

KLICKITAT COUNTY

ADVANCED LIFE SUPPORT GUIDELINES

FOR

KLICKITAT COUNTY EMERGENCY MEDICAL SERVICES

*VERSION 6.5
July 2015*

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NOTE: Version 4.0 was revised to 6.5

ACKNOWLEDGMENT AND THANKS

Klickitat County's Medical Program Director would like to thank Lynn Wittwer, M.D., MPD of Clark County for the use of his protocols. These protocols serve as the primary source of Klickitat County's Pre-Hospital Advanced Life Support (ALS) Patient Care Guidelines.

Additional information was also used from, Skagit County EMS MPD and Spokane County EMS MPD protocols which have been invaluable to Klickitat County EMS.

REQUIREMENTS FOR ALL KLICKITAT COUNTY EMERGENCY MEDICAL PERSONNEL

1. The latest edition of the Washington State DOH Emergency Medical Responder (EMR)/ First Responder Field Protocols are hereby incorporated into the version 6.5 Klickitat County Pre-Hospital ALS Patient Care Guidelines as is fully set forth herein. EMR with current certifications and training are authorized to provide these interventions.
2. The latest edition of the Washington State DOH Emergency Medical Technicians (EMT) / EMT-Basic Field Protocols, and EMT-Special Skill Curriculum Intravenous Therapy are hereby incorporated into the version 6.5 Klickitat County Pre-Hospital ALS Patient Care Guidelines as is fully set forth herein. EMT with current certifications and training are authorized to provide these interventions.
3. Similarly, The latest edition of the Washington State DOH Advanced / Intermediate Life Support Technician Field Protocols and are hereby incorporated into the version 6.5 Klickitat County Pre-Hospital ALS Patient Care Guidelines as is fully set forth herein. Advanced with current certifications and training are authorized to provide these interventions.
4. It is expected that all EMR / First Responders, EMT / EMT-B, IV Technicians, Advanced / Intermediate EMT, shall obtain and keep copies of their current State Field Protocols. These EMS personnel are to follow the State Protocols. Also, all of the above personnel are required to review the Klickitat County Pre-Hospital ALS Patient Care Guidelines version 6.5 (can be reviewed in electronic format) to better understand their role in the ALS EMS system.
5. Additional Klickitat County EMR, EMT, IV Tech, and Advanced, patient care guidelines are specifically identified in the Klickitat County ALS Guidelines. They are also found as a Klickitat County EMR, EMT, IV Tech, and Advanced, protocol addendum document (such as CPAP, Epi, ASA, Backboarding) to their State Protocols.
6. It is expected that all Paramedics shall obtain and keep copies of the current Klickitat County Advanced Life Support Guidelines. These EMS personnel are to follow the County Guidelines.
7. It is expected that all Klickitat County EMS personnel shall obtain and keep copies of the current Klickitat County Operating Procedures (COPS) November 2013. These EMS Personnel are to follow these COPS as approved by the Klickitat County EMS Council and Washington State DOH EMS.
8. EMS providers are expected to follow the Southwest Region EMS and Trauma Care Council's Patient Care Procedures, and also are expected to follow the Klickitat County Prehospital Trauma Triage Destination Procedures.
9. Dr. Smith would also like to thank all the paramedics who helped with these protocols, especially David Nice, Katharina Larson, Eileen Filler, and Nicholas Bryan, also Karen Williams, for their efforts in reviewing these orders. Dr. Smith would like to thank Washington State Department of Health for all their assistance.
10. A special thanks to Mark Bryan for his typing, reviewing, and researching of these orders.

RECEIPT OF GUIDELINES / SIGNATURE PAGE

TO: Russell M. Smith M.D.
Klickitat County Medical Program Director
211 Skyline Drive
White Salmon, WA. 98672

SUBJECT: Emergency Medical Responder / EMT / Advanced EMT / PARAMEDIC
Support Patient Care Guidelines

The purpose of this letter is to inform the MPD that I have received and reviewed the following:

- Klickitat County Operating Procedures (COPS) 2013
- Advanced Life Support / Paramedic Guidelines (version 6.5)
- Advanced / Intermediate EMT Washington State Protocols
- EMT / EMT Basic Washington State Protocols
- EMT-Special Skill Curriculum Intravenous Therapy
- Emergency Medical Responder / First Responder State Protocols
- Klickitat County EMR, EMT, IV Tech, Advanced, Protocol Addendum document
- Southwest Region Patient Care Procedures (PCPs)

I understand these guidelines and agree to follow their directions.

Upon review, any comments about the Standing Orders should be directed to Dr. Smith or Mark Bryan CPM.

Signature

Printed Name

Agency

Date

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KLICKITAT COUNTY EMERGENCY MEDICAL SERVICES
PRE-HOSPITAL PATIENT CARE GUIDELINES
INTRODUCTION

The following PRE-HOSPITAL PATIENT CARE ALS GUIDELINES are intended as Paramedic treatment guidelines, and overarching guidelines for all EMS personnel working under the advice of the Medical Program Director for Klickitat County. They represent a consolidation of recommendations for patient care from many local and national sources.

They are intended to:

1. Standardize, pre-hospital patient care for Klickitat County
2. Provide EMS personnel with a guideline for pre-hospital patient care and an expectation of supportive orders online from the base hospital
3. Provide base hospital physicians and nurses with an understanding of what aspects of patient care have been stressed to the EMS providers and what their treatment capabilities may be
4. Provide the basic framework on which Medical Control can audit the performance of EMS personnel
5. Provide clarity to Advanced Life Support* procedures (within the guidelines). They will be identified by an * preceding the procedure. A *** is intended to identify an advanced life support therapy to be used only with base hospital physician concurrence
6. Provide color coding dosages and procedures:
 - a. **Adult: dosage and procedure**
 - b. **Pediatric: dosage and procedure**

They are not intended to:

1. Be absolute treatment doctrines, but rather guidelines with sufficient flexibility to meet the needs of complex cases.
2. Be a teaching manual for EMT's or paramedics. It is assumed that each EMT, Advanced, and Paramedic is trained to his/her level of certification and that he/she will continue to meet those requirements of the State for continuing education for recertification. Medical control will provide continuing education based on the results of patient care audits and review.
3. Interfere with wishes of the patient or family, or wishes of the patient's private physician.
4. Dictate details of care to advising physicians.
5. Warrant the EMS provider as an independent field practitioner.

It is expected that all emergency medical personnel within Klickitat County will be familiar with that portion of the **PRE-HOSPITAL PATIENT CARE GUIDELINES** appropriate to their certification level. Written acknowledgment of the receipt of this document is required as a part of your certification/recertification application.

GENERAL ORDERS FOR ADULT PATIENTS

I. Scene Size-up/Assessment:

- A. Scene Safety.
- B. Body Substance Isolation per Agency Exposure Control Plan.
- C. Mechanism of injury/nature of illness.
 - 1. *Medical:*
 - a. Nature of illness determine from the patient, family or bystanders why EMS was activated.
 - b. Determine the total number of patients. If there are more patients than the responding unit can effectively handle, initiate a mass casualty plan.
 - (1) Obtain additional help prior to contact with patients, such as law enforcement, fire, rescue, additional ALS units, utilities, and other related resources.
 - 2. *Trauma:*
 - a. Mechanism of injury- determine from the patient, family or bystanders and inspection of the scene what is the mechanism of injury.
 - b. Determine the total number of patients. If there are more patients than the responding unit can effectively handle, initiate a mass casualty plan.
 - (1) Obtain additional help prior to contact with patients.
 - (2) Begin triage.
 - (3) If the responding crew can manage the situation, consider spinal precautions and continue care.

II. Initial Assessment:

- A. General impressions of the patient.
- B. Assess patient and determine if the patient has a life threatening condition.
- C. Assess patient's mental status. Maintain spinal immobilization if needed.
- D. Assess the patient's airway status.
- E. Assess the patient's breathing.
- F. Assess the patient's circulation.
- G. Identify priority patients. Consider:
 - 1. Poor general impression,
 - 2. Unresponsive patient - no gag or cough,
 - 3. Responsive, not following commands,
 - 4. Difficulty breathing,
 - 5. Shock (hypo-perfusion),
 - 6. Complicated Child Birth,
 - 7. Chest pain with BP<100 systolic,
 - 8. Uncontrolled bleeding,
 - 9. Severe pain anywhere,
 - 10. Multiple injuries,
- H. If POLST/EMS-NO CPR Forms/Bracelet are intact. Follow protocols for EMS-No CPR.
- I. Proceed to the appropriate focused history and physical examination.
- J. Place patient in a position of comfort, unless contraindicated.

GENERAL ORDERS FOR ADULT PATIENTS (continued)

III. Focused History and Physical Exam - Medical Patients

- A. *Responsive Medical Patients,*
 - 1. Assess patient history,
 - 2. Perform physical examination,
 - 3. Assess baseline vital signs including pulse oximetry if available,
 - 4. Provide emergency medical care based on signs and symptoms in consultation with medical direction/control,
 - 5. Provide psychological support as necessary.
- B. *Unresponsive Medical Patients.*
 - 1. Perform rapid assessment,
 - 2. Utilize the techniques of patient assessment previously identified,
 - 3. Assess baseline vital signs including pulse, oximetry if available,
 - 4. Obtain patient history from bystander, family and friends.

IV. Focused History and Physical Exam - Trauma Patients

- A. Re-consider mechanism of injury
- B. Perform rapid trauma physical examination on patients with significant mechanism of injury.
- C. For patients with no significant mechanism of injury, e.g., cut finger
 - 1. Perform focused history and physical exam of injuries based on the techniques of examination. The focused assessment is performed on the specific injury site.
 - 2. Assess baseline vital signs including pulse oximetry if available.
 - 3. Assess patient history;
 - a. Chief complaint.
 - b. History of present illness.
 - c. Past medical history.
 - d. Current health status.

V. Detailed Physical Exam

- A. Patient and injury specific; e.g., cut finger would not require the detailed physical exam.
- B. Perform a detailed physical examination on the patient to gather additional information.

VI. Ongoing Assessment

- A. *Repeat Initial Assessment*
 - 1. For a stable patient, repeat and record every 15 minutes.
 - 2. For an unstable patient, repeat and record at a minimum every 5 minutes.
 - 3. Reassess and record vital signs.
 - 4. Repeat focused assessment regarding patient complaint or injuries
 - 5. Assess interventions.

VII. Communications:

- A. Information protocol during transport: Transmit essential communications and keep air or phone times as short as possible. The following protocols for advanced life support and basic life support communications should be used. If Medical Control feels additional communications are necessary, they may contact the transporting unit via H.E.A.R. system or by cell phone. Hospital trauma status will be given to the EMT or Paramedic requesting trauma system entry after evaluation of the patient. Follow the State Trauma Triage Tool.

1. Radio/Telephone Pre-Hospital Report format:
 - a. Unit identification and level of service.

GENERAL ORDERS FOR ADULT PATIENTS (continued)

- b. Age and sex of patient.
 - c. Transport code (1 or 3).
 - d. Chief complaint or reason for transport.
 - e. Very brief pertinent medical history (one sentence if possible).
 - f. Vital signs, LOC, Physical assessment findings.
 - g. Pertinent treatment rendered and patient response to treatment.
 - h. Request for additional information or treatment.
 - i. Estimated time of arrival (ETA).
- B. Advise Medical Control or receiving emergency department of changes in patient's condition en route and request for further treatment.
- C. Verbal report to emergency department physician and/or triage nurse. This should contain more detail than the radio report. The EMT now has the time to present thorough details of the scene, complete assessment of the patient, complete report on patient care and the results of your efforts.
- D. A written report to the emergency department physician and/or triage nurse. This should contain all the information of the verbal report and additional information found below. The MIR form must be given to the physician and/or triage nurse according to Washington State Law in the following format.
1. Complete approved State of Washington EMS medical incident report (MIR) form on all patient encounters (this should include no patient transports). S.O.A.P.E. charting is the most acceptable method of report writing. This is a LEGAL record and may be called upon as evidence in any court of law. (IF IT IS NOT WRITTEN, IT WAS NOT SEEN OR DONE.)
 2. Electronic reporting system: EMT must leave a short form MIR, then EMT must type an electronic form which follows S.O.A.P.E. format, and the EMT must send a completed form to the receiving facility or appropriate department within two hours if possible but no later than 24 hours, following the patient admission.

[S]-SUBJECTIVE and SCENE information. That information which the patient, family, bystanders or other witnesses tell you. Age of the patient, gender, race, estimated weight in Kg, chief complaint, scene description, history of the event, pertinent medical history of the patient, patient's physician, medications, allergies, other extenuating circumstances, history of smoking, if known.

[O]-OBJECTIVE information. This information you find on your complete head-to-toe physical exam. Level of consciousness/psychiatric status, skin vitals, vital signs (baseline, B/P, pulse and respiration's), H.E.E.N.T., neck, spine, thoracic, abdominal, pelvic, lower extremities, upper extremities, neurological including motor and sensation, note placement of medical alert tags. (This section should be done in outline form.)

[A]-ASSESSMENT. The patient diagnosis. May include more than one.

[P]-PLAN- Procedures and treatment performed. Record of your patient care and its results.

[E] EVALUATION; Record whether patient's condition improved, continued to decline, stabilized, etc.

VIII. Transportation:

- A. Advise emergency department of any changes in patient condition.
- B. Continue ongoing assessment and patient care.
- C. Appropriate mode and appropriate facilities per Trauma Triage Guidelines and Regional Patient Care Procedures.

GENERAL ORDERS- PEDIATRIC (LESS THAN 16 YRS OLD)

I. Scene Size-up and Initial Patient Assessment

- A. Assess ABC
 - 1. Airway - Do not hyperextend or hyper-flex child's neck. Check for Obstructions.
 - 2. Breathing - Check for Quality/Quantity of respirations.
 - 3. Circulation - Check capillary refill. Quality/Quantity of pulse.
- B. Consider possible domestic violence or abuse by adults.

II. Focused Assessment and Physical Examination.

- A. Consider the patient's developmental stage when assessing signs and symptoms.
- B. Physical exam may be better tolerated if conducted from trunk to head.
- C. Be alert for signs of child abuse and neglect.

III. Ongoing Assessment

IV. Transport

- A. Utilize Regional PCPs and County Operating Procedures regarding pediatric trauma destinations.

**QUICK REFERENCE
For Klickitat County EMS
Medical Control Concurrence Procedures and Medications**

Paramedic communication with online physician delegate at Klickitat Valley Hospital or Skyline Hospital is required for the following procedures and medications.

- 1) FIELD TERMINATION OF ACLS when doubt for code termination exists.
- 2) SEDATION of psychiatric patient with VALIUM, VERSED, HALDOL OR INAPSINE.
- 3) TRAUMA SURGICAL PROCEDURES:
 - Pleural Decompression (needle thoracentesis)
 - Surgical Cricothyrotomy
 - Needle-Jet Cricothyrotomy
 - Pericardiocentesis
 - Skin Stapling
 - Traumatic hemorrhagic lung isolation
- 4) EXCEED MAXIMUM CONTROLLED MEDICATIONS (See page 22 for dosages)
- 5) DIVERSION TO OTHER AREA HOSPITALS.
- 6) TRAUMA SYSTEM ACTIVATIONS.
- 7) ADMINISTRATION OF:
 - ROCEPHIN (antibiotics)
 - INSULIN

INTER-FACILITY TRANSFER

As a general rule, it is the responsibility of the transferring facility to ensure that the medical necessities for safe patient transfer are met. Medical instructions of the attending physician will be followed unless specifically contrary to Scope of Practice. If a physician attends the patient during transfer, he/she will direct all care regardless of standing orders. If a registered nurse attends the patient, he/she will direct the care of the patient when care required is contrary to Scope of Practice for the Paramedic. The Registered Nurse will provide care related to their Scope of Practice and from standing orders given by the attending physician at transfer or by contact with the receiving hospital physician. (i.e. fetal monitor, vaginal exams are within RN scope of practice but not the Paramedics). If treatment course is within the Scope of Practice for the Paramedic then patient care will remain with the paramedic.

The responsibility for transfer to another facility resides with the transferring facility. Patients will not be transferred to another facility without first being stabilized, when possible. Stabilization includes adequate evaluation and initiation of treatment to assure that transfer of a patient will not, within reasonable medical probability, result in material deterioration of the condition, death, loss or serious impairment of bodily functions, parts, or organs. Evaluation and treatment of patients prior to transfer to include the following:

- A. Establish and ensure an adequate airway and adequate ventilation.
- B. Initiate control of hemorrhage.
- C. Stabilize and splint the spine or fractures, when indicated.
- D. Establish and maintain adequate access routes for fluid administration.
- E. Initiate adequate fluid and/or blood replacement.
- F. Determine that the patient's vital signs (including blood pressure, pulse, respiration, and urinary output, if indicated) are sufficient to sustain adequate perfusion.

It is also the transferring facility's responsibility to establish the level of care needed for transport.

For ALS patient calls not meeting the above criteria, the following may apply:

- A. You may initiate pre-hospital protocols and guidelines including the establishment of intravenous lines, airway control, etc.
- B. You may refuse to transfer the patient until the facility has complied with the above evaluation and/or treatment. Should you decide this is necessary, contact Medical Control for concurrence and consultation or contact the MPD directly. Should the physician direct the EMS personnel to engage in care beyond their scope of practice, the EMS personnel have an obligation to inform the physician and request additional qualified help.

For ALS calls requiring procedures not covered by Klickitat County Patient Care Protocols, the following may apply:

- A. Maintain during transport intravenous medication infusions or other procedures which were initiated in a medical facility, if clear and understandably written and/or verbal instructions for such maintenance have been provided by the personnel at the sending facility.

INTER-FACILITY TRANSPORT (continued)

- B. Initiate or administer medications or blood products under specific written or verbal orders by transferring facility's (Medical Control) on line physician delegate. Such drugs and therapies could include but are not limited to the following: tocolytics, nitrates, thrombolytics, Aggrastat, Integrilin, Heparin, blood products, antibiotics, chest tubes with pleurovacs (and/or equivalents), autotransfusing device from chest tube.

If a BLS transport is requested and it is the judgment of the BLS crew that the patient needs to be transported by an ALS ambulance, it is mandated that an ALS crew be dispatched. Under no circumstances should a BLS crew transport a patient, if in their judgment, this patient may require skills above their certification level (with the possible exception of a MCI incident).

In the event of an emergency occurring en route that is not anticipated prior to transport, pre-hospital protocols and guidelines will immediately apply. Medical Control should be contacted for concurrence of any orders as appropriate; the receiving facility should be contacted as soon as possible to inform them of changes in the patient's condition.

Any deviation from an EMT or EMT-P scope of practice, the deviation should be reported to the MPD on an incident report within 24 hours of occurrence.

SPECIALTY CARE TRANSPORTS

Klickitat County Patient Care Guidelines have all the components required by Federal Guidelines for specialty care transports. Federal Guidelines HCPCS AO 434 Specialty Care Transport (SCT). Each state is required to establish individual guidelines. You will find that the Klickitat County Patient Care Guidelines contain all required elements of the SCT guideline. These include:

Needle Cricothyroidotomy,
Surgical cricothyroidotomy,
Pericardiocentesis,
Pleurodecompression,
Chest Tube and collection systems,
E.T. Tube placement,
Ventilator operations,
Monitoring Systems: SPO₂; Capnography; Pacing; Cardioversion, 12 lead monitoring;
RSI,
IV infusions, vasopressors.
Medications for high risk transports,
IO placement

Due to the nature of Klickitat County and the requirement of prolonged transports from local area hospitals to higher care centers, Specialty Care Transports are a required aspect of EMS care. All personnel are to remain proficient with these above mentioned skills, in addition to skills used on a routine basis while performing assigned duties.

PATIENT TREATMENT RIGHTS

I. CONSENT:

1. These pre-hospital care protocols are intended for use with a conscious, consenting patient, or an unconscious (implied consent patient)
2. If conditions warrant, treatment of a minor (under age 18) is done via implied consent.

II. RIGHT TO MAKE DECISION REGARDING CARE:

1. If a conscious patient who is rational refuses treatment, the EMT should document the refusal (see guidelines for refusing care) (Klickitat County Operation Procedures).
2. If a conscious patient who is irrational (or impaired by alcohol or drugs) refuses treatment, the EMT should contact Medical Control and/or police and/or county mental health professional, if necessary (see guidelines for refusing care).
3. If a patient's family, patient's physician, or nursing home refuses treatment for a patient, protocols are contained herein to deal with those situations.
4. A rational patient has the right to select a hospital within the local area to be transported to in a non-emergent situation.
5. If a patient is a minor (under age 18) and no consenting adult is available and the minor refuses treatment, the EMT should contact Medical Control (police etc.)

Note: When in doubt contact the Medical Control and fully document all of your actions.

COGNITIVE DECISION SCREENING PROCEDURE

PURPOSE: To outline a standard method of determining mental capacity for the purpose of prehospital decision-making. This document may be applied alone, or in conjunction with an existing Klickitat County Patient Care Guideline where a patient's capacity to decline assessment, treatment, or transportation is in question. It consists of the neurological assessment component as well as the six-item screening tool.

Patients being screened for decisional capacity must meet ALL of the following criteria:

- Is alert & oriented to person, place, time and event
- Does not demonstrate or verbalize a danger to self or others
- Does not appear impaired by drugs or alcohol
- No obvious evidence of impairment due to mental illness
- No obvious evidence of acute neurologic insult or injury (Loss of Consciousness)
- No evident impairment from hemodynamic instability, such as:
 - Hypoxia
 - Hypotension/hypertension
 - Cardiac dysrhythmias
- No evidence of hypoglycemia when indicated with BGL < 60
- Glasgow Coma Scale greater than 13

Confirm decisional capacity as appropriate, with score of 5 or 6 on **Cognitive Screening Tool:**

I'm going to ask you some questions and ask the you remember three words. After I say all three words, please repeat them out loud; remember them, because I will ask you to repeat them again in a few minutes. Repeat these words: APPLE, TABLE, PENNY	Score	
What year is it?	0	1
What month is it?	0	1
What day of the week is this?	0	1
What were the three words?	Apple	0 1
	Table	0 1
	Penny	0 1
Total	6	

NON-TRANSPORT OF PATIENTS

I. Impaired Decision Making Capacity Defined

- A. Inability to understand the nature of his/her illness/injury.
- B. Inability to understand risks or consequences of refusing care/transport.
- C. Individuals impaired by:
 - 1. Alcohol/Drugs
 - 2. Psychiatric conditions
 - 3. Injuries (head injury, shock, etc.)
 - 4. Organic Brain Syndrome (OBS) (Alzheimer's, mental retardation, etc.)
 - 5. Minors (<18 years old)
 - 6. Language/communication barrier (including deafness)

II. Criteria for Informed Refusal/Consent

- A. Person is given accurate information about possible medical problems and the risk/benefits of treatment or refusal.
- B. Person is able to understand and verbalize these risks and benefits.
- C. Person is able to make a decision consistent with his/her beliefs and life goals.

III. Capable of making informed decision, immediate medical care and/or ambulance transport necessary:

- 1. A refusal form is necessary.
- 2. Every effort will be made to convince these patients to accept necessary pre-hospital intervention and transport to definitive care. Options available to the Paramedic include:
 - solicit assistance from family, friends, clergy and/or other close associates to persuade the patient to accept necessary treatment and transport.
 - solicit assistance from law enforcement (police hold), and/or mental health professional (psychiatric hold), as the situation directs.
- 3. **CONSULTATION WITH MEDICAL CONTROL IS MANDATORY.**
- 4. MIR documentation shall include:
 - The patient's chief complaint.
 - Events prior/reason for call to EMS.
 - Pertinent medical history.
 - Description of scene (if relevant to patient's c/c).
 - Physical exam including vital signs.
 - Clinical impression.

NON TRANSPORT OF PATIENTS (continued)

- Pre-hospital interventions.
- Consultation with Medical Control or MPD as necessary.
- Patient's response to medical care and/or transport attempts.
- Instructions to patient and/or family including risks/benefits of treatment/transport.

5. If the patient still refuses treatment/transport, the attending EMT or Paramedic will be responsible for explaining the **REFUSAL INFORMATION FORM**.

Completion of the form includes:

- Explanation of instructions and release of liability to the patient.
- Receipt of signature (dated) from patient or legal guardian.
- Completion of patient assessment, Medical Control consult, and patient disposition sections.

IV. Not capable of making informed decision, medical care and/or ambulance transport necessary:

1. A refusal form is necessary.
2. Every effort will be made to convince these patients to accept necessary pre-hospital intervention and transport to definitive care. Options available to the Paramedic include:
 - solicit assistance from family, friends and/or other associates to persuade the patient to accept necessary treatment/transport.
 - solicit assistance from law enforcement (police hold), mental health professional (psychiatric hold), and/or clergy as the situation directs.
 - consider physical and/or chemical restraint (Haldol, Inapsine) per Medical Control concurrence based on the patient's condition and current situation.

Physical and/or chemical restraint can occur only when the Paramedic believes the patient poses a danger to him/herself or others.

3. **CONSULT WITH MEDICAL CONTROL IS MANDATORY.**
4. MIR documentation shall include:
 - The patient's chief complaint.
 - Events prior/reason for call to EMS.
 - Pertinent medical history.
 - Description of scene (if relevant to patient's c/c).

NON-TRANSPORT OF PATIENTS (continued)

- Physical exam including vital signs.
- Clinical impression.
- Pre-hospital interventions.
- Consultation with Medical Control or MPD as necessary.
- Patient's response to medical care and/or transport attempts.
- Instructions to patient and/or family including risks/benefits of treatment/transport.

5. If the patient still refuses treatment/transport, the Paramedic will be responsible for explaining the **EMS REFUSAL FORM**. Completion of the form includes: (Back of State MIR form or other approved form).

- Explanation of instructions and release of liability to the patient.
- Receipt of signature (dated) from the patient or legal guardian.
- Completion of patient assessment, Medical Control consult, and patient disposition sections.

6. Every reasonable effort should be made to ensure patients receive necessary medical treatment and transport. If the patient seems hesitant regarding their medical care/transportation or any doubts exist, you should provide any necessary care/transportation.

7. Should the above efforts prove fruitless, it may be necessary to leave these patients at the scene. Aforementioned documentation guidelines will be adhered to.

MEDICATION AND ALLERGIES

All medications in these protocols are to be administered only after ascertaining that the patient is not allergic to them. In critical situations when the patient is obtunded, personnel are reminded to question family, friends, and to look for Medic-Alert identification and/or "Vial of Life" canisters.

NURSING HOME CALLS/ ADULT FOSTER CARE

- I. Unless a written or verbal "No-Code" order is given by the physician, it can be assumed that full resuscitative efforts will be undertaken by the Paramedics if they are called to the nursing home/Adult Foster Care. If a "No-Code" status has been determined as appropriate, it will be written in the patient's chart by the attending physician. A verbal "No-Code" order can be taken by the Paramedic from the attending physician by telephone if known to the Paramedic, or more appropriately, via Medical Control and relayed to the Paramedic.
- II. Resuscitative efforts, once begun, will be terminated only upon agreement of the Medical Control Physician and/or the attending physician in consultation.

LEVEL OF PATIENT CARE : PARAMEDIC DEFERS CARE TO EMT; ADVANCED EMT

All patients receiving medical care in Klickitat County will be evaluated by the highest certified EMS professional available on scene. Klickitat County EMS recognizes that not all patients require paramedic level care. Care therefore may be rendered by a BLS/Advanced technician once the following criteria has been met:

- 1). A paramedic level evaluation (or highest provider on scene) must be performed, or directly witnessed.
- 2). The paramedic (or highest provider on scene) has determined the patient's condition to be stable and is not likely to alter during further care or transport,
- 3). The patient is not in need of any further paramedic level interventions. Providing the above criteria has been met, the EMT/B or EMT/I can assume care for the patient.

Once a Paramedic level intervention has been initiated, the Paramedic can not turn the patient over to any EMS provider that is not certified to the level of intervention. Example; If MS has been administered to a hip fracture, the paramedic can not defer care to any other EMS provider lower than a medic level. Example: If the Paramedic starts an IV on a patient which is stable, care of patient can not be less than an IV tech.

If patient condition can alter, the Paramedic must remain in care of the patient.

BLOOD DRAWS

Blood draws will be limited to EMT/IV, EMT Advanced, and ALS personnel only and the following medical conditions:

- * A. Medical cases requiring laboratory documentation such as:
 1. Suspected drug overdose.
 2. Unconscious patient, unknown cause.
 3. Trauma team patients.
 4. Major medical e.g. suspected cardiac, CVA, etc.
- * B. Blood draws to occur at the time of I.V. start, with aseptic technique (provodine-iodine and no alcohol swabs for law enforcement samples only).

Blood Draw Protocol:

- * C.
 1. Obtain blood draw
 2. Order of Filling:
 - Glass Culture tube "Yellow top" -10cc (fill if indicated)
(yellow top to be wiped with two alcohol wipes, then fill)
 - Gold top – 4cc
 - Green top – 3cc
 - Purple top – 4cc
 - Blue top – 2cc
 3. Allow tubes to fill under their own vacuum.
Tubes must be filled immediately after blood draw.
 4. Gently invert tubes minimum of two times to mix medium with blood.
 5. Label tubes (full name, DOB, time, initials of person drawing blood)
 6. Deliver to emergency department or laboratory personnel.

CONTROLLED DRUGS (LEGEND MEDICATIONS)

Controlled (legend) medications will be maintained at each agency utilizing FDA approved protocols and security. Each agency will maintain the Controlled Drugs as per the FDA requirement and maintain a permanent record.

Paramedics only are authorized to administer controlled drugs.

Up to **30 mg** of **Morphine** may be given per protocols without need to contact Medical Control. (e.g., Chest pain, congestive failure, severe musculoskeletal pain). Additional **Morphine** may be given only with Medical Control concurrence.

Up to **4 mg** of **Dilaudid** may be given per protocols without need to contact Medical Control. (e.g., Chest pain, severe musculoskeletal pain). Additional **Dilaudid** may be given only with Medical Control concurrence.

Up to **400 mcg** of **Fentanyl** may be given per protocols without the need to contact Medical Control. (e.g. Chest pain, severe musculoskeletal pain). Additional **Fentanyl** may be given only with Medical Control concurrence.

Up to **20 mg** of **Valium** may be given per protocol for sedation, or treatment of seizures. (Examples paralytic assisted intubation or synchronized cardioversion.) without the need to contact Medical Control. Additional **Valium** may be given only with Medical Control concurrence.

Up to **20 mg** of **Versed** may be given per protocol for sedation, (for example paralytic assisted intubation or for synchronized cardioversion) without the need to contact Medical Control. Additional **Versed** may be given only with Medical Control concurrence.

Up to **0.3 mg/kg** of **Etomidate** (0.1 mg/kg conscious sedation 0.3 mg/kg RSI dosage) may be given per protocol for sedation or induction without the need to contact Medical Control. Additional Etomidate may be given with Medical Control concurrence.

Up to **60 mg** of **Toradol (Ketorolac)** (30 mg IV use or 60 mg IM use) may be given per protocol for musculoskeletal, renal or gallbladder pain. Additional **Toradol** may be given with Medical Control concurrence.

*** I.V. FLUIDS**

Intravenous access is to be established on all ILS/ALS criteria patients unless unable to start IV or IO lifelines.

* Procedure to be done by ILS/ALS personnel only.

The purposes of I.V. access are:

- a. Fluid resuscitation.
- b. Administration of IV medications per protocol.
- c. The anticipation of need for a./b. above.

IV fluid of choice is a balanced salt solution. If fluid is not needed for resuscitation, a balanced salt solution or D5W may be used TKO preferably through a microdrip or a soluset. A saline lock may be substituted.

Lactated Ringers or Normal Saline will be the balanced salt solution of choice unless otherwise approved by the MPD.

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PRE-HOSPITAL PATIENT CARE GUIDELINES

CARDIAC

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CARDIOPULMONARY RESUSCITATION GUIDELINE
DEATH IN THE FIELD (DIF) GUIDELINE

1. EMT's may withhold resuscitation of patients only if:
 - a. The patient is in a skilled nursing facility and there is a DNR order signed by a physician;
OR
 - b. There is an EMS-No CPR bracelet intact and not defaced or the original EMS-No CPR form is present, and there is no suspicion of possible suicide/homicide;
OR
 - c. There is a signed and notarized Living Will present which states no CPR to be performed, and consultation has occurred with Medical Control;
OR
 - d. There is an obvious sign of death, e.g., rigor mortis, decomposition, decapitation, dependent lividity, evisceration of heart or brain, or incineration;
OR
 - e. The patient is a pulseless, apneic victim of a multiple casualty incident where resources of the EMS system are required for stabilization of other patients;
OR
 - * f. The patient is a victim of blunt trauma or penetrating trauma to the head and had no vital signs in the field (pulseless, apneic, fixed and dilated pupils). In traumatic deaths, a monitor need not be used in the initial assessment of the patient unless the Paramedic doubts death has occurred.
2. In all other cases, patient resuscitation should begin immediately, including CPR, if necessary, by the first on-scene EMS personnel and advanced life support carried out per county protocol.
3. The victim of a medical (non-traumatic) cardiac arrest should be determined to be dead in the field (DIF) and should not be transported if:
 - a. The patient's ECG shows asystole or agonal rhythm upon initial monitoring in three leads, and the patient has not responded to the initial cycle of advanced cardiac life support for asystole (see page 35). This patient may be determined to be dead in the field after consultation with medical control or the patient's physician.
 - b. The patient's ECG shows asystole or agonal rhythm upon initial monitoring in three leads and who in the paramedic's best judgment is not resuscitatable. This patient may be determined to be dead in the field after consultation with medical control or the patient's physician.
 - c. Patients found in Pulseless Electrical Activity (PEA) who have not responded to appropriate advanced cardiac life support measures for PEA may be determined to be dead in the field only after consultation with medical control or the patient's physician.

CARDIOPULMONARY RESUSCITATION GUIDELINE
DEATH IN THE FIELD (DIF) GUIDELINE (continued)

- d. The patient who has been shown to be unresponsive to appropriate and prolonged advanced cardiac resuscitative measures and who will require continuous CPR during transport may be determined to be dead in the field after consultation with medical control.
 - e. ETCO₂ monitoring with CPR indicates the following: <10 mmHg CO₂ for > 20 minutes with CPR, resuscitation efforts may be terminated with medical control concurrence.
4. Documentation:
- a. All patient encounters will be recorded on an MIR or electronic reporting system with time and procedures documented;
 - b. All non-resuscitation and termination of resuscitation will have an EKG strip documenting cardiac rhythm with time and date recorded on the strip. (Exception: traumatic arrest as above).
 - c. All conversation with medical control to be documented, to include the time, physician's name and instructions.
 - d. The Coroner's Office will be notified by the paramedic in charge on all cases of DIF.
5. Precautions:
- a. All hypothermic patients, possible drug overdoses, victims of electrocution, lightning and drowning should have resuscitative efforts begun.
 - b. Consider the needs of survivors when discontinuing a code.
 - c. If any doubt exists about the resuscitation of a patient, consult Medical Control.

WASHINGTON STATE
EMS PROVIDER'S PROTOCOLS FOR EMS-NO CPR FORM

1. **The responding EMS provider should perform routine patient assessment and resuscitation or interventions until they confirm the EMS-No CPR status in one of the following ways:**
 - a) Determine the EMS-No CPR bracelet is intact and not defaced. The bracelet will be located on either wrist, either ankle, or on a necklace or neck chain, or that the original EMS NO CPR form is present.
 - b) If no bracelet is located, look for the **original** EMS-No CPR form at the bedside, on the back of the bedroom door, or on the refrigerator. In extended or intermediate care facilities, look for the form with the patient's chart.
 - c) If bracelet is not attached, or if it has been defaced and no valid EMS-No CPR form is located, the EMS-No CPR form must be considered invalid.

2. The EMS-No CPR form is not honored in cases where there is suspected homicide or suicide:

3. **When the patient is determined to be "obviously dead", resuscitation measures shall not be initiated.**

The "obviously dead" are victims who, in addition to absence of respiration and cardiac activity, have suffered one or more of the following:

a) Decapitation	d) Rigor Mortis
b) Evisceration of heart or brain	e) Decomposition
c) Incineration	f) Dependent Lividity

4. **After confirming that the patient has a valid EMS-No CPR form, the EMS provider should carry out these standard EMS-No CPR orders:**
 - a) Open airway using AHA/ARC manual methods (do not provide positive pressure ventilation with a bag valve mask, pocket mask or endotracheal tube.)
 - b) Clear airway (including stoma) of secretions with appropriate suction device.
 - c) Provide oxygen per nasal cannula at 2-4 l/min.
 - d) Make the patient comfortable and provide emotional support.
 - e) Control any bleeding.
 - f) Provide pain medications **as per local protocols**.
 - g) Provide emotional support to the family.
 - h) Contact patient's physician or on-line medical control **if directed by local protocols** or if questions arise.

