderness, deformities, crepitus and presence and equality of distal pulses
- assess sensory and motor function as indicated

Lower Extremities

- observe for wounds, deformities, asymmetry, edema and skin color
- palpate for tenderness, deformities, crepitus, warmth and presence and equality of distal pulses
- assess sensory and motor function as indicated

Back

- observe and palpate for wounds, bruising, discoloration, sacral edema, deformities, asymmetry, tenderness and crepitus

Initial Vital Signs

- pulse
- blood pressure
- respirations
- cardiac rhythm (if indicated)
- consider orthostatic vital signs as indicated to assess volume status
- pulse oximetry (if available)

Precautions and Comments:

- Observation and palpation steps can often be done simultaneously with gathering of the patient's history.
- A **systematic approach** will enable the rescuer to be rapid and thorough and not miss subtle findings that may become life-threatening.
- The Secondary Survey should **only** be interrupted if the patient experiences airway, breathing or circulatory deterioration requiring immediate intervention. Complete the examination before treating the other problems that have been identified.
- **Reassessment** of vital signs and other observations may be necessary, particularly in critical or rapidly-changing patients. Changes and trends observed in the field are essential data to be documented and communicated to the receiving facility staff.

PREHOSPITAL PATIENT TREATMENT BASIC TREATMENT GUIDELINES FOR ALL PATIENTS

Primary Survey

Identify and correct all immediate life-threatening conditions:

- airway (with spinal stabilization if indicated)
- breathing
- circulation

Secondary Survey and Patient History*

Systematic examination of patient and gathering of specific pertinent information to identify potential life-and limb threatening conditions.

Treatment Decision*

Select appropriate treatment guideline(s) for the patient's condition.

Patient Positioning

Place patient in position of comfort unless contraindicated by specific guideline.

Implement Treatment*

Treat patient as indicated in specific guideline(s).

Reassessment and Evaluation*

Frequently reassess the patient's status and response(s) to treatment(s).
Evaluate and implement alternative treatment guideline(s) as indicated.

Disposition

Disposition decision (treat and release or transport, means/method, timing, in treatment sequence, appropriate destination and priority) will be dependent on patient preference, condition (critical vs. non-critical, trauma vs. medical, adult vs. pediatric, etc.), local conditions (geography, weather, traffic, etc.), and available resources.

Communication

Contact on-line medical consultation or receiving facility as indicated. Provide complete verbal report of patient assessment and responses to treatment to receiving facility staff upon arrival with patient.

Documentation

Document relevant aspects of patient assessment and responses to treatment, including changes and trends observed and provide copy to receiving facility staff.

*done during transport in the potentially unstable or critical trauma patient.

PREHOSPITAL PATIENT ASSESSMENT PATIENT HISTORY

Information Needed:

Medical Patient

Chief Complaint:

- what is the problem? (why were we called?)
- when did it start?
- what caused or brought on the condition?
- how intense/severe?
- is it constant or changing? does anything make it better or worse?
- for discomfort: describe the quality, location, radiation, if any.
- experienced or been treated before for this problem? When? Results?

Trauma Patient

Chief Complaint (see Medical Patient).

- associated symptoms or complaints
- mechanism of injury: (**see specific Information Needed in TRAUMA guidelines**)
- what was the energy source?
- how forceful?
- what trajectories were involved?
- what damage occurred?
- how did the injury happen: cause, precipitating factors, etc.?
- changes in mental status and pertinent findings since injury
- treatments since injury (first aid on scene, movement of patient by bystanders, etc.)

All Patients

- age
- associated complaints: questions as for chief complaint
- focused past medical history (medical, surgical, gynecological, psychiatric)
- personal physician, health plan, and hospital preference
- medications (prescription and over-the-counter), and drugs (alcohol, recreational)
- allergies (drugs, foods, insect stings, etc.)
- survey of patient's immediate environment for additional information
- other specific information needed as indicated in each guideline

Precautions and Comments:

- Management of life-threatening problems takes precedence over gathering of information.
- **Questions should be open-ended** and not "lead" the patient.
- **History is commonly obtained before or during physical assessment.** Family or bystanders can often provide essential information not available from the patient.
- Assessing the patient's use of over-the-counter medications (including aspirin and other pain relievers, cold and allergy remedies, etc.) and birth control pills is important.
- Documentation is essential to convey the information obtained about the patient's history and chief complaint.

ABDOMINAL DISCOMFORT

Information Needed:

- discomfort: location, quality, severity, onset, duration, aggravation or alleviation, radiation
- associated symptoms: “indigestion”, fever or chills, nausea, vomiting, diarrhea, diaphoresis, dizziness
- gastro-intestinal: time and description of last meal, description of vomit if any, time of last bowel movement and description of feces (color, consistency, presence of blood, etc.)
- urination: difficulty, pain, burning, frequency and description (color, consistency, unusual odor, presence of blood, etc.)
- gynecological: last menstrual period, vaginal bleeding or discharge, sexual activity or trauma, and possibility of pregnancy
- medical history: surgery, related diagnoses (e.g., infection, PID, hepatitis, gallstones, kidney stones, etc.) medications (OTC and prescribed) and other self-administered remedies (baking soda, epsom salts, enemas, etc.).

Objective Findings:

- general appearance: level of distress, skin color, diaphoresis
- abdominal tenderness (guarding rigidity, distention)
- pulsating masses
- quality of femoral pulses
- cardiac rhythm if indicated

Treatment:

- position of comfort
- NPO
- IV access
- if hypotensive:
 - fluid challenge
 - consider PASG

Precautions and Comments:

- Exact Cause of pain frequently very difficult to ascertain
- Upper abdominal pain or “indigestion” may reflect cardiac origin. **Refer to CHEST DISCOMFORT guideline.**

ALLERGIC REACTION

Information Needed:

- exposure to allergens (bee stings, drugs, nuts, seafood, etc.), prior allergic reactions
- respiratory: wheezing, stridor, respiratory distress
- skin: itching, hives, rash
- other symptoms: nausea, weakness, anxiety

Objective Findings:

MILD

hives, rash

MODERATE

hives, rash
bronchospam
(normotensive)

SEVERE

altered mental status
(hypotension)

Treatment:

remove etiologic agent

MILD

- diphenhydramine 25-50mg
IM

MODERATE

- consider IV access
- diphenhydramine-50mg
IM or IV
- inhaled beta-2 broncho-
dilator*
- epinephrine 1:1,000 0.3mg
SQ(may repeat in 5
minutes)

SEVERE

- IV access
- epinephrine 1: 10,000 0.3
mg. slow IV
- diphenhydramine 50 mg IV
(or IM if can't establish IV
access)
- inhaled beta-2 specific
bronchodilator*
- fluid challenge (titrate to
systolic pressure of 100
mm/Hg)

***albuterol** 5 mg total dose via nebulizer or other equivalent medication

Precautions and Comments:

- Anxiety, tremor, palpitations, tachycardia, and headache are not uncommon with administration of epinephrine. These may be particularly severe if given IV. Especially in elderly patients, it may precipitate angina, AMI or dysrhythmias.
- Be sure you are given the proper dilution of epinephrine to your patient, and give slowly.
- Edema of any of the soft structures of the upper airway may be lethal. Observe closely, and be prepared for early intubation before swelling precludes this intervention.