5. **If resuscitative efforts have been started before learning of a valid EMS-No CPR order, then the EMS provider should STOP these treatment measures:**
 - a) Basic CPR.
 - b) Intubation (leave the endotracheal tube in place, but stop any positive pressure ventilations.
 - c) Cardiac monitoring and defibrillation.
 - d) Administration of resuscitative medications.
 - e) Any positive pressure ventilation (through bag valve masks, pocket face masks, endotracheal tubes).

WA STATE EMS PROVIDER'S PROTOCOLS FOR EMS-NO CPR FORM
(continued)

6. **Other DNR Orders: We continue to encourage medical facilities to use the DOH EMS-No CPR Directive: (POLST)**

Sometimes health care facilities prefer to use their own health care DNR orders. When EMS providers see other DNR orders, they should do the following:

- a). Verify that the order has a physician signature requesting "Do Not Resuscitate,"
- b). Verify the presence of the patient's name on the order.
- c). Contact on-line medical control for further consultation. In most cases, on-line medical control will advise to withhold CPR following verification of a valid physician-signed DNR order.

7. **Revoking the EMS-No CPR form. The following people can inform the EMS system that the EMS-No CPR form has been revoked:**

- a) The patient (by destroying the form and bracelet, or by verbally withdrawing the directive/form.)
- b) The Attending Physician.
- c) The legal surrogate for the patient expressing the patient's intent to revoke the directive or EMS-No CPR form.

Note: The patient's wishes in regard to resuscitation should always be respected. Sometimes, however, the family may vigorously and persistently insist on CPR even if a valid EMS-No CPR form or bracelet is located. In such circumstances, initiate resuscitative efforts until relieved by paramedics (for First Responders and EMT's). Advanced life support personnel should continue treatment and consult Medical control.

8. **Documentation**

- a) Complete the Medical Incident Report (MIR) form approved by your Medical Program Director.
- b) State in writing at the upper left hand corner of the narrative summary: **"Patient identified as EMS-No CPR by form, bracelet or both."**
- c) Record the name of the patient's Attending Physician, and state whether you contacted the Attending Physician.
- d) Record the reason why the EMS system was activated.
- e) Provide appropriate support for family and bystanders when patient has expired.
- f) Follow your local Program Director's protocols for patients who have expired. Actions may include contact of the local coroner's office, the local law enforcement agency, the local chaplain service or funeral home. The MIR form must still be completed.

STATE PROTOCOLS FOR EMS-NO-CPR (continued)

9. **Liability for the EMS Provider**

Washington State Law provides immunity from liability to all EMS providers, who perform their professional duties in accordance with these protocols (RCW 70.122.051). In the situation where the EMS-No CPR form is executed pursuant to Part 5, the Legal Surrogate Decision-Maker Statement, the immunity is not absolute. However, since these protocols follow the requirements of Natural Death Act, the risk of liability is minimal.

REMEMBER:

No CPR does not mean No Treatment or No Caring. Providing comfort care measures is an important responsibility and service you provide to terminally ill patients and their families at a crucial moment in their lives.

Once death has occurred, the family and relatives become your patients.

DO NOT RESUSCITATE ORDERS

DEFINITIONS:

1. A DNR (DO NOT RESUSCITATE OR NO CODE) Order is an order issued by a physician directing that in the event the patient suffers a cardiopulmonary arrest. (i.e., clinical death) cardiopulmonary resuscitation will not be administered.
2. A living will is a legally executed document expressing the patient's wish to not undergo ALS resuscitation (under the circumstances spelled out on the document.)
3. EMS NO CPR - a form signed by the patient (or legal guardian) and personal physician allowing EMS providers to withhold resuscitation if the patient is apneic and pulseless, (see ARRYTHMIAS, for more details)
4. Resuscitation includes attempts to restore failed cardiac and/or ventilatory function by procedures such as endotracheal intubation, mechanical ventilation, closed chest massage, defibrillation and use of ACLS cardiac medications.
5. Clinical Death exists when a patient is pulseless and non-breathing.
6. Biological death has occurred when no CNS signs of life exist.

Protocol:

1. When the patient's family, friends or nursing home personnel state that the patient is not to be resuscitated:
 - a. BLS protocols at the EMT-B level will be followed while attempting to determine if a written EMS NO- CPR, DNR order from the patient's physician is in the patient's medical file or a Living Will is present.
 - b. In the absence of the above, call Medical Control or the attending physician, if known by you and available.
 - c. The EMT must document the EMS- NO CPR, DNR order, or Living Will in the patient care report.
2. No BLS or ALS procedures should be performed on a patient who is the subject of a confirmed EMS-NO CPR, DNR order or has a Living Will and who is Pulseless and Non-Breathing. Exceptions to this would be a suspected suicide or homicide victim; in these cases, full resuscitation efforts should be carried out.

CARDIAC ARREST GENERAL GUIDELINES

PARAMEDIC ONLY SKILL:

1. General Principles in Cardiac Arrest:
 - A. Each medication bolus should generally be followed by 2 minutes of CPR to assess the effects of the bolus before proceeding to additional medication steps in the guidelines.
 - B. The following medication may be given by ET tube instead of IV if and only if IV access is not established at the time the drugs are indicated. **EPINEPHRINE, LIDOCAINE, NARCAN** and **ATROPINE**.
 - C. If resuscitation is successful, proceed to appropriate post resuscitation guidelines and patient's current condition guidelines. Example: Chest Pain, Cardiogenic Shock, INDUCED HYPOTHERMIA.
 - D. If unsuccessful, after completing entire cycle, or if known time down greater than 30 min, contact Online Medical Control Physician for advice on continuing resuscitation. Capnography indicates <10 mmHg for >10 min.
 - E. Resuscitation may be terminated in the field if all of following criteria are met:
 1. The electrical rhythm is asystolic, confirmed in two different leads, and has not responded to the guideline treatment for asystole.
 2. There are no pulses, heart tones, or Capnography waveforms; PEA identified and patient has not responded to the guideline treatment for PEA.
 3. There is no respiratory effort.
 4. Hypothermia is not present.
 5. This case is not suspected as being Homicide or Suicide.

PRECORDIAL THUMP

PARAMEDIC ONLY SKILL:

1. Precordial Thump indicated in:
 - A. Witnessed, monitored ventricular tachycardia or fibrillation, when defibrillator and pacer capability is not immediately available.
 - B. Monitored ventricular asystole when repeated precordial thumps produce a ventricular complex and pulse. Maintain precordial thumps until spontaneous rhythm occurs or a pacemaker is inserted or initiated.

DRUG RECOMMENDATIONS – ACLS

- I. The recommended dose of **Epinephrine** is 1 mg. IV push every 3-5 minutes. **Epinephrine** may also be used as:
Continuous infusion: Mix 1 mg in 250 ml NS or D5W and run at 1-10 ug/min.
Initial starting dose is 1ug/min and titrate to response. (15 gtts = 1ug) (60gtts set)
Endotracheal Dose: 2-2.5 mg every 3-5 min. (Dilute in 10 ml of Normal Saline).
- II. **Vasopressin: 40 units IV push**, Used in Ventricular fibrillation/Pulseless Ventricular Tachycardia and Asystole. Substitutes for Epinephrine for first and/or second dosing.
- III. **Sodium Bicarbonate (1 mEq/kg):**
 - May be considered early in resuscitation if arrest time > 5 min
 - Indicated and helpful if known or suspected hyperkalemia
 - Indicated and helpful in tricyclic overdoses
 - May be helpful if intubated and continued long arrest interval
 - May be helpful upon return of spontaneous circulation after long arrest.
 - Suspected respiratory arrest.
- IV. **Atropine – 3 mg full atropinizing dose in adult. (0.04 mg/kg total dose)**

May be helpful to have short dosing intervals, e.g 0.5 mg given 3-5 minutes between doses in bradycardias.

VENTRICULAR FIBRILLATION AND PULSELESS VENTRICULAR TACHYCARDIA

I. Initial Intervention:

1. Identify absence of pulse/respirations. If monitored, witnessed arrest; precordial thump.

IF ARREST HAS BEEN IN PROGRESS FOR MORE THAN 3-5 MINUTES:

- * 2. CPR, Apply EKG pads; ET tube 100% Oxygen, IV Balanced Salt Solution.
- * 3. EKG or paddles for "Quick Look."
Determine presence of ventricular fibrillation or ventricular tachycardia.
Defibrillate X1 Biphasic 200 ws
If V-Fib persists, CPR, Meds; **Defib: Biphasic 300 ws**
If V-Fib persists, CPR, Meds; **Defib: Biphasic 360 ws**
(Children 2 ws/kg first shock; 4 ws/kg subsequent shocks. same dose for both monophasic and biphasic up to 120 ws biphasic).

IF ARREST HAS BEEN IN PROGRESS FOR LESS THAN 3 MINUTES:

- * 2. EKG or paddles for "Quick Look."
Determine presence of ventricular fibrillation or ventricular tachycardia.
Defibrillate X1 Biphasic 200 ws
If V-Fib persists, CPR, Meds; **Defib: Biphasic 300 ws**
If V-Fib persists, CPR, Meds; **Defib: Biphasic 360 ws**
(Children 2 ws/kg first shock; 4 ws/kg subsequent shocks. same dose for both monophasic and biphasic up to 120 ws biphasic).
- * 3. CPR; Apply EKG pads; ET Tube; Oxygen 100%; IV Balanced Salt Solution.

II. Drug Therapy:

- * 1. Drug Therapy – (**Defibrillate 360 ws Biphasic** after each drug given).
 - a. **Epinephrine; 1.0mg IV or ET (2-2.5 mg). Repeat every 3-5 minutes prn.**
(Children 0.01mg/kg initial dose, 0.01mg/kg second and subsequent doses every 3-5 minutes).
OR
* **Vasopressin 40u IV (single dose only) (peds; Not Recommended)**
 - * b. If V-Fib persists, **Lidocaine 1.0-1.5 mg/kg bolus, may repeat 0.5-0.75 mg/kg bolus in 3-5 minutes if V-Fib persists. Max 3 mg/kg**
(peds, 1mg/kg, may repeat 0.5-0.75 mg/kg to max of 3 mg/kg)
OR
* **Amiodarone 300 mg IV push (may repeat 150 mg IV in 3-5 min. maximum total dose of 2200mg/24hrs.) (peds; 5 mg/kg rapid IV bolus, repeat 5 mg/kg in 3-5 min., 5mg/kg infusion over 20-60min. Total of 15 mg/kg/24 hours)**
 - * c. If multifocal WCT (Torsades) or if Hypomagnesemia is suspected, **Magnesium Sulfate 1-2 grams bolus IV push. (peds; 25-50 mg/kg over 10-20 min infusion, total max 2 gms)**
 - * d. Consider **NaHCO₃ 1 mEq/kg IV**. Can be used earlier in medication administration cycle.
 - * e. Continuously monitor effectiveness of CPR, oxygenation, Capnography.

**VENTRICULAR FIBRILLATION
AND PULSELESS VENTRICULAR TACHYCARDIA (Continued)**

III. If defibrillation is successful:

1. Supraventricular rhythm greater than 60/minute with pulses:
 - a. Utilize an infusion rate of the drug associated with restoration of a stable rhythm. If no antiarrhythmic given during the resuscitation, follow below medications.
 - b. **Lidocaine 1 mg/kg IV bolus (slowly over 2-3 minutes, if not given already). [Max. 3 mg/kg total dose.] (peds: same as adult)**

Lidocaine drip (follow Lidocaine protocol).

If transport time extended, repeat **Lidocaine** one-half bolus at 8 minutes, if not given already. [Max. **Lidocaine 3 mg/kg total dose**] (peds, may repeat 0.5-0.75 mg/kg in 8 min to max of 3 mg/kg)

OR

Amiodarone mix 1000 mg into 500 cc NS run at 1mg/ min. (30ml/hr or 30 gtts/min) peds; 5mg/kg infusion over 20-60min. Total of 15 mg/kg/24hours) (Note glass bottle and nitro drip tubing required for IV drip)

2. Bradycardia, Idioventricular rhythm: (No **Lidocaine or Amiodarone** bolus or drip)
 - a. **Atropine 0.5 mg IV; repeat as needed every 3-5 minutes to total dose of 3.0 mg.(0.04mg/kg total) peds 0.02 mg/kg (max single dose 0.5mg in child.)**
 - b. **External pacemaker, early.**
 - c. **Dopamine** per protocol
 - d. **Epinephrine** drip per protocol

ASYSTOLE GUIDELINE

I Initial Intervention:

1. **CPR.**
 - a. Identify absence of pulse and respirations.
- * 2. EKG paddles for "Quick Look."
Determine presence of "Electrical Asystole."
If question as to asystole vs. fine V-Fib, **defibrillate** as for ventricular Fibrillation.
3. If unsuccessful:
Apply EKG Leads. Determine asystole in 3 leads.
IV TKO with balanced salt solution.
ET tube, 100% O₂.
4. Consider possible causes and treat per protocol:

Hypoxia	Acidosis	Hypothermia
Hyperkalemia	Drug overdose	Calcium Channel Blockers
Hypovolemia	Tamponade	Tension pneumothorax
Massive AMI	Massive PE	Hypokalemia

II. Electrical Therapy:

- * 1. Consider immediate (within 60 seconds) **transcutaneous pacemaker** if:
 - a. Bradycardia converting to asystole during resuscitation
 - b. Defibrillation → asystole
 - c. Asystole due to **Adenocard** administration.

III. Drug Therapy

- * 1. **Epinephrine; 1.0mg IV**; May repeat every 3-5 minutes prn.
or
ET (2-2.5 mg every 3-5 min. Dilute in 10 ml of Normal Saline); May repeat every 3-5 minutes prn. (**child: 0.01mg/kg may repeat 3-5 min; ET dose 0.1 mg/kg**)
or
Vasopressin 40u IV (single dose only) Replaces first or second dose of **Epinephrine (peds; Vasopressin Not Recommended)**
- * 2. Consider **NaHCO₃ 1 mEq/kg IV. (peds; 1 mEq/kg).**
 - a. Continuously monitor effectiveness of CPR and oxygenation.
- * 3. If rhythm is restored, follow appropriate protocols e.g., fibrillation, bradycardia, hypotension, etc. If asystole persists, consider termination of efforts. Capnography <10 Torr for Ten Minutes, consider termination.

PULSELESS ELECTRICAL ACTIVITY

Includes:

Electromechanical dissociation
Idioventricular rhythms
Ventricular escape rhythms
Brady asystolic rhythms
Post defibrillation idioventricular rhythms
Pseudo-EMD

I. Initial Intervention

1. Identify absence of pulse and respirations.
2. CPR.
- * 3. EKG paddles or leads. Determine presence of PEA (electrical rhythm without pulses). ETCO₂ monitoring and ventilations only (no chest compressions) generate a waveform, then patient has blood movement, treat for hypotension.
- * 4. Consider Pseudo-EMD:
 - *** Hypovolemia (volume infusion)
 - *** Cardiac Tamponade (pericardiocentesis)
 - *** Tension Pneumothorax (needle decompression)
 - Hypoxia (oxygenate)
 - Drug Overdose (e.g. tricyclic, beta blocker, calcium channel blocker, digitalis)
 - * Hyperkalemia (NaHCO₃, CaCl₂, D50, insulin)
 - * Acidosis (ventilate, NaHCO₃)
 - Massive Acute Myocardial Infarction (pressor agents)
 - Massive Pulmonary Embolus
 - Hypothermia
- * 5. **ET tube, 100% O₂.**
IV; volume challenge with 300-500 cc. balanced salt solution

II Drug Therapy

- * 1. **Epinephrine; 1.0mg every 3-5 minutes IV or ET(ET dose regimen) ; repeat every 3-5 minutes prn. (child: 0.01mg/kg may repeat 3-5 minutes; ET 0.1 mg /kg).**
- * 2. If bradycardia, **Atropine 0.5-1 mg IV, may repeat to 0.04mg/kg total.(3 mg total) (ET dose regimen) (child: 0.02 mg/kg ; ET 0.03 mg/kg)**
- * 3. If witnessed event, consider Transcutaneous Pacemaker.
4. Continuously monitor effectiveness of CPR and oxygenation.

DYSRHYTHMIAS

I. Initial Intervention

1. Scene and Initial Patient Assessment.
2. **O₂ (SAT monitor) and CPR**, as needed.
- * 3. Apply **EKG. 12 Lead prn.** (Do not delay care to obtain 12 lead)
ET tube, as indicated, with 100 % O₂.

II. TACHYDYSRHYTHMIAS

A. VENTRICULAR TACHYCARDIA –

(Stable) with adequate perfusion, (conscious, no shock, no CHF, no angina). *Choose one antiarrhythmic agent. Be careful not to cause pro-arrhythmic responses with administration of multiple antiarrhythmic medications.*

1. O₂ High flow.
- * 2. **IV balanced salt solution.**
- * 3. **Lidocaine 1-1.5 mg/kg; Repeat bolus 0.5 mg/kg** every 8 min., if needed.
Start infusion at **1-4 mg/min. (total 3 mg/kg).**
OR
Amiodarone 150 mg IV over 10 min. May repeat every 10 min times three as needed and tolerated.
Start infusion (1000 mg into 500cc NS run at 1mg/min or 30gtts/min)
- * 4. IF VT persists, **cardiovert** as in unstable VT.
- * 5. If VT is caused by hypomagnesemia, Torsades or TCA OD, **Magnesium Sulfate 2 grams** diluted to 50-100 D5W or NS IV Slow (5-30 min.), should be used first. **(Peds; 25-50 mg/kg over 10-20 min; max dose 2 grams; faster for Torsades)**

B. VENTRICULAR TACHYCARDIA –

(Unstable = unstable condition must be related to the tachycardia. Signs & symptoms may include chest pain, SOB, decreasing LOC, low blood pressure, shock, pulmonary congestion, congestive heart failure, acute MI.)

1. **O₂ high flow.**
- * 2. **IV**
- * 3. Consider **sedation** as needed.
(Etomidate 0.1 mg/kg max 20 mg) [Preferred] or
(Versed 2.0-5.0 mg IV) or (Valium 2.0—5.0 mg)
- * 4. **Synch cardiovert**
Biphasic: 100, 200, 300, 360 ws. **(peds 0.5 ws/kg, 1 ws/kg prn).**
- * 5. If recurrent VT or persistent:
Lidocaine, per protocol
OR
Amiodarone, per protocol
OR
Magnesium Sulfate, per protocol for suspected hypomagnesemia, Torsades or TCA overdose.

DYSRHYTHMIAS (continued)

C. WIDE-COMPLEX TACHYCARDIA (WCT) of uncertain type (SVT vs. VT)

STABLE

1. O₂ high flow
- * 2. IV in a large, proximal vein
- * 3. Lidocaine 1-1.5 mg/kg; Repeat bolus 0.5 mg/kg every 8 min., if needed.
Start infusion at 1-4 mg/min. (total 3 mg/kg).
OR
Amiodarone 150 mg IV over 10 min. May repeat every 10 min times three as needed and tolerated.
Start infusion at (1000 mg into 500cc D5W run at 1mg/min or 30 gtts/min)
- * 4. If WCT rhythm persists, cardiovert as needed as if unstable.

UNSTABLE See above definition.

- * 1. Cardiovert as per unstable VT. (SYNCH @ 75j – 120 j – 150 j – 200 j)
2. Consider sedation as needed. (Versed, Valium, Etomidate)

D. SUPRAVENTRICULAR TACHYCARDIA

SINUS TACHYCARDIA:

1. consider cause (e.g., hypovolemia, etc.).
2. treat shock

ATRIAL FIBRILLATION/FLUTTER –with rapid ventricular rate:

* **Stable:**

- * Diltiazem (Cardizem): 0.25 mg/kg IV (usually 15 to 20 mg) slowly over 2-3 min. Consider if pt. Is stable, May repeat in 15 min. with 0.35 mg/kg (typically 20 to 25 mg) slowly over 2-3 min. Maintenance infusion, 5-15 mg/hr drip, titrated to physiologically appropriate heart rate.

Unstable:

- * 1. Cardiovert synchronized at Biphasic: 100, 200, 300, up to 360 ws.;
Peds 0.5 ws/kg to 1 ws/kg
2. Sedation as needed.
Etomidate 0.1 mg/kg [preferred] or,
Versed, 2.0-5.0 mg or,
Valium, 2.0-5.0 mg

E. PSVT, nodal tachycardia, PAT etc.

1. If stable, attempt vagal maneuvers:
 - * a. Cough, valsalva
 - * b. Carotid sinus massage: (CSM)
Establish bilateral carotid, no bruits; do right CSM, wait 1 minute; do left CSM if right unsuccessful.
2. If PSVT persists:

Push Adenocard as per below Dosing Regimen.

DYSRRHYTHMIAS:
SUPRAVENTRICULAR TACHYCARDIA (continued)

*** ADENOCARD Dosing Regimen**

- a. Large Bore I.V. (antecubital preferred, two port tubing)
- b. **6 mg Adenocard** I.V. rapid push (< 2 seconds) followed with rapid saline flush.
If no conversion:
 2nd **12 mg Adenocard** I.V. rapid push, followed with rapid saline flush.
 3rd **12 mg Adenocard** I.V. rapid push, followed with rapid saline flush.
Ped: 0.1 mg/kg. (max dose 6 mg) If unsuccessful, repeat at 0.2 mg/kg (max dose 12 mg)
- c. Record B/P before and after each bolus, Record any patient symptoms, complaints etc.
(For patient on Theophylline, dosage adjusted to **12, 12, 18 mg** Pushes)
- d. **Contra-indication: 2nd block, 3rd block, allergy, denervated heart (transplants) known WPW.**
- e. Caution: Asthma, pregnancy, and Pt. on Tegretol/Dipyridamole
- f. Ineffective in A-Fib/A-Flutter

- * 3. If PSVT persists:
 - a. **Diltiazem (cardizem) 0.25 mg/kg** (typically **15 to 20 mg**)
 - b. May repeat at **0.35 mg/kg** (typically **20 to 25 mg**)
 - c. Maintenance infusion, **5-15 mg/hr drip**, titrated to physiologically appropriate heart rate.
- * 4. If hypotensive, fluid challenge 200-300cc balanced salt.
 - a. Contraindication: pulmonary edema
- * 5. **Unstable**

Unstable condition must be related to the tachycardia. Signs & symptoms may include chest pain, SOB, decreasing LOC, low blood pressure, shock, pulmonary congestion, congestive heart failure, acute MI.)

- a. **Etomidate 0.1 mg/kg** only; for sedation, as needed.
or
Versed 2.0—5.0 mg only for sedation, as needed.
or
Valium 2.0—5.0 mg only for sedation, as needed.
- b. **Cardioversion: Biphasic: 50, 100, 200, 300, 360 ws, synchronized**
(Peds 0.5ws/kg, to 1ws/kg)

F. JUNCTIONAL TACHYCARDIA:

- 1. **Cardizem:** Consider if pt. is stable, **0.25 mg/kg IV**(usually **15 to 20 mg**) slowly over 2-3 min. May repeat in 15 min. with **0.35 mg/kg** (typically **20-25 mg**) slowly over 2-3 min.
Maintenance infusion, **5-15 mg/hr drip**, titrated to physiologically appropriate heartrate
Use Cardizem with caution in Pulmonary Edema patients.
- 2. **DO NOT CARDIOVERT!!!!!!!**

DYSRRHYTHMIAS (continued)

III. BRADYDYSRRHYTHMIAS

A. (SINUS, A-V, NODAL, IDIOVENTRICULAR)

1. No treatment needed if no serious signs or symptoms.
2. If serious signs or symptoms, (chest pain, dyspnea, decreased LOC, low blood pressure, shock, Acute Pulmonary Edema/CHF, acute MI, PVC's etc.):
 - * a. **Atropine 0.5 mg IV**, repeat every 2-5 minutes as needed to **3 mg (0.04 mg/kg)** total dosage to maintain rate 60/min; discontinue **Atropine** if chest pain increases.
Peds: 0.02 mg/kg. repeat once if needed.
 - * 2. **External pacemaker** per protocol;
 - a. Do not delay transcutaneous pacer while awaiting IV access or for **Atropine** to take effect.
 - b. This is the primary treatment for high degree heart blocks (Second degree type II AV block and third degree or denervated heart).
 - * 3. **Epinephrine 2-10 mcg/min (1 mg/250cc NS = 4 mcg/cc) OR (1mg/500cc NS = 2 mcg/cc)**; titrate for rate and BP.
Pediatric 0.1—1.0 mcg/kg/min titrate to effect:
 - * 4. **Dopamine 2-20 mcg/kg/min** for BP. (B/P \leq 90 systolic)
Peds: same as adult.

CONGESTIVE HEART FAILURE/PULMONARY EDEMA

I. Initial Interventions:

1. Scene Size-up and Initial Assessment (rales/crackles)
2. Sit patient up if possible; dangle legs.
3. **O₂**, maintain Sats above 94% discretionary.
- * 4. If patient in extremis
 - a. **CPAP** (follow protocols)
 - b. **100% O₂**
 - c. BVM assist as needed, Intubate, as needed.
 - d. Sedation as needed.
- * 5. EKG monitor; treat dysrhythmias as indicated per protocol.
- * 6. IV TKO or saline lock.

II. Drug Therapy

1. If systolic BP > 110
 - * a. **Nitroglycerin 0.4 mg or Nitrospray 0.4 sublingual.**
 - * b. May repeat **Nitroglycerin or Nitrospray** x 2 every 3-5 min; or **Nitropaste 2 inches** applied to chest.
- * 2. Consider **NTG drip** as per protocol on page 42.

Nitro is contraindicated in Right Sided Myocardial Infarctions:

- * 3. **Lasix 40-80 mg IV.**
- * 4. **Morphine Sulfate 2-5 mg** slow IV; may give **2mg prn.** to total dosage of **30 mg.** Use caution in Right Sided Myocardial Infarctions.

CONTRAINDICATIONS to Nitro: Severe anemia, hypotension or uncorrected hypovolemia, cerebral hemorrhage, closed angle glaucoma, head trauma, increased ICP, pericardial tamponade, constrictive pericarditis, patient's on erectile dysfunction medications.

NITROGLYCERIN IV ADMINISTRATION GUIDELINE

INDICATIONS: Organic nitrate and potent venodilator with antianginal, anti-ischemic, and antihypertensive effects. Drug of choice in unstable angina or CHF associated with acute MI.

Nitro is contraindicated in Right Sided Myocardial Infarctions/or extreme caution with medical control's concurrence:

DOSAGE: 10-20 mcg/min initially. Increase by 5-10 mcg/min increments every 5-10 min until desired hemodynamic response. If no response at 20 mcg/min, 10 mcg/min increases may be used.
NO FIXED OPTIMUM DOSE.

DO NOT USE FILTERS, USE ONLY NON-ABSORBING NITROGLYCERIN TUBING.

NITROGLYCERIN		
Concentration		Administration
200 mcg/mL	100 mcg/mL	Rate mcg/mL
1.5	3	5
3	6	10
4.5	9	15
6	12	20
9	18	30
12	24	40
15	30	50
18	36	60
21	42	70
24	48	80
27	54	90
30	60	100

CONTRAINDICATIONS to Nitro: Severe anemia, hypotension or uncorrected hypovolemia, cerebral hemorrhage, closed angle glaucoma, head trauma, increased ICP, pericardial tamponade, constrictive pericarditis, patient's on erectile dysfunction medications.

NITROGLYCERIN IV ADMINISTRATION PROTOCOL Continued

- PRECAUTIONS:** Severe hepatic or renal disease.
- DRUG INTERACTIONS:** Potentiated by alcohol, antihypertensives, aspirin, beta adrenergic blockers, phenothiazines and tricyclic anti-depressants. May cause marked orthostatic hypotension with calcium channel blockers, erectile dysfunction medications. May antagonize anti-coagulant effects of Heparin****. Inhibited by vasopressors, bronchodilators, decongestants, glaucoma agents.
- INCOMPATIBLE :** **DO NOT ADD/MIX WITH ANY OTHER DRUG.**
- SIDE EFFECTS:** Headache (50%), abdominal pain, allergic reactions, (e.g. itching, tracheobronchitis, wheezing), restlessness, tachycardia, vomiting, nausea, palpitations, hypotension, dry mouth, apprehension, angina, dizziness, muscle twitching, vasodilation with flushing.
- ANTIDOTE:** Notify MD of all side effects. Discontinue if blurred vision or dry mouth occur. For accidental overdose with severe hypotension and reflex tachycardia, reduce rate or temporarily discontinue until condition stabilizes.
- Lower head of bed, administer IV fluids, use O₂ and assist ventilation if needed.

CARDIOGENIC SHOCK

I. Initial Interventions:

1. Scene Size-up and Initial Patient Assessment
2. **O₂**, high flow
* **Intubate**, as needed.
3. Supine position; Trendelenburg, as needed. [DO NOT USE MAST]
- * 4. EKG, 12 lead, treat any dysrhythmias as per protocols.
- * 5. **IV** balanced salt solution; **fluid challenge 200-300 cc** in 5-10 min if no rales; if patient's condition improves continue fluid challenges, but if pulmonary edema develops, switch to TKO or saline lock.

II. Drug Therapy:

- * 1. **Dopamine 5-20 mcg/kg/min infusion**, as needed if hypotension persists; decrease dosage as pressure improves.

DOPAMINE DRIP CHART.

Mix:

400 MG in 250 ml D5W or **800 mg into 500 ml D5W**

PATIENT WEIGHT:

mcg Kg/ min	2.5 kg	5 kg	10 kg	20 kg	30 kg	40 kg	50 kg	60 kg	70 kg	80 kg	90 kg	100 kg
2 mcg	**	**	**	1.5	2	3	4	5	5	6	7	8
5 mcg	**	1	2	4	6	8	9	11	13	15	17	19
10 mcg	1	2	4	8	11	15	19	23	26	30	34	38
15 mcg	1.4	3	6	11	17	23	28	34	39	45	51	58
20 mcg	2	4	8	15	23	30	38	45	53	60	68	75

Microdrips per minute (or ml/hour)

Chest Pain / Possible ACS

I. Initial Interventions

1. Scene Size-up and Initial Patient Assessment
2. O₂ at 4-10 liters (nasal/non-rebreather mask as needed.)
- * 3. Monitor; treat any dysrhythmias as per protocols.
If ischemic event suspected, obtain serial 12 lead EKG.
Do not delay treatment or transport to do 12 lead EKG
- * 4. Establish IV- TKO balanced salt solution.

II Drug Therapy:

1. If systolic BP > 110,
 - * a. Nitroglycerin 0.4 mg sublingual. or Nitropaste 2 inches applied to the chest. or Nitrodrip titrate to effect, keeping B/P ≥ 110.
 - * b. May repeat Nitroglycerin x2 every 3-5 minutes, OR Nitrodrip titrate to effect, keeping B/P ≥ 110

NOTE: IF RIGHT SIDED OR INFERIOR AMI IS SUSPECTED DO NOT ADMINISTER NITROGLYCERIN, ADMINISTER FLUID CHALLENGE.

- * 2. Anti-emetic medications:
 - a. Zofran (Ondansetron) 4-8 mg IV, IM or IO. May repeat X 1 in 15 minutes.
OR
 - b. Promethazine (Phenergan) 12.5 – 25mg IV, IM or IO for Nausea/Vomiting or in conjunction with opioids to prevent Nausea/Vomiting. Should be given before opioids. **Never SQ.**
OR
 - c. Inapsine 0.625 –2.5 mg (1/4—1cc) I.V. IM. or IO for Nausea/Vomiting or in conjunction with opioids to prevent Nausea/Vomiting. Should be given before opioids.
- * 4. Pain medications:
 - a. Morphine Sulfate 2-5 mg IV; may repeat titrate to effect to total 30 mg.
 - b. Fentanyl 50-100 ug IV may repeat 50 ug titrating to effect. May be better tolerated by patient that can become hemodynamically unstable than MS. Max 400 mcg.
 - c. Dilaudid 0.5-1 mg IV may repeat half initial dose titrating to effect. Preferred if used when longer acting pain control is needed.
- * 5. Aspirin, 4 baby (81 mg) chewed well and swallowed. (total 324 mg) [Aspirin contraindicated in known allergy, active bleeding ulcer].
6. Contact Medical Control ASAP. Inform: "We have a possible MI, our ETA is and notify of 12 lead interpretation, emergent transport."
 - a. If appropriate, the need for **thrombolytics** must be evaluated. Initiate Pre-Hospital Care Protocols.

PRE-THROMBOLYTIC CARE GUIDELINES
ACUTE MI

I Initial Interventions:

1. Scene Size-up and Initial Patient Assessment
2. **Oxygen** (nasal cannula or non-rebreather mask) as needed
- * 3. Monitor, treat any dysrhythmias per protocols.
- * 4. 12 lead EKG;
Notify Medical Control of 12 lead findings when appropriate:
Medical Control must be informed of AMI, elevation of ST segment (2 mm in chest leads and 1 mm in limb leads) in 2 or more contiguous leads, for example: Leads II, III, AVF,
- * 5. **IV's** TKO Balanced salt solution or Saline Lock, Bilateral large bore. (**Important to make as few punctures as possible**). 18 gauge or > preferred. A multi-port IV set is preferred.
- * 6. **Phlebotomy** needs to be done prior to any drug administration. Blood draw tubes for cardiac profile: Lavender top; blue top; red top and green top.
7. Pre-Hospital Thrombolytic Checklist Questionnaire needs to be completed (See p.).

II. Drug Therapy:

1. **ASA 324 mg p.o. (4- 81 mg chewable tablets).**
If absolutely known patient has already received at least 324mg of **ASA** on the day **tPA** therapy begins, do not administer additional **ASA**. If there is a history of **ASA** intolerance, consult physician.
- * 2. **Heparin 60 units/kg, maximum dose 4000 units IV. Drip 12 units /kg/hour rounded to nearest 50 units, with maximum rate 1000 units/hour.** (check precautions)
- * 3. ***Pain therapy as needed. See chest pain protocol***
- * 4. Anti-emetic medications:
 - a. **Zofran (Ondansetron) 4-8 mg IV, IM or IO.** May repeat X 1 in 15 minutes.
OR
 - b. **Promethazine (Phenergan) 12.5 – 25mg IV, IM, or IO** for Nausea/Vomiting or in conjunction with opioids to prevent Nausea/Vomiting. Should be given before opioids. **Never SQ.**
OR
 - c. **Inapsine 0.625 –2.5 mg (1/4—1cc) I.V. IM. or IO** Should be given before opioids.
5. Vital signs and neurological assessment to be taken q. 15 min.
- * 6. If patient presents with an inferior AMI, do a right sided 12 lead EKG to R/O Right Ventricle Infarction. If pt hypotensive, do an I.V. **Fluid Challenge** of 250 ml, repeat fluid challenge(s) PRN. Monitor pt. for Pulmonary Edema.

PREHOSPITAL THROMBOLYTIC CHECKLIST		
YES	NO	
		Hemorrhagic stroke (other type CVA within 1 year)
		Intracranial Pathology (tumor, recent head trauma, etc.)
		Active Internal Bleeding Within 10 days (except menses)
		Suspected Aortic Dissection
		Uncontrolled Hypertension (BP> 180/110)
		Current use of anticoagulants (not including aspirin)
		Recent trauma (2-4 weeks)
		Prolonged CPR (>10 min)
		Major surgery (< 3 weeks prior)
		Recent (2-4 weeks) internal bleeding
		Known allergy to thrombolytic and/or prior use
		Terminal Illness
		Pregnancy

BRIEF CHECKLIST FOR USE OF THROMBOLYTIC THERAPY

(Note: Thrombolytics only to be initiated at the hospital by Emergency Room Staff).

Candidates:

1. Chest pain of at least 30 min. duration. Time of onset of chest pain during which patient is a candidate for therapy is at the discretion of M.D.
2. ST segment elevation of 1.0 mm in limb leads and 1.5 mm for females and 2.0 mm for males in chest leads. Elevation must be in two or more contiguous leads. (i.e. II, III, AVF or V₁, V₂, V₃)

Absolute Contraindications:

1. Active internal bleeding.
2. Pregnancy.
3. Recent major surgery.
4. Recent severe hemorrhagic problem.
5. Recent stroke.

Relative Contraindications:

1. Known bleeding diathesis.
2. History of intracranial hemorrhage or neoplasm.
3. History of stroke.
4. History of minor surgery within 2-4 weeks.
5. Recent hemoptysis, GI, GU, or ENT hemorrhage.
6. History of recent trauma.
7. Prolonged CPR or traumatic intubation.
8. Coma.
9. Indwelling or recent subclavian catheter.
10. Hypertension; severe, prolonged, with B/P > 180/110.

Other Considerations:

1. Anticoagulation therapy with Coumadin.
2. Diabetic hemorrhagic retinopathy.
3. Advanced liver or kidney disease.
4. Known or suspected left heart thrombus.
5. Infectious endocarditis.
6. Any pathology with predisposition to bleeding such as ulcerative colitis, polycystic kidneys, AV malformation, vascular tumors.
7. Indwelling or recent internal jugular catheter.
8. If Streptokinase is to be used, administration of Streptokinase between the past 2 weeks and 6 months.

S.T.E.M.I. QUICK RECOGNITION		
Quick Reference		
STEMI TYPE	ST CHANGES IN LEADS	ARTERY OCCLUSION
Inferior	II III aVF	Right Coronary—Posterior
High Lateral	I aVL	Diagonal
Lateral	I aVL V ₅ V ₆	Circumflex of Obtuse Marginal
Anterolateral	V ₃ V ₄ V ₅ V ₆	Left Anterior Descending
Anterior	V ₃ V ₄	Left Anterior Descending- Circumflex
Anteroseptal	V ₁ V ₂ V ₃ V ₄	Proximal Left Anterior Descending
Septal	V ₁ V ₂	Left Anterior Descending, Diagonal
Posterior	V ₈ V ₉ <i>Reciprocal ST depression in V1 V₂ V₃ V₄</i>	Right Coronary Artery—Circumflex
Right Sided	RV ₃ RV ₄	Right Coronary Artery

ST or T wave changes suggestive of possible AMI:

1. ST Elevation greater than 1 mm limb leads, and 1.5 mm for females and 2 mm in males in two or more contiguous V leads,
2. Inverted T waves, or flat T wave formation in two or more leads
3. Pathologic Q wave \geq 0.03 seconds or 1/3 the height of QRS

EMT: AUTOMATIC EXTERNAL DEFIBRILLATION

Pending arrival of ALS personnel

I Initial Interventions:

1. Initial Assessment (ABC's)
2. If no Pulse:
 - a. Initiate CPR., until defibrillator is attached
 - b. Ventilate with 100% Oxygen, (do not delay AED operations)
 - c. Attach defibrillation electrodes and press **Analyze**
 - d. Follow AED verbal prompts

Note: Do not use AED if patient is < 90 lbs of weight without pediatric attachment connected.

II. Defibrillation Sequence:

1. If shock advised, **defibrillate once** (360 ws) Monophasic only. 120 ws. Biphasic.
Note: Pulse checks not necessary between shocks unless "No Shock Advised"
2. Check Pulse:
Note: If patient is hypothermic, limit shocks to 3, continue CPR until ALS arrival.
3. If no pulse:
 - a. **CPR** for 2 minute then check pulse
 - b. If no pulse press **Analyze**
 - c. **Defibrillate**, 360 ws once as necessary

Note: Pulse check not necessary between shock unless "No Shock Advised".

 - d. **CPR** for 1 minute
4. Check Pulse
5. If no pulse:
 - a. Press **Analyze**
 - b. **Defibrillate**, 360 ws once as necessary.

Note: Pulse check not necessary between shocks unless "No Shock Advised".

III. Persistent V-Fib

If V-fib persists after 3 shock/CPR cycles, repeat sets as above followed with 2 minute of CPR between each set until "No Shock Advised".

IV. Patient Regains Pulse (Return to Spontaneous Circulation)

If the patient regains pulse or pulse present during above sequence:

- a. Assess vital signs
- b. Support airway and breathing

V. Other Considerations:

1. "No Shock Advised" and no pulse present.
 - a. Resume **CPR** and **re-analyze** after 1-3 minutes,
2. A written report with event summary attached must be completed and sent to MPD.

STANDING ORDERS FOR EXTERNAL PACEMAKER

I. INDICATIONS:

- A. Asystole following defibrillation, or when bradycardia degenerates to asystole.
- B. Third or second degree block.
- C. Symptomatic bradydysrhythmia not responding to **Atropine**.
- D. First line therapy for bradydysrhythm in denervated hearts. (heart transplants)

II. PROCEDURE:

A. Initial Intervention:

- 1. CPR, as indicated.
- 2. Establish rhythm and baseline vital signs.
- 3. O₂ high flow.
- 4. **Atropine** per protocol page 161.

*

B. Pacing Procedures:

- 1. Attach pacing electrodes.
- 2. Select: demand operation, if stand-alone pacemaker.
- 3. Adjust ECG gain to sense intrinsic QRS complexes.
- 4. Pacing rate 80.
- 5. Activate Pacer: **Increase current until capture, decrease current until just above capture threshold.** EKG capture: change in QRS, wide QRS, QRS after each pacer spike. Mechanical capture: pulse, rise in B/P, increase in LOC, improved color/temperature, etc.
- 6. Document with rhythm strips.

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C. Monitoring Patient Response:

- 1. If patient is conscious, assess patient for comfort; consider sedation as needed (**Versed 1- 4 mg IV or IM, or Valium 2.0-5.0 mg IV only**).
- 2. If patient unconscious, assess blood pressure and pulse.
- 3. Institute medical therapy with **Dopamine** drip, or **Epinephrine** drip, if no capture with pacer for bradycardic rhythms.
- 4. If no response to pacer or ACLS drugs, contact Medical Control.

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III. Documentation:

- 1. Date, time, baseline rhythm, pacing rhythm strips.
- 2. Milliamp current required to capture.
- 3. Pacing rate and mode selected.
- 4. Patient response to pacing: electrical/mechanical.
- 5. Medications used.
- 6. Date, time pacing terminated.

IV. Contraindications:

- 1. Asystole as presenting rhythm.
- 2. Pediatric patient too small for correct application of pacer pads.
- 3. Patient meeting death in the field criteria.
- 4. Patient with signs of penetrating or blunt trauma.

*** **CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)** ***

I. Introduction: (Paramedic, Advanced and EMT intervention only)

1. CPAP has been successfully demonstrated as an effective adjunct in the management of pulmonary edema secondary to congestive heart failure.
2. CPAP is a non-invasive procedure that is easily applied and can be easily discontinued without untoward patient discomfort.
3. CPAP may prove to be a viable alternative in many patients previously requiring endotracheal intubation by prehospital personnel.

II. Prehospital Indications:

1. Congestive heart failure
2. Pulmonary edema due to volume overload
 - a. Renal insufficiency
 - b. Iatrogenic volume overload
 - c. Liver disease
3. Non-Cardiogenic Pulmonary Edema of any cause
4. Asthma and COPD.

III. Contraindications:

1. **Absolute** – Respiratory Arrest, Agonal Respirations, Unconscious, Pneumothorax, Facial anomalies e.g. burns, fractures, facial trauma, etc.
2. NOT TO BE USED IN CHILDREN
3. **Relative** – Decreased L.O.C., Claustrophobia, Patient Intolerance to equipment (e.g. mask), Tracheostomy (if lacking an adaptor)

IV. Hazards:

1. Gastric distension, corneal drying, hypotension, pneumothorax
2. COPD and asthmatic patients may have a higher risk of complications such as pneumothorax and CO₂ retention. Monitor closely.

V. Procedure:

1. Place facemask and apply O₂ device as per manufacturer recommendation
2. Airway pressure should be set at 5 cm/H₂O and adjusted per patient response. Do not exceed 25 cm/H₂O
3. Consider mild sedation PRN if patient has difficulty tolerating device

*****INDUCED HYPOTHERMIA*****

I. PURPOSE:

Increased brain temperature contributes to ischemic brain damage in patients post cardiac arrest. Studies have shown that lowering brain temperatures, even a few degrees decreases ischemic damage. In studies of out of hospital cardiac arrest, induced hypothermia protocols have contributed to improved neurological outcomes.

II. INDICATIONS:

1. Return of spontaneous circulation (ROSC) following a non-traumatic cardiac arrest.
2. Patient who remains comatose (coma is defined as not following commands, no speech, no eye opening, no purposeful movements to noxious stimuli, brainstem reflexes and pathological/posturing movements are permissible) GCS <8.
3. Endotracheal Intubated patients only.
4. Patient who is maintaining a systolic blood pressure of >90 with or without use pressor agents.

III. CONTRAINDICATIONS:

1. Patients who have regained consciousness.
2. Patient having any current hemorrhage related complications or recent major surgeries within 14 days. Patient with recent traumatic event.
3. Patient must be greater than 16 years of age.
4. Female patient who is pregnant.
5. Initial temperature must be greater than 34C (93.2 F)
6. Patient must be intubated with capnography verifying placement.
7. Patient unconscious prior to arrest due to other causes.
8. Patient with end stage terminal illnesses.

III. PROCEDURE:

1. Airway, *must have ET placement and verified with ETCO₂*. **Oxygen** High Flow. Monitor respiratory rate carefully. ETCO₂ reading must be > 20 mmHg. with target ETCO₂ at 40 mmHg.
2. Check to verify Circulation, vital signs and systemic circulation. B/P >90 Systolic. This blood pressure may be maintained by an intravenous vasopressor if needed.
3. Perform a thorough neurological evaluation.
4. Remove outer clothing, can leave underwear in place. Apply ice packs to axilla, head, neck and groin. Remember, no direct contact of ice to skin.

INDUCED HYPOTHERMIA (continued)

III. PROCEDURE: CONT:

5. If patient is not currently sedated, administer **Versed 5 mg to max dose of 20 mg IV/IO**. Loading dose. **Versed maintenance infusion. 25 mg Versed added to 100cc NS, (0.5 mg/mL NS) infused at 0.02—0.10 mg/kg/hr. or 1—7 mg/hr. Generally 5 mg/hr (20gtts/min)**
6. 4 Degree C Saline Bolus 30—40 mL/Kg to max of 2 Liters. Core temp target is 32C—34C (91.5F—93.2F)
7. **Fentanyl 50—100 mcg** repeat half dose every 30 min,
OR
8. **Dilaudid 1—2 mg IV** may repeat X 2 every hour.
9. **Vecuronium 5—10 mg IV/IO**. Repeat PRN. **Vecuronium (Norcuron)** Maintenance doses 25—40 minutes **0.01—0.015 mg/kg** or IV infusion, see drug reference for administration rate.
10. **Dopamine 10—20 mcg/kg/min** maintaining Systolic B/P at 90-100 mmHg.
11. If at any time patient circulation is lost, discontinue induced hypothermia protocols and treat patient with appropriate cardiac arrhythmia protocols.
12. Remember, hypothermic patients are prone to **metabolic alkalosis**, so **do not hyperventilate** the patient. Patient respirations need to be inside the ETCO₂ perimeters.
13. Do Not delay transport to hospital for purpose of inducing hypothermia.
14. Reassess patient often for changes in Temperature, EKG, pulses, B/P, neuro, sedation, paralytic responses etc.

EMT ASPIRIN GUIDELINES

INDICATIONS:

1. Patients exhibiting any of the following signs or symptoms:
 - a. Uncomfortable pressure, fullness, squeezing or substernal pain of the chest that lasts more than a few minutes, or goes away and comes back.
 - b. Pain that radiates to the shoulders, neck or arms.
 - c. Chest discomfort with lightheadedness, fainting, diaphoresis, nausea or shortness of breath.

OR

2. Patients exhibiting any two of the following signs or symptoms, and EMT believes it to be of cardiac origin:
 - a. Atypical chest pain, stomach or abdominal pain. This may include discomfort that can be localized to a point, that is "sharp" in nature, that is reproducible by palpation, or that is in the "wrong" location (such as the upper abdomen).
 - b. Unexplained nausea (without vomiting) or lightheadedness (not Vertigo) without chest pain.
 - c. Shortness of breath and difficulty breathing (without chest pain).
 - d. Unexplained anxiety, weakness or fatigue.
 - e. Palpitations, diaphoresis or paleness.

CONTRAINDICATIONS FOR USE OF ASPIRIN BY EMT.

1. Patient is allergic to aspirin or ibuprofen (Motrin, Advil)
2. If patient has just taken aspirin for this event, do not administer any more aspirin.

PROCEDURES:

1. ALS/Advanced upgrade and evaluation in patient care is required unless ALS/Advanced is unavailable.
2. Be sure that the patient is alert and responsive.
3. If the patient has his/her own nitroglycerin and meets the criteria for administration, do not delay administration of nitroglycerin over aspirin administration.
4. Have the patient chew two baby **Aspirin 81mg** each (162mg total dose).
5. Record your actions, including the dosage and the time of administration.

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PRE-HOSPITAL PATIENT CARE GUIDELINES MEDICAL

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ACUTE ABDOMEN – NONTRAUMATIC

I. Initial Interventions:

1. Scene Size-up and Initial Patient Assessment
2. Protect airway – anticipate vomiting.
High flow O₂ (COPD caution).
- * 3. EKG -- Monitor vital signs frequently.
- * 4. **IV** – balanced salt solution TKO (consider second IV prn shock). If shock present, fluid challenge as per hypovolemia protocol.
5. Focused History and Physical Exam: Carefully evaluate abdomen, check for pulses in legs.
6. Nothing by mouth.

II Medical Interventions:

- * 1. Patient's with severe abdominal pain, or signs such as renal colic should be considered for analgesics:
 - a. **MS 2-4 mg** slowly IV q 5 min. (titrate, keeping systolic BP \geq 90)
 - b. **Fentanyl 50-100 ug IV** may be better tolerated by patients that can become hemodynamically unstable than **MS**
 - c. **Dilaudid 0.5- 1 mg IV** (longer acting)
 - d. **Ketorolac (Toradol) 30 mg IV, 60 mg IM**
- * 2. Consider the use of antiemetics.
 - a. **Zofran (Ondansetron) 4-8 mg** IV, IM or IO. May repeat X 1 in 15 minutes.
 - b. **Phenergan 12.5 – 25 mg** I.V. slowly or deep I.M.
 - c. **Inapsine 0.25 -- 1.0 cc (0.625 -- 2.5 mg** I.V. slowly or I.M.)
 - d. **Benadryl 25 mg IV.**

ACUTE ABDOMEN NON-TRAUMATIC
DISSECTING AORTA

I. Initial Interventions:

1. Scene Size-up and Initial Patient Assessment
 2. Protect airway – anticipate vomiting.
High flow O₂ (COPD caution).
 3. Focused History and Physical Exam: Carefully evaluate chest and abdomen, check for pulses in legs. Auscultation of the abdomen is preferred over palpation. Note that chest pain is often a dominant symptom.
 - * 4. EKG -- Monitor vital signs frequently.
 - * 5. **IV's** – Large bore balanced salt solution TKO (consider second IV PRN shock).
If shock present, fluid challenge as per hypovolemia protocol.
 6. Nothing by mouth.
 - * 7. Patient's with severe chest or abdominal pain associated with Dissecting Aorta. Consider the following:
 - * a. **MS 2-4 mg** slowly IV q 5 min., titrate prn
OR
 - b. **Fentanyl 50-100 ug IV** may repeat to max dose of 300 mcg.
OR
 - c. **Dilaudid 0.5-1 mg IV** (longer acting) titrate prn max dose 4 mg/hour.
- NOTE:** *If patient is normal/hypertensive; blood pressure can be lowered 20—30% of Initial pressure:*
- * 8. If hypertensive, >180/110 on two separate measurements, 15 min apart, (if no contraindications of CHF, 1st degree heart block, cardiogenic shock or asthma) administer: **Labetalol 10 mg** over 2 minutes, repeat **10 mg** or give **20 mg** dose every 10 minutes as needed. **Limit decrease to 20% of initial B/P**
 - * 9. Consider sedation:
Inapsine 0.5-1.0 cc (1.25-2.5 mg I.V. slowly or I.M.)
OR
Versed 1—2 mg I.V. slowly or I.M.)
OR
Valium 2.0 – 5 mg. I.V. slowly or I.M.)
 10. Consider application of MAST pants for Abdominal Aneurysm.
 11. Surgical Team activation.
 12. Rapid but smooth transport to closest medical facility.

ACUTE ABDOMEN – NONTRAUMATIC

RUPTURED AORTIC ANEURYSM

I Initial Interventions:

1. Scene Size-up
2. Airway protection:
Oxygen administration; High Flow NRM
3. Focused History and Physical Exam: Carefully evaluate the abdomen, check for pulses in legs, Auscultation of abdomen is preferred over palpation. (listen for bruits)
4. Differentiate between Ruptured Aortic Aneurysms and Dissecting Aorta.

II. Medical Interventions:

1. EKG monitor
Frequently check Vital Signs
2. IV's—large bore with balanced salt solution. If patient is hypotensive, fluid challenge as per hypovolemia protocol.
3. MAST trousers.
4. Give nothing by mouth.
5. Phlebotomy for type and cross match.
6. Alert hospital for surgical intervention and preparation for Blood Product administration. Alert Life Flight for possible transport.
7. Careful titration of **Fentanyl 50 mcg**, **Morphine 4 mg** or **Dilaudid 1 mg** for pain.

ANAPHYLAXIS

(BEE STING OR MEDICATION/FOOD ALLERGY)

MILD REACTION—GENERALIZED ITCHING, HIVES, NO DYSPNEA/WHEEZES

- * 1. **IV** – balanced salt solution. (Fluid Boluses as needed to treat shock).
- * 2. **Oxygen** as needed. **EKG** monitor.
- * 3. **Benadryl** 25-50 mg IM, or P.O. or IV -- 25 mg (Child 1 mg/kg IM or P.O. or IV 0.5 mg/kg). (*EMT administration P.O. Tabs Benadryl 25—50 mg*)
- * 4. **Famotidine** 20 mg IV. (Child > 1 y.o. 0.25 mg/kg up to 20 mg IV)
- * 5. **Solumedrol** 125 mg IV, IM or IO. (Child 2mg/kg not to exceed 125mg).
OR
Decadron 8-20 mg IV, IO or IM; (child 0.3--0.6 mg/kg IV, IO or IM not more than 1 ml per thigh)

SEVERE REACTION-DYSPNEA, WHEEZES, LARYNGOSPASM, SHOCK

- * 6. **MedNeb for wheezes** (per protocol) **Albuterol/Atrovent**
- * 7. Airway, (E.T. tube, cricothyrotomy prn). (Drug Assisted Intubation per protocols)
- * 8. **Epinephrine** 1:1000-0.3—0.5 mg; IM or Sublingual (child 0.01 mg/kg [0.01 cc/kg]).
Preferred Dosing: Caution for Epinephrine Administration: Adult >50 y.o. or cardiac history.
OR
Terbutaline 0.25 mg Sub Q. every 15—30 min X 2 (Peds 0.01 mg/kg repeat X 1) *May be administered as an alternative to Epinephrine.*

Alternative Dosing EPINEPHRINE: Extreme Reaction, uncompensated shock

- * a. **I.V. Epinephrine** drip, 2—10 mcg/min: Mix 1 mg 1:1000 in 500cc NS (2 mcg/cc) titrate to effects, start at 1 ml/min and increase every 1 minute, as needed.(titrate to HR, BP, and PVC's.)
(Child: 0.1 mcg/kg/min, increase as needed).
- * b. **I.V. Epinephrine** – 1:10,000 – 0.1 mg (1 cc) IV, repeat every 3-5 minutes as needed to maximum of 0.3-0.5 mg- monitor EKG closely.
(Child: 0.01 mg/kg)
- * 9. **Dopamine** (2-20 mcg/kg/min). per protocol page 169, as needed, if above not effective for shock. Maintain SBP > 90.

ADDITIONAL ORDERS FOR BEE STING

- 1. Follow above orders.
- 2. Search for stinger, apply loose rubber tourniquet above and below stinger, remove with gentle scraping with knife blade or credit card.
- * 3. **Epinephrine** 1:1000 0.3 mg may be given into sting site (except fingers, toes, nose, ear).

ANAPHYLAXIS “EPINEPHRINE IM INJECTION”
EMT/ADVANCED TECHNICIAN ORDERS

Note: Life threatening airway/respiratory compromise may develop as the reaction progresses.

I. Scene Size up/Initial Patient Assessment

II. Initial Intervention:

1. Signs and Symptoms
 - a. *Not all signs and symptoms are present in every case.*
 - b. **History-** *Previous exposure; Previous experience to exposure; Onset of Symptoms; Dyspnea.*
 - c. **Level of consciousness-** *unable to speak; Restless; Decreased level of consciousness; Unresponsive.*
 - d. **Upper Airway-** *Hoarseness; Stridor; Pharyngeal edema/spasms.*
 - e. **Lower Airway-** *Tachypnea; Hypoventilation; Labored-accessory muscle use; Abnormal retractions; Prolonged expirations; Wheezes; Diminished lung sounds.*
 - f. **Skin-** *Redness; Rashes; Edema; Moisture; Itching; Urticaria; Pallor; Cyanotic*
 - g. **Vital Signs-** *Tachycardia; Hypotension*
 - h. **Gastrointestinal-** *Abnormal cramping; Nausea/vomiting; diarrhea*

Note: When a paramedic system exists, ALS rendezvous shall be arranged as soon as possible as directed by local or regional patient care procedures or when directed by medical direction/control.

III. Medical Interventions:

1. Remove offending agent (i.e. Stinger)
2. ABC's
Oxygen High Flow NRM
Ventilate as needed (if not done during initial interventions)
3. Anaphylaxis/Allergic Reaction with Severe Respiratory Distress.
 - a. Circulation.
 - b. **Epinephrine 1:1000** (administered by IM from EMS supplies)
 - i. Dosage:
 - a. **Adult: (30 kg or above) adult (0.3mg)**
 - b. **Infant or Child (under 30 kg) (0.01mg/kg)**
 - ii. Assure **epinephrine** is not cloudy, crystallized or discolored.
 - iii. Record time of injection and reassess in two minutes
 - a. Contact medical control
 - b. Provide supportive care and transport.
 - c. If the administration of Epi is refused do not administer Epi, contact medical control and continue supportive care.
4. Pulse Oximetry if available
5. Psychological support.

IV. Ongoing Assessment

V. Transport.

CAPNOGRAPHY

I GENERAL CONSIDERATIONS:

- A. Capnography (ETCO₂ monitoring) is a non-invasive method that measures CO₂ in exhaled gases, thus providing an evaluation of ventilatory status. Capnography is an early indicator of the body's physiological response to hemodynamic changes and thereby serves as another assessment tool. Capnography is also valuable in demonstrating clinical evidence for the need of medical interventions such as RSI and cricothyrotomy.

II INDICATIONS:

- A. Capnography should be used in all the following medical/trauma emergencies.
1. Respiratory distress or failure. (ie. CHF, COPD, asthma)
 2. Shock due to trauma (ie hypovolemic shock stage 1 indicator)
 3. Shocks due to medical emergencies. (ie. Cardiogenic, anaphylaxis)
 4. Cardiac Arrest
 5. R/O PEA
 6. Intubated patients to prove ET placement and necessity of intubation.
 7. Any other medical conditions where hemodynamic monitoring is indicated.
 8. Sedated or high doses of opioids, benzodiazepines or other respiratory depressant medications.

III CONTRAINDICATIONS:

- A. There are no contraindications to the use of capnography.

IV. PROCEDURES:

A. <i>For patients who are intubated.</i>
--

1. Attach the mainstream or side stream sensor to the ET tube.
2. Provide ventilatory assistance to maintain CO₂ readings at 35-45 mmHg. (30-35 mmHg in serious head injury patients)
3. Confirm tube placement by auscultating breath tones
4. Confirm tube placement by using ETCO₂ waveform if available.
5. Monitor CO₂ readings.

Note: CO₂ readings (<0.5%) and no wave form would indicate a possible misplaced ET Tube.

B. <i>For Non-intubated patients:</i>
--

1. Attach the mainstream or side stream sensor to the appropriate collecting device.
2. Ensure that the sensor is working adequately.
3. Have wave form available.
4. Monitor CO₂ readings, printable strip of waveform for documentation.

Capnography (continued)

C. Causes of increased $ETCO_2$

1. Fever
2. Sepsis
3. Sodium Bicarbonate Administration
4. Increased metabolic rate
5. Seizures
6. Respiratory depression
7. Muscular paralysis
8. Hypoventilation
9. COPD
10. Rebreathing
11. Leak in ventilator circuit

D. Causes of Decreased $ETCO_2$

1. Hypothermia
2. Pulmonary hypoperfusion
3. Cardiac arrest
4. Pulmonary embolism
5. hemorrhage
6. Ventilator disconnect.
7. Esophageal intubation
8. Complete airway obstruction
9. Poor sampling
10. Leak around ET tube and cuff
11. Hypotension
12. Hyperventilation.

NOTE: $ETCO_2$ monitoring in cardiac arrest indicates the following; <10 mmgh CO_2 with CPR for >20 min. indicates that the patient has no cellular respiration and resuscitative efforts can be terminated with Medical Control concurrence

CVA

I. Initial Interventions:

1. Scene Size-up and Initial Patient Assessment.
2. Protect and maintain airway-place patient in lateral position, on paralyzed side if present-nasopharyngeal or oropharyngeal airway suction prn.
3. **Oxygen;** Maintain Sat levels above 94%.
 - a. Assist ventilation, as needed. Oral intubation preferable to nasotracheal. If intracranial bleed suspected, maintain normal ventilation rate and target EtCO₂ of 30 - 35 mm/hg.
 - * b. **RSI** as needed.
- * 4. Cardiac monitor.
5. Focused History and Physical Exam.
- * 6. Initiate **IV TKO or saline lock**- draw blood for chemical analysis.

II. Other Considerations:

1. Reassure patient if conscious; remember that patient may understand and hear all conversation even though he/she appears comatose or confused.
2. Treat the following per protocols:
 - a. Consider potential sources of abnormal mental status (hypoglycemia, drugs, etc.).
 - b. Consider potential predisposing conditions for stroke (hypertension, dysrhythmias).
- * 3. Altered mental status protocol (**Glucometer/D50/Narcan/Thiamine**). Treatment is based upon presenting signs and symptoms; D50 for diabetic, Narcan for OD, Thiamine for ETOH.
4. If hypertensive, >180/110 on two separate measurements, 15 min apart, (if no contraindications of CHF, 1st degree heart block, cardiogenic shock or asthma) administer: **Labetalol 10 mg** over 2 minutes, repeat **10—20 mg** every 10 minutes as needed. **Limit decrease to 20% of initial B/P**
5. Transport **Emergently** if the patient meets the following criteria:
 - a. **Patient > 18 years of age, not pregnant, exhibiting acute signs of ischemic CVA.**
 - b. **Signs and symptoms must have been recognized within 2 hours.**

Clinical presentation of acute CVA may include:

-Aphasia	-Hemianopsia
-Ataxia	-Hemiparesis
-Cranial nerve palsies	-Loss of sensation
-Diplopia	-Quadriparesis
-Dysarthria	-Visual disturbances

- * Treat other symptoms should they arise according to protocols.

DROWNING/NEAR DROWNING

I. Initial Intervention

1. Scene Size-up and Initial Patient Assessment. (Protect cervical spine).
2. Establish and maintain airway:
 - a. clear mouth and pharynx, suction liberally with tonsil tip, sweep oropharynx with finger.
 - b. Support ventilations, as needed.
 - * c. Intubate, as needed.
 - d. 100% O₂; monitor lung sounds frequently.
- * 3. **Cardiac monitor.**
- * 4. Treat dysrhythmias per protocol.
- * 5. **IV balanced salt solution TKO.**

II. Drug Therapy

- * 1. **NaHCO₃ 1-2 mEq/kg IV** for apnea, cyanosis and/or prolonged submersion.
Pediatric: 1—2 mEq/kg IV.
2. Unconscious patient protocol, as indicated.
 - a. Glucometer
 - * b. **D50 25 gm IV [preferred given through NS IV line]**
(child/infant D25% 0.5-1.0 gm/kg) (D10 in neonates 2—4 mL/kg) (may repeat X 2 every 5 minutes, prn.)
 - * c. **Narcan** per protocol
child ≤ 5 yrs (or ≤ 20 kg) 0.1 mg/kg
 - * d. **Thiamine 100 mg IV or IM**
Child: 1mg/kg IV or IM

III. Other Considerations

1. All near drowning patients should be transported to the hospital for evaluation.
2. Protect against and/or treat hypothermia per protocols page 74.

DYSTONIC (PHENOTHIAZINE REACTION)

I. General Considerations

Occurs uncommonly during therapy with phenothiazine-type drug (listed below).

1. Characteristics:
 - a. sudden onset, usually younger patient;
 - b. contractions of muscles of face, neck, back;
 - c. protrusion/fasciculations tongue common;
 - d. oculogyric crisis (eyes looking upwards);
 - e. laryngospasm sometimes present;
 - f. better with voluntary activity;
 - g. emotional patient (frightened);
 - h. drugs involved: Compazine, Prolixin, Stelazine, Haldol, Navane, Trilafon, Moban, Loxitane, Inapsine.

II. Initial Intervention

1. Initial Patient Assessment
2. Focused History and Physical Exam.
 - a. LOC
 - b. Vital Signs
 - c. reassessment exam as indicated
3. IV, TKO or Saline lock.

III. Drug therapy

- * 1. **Benadryl 25-50 mg IV/ Deep IM,**
Pediatric: 1.0 mg/kg IV/Deep IM, maximum same as adult dose.
Usually complete relief in 1-2 minutes IV and 15-20 minutes IM.
2. Transport.

EPISTAXIS – NOSEBLEED

*****PARAMEDIC PROCEDURE ONLY*****

I. Initial Intervention:

1. Patient Assessment
2. Establish and maintain airway / supplemental oxygen, as indicated / anticipate vomiting / advise patient not to swallow blood. Treat all associated Signs and Symptoms of epistaxis.
3. Vital signs / treat shock, if present or anticipated as per protocols.
4. Treat as anterior bleed initially: Sit patient up and lean forward slightly. Pinch anterior cartilaginous portion of nose firmly for 10 minutes and have patient breathe through mouth.

* If no improvement, treat as posterior bleed and insert Nasal balloon or Foley catheter into nares.

II. Procedure for Insertion of Nasal Balloon

1. Choose size of **nasal balloon** to fit patient (small, regular, large).
2. Sit patient up, if possible.
- * 3. Check nasal balloon for eccentric inflation pattern, then lubricate with **Lidocaine jelly**; have patient blow nose to clear clot; insert Nasal balloon to hub along floor of nasal cavity.
4. Inject 8 cc of water (or air) slowly, then check patient for continued bleeding; inspect posterior nasopharynx.
5. Inject additional water or air, as needed, until bleeding stops, opposite nostril is occluded, or soft palate bulges; then remove enough water or air to relieve pressure. Document volumes of air/water used.
6. This technique should be performed en route to the hospital.

GASTRIC DECOMPRESSION – NASOGASTRIC/OROGASTRIC TUBE

I. Indications

1. Inability to adequately ventilate due to gastric distension, patient intubated.
2. Gastric distention with Nausea/Vomiting
3. Drug Overdose

II. Contraindications

1. Head/face injured trauma patient – orogastric placement only.
2. Anatomic abnormalities preventing correct placement

III. Procedure

1. Determine correct size and depth of tube
 - a. Size:
 - i. Newborn 8.0 fr
 - ii. Toddler/preschool 10 fr
 - iii. School age 12 fr.
 - iv. Adolescents/adults 14-18 fr
 - b. Depth:
 - i. Nasogastric: Top of nose, over the ear to xyphoid process
 - ii. Orogastric: Lip, around angle of mandible to xyphoid process
2. Insert Tube
 - a. Nasogastric:
 - i. Pass tube along nasal floor into stomach
 - ii. Instill air into tube w/ 60cc syringe and auscultate epigastrium
 - iii. Secure tube to nose.
 - b. Orogastric:
 - i. Visualize posterior pharynx, pass tube over tongue into stomach.
 - ii. Instill air into tube w/ 60cc syringe and auscultate epigastrium
 - iii. Secure tube to corner of mouth
3. Aspirate/suction stomach contents until patient can be ventilated or gets relief.

IV. Precautions/complications

1. In head trauma patient where gastric decompression would benefit ventilation, gastric tube placement will be through the mouth.
2. NG/OG intubation should only be considered if patient will benefit from procedure.
3. Complications associated with NG tube placement.
 - i. Epistaxis
 - ii. Intracranial placementComplications associated with NG/OG tube placement
 - i. Bronchial placement
 - ii. Pharyngeal perforation, esophageal obstruction or rupture
 - iii. Bronchial or alveolar perforation
 - iv. Pneumothorax
 - v. Gastric or duodenal rupture

HEAT SYNDROMES

I. HEAT CRAMPS, HEAT EXHAUSTION

1. Scene Size-up and Initial Patient Assessment.
Vital signs and secondary survey, as indicated.
Oral temperature/LCD thermometer.
- * 2. Cardiac monitor.
3. Move to cooler environment, remove excess clothing.
Tepid compresses to forehead, neck, extremities.
4. Oral fluids, if possible (water, sports drinks, etc.).
- * 5. Initiate **IV with balanced salt solution**, if unable to take oral fluids or if hypotensive, **Fluid challenge with 250-500 cc rapidly**.
6. Transport as necessary.

II HEAT STROKE

1. Scene Size-up and Initial Patient Assessment.
Vital signs and secondary survey as indicated.
Rectal temperature if comatose or LCD thermometer.
- * 2. Cardiac monitor.
3. Move to cooler environment, remove clothing, aggressive cooling with wet sheets, cool packs, evaporative airflow.
- * 4. **High flow O₂** / protect and maintain airway.
Intubate, as needed.
- * 5. Initiate **IV with balanced salt solution/fluid challenge with 250 cc over 20 minutes** unless pulmonary edema develops.
- * 6. Control Seizures or to control shivering when cooling.
 - a. **Valium IV 5.0 – 10.0 mg** slowly and may repeat in 3-5 min. to total dose of **20mg**
OR
 - b. **Versed 2-5mg IV**.
- * 7. Treat cardiac dysrhythmias per protocol.
- * 8. Altered mental status protocol (**Glucometer/D50/Narcan/Thiamine**), as indicated.
9. Rapid transport to hospital.

HYPERKALEMIA

I. Recognition/Signs/Symptoms

1. Suspect in known renal failure or dialysis patient.
2. Symptoms: tingling, numbness, paresthesias, flaccid weakness.
3. Signs: EKG changes (peaked T waves, prolonged P-R interval, wide QRS, PVC's, Bigeminy, V-Tach, V-Fib).

II. Initial Intervention

1. Establish and maintain airway, as needed.
2. O₂. As needed
3. CPR, as indicated.
- * 4. Cardiac monitor.

III. Specific Therapy

- * 1. Establish IV Balanced Salt Solution Run open if patient can tolerate; blood draw, if possible.
- * 2. **10% CaCl 5 cc (500 mEq) IV slowly (2-3 min).** (Caution: Do not mix with bicarbonate.) (Flush IV tubing very well before administration of Sodium Bicarbonate) (**Pediatric: 10% CaCl- solution 0.2 ml/kg give slowly over 5-30 min**)
- * 3. **Sodium bicarbonate one ampule (50 mEq) in 50 cc** balanced salt solution administered over 10 min.; flush tubing.
Pediatric: 0.5- 1.0 mEq/kg IV over 10 min.
- * 4. **Lasix 40 mg IV.**
Pediatric: 0.5 – 1 mg/kg IV
- * 5. **Albuterol 2.5 mg/3cc** via medication nebulizer.
(Child: adult dose: 2.5 mg/3 cc)
- * 6. **Contact for Medical Control concurrence:**
25 g Dextrose, followed by **10 units regular Insulin IV** push [if available].
Pediatric: 0.5 gm/kg followed by 0.1 units/kg of regular insulin.
May repeat dosage if signs and symptoms persist with medical control concurrence.
- * 7. Follow protocols for dysrhythmias.
8. Rapid transport.

HYPERTENSIVE EMERGENCIES

I. Initial Intervention

1. Scene Size-up and Initial Patient Assessment
2. Confirm hypertension (use appropriate size cuff).
History, as available.
3. Hypertensive emergencies: Systolic >180 pressure, Diastolic pressure >120 with:
 - A. acute pulmonary edema,
 - B. angina,
 - C. hypertensive encephalopathy;
 - i. headache,
 - ii. nausea and vomiting,
 - iii. blurred vision,
 - iv. confusion.
4. Blood pressure reduction should not exceed a 20% drop in B/P over 30-60 min.

II. Treatment

1. **Oxygen PRN**, maintain Sat levels above 94%
- * 2. **IV TKO or NaCl Lock. EKG**
3. Semi-sitting or recumbent.
- * 4. **Nitroglycerine 0.4 mg**. May repeat **Nitroglycerine x 2** every 3-5 minutes, Nitro Dose alternatives:
 - a. **Nitropaste** 2 inches applied to chest.
 - b. **Nitro drip (see Nitro Drip protocols page 42)**
- * 5. **Morphine Sulfate 2-4 mg IV**; Titrate prn for pulmonary edema/ angina to **30 mg**. **Dilaudid 1—2 mg IV**; Titrate prn for pulmonary edema/angina to **6 mg**
- * 6. **Labetolol 10 mg IV**, over 2 minutes. The goals are a HR > 60, but < 80 and a SBP 20% of initial blood pressure. **Labetolol 10 mg IV** over 2 min may be repeated 10—20 mg every 10 min. as needed. Note do not lower the Systolic B/P more than 20% of the initial B/P.
 - (a) If patient becomes hypotensive or exceeds desired target B/P decrease or HR < 50 then stop **Labetolol**.
 - (b) **Labetolol** is Contraindicated if Severe CHF, 1st degree AV Block, Cardiogenic Shock or Asthma.
- * 7. **Versed 2.5-5mg IV** slowly for seizures as needed.
OR
Valium IV 5.0 – 10.0 mg slowly and may repeat in 3-5 min. to total dose of **20 mg** as needed for seizures (Administer **Versed** or **Valium** early if hypertension is due to Cocaine toxicity).
8. Transport to hospital.