ALTERED MENTAL STATUS

Information Needed:

- surroundings: syringes, blood glucose monitoring supplies, insulin, etc.
- change in mental status: baseline status, onset and progression of altered state, antecedent symptoms such as headache, seizures, confusion, trauma, etc.
- medical history: psychiatric and medical problems, medications, and allergies

Objective Findings:

- level of consciousness and neurological assessment
- signs of trauma
- breath odor
- pupil size and reactivity
- needle tracks
- medical information bracelets or medallions
- blood glucose level

Treatment:

KNOWN OR SUSPECTED HYPOGLYCEMIA

- **glucose paste** or other oral glucose administration if patient is able to maintain their airway and follow commands.
- **IV access**
- **dextrose 50%** 25 g IV push (blood glucose < 60mg/dl). May repeat as indicated.
- **glucagon** 1mg IM if IV access is not immediately available.

SUSPENDED OR INTRACRANIAL EVENT

- IV access
- if normo- or hypertensive, avoid excess fluid administration
- position semi-Fowler's 30 elevation
- prehospital screening for thrombolytic or neuroprotective drug therapy
- comfort and reassure patient

UNKNOWN CAUSE

- consider IV access
- consider **naloxone** 2 mg. IV push or IM. (titrate to overcome respiratory depression and repeat as needed)
- consider **dextrose 50%** 25g IV push if unable to measure blood glucose level

SEIZURES

- IV access
- diazepam 5mg IVP (may repeat as needed up to 20mg or may be administered rectally up to 20 mg).

BEHAVIORAL OR PSYCHOLOGICAL

- comfort and reassure patient
- restrain only as necessary

Precautions and Comments:

- Transport in left lateral recumbent position if no spinal injury is suspected.
- Be attentive for excessive oral secretions, vomiting, and inadequate tidal volume.
- Injudicious use of naloxone may precipitate withdrawal symptoms and combativeness.
- Treatment of seizures should be based on the severity and length of the seizure activity.
- Focal seizures without mental status changes may not require prehospital pharmacological intervention.

BAROTRAUMA/DECOMPRESSION SICKNESS

Information Needed:

- length of time patient submerged
- duration of and time since descent/ascent
- depth of submersion
- temperature of the water
- mechanism of injury suggestive of head/neck injury

Objective Findings:

- joint pain (location)
- pulmonary exam: rales or signs of pulmonary edema, respiratory distress
- neurologic exam: monitor continuously for changes of focal deficits
- cardiac rhythm

Treatment:

- 100% oxygen by non-rebreather mask
- IV access
- place patient in left lateral Trendelenberg position
- immediate hyperbaric therapy (if available)

Precautions and Comments:

- Keep patient supine/left lateral recumbent position if possible to reduce risk of cerebral air embolism.
- Rapid ascent or breath-holding during ascent may cause central air embolism or ruptured tympanic membrane(s).
- Focal deficits and neurologic changes indicate need for rapid transport to a hyperbaric chamber.

BITES AND STINGS

Information Needed:

- type of animal or insect: time of exposure
- symptoms:
 - localized: pain, swelling, stinging sensation
 - systemic: dizziness, sweating, weakness, itching, trouble breathing, muscle cramps
- history of previous exposures, allergic reactions, any known specific allergen

LOCALIZED REACTION

- puncture marks at injury site
- rash, hives
- localized erythema and/or edema
- heat in the area of injury

SYSTEMIC REACTION

- ANY or ALL of the localized findings plus
- respiratory distress, wheezing, stridor
- diaphoresis (out of proportion to air temperature)
- hypotension, tachycardia, tachypnea

Treatment:

- Bring in offending spider, bee, marine animal or other suspected creature for positive identification.
- Ensure personal safety
- Remove the stinger or injection/biting mechanism if visible.
- Do NOT squeeze venom sac if present from a honeybee sting. Scrape it out.

LOCALIZED REACTION

- cooling measures on wound site for general comfort
- **diphenhydramine** 25-50 mg IM or IV
- neutralize jellyfish stings with vinegar or baking soda paste.
- apply heat to stingray stings.

SYSTEMIC REACTION

- if there are signs/symptoms of an anaphylactic reaction refer to **ALLERGIC REACTION guideline**.
- IV access

Precautions and Comments:

- Allergy kits or EPIPENS are frequently prescribed for persons with known systematic allergic reactions. The kits contain epinephrine and an antihistamine. Prehospital personnel may assist with use of patient's own medication.
- Time since envenomation is important, as anaphylaxis rarely occurs more than 60 minutes after inoculation.
- About 2/3 of patients who have experienced a generalized reaction will have a similar or more severe reaction upon reinoculation. It is possible to have a severe reaction with a "first" inoculation.
- Ice applied directly to skin surfaces can cause serious tissue damage and should not be used.
- A cool wet cloth can afford some pain relief but does nothing to stop the venom.
- All human bites should be further evaluated at a medical facility for proper cleansing and potential antibiotic therapy.

DYSRHYTHMIAS: SYMPTOMATIC BRADYCARDIA

Information Needed:

See **DYSRHYTHMIAS: General Guidelines.**

Objective Findings:

- mental status
- perfusion
- cardiac symptoms: chest discomfort, shortness of breath, hypotension, rales.

Treatment:

- **atropine** 0.5 - 1.0 mg IV push. May repeat every 3-5 minutes to maximum dose of 0.4 mg./kg
- **transcutaneous pacing** (if available). Consider sedation (with **diazepam**) prior to pacing.
- **dopamine** 5-20 mcg/kg/min IV infusion.
- **epinephrine** 2-10 mcg/min IV infusion.

If heart rate normalizes but hypotension persists:

- Administer **fluid challenge 10 ml/kg**. Repeat as necessary.
- Titrate **dopamine** 5-20 mcg/kg/min IV infusion to maintain systolic BP of at least 90 mm Hg.

Precaution and Comments:

- If transcutaneous pacing is available, it should be initiated as soon as possible while IV and therapies are being established.

BURNS

Information Needed:

- type and source of burn: explosion, chemicals, electrical, steam, smoke or toxic fumes.
- complicating factors: exposure in enclosed space, total time exposed, drugs or alcohol.
- medical history: cardiac or respiratory disease, circulatory problems, etc.

Objective Findings:

- evidence of inhalation injury or toxic exposure
- extent of burn (depth--full or partial thickness, and TBSA affected)
- entrance or exit wounds if electrical or lightning strike
- associated trauma from explosion, electrical shock, or fall

Treatment:

THERMAL

- stop the burning process
- remove jewelry and non-adhered clothing. Do not break blisters.
 - if <10-15% of body surface, cover with sterile, moist saline dressing.
 - if >10-15% TBSA, cover with sterile or clean dry sheet.
- prevent hypothermia
- IV access
- If Partial or Total Thickness >15% TBSA, consider fluid challenge 250 ml q 15 minutes, titrated to maintain adequate BP and perfusion. Monitor lung sounds. Maximum 1 liter.
- morphine sulfate 2-4 mg slow IVP as needed for discomfort. Repeat as indicated.

CHEMICAL

- decontamination and HazMat procedures
- brush off dry power, if present
- remove and contaminated or wet clothing (including underwear)
- irrigate with copious amounts of saline or water continue irrigation while enroute.
- remove jewelry
- IV access

ELECTRICAL

- continuous cardiac monitoring; Treat DYSRHYTHMIAS according to appropriate guidelines.
- IV access
- moist dressing on any exposed, injured areas.

Precautions and Comments:

- Inhalation injuries may cause delayed but severe airway compromise. Be prepared for early intubation.
- Do not apply ice or ice water directly to skin surfaces as additional injury will result.
- Lightning injuries may cause prolonged respiratory arrest.
- Assume presence of associated multisystem trauma if patient presents with signs or symptoms of hypovolemia.

CARDIAC ARREST ASYSTOLE

Information Needed:

- See Cardiac Arrest General Guidelines.