HYPOGLYCEMIA

I. Initial Intervention

1. Scene Size-up and Initial Patient Assessment.
2. Establish and protect airway; **Oxygen**
3. Consider:
 - a. History from family, bystanders, medic-alert tag.
 - b. Unknown coma assume drugs, hypoglycemia.

II. Treatment

1. Obtain blood for glucose sample; determine glucose level. Administer **oral glucose** if glucose is low by evidence of test or patient assessment consistent with hypoglycemia, and patient is conscious. Note: EMT/B may administer oral glucose to a diabetic with altered mental status who is conscious and able to swallow. (Unless patient has not taken their insulin in days)
- * 2. **Establish IV.** If unable to take oral glucose, administer **25 gm. Dextrose (D50) IV**, if hypoglycemia known or suspected; may repeat x 1, as needed. (Child 0.5—1.0 gm/kg- D25% 2—4 mL/kg) (Infant D25% 2—4 mL/kg) (Neonate D10%. 2—4 mL/kg).
- * 3. If unable to establish IV and patient unable to take orals, and patient is a known diabetic:
 - a. **Glucagon, 1 mg (unit) by SC or IM**
Pediatric < 20 kg 0.05--0.1 mg/kg; maximum dose 1 mg; SC or IM
 - b. Continue to attempt intravenous access.
25 gm Dextrose 50% when IV established.
- * 4. If no response to glucose, follow Altered Mental Status Protocol. If glucometer shows hypoglycemia, may repeat **Dextrose 25 grams.**
5. Perform secondary survey to evaluate for associated conditions.
- * 6. **EKG**
- * 7. Transport all patients on oral anti-hypoglycemic agents who develop hypoglycemia.

Note: In general, give IV **Glucose** for any hypoglycemia less than 50, even if oral glucose given.

EMT Glucose Monitor/ Diabetic Emergency

1. Signs and Symptoms:

- A. ***Hypoglycemia*** (develops rapidly)
 - a. Dizziness and headache
 - b. Abnormal, hostile or aggressive behavior
 - c. Fainting, convulsions, may be comatose
 - d. Weak and rapid pulse
 - e. Skin pale, cold, and clammy
 - f. Copious saliva, drooling

- B. ***Hyperglycemia*** (develops slowly)
 - a. Dry mouth, and intense thirst
 - b. Abdominal pain and vomiting
 - c. Restlessness
 - d. Full, rapid pulse
 - e. Dry, red warm skin
 - f. May be comatose

2. Patient Assessment:

- a. Follow altered level of consciousness protocols.
- b. Define techniques for *glucometer* test.
 - 1. Cleanse the area
 - 2. Turn on *glucometer*
 - 3. Check status of *glucometer*
 - 4. Insert test strip into *glucometer* and apply blood to test strip
 - 5. Read monitor results.

3. Emergency Medical Care.

- a. **Glucometer** blood sugar < 60 with associated signs and symptoms. If the patient is able to swallow, administer oral glucose, or substance high in simple sugar, i.e. honey in orange juice.
- b. **Glucometer** blood sugar > 120 with associated signs and symptoms. Administer no sugar.
 - 1. Be prepared for patient to vomit
 - 2. Provide supplemental oxygen and/or ventilation.
 - 3. Maintain body temperature.

4. Transportation:

- a. Place patient in position of comfort, preferable lying on their side, and be prepared for vomiting.
- b. If patient regains full consciousness and refuses transport, ***Consult with Medical Control.***

Glucometer weekly control check:

- a. Levels high and low need to be preformed and control documented.
- b. Battery check
- c. Use proper monitor glucose sticks
- d. Proper equipment: 2x2, lancets and holder, extra batteries, alcohol wipes.

HYPOTHERMIA/COLD EXPOSURE

I. INITIAL INTERVENTIONS:

- A. Scene Size-up and Initial Patient Assessment.
 1. Remove wet clothing, protect against heat loss and wind chill.
 2. Maintain patient supine (do not allow patient to ambulate/exert themselves).
 3. Avoid rough handling.
 4. Monitor temperature (hypothermic thermometer).
- * B. **EKG.**

II. Pulse/Breathing Present:

- A. Mild Hypothermia: (34 - 36 degrees C aka 93.2 - 96.8 degrees F) Moderate Hypothermia (30 - 34 degrees C aka 86 - 93.2 degrees F):
 1. Institute rewarming procedures, ie **Oxygen** warmed and humidified, warm packs, heated blankets, warmed ambulance, etc.
 2. If temperature is below *34 degrees C* begin truncal rewarming:
 - * a) Warmed **IV** fluids (200 - 300 ml) **avoid over-hydration.**
 - b) Heat packs to groin, axillary.
 - c) **Oral glucose** if hypoglycemic.
- * B. Severe Hypothermia (<30 degrees C aka <80 degrees F):
 - * 1. Warmed **IV** fluids (200 - 300 ml) **avoid over-hydration.**
 2. **Oxygen** warmed and humidified.
 3. Administer **25gms D50** IV if hypoglycemic. (Child 0.5—1.0 gm/kg- D25% 2—4 mL/kg) (Infant D25% 2—4 mL/kg) (Neonate D10%. 2—4 mL/kg).

-NOTE- Emergent, gentle transport. Notify receiving facility of need for in-hospital rewarming procedures:

III Pulse/Breath Absent:

- A. **CPR**
- B. If V-Fib present or occurs:
 - * 1. **Defibrillate** (120-150-200 ws biphasic) (peds 0.5—1 ws/kg)
 - * 2. **Intubate** ventilate with warmed, humidified **oxygen.**
 3. Warmed **IV** fluids (200 - 300 mL) (peds **avoid over-hydration.**)
- C. If temperature <30 degrees C (<86 degrees F).
 1. Continue **CPR.**
 2. Limit shock for VF/VT to 1 maximum.
 3. Withhold IV medications
 4. Continue above re-warming procedures during transport.
- D. If temperature > 30 degrees C (>86 degrees F).
 1. Continue CPR
 2. Repeat defibrillation prn as core temperature rises.
 3. IV medications as indicated (longer than normal dosing intervals)
 4. Continue above re-warming procedures during transport.

III. Other Treatment Considerations:

- * A. Unconscious patient protocols; draw blood, **Narcan 2mg IV** (Peds 0.1 mg/kg IV); **Thiamine 100mg IV** (Peds 1 mg/kg); Glucometer, if hypoglycemia known or suspected, **D50 25 grams IV.** (Child 0.5—1.0 gm/kg- D25% 2—4 mL/kg) (Infant D25% 2—4 mL/kg) (Neonate D10%. 2—4 mL/kg).
- B. If frostbite present; protect with dry dressings, do not rub frostbitten areas, and permit only gradual warming by room temperature out of hospitals.

NAUSEA AND/OR VOMITING

I. INDICATIONS:

1. Patients who are nauseated and vomiting from illnesses/trauma or medication administration.
2. For prophylactic administration when nausea and or vomiting maybe anticipated.

II. CONTRAINDICATIONS:

1. When specific medication allergy is known to exist.
2. If patient is under the age of 2 years old
3. Recent Abdominal surgery.
4. Comatose
5. QT interval issue with **Inapsine**.
6. Use cautiously with Seizure disorders.
7. Use cautiously with hepatic failure patients giving **Zofran**
8. Use cautiously with patients having altered level of consciousness giving **Phenergan, Inapsine**.

III. GENERAL CONSIDERATIONS:

1. Scene Size Up.
2. ABC's and vital signs
3. Airway management and oxygen administration.
4. Establish a baseline Neurological assessment.
5. Establish IV balanced Salt Solution.
6. Administration of anti-emetic.
 - a. **Zofran (Ondansetron) 4-8 mg** IV, IM or IO. May repeat X 1 in 10 minutes. OR Administer **8 mg Zofran ODT**. (oral disintegrating tablets)
Peds ODT 0.1 mg/kg \geq 20 KG 2mg (1/2 Tablet) \geq 40 KG 4 mg Tablet
Oral Disintegrating tablets come in 4 mg or 8 mg dosages
OR
 - b. **Phenergan 12.5 – 25 mg** I.V. slowly or deep I.M.
OR
 - c. **Inapsine 0.25 --1.0 cc (0.625 -- 2.5 mg** I.V. slowly or I.M.)
 - d. **Benadryl 25--50 mg** IV or IM.
7. Consider placement of Nasal Gastric Tube when appropriate:

POISONING AND OVERDOSES

I. Caution

Protect yourself from exposure: Patient should be removed from area of toxic substance by personnel equipped with proper safety gear [e.g. self-contained breathing apparatus].

II Initial Intervention

1. Initial Patient Assessment
2. Establish and maintain airway
 - a. Assist ventilations as necessary / **100% O₂**.
 - * b. Intubate, as needed.
 - *** c. Consider cricothyroidotomy, if needed.
3. Early contact with Medical Control or Poison Control
4. Monitor vital signs.
* **Cardiac monitor.**
- * 5. **IV** balanced salt solution, as needed.
- * 6. **Albuterol 2.5mg in 3 cc (Peds same as adult dose)** sterile water by MedNeb for wheezing.
7. Transport.

III. Specific Therapies

1. **Carbon monoxide:**
 - a. Hyperventilate patient with **100% O₂**.
 - b. Contact Medical Control for possible diversion to hyperbaric chamber at Providence Medical Center.
2. **Chlorine gas or dust:**
 - a. Humidified **oxygen**,
 - b. Treat per protocols for severe pulmonary edema or broncho-spasm..
3. **Hydrogen Sulfide:**
 - a. Respiratory depression, assist ventilations
 - b. Treatment seizures per protocol.
4. **Cyanide Inhalation:** Smoke inhalation for subject in closed homes/cars fires
 - a. Hyperventilate with **100% O₂** / assist ventilations
 - b. **Hydroxocobalamin 5 gm (vit B12)** IV, to be given over 30 min (**Peds 70 mg/kg IV over 15 min. not to exceed 5 gms**)
 - c. **Sodium Bicarb 1 mEq/Kg.** (**Peds same as adult**)
5. If specific industrial compound known, refer to protocols in:

EMERGENCY RESPONSE GUIDEBOOK
U.S. DEPARTMENT OF TRANSPORTATION
Follow these protocols except if superceded by a specific order in these "Protocols".

POISONS AND OVERDOSAGES (continued)

I. Initial Intervention

1. Initial Patient Assessment, LOC/ vital signs.
2. History as obtainable from patient and/or bystanders.
3. Early contact with Medical Control or Poison Control (1-800-222-1222)
Mary Bridge Children's Health Center (1-800-542-6319)
Oregon Health Sciences University (1-800-452-7165)

II. General Treatment Guidelines

1. *External contamination only:*
 - a. Protect medical and rescue personnel.
 - b. Remove contaminated clothing.
 - c. Brush off any solid material from skin.
 - d. Flush contaminated skin or eyes with copious amounts of water.
2. *Internal ingestion or inhalation:*
 - a. Responsive, alert patient with gag reflex:
 - i. **Activated Charcoal (Actidose)** per Poison Control or Medical Control **Adult 25-50 g PO; Child 1-2 g/kg PO (usual 12.5-25 g)**
 - ii. Carefully monitor vital signs and LOC.
 - iii. **Do Not Ipecac.** If parent has given Ipecac at home prior to your arrival, notify nurse upon arrival at hospital.
 - b. Major overdose, gag depressed, LOC depressed:
 - i. Establish and protect airway. NG Tube.
 - ii. Ventilate as needed with 100% Oxygen
 - iii. **Intubation** as needed (if narcotics suspected, administer **Narcan** prior to ET attempt.)
 - iv. **IV Balances** salt solution
 - v. **Glucometer**, Draw bloods
 - c. Depressed respirations, unknown ingestion:
 - i. Establish and protect airway as above
 - ii. **Narcan 2mg I.V.**
Child \leq 5 yrs (or \leq 20 kg) 0.1 mg/kg
 - iii. **D50 25 grams**, if known hypoglycemia or suspected.; Adult may repeat x 1 in 5 min, prn.
Child 0.5-1.0 gm/kg; may repeat x 1 in 5 min prn.
 - iv. **Thiamine 100 mg (Peds 1 mg/kg) IV** if alcoholism is suspected
 - v. **Cardiac Monitor** Treat dysrhythmias or cardiac arrest per protocols.

III. Specific Poison Therapies

1. **Cholinergic (Organo-Phosphate Insecticides)**
Salivation/lacrimation/urination/defecation/gastro/emesis/myopia/muscle fasciculation
 - a. Above assessment and general therapy
 - b. **Atropine 1-2 mg IV**, repeat every 5 minutes until secretions diminished
Child 0.02mg/kg
 - c. Suction prn
 - d. **Valium IV 5.0 – 10.0 mg** slowly and may repeat in 3-5 min. to total dose of **20 mg** for seizures; or **Versed 2-5 mg** per protocols for seizures. (**Child 0.05 mg/kg IV/IM**)

POISONS AND OVERDOSAGES (continued)

III. Specific Poison Therapies: (continued)

2. Tricyclic Antidepressants

- a. Hyperventilate in assisting respirations.
- * b. Treat hypotension with fluid challenge, **Dopamine 2—10 mg/kg/hr.**
- * c. If tachycardia >110, dysrhythmia or widening QRS, or if seizures,
 - i. **NaHCO₃ 1 mEq/kg** /slow IV push. (Child-1 mEq/kg).
Add **NaHCO₃ 100 mEq** to NS 1000 mL with IV rate 150 mL/hr.
 - * ii. **Magnesium Sulfate 2 gms** in 100 mL NS, IV, slow push (5-20 min.) if torsades de pointes. (Peds 25—50 mg/kg over 10—20 min for perfusing rhythm)
 - iii. **Lidocaine 1—1.5 mg/kg IV, infusion 2—4 mg/min** (Peds same as adult dose) if V-Tach.
 - iv. **Diazepam 5—10 mg IV** for seizures. (Peds 0.2—0.5 mg/kg IV)
- 3. **Cyanide Poison** (odor of bitter almonds); suspect in closed house fire, patient apneic and asystolic.
 - a. **Hydroxocobalamin 5 gm (vit B12) IV**, to be given over 30 min
See protocols. (Peds 70 mg/kg IV over 15 min. not to exceed 5 gms)
- 4. If specific industrial compound known, refer to protocols in:

EMERGENCY RESPONSE GUIDEBOOK
U.S. DEPARTMENT OF TRANSPORTATION
 Follow these protocols except if superceded by a specific order in these "Protocols".

- 5. **Calcium Channel Blockers or Beta Blockers** with bradycardia:
 - * a. **Atropine 0.5-1.0mg IV** (max 3mg) (child 0.02mg/kg).
 - * b. **Calcium Chloride 250-500 mg IV**, if Calcium Channel Blocker O.D.
(child 20mg/kg).
 - * c. **Glucagon 2—5 mg IV** for Beta Blockers.
(child). 0.1 mg/kg
 - d. **Fluid Challenge** 200-300 ml balanced salt solution.
(child 20 cc/kg)
 - * e. **Pace** as needed.
 - * f. **Dopamine 5-20 mcg/kg/min** for hypotension
(child 5-20 mcg/kg/min)
or
Epinephrine drip 2—10 mcg/min increase as needed to 10/mcg/kg
(child 0.1—1.0 mcg/kg/min) Drip 1 mg into 500 mL NS = 2 mcg/mL
- 6. **Cocaine, Methamphetamine, MDMA (Ecstasy)**
 - a. Cocaine induced arrhythmias:
 - i. 100% O₂
 - * ii. **Valium IV 2.0 – 5.0 mg** slowly and may repeat in 3-5 min. to total dose of 20 mg or **Versed 2.5-10mg IM/IV** for sedation or seizures.
 - * iii. Stable V-Tach; **NaHCO₃- 1mEq/KG**, followed if needed by **Lidocaine 1 mg/kg**
 - * iv. V-Fib; treat per protocol, limit **Epi** to 1 mg q 5 minutes.
- 7. **Benzodiazepine.**
 - a. **Romazicon 0.2 mg IV** over 15 sec. Repeat in 1 min intervals PRN to total of 1 mg. In case of re-sedation repeat same dose after 20 min. Not to exceed 3 mg in 1 hour. Peds: One year or older: 0.01 mg/kg IV over 15 sec. Repeat in 1 min intervals PRN to total of 0.05 mg/kg. or 1 mg maximum dose whichever is greater.

TOXIDROME TABLE

TOXIDROME	EXAMPLES	CLINICAL FEATURES	ANTIDOTES
Sympathomimetic	Cocaine Methamphetamine MDMA (ecstasy)	Agitation Diaphoresis Hypertension Seizures	Midazolam 2-10 mg Peds 0.1 mg/kg
Opioid	Heroin MS Fentanyl	Depressed Mental Status Respiratory Depression	Naloxone 0.4-2 mg Peds 0.1 mg/kg
Cholinergic	Pesticides Chemical warfare agents	Defecation Urination Myopia/muscle fasciculations Bronchospasms Emesis Lacrimation Salivation	Atropine 1 mg (repeat as need) Peds 0.02 mg/kg Valium 5—10 mg Peds 0.1 mg/kg
Sedative/Hypnotic	Barbituates Benzodiazepine GHB	Depressed Mental Status Hypotension Hypothermia	Supportive care: (Benzo only) Romazicon 0.2 mg repeat every 1 min to total of 1 mg. Peds 0.01 mg/kg (see drug cht)
Cardiotoxic	Beta Blockers Calcium Channel Blockers	Bradycardia	Glucagon 2-5 mg Peds 0.1-0.25 mg/kg Calcium Chloride 250-500 mg Peds 20 mg/kg
Anticholinergic	Atropine Jimson Weed Diphenhydramine	Delirium Hyperthermia Tachycardia	Supportive care:
Sodium Channel Blockers	Tricyclic	Altered Mental Status Hypotension Seizures Tachycardias V-Tach	Fluid challenge 20 mL/kg Sodium Bicarb 50 mEq in 1000 mL NS Drip. Peds 1 mEq/kg Magnesium 2 gms Peds 25 mg/kg Lidocaine 1—1.5 mg/kg Dopamine 2-20 mcg/kg Valium 5—10 mg Peds 0.1 mg/kg Midazolam 2-10 mg Peds 0.1 mg/kg
Drugs that prolong QT May include: Antipsychotics Antihistamines Antiemetics Antidepressants	Diphenhydramine Droperidol, Zofran Inapsine	Torsades de Pointes Hypotension Seizures Wide Complex Tachycardia	Magnesium Sulfate 2 gms Peds 25--50 mg/kg
Cyanide Poisoning	Smoke Inhalation (plastics)	Respiratory distress Cardiac arrhythmias.	Hydroxocobalamin 5 Gms Peds 70 mg/kg

PSYCHIATRIC DISORDERS

I. General Considerations

- A. Immediate danger to patient or medical personnel:
 - 1. Guarantee your own safety
 - 2. Call law enforcement, use of force by Law Enforcement is appropriate to render the situation safe in order that care may be given to the patient.
 - 3. Request Mental Health Professional as needed.
 - 4. Assess and treat life-threatening problems
- B. No evidence of immediate danger:
 - 1. Approach patient in a calm manner.
 - 2. Show self-confidence and convey concern for patient.
 - 3. Reassure patient he/she should and will be taken to a hospital where there are people who are interested in helping him/her.
 - 4. One EMT should establish rapport and deal with the patient.
 - 5. Answer questions honestly
 - 6. Do not leave the patient alone or turn your back

II. Initial Intervention

- A. Signs and Symptoms
 - 1. Psychological crisis
 - a. Panic
 - b. Agitation
 - c. Bizarre behavior
 - d. Danger to self or others
 - 2. Suicide Risk
 - a. Depression
 - b. Suicidal gestures
 - 3. Mental Status Examination (see altered mental status page 89)

III. Management:

- A. Manage Airway, VS and repeat exams as needed.
- B. Restrain with non-constricting restraints (Leather or Velcro) only if necessary for your protection and that of the patients, must be continually assessed for circulatory and neuro compromise. (every 15 min) Follow Federal Guidelines.
- C. Treat other medical emergencies according to protocols
- * D. Violent patients judged as unsafe for transport (possible for injury to patient or EMS personnel) may be sedated by EMT-P without physician concurrence if patient poses an immediate threat. Otherwise physician consult is advised. Suggested regimen for sedation:
 - 1. **Inapsine 1.25-5.0 mg IV or IM.** (See also Inapsine protocol).
OR
 - 2. **Haldol 2.5-5.0 mg IV or IM.** may be followed with **Benadryl.** (Haldol protocol)
OR
 - 3. **Versed--- 2-5 mg IV or IM.**
OR
 - 4. **Valium 2.0—5.0 mg IV** slowly.

Note: **Medications may be repeated during transport with Physician Concurrence.**

PSYCHIATRIC DISORDERS (continued)

IV Inter-facility transportation of Patients

- A. Transportation Considerations
 - 1. Transport orders written by county mental health professional
 - 2. Transport protocols will be completed/met if a hospital patient.
(See inter-facility transport)
 - 3. If direct transport from county jail and if patient judged by EMS as not stable for transport, patient will be taken to Klickitat Valley Health Services or Skyline Hospital Emergency Departments for evaluation.
 - 4. All Inter-facility transportation of Psychiatric patients will be properly restrained. Hard type restraints that do not constrict will be used. Leather, Velcro, and soft type are acceptable. These restraints will be evaluated for patient compromise of circulatory and neurological function every 10-15 min and document as to findings.
 - *** 5. Violent patients judged as unsafe for transport (possible for injury to patient or staff) may be sedated prior to transport by the Emergency Department physician at the request of the EMT-P

These drugs may be repeated in 1-2 hours, as needed, and a dose may be given by EMT-P during transport with Physician concurrence.

- 6. Emergencies arising during transport will be treated according to protocols and guidelines.

RESPIRATORY EMERGENCIES

I. UPPER AIRWAY OBSTRUCTION

1. Partial Obstruction
 - A. **O₂** 100%.
 - B. Sit patient up and have him/her cough.
 - C. Transport if obstruction is not cleared or if suspicious of aspiration.

2. Complete Obstruction
 - A. AHA protocol for complete obstruction.
 - * B. **Laryngoscopy** in unconscious patient with attempt to remove with MacGill forceps.
 - *** C. If obstruction not removed and unable to ventilate, consider **cricothyroidotomy** or **needle jet insufflation**
 - D. Transport to closest hospital.

II. INSUFFICIENT RESPIRATION OR ARREST

1. Rule out obstruction.
2. Ventilate with mouth-to-mask or bag-valve mask.
- * 3. Consider **CPAP** or **intubation/RSI (refer to protocols)**
4. **O₂** 100%.
- * 5. **IV** balanced salt solution TKO.
- * 6. **Narcan 2.0 mg IV**, if cause of arrest unknown or if narcotics possible.
(child ≤ 5 y.o. or ≤ 20 kg 0.1mg/kg IV).

III. INADEQUATE VENTILATION DUE TO TRAUMA

1. See Trauma Protocols.

RESPIRATORY EMERGENCIES (continued)

IV. ASTHMA

1. Initial Patient Assessment.
2. Elevate head of stretcher 45-90 degrees. Patient in position of comfort.
3. Administer **O₂**, high flow by non-rebreather mask, humidified.
- * 4. If known asthmatic having recurrent attack:
 - A. **Albuterol 2.5mg/3 cc H₂O** add **Atrovent 2.5 ml (0.5mg)** (same dose peds) via MedNeb inhaler. (Note: May repeat or give continuously as tolerated prn) Set **O₂** flow at 6-10 liters per minute for proper misting. **Child – One-half Adult dosage Atrovent.** (May increase to full adult dose if blow-by or if child is not responding well to half-dose). (EMT/B to assist Pt with their own inhaler if patient is having SOB/Wheezing, in consultation with medical control).
- * 5. **IV** Balanced Salt solution, check for dehydration, administer fluids prn.
- * 6. **Cardiac monitor.**
7. Pulse oximetry.
- * 8. In **status asthmaticus**, unable to ventilate or to administer MedNeb,

Epinephrine 1:1000, 0.01mg/kg SQ (maximum adult dose not to exceed 0.3-0.5 mg SQ) or 1:10,000 0.01 mg/kg usual dose 0.3—0.5 mg IV slowly. (Peds: 1:1000 0.01 mg/kg SQ / 1:10,000 0.01 mg/kg IV slowly).

OR

Epinephrine IV infusion – 1 mg 1/1000 in 500 cc (2 mcg/cc) titrate to effect. Start at 1cc/min. (Child: 0.1mcg/kg/min IV infusion or 0.01cc/kg IM.)
- * 9. **Terbutaline; 0.25 mg SQ or IM.** Repeat 15- 30 min. PRN to total of 0.5 mg. If patient >55 y.o. or history of cardiac, consider half dose. (Pediatric; 6-12 y.o. 0.005—0.01 mg/kg Sub Q, may repeat 15—30 min).
- * 10. **Solumedrol 125mg IV** prn for continued wheezes/dyspnea or long transport (> 10 minutes). (Peds: 1 mg/kg IV not to exceed 125 mg)

OR

Dexamethasone 0.3 -- 0.6 mg/kg IM for moderate to severe.
Dexamethasone 0.3 -- 0.6 mg/kg IM for moderate to severe (Peds).
- * 11. Consider **Magnesium Sulfate 2 gm** in 50-100cc over 4-5 min IV (child 25-50 mg/kg IV over 10-20 min)
- * 12. Consider CPAP
- *** 13. **Intubate/RSI**, as needed.

RESPIRATORY EMERGENCIES (continued)

V. COPD

1. Initial Patient Assessment.
2. Elevate head of stretcher 45-90 degrees and allow patient to position of comfort.
3. **O₂**, Sats below 94% - 2 liters per nasal cannula.
If cyanotic or suspected MI or severe respiratory distress; high flow **O₂** by mask. Be prepared to assist respiration
- * 4. **IV** TKO or saline lock.
- * 5. Consider CPAP
- *** 6. **Intubate/RSI prn.**
Consider sedation with **Versed, 2—5 mg** or **Valium 5—10 mg** as needed.
- * 7. **Cardiac monitor.** (Dysrhythmias common in COPD.)
- * 8. **Albuterol 2.5mg/3 cc H₂O** add **Atrovent 2.5 ml** via MedNeb inhaler (may repeat or give continuously as tolerated prn). Set Med Neb Oxygen flow to 6-10 liters to ensure proper misting

(EMT/B to assist Pt. to take their own inhaler if patient is having SOB/wheezing, in consultation with medical control).
- * 9. **Terbutaline; 0.25 mg SQ.** Repeat 15- 30 min. PRN to total of **0.5 mg**. If patient >55 y.o. or history of cardiac, consider half dose.
- * 10. **Solumedrol 125mg** IV prn for continued wheezes/dyspnea or long transport (> 10 minutes).
OR
Dexamethasone 8—20 mg IV/IM for moderate to severe.

VI. Considerations for all patients:

1. **Capnography** combine with patient condition/presentation to ascertain ventilatory status.
 - a. EtCO₂ normal range is 35-45 mm/hg
 - b. Normal EtCO₂ may be higher in COPD patients

SEIZURES (MAJOR MOTOR GRAND MAL)

I. Initial Intervention

1. Initial Patient Assessment.
2. Brief history, as available.
3. Establish airway patency.
 - a. Do not force teeth apart.
 - b. Nasopharyngeal airways useful and well tolerated.
4. **100% O₂**, high flow. Suction as needed

II. Treatment/Drug Therapy

1. If seizure has persisted >5-10 minutes or if repetitive:

- * a. **IV TKO.**
- * b. Draw blood for laboratory;
- c. **Glucoscan.**
- * d. **EKG.**
- * e. **Dextrose 25 gm D50% IV** if known hypoglycemic may repeat x 2 in 5 minutes, prn (**child/infant D25% 0.5—1 gm/kg**) (**D10 in neonates 2—4 mL/kg**) (may repeat X 2 every 5 minutes, prn.)
- * f. **Versed 2.0—5.0 mg IV or IM.** May repeat in 5 minutes: **Peds 0.1 mg/kg IV to max single dose 2.5 mg. May repeat x 1: May give 0.2 mg/kg IM total.**
OR
Valium 5 – 10 mg IV. May repeat in 10 minutes: **Peds 0.2—0.5 mg/kg given IV over 3—5 minutes. May repeat 5—10 min, max dose 5 mg <5 y.o. and 10 mg > 5 y.o. to adolescents.**
- * g. If unable to give **anticonvulsants** IM/IV, **Versed** may be given *intranasally* via a *Mucosal Atomization Device* at a dose of **5.0 mg (Ped 0.2mg/kg, max dose of 5 mg)**
- * h. **Thiamine 100 mg IV *for Adult*,** if alcoholism suspected.
- * i. **Magnesium Sulfate 2 gm IV** over 5-10 minutes for possible alcohol withdrawal seizure.

III. Other Considerations

1. **Be prepared to manage respiratory depression should it occur**
2. Seizures that self-terminate in known epileptic may not require treatment or transport.
3. Seizures may be a sign of cerebral hypoxia from cardiac arrest.
4. Seizures may be caused by dysrhythmias.
5. Febrile seizures in children are usually brief in nature.

SEPTIC SHOCK (SEVERE)

I. General Considerations

1. Initial assessment.
Check for Systemic Inflammatory Response Syndrome (SIRS)
2. History Suggestive of New Infections
 - a. Pneumonia/Emphysema
 - b. Urinary Tract Infection
 - c. Acute Abdominal Infection
 - d. Meningitis
 - e. Skin/Soft Tissue infection (cellulitis)
 - f. Bone/joint infection
 - g. Endocarditis
 - h. Implant device infection
3. History of immunosuppressive treatment or medications which cause immunocompromised conditions.
4. Vital Signs:
Systolic B/P < 90 or MAP < 70 (do serial VITALS every 3-5 min)
(sepsis usually causes widening pulse pressures)
Heart Rate above 90 (consider beta-blockers used by pt)
Temperature above 100.4 F. or below 96 F.

II. Initial Interventions

1. Maintain airway. Drug Assist Intubation PRN.
2. **Oxygen administration.** Sat Monitor. Maintain levels above 94%.
3. Monitor vital signs frequently.
- * 4. **EKG** monitor.
5. Trendelenburg position, if tolerated and not interfering with respirations.
6. **Blood Glucose Levels** should be maintained between 70 mg/dl and 150 mg/dl.
7. Prevent Hypothermia.

III. Treatment

- * 1. Initiate **IV'S** with large bore needle and *WARMED* balanced salt solution. Two large bore lines recommended for SEVERE SEPSIS. (IO if IV unsuccessful).
- * 2. Phlebotomy: Draw blood and put in all tubes. In addition, 5 cc of blood should be added to the blood culture tubes. Use Sterile Technique to avoid unintentional contamination of culture medium. Indicate the time blood was placed in medium. Provide the correct culture tube for the correct medical facility.
- * 3. Give 20 mL/kg boluses up to **two (2) liters fluid** or until the following occurs:
 1. BP systolic is 110.
 2. Neck vein distension develops.
 3. Pulmonary rales develop.
 4. ***If additional fluids required, contact Medical Control, if unable to contact medical control, administer additional boluses of fluid until above are criteria is met.***

(pediatric fluid challenge 20cc/kg rapidly, may repeat x 2, as indicated.)

SEPTIC SHOCK (continued)

- *** 4. Septic shock not responding to fluid challenge; **Norepinephrine 2—16 mcg/min infusion, (10 mcg/min recommended)** until pressure is at low normal 80—100 mmHg. Decrease rate to 2—4 mcg/min to maintain pressure. May increase if needed until pressure improves.

NOREPINEPHRINE (Levophed)																	
DRUG AMOUNT 8 mg			DILUENT 250 mL D5W						CONCENTRATION 32 mcg/mL								
USUAL DOSE 2—16 mcg/min			MAXIMUM DOSE 20 mcg/min						DIRECTIONS Mix 8 mg into 250 mL D5W								
DOSE mcg/min	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20
RATE mL/hr	3.8	6	8	9	11	13	15	17	19	21	23	24	26	28	30	34	38

- *** 5. **Rocephin (ceftriaxone) 2 GM's IV over 30 min** for adult.
Pediatric Rocephin (ceftriaxone) 75 mg/kg over 30 min.
Medical Control must be contacted for consultation before **Rocephin** can be administered.
6. Alert ED of Severe Septic patient as soon as possible.
7. Rapid transport.

SHOCK (Medical)

I. General Considerations

1. Tachycardia is the first signs of shock. (check if Pt. is on Betablockers)
2. Pulse pressure often narrows prior to fall in systolic.
3. Changing level of consciousness important clue.
4. Monitor Capnography for early indications of shock.

II. Initial Interventions

1. Maintain airway. ET intubation as needed.
2. **100 % O₂**.
3. Monitor vital signs frequently.
- * 4. **EKG** monitor.
5. Trendelenburg position, if tolerated and not interfering with respirations.

III. Treatment

- * 1. Initiate **IV** with large bore needle and warmed balanced salt solution. Minimum of Two large bore lines recommended for shock/sepsis.
2. **Hypovolemia – GI Bleed**
 - A. Give up to **two (2) liters Warmed fluid** until:
 1. BP systolic is 90-100.
 2. Neck vein distension develops.
 3. Pulmonary rales develop.
 4. ***If additional fluids required, contact Medical Control, if unable to contact medical control, administer additional liters of fluid until above are criteria is met.***
(pediatric fluid challenge 20cc/kg rapidly, may repeat x 2, as indicated.)
 - B. Medical associated shock not responding to fluid challenge;
 1. **(Dopamine 5-20 mcg/kg/min)**
(Child; 2-20 mcg/kg/min)
3. **Hypovolemic – suspected abdominal aortic aneurysm.**
Follow above, fluids to blood pressure systolic 90-110.
MAST Pants unless respiratory compromise (COPD etc.)
4. **Cardiogenic/Medical non hemorrhagic**
 - A. **Fluid challenge** with 200-300 cc over 5-10 minutes. May repeat x 1-2, if indicated. (See protocol for Cardiogenic Shock).
 - B. **Dopamine 5-20 mcg/kg/min**, as needed if hypotension persists.
Decrease dosage as pressure improves.
Pediatric fluid challenge 20 cc/kg rapidly; may repeat x 1, as indicated.
Pediatric Dopamine 2—20 mcg/kg/min).
- *** 5. Contact Medical Control for orders to administer O-Neg—O-Pos blood. (if indicated). Follow ARC Blood Transfusion protocol.
6. Rapid transport. Early activation of Surgical Team.

UNCONSCIOUS PATIENT/UNKNOWN CAUSE OR ALTERED MENTAL STATUS/UNKNOWN CAUSE

I. Initial Intervention

1. Obtain history as possible.
2. Quick physical exam with emphasis on cardiopulmonary resuscitation and neurologic status.
 - a. Assume head and spine injury if trauma is a possibility and treat accordingly.
3. Protect airway – suction, airway control, etc. prn.

II. Treatment

1. **Oxygen administration.** Maintain Sat levels above 94%.

 - a. **Intubate** prn;
- * 2. **Glucometer**, Draw blood for baseline studies
 - a. Repeat glucoscan after D50 administration
 - b. Normal serum glucose 60-120 mg/Dl.
- * 3. **IV** balanced salt solution TKO.
- * 4. **EKG.**
- * 5. **Thiamine 100 mg IV.** If ETOH abuse suspected.
6. **D 50% Dextrose 25 g**, if hypoglycemic, may repeat x 2 q 5 minutes, prn.
(child/infant D25% 0.5—1.0 gm/kg; 2—4 mL/kg) (D10 in neonates 4 mL/kg)
(may repeat X 2 every 5 minutes, prn.)
- * 7. **Narcan;**

NARCAN DOSING REGIMEN

- | |
|--|
| <ol style="list-style-type: none">a. Respiratory depression/apnea 2.0 mg IV, ET, IM, may repeat x 3 to total 10 mg max dose. Initially 0.4 mg followed by 1.6 mg IV, ET, IM.
Child ≤ 5 y.o. or ≤ 20kg, 0.1 mg/kg IV, ET, IO, IMb. Altered sensorium (O2 sat, EtCO2 normal) Titrate 0.4 mg prn to maintain airway and respirations. Do not exceed max dose above.c. ET medication is 4.0 mg mixed with 10cc of NS.d. IN medication is 2.0 mg (1.0 mg in each nostril) |
|--|

-Note- *If patient opiate dependent consider titrating dose and prepare for symptoms of withdrawal. Observe carefully during transport for changes in LOC, airway, pupils, and vital signs.*

STANDING ORDERS
APPROVED IV MAINTAINANCE TECHNICIANS

1. Scene Size-up and Initial Assessment
2. Protect and maintain airway.
O₂ as indicated by transferring physician.
3. Focused History and Physical Exam.
Vital signs, record q 15-20 minutes.
4. Infusion maintenance.
 - A. Check patency and type of infusion solution.
 1. IV maintenance technician not to transport patient with medications added to IV bags.
 - B. Stabilization
 1. Dressing over insertion site.
 2. Stabilize limb on arm board if necessary.
 3. Stabilize tubing as needed.
 - C. Fluids
 1. Start with full bag of prescribed solution hung by hospital staff.
 2. Adjust flow rate to prescribed rate.
 3. Replace bag with sterile technique when 50cc remain in current bag and readjust flow rate.
 4. Adjust flow rate as needed.
 - D. Patency
 1. Observe for patency as necessary and record.
 2. Avoid kinks in tubing, pressure over or near insertion site.
 3. Observe insertion site for infiltration and extravasation.
 4. Consider possibility of clot occlusion if not patent and no other reason for lack of flow.
 - E. Discontinuing an infiltrated or occluded IV
 1. Turn infusion off via roller clamp.
 2. Gently and systematically remove tape.
 3. Remove catheter and quickly cover with sterile 2x2.
 4. Immediately observe for intact catheter.
 5. Hold direct pressure over insertion site for 1-2 minutes until bleeding stops.

STANDING ORDERS

APPROVED IV MAINTENANCE TECHNICIANS (continued)

6. Secure 2x2 over site with tape or Band-Aid.
 7. If catheter is not intact and a portion is missing, assume catheter embolus and immediately tourniquet limb well above insertion site, keep limb in dependent position and immediately seek medical intervention.
- F. Patient Assessment
1. Respiratory and cardiovascular status assessed at start and every 15 minutes throughout transport.
 2. Record fluid delivered and fluid remaining in bag every 15 minutes and at end of transport.
 3. Condition of infusion site checked frequently and recorded.
 4. Discontinue infusion if patient develops acute dyspnea, rales, wheezes; or urticaria (hives) or other evidence of a allergic reaction.

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TRAUMA GUIDELINES

GENERAL CONSIDERATION

The following trauma guidelines are intended as guidelines for EMT/ALS trauma care for Klickitat County and do not constitute a teaching manual for trauma life support. It is expected that a large portion of the EMT training and continuing education will be devoted to sharpening the trauma management skills.

It cannot be overemphasized that adequate management of the severely traumatized patient can occur only in the operating room, and that field care is appropriate to stabilize the patient's vital functions and to ensure safe transport without further injury. In other words, a modified scoop and run approach is the standard of care. It will be expected that for trauma patients an average of ten minutes on-scene time will be attempted, unless there are extenuating problems such as entrapment or multiple patient scenarios.

Upon evaluation of the patient(s) and determining the need for a trauma team, the paramedic will use the Trauma H.E.A.R. Report format for accurate relay of information.

1. Contact intended receiving facility as soon as possible via H.E.A.R.
2. Enter Oregon's Trauma System, if the patient is going to Oregon.
Enter Washington's Trauma System, if the patient is going to Washington.
3. It is expected that EMS personnel shall follow the DOH approved Southwest Region EMS and Trauma Care Council's Patient Care Procedures, and the Washington State Trauma Triage Tool, for activation and destination procedures for patients meeting trauma system entry criteria. Please see the appendix for these procedures.

TRAUMA GUIDELINES

I. SCENE SIZE-UP AND INITIAL PATIENT ASSESSMENT

1. Establish Responsiveness.
2. Airway Patency
 - A. Assess airway.
 - B. Establish patent airway by chin-lift / jaw-thrust method.
 - C. Clear airway of foreign bodies.
 - D. Oropharyngeal / nasopharyngeal airway, as indicated.
 - * E. ET tube, as indicated (oro-tracheal preferred, **SUX** and/or **Norcuron** as indicated).
 - *** F. Cricothyroidotomy or needle-jet, as indicated.
 - G. MAINTAIN C-SPINE CONTROL.
3. Breathing Control
 - A. Assess; expose chest, observe rate, depth, movement, auscultation.
 - B. **O₂ 100%**.
Ventilate, as needed.
 - C. Suction, as needed.
 - D. Treat open pneumothorax, flail segment, and tension pneumo per protocols.
4. Circulatory Control
 - A. Assess: pulse quality, rate, regularity, skin color, and capillary refill.
 - B. CPR, as indicated.
 - * C. Large bore **IV's** (2) Warmed balanced salt solution as soon as possible (do not delay transport).
 - *** D. **Blood** to be administered , as indicated (with Medical Control concurrence).
 - E. MAST, as indicated.
 - * F. **EKG monitor** as soon as stabilization permits.
5. Bleeding Control
 - A. Assess for exsanguinating hemorrhage
 - B. Direct pressure for external hemorrhage control/Tourniquet if applicable
 - C. MAST inflated for lower extremity/abdominal hemorrhage.
6. Blood Pressure
 - A. Treat shock as per protocols. Page 121.
 - B. Establish flow sheet to follow patient progress.
7. Temperature:
 - A. Maintain body core temperature. Shock patients are prone to hypothermia, which causes difficulties in coagulation
 - B. Heat from external sources should be applied. Insta-heat, warm packs, warmed blankets or Warmed Balanced Salt Solutions.

TRAUMA GUIDELINES (Continued)

II. FOCUSED/DETAILED HISTORY AND PHYSICAL EXAM AND MANAGEMENT

1. **Head and Skull**

- A. Assess: palpate, inspect, evaluate pupil function, cranial nerves.
- B. Focal neurologic signs or Glasgow Coma Score of 8 or less.
- C. Airway management, O2 high flow, intubate as needed,
- D. I.V. large bore. Follow appropriate protocols.

2. **Cervical Spine**

- A. Immobilize.
- B. Assess: palpate, inspect.

3. **Maxillofacial**

- A. Assess: palpate, inspect.
- B. Maintain airway; suction prn; hemorrhage control; stabilize impaled objects.
- *** C. Treat the following per surgical protocols:
 - 1. Airway compromise or occlusion.

4. **Chest**

- A. Assess: palpate, inspect, auscultate.
- B. Stabilize flail segments.
- C. Close open pneumothorax with occlusive dressing.
- *** D. Treat the following per surgical protocols:
 - 1. Tension pneumothorax.
 - 2. Suspected cardiac tamponade.

5. **Abdomen and Pelvis**

- A. Assess: palpate, inspect and auscultate.
- B. **MAST** prn. SAM pelvic splint prn.
- C. Cover open wounds with saline-moistened dressings
- D. Evisceration: cover with moist sterile dressings; do not attempt to replace.

6. **Extremities**

- A. Assess: palpate, inspect, evaluate neurovascular status.
- B. Fractures:
 - 1. Straighten severely angulated fractures; reevaluate neurovascular status.
 - 2. Do not push bones back into open wounds.
 - 3. Control bleeding; apply moistened dressing to open wounds.
 - 4. Splint appropriately; check neurovascular status after splinting.

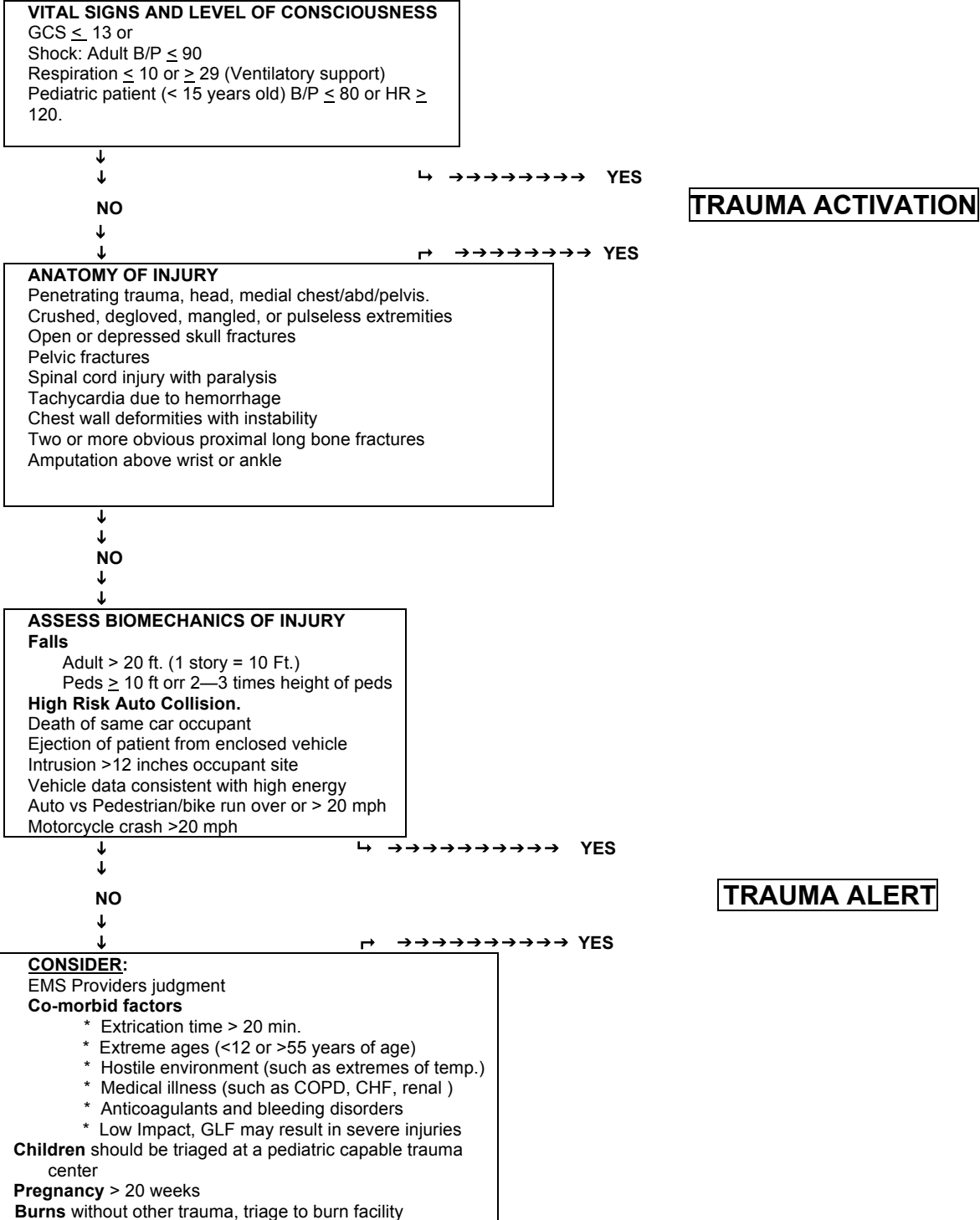
7. **Spine**

- A. Assess: palpate, inspect, evaluate paresis, paralysis and level.
- B. Immobilize entire patient adequately.

PREHOSPITAL TRAUMA TRIAGE DESTINATION PROCEDURES

TRAUMA TEAM/TRAUMA ALERT:

Initial evaluation of patient(s) and scene, with regards to following factors, should be made rapidly to determine need for trauma center care or rapid transport. Establish DIRECT communication with Medical Control and request Trauma Team or Trauma Alert if any of the following criteria are met:



GLASGOW COMA SCALE (adult)

NEURO ASSESS	RESPONSE	SCORE
BEST EYE OPENING	Spontaneous	4
	Verbal	3
	Pain	2
	No Response	1
BEST MOTOR RESPONSE	Spontaneous	6
	Localizes pain	5
	Withdraws to pain	4
	Flexion to pain (decorticate)	3
	Extension to pain (decerebrate)	2
	No Response	1
BEST VERBAL RESPONSE	Oriented	5
	Confused	4
	Inappropriate words	3
	Incomprehensible sounds	2
	No response	1
TOTAL		3-15

GLASGOW COMA SCALE (pediatric)

BEST EYE OPENING	Spontaneous	4
	Verbal	3
	Pain	2
	No Response	1
BEST MOTOR RESPONSE	Spontaneous	6
	Localizes pain	5
	Withdraws to pain	4
	Flexion to pain (decorticate)	3
	Extension to pain (decerebrate)	2
	No Response	1
BEST VERBAL RESPONSE (age 2-5)	Appropriate words	5
	Inappropriate words	4
	Screams or cries	3
	Grunts	2
	No sound response	1
BEST VERBAL RESPONSE (age 0-23 months)	Smiles or coos	5
	Cries appropriately	4
	Cries inappropriately	3
	Persistent cries or grunts	2
	No sound response	1
TOTAL		3-15

AIRWAY

ENDOTRACHEAL INTUBATION WITH PARALYTICS

I. INDICATIONS:

Need for immediate intubation assumed:

1. Respiratory insufficiency with altered LOC,
2. Status epilepticus not responding to anticonvulsants,
3. Respiratory burns with impending respiratory failure,
4. Patient unable to protect airway; trauma, obstruction, overdose,
5. With failed attempt at orotracheal/nasotracheal intubation.

II. MANAGEMENT:

1. Initial intervention:
 - a. **100% O₂** assisted ventilations BVM, pre-oxygenate patient prior to SUX if possible.
 - b. **Suction** as needed.
 - * c. **IV** secured.
 - d. Surgical equipment or secondary airway adjuncts available. King Airway, Eschman etc.
 - * e. **Cardiac monitor.**
- * 2. PRELIMINARY DRUG THERAPY (prn)
* **Lidocaine 1 mg/kg IV.** Suspected head injury or increased ICP patients only.
* **Atropine** (only administer for second or multiple SUX doses when given). Adult dose 0.5 mg. Peds <12 years old, 0.01 mg/kg IV;
* **Etomidate; 0.3 mg/kg IV** slowly over 1 minute, may repeat in 5-15 minutes as needed. **Etomidate- children same as adult.**
* **Valium 2 – 10 mg IV** slowly or **Versed 2 – 5** IV slowly for sedation as needed. **Valium in children: 0.1-0.3 mg/kg** slow IV push. **Versed in children: 0.1-0.3 mg/kg up to 5 mg,** slow IV push.
- * 3. **Succinylcholine 1--1.5 mg/kg IV** push.
4. **Cricoid pressure** (Sellick Maneuver) until intubation successful and ET tube cuff is inflated.
- * 5. After fasciculation's stop, ventilate patient 4-5 times with BVM.
Perform endotracheal intubation.
- * 6. If relaxation inadequate in 60-120 seconds, repeat dosage of **SUX. (atropine advised** for repeated doses of Succinylcholine) Reattempt intubation.
- *** 7. If intubation repeatedly unsuccessful, ventilate with BVM until spontaneous respirations return (6-10 minutes), If unable to ventilate patient, perform cricothyroidotomy or use alternative airway adjuncts. Anticipate Hypoxic Patient.
- * 8. Treat bradycardia per protocol with **Atropine** IV. Temporarily halt intubation, hyperventilate with BVM and **100% O₂.**

ENDOTRACHEAL INTUBATION (continued)

- * 9. Upon successful intubation, **confirm ET tube placement by auscultation, capnometry (FEF or capnometer), and secure with a tube securing device, tape acceptable.** Release cricoid pressure, ventilate with BVM and 100% O₂.
 - 10. Document GCS/neuro prior to SUX.
 - 11. Document Capnometry on **all** paralytic-assisted intubations with paper recording.
 - 12. Suspected increased intracranial pressure (trauma, intracranial bleed, etc.), fasciculations theoretically could increase intracerebral pressure. In this circumstance, the defasciculating dose of **Norcuron** (listed in #3) may be helpful.
 - 13. Once intubation has been accomplished, normal ventilation rates should be maintained. Administer **100% O₂** via Bag-valve-ET at ~8—12 per minute (assist ped's respirations at normal ventilation rates per age) Maintain CO₂ between 30 and 45 TORR.. For the patient with closed head injury maintain BP of 90 systolic.
 - 14. Identified indication for long term paralytic after successful intubation:
 - Patient successfully intubated and beginning to arouse or become combative.
 - Risk of losing patent airway exists.
 - Extended transport times.
-
- * a. Paralytic agents.
 - Vecuronium (Norcuron) 0.1mg/kg IV bolus.**
 - Vecuronium (Norcuron)** Maintenance doses 25—40 minutes **0.01—0.015 mg/kg** or IV infusion, see drug reference for administration rate.
 - * b. Sedation in conjunction with paralytics.
 - Versed 2.0-5.0mg IV (0.1 mg/kg IV child)** (consider IV infusion)
 - OR
 - Valium 2.0-10.0 mg IV (0.01—0.02 mg/kg) (0.05 mg/kg child IV)**
 - OR
 - Etomidate 0.3 mg/kg IV (0.3 mg/kg child IV)**
 - * c. Pain Control:
 - i. **Morphine Sulfate 2-5 mg IV; total 20 mg.**
 - ii. **Fentanyl 50-100 ug IV may repeat 50 ug** May be better if patient can become hemodynamically unstable. **Max 400 mcg.**
 - iii. **Dilaudid 0.5-1 mg IV may repeat half initial dose** titrating PRN. Preferred if used when longer acting pain control is needed.
 - d. Follow above recommendations for ventilation, notify receiving physician of long acting paralytic use.
 - e. Other Considerations long acting paralytics.
 - Duration of action 25-40 minutes.
 - Prolonged excretion in renal or hepatic patients.
 - Like Sux, has no effect on consciousness or pain threshold.

DIFFICULT AIRWAY EVALUATION:

CLINICAL INDICATIONS:

Between 1-3% of patients who require endotracheal intubation have airways that make intubation difficult. Recognizing these patient allows the paramedic to proceed with caution and keep as many options open as possible. It also allows the paramedic to prepare additional equipment (crichothyrotomy) that may not ordinarily be part of a standard airway. The mnemonic LEMON is useful in evaluating patients for signs that may be consistent with a difficult airway and should raise the paramedic's index of suspicion.

PROCEDURE:

I. *Look externally*

External indicators of either difficult ventilation include:

- Presence of a beard or mustache
- Abnormal facial shape especially the jaw.
- Extreme cachexia (loss of body mass) Edentulous mouth.
- Obesity
- Large front teeth
- Short Neck
- Kyphosis

II. *Evaluate (3-3-2)*

- 3 fingers between upper teeth and lower teeth
- 3 fingers from tip of mandible to start of neck
- 2 fingers between thyroid notch and floor of mandible

III. *Mallampati*

Patient in sitting position, head in neutral position, mouth open, tongue protruding:

- **Class I** soft palate, uvula, fauces, pillars visible
- **Class II** soft palate, uvula, fauces visible
- **Class III** soft palate, base of uvula visible
- **Class IV** only hard palate visible

IV. *Obstruction*

Besides the obvious difficulty if the airway is obstructed with a foreign body, the provider should also consider other obstructions such as tumor, abscess, or expanding hematoma, vomitus or blood/blood clots.

V. *Neck Mobility*

Ask the patient to place their chin on their chest and to tilt their head backwards as far as possible. Obviously, this will not be possible in the immobilized trauma patient.

NOTE:

Prepare for secondary airway adjuncts, King Airway, Surgical airways. Alert receiving facility of airway problems.

AIRWAY (continued)

KING AIRWAY LTS-D

I. INDICATIONS:

1. Alternative airway control when endotracheal intubation is not available or endotracheal intubation is not successful after at least 3 documented attempts.
2. Cardiac arrest patients.
3. Respiratory arrest patients.
4. Unconscious patient with inadequate respirations and no gag reflex.
5. Facilitate pulmonary hygiene.

II. CONTRAINDICATIONS:

1. Responsive patients with an intact gag reflex
2. Patient with known esophageal disease
3. Patient who have ingested caustic substances
4. Patient has a tracheostomy or laryngectomy.

III. PROCEDURES:

1. Maintain body substance isolation.
2. Provide respiratory support as needed for the patient.
3. Insure cervical spine immobilization when indicated; If trauma patient, Do Not extend the neck.
4. Do not delay patient care, primary BLS procedures, or transport to place device.
5. Choose the correct size King Airway.

LTS-D Size 2 (Green)	35-45 inches in height	Inflation: 25-35 mL
LTS-D Size 2.5 (Orange)	41-51 inches in height	Inflation: 30-40 mL
LTS-D Size 3 (Yellow)	4-5 feet in height	Inflation: 40-55 mL
LTS-D Size 4 (Red)	5-6 feet in height	Inflation: 50-70 mL
LTS-D Size 5 (Purple)	> 6 feet in height	Inflation: 60-80 mL
6. Test cuff inflation system, remove air from cuff prior to insertion.
7. Lubricate the King Airway with a water soluble lubricant.
8. Hyperventilate the patient with a BVM for 30 seconds.
9. Place the patient's head in neutral position.
10. In the supine patient, lift the tongue and mandible upward with non-dominant hand.
11. Hold the King LTS-D at the connector with dominant hand. Using the lateral approach, introduce tip into corner of mouth.
12. Advance the tip behind the base of tongue, while rotating tube back to midline so that blue orientation line faces chin of patient.
13. Without exerting excessive force, advance tube until base of connector is aligned with teeth and gums.
14. Inflate cuff with appropriate volume of air as indicated by the color code on the syringe.
15. Begin ventilation with 100% oxygen via BVM, assess breath sounds.
16. If necessary, add additional volume to cuffs to maximize seal of airway.
17. Confirm proper placement by auscultation, chest movement, oxygen saturation and capnography.
18. All patients with an inserted King Airway LTS-D device should have their head and neck immobilized with a cervical collar.
19. Document proper airway placement.

KING AIRWAY (continued)

20. Reassessment of King Airway LTS-D is required after each significant patient movement.
21. These are single use devices, and should not be reused.
22. The King Airway LTS-D is a short-term device. It may be left in place for a maximum of two (2) hours, unless otherwise instructed by the receiving physician.

CAUTION: When facial trauma has resulted in sharp broken teeth or dentures, remove the dentures and exercise caution when passing the KING AIRWAY as to prevent the cuffs from tearing.

AMPUTATION

I. INITIAL INTERVENTION:

1. Initial Patient Assessment.
Bleeding Control Guidelines should be followed if Life Threatening Bleeding is occurring.
2. Stump:
 - A. Cover with sterile dressing.
 - B. Saturate with sterile saline.
 - C. Cover with dry dressing.
3. Severed part:
 - A. Rinse gently with sterile saline to remove debris.
 - B. Wrap severed part with moistened gauze, place in a ziploc bag.
 - C. Place bag in ice water.
 - D. Place label with name, date and time on the bag.
4. Partial amputation:
 - A. Cover with sterile dressing.
 - B. Saturate with sterile saline.
 - C. Cover with dry dressing.
 - D. Splint in anatomical position.
 - E. Avoid torsion and angulation (reduce torsion into anatomical position).
 - F. If digit devascularized completely, use ice to keep distal digit as cool as possible (without direct contact of skin with ice).

II. TREATMENT:

1. Oxygen prn
- * 2. IV fluid challenge if hypotensive.
- * 3. **Morphine Sulfate** for pain 2-5 mg IV; may repeat as necessary titrated to pain (up to 30 mg for Adults)
(child **Morphine** 0.1 - 0.2 mg/kg).
Fentanyl 50-100 mcg (up to 400 mcg);
(Child **Fentanyl** 0.5- 2.0 mcg/kg)
Dilaudid, for pain, 1—2 mg IV; may repeat as necessary titrated to pain (up to 6 mg for adults). (Child **Dilaudid** 0.015 to 0.02 mg/kg)

III. COMMENTS:

1. Do not use dry ice or put severed part in direct contact with ice.
2. Control bleeding by direct pressure.
3. Do not neglect total patient care in favor of caring for the amputation.
4. Time is of the greatest importance to assure viability. Re-implantation of the amputated part is available at SWWMC, Emanuel, or OHSU.
5. **NOTE:** Lower extremity amputations seldom have re-implantation.

BLEEDING CONTROL

I. INDICATIONS:

Ongoing bleeding uncontrolled with direct pressure.

II. CONTRAINDICATIONS:

Tourniquets are for extremity injuries only.

III. PRECAUTIONS:

1. Contaminated wounds that cannot be easily cleaned with saline irrigation should not be closed unless necessary for temporary control of significant bleeding.
2. Wounds that might extend into cranium, throat, airway, thorax or abdomen should not be packed with dressings.
3. Human or animal bites should not be dressed and bandaged with a pressure dressing unless absolutely necessary to control life threatening bleeding

IV. TREATMENT:

1. Arterial bleeding: Apply direct pressure and immediately place a tourniquet.
 - a. Tourniquets applied proximally and tight enough to completely stop bleeding. They should be at least 2-3" wide and compression sustained. They may be applied over clothing and left in place or loosened to reassess bleeding. **Note**, the femoral artery requires TWO tourniquets to control hemorrhage. Note time of application for transfer of care.
 - b. Pack wound with hemostatic agent and Kerlex after bleeding controlled. Note number of packed dressings for transfer of care. Apply pressure dressing with Koban or Koflex.
2. Venous bleeding: Apply direct pressure to the wound. If bleeding is controlled, apply a pressure dressing. Elevate the bleeding extremity above the heart to reduce pressure in injured tissue.
3. If wound is unable to have tourniquet applied and pressure dressing is ineffective, wound closure by stapling may be necessary. Follow Skin Stapling Guidelines.
4. Amputations may need to have a tourniquet applied and wound packed. Care for amputated part as per Amputation Guidelines.
5. Follow Pain Control Guidelines as needed once bleeding is controlled.
6. Treat for shock as needed per Shock Guidelines.

BLAST/EXPLOSIVE INJURY

I. INDICATIONS:

- A. Injuries sustained in a blast or explosion, including;
 - 1. Industrial explosions
 - 2. Terrorist bombings
 - 3. Any other type of explosion

II. CRITERIA:

A. Overview:

Explosions can produce unique patterns of injury seldom seen outside combat. When they do occur, they have the potential to inflict multi-system life-threatening injuries on many persons simultaneously. The injury patterns following such events are a product of the composition and amount of the materials involved, the surrounding environment, delivery method (if a bomb), the distance between the victim and the blast, and any intervening protective barriers or environmental hazards. Because explosions are relatively infrequent, blast-related injuries can present unique triage, diagnostic, and management challenges to providers of emergency care.

B. Classification of explosives.

High-Order Explosives produce supersonic over-pressurization shock wave and are the product of materials like, Nitroglycerin, TNT, C-4, Semtex, and Ammonium Nitrate Fuel Oil.

Low-Order Explosives produce a subsonic explosion but no pressure wave, and are the product of materials like, pipe bombs, gunpowder, pure petroleum based bombs (Molotov cocktails).

HE and LE cause different injury patterns.

C. Blast injuries:

The four basic mechanisms of blast injury are termed as; **Primary; Secondary; Tertiary; and Quaternary.**

Primary: Blast wave, intense over-pressurization impulse created by a HE explosion. High pressure disruption of victims. Barotrauma to lungs, GI tract, middle ear.

Secondary: Blast wind causes flying debris and fragments (high heat). Any body part may be affected.

Tertiary: Results from victims being thrown by the blast wind. Any body part may be affected.

Quaternary: All explosion related injuries, illnesses, or diseases not due to primary, secondary or tertiary mechanisms. Any body part may be affected. Includes exacerbation or complications of existing conditions.

BLAST INJURIES (continued)

III. TREATMENT:

A. Scene Safety:

1. Consider risks of secondary explosions at scene, triage area, staging area or receiving facilities.
 - a. Be observant for victims, vehicles, packages or containers that seem out of place. Alert Law enforcement immediately.
2. Consider risks of radiation contaminated victims of terrorist explosions, screen with Geiger Counters.
3. Consider risks of unstable buildings and infrastructure.

B. Initial Patient Contact. Scene Size Up. (Broadcast to all inbound units IMMEDIATELY)

1. Initiate MCI plan if needed.
 - a. Triage patients
 - b. During triage, apply tourniquets to severely bleeding extremities.
2. Explosion scenes should be presumed to be crime scenes until cleared by Law Enforcement.
3. Explosion/blasts may cause bilateral ruptured tympanic membranes, consider communications with patients difficult.
4. A.B.C's.
Administer High Flow Oxygen.
5. EKG Monitor if available, Vital Signs.

Specific Treatments:

A Severe Bleeding:

1. Re-evaluate tourniquets and continued use, contact medical control for release of tourniquet. Consider hemostatic agents.
2. Initiate IV/IO Lifeline, Balanced Salt Solutions. Maintain SBP at a range of 90-110.

B. Consider Primary Blast Related Injuries: (pressure wave)

1. Blast Lung suspected: SOB, rapid respirations, hypoxia (SAT's <95%) wheezing, cough, hemoptysis, Bradycardia, Pulmonary Edema.
2. Administer High Flow Oxygen via BiPAP/CPAP with Pulmonary Edema..
3. Monitor Capnography and Pulse oximetry.
4. Initiate IV/IO Balanced Salt Solution. TKO rate.
5. If Hypotension presents follow appropriate protocols. Contact medical control to exceed 250 mL administration of fluids.
6. Observe for signs of blast lung.

BLAST INJURIES (continued)

- C. Consider Secondary Blasts Related Injuries: (Blast wind, Projectiles)
 - 1. Impaled objects: Follow appropriate Protocols.
 - 2. Burns: Follow appropriate Protocols.

- D. Consider Tertiary Blast Related Injuries: (thrown by blast, pinned by debris)
 - 1. Spinal Immobilization.
 - 2. If multisystem Trauma, Follow appropriate Protocols.
 - 3. If Crush Syndrome suspected. Follow appropriate Protocols.

- E. Consider Quaternary Blast Related Injuries.
 - 1. Provide appropriate protocol based care for any medical and/or trauma related condition.

IV: *TRANSPORT:*

- A. Transport all Primary Blast patient's within 10 minutes of EMS patient contact unless delayed because patients exceed medical resources available.

- B. Do not delay transport for initiation of IV lifelines.

- C. Transport as per MCI requirements.

BLOOD ADMINISTRATION

******MEDICAL CONTROL CONCURRENCE******

I. Objectives:

To supplement and restore circulating volume and perfusion to major viscera and body systems in the critically injured patient; to be utilized as an adjunctive means, in coordination with the protocol for the management of hypovolemic shock.

1. The ambulance crew may carry three (3) units of low-titer O Neg. cells on all scene calls and interfacility transportation where blood is potentially needed.
2. For Interfacility Transport, may administer blood products as ordered by transferring physician.

II. Indications:

1. Adult: (patients appearing > 12 years old)
 - a. Systolic BP \leq 80 mmHg, or absence of radial pulse by palpation.
 - b. BP response remains \leq 80 mmHg following rapid infusion of two liters of a balanced salt solution.
 - c. Absence of an isolated head injury (i.e. GSW to head)
 - d. Known or highly suspected hemodynamically significant hemorrhage.
2. Pediatric: (patients appearing 6-11 years old)
 - a. Absent radial pulse or: SBP \leq 60 mmHg and/or HR \geq 140.
 - b. BP and HR response does not meet threshold criteria for age groups following two 20 cc/kg boluses of a balanced salt solution.
 - c. Known or highly suspected hemodynamically significant hemorrhage.
3. Pediatric: (patients appearing < 6 years old)
 - a. SBP \leq 40 mmHg and/or HR \geq 160.
 - b. BP and HR response does not meet threshold criteria for age groups following two 20 cc/kg boluses of a balanced salt solution.
 - c. Known or highly suspected hemodynamically significant hemorrhage.

BLOOD ADMINISTRATION (continued)

III. Administration:

1. Blood should be given with blood "Y" tubing that has been previously "primed" with NS or Plasmalyte; blood should only be given with NS or Plasmalyte.
2. Blood tubing should incorporate a pressure infuser bag for rapid infusions.
3. If possible the blood tubing should be connected directly into the IV catheter. #18 gauge or larger over-the-needle catheter should be used. If not possible, connect into a "y" port with a larger bore needle (16 or 14 gauge). (Peds 18-20 gauge needle is adequate)
4. If piggy-backed into an IV of balanced salt solution, the balanced salt solution should be discontinued while blood is transfusing.
5. Check expiration date, the patient's ABO group and Rh type on the blood bag against the lab slip. Lab slips should be signed by two persons, or checked by two persons prior to administrations to ensure proper match. Confirm proper patient is receiving correct blood type and Rh factor.
6. Gently rotate the unit of PRBC's prior to administration.
7. Prior to infusing, always check vital signs and Temperature, then repeat every 15 min. after infusion begins.
8. Give **Benadryl 25—50 mg IV**.
9. Flow rate:
 - a. Adults: Wide open until SBP \geq 100 mmHg.
 - b. Pediatrics: Infusion rate of 10 cc/kg bolus and repeat bolus PRN until BP and HR response meets threshold criteria.
10. If there is a reason to suspect an infusion reaction, DC the infusion and contact the transferring physician immediately for further instructions.
11. After the transfusion is completed, flush the line with NS and continue to monitor patient's VS and temp closely.

***NOTE: PRBC's may be infused through either IV or IO access.**

IV. Objectives:

To ensure FDA Standards are met during transportation and storage of blood products:

1. Transportation and Storage:
 - a. Ambulance crews may carry 2-3 units of O Pos (and O Neg for women in child bearing years) packed cells on scene calls and interfacility transfers where the potential exists for use of PRBC's.
 - b. Packed cells will be stored in a cooler with bagged ice and an appropriate thermometer. Temperature will be maintained between 1-6 degrees C. Blood temperatures will be recorded on departure and on arrival back to the hospital laboratory.
 - c. Between ambulance calls, blood will be stored in designated blood refrigerators with proper documentation of refrigerator temperature per FDA Standards.
 - d. If blood is given during either field care or interfacility transport:
 1. Document donor number on chart (FDA Standard)
 2. Notify blood bank which unit was transfused, patient name, and facility that the patient was transported to.
 3. If blood is transfused, and patient destination is other than the ambulance Medical Control facility, complete the American Red Cross Transfer Form and leave with patient.

BLOOD ADMINISTRATION (continued)

4. Blood bank will set up a replacement unit.
2. Blood products received from the sending facility:
 - a. Usually type specific or may be typed and crossed for individual patients.
 - b. Transport container usually is a sturdy cardboard and/or Styrofoam container with packaged ice.
 - c. Appropriate documentation for units transfused en route: Note which units were given on the Red Cross Transfer slip.
 - d. Care of blood products on arrival to the receiving facility:
 - i. Stable patient:
 - a. If the patient is determined stable by the paramedic, any blood products transferred with the patient should be carried to the blood bank for their inspection and crossing as needed.
 - ii. Unstable patient:
 - a. If the patient is determined unstable by the paramedic, the blood products should stay with the patient.
 - b. Notify the Trauma Resuscitation Nurse/ER personnel that the blood is being left (leave in transport container) and number of remaining units.
 - c. Call blood bank and notify them of the blood, number of units, and the location of the patient. (i.e., KVH, Skyline, Emanuel Hospital Portland).
3. Storage of blood products during transport:
 - a. Whole blood:
 - i. 1-6 degrees C.
 - ii. Appropriate container with wet ice.
 - b. Packed cells:
 - i. 1-6 degrees C.
 - ii. Appropriate container with wet ice.
 - c. Fresh frozen plasma:
 - i. Frozen
 - a. -20 degrees C. or colder.
 - b. Packed in dry ice.

Note: Record temperature of blood products every 30 minutes. Document on MIR or lab forms.

BLOOD ADMINISTRATION (continued)

- ii. Thawed
 - a. Maintain in blood cooler 1-6 degrees C.

- 4. Transfer of blood products for shipment:
 - a. Whole blood, Packed Red Blood cells:
 - i. Use only Red Cross Shipping boxes with one inch Styrofoam insulation that have a plastic liner between the Styrofoam and the box. The box must contain absorbent material.
 - ii. Place the product in the box, but do not stack or layer units. Cover product with a bag of crushed wet ice or cubed ice and water (approximately five pounds). The bag of ice must be in contact with each unit of blood. This is the only acceptable refrigerant.

- 5. Return and transfer record:
 - a. Returned to Red Cross:
 - i. The transferring agency will complete the form and retain the yellow copy for their records.
 - ii. The original and all other copies should be returned with the product.

 - b. Transferred to another hospital with patient:
 - i. The transferring agency will prepare and handle the Return and Transfer records.

BURNS

I. INITIAL MANAGEMENT:

1. Remove patient from the source of the burn.
2. Douse or remove any smoldering clothing or bedding and any restricting jewelry, especially rings.
3. If acid or chemical burns, remove clothing and brush off dry chemicals, flush with large amounts of water. (Beware of Hypothermia).

OTHER THAN THE CONSIDERATIONS ABOVE, PROCEED AS WITH ANY OTHER INJURED PATIENT.