Objective Findings:

- Confirm asystole in at least 2 leads.
- Ensure that monitor is functioning and electrode and cables are properly attached by documentation calibration spike and/or CPR compressions.

Treatment:

- Standard cardiac arrest management: ABCs, CPR, intubate, confirm tube placement, ventilate
- with 100% oxygen, establish IV access.
- **epinephrine** 1:10,000 1 mg IV push. Repeat every 3-5 minutes.
- **atropine** 1 mg IV push. Repeat every 3-5 minutes to total dose of 0.4 mg/kg.
- Consider **Sodium Bicarbonate** 1 meq/kg if the patient has suspected hyperkalemia (e.g., patients with renal failure or on dialysis). May repeat 0.5 meq/kg every 10 minutes.
- Consider **termination of efforts** in field if cardiac unresponsiveness had been determined.

Precautions and Comments:

- Pacing has not been shown to be effective in most patients presenting in asystole.

TRAUMATIC CARDIAC ARREST

Information Needed:

History of arrest:

- witnessed trauma--time down
- unwitnessed trauma--time last seen
- bystander CPR and treatments given prior to arrival
- Scene: evidence of high-energy trauma

Objective Findings:

- physical signs of high energy trauma and/or blood loss
- unconscious
- absent ventilations
- absence of pulse
- if asystole (confirm in at least 2 leads) or agonal, insure that monitor is functioning and
- electrodes and cables are properly attached by documenting calibration spike and/or chest thump.

Treatment:

- Check rhythm. If V-Fib or V-Tach, proceed to that specific dysrhythmia guideline.
- Determination of death may be made if not profoundly hypothermic nor drug overdose
- suspected as cause of asystole.
- Provide grief support and referrals for on-site survivors as available.

Precautions and Comments:

- If patient is hypothermic, transport may be indicated to rewarm patient in hospital setting prior to termination of efforts.

CHEST DISCOMFORT OF SUSPECTED CARDIAC ORIGIN

Information Needed:

- discomfort: location, quality, severity, onset, duration, aggravation, alleviation, whether related to exertion or respirations.
- associated symptoms: nausea, vomiting, diaphoresis, dyspnea, dizziness, palpitations, “indigestion”
- associated signs: cough, fever, hiccoughs
- medical history: cardiac or pulmonary problems, heart surgery

Objective Findings:

- general appearance: level of distress, apprehension, skin color, diaphoresis
- signs of CHF: jugular venous distention, peripheral edema, respiratory distress
- chest auscultation: rales, wheezes, decreased sounds
- abdominal tenderness
- cardiac rhythm

Treatment:

- Reassure patient and place in position of comfort or supine if hypotensive.
- IV access
- **nitroglycerin** 0.4 mg SL. May repeat every 5 minutes up to 3 doses total if SBP>100. If BP drops significantly after initial dose or becomes borderline, use caution with repeat doses.
- **aspirin** 160 mg PO
- If discomfort persists, consider **morphine sulfate** 2-4 mg IV. Repeat as indicated to total dose of 10 mg.
- If hypomagnesemic state is suspected, consider **magnesium sulfate** 1-2 slow IV.
- If dysrhythmia is present, **refer to appropriate DYSRHYTHMIA guideline(s)**.
- If hypotension develops, consider
 - fluid challenge
 - dopamine 5-20 mcg/kg/min IV infusion
- Prehospital screening for thrombolytic therapy

Precaution and Comments:

- Suspicion of MI/angina is based on patient history; no physical findings will exclude until conclusively ruled out by receiving facility.
- MI/angina may present with only back, shoulder or arm pain, or possibly no pain.
- Constant monitoring of patient condition, vital signs and rhythm is essential.
- If patient develops depressed respirations, following morphine administration, be prepared to actively support airway and ventilations, and consider naloxone.
- Consider other potential causes of chest pain: pulmonary embolus, pneumonia, aortic aneurysm, and pneumothorax.

- Beware of IV fluid overload in the potential cardiac patient. Monitor lung sounds carefully.
- Transport RLS only if significant deterioration occurs or is imminent. Anxiety may worsen condition.

CHILDBIRTH

Information Needed:

- estimated due date
- anticipated problems (multiple fetuses, premature delivery, placenta previa, lack of prenatal care use of narcotics or stimulants, etc.)
- gravida/para
- onset of labor
- rupture of membranes
- frequency of contractions
- urge to bear down or have bowel movement

Objective Findings:

- observe perineal area for:
 - fluid or bleeding
 - crowning (check during contraction)
 - abnormal presentation (breech, extremity, cord)

Treatment:

- IV access

“NORMAL” DELIVERY

- assist with delivery
- clean, preferably sterile technique
- control and guide delivery of baby’s head and body
- check for nuchal cord
- suction mouth, then nares
- clamp and cut cord
- dry and wrap infant for warmth (including head)
- note time of delivery
- assess infant’s status, respirations and pulse rate
- evaluate mother post delivery for excessive bleeding (greater than 300-500 m1)
- following placental delivery, consider **pitocin** 10 units IM or 20 units in 1000m1 NS IV at a rate of 200m1/hr.

POST-PARTUM HEMORRHAGE

- fundal massage
- **fluid challenge**
- **pitocin** 20 units in 1000m1 NS IV at a rate of 500m1/hr.

BREECH DELIVERY

- assist with delivery, if able
- provide airway with gloved hand for baby if needed
- if unable to deliver, left lateral Trendelenberg position and rapid transport.

PROLAPSED CORD

- left lateral Trendelenberg position, elevate hips, if possible
- if cord is pulseless, manually displace presenting part off cord
- rapid transport

Precautions and Comments:

- The primary enemy of a newborn is hypothermia, which can occur within minutes due to increased evaporative heat loss resulting from the infant's large body surface area and the presence of amniotic fluid.
- Consider early tracheal suctioning after delivery of the infant with evidence of meconium.
- Keep the baby at or below the level of the mother until the cord is clamped.
- Do not pull on the cord.
- Do not delay transport for delivery of placenta. If it delivers, place it in a plastic bag for transport with the mother.

CHEST AND ABDOMINAL TRAUMA

Information Needed:

- mechanism of injury: see MULTISYSTEM TRAUMA guideline.
- patient complaints: chest discomfort, respiratory distress, neck discomfort, other injuries.
- past medical history: particularly cardiovascular and respiratory problems, medications, and possibility of pregnancy.

Objective Findings:

- wounds, bruising, chest wall movement, rib cage/sternal and pelvic stability, crepitus, areas of tenderness.
- neck veins, tracheal position, air leaks, breath sounds, heart sounds, pulse pressure.

Treatment:

- for open chest wound with air leak, occlusive dressing taped on 3 sides.
- consider needle **pleural decompression** for suspected tension pneumothorax (respiratory distress with absent breath sounds and hypotension). Release occlusive dressing first.
- IV access with large-bore-catheter.
- **fluid challenge** if hypotensive.
- cover eviscerations with moist saline gauze to prevent further contamination or drying.
- immobilize impaled objects in place to prevent further movement.
- if hypotension continues, consider PASG (legs only).
- if pregnant >5 months gestation and transporting with full spinal precautions, tilt the spine board to the left lateral position to relieve uterine pressure on abdominal blood vessels.
- consider **lidocaine** for significant PVCs in the presence of possible cardiac contusion.
(Refer to **CHEST DISCOMFORT** and **DYSRHYTHMIAS-PVCs** guidelines as needed.)
- **Refer to RESPIRATORY DISTRESS guideline as needed.**

Precautions and Comments:

- Consider medical causes of respiratory distress such as bronchospasm, pulmonary edema, or COPD that have either caused trauma or been aggravated by it.
- Chest injuries significant enough to cause respiratory distress are commonly associated with significant internal blood loss. Reassess frequently for signs and symptoms of hypovolemia.
- Significant intrathoracic or intr-abdominal injury may occur without any external signs of injury, particularly in children. Consider the mechanism of injury and the forces involved and be highly suspicious of occult trauma.