4. Initial Patient Assessment,
5. Evaluate and assist ventilation; high flow **O₂** if potential exposure to carbon monoxide or if dyspnea present.
6. Observe for signs of upper airway obstruction, particularly if delay or long distance transport.
7. Circulation – CPR, if necessary.
8. Hemorrhage – control as usual in any trauma case.
9. Fractures – splint and stabilize.
10. Shock – standard treatment and prevention measures.
11. Burns:
 - a. Describe the burn anatomically: i.e., “both hands and feet.”
 - b. Cover with clean dressing or sheet.
 - c. Do not use ointment, creams, sprays or anything else on burned skin.
 - d. Do not use ice. Conserve warmth with sheets or blankets.
 - e. Elevate the burned extremities.
12. Chemical Burns – treat the same as thermal burns.
13. Electrical Burns:
 - a. Always worse than they appear due to the deep injury.
 - b. Monitor carefully for dysrhythmias.
 - c. Protect C-Spine.
 - d. Seizure precautions.

II. ASSESSMENT:

1. Evaluate the burn for depth and area (using Rule of 9). Separate into critical and non-critical burns. The following are the criteria for critical burns:
 - a. Burns complicated by respiratory tract injuries.
 - b. Partial thickness (second degree) burns of >30% of the body surface.
 - c. Full thickness (third degree) burns of >10% of the body surface.
 - d. Burns of the hands, feet, face and genitalia.
 - e. Electrical burns.
 - f. Deep acid or caustic burns.
 - g. Burns in coexisting medical conditions (diabetic, in shock or traumatic injuries, COPD, Asthma, extremes of age ≤ 5 y.o. or ≥ 60 y.o.).

BURNS (continued)

III. TREATMENT:

1. O₂ per nasal cannula at 4 L/min.
- * 2. Balanced salt solution IV TKO. (Lactated Ringers recommended)
Drip rate 3-5 ml/kg x Body Surface Area burned. Total equals 24 hours of fluids. Half (1/2) of the total amount should be infused within the first 8 hours.
3. If Carbon Monoxide poisoning is suspected, non-rebreather mask at 10-12 L/min. Other inhalation poisoning suspected, refer to protocols.
- *** 4. Consider **Endotracheal Intubation** if necessary to maintain airway.
Versed 2-5 mg IV (0.1 mg/kg IV child) or **Valium 2.0 – 10 mg IV(0.1—0.3 mg/kg child IV)** or **Etomidate 0.3 mg/kg IV (0.3 mg/kg child IV)** along with paralytics, as indicated. **Succinylcholine 1--1.5 mg/kg IV** push.

(Note: Succinylcholine can be used on the day of the burn or one year after, never in between the two dates.)
5. NPO.
- * 6. **Morphine Sulfate** for pain **2-5 mg IV**; may repeat as necessary titrated to pain (up to **30 mg** for Adults)
(child **morphine 0.1 - 0.2 mg/kg**).
Fentanyl 50-100 mcg (up to 400 mcg);
(Child **fentanyl 0.5- 1.0 mcg/kg**)
Dilaudid, for pain, **1—2 mg IV**; may repeat as necessary titrated to pain (up to 10 mg for adults). (Child **Dilaudid 0.015 to 0.02 mg/kg**)

Toradol is not recommended for any burn patients.

NOTE: IV meds only in burns, no IM meds!
- * 7. To augment narcotic/sedation/nausea control.
Zofran (Ondansetron) 4-8 mg IV, IM or IO. May repeat X 1 in 15 minutes.
Inapsine 0.625 - 2.5 mg IV (.25 – 1 mL)
Phenergan 12.5 – 25 mg IV slowly /IM
8. Wrap the patient in clean or sterile sheet after removal of clothing and use sufficient blankets for warmth.
- * 9. **Treat dysrhythmias per protocols.** Monitor EKG closely.

CRUSH SYNDROME

I. INDICATIONS

Patient entrapped by crushing mechanism for a prolonged time.

II. SIGNS AND SYMPTOMS:

1. Compression of vasculature in excess of 60 minutes
2. Involvement of a large muscle mass. Profound edema in affected area.
3. Pulse and capillary refill return to distal limb after release from entrapment.
4. Arrhythmias including Peaked T waves and widening QRS complexes.
5. Usually absence of pain in affected region.
6. Hypotension and shock.
7. Rapid deterioration of patient after release. LOC changes at any time.

III. MANAGEMENT

1. Coordinate time of release with rescue personnel. Maintain body temperature during rescue operations.
2. Treat as any other multiple trauma victim.
- * 3. Secure Airway; High flow oxygen. Intubate if indicated. *Do not use **SUX**.*
- * 4. Monitor EKG, especially for Peaked T waves, widening QRS complexes and tachyarrhythmias
- * 5. IV large bore infuse 1000—2000 ml balanced salt solution just prior to extrication
2 exceptions:
 - a. If prolonged extrication infuse at 1500 ml/hour
 - b. Patient under 12 and elderly or those with renal failure should receive 20cc/kg boluses and check VS and lung fields.
- * 6. TREAT PATIENT WITH THE FOLLOWING ONLY IF CRUSH SYNDROME IS PRESENT. Signs and symptoms and EKG findings per above positive for crush syndrome.
- * 7. **Sodium Bicarbonate** 1 Ampule of 50 cc (50 mEq) admin. over 10 min. PRN X2
- * 8. **Lasix** 40 mg IV slowly.
- * 9. Pain Control **Fentanyl** 50—100 mcg PRN. Avoid Morphine.
10. During extrication process or transport, suspect hyperkalemia. If peaked T wave or QRS complexes become prolonged, *MEDICAL CONCURRENCE REQUIRED*.
 - *** a. Administer **10cc Calcium Chloride** 250—500 mEq IV slowly if dysrhythmias continue. (*DO NOT give with **NaHCO₃** Flush Line First*).
 - * b. Give **10.0 mg or 12cc Albuterol** med neb. May repeat as needed.
 - *** c. **50 grams Dextrose** (1 ampule) IV rapidly in conjunction with **10 units regular insulin** IV.
 - i. Monitor Blood Sugar levels closely.
 - ii. May repeat with medical control concurrence.
11. Rapid transport to the closest medical facility: Aero-medical transport if indicated.

FIELD TOURNIQUET

I. DEFINITION:

A tourniquet is a constricting or compressing device used to control venous and arterial circulation to an extremity for a period of time. Pressure is applied circumferentially to the skin and underlying tissues of a limb; this pressure is transferred to the vessel walls causing a temporary occlusion.

II. INDICATIONS:

1. Exsanguinating extremity trauma which cannot be controlled with direct pressure or elevation.
2. Mass Casualty Incident where temporary control of life-threatening extremity hemorrhage is indicated until situation is under control.

Note: While there are potential risks involved with the use of a tourniquets, expeditious and clinically appropriate application in the presence of potentially life threatening hemorrhage is in keeping not only with the standards of medical professionals, but accordingly so with the best interest of the patient.

III. CONTRAINDICATIONS:

1. Never use a tourniquet for more than 180 min. (3 hours) This time includes extrication/on-scene and transport. There is risk of ischemic tissue injury.
2. Any exsanguinating extremity injury that can be controlled with direct pressure and elevation, or hemostatic bandages. If these actions do not control the hemorrhage, than apply tourniquet.
3. Never apply a tourniquet over an impaled object.
4. Never apply a tourniquet on a joint. Tourniquet can injure the nerve.

IV. PROCEDURE: application.

1. Assess Pulse/Motor/Sensation status prior to tourniquet application.
2. Apply tourniquet proximal (3-5 cm) to wound margins.
3. Do not apply tourniquet over clothing. Do not cover the tourniquet with a bandage.
4. Secure tourniquet in place, continue to tighten the tourniquet until hemorrhage is controlled. Avoid over-tightening the tourniquet. Use only the minimal effective pressure required to reliably maintain arterial occlusion throughout the procedure.
5. Elevate the extremity when possible.
6. Note the time when tourniquet is applied, reassess every 5 min.
7. Notify receiving facility that the patient has a tourniquet in place. (tag or mark the patient with a TO if possible)

NOTE: *For Femoral Artery involvement, two tourniquets are required to ensure effective control.*

V. PROCEDURE: removal

1. If tourniquet time is longer than 2 hours, contact medical control for consultation on appropriate medical considerations for removal.

*****HEMOSTATIC AGENTS*****

(Blood clotting agents PARAMEDIC ONLY)

I. GENERAL CONSIDERATIONS

Hemorrhage always has been, and continues to be one of the leading causes of death in trauma. **CELOX™** (Cell Lock) is a granular mixture with Chitosan as a base product. It is designed to be poured directly into the bleeding wound (including arterial) and have pressure applied with a gauze roll. The mechanism of action is dual fold. Its cationic polymers bind strongly to the anionic groups on the surface of red blood cells. This clumps the red cells together effectively creating a clot. In addition Celox™ absorbs water. The clot itself is malleable and moldable. Because Celox™ clots independently of the normal clotting factors it clots heparinized and cold blood. Celox™ also does not generate the exothermic reactions that other hemostatic agents produce.

II. INDICATIONS

- A. Use in peripheral vascular hemorrhage either venous or arterial.
- B. Use in deep wounds for the control of external hemorrhage.

III. CONTRAINDICATIONS:

- A. Internal organ hemorrhage,
- B. Head wounds penetrating to the brain.

IV. INITIAL MANAGEMENT :

- A. Patient assessment:
 - ABC's
 - Wound care by direct pressure.
- B. Continue to look for other life threatening injuries.

V. PROCEDURES:

- A. Stop all life threatening bleeding by use of *proximal pressure point*. Continue to hold pressure point throughout the application procedure.
- B. Select the appropriate amount of hemostatic agent.
- C. Tear open the package.
- D. Blot excess blood from the wound using gauze.
- E. Immediately pour entire contents of pouch into the wound evenly.
- F. Apply firm pressure directly to the wound for 5 minutes using a gauze pad.
- G. Apply a pressure bandage over the wound. Release pressure point.
- H. If any bleeding persists apply direct pressure for additional 5 minutes.
- I. Treat all other injuries and transport the patient immediately.
- J. To remove the product: Irrigate thoroughly all material from wound prior to hospital wound care protocols.

INTRAOSSIOUS INFUSION GUIDELINES

I. INDICATION:

Intraosseous infusions are an alternative access site when other IV access is unobtainable. It is an emergent procedure intended specifically for the critically ill or injured child or adult. Intraosseous access should be initiated within two (2) minutes after routine IV access has proven to be unobtainable. In the pediatric patient who appears to be in peripheral vascular collapse due to any cause, the intraosseous access should be attempted immediately.

Above applies to the following:

1. Patients between 3-39 kg use the **EZ-IO PD®**
2. Patients over 40 kg use the **EZ-IO AD®**
3. Altered mental Status (GCS of 8 or Less).
4. Respiratory compromise (such as patients with a SaO₂ 90% after appropriate oxygen therapy or a respiratory rate < 10 or > 40 / Min).
5. Hemodynamic instability (As noted by a decreased BP, decreased skin perfusion, delayed capillary refill or weak or absent radial pulses).

II. CONTRAINDICATIONS:

1. Infection at or near proposed site.
2. Suspected or actual fracture of the same limb.
3. Pre-existing medical condition involving that extremity.
4. Inability to locate landmarks.
5. Excessive tissue at insertion site. (obesity)

III. SITES:

1. Preferred site – One or two cm. below the tibial tuberosity on the flat anteromedial tibial surface.
2. 2nd site—One or two cm proximal to the medial malleolus on the medial aspect of the tibia.
3. 3rd site—One or two cm proximal to the lateral humeral head. For patients over 40 kg.

INTRAOSSEROUS INFUSION GUIDELINES (continued)

IV. CONSIDERATIONS:

1. Flow Rates:

Due to anatomy of the IO space flow rates may be slower than those achieved with IV catheters.

- Rapidly flush (bolus) 10 mL saline with a syringe through the **EZ-IO**®
- Use a pressure bag or pump for continuous infusions (Exercise extreme caution with continuous fluid administration in children).

2. Pain:

Insertion of the EZ-IO in a conscious patient may cause mild to moderate discomfort but is usually no more painful than a large bore IV however; if pain of infusion is a strong possibility, consider SLOW administration of **0.5 mg/kg of 2% Lidocaine /max 40 mg.** (preservative free) through the **EZ-IO**® extension set and catheter prior to fluid bolus.

V. PRECAUTIONS:

The **EZ-IO PD**® and **EZ-IO AD**® are not intended for prophylactic use.

VI. EQUIPMENT:

1. **EZ-IO**® Driver
2. **EZ-IO**® PD and AD needle set
3. Alcohol and betadine swabs
4. **EZ-Connect**™
5. 10 mL pre-filled Normal Saline Syringe
6. 1000mL Balanced Salt Solution.
7. Tape and Gauze
8. Pressure Bag
9. **2% Lidocaine** (preservative free) **100 mg/5mL** pre-filled syringe.

VII. PROCEDURE:

1. If the patient is conscious, advise them of the EMERGENT NEED for this procedure and obtain informed consent.
2. Body Substance Isolation Equipment.
3. Determine **EZ-IO**® Indications
4. Rule out Contraindications
5. Locate insertion site. (preferred sites first)
6. Clean insertion site using aseptic technique
7. Prepare the **EZ-IO**® driver and needle set
8. Stabilize the bone and insert **EZ-IO**® needle set (pull traction on the skin).
9. Remove Driver from needle set while stabilizing catheter hub
10. Remove stylet from needle set, place stylet in shuttle or sharps container
11. Confirm placement, connect primed **EZ-Connect**™ to extension set
12. Conscious patients should receive **0.5 mg/kg 2% Lidocaine IO/ max 40 mg**

MAST

CONTROVERSIAL:

Current scientific opinion is split on the utility/effectiveness/ appropriateness of the MAST garment. For the present, MAST may be useful for specific applications.

I. Indications

1. Traumatic hypovolemic shock as defined by blood pressure or by clinical signs of inadequate tissue perfusion.
2. Intra-abdominal hemorrhage due to trauma, aneurysm, etc.
3. Femur or pelvic fractures (may be used with a traction splint).

II. Contraindications

1. Acute pulmonary edema.
Cardiogenic shock, cardiac tamponade.
Suspected intrathoracic hemorrhage (hemothorax).
2. Do not inflate abdominal section:
 - A. In late pregnancy.
 - B. If respiratory compromise occurs.
3. Inflate legs only in pediatric patient under age 10.

III. Procedures

1. Primary survey.
2. Vital signs.
3. Remove clothing from the lower extremities.
4. Place or slip trousers onto patient; abdominal section should not extend above lower ribs.
5. Encase lower extremities and abdomen in trousers and secure straps.
6. Inflate trousers beginning with leg sections, then abdomen until:
 - A. Patient's blood pressure is restored to 90 systolic.
 - B. Velcro starts to crackle and separate.
 - C. Pop-off valve begins to operate.
7. Turn valve on tubing to "close" position.
8. Monitor vitals carefully q 5 minutes.
- * 9. Cardiac monitor.
10. Deflation shall not be performed in the field except when pulmonary edema develops.

NOTE: Gauges are inaccurate for field usage and their use is discouraged.

PENETRATING TRAUMA FROM TASER® WEAPONS

I. GENERAL CONSIDERATIONS:

1. Law Enforcement agencies in the county are beginning to use less lethal devices in the arrest of high risk suspects. This means that EMS is going to be called in to perform procedures resulting from the device usage.
2. Always ensure that the scene is safe for EMS to enter. Follow the directions of Law Enforcement when you arrive. (non-medical)

II. INDICATIONS:

1. Darts can be removed in the field by EMS personnel when requested by Law Enforcement. The darts are only (1/4 inch) in length, barbed, and can be safely removed in the field without the use of special instruments.
2. Patients must be in police custody and EMS personnel must be convinced that the patient is adequately restrained.

III. CONTRAINDICATIONS:

1. The darts should only be removed in the field if the darts do not involve the eye, face, neck, breast, and groin. Patients with retained darts in these areas should be transported to a hospital to have them removed by a physician.

IV. PROCEDURES:

1. Gloves must be worn during the procedure.
2. Ensure that the wires are disconnected from the Taser® or the wires have been cut.
3. Push on the body part in which the barbed darts (straight #8 fish hook) is imbedded in and simultaneously pull the dart straight out.
4. Apply alcohol or iodine to the punctured areas and dress as needed.
5. Treat all darts as a "Contaminated Sharp". The darts should be placed in a biohazard sharps container and turned over to Law Enforcement as evidence.
6. All patients must be thoroughly assessed to determine if any other medical problems or injuries are present. Carefully document any positive or negative findings on your MIR.
7. If the individual does not have any other presenting injuries/illnesses, they may be left in the custody/care of Law Enforcement.
8. If transported to the hospital, follow the Patient Care Procedures regarding restraints for aggressive or violent patients.

SHOCK (Traumatic)

I. General Considerations

1. Tachycardia is the first signs of shock. (check if Pt. is on Betablockers)
2. Pulse pressure often narrows prior to fall in systolic.
3. Changing level of consciousness important clue.
4. Monitor Capnography
5. Control all external hemorrhages with Direct Pressure/ Hemostatic Agents or Tourniquets.

II. Initial Interventions

1. Maintain airway. ET placement as needed.
2. **100 % O₂**.
3. Monitor vital signs frequently. (every 5—10 min)
- * 4. **EKG** monitor.
5. Trendelenburg position, if tolerated and not interfering with respirations.

III. Treatment

- * 1. Initiate **IV's** with large bore needle and Warmed balanced salt solution. Minimum of Two (2) large bore lines recommended for trauma.
2. **Hypovolemia – trauma/neurogenic.**
 - A. Give up to **two (2) WARMED liters of fluid** until:
 1. BP systolic is 90-100.
 2. Neck vein distension develops.
 3. Pulmonary rales develop.
 4. ***If additional fluids required, contact Medical Control, if unable to contact medical control, administer additional liters of fluid until above are criteria is met.***
(pediatric fluid challenge 20cc/kg rapidly, may repeat x 2, as indicated.)
 5. **Tranexamic Acid 1 Gm** into 100mL NS, infused over 10 min.
Once infused, **1 Gm** into 250 mL infused over 8 hours.
 - B. If Head Injury and Shock
 1. Target B/P 90 systolic
 2. Maintain normal ventilation rate
 3. Target EtCO₂ 30 mm/hg
 - C. Neurogenic shock not responding to fluid challenge;
 1. **(Dopamine 5-20 mcg/kg/min)**
(Child; 2-20 mcg/kg/min)
- *** 3. Contact Medical Control for orders to administer O—Neg /O—Pos blood. (if indicated) . Follow ARC Blood Transfusion protocol. Page D
4. Contract Receiving Medical Facility and advise of Full Trauma Activation. Recommend Aeromedical transport if applicable.
5. Rapid transport.

TRAUMA SURGICAL GUIDELINES

******MEDICAL CONTROL CONCURRENCE******

CRICOTHYROIDOTOMY

I. INDICATIONS:

LIFE-THREATENING UPPER AIRWAY OBSTRUCTIONS WHERE NON-INVASIVE OR MANUAL MEASURES HAVE FAILED TO ESTABLISH AN AIRWAY AND ATTEMPTS AT VENTILATION HAVE FAILED AND ENDOTRACHEAL INTUBATION IS NOT FEASIBLE.

*******NOT TO BE USED IN PEDIATRIC MANAGEMENT*******

II. MANAGEMENT:

1. Failed attempts at establishment of airway.
- *** 2. Surgical Cricothyroidotomy:
 - A. Place patient supine, protect cervical spine, as indicated.
 - B. Identify the cricothyroid membrane in the midline between the thyroid And cricoid cartilage's. Grasp the thyroid cartilage with middle finger and thumb; identify the cricothyroid membrane with index finger (should be done with non-dominant hand).
 - C. Prep with iodine soap.
 - D. Locally anesthetize, if patient is conscious, **1-2 cc 2% Lidocaine subcutaneous**.
 - E. Make a vertical skin incision approximately 2.5 cm in length over the Cricothyroid membrane. Expose and carefully incise through the membrane.
 - F. Insert the tracheal hook into the incision and pull the lower margin caudally to open the incision (alternatively, insert a Trousseau dilator or similar instrument to open incision).
 - G. Insert an appropriately sized, cuffed ET tube or tracheostomy tube into The cricothyroid membrane incision, direct the tube caudally into the trachea. Inflate the cuff and ventilate the patient.
 - H. Secure the ET tube; control local bleeding with direct pressure.

III. Rapid transport.

NEEDLE-JET CRICOTHYROIDOTOMY

I. INDICATIONS:

FAILED ATTEMPTS AT ESTABLISHMENT OF AIRWAY AS ABOVE .

*******MAY BE USED FOR ADULTS AND PEDIATRICS*******

II. MANAGEMENT:

1. Attempt airway and ventilation with 100% O₂.

2. Needle-Jet Cricothyroidotomy:

- A. Place patient supine; if cervical spine permits hyperextend moderately.
- B. Identify the cricothyroid membrane in midline between the thyroid and cricoid cartilage's.
- C. Prep with iodine soap. Locally anesthetize, if patient is conscious, with 1cc 2% Lidocaine subcutaneous.
- D. Assemble a #10- or #14 gauge over-the-needle catheter to a 5-10 ml. syringe.
- E. Puncture the skin midline and directly over the cricothyroid membrane.
- F. Direct the needle at a 45 degree angle caudally through the membrane aspirating constantly; aspiration of air signifies entry into the tracheal lumen.
- G. Withdraw the needle and carefully advance the catheter into the trachea.
- H. Attach the catheter to oxygen tubing with a suction tubing "Y" connector to a high pressure oxygen source (50 PSI) and ventilate at one second on, four seconds off. Allow enough time for exhalation.
- I. Secure device to skin.

III. Rapid transport.

PERICARDIOCENTESIS

I. INDICATIONS:

PERICARDIAL TAMPONADE – RAPIDLY DETERIORATING PATIENT.

II. MANAGEMENT:

1. Establish airway and ventilations with 100% **O₂**.
- * 2. **IV** balanced salt solution, fluid challenge as per protocols.
- * 3. **Cardiac monitor.**
4. CPR, as needed.
- *** 5. Pericardiocentesis:
 - a. Prep the xiphoid area with iodine soap.
 - b. Local anesthesia, if indicated (**1 cc 2% Lidocaine** subcutaneous).
 - c. Attach a #14 gauge, 5 ½ inch over-the-needle catheter to large syringe.
 - d. Puncture the skin 1-2 cm inferior to the left margin of the xiphoid process, at a 45 degree angle to the skin.
 - e. Carefully advance the needle/catheter cephalad aiming for the tip of the left scapula, aspirating constantly.
 - f. When the needle tip enters the blood-filled pericardial sac, withdraw as much blood as possible (pericardial sac blood will not clot). In a simple cardiac tamponade, withdrawal of a small amount of pericardial blood may result in rapid drop of the central venous pressure (neck veins) and a slow improvement in blood pressure.
 - g. If the needle is advanced too far during insertion or if the epicardium contacts the needle tip during aspiration, an injury pattern will appear on the cardiac monitor (ST-T wave changes, PVC's, etc.). The needle tip should be withdrawn slightly until the changes subside.
 - h. After aspiration, withdraw the needle and secure the catheter to the skin while occluding the catheter with a small syringe attached. The pericardial sac may then be repeatedly aspirated as needed.
6. **Rapid transport.**

PLEURAL DECOMPRESSION

I. INDICATION:

TENSION PNEUMOTHORAX, RAPIDLY DETERIORATING PATIENT

II. MANAGEMENT:

1. Establish airway.
2. 100% O₂.
- * 3. **Sedate as needed.** Patient hemodynamically stable.
- *** 4. Decompress chest.
 - a. Identify the 2nd intercostal space, in midclavicular line on the side of the tension pneumothorax or anterior mid-axillary line, 5th intercostal space.
 - b. Prep the area with iodine soap.
 - c. If patient conscious, anesthetize area with **2% Lidocaine 2cc** subcutaneous and into intercostal muscle.
 - d. Attach a #10 (Adult) or #14 (Pediatric) gauge over-the-needle catheter (3-6 cm length) snugly to a 35 or 50 ml. Syringe.
 - e. If possible, place patient in upright position.
 - f. Insert needle/catheter into the skin and direct the needle just superior to the 3rd rib into the 2nd intercostal space.
 - g. Puncture the parietal pleura; a “pop” is usually felt.
 - h. Aspirate as much air as possible; if necessary the syringe can be removed to allow “free flow” of air from the pneumothorax until equilibrium is reached.
 - i. Remove the needle, secure the catheter to the skin; apply a flutter-valve, if possible.

III. CAUTIONS:

1. Understand and review the signs and symptoms of tension pneumothorax.
2. This procedure to be used only in life-threatening situations
3. Complications include local hematomas, cellulitis and pneumothorax.

SKIN STAPLING

I. INDICATIONS:

To control significant hemorrhage from lacerations, with closable margins, that cannot otherwise be controlled using routine methods described in the Bleeding Control Guidelines.

II. PRECAUTIONS:

1. Staples will need to be removed in the emergency department and the wound will require thorough cleaning.
2. Skin stapling cause's pain, however can normally be tolerated without local anesthesia. Local anesthesia injection may actually be more painful than the stapling itself. Inform the patient that you intend to apply staples and some pain is anticipated.
3. Wounds without clear margins or with large areas of missing skin will not benefit from stapling.
4. Due to risk of permanent scarring, wounds involving the face should not be closed with staples unless absolutely necessary to control life-threatening bleeding.
5. Wounds that might extend into cranium, throat, joint, thoracic or abdominal cavity, or contain visible bone or tendon should not be stapled unless absolutely necessary to control life threatening bleeding.
6. Human or animal bites should not be stapled unless absolutely necessary to control life threatening bleeding.

III. MANAGEMENT:

1. Irrigate profusely with saline and remove all debris if possible.
2. Approximate the laceration margins with a gloved hand.
3. Align the stapler in the middle of the wound, making sure both edges of the stapler are in contact with the wound margins.
4. Apply staples with firm downward pressure, approximately every 0.5-1cm, until wound is closed and bleeding has stopped or slowed significantly.
5. Apply a pressure dressing to the stapled wound if possible.
6. Upon arrival to the emergency department, inform the receiving physician staples have been applied to the wound under non-sterile conditions. The staples may need to be removed by the physician in order to fully clean the wound. Describe the appearance of the wound and degree of potential contamination. Note number of staples applied to close wound. Record all findings and treatment in your MIR.
7. Follow Pain Management Guidelines.

THORACOSTOMY (Chest) TUBES

I. INDICATIONS:

Patients being transported with Thoracostomy Tubes in place.

II. GUIDELINES:

1. All thoracostomy tubes must be securely attached to patient before transport. This should include: confirmation of suturing to the skin, occlusive dressing to thoracostomy site, and secure taping of the thoracostomy tube to the patient.
2. All thoracostomy tubes should be connected to a commercially available Pleur-Evac or a Heimlich valve.
3. If suction was being applied to the Pleur-Evac at the sending facility, it will be maintained during the transport at the same settings unless otherwise instructed by the sending physician.
4. In the event of a sudden deterioration in the patient's status, all thoracostomy tubes will be placed on suction.
5. Thoracostomy tubes should be re-examined every 15 minutes during transport to ensure proper function.
6. In the event that a thoracostomy tube becomes dislodged, no attempt will be made to reposition. The thoracostomy tube should be put to suction and the patient observed for signs of a tension pneumothorax
7. If tension pneumothorax should develop, initiate appropriate care with needle decompression and contact sending physician, and receiving physician.
8. Provide appropriate analgesia to all patients.
9. If the patient becomes hypotensive and tension pneumothorax is not suspected, refer to Hypotension and shock guidelines.

TRAUMATIC HEMORRHAGIC LUNG ISOLATION

I. INDICATIONS:

Unilateral Hemorrhagic Lung Injuries: penetrating chest trauma: GSW or Knife Wounds.

II. MANAGEMENT:

1. Establish airway, assist with ventilations as needed.
2. Administration of 100% oxygen.
- * 3. Establish multiple large bore IV lifelines with balanced Salt Solutions:
- * 4. Prepare to Intubate the patient. If patient is conscious and time permitting, use RSI techniques:
5. *Left Lung Injury:*
 - a. Intubate the right mainstem bronchi 1" past the carina and inflate the cuff. Ventilate half the normal tidal volume. (ventilating one lung not two)
6. *Right Lung Injury:*
 - a. Remove the ET tube BVM attachment. You will need one full size smaller attachment for this procedure.
 - b. Measure and mark the following three places on a Foley Catheter. With a Foley Catheter inserted through the ET tube, mark the Foley Catheter at the attachment end when both tips are together, then 1" past the ET tube tip, and the final 3rd mark 2" past the tip of the ET tube. You may have to cut the ET tube down in order to get the Foley Catheter to fit. Cut about 2" off the attachment end of the ET tube. (Best to have the ET and Foley Catheter already set up and in kit form)
 - c. Leave the Foley Catheter to the first mark inside the ET tube, insert the ET tube into right mainstem bronchi past the carina. Foley Catheter can be advanced to 2nd or middle mark. Inflate the Foley Catheter with 7-10 cc of air.
 - d. Once Foley Catheter is inflated retract ET tube, without moving Foley Catheter, to proper ET Tube placement point. This should be at the 3rd mark on the Foley Catheter.
 - e. Inflate the ET Tube cuff, and replace the ET Tube BVM attachment with a complete size smaller attachment. The smaller size will allow for the Foley Catheter in the lumen.
 - f. Ventilate the patient using half the tidal volume. Remember ventilating one lung not two.
7. If penetrating injuries to the chest, cover the entry and exit wounds with an occlusive dressing, sealing up the open chest wound. Follow *Pleural Decompression Protocols*.
8. Remember it is possible to have a decreased B/P with ventilated patients in addition to blood loss into the chest.

III. CAUTIONS.

1. Understand and review the signs and symptoms of hemo-pneumothorax.
2. This procedure is to be used only for life-threatening situations;
3. Monitor the patient for further changes with hypotension and tension pneumothorax.

VENTILATOR MANAGEMENT

I. INDICATIONS:

Patients who are mechanically ventilated.

II. MANAGEMENT:

1. Provide for patient comfort and safety.
2. Optimize ventilator parameters.

III. GUIDELINES:

1. Connect ventilator hose to oxygen outlet, and power supply to AC outlet.
2. Turn on the oxygen supply and check cylinder pressure to ensure enough oxygen for the intended use and time.
3. Set ventilation parameters to suit the patient's medical needs. Confirm with sending physician's orders.
4. The following standard ventilator settings will be initiated unless other physician orders/patient condition are indicated.
 - a. FIO₂ titrated to maintain SpO₂ > 90%
 - b. Respiratory rate = 10—12
 - c. Duration of ventilation = 1:1.5 Unless otherwise directed
 - c. Tidal Volume = 4—8 mL/kg
 - d. PEEP = 5
 - e. Pressure MAX = 20—40
 - f. Mode = Assist control
5. Briefly occlude the patient connection port of the patient-valve with thumb and check that the peak inflation pressure reading on the manometer is appropriate for the patient.
6. Connect the patient valve to the endotracheal tube.
7. Monitor the inflation pressure manometer to ensure correct ventilation.
8. Make appropriate adjustments per patient's clinical condition, ETCO₂ should be maintained between 38—42 mmHg. ETCO₂ must be monitored by waveform capnography at all times.
9. Adjustments beyond the following parameters require physician orders.
 - a. Respiratory rate <8 or >16
 - b. PEEP >10
 - c. ETCO₂ <38 or >42 mmHg.
10. Provide sedation, paralytics, and analgesia during the transport.

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**PRE-HOSPITAL CARE GUIDELINES OBSTETRICAL-GYNECOLOGICAL
EMERGENCIES**

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GENERAL CONSIDERATIONS OF OB/GYN

1. Most deliveries proceed without complications.
2. Most routine, uncomplicated pregnancies in labor may be transported with a minimal of ALS intervention.
3. Transport most pregnant females in the position of comfort.
4. If possible, **transport** unconscious or traumatized **third-trimester pregnant females in left lateral recumbent** (spinal precautions maintained if needed).
5. Treat hypotension in the pregnant female aggressively.
6. **Following emergency delivery, the baby has primary consideration.**

EMERGENCY DELIVERY

I. INITIAL INTERVENTIONS:

1. Scene size up and initial patient assessment

IF DELIVERY APPEARS IMMINENT, PROCEED AT SCENE:

II. TREATMENT:

1. **O₂** – high flow.
2. Place mother supine.
- * 3. Start **large bore IV** with balanced salt solution (time permitting).
4. Apply **gentle counter-pressure** to baby's head as it delivers.
5. As soon as head delivers, **suction baby's nose and mouth** with bulb syringe.
6. **Assist delivery** of shoulders and rest of body.
7. After delivery, **clamp cord** using two clamps 6-8 inches from baby's body; cut cord between clamps.
8. Give newborn primary attention; keep warm, dry, clear airway. Perform APGAR at 1 min and 5 minutes
9. **Let placenta deliver normally**; do not pull on cord.
10. Place delivered placenta in plastic bag for transport.
11. After delivery of placenta, massage uterus firmly.
12. Examine perineum for tears, apply direct pressure with gauze pad to any bleeding tears. **Do not** pack vagina.
13. Estimate blood loss. Treat for hypovolemia as needed.
14. Transport.

COMPLICATIONS OF DELIVERY

I. BREECH DELIVERY

1. **High flow O₂** to mother.
2. If breech obvious, **transport without delay** to hospital.
3. Place mother supine or in Trendelenburg position.
4. If delivery occurs during transport:
 - A. Allow the mother to push-do not pull the baby – gently extract.
 - B. Support delivered body and extremities on your hand and arm.
 - C. If head not delivered, place gloved hand in vagina to form a “V”
Around baby’s mouth and nose should it begin to breathe.
 - D. Be familiar with Mauriceau Maneuver.
 1. Finger of left hand inserted into infants mouth or under mandible, finger of right hand curved over shoulder.
 2. Assistant asserts suprapubic pressure on head.

II. PROLAPSED CORD

1. Initial Patient Assessment,
2. Frequent vital signs.
3. **High flow O₂** to mother.
4. Place mother in knee-chest position or extreme Trendelenburg position.
5. Insert gloved hand into vagina and **gently lift head/body off of cord.**
6. **Observe cord for pulsations** and continue until relieved by hospital staff.
7. Rapid transport.

COMPLICATIONS OF DELIVERY (continued)

III. CORD WRAPPED AROUND NECK

1. Gently attempt to loosen cord.
2. With two fingers behind baby's neck, try to slip cord forward, over baby's upper (anterior) shoulder and head. If unsuccessful, attempt to slip under lower shoulder and over head.
3. If unsuccessful, clamp cord with two clamps, cut cord between clamps, and carefully unwrap cord from around neck.
4. Assist delivery.

IV. PLACENTA PREVIA / ABRUPTIO PLACENTA

1. Initial Patient Assessment
2. Frequent vital signs.
3. **High flow O₂.**
- * 4. **IV** balanced salt solution- If hypovolemic, fluid challenge and MAST prn.
5. Transport, contact delivery room en route.

V. POSTPARTUM HEMORRHAGE

EARLY – USUALLY DUE TO UTERINE ATONY OR TEARS OF THE CERVIX

LATE – (7-10 DAYS) – RETAINED PLACENTAL PARTS

1. Initial Patient Assessment.
2. **High flow O₂.**
- * 3. **IV** – large bore, one or more, with balanced salt solution.
- * 4. If hypovolemic: **IV fluid challenge per protocol.**
5. **External uterine massage** (elevate and firm pressure).
6. If atony of uterus is present and uterus is large and doughy, **Oxytocin (Pitocin) 20—40 units into 1000 mL NS and infuse at 200 mL/hr may titrate rate higher to control uterine atony.**
7. Rapid transport to hospital.

TOXEMIA OF PREGNANCY

PRE-ECLAMPSIA AND ECLAMPSIA

I. SYMPTOMS / SIGNS

1. Mild Pre-eclampsia:
 - a. Hypertension (moderate)
 - b. Edema
 - c. Weight gain
2. Moderate to Severe Pre-eclampsia (any one of the following):
 - a. Hypertension >160 systolic or >110 diastolic
 - b. Headache
 - c. Cerebral disturbances (changes in behavior)
 - d. Visual disturbances (flashes of light)
 - e. Epigastric pain
 - f. Dyspnea
 - g. Cyanosis
3. Eclampsia [Toxemia] (any one of the above plus):
 - a. Seizure or Post-ictal

II. TREATMENT:

1. Initial Patient Assessment.
2. Frequent vital signs.
3. **High flow O₂. RSI if needed**
- * 4. **IV TKO. Balanced Salt Solution.**
- * 5. **Cardiac monitor.**
Pulse oximetry.
6. Seizure precautions.
 - * a. **Magnesium Sulfate 4 gm IV** slow (over 15 min). Followed by, **infusion of 1—2 gm/hr. (1—2 gm mix in 100 mL NS)** Check DTR and Resp. If DTR absent or Resp < 12, D/C. **Magnesium Sulfate.**
 - * b. If patient seizing, give **Valium 5.0--10mg IV**. Repeat **5 mg** doses to desired effect. **Max** dose of **20 mg**. Monitor respirations and oxygenation carefully.
- * 7. Give **Calcium Chloride 250—500 mEq of 10%** solution over 3 – 5 min. If DTR absent or resp. rate < 8. Can cause bradycardia and arrhythmias if infused to rapidly.
- * 8. **Labetalol 10 mg IV** followed by **20 mg, 40 mg, 80 mg every 10 minutes until total dose 300 mg** or diastolic B/P < 110
- * 9. Rapid transport – calm and reassure patient en route.