DYSRHYTHMIAS: GENERAL GUIDELINES

Information Needed:

- presenting symptoms: time of onset; gradual or sudden
- associated symptoms: discomfort (location, quality, radiation, severity); palpitations, dizziness, syncope, dyspnea, nausea, fever, cough.
- medical history: dysrhythmias, cardiac disease, stress, drug abuse, pacemaker, AICD.

Objective Findings:

- signs of shock
- signs of hypoxemia
- cardiac rhythm

Treatment:

- high-flow oxygen
- IV access
- Refer to specific DYSRHYTHMIA guideline.
- Refer to CHEST DISCOMFORT guideline as indicated.

Precautions and Comments:

- The asymptomatic patient with adequate perfusion may not require anti-dysrhythmic treatment.
- Record cardiac rhythm strip of initial findings and all changes observed.
- Nitroglycerin and other medication patches should be removed prior to cardioversion, defibrillation, or transcutaneous pacing.

EXTREMITY TRAUMA

Information Needed:

- mechanism of injury

Objective Findings:

- Check for deformity and open wounds
- Note range of motion
- Check pulses
- Check sensation

Treatment:

• **FRACTURED/DISLOCATION**

Control any external bleeding, and when possible, splint injured extremities in the position found unless precluded by extrication considerations and/or patient comfort. If the extremity is pulseless, you may attempt to place it in normal anatomic position to restore circulation by gently in-line traction. **If initial repositioning does not restore circulation, DO NOT manipulate further. Apply splint and cooling packs.**

• **AMPUTATION**

If not completely severed, treat as fracture/dislocation. If severed, place part in dry, sterile dressing, place in sealed plastic bag, and place on ice or cold pack. Do not pack in ice to avoid freezing part.

Specific Injuries:

PELVIC F

Splinting may be accomplished with MAST or KED.

FEMUR F

Immobilize with traction splint if no knee or tib/fib fractures are present. If they are present, use MAST or KED to splint.

HIP Fx/Disloc

Some fractures may bear weight so do not rule it out even if patient can walk. Place in position of comfort using pillows to keep legs comfortably apart. DO NOT attempt to reduce suspected dislocations in field.

KNEE Fx/Disloc

Splint in position of comfort. DO NOT apply traction.

TIB/FIB Fx

Splint in position of comfort.

**Fx/Disloc:
SHOULDER
HUMERUS
CLAVICLE**

Splint with sling and swath.

**Fx/Disloc:
FOREARM
WRIST
HAND
FINGER**

Splint with padded rigid device in position of comfort.

- Pain control with **M.S.** 4mg IV or IM initially. Follow with 2-4 mg increments to total of 10mg.

Precautions and Comments:

Isolated extremity injury itself is rarely life threatening though it appears quite dramatic. However, complications of poorly managed injuries may result in serious sequelae that are potentially lethal. The most important and immediate danger is the potential for developing hemorrhagic shock. For example, pelvic fractures and closed femur fractures may result in significant blood loss into the surrounding tissue. In addition, many orthopedic injuries, though not immediately life threatening, are disabling. Careful and thorough management will prevent exacerbation of existing injury and preserve function.

GYNECOLOGICAL EMERGENCIES

Information Needed:

- last menstrual period and possibility of pregnancy
- duration and amount of any bleeding
- if pregnant, gestational age of fetus, gravida/para, and anticipated problems (placenta previa, pre-eclampsia, lack of prenatal care, use of narcotics or stimulants, etc.)
- presence of contractions, cramping or discomfort.

Objective Findings:

VAGINAL BLEEDING

- estimated blood loss
- hypotension

SPONTANEOUS ABORTION (MISCARRIAGE)

- fetus <20 weeks gestation or >500 grams weight
- vaginal bleeding; passage of the products of conception
- hypotension

PRE-ECLAMPSIA OR ECLAMPSIA

- altered mental status or seizures
- hypertension

Treatment:

- IV Access

VAGINAL BLEEDING

- place pad or large dressing over vaginal opening
- fluid challenge if hypotensive
- consider Trendelenberg position if hypotensive.

SPONTANEOUS ABORTION

- place pad or large dressing over vaginal opening
- fluid challenge if hypotensive.
- save and transport all tissue or fetal remains passed.

PRE-ECLAMPSIA OR ECLAMPSIA

- minimize stimulation (lights, noise, other stressors).
- left lateral decubitus position.
- Refer to ALTERED MENTAL STATUS (SEIZURE) guideline as needed.

- Refer to ABDOMINAL DISCOMFORT guideline as necessary.

Precautions and Comments:

- Spontaneous abortion of a fetus >20 weeks gestational age should be considered a neonatal resuscitation. **Refer to Pediatric Protocols.**
- Do not pack the vagina with any material to stop bleeding. A bulky dressing or pad should be used externally to absorb blood flow.

HEAD, NECK AND FACIAL TRAUMA

Information Needed:

- refer to **TRAUMA: General Guidelines**.
- medical history: cardiovascular problems, diabetes, seizure disorder

Objective Findings:

- altered mental status
- neurologic impairment or focal deficit
- external evidence of trauma: wounds, deformities, swelling, contusions, tenderness, crepitus, double vision, extra-ocular movement, blood or fluid from ears or nose.

Treatment:

- spinal immobilizations if indicated
- if patient has altered mental status, **hyperventilate with 100% oxygen**.
- remove impaled objects that obstruct the airway; otherwise, stabilize impaled objects with bulky dressing and leave in place.
- cover both eyes if eyes are injured
- IV access
- Avulsed teeth can also be kept in a “Tooth Preservation System” jar.

Precautions and Comments:

- If head injury patients deteriorate, recheck for problems with airway, oxygenation, or perfusion.
- Be prepared to turn entire spine board on side if patient vomits.
- Fracture of larynx should be suspected in patients with respiratory distress and abnormal voice.
- Avulsed teeth can often be salvaged. Keep moist in saline-soaked gauze and transport with patient.

HIGH ALTITUDE ILLNESS

Information Needed:

- Presenting symptoms generally fall into three categories:

Acute mountain sickness (AMS)

- headache
- sleeplessness
- anorexia, nausea

High altitude pulmonary edema (HAPE)

- dyspnea, cough
- headache, confusion
- fatigue, nausea

High altitude cerebral edema (HACE)

- altered mental status
- may have focal deficits

- note present and highest altitude attained, time at this altitude, duration of ascent.
- medical problems, medications (especially DIAMOX® acetazolamide), and previous experience at high altitudes.

Objective Findings:

- mental status: confusion, lack of coordination, coma
- lungs: respiratory rate, distress, rales, wheezing, sputum (blood or frothy)

Treatment:

- Encourage “pursed lip breathing”, a form of “Self C-PAP”.
- Descend; even 1000-1500 feet may make the enough difference to relieve symptoms.
- Refer to ALTERED MENTAL STATUS guideline as needed.

Precautions and Comments:

- Recognition of the problem is the most critical part of treating high altitude sickness.
- Recognize symptoms that are out of proportion to those being experienced by the rest of the party: fatigue or trouble breathing (particular at rest).
- DESCENT is the mainstay of treatment. Oxygen may also relieve symptoms and may allow more time for orderly evacuation.
- Treatment for acute mountain sickness is rest. This increases the body’s time to acclimatize. Descend if symptoms progress, or ataxia is present.
- Diuretics are not useful in the treatment of high-altitude pulmonary edema.

HYPERTHERMIA

Information Needed:

- patient age, activity level
- medications: tranquilizers, alcohol, diuretics, antidepressants (especially TCAs), etc.
- associated symptoms: cramps headache, orthostatic symptoms, nausea, weakness
- air temperature and humidity; presence of excess clothing

Objective Findings:

	HEAT CRAMPS	HEAT EXHAUSTION	HEAT STROKE
Temp:	usually normal	normal to slight elevation	core temp usually 104 F or greater
Mental Status:	alert	alert to slight confusion	altered mental status
Skin:	sweaty; may be warm or cool to touch	sweaty, usually hot to touch	usually flushed, hot may or may not be moist if exercise induced
Neuro:	normal except for muscle cramps, usually legs	no loss of control of extremities but feels very weak	may have active persistent seizures

Treatment:

- remove excess clothing
- move patient to cool area

HEAT CRAMPS

- give cool/cold liquids PO as tolerated
- stretch cramped muscles to reduce pain.

HEATH EXHAUSTION

- cardiac monitor
- IV access
- give cool/cold liquids PO as tolerated.

HEAT STROKE

- spray or sprinkle tepid water and use fan to cool patient
- cardiac monitor
- IV access
- fluid challenge PRN
- continue COOLING measures during transport
- Refer to ALTERED MENTAL STATUS SEIZURE guideline as indicated.

Precautions and Comments:

- Person at greatest risk of hyperthermia are the elderly, individuals in endurance athletic events, and persons on medications which impair the body's ability to regulate heat.
- Be aware that heat exhaustion may progress to heat stroke.
- Do not use ice water or cold water to cool patient due to potential vasoconstriction.
- Do not place towels or blankets on the patient as they may increase core temperature.
- Patients with simple heat cramps may not need to be transported if cooling measures and liquids relieve symptoms.

HYPOTHERMIA

Information Needed:

- length of exposure
- air temperature, water temperature, wind velocity, was patient wet or dry
- history and time of changes of mental status
- medical history: alcohol, tranquilizers, anticonvulsants, medical problems such as diabetes

Objective Findings:

- mental status
- shivering
- note patient's temperature if possible
- evidence of local injury; blanching, blistering, erythema of extremities, ears, nose
- continuous cardiac monitoring

Treatment:

- Remove all clothing: dry patient, cover with blankets (warmed if possible) to prevent further heat loss.
- Maintain warm environment
- IV access (use warmed fluids if available)

Precautions and Comments:

- May need prolonged observation to detect pulse and respirations.
- If patient has an organized electrical rhythm, CPR is currently felt to be unnecessary.
- Bradycardia is normal and should not be treated. Even very slow rates may be sufficient for metabolic demands. CPR is indicated for asystole and ventricular fibrillation, although defibrillation and other treatments may not be effective until patient is rewarmed.
- Patient should not be determined "dead" until rewarmed or determined dead by other criteria.
- Heat packs with temperature greater than 110 F should not be used to rewarm patient because of risk of burning skin.
- Excessive motion and intubation have been known to precipitate ventricular fibrillation. Therefore patients should not be intubated if airway and respiration can be maintained by alternative techniques.
- Frost bite: Do NOT rub or apply hot packs in the field situation. Avoid thaw and refreeze.
- Be aware that wet clothing may not always feel wet to touch in a very cold environment.
- Patients who have stopped shivering may be profoundly hypothermic.

CARDIAC ARREST GENERAL GUIDELINES (MEDICAL, NON-TRAUMA RELATED)

Information Needed:

- history of arrest:
 - witnessed collapse--time down and preceding symptoms
 - unwitnessed collapse--time last seen
 - bystander CPR and treatments given prior to arrival
- past medical history: diagnoses, medications
- scene: evidence of drugs, hypothermia, trauma, DNR form or medallion, nursing home or hospice patient.

Objective Findings:

- unconscious
- agonal or absent ventilations
- absence of pulse
- signs of trauma or blood loss (**Refer to TRAUMA ARREST guideline.**)
- rigor; fixed dependent lividity
- air temperature; skin temperature

Treatment:

- Check rhythm. If V-Fib or V-Tach, proceed to that specific dysrhythmia guideline.
- **Standard cardiac arrest management: ABCs, CPR, intubate, confirm tube placement, ventilate with 100% oxygen, establish IV access.**
- If hypothermic, remove wet clothing, begin basic rewarming and avoid further loss of body heat or unnecessary movement. **Refer to HYPOTHERMIA guideline.**
- If drug overdose is suspected, **refer to POISONING and OVERDOSE guideline.**
- Consider **termination of efforts** if no response to ALS measures.
- Provide **grief support** and referrals for on-site survivors as available.

Precautions and Comments:

- Ensure effective CPR continues while advanced skills are carried out.
- Epinephrine, atropine, naloxone, and lidocaine may be administered via the endotracheal tube. Endotracheal drug doses are double the standard IV dose, and should be diluted to 10 ml total volume with sterile saline. ET drugs should not exceed 10 ml for any single dose.
- Maximum total doses are also doubled for ET administration. For Epinephrine doses >1mg, consider using 1:1,000 concentration and diluting to 10ml total volume in order to avoid exceeding the per dose volume limitations. Sodium bicarbonate and other drugs may not be administered via the ET route.
- Remove any NTG patch to avoid further vasodilation during cardiac arrest and to prevent potential hazard if defibrillation becomes necessary.
- If patient is hypothermic, transport may be indicated to rewarm patient in hospital setting prior to termination of efforts.
- Refer to section on PALLIATIVE CARE when indicated.

**CARDIAC ARREST
VENTRICULAR FIBRILLATION
PULSELESS VENTRICULAR TACHYCARDIA**

Treatment Needed:

- Initiate and continue CPR until defibrillator is available and ready. Consider precordial thump if arrest is witnessed and defibrillator is not immediately available.
- **Defibrillate** up to 3 times if needed (200 J, 300 J, 360 J); check monitor between defibrillations.
- Standard cardiac arrest management: ABCs, CPR, intubate, confirm tube placement, ventilate with 100% **oxygen**, establish IV access.
- If defibrillation is successful at any point, and normal sinus rhythm or sinus tachycardia with pulses results, administer **lidocaine** 1.5 mg/kg IV push. Repeat in 3-5 minutes to maximum dose of 3.0 mg/kg.
- If rhythm changes, check for pulse and proceed to specific CARDIAC ARREST or DYSRHYTHMIA guideline as indicated.
- If VF/VT persists:
 - **epinephrine** 1:10,000 =, 1 mg IV push; repeat every 3-5 minutes
 - **defibrillate** 360 J (maximum setting; repeat after each drug administration)
 - **lidocaine** 1.5 mg/kg IV push
 - **defibrillate** 360 J
 - **lidocaine** 1.5 mg/kg IV push
 - **defibrillate** 360 J
 - **bretyllium** 5 mg/kg IV push
 - **defibrillate** 360 J
 - **consider sodium bicarbonate** 1mg/kg if the patient has suspected TCA overdose, DKA or suspected hyperkalemia. May repeat 0.5 mg/kg every 10 minutes
 - **defibrillate** 360 J
 - **bretyllium** 10 mg/kg IV push (repeat every 10 minutes to maximum dose 35 mg/kg)
 - **defibrillate** 360 J
 - Consider **magnesium sulfate** 1-2 g IV
 - **defibrillate** 360 j
 - Consider **procainamide** 20 mg/min to maximum total of 17 mg/kg
 - **defibrillate** 360 J

Precautions and Comments:

- Epinephrine and lidocaine may be given by the endotracheal route. Endotracheal doses are double the IV dose and should be diluted to a total volume of 10 ml with sterile saline. ET drugs should not exceed 10 ml for any single dose. Maximum doses are also doubled for ET drug administration. For epinephrine doses > 1 mg, consider using 1:1,000 concentration and diluting to 10 ml in order to avoid ET dose volume problems. Sodium bicarbonate and other drugs listed may not be given by the endotracheal route.
- Torsades de pointes is a special form of ventricular tachycardia. See DYSRHYTHMIAS-WIDE COMPLEX TACHYCARDIA guideline.
- Consider other dosing regimens for epinephrine (high-dose, intermediate, or escalating).