SPONTANEOUS ABORTION

I. INITIAL INTERVENTIONS

1. Initial Patient Assessment (establish last menstrual period).
2. Frequent vital signs.

II. TREATMENT

1. If hypotensive:
 - A. **High flow O₂.**
 - B. **Cardiac monitor.**
 - C. **IV large bore with balanced salt solution per protocol.**
 - D. **MAST prn.**
2. Apply loose perineal pad. Collect any tissue passed and bring to the hospital.
3. Transport.

SEXUAL ASSAULT

I. INITIAL ASSESSMENT

1. Initial Patient Assessment
2. Focused History/Exam, as indicated – treat associated injuries per applicable protocols.
3. Contact local police / sheriff's office and alert them to the assault. Do not delay patient treatment while waiting for law enforcement.
4. Do not allow patient to bathe, douche, etc. If clothing already changed, collect clothing worn during assault for transport to the hospital in a paper bag. Maintain chain of evidence.
5. Give emotional support and reassurance to patient. If patient is unwilling or embarrassed to answer questions, do not press inquiries.
6. Transport. Advise local law enforcement as to destination. Remember, this is also a crime victim and often you are at a crime scene.

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PRE-HOSPITAL PATIENT CARE PEDIATRIC GUIDELINES

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PEDIATRICS
PEDIATRICS AT A GLANCE

I. PEDIATRICS DEFINED:

1. Pediatric Patients: Individuals who have not reached their 15th birthday or **who appear** not to have reached their 15th birthday.
2. Newborn Patients: Birth to 28 days of age.

AVERAGES FOR AGE

	PULSE	BP SYSTOLIC	RESP.	WEIGHT (kg)
Premature Newborn	140	50-60	<60	1-2
1 year	110-150	60-90	30-60	3-4
2 years	100-140	75-100	25-40	10
6 years	90-100	75-100	25-40	16
10 years	80-100	85-100	20-30	20
Adolescent	70-100	90-100	14-22	40
	60-100	100-120	12-20	50-70

ET TUBE SIZES

PREMATURE	2.5
NEWBORN	3.0
6 MONTHS	3.5
18 MONTHS	4.0
3 YEARS	4.5
5 YEARS	5.0
6 YEARS	5.5
8 YEARS	6.0
12 YEARS	6.5
16 YEARS	7.0
ADULT	8.0-9.0

ET LENGTH

(cm Lip to Tip)

6 + wt. kg
6 + wt. kg
11
11
13
14
15
17
19
20-24
22-24

II. MEDICATION CONSIDERATIONS

1. A * in these protocols indicates a pediatric medication dose or procedure:
2. Administration of medications to the pediatric patient is usually determined by weight. Dosages of specific medications should **never** exceed the maximum identified adult dose.

* **3. PEDIATRIC FLUID CHALLENGE**

- a. 20 cc/kg Balanced salt solution rapidly IV, may repeat initial dose x 1, as needed. TKO fluid—balanced salt solution preferred.

- * 4. For endotracheal tube administered medications, dilute with Normal Saline to a volume of 3-5 ml and follow with several positive pressure ventilations.

**GENERAL INSTRUCTIONS:
MANAGEMENT OF SEVERELY ILL OR INJURED CHILD**

I. INITIAL INTERVENTIONS

1. Establish responsiveness.
2. Assess airway; open airway, as needed, avoiding hyperextension.
 - a. **Protect cervical spine.**
 - b. Ventilate, as needed.
 - * c. Endotracheal tube, as needed.
3. Assess pulse.
 - a. CPR, as indicated; follow cardiac arrest protocols.
4. Assess hemorrhage; control, if present.
5. Assess pulse rate, respirations, BP.
 - a. Treat shock, as per protocol.

II. FOCUSED HISTORY AND PHYSICAL EXAM:

1. Head-to-toe exam, as indicated.
2. Brief history, including age, general health, history of present illness, medications, fever, trauma.

III. TREATMENT:

1. **O₂** by face mask (6L), unless this causes agitation. Consider blow by **O₂**
- * 2. Establish **cardiac monitor** for shock, coma, irregular pulse, etc.
- * 3. If condition warrants IV fluids or IV medications, establish an IV with microdrip tubing and soluset. IO line may be indicated.

NOTE:

Pediatric MAST pants may be effective, are rapid, and should be on all transport vehicles. Inflate legs only in a child under age 10.

Most pediatric medical emergencies (not trauma) are respiratory emergencies.

GENERAL INSTRUCTIONS:
MANAGEMENT OF SEVERELY ILL OR INJURED CHILD
(continued)

IV. PEDIATRIC TRAUMA

Most pediatric respiratory emergencies can be managed with oxygen, suction, proper patient positioning, and occasionally with IPPV with bag and mask. Rarely will intubation be necessary.

Pediatric emergencies should be transported to the closest stabilization facility.

In certain categories of pediatric trauma, County Operational Procedures and Washington State Trauma Triage Tool will be used. Early contact with receiving medical facility, with accurate triage information, is mandated in the seriously injured pediatric patient. Field triage criteria may include, but not be limited to: (Refer to Wa. St. TTT.)

1. Shock:
 - a. Systolic BP < 80 in child \geq 6 years old $\Rightarrow\Rightarrow$ *not responding*
 - b. Systolic BP < 60 in child < 6 years old $\Rightarrow\Rightarrow$ *to therapy*
2. Severe Respiratory Distress
3. Head Injury in Shock
4. Amputations
5. Burns \geq 15%
6. Obvious Spinal Cord Injuries

NEWBORN RESUSCITATION

I. GENERAL CONSIDERATIONS:

1. Prevent heat loss from the infant:
 - a. Quickly and gently dry infant; Remove wet linen from contact with infant.
 - b. Maintain warm environment, place in mothers arms if condition warrants.

II. INITIAL INTERVENTIONS:

1. **Sniffing position** usually opens airway.
 - a. **Bulb suction** nose and mouth.
 - b. If meconium is present, **suction with meconium aspirator**, as needed.
 - c. Marked meconium staining:
 - * i. Visualize cords, suction with meconium aspirator or # 10 catheter.
 - * ii. **Intubate** and suction trachea with ET tube as suction tube.
 - * iii. **Reintubate** and attempt ventilations. Suction as needed.
2. **Breathing Control:**
 - a. **Stimulate** respirations by flicking heels, rubbing spine, dry with blanket.
 - b. Face mask with **6L O₂**.
 - c. **Positive pressure ventilation** for:
 - i. Apnea or gasping respirations-**APGAR** score 5 or less.
 - ii. Assess **APGAR** at 1 minute and 5 minutes after birth.
 - * d. **Intubation** for persistent apnea or APGAR less than 5 after 10 minutes.
3. **Clamp and cut cord** 6"-8 " from baby. Transport delivered placenta to hospital.
 - *** a. May use **umbilical vein** for IV access prn. Contact Medical Control.

III. FURTHER TREATMENT:

- * 1. Persistent bradycardia (rate < 80) or asystole despite PPV.
 - a. **Epinephrine 0.01-0.03 mg/kg (1:10,000)** IV, IO, or ET Tube.
2. Respiratory depression due to maternal narcotics despite adequate O2 and PPV.
 - * a. **Narcan 0.1 mg/kg** ET Tube, IM, IO, IV.
3. Neonatal Fluid Resuscitation: **10 ml/kg Balanced Salt Solution**.

APGAR SCORING

SCORE	0	1	2
HEART RATE	ABSENT	< 100	> 100
RESP. EFFORT	ABSENT	SLOW, IRREGULAR	GOOD, CRYING
MUSCLE TONE	LIMP	SOME FLEXION OF EXTREMITIES	ACTIVE MOTION
REFLEX IRRITABILITY (NASAL CATHETER)	NO RESPONSE	GRIMACE	COUGHS, SNEEZES
COLOR	BLUE/PALE	EXTREMITIES BLUE	COMPLETELY PINK

PEDIATRIC APNEA AND CYANOSIS

I. INITIAL INTERVENTIONS

1. Initial Patient Assessment.
2. Assess for seizure activity; treat per guidelines.

II. TREATMENT:

1. **Protect airway** against vomiting and aspiration.
2. **O₂ 100%** by mask, if cyanosis or apnea; ventilate with bag valve mask.
- * 3. **Intubate**, as indicated, **100% O₂**, ventilate with bag valve mask.
- * 4. **IV balanced salt solution TKO**, if intravenous medications warranted (or IO).
5. Transport.

NOTE: Transport any child with history of apnea or cyanosis to hospital for evaluation.

CROUP AND EPIGLOTTITIS

I. INITIAL INTRVENTIONS:

1. Initial Patient Assessment
2. Calm patient. Sitting position preferably, parent's lap best, if possible.
3. Assess rate and quality of respirations; note retractions.
 - a. Do not attempt to visualize pharynx.

II. TREATMENT:

1. **NS nebulized** by MedNeb and mask for mild stridor.
2. For cyanosis and severe stridor:
 - a. **O₂ high flow**, humidified.
 - * b. **Racemic epinephrine**
 - i. If child 20-40 kg 0.5 in 5 cc NS by Med Neb and mask
 - ii. If child < 20 kg 0.25 in 5 cc NS by Med Neb and mask.
 - * c. **Dexamethasone 0.3—0.6 mg/kg IM for moderate to severe.**

Note: **Dexamethasone** should be given in the thigh of children up to 5 yrs of age. Do not give more than 1 cc per thigh.

NOTE: Do not attempt intubation.

3. For respiratory arrest or cyanosis with loss of consciousness:
 - a. Supine position.
 - b. Proper neck position and **attempt positive pressure ventilation**,
 - * c. If unable to ventilate, **may attempt intubation.**
 - *** d. If unsuccessful, **needle cricothyroidotomy** with 14 gauge needle/catheter.

*****PEDIATRIC COMA/ALTERED MENTAL STATUS: UNKNOWN*****

I. INITIAL INTERVENTIONS:

1. Initial Patient Assessment.
2. If obvious trauma, secondary survey, follow appropriate protocol for head injury, shock, etc.
If no discernible trauma, obtain relevant history (fever, diabetes, seizure, Etc.) and perform focused/detailed history and physical exam.

II. TREATMENT:

1. **Establish airway.**
 - a. **Protect** cervical spine.
 - b. **Oxygen 100%** by mask.
 - c. **Ventilate**, as needed.
 - * i. **Intubate**, as needed.
- * 2. **Establish IV or IO** balanced salt solution, TKO.
- * 3. **Obtain blood specimens.**
- * 4. **D50 0.5-1.0 g/kg IV or IO**
 - a. *Dilute 50% glucose 1:1 for infant to make D25.*
 - b. *Dilute 50% glucose 1:2 for newborns to make D12.5.*
- * 5. **Narcan 0.1mg/kg IV or IO**; if unable to start IV or IO, give IM.
6. Transport.

*****FEVER*****

I. INITIAL INTERVENTION:

1. Initial Patient Assessment.
 - a.. Vital signs.
2. Oral or rectal temperature greater than 38 degrees C (100 degrees F):
 - a. **Remove** heavy or swaddling clothes, keep lightly dressed.
 - b. If no other problems than fever identifiable, no therapy required at scene.
3. If other problem (seizure, coma, etc.), follow indicated protocol.
 - a. If child appears toxic, do not delay transport

II. TREATMENT:

1. Fever associated with seizure.
 - a. **High flow O₂** by mask.
 - b. If fever above 103^o, initiate cooling by removing clothing.
 - * c. **Tylenol (acetaminophen)** rectal suppository; **20 mg/kg**. (1 grain = 65 mg).
2. Status Epilepticus.
 - * a. **IV or IO** balanced salt solution TKO.
 - * b. **Valium 0.1—0.3 mg/kg**; give slowly IV over 1-2 minutes. Be prepared to manage ventilations. May repeat prn. Or **Versed 0.1 mg/kg IV**, **0.3 mg/kg via MAD**. May repeat X1. May give **0.2 mg/kg IM**. Max dose 6 month to 5 years is **6 mg**, and max dose for 6 year or older is **10 mg**

SUDDEN INFANT DEATH SYNDROME

I. GENERAL CONSIDERATIONS:

1. Infants usually less than six (6) months of age.
 - a. Sudden, without apparent cause, during sleep.
 - b. It may be impossible to differentiate SIDS from suspected child abuse.

II. INTERVENTIONS:

1. Initial Patient Assessment
2. **CPR** unless there are obvious signs of death (rigor, lividity, etc.).
 - a. Follow protocol for cardiac arrest.
 - b. Resuscitation may be terminated only by order of base station physician or family physician at the scene.
3. Support the parents. Avoid questions or comments suggesting blame.
4. Observe carefully and note:
 - a. Location and position of child.
 - b. Objects immediately surrounding the child.
 - c. Behavior of all adults present.
 - d. The explanations provided.
 - e. Vomitus in mouth or foreign body present.
5. Report all observations to Medical Control or to County Coroner.

CHILD ABUSE

I. GENERAL CONSIDERATIONS:

1. **Be alert to findings suspicious of child abuse:**
 - a. Explanations of mechanisms of injury conflicting with actual injury.
 - b. Suspicious injuries, e.g., cigarette burns, multiple bruises of varied age, belt marks, etc..
 - c. Child with history of repeated injuries.
 - d. Blame placed upon others.
 - e. Procrastination by caretaker(s) in seeking aid.
 - f. Sexual abuse accompanying physical abuse, or may be present without signs of apparent physical abuse.

II. INITIAL INTERVENTIONS:

1. Scene Size-up and Initial Patient Assessment.
2. Focused/Detailed History and Physical Exam.

III. TREATMENT:

1. Treat trauma and/or shock per protocols.
 - a. Transport without delay for critical cases.
2. Document as carefully as possible caretaker's descriptions of the event(s).
 - a. Note the environment carefully including temperature.
 - b. Note the reaction of all adults (including all caretakers).
 - c. Note clothing, stains, conditions, bring clothing in with patient.
 - d. Encourage the caretaker(s) to allow transport of the child to the hospital for medical evaluation and/or treatment.
 - e. Should caretaker(s) not allow transport, notify base hospital which will contact Child Protective Services (CPS).
3. Support and reassure the child;
 - a. Be non-judgmental.
 - b. Be supportive to family concerns.

INTRAOSSIOUS INFUSION GUIDELINE

I. INDICATION:

Intraosseous infusions are an alternative access site when other IV access is unobtainable. It is an emergent procedure intended specifically for the critically ill or injured child or adult. Intraosseous access should be initiated within two (2) minutes after routine IV access has proven to be unobtainable. In the pediatric patient who appears to be in peripheral vascular collapse due to any cause, the intraosseous access should be attempted immediately.

Above applies to the following:

1. Patients between 3-39 kg use the **EZ-IO PD**®
2. Patients over 40 kg use the **EZ-IO AD**®
3. Altered mental Status (GCS of 8 or Less).
4. Respiratory compromise (such as patients with a SaO₂ 90% after appropriate oxygen therapy or a respiratory rate < 10 or > 40 / Min).
5. Hemodynamic instability (As noted by a decreased BP, decreased skin perfusion, delayed capillary refill or weak or absent radial pulses).

II. CONTRAINDICATIONS:

1. Infection at or near proposed site.
2. Suspected or actual fracture of the same limb.
3. Pre-existing medical condition involving that extremity.
4. Inability to locate landmarks.
5. Excessive tissue at insertion site. (obesity)

III. SITES:

1. Preferred site – One or two cm. below the tibial tuberosity on the flat anteromedial tibial surface.
2. 2nd site—One or two cm proximal to the medial malleolus on the medial aspect of the tibia.
3. 3rd site—One or two cm proximal to the lateral humeral head. For patients over 40 kg.

INTRAOSSUEOUS INFUSION PROTOCOL (Continued)

IV. CONSIDERATIONS:

1. Flow Rates:

Due to anatomy of the IO space flow rates may be slower than those achieved with IV catheters.

- Rapidly flush (bolus) 10 mL saline with a syringe through the **EZ-IO®**
- Use a pressure bag or pump for continuous infusions (Exercise extreme caution with continuous fluid administration in children).

2. Pain:

Insertion of the **EZ-IO®** in a conscious patient may cause mild to moderate discomfort but is usually no more painful than a large bore IV however; if pain of infusion is a strong possibility, consider SLOW administration of **0.5 mg/kg of 2% Lidocaine max 40 mg.** (preservative free) through the **EZ-IO®** extension set and catheter prior to fluid bolus.

V. PRECAUTIONS:

The **EZ-IO PD®** and **AD®** are not intended for prophylactic use.

VI. EQUIPMENT:

1. **EZ-IO®** Driver
2. **EZ-IO® PD** and **AD** needle set
3. Alcohol and betadine swabs
4. **EZ-Connect™**
5. 10 mL pre-filled Normal Saline Syringe
6. 1000mL Balanced Salt Solution.
7. Tape and Gauze
8. Pressure Bag
9. **2% Lidocaine** (preservative free) **100 mg/5mL** pre-filled syringe.

VII. PROCEDURE:

1. If the patient is conscious, advise them of the EMERGENT NEED for this procedure and obtain informed consent.
2. Body Substance Isolation Equipment.
3. Determine **EZ-IO®** Indications
4. Rule out Contraindications
5. Locate insertion site. (preferred sites first)
6. Cleans insertion site using aseptic technique
7. Prepare the **EZ-IO®** driver and needle set
8. Stabilize the bone and insert **EZ-IO®** needle set
9. Remove Driver from needle set while stabilizing catheter hub
10. Remove stylet from needle set, place stylet in shuttle or sharps container
11. Confirm placement, connect primed **EZ-Connect™** to extension set
12. Conscious patients should receive **0.5 mg/kg 2% Lidocaine IO/ max 40 mg.**

KLICKITAT COUNTY EMS

MEDICATION

QUICK REFERENCE

QUICK MEDICATION REFERENCE

<i>Medication</i>	<i>Dosage (Pediatrics in red)</i>	<i>Indication</i>
Acetaminophen	20mg/kg PR, 15mg/kg PO-under 4yo	Fever
Activated Charcoal	50g PO 1-2g/kg (Max 50g)	Ingested poison
Adenosine	6mg, 12mg IV, IO rapid 0.1mg/kg, 0.2mg/kg	Regular WCT, SVT
Albuterol	2.5mg/3ml Nebulized Peds same as adult.	Wheezes, Hyperkalemia
Amiodarone	1) 300 mg IV may repeat 3-5 min 150 mg 5mg/Kg IV may repeat 3-5 min 5 mg/kg X 2 2) 150 mg Infusion over 10 min may repeat every 10 min 5 mg/kg over 20—60 min. May repeat to max 15 mg/kg	1) V-Fib, V-Tach 2) Stable V-Tach, Acute onset A-Fib.
Aspirin	162-324mg PO (4 – 81 mg baby aspirins) Peds Consult On line medical control	Acute Coronary Syndrome
Atropine	1) 0.5-1mg IV, IO Bolus, max 0.04mg/kg 0.02mg/kg (min 0.1mg, max 0.5mg) 2) 2- 5mg IV, IO, IM every 2 min 0.02mg/kg	1) Symptomatic Bradycardia, Aystole 2) Organophosphate poisoning
Atrovent	500mcg/2.5ml NS Nebulized	Wheezes
Calcium Chloride	1) 500—1000mg IV, IO, max 1000mg 20mg/kg 2) 250-500mg IV, IO 20mg/kg	1) Hyperkalemia 2) Calcium Channel Blocker OD
Dextrose 50%	25gms PO, IV, IO max single dose 0.5—1.0 g/kg PO, IV, IO	Hypoglycemia, Hyperkalemia
Dexamethasone <i>Decadron</i>	1. 8—20 mg IV, IM, IO 0.3—0.6 mg/kg IM, IV, IO 2. 1—2 mg/kg IV, IM, IO 0.5—1 mg/kg IV,IM,IO	1. Croup, Asthma, COPD, Anaphylaxis 2. Cerebral Edema (non-traumatic)
Diazepam <i>Valium</i>	1) 5—10 mg IV, IM, PR 0.1—0.3 mg/kg IV, IM, PR 2) 2.5—5 mg IV, IM 0.05—0.15 mg/kg IV, IM	1) Seizures 2) Anxiety, sedation 3) Muscle Spasms
Dilaudid <i>HydroMOpone</i>	1—2 mg with 0.5—1 mg every 1-6 hours IV, IO, IM < 50 kg 0.015—0.02 mg/kg IV, IM, IO >50 kg 1—2 mg with 0.5—1 every 1-6 hours IV,IO, IM	Pain management
Diltiazem <i>Cardizem</i>	1) 0.25mg/kg IV, IO (Second dose 0.35mg/kg IV, IO) 2) 10 mg/hr IV Infusion	1) Symptomatic AFib/AFlutter with RVR 2) SVT after Adenosine
Diphenhydramine <i>Benadryl</i>	25-50mg IV, IO, IM, max 50mg 1mg/kg	Allergic reaction/Anaphylaxis Dystonic Reaction
Dopamine	5-20 mcg/kg/min IV IO Child dose same as adult	Cardiogenic Shock Hypotension not related to hemorrhage Sepsis
Droperidol <i>Inapsine</i>	0.625-2.5mg IV, IO, IM, max 5mg 0.05mg/kg to 2.5 mg max dose	Antiemetic, Sedation/Chemical Restraint
Epinephrine 1:1,000	0.3mg IM 0.01mg/kg IM	Anaphylaxis

KLICKITAT COUNTY: ALS PATIENT CARE GUIDELINES (Version 6.5)

<i>Medication</i>	<i>Dosage (Pediatrics in red)</i>	<i>Indication</i>
Epinephrine <i>1:10,000</i>	1) 1mg IV, IO 0.01mg/kg 2) 0.3 mg IV may repeat 3-5 min to total of 0.3—0.5 mg 2-10mcg/min IV Infusion 0.1-1mcg/kg/min	1) Pulseless Arrest 2) Anaphylaxis, Non Hypovolemic Shock, Asthma
Etomidate	1. 0.1 mg/kg IV, IO, may repeat prn. 2. 0.3 mg/kg IV, IO may repeat prn 0.1 mg 0.3 mg/kg peds >8 YO	1) Sedation 2) Intubation
Famotidine	20 mg IV 0.25 mg/kg IV	Anaphylaxis
Fentanyl	25-100mcg IV, IO, IM 0.5—2 mcg/kg (Max 25 mcg)	Pain Management
Glucagon	1) 1mg IM 0.5mg IM 2) 3-5mg IV, IO 50 mcg/kg IV over 5 min up to 1 mg max dose.	1) Hypoglycemia with no IV/IO 2) Beta Blocker OD, Calcium Channel Blocker OD
Haloperidol <i>Haldol</i>	<i>Consult with Medical Control before psych pt admin.</i> 2.5—5 mg IV, IM, IO to max dose of 20 mg 0.1 mg/kg do not exceed adult dose.	Psychiatric Sedation
Heparin	60 units/kg to max bolus 4000 units IV. Followed by 12 units/kg/hr rounded to nearest 50 units, maximum rate 1000 units/hour.	AMI, PE, DVT
Hydroxocobalamin	5g IV, IO Bolus over 15 min, max 10g 70mg/kg IV, IO over 15 min	Cyanide poisoning
Inapsine <i>Droperidol</i>	1) 0.625—1.25 mg (1/4—1/2 cc) IV, IO, IM 2) 0.625—2.5 mg (1/4—1 cc) IV slowly 1.25—5 mg IM Pediatric Consult with MC	1) Antiemetic 2) Sedation
Insulin	<i>Consult with Medical Control before pt admin.</i> 10 units IV, SQ	Hyperglycemia, Hyperkalemia
Ketorolac <i>Toradol</i>	30mg IV, IO, 60mg IM, max 60mg 0.5mg/kg IV or 1mg/kg IM (2-16 yo max 15mg IV or 30mg IM)	Pain Management without suspected active bleeding
Labetalol <i>Normodyne, Presolol</i>	10 mg IV slowly over 2 min, PRN doses 10—20 mg every 10 min. Do not lower SBP more than 20% of initial findings	Acute Hypertension CVA (The goals are a HR > 60, but < 80 and a SBP 20% of initial blood pressure).
Lasix <i>Furosimide</i>	40-80 mg IV 0.5—1 mg/kg, Consult with Medical Control	1. CHF, Pulmonary Edema 2. Hyperkalemia
Lidocaine	1) 1—1.5 mg/kg IV, IO, max 3mg/kg 1—1.5 mg/kg IV max 3 mg/kg 2) 0.5—0.75mg/kg IV, IO, max 3mg/kg 0.5mg/kg 3) 40mg IO 0.5mg/kg (Max 40mg)	1) Pulseless VT/VF 2) Symptomatic stable VT 3) Pain control in IO procedure
Magnesium Sulfate	2gms IV, IO Infusion over 5 min 25-50mg/kg IV, IO over 5 min	Torsades de Pointes, TCA, OD Eclamptic, Seizure, Asthma ETOH Seizure
Methylprednisolone <i>Solu-Medrol</i>	125mg IV, IO Bolus	
Methylprednisolone <i>Solu-Medrol</i>	125mg IV, IO Bolus 2mg/kg (Max 125mg)	Asthma COPD Anaphylaxis

KLICKITAT COUNTY: ALS PATIENT CARE GUIDELINES (Version 6.5)

<i>Medication</i>	<i>Dosage (Pediatrics in red)</i>	<i>Indication</i>
Midazolam <i>Versed</i>	2-10mg IV, IO, IN Bolus or Deep IM 0.1-0.2mg/kg	Seizures Sedation Hyperadrenergic Toxicity Muscle Spasm
Morphine	2-10mg IV, IO, IM Bolus 0.1-0.2mg/kg	Pain management
Naloxone <i>Narcan</i>	0.1-2mg IV, IM, SL 2.0 mg IO, IN 0.1mg/kg	Acute respiratory depression & AMS from opioid use
Nitroglycerine	0.4mg SL 2" paste TD Peds Consult MC	ACS CHF/Pulmonary Edema
Norepinephrine <i>Levophed</i>	2—16 mcg/min initially to B/P, decrease to maintain B/P 0.1—0.2 mcg/kg/min	Septic Shock
Ondansetron <i>Zofran</i>	4-8mg IV, IO, IM, max 16mg Under 40 kg 0.1mg/kg	Antiemetic
Oxygen	1-6 L/pm NC; 8-15 L/pm NRB; 10-15 L/pm CPAP; 15 L/pm BVM	SpO2 under 94% RA
Oxytocin <i>Pitocin</i>	20—40 units in 1000 mL NS infuse 200 mL/hr. May increase rate in response to uterine atony.	Postpartum hemorrhage
Phenergan <i>Promethazine</i>	6.25-25 mg IV slowly Pediatrics Consult with Medical Control up to 6	Antiemetic, Potentiates opiates,
Racemic Epinephrine	0.5ml/3ml NS Nebulized Under 20kg – 0.25ml/3ml NS Neb	Stridor
Rocephin	2 Gms IV over 30 min 50—75 mg/kg IV over 30 min	Sepsis
Romazicon	1 st Dose 0.2 mg over 15 sec. No Response repeat in 1 min intervals 0.2 mg to total of 1 mg. 1st Dose 0.01 mg/kg over 15 sec. No response repeat in 1 min intervals 0.01 mg/kg to total of 0.05 mg/kg or 1 mg Max.	Benzodiazepine OD's
Sodium Bicarbonate	1) 1 mEq/Kg second dose 0.5 mEq/Kg 2) 50 mEq in 1000ml LR 1mEq/kg, max 50mEq	1) Cardiac Arrest 2) TCA OD, Crush Injury w/ Hyperkalemia
Succinylcholine	1—1.5 mg/kg IV, IO 1—1.5 mg/kg IV, IO 2 mg/kg Up to 10 years of age.	Drug Assisted Intubations
Tranexamic acid	1 Gm IV (only) 15 yrs old or older over 50 kg	Hemorrhagic shock (trauma)
Terbutaline	1) 0.25 mg SQ may repeat every 15—30 min 2) 0.25 mg SQ may repeat every 15—30 min <i>(MC Consult)</i> . Not Recommended in children under 8 years of age.	1) Asthma COPD 2) Tocolytic
Thiamine	100 mg IV, Pediatrics rarely given	AMS, ETOH OD.
Vasopressin	40 units IV, IO, ET Not Recommended in Pediatric Patients	Refractory V-Fib/Pulseless V-Tach
Vecuronium	1 st dose 0.08—0.1 mg/kg IV, IO 2 nd / 3 rd etc doses 0.01—0.05 mg/kg	Post Intubated Pt requiring long acting Paralytics. Facilitate ET when Sux not recommended.

ACETAMINOPHEN (Tylenol)

THERAPEUTIC EFFECTS:

1. Thought to produce analgesia by blocking pain impulses by inhibiting synthesis of prostaglandin in the CNS.
2. The drug may relieve fever through central action in the hypothalamic heat regulating center.

INDICATIONS:

1. Mild pain relief.
2. Fever control.

CONTRAINDICATIONS:

1. Patients hypersensitive to Acetaminophine.
2. Use cautiously in patients with long term alcohol abuse.
3. Patient with hepatic disorders.

PRECAUTIONS/SIDE EFFECTS:

1. May decrease glucose levels.
2. May decrease hemoglobin and hematocrit levels.
3. May decrease WBC, RBC, and platelet counts.
4. May reduce clotting time.

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

PEDIATRIC:

1. Fever: **15 mg/kg Acetaminophine. Under 4 years of age.**
Rectal Suppository

ACETYLSALICYLIC ACID **(Aspirin)**

THERAPEUTIC EFFECTS:

1. Antipyretic.
2. Anti-inflammatory analgesic.
3. Reduces platelet aggregation (may reduce the size of a blood clot within a coronary artery causing an AMI).

INDICATIONS:

1. For treatment of patients with suspected AMI.

CONTRAINDICATIONS:

1. Hypersensitivity to aspirin or nonsteroidal anti-inflammatory analgesics.
2. Active Gastric bleeding.
3. Pediatric patients.

PRECAUTIONS/SIDE EFFECTS:

1. Gastric irritation.
2. Should be used during pregnancy only if clearly indicated.
3. Recent Surgeries

ADMINISTRATION DOSAGES AND ROUTE:

ADULT:

- 324 mg chewable tablets orally (4 – 81 mg baby aspirin).
1 - 325 mg tablet orally with small amount of water.

PEDIATRIC:

NOT FOR USE IN PEDIATRIC PATIENTS.

ACTIVATED CHARCOAL (Actidose/Sorbitol)

THERAPEUTIC EFFECTS:

1. Specially prepared charcoal with a surface that will absorb and bind toxins

INDICATIONS:

1. In poisonings where vomiting is contraindicated.
2. Drug overdoses

CONTRAINDICATIONS:

1. Airway that cannot be controlled.

PRECAUTIONS/SIDE EFFECTS:

1. Administer only after emesis or in those cases where emesis is contraindicated.
2. Not to be given with syrup of epicac.

ADMINISTRATION/ DOSAGE/ROUTES:

ADULT:

1. 50 gm (2 tablespoons-6 teaspoons mixed with a 8 oz. glass of water).
Given orally or preferably through a nasal gastric tube.

PEDIATRIC:

1. 1.0-2.0 gm/kg mixed with a glass of water (size dependant)
Given orally or preferably through a nasal gastric tube.

ADENOCARD (Adenosine)

THERAPEUTIC EFFECTS:

1. Slows conduction through the AV node.
2. Can interrupt reentry pathways through the AV node.

INDICATIONS:

1. Conversion to sinus rhythm of paroxysmal supraventricular tachycardia (PSVT) excluding known Wolf-Parkinson-White syndrome.

CONTRAINDICATIONS:

1. Second Degree AV Block Mobitz Type II.
2. Third Degree AV Block.
3. Sick Sinus Syndrome.
4. Hypersensitivity to **adenosine**.

PRECAUTIONS/SIDE EFFECTS:

1. May exacerbate *asthma*.
2. Should be used during pregnancy only if clearly needed.
3. May cause hypotension, facial flushing, dyspnea, light headedness, or nausea.
4. Effects are potentiated by *Persantine* (dipyridamole) and therefore smaller doses may be effective.

ADMINISTRATION/DOSAGE/ROUTES

ADULT:

1. Rapid IV push. Large gauge IV in antecubital vein (AC). Follow each dosage with a 20cc bolus of NS.
 - a. First dose: **6 mg**
 - b. Second Dose: **12 mg** may be given after 2 minutes
 - c. Third Dose: **12 mg** may be given after 2 minutes
2. Pt taking Theophylline: **1st 12 mg, 2nd 12 mg, 3rd 18 mg.**
3. Pt with Heart Transplant $\frac{1}{2}$ dosages.
4. Pt taking medications Tegretol or Persantine $\frac{1}{2}$ dose.

PEDIATRIC:

1. Rapid IV push. Large gauge IV in antecubital vein (AC). Follow each dosage with a 10cc bolus of fluid.
 - a. First dose: **0.1 mg/kg**
 - b. Second dose: **0.2 mg/kg** may be given after 2 minutes
 - c. Third dose: **0.2 mg/kg** may be given after 2 minutes

***** All pediatric administration of this medication requires receiving physician's approval.**

ALBUTEROL
(Ventolin, Proventil)

THERAPEUTIC EFFECTS:

1. Synthetic sympathomimetic which causes bronchodilation with less effect than Epinephrine. The duration of effect is about four hours.

INDICATIONS:

1. Bronchial asthma.
2. Bronchospasm in emphysema.
3. Chronic bronchitis.
4. Hyperkalemia
5. Anaphylaxis
6. Pulmonary Embolism

CONTRAINDICATIONS:

1. Known hypersensitivity to the drug.
2. Tachydysrhythmias.

RELATIVE CONTRAINDICATIONS:

1. Hypertensive patients.
2. Cardiac history.

PRECAUTIONS/SIDE EFFECTS:

1. Patient may experience, palpitations, anxiety, nausea/vomiting and dizziness.
2. Tachydysrhythmias.

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. **2.5 mg (0.5 ml)** mixed in 3 ml saline in nebulizer, Oxygen flow 6 L/min,

PEDIATRIC:

1. > 2 yrs: **2.5 mg (0.5 ml)** mixed in 3 ml saline in nebulizer. O2 flow 6 L/min. May repeat to total dose of **10 mg**.
2. < 2 yrs: **1.25 mg (0.25 ml)** mixed in 3 ml saline in nebulizer. O2 flow 6 L/min.

AMIODARONE (Cordarone)

THERAPEUTIC EFFECTS:

1. Prolongs action potential duration and refractory period in all cardiac tissue including AV and SA node.
2. Causes coronary and peripheral vasodilation therefore decreases peripheral vascular resistance (afterload).

INDICATIONS:

1. Arrhythmias :
 - a. Ventricular Fibrillation
 - b. Ventricular Tachycardia
 - c. Acute onset A-Fib with Rapid Ventricular Response

CONTRAINDICATIONS:

1. 2nd and 3rd degree AV blocks
2. Bradycardia
3. Patients taking medications which prolong QT interval.
4. Any patient suffering from prolonged QT interval, either new onset or chronic condition. (diltiazem, digitalis, calcium channel blockers)
5. CHF
6. Hepatic function impairment
7. Sensitivity to Amiodarone.

PRECAUTIONS/SIDE EFFECTS:

1. Bradycardia
2. Flushing of the face, numbness, tingling, trembling, and shaking of the head.
3. Decreases Blood Pressure
4. AV blocks
5. Increases QT interval.

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. VF/VT; give **300 mg IV**; May repeat **150 mg** every 3—5 minutes to maximum dose of **2200 mg/24 hours**.
2. Stable Wide Complex Tachycardia: Infusion **150 mg IV** over 10 minutes; May repeat **150 mg IV** every 10 minutes to a maximum dose of **2200 mg/24 hours**.
3. Maintenance infusion: **540 mg IV** over 18 hours. (*Mix **1000 mg** in **500 ml D5W** and run at **15 ml/hr** or **15 gtt/min** through low absorbing NTG tubing*)

PEDIATRIC:

1. VF/VT: give **5 mg/kg** rapid IV push; May repeat half (**2.5 mg/kg**) initial dose every 3 – 5 minutes to maximum dose of **15 mg/kg/ 24 hours**
IV maintenance drip **5 mg/kg** infusion over 20-60 min. Total **15 mg/kg/24 hours**.

ATROPINE

THERAPEUTIC EFFECTS:

1. Blocks the parasympathetic nervous system and its inhibiting effects on:
 - a. The heart. Does not increase the strength of cardiac contraction.
 - b. Other systems affected by parasympathetic nervous system.
 - c. Bronchial dilator.

INDICATIONS:

1. Bradycardia with hypotension or escape beats.
2. Asystole.
3. PEA.
4. Nerve agents or organophosphate poisoning.
5. Asthma.
6. Prior to secondary use of succinylcholine administration for RSI.