DYSRHYTHMIAS: NARROW COMPLEX TACHYCARDIA

Information Needed:

- See DYSRHYTHMIAS: General Guidelines.

Objective Findings:

- level of consciousness and perfusion status.

STABLE

- no signs of altered mental status or poor perfusion

UNSTABLE (CONSCIOUS)

- altered mental status
- signs of poor perfusion (chest pain, dyspnea, rales, hypotension)
- other significant symptoms related to the tachycardia

UNSTABLE (UNCONSCIOUS)

- signs of poor perfusion (chest pain, dyspnea, rales, hypotension)
- other significant symptoms related to the tachycardia

Treatment:

STABLE

- **adenosine** 6 mg. rapid IV push flushed with 20cc NS bolus.
- If dysrhythmia persists, may repeat **adenosine** 12 mg rapid IV push flushed with 20 cc NS bolus up to two doses (30 mg total)

UNSTABLE (CONSCIOUS)

- **adenosine** 6 mg rapid IV push flushed with 20 cc NS bolus.
- If dysrhythmia persists, may repeat **adenosine** 12 mg rapid IV push flushed with 20 cc NS bolus up to two doses (30 mg total).
- Sedate patient prior to cardioversion with **diazepam** 5-20 mg slow IV push.
- **synchronized cardioversion** at 100 J. May repeat at 200 J, 300 J, 360 J.

UNSTABLE (UNCONSCIOUS)

- **synchronized cardioversion** at 100 J. May repeat at 200 J, 300 J, 360 J.

Precautions and Comments:

- A narrow QRS complex is defined as less than 0.12 sec.
- If the rate is less than 160 beats per minute, the tachycardia is most likely to be secondary to some other factor such as hypoxia, hypovolemia, pain, fever, etc.

NEAR DROWNING

Information Needed:

- description and temperature of fluid in which submerged
- length of time submerged
- depth and mechanism of injury
- possibility of alcohol or other drugs/medications involved

Objective Findings:

- evidence of head and/or neck trauma
- neurologic status: monitor on a continuous basis
- respiratory: rales or signs of pulmonary edema, respiratory distress

Treatment:

- stabilize neck prior to removing patient from water if any suggestion of neck injury
- cardiac monitor
- IV access
- If hypothermic, refer to HYPOTHERMIA guideline
- If barotrauma is suspected, refer to BAROTRAUMA guideline.
- If other trauma is suspected, refer to appropriate TRAUMA guideline

Precautions and Comments:

- Be prepared to manage vomiting. Patient on spine board should be prepared for log-rolling.
- All near drownings or submersions should be transported. Any patient can deteriorate rapidly.
- Beware of neck injuries; collar and backboard can be applied in the water.
- If patient hypothermic, defibrillation may be unsuccessful until patient warmed.
- Consider gastric decompression with NG tube if gastric distention interferes with ventilation efforts.
- Alcohol/drugs may interfere with respiratory drive and/or cardiac rhythm.

POISON AND OVERDOSE

Information Needed:

- surroundings and safety: check for syringes, containers, flammables, gas cylinders, etc. Note odors in house or surroundings.
- for drug ingestions: note drug(s), dosage(s), number remaining and date of prescription(s) and bring container(s) with patient.
- for other poisoning and exposures: if possible, note identifying information, warning labels or numbers on packaging.
- duration of illness: onset and progression of present state, antecedent symptoms such as headache, seizures, confusion, etc.
- history of event: ingested substances, drugs, alcohol, toxic exposures, suicidal intentions, and the work environment.
- past medical history, psychiatric problems.
- if possible, corroborate information with family member or responsible bystander.

Objective Findings:

- breath odor
- needle tracks
- medic alert tags/bracelets/medallions
- cardiac rhythm
- blood glucose level

Treatment:

- IV access

NARCOTICS

- **naloxone** 2 mg IV push or IM. Repeat as necessary for respiratory depression and/or significant hypotension.

ANTIPSYCHOTICS WITH EXTRAPYRAMIDAL REACTION

- **diphenhydramine** 50 mg IV push or IM. Repeat as needed.

ORGANOPHOSPHATES

- **atropine** 2 mg IV push or IM. Repeat every 2-5 minutes until SLUDGE symptoms subside.

TRICYCLIC ANTIDEPRESSANTS

- **hyperventilate** with 100% oxygen
- **sodium bicarbonate** 1 meq/kg IV push for hypotension, seizure, and/or QRS widening. Repeat with 0.5 meq/kg as needed.
- After total of 2 meq/kg sodium bicarbonate, consider **lidocaine** 1 mg/kg for ventricular dysrhythmias.

UNKNOWN SUBSTANCE

- **naloxone** 2 mg IV push or IM. Repeat as needed.
- **dextrose** 50% 25 g IV push if hypoglycemia is suspected or determined.
- If hypotensive, administer fluid bolus 10 ml/kg.
- Consider activated charcoal slurry 0.5-1.0 g/kg PO (with or without Sorbital) for patient able to maintain their own airway.
- Continuously monitor vital signs and cardiac rhythm during transport.

Precautions and Comments:

- In suspected opiate overdoses, withhold endotracheal intubation until after the patient has received naloxone.
- Significantly higher doses of naloxone may be needed for treatment of overdoses with synthetic opioid compounds such as demerol, fentanyl, etc.
- Consider titrating naloxone to achieve adequate respiratory effort and avoid a withdrawal reaction or combativeness.
- Consider withholding naloxone in narcotic-dependent comfort care (hospice, end-stage terminal illness or DNR) patients.
- Patients with tricyclic antidepressant overdoses may experience rapid depression of mental status, sudden seizures, or worsening of vital signs. Attentive monitoring of cardiac rhythm, vital signs and mental status are essential in these patients. Use extreme caution if considering charcoal (not recommended). Sodium bicarbonate may be needed and standard anti-dysrhythmic therapies may be inappropriate and ineffective.
- Charcoal is ineffective for iron overdoses.
- Consider all environmental poisonings Hazardous Materials Incidents and exercise appropriate caution.

PALLIATIVE CARE

Information Needed:

- past medical history: terminal medical condition or diagnosis.
- express statement(s) of patient's wishes:
 - Prehospital Do Not Resuscitate form or medallion
 - "Intensity of Care Preferences" or "Comfort Care Request" form(s)
 - Consider other advance directive explicitly stating patient's wishes regarding specific treatments or resuscitative measures.
 - Consider statements from family regarding patient's wishes.

Objective Findings:

- complaints or obvious signs of discomfort.
- special infusion apparatus: narcotic, hyperalimentation or oncology agents.

Treatment:

- Comfort and reassure patient.
- Maintain special infusion apparatus at pre-set rates.
- IV access if not precluded by patient's wishes.
- Consider **morphine sulfate** 2-4 mg IV for relief of discomfort. Titrate and repeat dosing as needed to maintain analgesia without significant respiratory depression.
- Allow family/friends to accompany patient and participate in care within limits of their ability.

Precautions and Comments:

- Do not administer narcotic antagonist without physician order. Violent withdrawal may be precipitated in patients on a narcotic infusion.
- Do not discontinue hyperalimentation infusions as rapid hypoglycemia may result.
- If prior arrangements have been made with a hospice, every attempt should be made to transport the patient to that facility which is most familiar with the patient's treatment plan and wishes.
- Provide grief support and referrals to on-site survivors as appropriate.
- Please see Appendix for California State EMS DNR form and suggested "Comfort Care Request" form.

CARDIAC ARREST PULSELESS ELECTRICAL ACTIVITY (PEA)

Information Needed:

- **Refer to CARDIAC ARREST General Guidelines**

Objective Findings:

- description of cardiac rhythm: frequency, regularity and width of complexes.
- evidence of trauma, poisoning, overdoses, or hypothermia.

Treatment:

- **Standard cardiac arrest management: ABCs, CPR, intubate, confirm tube placement, ventilate with 100% oxygen, establish IV access.**
- **epinephrine** 1:10,000 1 mg IV push. Repeat every 3-5 minutes.
- consider possible causes and corresponding treatments:
 - hypovolemia: **IV fluid bolus 5-10 ml/kg NS.** Repeat as necessary.
 - hypoxia: **Check tube placement. Ventilate with 100% oxygen.**
 - tension pneumothorax: **Chest decompression (see CHEST TRAUMA guideline).**
 - hypothermia: remove wet clothing as appropriate, begin basic rewarming and avoid further loss of body heat or unnecessary movement. **Refer to HYPOTHERMIA guideline.**
 - drug overdoses: **Refer to POISONING AND OVERDOSE guidelines.**
 - suspected hyperkalemia (e.g., patients with renal failure or on dialysis): **sodium bicarbonate** 1 meq/kg. May repeat 0.5 meq/kg every 10 minutes.
 - absolute or relative bradycardia: **atropine 1 mg IV push.** May repeat to a maximum of 3 mg.

Precautions and Comments:

- Causes such as acidosis, cardiac tamponade, pulmonary embolism, and myocardial infarction may be difficult to diagnose with certainty in the field and have little definitive prehospital treatment.
- Epinephrine and atropine may be administered via the endotracheal tube. Endotracheal drug doses are double the standard IV dose, and should be diluted to 10 ml total volume with sterile saline. ET drugs should not exceed 10 ml for any single dose. Maximum doses are also doubled for ET administration. For Epinephrine doses > 1 mg, consider using 1:1,000 concentration and diluting to 10 ml total volume in order to avoid exceeding the per dose volume limitations. Sodium bicarbonate and other drugs may not be administered via the ET route.

DYSRHYTHMIAS
PREMATURE VENTRICULAR CONTRACTIONS (PVCs)

Information Needed:

- See DYSRHYTHMIAS: General Guidelines.

Objective Findings:

- frequency and pattern of PVCs and underlying rhythm

LOWER POTENTIAL RISK

- no chest discomfort or significant associated symptoms.
- infrequent, single, unifocal PVCs

HIGH RISK FOR CARDIAC COMPLICATIONS

- chest discomfort or other significant symptoms
- frequent (>6 minute) multi-focal PVCs
- couplets or runs of V-Tach

TREATMENT:

LOWER POTENTIAL RISK

(No pharmacological treatment necessary)

HIGH RISK

- **lidocaine** 1.5 mg/kg IV
- repeat **lidocaine** in 5 - 10 minutes with 0.5 to 0.7 mg/kg IV to maximum total dose of 3 mg/kg
- **Refer to CHEST DISCOMFORT guideline as indicated.**

If PVCs persist, consider:

- **procainamide** 100 mg slow IV push over 2 minutes. May repeat at 20 mg/minute to maximum dose of 17 mg/kg, or until hypotension develops, or QRS widens by 50%.
- **bretyllium** 5 mg/kg slow IV push over 8 - 10 minutes. May repeat every 10 minutes with 10 mg/kg to maximum dose of 35 mg/kg.

Precautions and Comments:

- **Do not use lidocaine** in the presence of underlying atrial fibrillation, atrial flutter, bradycardia with ventricular escape beats, or other conduction defeat (2nd, or 3rd degree heart block).
- Repeat lidocaine doses should be reduced by one-half in elderly patients and patients with known liver disease, congestive heart failure, or on dialysis.

RESPIRATORY DISTRESS

Information Needed:

- respiratory: fever, sputum production, medications (bronchodilators), asthma, COPD, symptoms- dyspnea, cough, exposures- allergens, toxins, fire
- cardiac: cardiac medications, CHF
- CNS: acute change in mental status
- trauma: blunt or penetrating

Objective Findings:

- mental status (awake, alert and cooperative or not)
- respiratory rate and rhythm or pattern
- skin color (mucosa) or pulse oximetry reading
- work of breathing or effort (heart rate, diaphoresis, retractions)
- air entry, sounds, and inspiratory:expiratory ratio
- estimate of tidal volume by visual and/or auscultatory means
- normal air flow, wheeze, stridor, absence

Treatment:

AIRWAY OR RESPIRATORY FAILURE

- manually position airway
- suction as needed
- assist ventilations with supplementary oxygen

UPPER AIRWAY OBSTRUCTION

- relieve obstruction (position, suction, visualization and removal, Magill forceps, endotracheal tube)
- overcome effects of obstruction (longer inspiratory time during assisted ventilation)
- for suspected anaphylaxis or severe allergic reaction, consider **epinephrine** (1:1,000 concentration; 0.3 mg IM or SQ. May repeat as indicated every five minutes.)

LOWER AIRWAY OBSTRUCTION

Bronchospasm:

- **inhaled beta-2 specific bronchodilator** via nebulizer, repeat as indicated.
- **terbutaline** - 0.25 mg IM, repeat as indicated
- consider **epinephrine** in severe cases, 1:1,000 concentration; 0.3 mg IM or SQ, repeat as indicated.

Frothy sputum and/or rales:

- **nitroglycerin** 0.4 mg SL (repeat as indicated if blood pressure remains > 90mmHg)
- **furosemide** 80 mg IV
- **morphine sulfate** 2-4 mg IV. May repeat as indicated.
- If hypotensive, **dopamine** 5 - 20 mcg/kg/min IV infusion; titrate to systolic blood pressure of 90mmHg. Use with caution in patients with fever and purulent sputum.

- Perform tracheal suctioning for secretions using clean technique.

Precautions and Comments:

- If patient has prolonged expiratory phase during assisted ventilations, decrease ventilatory rate to reduce air trapping.
- Allow complete expiration before next ventilation.
- Increase tidal volume if you must use lower ventilatory rate.
- Use epinephrine with caution in patients with documented heart disease.
- Supplemental oxygen should not be withheld in COPD or chronic upper airway obstruction, but it may decrease respiratory rate.
- The endotracheal tube's placement and patency must be maintained at all times. Confirm endotracheal tube position (reassessed and documented) with any patient transfer. Confirm by direct visualization and/or esophageal intubation detector device.
- Rapid deterioration or decreased breath sounds have several causes, including: tube dislodgment into esophagus, tube migration into right mainstream bronchus, secretions in tube, pneumothorax (asymptomatic or tension). Check the tube position with laryngoscope and/or esophageal detection device and consider reintubation.
- Endotracheal intubation may be complicated by:
 - pharyngeal fluids - correct with suction, cricothyroid pressure
 - spinal or head injury - use cervical stabilization
- Use of nitroglycerin may uncover hypovolemia in the patient with normal blood pressure and may drop the blood pressure precipitously.

SNAKEBITE (PIT-VIPER)

Information Needed:

- type of snake, if known and location found
- appearance of snake; shape of pupil, presence of stripes or rattle
- approximate size (length) of snake
- time of bite
- prior first aid by patient or friends
- symptoms: local pain and swelling, peculiar taste in mouth, hypotension, coma, bleeding.

Objective Findings:

- one or more puncture wounds, or horseshoe set of teethmarks.

NON-ENVENOMATED

- no discoloration around puncture marks
- little or no pain after a few minutes

MINIMAL ENVENOMATION

- dark discoloration around punctures within 15 minutes
- mild edema formation
- increasing pain with time
- oozing or dark fluid from punctures
- peculiar taste in mouth (“metallic taste”)
- mild tachycardia

SERIOUS ENVENOMATION

- dark discoloration around punctures within 5 minutes
- marked edema formation
- severe pain within short time
- oozing of hemolyzed blood from punctures, possible formation of fluid blebs on skin
- definite “metallic” taste
- peculiar worm-like twisting motion to lips
- hypotension
- marked tachycardia
- altered mental status

Treatment:

- **Safety first;** do not attempt to capture snake unless experienced in doing so.
- Remove rings or other bands which might embarrass circulation later.

NON-ENVENOMATED

- transport all suspected envenomations for medical evaluation

**MINIMAL
ENVENOMATION**

- apply constrictor ban (not a tourniquet)
- document distal pulse
- immobilize bitten part with splint
- IV access
- **Morphine sulfate** 2-4 mg IV. Repeat as indicated to total of 10 mg.

**SERIOUS
ENVENOMATION**

- apply constrictor band (not a tourniquet)
- document distal pulse
- immobilize bitten part with splint, etc.
- IV access
- **fluid challenge**
- **morphine** sulfate 2-4 mg IVs. Repeat as indicated to total of 10 mg.

Precautions and Comments:

- Currently no indication to incise minimal envenomations
- If snake is dead, bring it in for positive identification. If alive and wild, do not try to capture it.
- All so-called “pet” snakes must be positively identified.
- Ice applied directly to skin surfaces can cause serious tissue damage and should not be used. A cool wet cloth can afford some pain relief but does nothing to stop the venom.
- Exotic poisonous snakes such as those in zoos have different signs and symptoms than those of the pit vipers. Zoos and legal exotic snake collectors are required to have a starter supply of antivenom on hand for each type snake.
- Bites from coral snakes, ELAPIDS related to cobras, usually do not have any early symptoms, thus all bites are considered envenomated.

MULTI-SYSTEM TRAUMA

Information Needed:

- mechanism of injury:

PENETRATING TRAUMA & ASSAULTS

- number of assailants
- type(s) of weapon(s) used
 - caliber of and distance from firearms
 - length, description, and depth of penetration for blades or other objects

FALLS

- cause or precipitating factors
 - mechanical--tripped, slipped or pushed
 - syncopal--fainted, got dizzy, became weak, etc.
- height and direction of fall
- surface(s) fallen upon

VEHICLE COLLISIONS

- estimated speed, forces and trajectories
- type of vehicle(s)
- type if impact (head-on, rollover, end-over-end, perpendicular, auto-ped, etc.)
- damage (passenger space intrusion, windshield, and steering wheel, etc.)
- protective devices (airbags, lap and/or shoulder belts, child seats, helmets, etc.) and damage sustained.
- patient complaints
- initial level of consciousness and position
- patient movement and treatment since injury
- modifying factors: drugs, alcohol, pregnancy, medications, diseases

Objective Findings:

ACEP indicators of significant injury:

- **Multisystem blunt or penetrating trauma with unstable vital signs**
- hemodynamic compromise
- respiratory compromise
- altered mental status

High Energy Event:

- ejection from vehicle
- death of occupant in same vehicle
- auto crash with significant vehicular body damage or rollover
- significant fall
- bent steering wheel
- auto-pedestrian impact

- significant motorcycle, ATV or bicycle impact
- significant assault or altercation

Anatomical Injury:

- penetrating injury of head, neck, torso, or groin
- combination of burns >10% or involving face, airway, hands, feet or genitalia
- amputation above wrist or ankle
- paralysis
- flail chest
- two or more obvious proximal long bone fractures (upper arm or thigh)
- open or suspected depressed skull fracture
- unstable pelvis or suspected pelvic fracture

Treatment:

- airway with spinal immobilization if indicated
- consider peural decompression if tension pneumothorax is suspected (**Refer to CHEST & ABDOMINAL TRAUMA guideline**).
- circulation, with control of major bleeding
- transport decision
 - if patient unstable, transport immediately. Treat enroute.
 - uncontrollable airway obstruction
 - inability to ventilate/oxygenate
 - shock
 - altered mental status
 - if patient stable, assess for potentially life-threatening injuries and treat accordingly.
- IV access with large-bore catheter
- **fluid challenge** if patient is hypotensive
- consider second IV or PASG
- secondary survey
- splint suspected fractures and bandage open wounds
- cardiac monitor
- judicious use of analgesics should be considered

Precautions and Comments:

- In critical patients, the secondary survey and treatment are done while enroute.
- Reassessment of critical patients should occur at least every 5 minutes. Vital signs and other reassessment information should be documented.
- Trauma patients pose a significantly increased risk for exposing prehospital personnel to blood and other bodily fluids. Barrier precautions should be in place before arrival at the scene and universal body substance isolation procedures should be observed at all times.

DYSRHYTHMIA WIDE COMPLEX TACHYCARDIA

Information Needed:

- See **DYSRHYTHMIAS: General Guidelines.**

Objective Findings:

STABLE

- no altered mental status
- no signs of poor perfusion

UNSTABLE

- altered mental status
- signs of poor perfusion (chest pains, dyspnea, rales, hypotension) related to the tachycardia

Treatment:

STABLE

- **lidocaine** 1.5 mg/kg IV push. May repeat in 5-10 minutes with 0.75 mg/kg to maximum dose of 3 mg/kg.
- Consider **adenosine** 6 mg rapid IV bolus flushed by 20 cc NS. May repeat with 12 mg rapid IV bolus in 2-3 minutes. May repeat 12 mg dose in 2-3 minutes.
- Consider **procainamide** 100 mg slow IV (20 mg/min). May repeat to maximum dose of 17 mg/kg, or widening of QRS by 50%, or hypotension.
- Consider **bretyllium** 5-10 mg/kg slow IV (over 8-10 minutes). May repeat in 15 minutes to maximum dose of 30 mg/kg.
- Consider **magnesium sulfate** 1-2 g slow IV (1 g/min) for suspected Torsades de pointes or hypomagnesemic state.
- **synchronized cardioversion** at 100 J. May repeat at 200 J, 300 J, 360 J.

UNSTABLE

- **diazepam** 5 mg slow IV push for sedation if patient is awake.
- **unsynchronized or synchronized cardioversion** at 100 J. May repeat at 200 J, 300 J, 360 J.
- Consider brief trial of anti-dysrhythmic medications, particularly if rate is less than 150/minute.

Precautions and Comments:

- A widened QRS complex is defined as greater than or equal to 0.12 sec.
- A wide complex tachycardia is most often ventricular in origin but may be supraventricular tachycardia with aberrant conduction.