CONTRAINDICATIONS:

1. There are no known contraindications in the emergency settings.
2. Infranodal AV blocks (mobitz type II or new onset third degree with wide QRS complexes).
3. Denervated heart transplants. (Atropine will not work).
4. Tachycardia.
5. Narrow angle glaucoma.

PRECAUTIONS/SIDE EFFECTS:

1. Dilated pupils, dry mouth.
2. Tachycardias, may become uncontrolled.
3. VT, VF.

ADMINISTRATION/DOSAGE/ROUTES

ADULT:

1. **Bradycardia:**
 - a. 0.5 – 1.0 mg IV, ET, IO. Every 3-5 minutes, up to 0.04mg/kg.
2. **Asystole/PEA**
 - a. 1.0 mg IV, ET, IO (2 mg ET) every 3-5 minutes, up to 0.04 mg/kg.
3. **Organophosphate or Nerve agent poisoning:**
 - a. 2.0-5.0 mg IV, ET, IO every 15 – 30 minutes or until symptoms improve.
4. **Asthma:**
 - a. 0.4 - 2.0 mg nebulized in 3 ml of Normal Saline.
5. **RSI.** For use after first dosing of succinylcholine.
 - a. 0.5 mg IV, IO.

PEDIATRIC:

1. **Bradycardia:**
 - a. 0.02 mg/kg repeat once if needed.
2. **Asystole/PEA**
 - a. 0.02 mg/kg minimum dose 0.1 mg; maximum dose 1.0 mg; May repeat in 5 minutes to maximum dose of 1.0 mg. IV, IO, ET (ET 0.04 mg/kg) (5cc NS).
3. **Organophosphate or Nerve agent poisoning:**
 - a. 0.05 mg/kg IV, IO, slowly, repeat in 10-30 minutes as needed.
4. **Asthma:**
 - a. 0.4 mg nebulized in 3 ml of NS.
5. **RSI:**
 - a. 0.02 mg/kg; minimum dose 0.1 mg IV, IO.

BENADRYL
(Diphenhydramine)

THERAPEUTIC EFFECTS:

1. Inhibits the release of histamine, thereby reducing bronchoconstriction and vasodilation.

INDICATIONS:

1. Anaphylaxis
2. Allergic reactions
3. Urticaria
4. Dystonic Reactions
5. Antiemetic

CONTRAINDICATIONS:

1. Asthma (relative contraindication)
2. Pregnant or lactating females
3. Known hypersensitivity to Benadryl

PRECAUTIONS/SIDE EFFECTS:

1. May induce:
 - a. hypotension
 - b. headache
 - c. palpitations
 - d. tachycardia
 - e. sedation
 - f. drowsiness
 - g. blurred vision
 - h. disturbed coordination

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. Give 25 – 50 mg IV, IO slowly or deep IM or 25 –50 mg tablets PO.

PEDIATRIC:

1. Give 1 mg/kg IV, IO slowly or deep IM.

CALCIUM CHLORIDE 10%

THERAPEUTIC EFFECTS:

1. Essential for the transmission of nerve impulses that initiate the contraction of cardiac muscle. A specific antagonist of the adverse effects of potassium.

INDICATIONS:

1. Suspected hyperkalemia associated with bradycardia, hypotension and unstable cardiac arrhythmia.
2. Calcium Channel Blocker overdose/toxicity
3. Hypocalcemia with tetany
4. Hypermagnesemia

CONTRAINDICATIONS:

1. Ventricular Fibrillation: should not be used during resuscitation efforts unless hyper-kalemia, hypocalcemia, or calcium channel blocker toxicity is suspected.
2. Digitalis toxicity
3. Hypercalcemia

PRECAUTIONS/SIDE EFFECTS:

1. Use caution in patient known to take digoxin, may cause life-threatening arrhythmias.
2. Decrease in heart rate or asystole
3. Decreased Blood Pressure
4. Coronary and cerebral artery spasm
5. Nausea and Vomiting
6. Extravasation causes necrosis
7. Incompatible with Sodium Bicarbonate

NOTE: Use a large secure vein; SQ infiltration can cause tissue necrosis: Flush the line before and after use as Calcium Chloride is incompatible with Sodium Bicarbonate.

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. Hyperkalemia: Hypocalcemia
 - a. 500 – 1000 mEq (5 – 10 cc) IV or IO slowly over 5-10 minutes.
2. Calcium Channel Blocker overdose/toxicity
 - a. 250 – 500 mEq (2.5 - 5 cc) IV or IO slowly over 2 - 5 minutes.

PEDIATRIC:

1. Hyperkalemia: Hypocalcemia
 - a. 20- 25 mEq/kg (0.2-- 0.25 cc) IV or IO slowly over 5 – 10 minutes.
2. Calcium Channel Blocker overdose/toxicity
 - a. 10 – 12.5 mEq/kg (0.1 – 0.12 cc) IV or IO slowly over 2 – 5 minutes.

50% DEXTROSE

THERAPEUTIC EFFECTS:

1. Dextrose is a simple sugar which the body can rapidly metabolize while in hypoglycemia states.

INDICATIONS:

1. Hypoglycemia
2. Altered Level of Consciousness
3. Hyperkalemia

CONTRAINDICATIONS:

1. None

PRECAUTIONS/SIDE EFFECTS:

1. Draw sample blood and determine glucose levels before administration.
2. Extravasation causes tissue necrosis.

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. 50 ml of 50% dextrose (25 gm) IV, IO, may be repeated. Should be infused with a running IV lifeline.

PEDIATRIC:

1. **Child:**
 - a. 1.0 ml/kg (0.5 gm/kg) of 50% dextrose IV, IO, may be repeated. Should be infused with a running IV lifeline.
2. **Infant:**
 - a. 1.0 ml/kg (0.5 gm/kg) of 25% dextrose IV, IO, May be repeated. Should be infused with a running IV lifeline. 1:1 dilution of 50% dextrose makes 25% dextrose.
3. **Neonate:**
 - a. 1.0 ml/kg (0.5 gm/kg) of 10% dextrose IV, IO, May be repeated. Should be infused with a running IV lifeline. (dextrose come prepared as 10% solution or 1:2 dilution of 50% dextrose = 12.5% dextrose).

<p>DEXAMETHASONE Decadron</p>
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THERAPEUTIC EFFECTS:

Dexamethasone Sodium Phosphate is a member of the glucocorticoid class of hormones. This means Dexamethasone is a steroid. Dexamethasone has anti-inflammatory effects on the body. Dexamethasone improves lung function and myocardial performance. Dexamethasone increases the production of surfactant in the lungs, decreases pulmonary edema and relaxation of bronchospasms.

INDICATIONS:

1. Moderate to severe croup
2. Reactive Airway Disease: Acute exacerbation of Bronchial Asthma.
3. Anaphylaxis
4. Cerebral Edema (non-traumatic)

CONTRAINDICATIONS:

1. Known Hypersensitivity to any component of Dexamethasone, including sulfites.
2. Preterm infants
3. Exposure to Varicella Zosters within 3 weeks
4. Varicella Virus Vaccine (Varivax) in 2 weeks
5. Pre-existing immunodeficiency.
6. Pregnancy

RELATIVE CONTRAINDICATIONS:

1. Diabetics should only be given Dexamethasone in life threatening situations.
2. CHF

PRECAUTIONS/SIDE EFFECTS:

1. Sodium Retention; Fluid Retention; Potassium Loss.
2. Hyperglycemia:
3. Hypokalemic alkalosis.
4. Hypertension
5. Convulsions
6. Dexamethasone is not compatible with benadryl or versed in IV tubing.

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. Reactive Airway Disease/Anaphylaxis
8 – 20 mg IV bolus or IM
2. Cerebral Edema
1—2 mg/kg IV bolus or IM

PEDIATRIC:

1. Reactive Airway Disease
0.3—0.6 mg/kg IM, IV (note – do not give more than 1 mL in each thigh)
2. Cerebral Edema
0.5 – 1.0 mg/kg IV

DIAZEPAM (Valium)

THERAPEUTIC EFFECTS:

1. Diazepam is a medium length acting Benzodiazepine with sedative-hypnotic effects.
2. Benzodiazepines act as CNS depressants by inhibiting neurotransmitters thus causing sedative effects to hypnosis to coma. Blocking the neurotransmitters also act to control convulsive activity in the cortex.

INDICATIONS:

1. Premedication prior to procedures, (i.e. cardioversion)
2. Premedication prior to endotracheal intubation
3. Anxiety disorders
4. Seizures
5. Need for large muscle relaxation: ie. Back Strains, Long Bone Fractures, etc.

CONTRAINDICATIONS:

1. Known sensitivity to Benzodiazepines
2. Acute Narrow Angle Glaucoma
3. Shock
4. Respiratory failure in which the EMT/P is not able to manage

RELATIVE CONTRAINDICATIONS:

1. Respiratory depression
2. Bradycardia
3. Hypotension
4. Altered level of sensorium

PRECAUTIONS/SIDE EFFECTS:

1. May depress respirations.
2. Need to reduce dosage by ½ in elderly or hepatic failure.
3. Nausea and vomiting
4. Hypotension

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. **Diazepam 5.0 – 10.0 mg** IM/IV slowly and may repeat in 3-5 min. to total dose of **20 mg**. IV dose recommended 1:1 Dilution with NS. IM doses should not be diluted:
2. Sedation Dosage: **2.5—5.0 mg**, IM/IV slowly and may repeat in 30 min. to total of **20 mg**

PEDIATRIC:

1. **0.1—0.3 mg/kg** IM/ IV slow IVP may repeat x 1 prn

DILAUDID
Hydromorphone

THERAPEUTIC EFFECTS:

1. A potent analgesic eight time more potent than morphine.
2. Pure opioid agonist acting on MU-opioid receptors.
3. A vasodilator.

INDICATIONS:

1. The control of moderate to severe pain.
2. The control of severe pain associated with traumatic and non-traumatic injuries.

CONTRAINDICATIONS:

1. Hypersensitivity to the drug.
2. Respiratory depression of non-intubated patients.
3. Hypotension or volume depletion patients.

PRECAUTIONS/SIDE EFFECTS:

1. Head injury patients.
2. Causes respiratory depression.
3. Narcan should be readily available when Dilaudid is used.

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. Pain; 1.0 – 2.0 mg with 0.5- 1.0 mg every 1—6 hours as needed.
IV slowly or IO, IM.

PEDIATRIC:

1. < 50 kg: Musculoskeletal pain 0.015—0.02 mg/kg IV slowly, IO, IM.
>50 kg: Musculoskeletal pain 1.0 –2.0 mg every 2—6 hours as needed.

DILTIAZEM
(Cardizem)

THERAPEUTIC EFFECTS:

1. Is a calcium ion influx inhibitor (slow channel blocker or calcium channel antagonist).
2. Slows AV nodal conduction time and prolongs AV nodal refractoriness.

INDICATIONS:

Rapid supraventricular dysrhythmias with rapid ventricular response.

CONTRAINDICATIONS:

1. Drug hypersensitivity to the medications
2. Sick Sinus Syndrome
3. 2nd or 3rd degree heart block
4. Severe hypotensive/cardiogenic shock
5. IV simultaneous use with beta blockers
6. Ventricular Tachycardia
7. Atrial fibrillation/flutter associated with WPW syndrome (short PR syndrome)
8. Newborns

PRECAUTIONS/SIDE EFFECTS:

1. CHF
2. Hypotension
3. Cardiac dysrhythmias/ventricular slowing

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. **Diltiazem** is given **0.25 mg/kg** (typically **15 – 20 mg**) IV slowly over 2 – 3 min.
May repeat in 15 minute with **0.35 mg/kg** (typically **20 – 25 mg**) IV slowly over 2 – 3 min.
2. **Diltiazem Maintenance Infusion: 5 – 15 mg/hr**, titrated to physiologically appropriate heart rate.

DOPAMINE
(Intropin)

THERAPEUTIC EFFECTS:

1. Beta agonist which does not appreciably increase myocardial oxygen consumption. It maintains renal and mesenteric blood flow while inducing vasoconstriction and increasing blood pressure.

INDICATIONS:

1. Cardiogenic shock
2. Hypotension not secondary to hypovolemia

CONTRAINDICATIONS:

1. Hypotension due to hypovolemia without aggressive fluid resuscitation.
2. Hemorrhagic hypovolemia.

PRECAUTIONS/SIDE EFFECTS:

1. Tachydysrhythmias
2. Ventricular Fibrillation
3. May be deactivated by alkaline solutions
4. Reduce the dosage when patient is on Monoamine oxidase inhibitors (anti-depressants)
5. Blood Pressure should be constantly monitored

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. 5-20 mcg/kg/min titrating to blood pressure.. (Mix 400 mg/D5W yielding 1600 mcg/cc)

PEDIATRIC:

1. Same as the ADULT:

DOPAMINE DRIP CHART.

Mix: 400 MG in 250 ml D5W or 800 mg into 500 ml D5W

PATIENT WEIGHT:

mcg Kg/ min	2.5 kg	5 kg	10 kg	20 kg	30 kg	40 kg	50 kg	60 kg	70 kg	80 kg	90 kg	100 kg
2 mcg	**	**	**	1.5	2	3	4	5	5	6	7	8
5 mcg	**	1	2	4	6	8	9	11	13	15	17	19
10 mcg	1	2	4	8	11	15	19	23	26	30	34	38
15 mcg	1.4	3	6	11	17	23	28	34	39	45	51	58
20 mcg	2	4	8	15	23	30	38	45	53	60	68	75

Microdrips per minute (or ml/hour)

EPINEPHRINE (Adrenalin)

THERAPEUTIC EFFECTS:

1. A potent alpha and beta stimulant which is diluted 1.0 mg in 1.0 cc (1:1,000) or 10.0 cc (1:10,000) of saline. It increases the electrical activity of the heart through its beta activities.

INDICATIONS:

1. Ventricular Fibrillation/ Pulseless Ventricular Tachycardia
2. Asystole
3. Pulseless Electrical Activity
4. Asthma
5. Anaphylaxis
 - a. Moderate
 - b. Severe
6. Bradycardia:

CONTRAINDICATIONS:

1. None in the patient who needs aggressive resuscitation

RELATIVE CONTRAINDICATION:

1. Patient over the age of 50

PRECAUTIONS/SIDE EFFECTS:

1. Should be protected from sunlight
2. Not to be infused with alkaline solutions.
3. Drug actions are short in duration.

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. **V-F/Pulseless VT/PEA/Asystole**
 - a. 0.5-1.0 mg IV of 1:10,000 solution every 3-5 minutes as needed (ET 1-2 mg/10 cc NS)
2. **Anaphylaxis (moderate)**
 - a. 0.3—0.5 mg of 1:1000 SQ (0.01 mg/kg)
3. **Anaphylaxis (severe)**
 - a. 0.3—0.5 mg of 1:10,000 IV, IO (0.01 mg/kg) (ET 0.6—1.0 mg in 10 cc)
 - b. Drip form 1 mg 1:1000 in 500 cc NS (2 mcg/cc) titrate to effect, start 1 cc/min.
 - c. 0.3—0.5 mg of 1:1000 SQ/ SL
4. **Asthma:**
 - a. 0.3—0.5 mg of 1:1000 SQ (0.01 mg/kg)
 - b. Drip form 1 mg 1:1000 in 500 cc NS (2 mcg/cc) titrate to effect, start 1 cc/min.
5. **Bradycardia:**
 - a. Drip form 1 mg 1:1000 in 500mL NS (2 mcg/cc) titrate to effect, start 1 cc/min.

PEDIATRIC:

1. **V-F/Pulseless VT/PEA/Asystole**
 - a. 0.01 mg/kg of 1:10,000 IV, IO every 3-5 min. prn (ET 0.1mg/kg in 3 cc NS)
2. **Asthma/Anaphylaxis (moderate/severe)**
 - a. Same as Adult (0.01 mg/kg)
3. **Bradycardia:**
 - a. 0.01 mg/kg of 1:10,000 IV, IO every 3-5 min. prn (ET 0.1mg/kg in 3 cc NS) **ET 0.1 mg/kg of 1:10,000 in 3 cc NS**

ETOMIDATE (Amidate)

THERAPEUTIC EFFECTS:

1. Etomidate is a short acting sedative-hypnotic, which has no analgesic effects: Etomidate has rapid onset (within 1 minute) and duration of effects is within 5-15 minutes.
2. Etomidate depresses the activity and reactivity of the brain stem.
3. Etomidate does not tend to cause cardiovascular or respiratory depression.

INDICATIONS:

1. Short procedures where sedation is needed. (i.e. cardioversion)
2. Intubation procedures.

CONTRAINDICATIONS:

1. Sensitivity to the medication
2. Sepsis
3. Transplantation patients
4. Adrenalin gland insufficiencies

PRECAUTIONS/SIDE EFFECTS:

1. Can block adrenal gland hormonal production.
2. Nausea/vomiting
3. Can cause brief period of apnea
4. Fast or slow breathing/fast or slow heart rate/increase or decrease B/P.
5. Involuntary myoclonic muscle movements or tremors about 30% of the time. Self resolving within 1—2 minutes.
6. Pain at injection site.

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. Sedation dose: 0.1 mg/kg IV, over 1 minute, may repeat prn (5-15 min).
2. Intubation dose: 0.3 mg/kg IV over 1 minute, may repeat as needed prn (5-15 min) at 0.1mg/kg.

PEDIATRIC:

1. Sedation dose: 0.1 mg/kg IV over 1 minute, may repeat prn (5-15 min).
2. Intubation dose: 0.3 mg/kg IV over 1 minute, may repeat as needed prn (5-15 min) at 0.1mg/kg.

FAMOTIDINE
(Pepsid)

THERAPEUTIC EFFECTS:

Famotidine is a competitive inhibitor of Histamine H—2 receptors.

INDICATIONS:

1. Anaphylaxis
1. Urticaria associated with Anaphylaxis

CONTRAINDICATIONS:

1. Hypersensitivity to Famotidine
2. Hypersensitivity to other H—2 receptor antagonists

PRECAUTIONS/SIDE EFFECTS:

Renal Insufficiency patients

ADMINISTRATION/DOSAGE/ROUTES:

Adult

20 mg IV.

Pediatric

0.25 mg/kg IV

FENTANYL (Sublimaze)

THERAPEUTIC EFFECTS:

1. Fentanyl Citrate is a synthetic opioid related to phenylpiperidines. Fentanyl is reported to be 80 times as potent as morphine. Fentanyl is a short acting opioid lasting \pm 30 minutes. A potent analgesic for control of pain without as prominent hemodynamic changes. Fentanyl Citrate has sedative effects.

INDICATIONS:

1. Traumatic injuries with severe pain
2. Non-traumatic pain

CONTRAINDICATIONS:

1. Children under the age of 2
2. Patient taking mono-amine oxidase inhibitors or have stopped taking MAO inhibitor in the last 7—14 days
3. Patients known to have intolerances to Fentanyl or (Fentanyl active ingredient in Atiq, Duragesic patch)

PRECAUTIONS:

NOTE: Use with caution:

1. Acute Asthma Attack
2. Patients with acute CHF or Pulmonary edema
3. Patient with acute alcohol intoxication

NOTE: In following precautions, reduce the initial dose $\frac{1}{2}$ and titrate carefully additional doses.

1. Patient with respiratory depression (if patient intubated, no contraindication)
2. When given with Valium or Versed, can cause respiratory depression.
3. Patient on tricyclic antidepressants
4. Elderly patients with known hepatic or renal problems

SIDE EFFECTS:

1. Respiratory depression or arrest
2. Nausea and vomiting
3. Drowsiness and confusion
4. Bradycardia
5. Orthostatic hypotension
6. Hypothermia
7. Raised intracranial pressures (Use with caution in head injuries)
8. Reduce pulmonary compliance
9. When pushed to rapidly may cause tetany

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. **25 – 100 mcg slow over 3-5 minutes. IV, IM, IO (1 mcg/kg) initial loading dose, repeat with $\frac{1}{2}$ initial dose (50 mcg dose) to maximum dose of 300 mcg. Physician consult advised for higher dosing.**

PEDIATRIC:

1. **0.5—2 mcg/kg slow over 3-5 min. IV; IM, IO up to 100 mcg total initial loading dose, repeat with $\frac{1}{2}$ initial dose to maximum dose of 3 mcg. Physician consult advised for higher dosing.**

NOTE: Have specific antagonist **Naloxone Hydrochloride 2.0 mg** IV available for **Fentanyl** overdose.

GLUCAGON

THERAPEUTIC EFFECTS:

Converts liver glycogen to glucose. Also produces relaxation of smooth muscle of stomach, duodenum, small bowel and colon.

INDICATIONS:

1. Hypoglycemia.
2. Beta Blocker Overdose.
3. Calcium Channel Blocker Overdose.

CONTRAINDICATIONS:

1. Pheochromocytoma (vascular tumor of adrenal gland)
2. Hypersensitivity to Glucagon.

PRECAUTIONS/SIDE EFFECTS:

1. Occasional nausea and vomiting.

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. 1.0 mg IV, IM, or SQ.
2. 3mg—5mg IV for Beta Blocker and Calcium Channel Blocker overdoses.

PEDIATRIC:

1. 0.05 mg/kg up to 1.0 mg IV, IM or SQ.
2. 0.15—0.25 mg/kg up to 3—5 mg IV. For Beta Blocker and Calcium Channel Blocker overdoses.

HALOPERIOL (Haldol)

THERAPEUTIC EFFECTS:

1. A potent neuroleptic (tranquilizer) agent that produces tranquilization and sedation without altering the state of reflex alertness.

INDICATIONS:

1. Sedation of combative patients to facilitate restraint in emergency situations.

CONTRAINDICATIONS:

1. Patients with known hypersensitivity to Haldol
2. Patient with prolonged QT related syndromes

PRECAUTIONS/SIDE EFFECTS:

1. Hypoxia may be the cause of agitation
2. Hypotension may occur
3. May result in QT prolongation in susceptible patients
4. CNS depressants may be potentiated (narcotics, barbiturates, tranquilizers, alcohol). Dosage of Haldol should be reduced.
5. May cause Neuroleptic Malignant Syndrome (fever, rigidity, AMS, cardiac side effects).
6. Seizure threshold may be reduced
7. EPS (dystonia, akathisia, and oculogyric crisis) are common, treat with [Benadryl](#)

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

Consult Medical Control for sedation of Psyche patient.

1. [Haldol 2.5 – 5 mg](#) slow IV or IM (may be repeated in 20 min. to max dose [20 mg](#))
2. [Benadryl 25 –50 mg](#) IV or IM for EPS

PEDIATRIC:

1. [Child 0.1 mg/kg](#) slowly IV or IM (do not exceed adult dose)
2. [Benadryl 1mg/kg](#) IV or IM for EPS

NOTE. If hypotension occurs, fluid challenge 200cc – 300cc.

HEPARIN

THERAPEUTIC EFFECTS:

Heparin acts on multiple sites in the coagulation process. Heparin binds to antithrombin III catalyzing inactivation of thrombin and other clotting factors.

INDICATIONS:

1. Unstable Angina/Acute Myocardial Infarctions (confirmed)
2. Pulmonary Embolism
3. Deep Vein Thrombosis

CONTRAINDICATIONS:

1. Known sensitivity to the medications
2. Hemorrhage
3. Sensitivity to Pork, Corn, Sulfites.
4. Pregnant or Breastfeeding
5. NO IM administrations

PRECAUTION/SIDE EFFECTS:

1. Allergic reactions to Heparin occur rarely
2. Should be used with extreme caution whenever there is a risk of hemorrhage.
 - a. GI lesions
 - b. Recent surgery
 - c. Blood dyscrasias
 - d. Menstruation
 - e. Uncontrolled Hypertension
 - f. Indwelling Catheters
 - g. Severe HTN
 - h. Hepatic Disease

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. 60 units/kg to max bolus 4000 units IV. Followed by 12 units/kg/hr rounded to nearest 50 units, maximum rate 1000 units/hour.

PEDIATRIC:

1. Not for use in the pediatric patient.

HYDROXOCOBALAMIN

(Vitamin B-12, Cyanokit, Hydro Cobex)

THERAPEUTIC EFFECTS:

1. **Hydroxocobalamin** attaches to the cyanide directly, creating cyanocobalamin, a natural form of Vitamin B-12. which is excreted in through the kidneys. The advantage of this approach is that methemoglobin is not produced and the oxygen-carrying capacity of the victim's blood is not lowered.

INDICATIONS:

1. Cyanide poisoning either by inhalation or ingestion.

CONTRAINDICATIONS:

1. Documented Hypersensitivity to **Hydroxocobalamin**.

PRECAUTIONS/SIDE EFFECTS:

1. The most common side effect of **Hydroxocobalamin** is a temporary pink discoloration of the skin, urine and mucous membranes:

ADMINISTRATION DOSAGES AND ROUTES:

ADULT:

1. **Hydroxocobalamin** is given **70 mg/kg** (not to exceed **5 grams**) IV over 30 min. May be administered more rapidly in cardiac arrest.
2. May repeat PRN do not exceed **15 grams**. Second dose is to be infused over 6-8 hours.

PEDIATRIC:

1. Same as adult dose and secondary doses.

INAPSINE
(Droperidol)

THERAPEUTIC EFFECTS:

1. A potent neurogenic (tranquilizer) agent that produces tranquilization and sedation without altering the state of reflex alertness.
2. Inapsine potentiates other CNS depressants.
3. Inapsine has antiemetic properties.
4. The onset of action IV or IM is from 3 to 10 minutes after administration, with peak effect from 15 to 30 minutes. Duration of action is 2 to 4 hours.

INDICATIONS:

1. Sedation of combative patients to facilitate restraint in emergency situations.
2. Sedation of head injured patients to facilitate airway control.
3. Severe nausea and vomiting. (*Lower doses*)
4. Adjunct to administration of narcotics for possible Nausea/Vomiting and potentiate opioid effects.

CONTRAINDICATIONS:

1. Known sensitivity to Inapsine
2. Prolonged QT related syndromes

PRECAUTIONS/SIDE EFFECTS:

1. Hypoxia may be the cause of agitation.
2. It is a mild alpha-adrenergic blocker producing peripheral vasodilation and may cause hypotension.
3. CNS depressants may be potentiated (barbiturates, tranquilizers, alcohol). Dosage of Inapsine should be reduced.
4. Seizure threshold may be decreased.
5. Acute dystonic reactions may occur. Treat as per protocol (Page C11).
6. Use carefully in patients with hepatic and renal problems. Reduce dose by ½ .

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. **Inapsine 0.625-2.5 mg (1/4 cc-1 cc)** slow IV push.
OR
Inapsine 1.25-5.0 mg (1/2 cc – 2 cc) IM.

PEDIATRIC:

1. **PEDS DOSE – CONSULT MEDICAL CONTROL**

NOTE: Extra-pyramidal reaction occurs, **Benadryl 25-50mg** IV per protocol.

INSULIN

THERAPEUTIC EFFECTS:

Insulin is a naturally produced short acting hormone. Insulin stimulates peripheral glucose uptake. Insulin regulates glucose metabolism.

INDICATIONS:

1. Hyperglycemia
2. Hyperkalemia

CONTRAINDICATIONS:

1. Hypersensitivity to the drug.
2. Hypokalemia
3. Hypoglycemia

PRECAUTIONS/SIDE EFFECTS:

1. Infections

ADMINISTRATION/DOSAGE/ROUTES:

Adult

Insulin 10 units SQ, IV.

Pediatric

Consult with Medical Control

IPRATROPIUM BROMIDE (Atrovent)

THERAPEUTIC EFFECTS:

1. An anticholinergic (parasympatholytic) agent that inhibits vagally-mediated reflexes by antagonizing the action of acetylcholine resulting in bronchodilation. In combination with albuterol, the median duration is five to seven hours.

INDICATIONS:

1. Bronchial asthma.
2. Bronchospasm in emphysema.
3. Chronic bronchitis.
4. Cardiac Asthma.

CONTRAINDICATIONS:

1. Hypersensitivity to the drug or to atropine or its derivatives.

PRECAUTIONS/SIDE EFFECTS:

1. Should be used with caution in patients with narrow angle glaucoma, prostatic hypertrophy or bladder neck obstruction and only if necessary with pregnant patients.
2. Providers should ensure that the patient's eyes are protected from contact with this solution.

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. **0.5mg/2.5 mL** (1 unit dose vial) can be added to 1 unit vial of **albuterol** in small volume nebulizer attached to O₂ at 6 liters to vaporize solution.

PEDIATRIC:

1. **<5 yrs old; ½ adult dose**

KETOROLAC TROMETHAMINE (Toradol)

THERAPEUTIC EFFECTS:

1. Decreases inflammation, pain, and fever through inhibition of enzymes production that causes swelling response.

INDICATIONS:

1. For the control of moderate pain, generally musculoskeletal, renal and biliary pain and certain migraine headaches that present typically to patient.

CONTRAINDICATIONS:

1. Known sensitivity to Ketorolac.
2. Asthma
3. Pt.s taking NSAID's (asa, ibuprofen etc)
4. Avoid using with other Narcotic analgesics:
5. Recent bleeding or surgeries, GI bleeding, patients at risk of bleeding
6. Mixing with ASA or other NSAID's, Morphine, meperidine, promethazine because it precipitates.
7. Renal patient with advanced renal impairment or risk of renal failure.

PRECAUTIONS/SIDE EFFECTS:

1. CNS Headache, vertigo, coma, seizures, N/V
2. CVS Hypotension, hypertension, Bradycardia
3. Respiratory depression, asthma attacks, CHF.
4. GI bleed and other bleeding related problems
5. Ketorolac acts as a NSAID thins the blood.
6. Renal risks patients

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

Ketorolac 30 IV slowly 2—3 min. or 60 mg IM.

CHILD:

Ketorolac 0.5mg/kg IV or 1 mg/kg IM. 2—16 yo max dose 15 mg IV or 30 mg IM

<p style="text-align: center;">LABETALOL (Normodyne, Presolol, Trandate)</p>

THERAPEUTIC EFFECTS:

1. Unknown action, May be related to reduced peripheral vascular resistance, as a result of alpha and beta blockade.

INDICATIONS:

1. Hypertension, acute hypertensive crisis.

CONTRAINDICATIONS:

1. Patients with known hypersensitivity to Labetalol.
2. Bronchial asthma
3. CHF
4. Cardiogenic shock
5. Severe Bradycardia
6. Other conditions that cause hypotension

PRECAUTIONS/SIDE EFFECTS:

1. Cimetidine may enhance Labetolol's effects.
2. fatigue and headaches
3. Orthostatic Hypotension
4. Nausea and vomiting
5. Bronchial Spasms

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. **Labetalol, 10 mg** IV slowly over 1—2 min.; additional dose of **10—20 mg** can be administered at 10 minute intervals to a **max of 80 mg** or SBP decreases by 20% of initial findings.

CONSULT WITH MEDICAL CONTROL FOR HIGHER DOSAGES IF INDICATED.

CHILD:

Not recommended for children.

LASIX
(Furosemide)

THERAPEUTIC EFFECTS:

1. A potent diuretic which inhibits sodium re-absorption by the kidneys. Water is eliminated with the sodium. Its effects are noted within 5 minutes.
2. Causes vasodilation which reduces preload.

INDICATIONS:

1. Pulmonary edema; includes CHF.
2. Hyperkalemia.
3. Hypertensive Crisis.

CONTRAINDICATIONS:

1. Pregnancy except in life threatening circumstances.

PRECAUTIONS/SIDE EFFECTS:

1. Severe dehydration and electrolyte depletion may result from excessive doses of Lasix.
2. Hypotension may occur.

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. 0.5 – 1.0 mg/kg (normal 40 – 80 mg) IV slowly.

PEDIATRIC:

1. Consult with medical control, (usual dose is 0.5 -1 mg/kg).

LIDOCAINE (Xylocaine)

THERAPEUTIC EFFECTS:

1. An agent which increases the fibrillation threshold thereby reducing ectopy and the development of ventricular fibrillation.

INDICATIONS:

1. Fibrillation after defibrillation
2. Stable wide-complex tachycardia
3. Head injury patient prior to use of succinylcholine for intubation with risk of ICP.

CONTRAINDICATIONS:

1. 2nd degree Mobitz II and 3rd degree heart blocks
2. Bradycardias even when associated with wide complex PVC's

PRECAUTIONS/SIDE EFFECTS:

1. High plasma concentration may cause myocardial and circulatory depression.
2. Possible CNS symptoms (seizures)
3. Reduce infusion dose if severe CHF or low cardiac output is compromising renal or hepatic blood flow.

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. **V-fib or wide complex tachycardias:** 1.0 –1.5 mg/kg. If refractory give additional 0.5 – 0.75 mg/kg. May repeat in 5 – 10 minutes: IV. or IO. Infusion rate of 1 – 4 mg/min (30 – 50 ug/kg/min). **Maximum total dose 3mg/kg.**
2. **Head injury:** 1.0 mg/kg IV. or IO. One dose only.
3. ET: 2 – 4mg/kg in **10mL of solution.**
4. PVC's associated with Chest Pain: 1.0—1.5 mg/kg. If refractory give additional 0.5—0.75 mg/kg. May repeat in 5—10 minutes: IV, or IO. Infusion rate of 1—4 mg/min (30—50 mcg/kg/min) **Maximum Total Dose of 3 mg/kg.**

PEDIATRIC:

1. 1.0—1.5 mg/kg IV or IO
2. IV or IO infusion rate at 20 – 50 mcg/kg/min.

NOTE:

1. Repeat boluses should be decreased by 50% in these patients:

a. 70 years or older	b. Congestive Heart Failure
c. In Shock	d. Liver disease

MAGNESIUM SULFATE

THERAPEUTIC EFFECTS:

1. Blocks neuromuscular transmission
2. Decreases the amount of acetylcholine liberated at the end plate of the motor nerve impulse.

INDICATIONS:

1. Control of seizures in severe toxemia of pregnancy.
2. May be effective in treatment of V-Fib or pulseless V-Tach if hypomagnesemic state or torsades de pointes suspected.
3. Acute Asthma Attacks.

CONTRAINDICATIONS:

1. Magnesium should not be given to mothers with toxemia of pregnancy during the two hours immediately preceding delivery.

PRECAUTIONS/SIDE EFFECTS:

1. Because magnesium is removed from the body solely by the kidneys drug should be used with caution in patient with known renal impairment.
2. Clinical indications of a safe dosage regimen include the presence of the patellar reflex and absence of respiratory depression.

ADMINISTRATION/DOSAGE/ROUTES:

(Supplied as 500 mg/ml)

ADULT:

1. **Seizures/seizures with eclampsia:** 2 grams of 50% solution diluted with 100mL normal saline IV. or IO. over 5 –10 minutes. or 2 grams of 50% solution IM.
2. **V-Fib or pulseless V-Tach;** 2grams IV bolus.
3. **Acute Asthma:** 2 grams in 50—100 mL over 4 – 5 minutes.

PEDIATRIC:

1. **Seizures:** 0.2 ml/kg of 50% solution; consult with Medical Control.
2. **V-Fib or Pulseless V-Tach;** 25—50 mg/kg over 10—20 min infusion to a total maximum of 2 grams. (mg/kg dose into 50mL Normal Saline).
3. **Acute Asthma:** 25—50 mg/kg over 10-20 minute infusion to a total maximum dose of 2 grams. (mg/kg dose into 50mL Normal Saline)

NOTE: Calcium Chloride is the reversal agent for Magnesium Sulfate overdose. 500 – 1000 mEq (5 – 10 cc) IV or IO slowly over 5-10 minutes. initially; titrate following dosages to patient response.

Deep Tendon Reflexes should be documented before and during administration of Magnesium Sulfate. EKG monitor Patient!

MORPHINE SULFATE

THERAPEUTIC EFFECTS:

1. A potent analgesic.
2. Reduces myocardial oxygen demand and cardiac preload.
3. A mild vasodilator.

INDICATIONS:

1. The control of severe pain associated with acute myocardial infarctions.
2. The control of severe pain associated with traumatic and non-traumatic injuries.
3. Reduce cardiac preload in patient with pulmonary edema not associated with pain.

CONTRAINDICATIONS:

1. Hypersensitivity to the drug.
2. Respiratory depression of non-intubated patients.
3. Hypotension or volume depletion patients.

PRECAUTIONS/SIDE EFFECTS:

1. Head injury patients.
2. Causes respiratory depression.
3. Narcan should be readily available when MS is used.

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. AMI pain; 2.0 – 10.0 mg with 2.0 mg every 5 minutes as needed. IV slowly or IO. 5.0 – 15mg IM dependent upon patient weight.
2. Musculoskeletal pain 4.0—6.0 mg with 2.0 mg every 5 minutes as needed for pain- IV slowly or IO; IM 5.0 –15 mg

PEDIATRIC:

1. Musculoskeletal pain 0.1—0.2 mg/kg IV slowly, IO, IM

NARCAN
(Naloxone)

THERAPEUTIC EFFECTS:

1. It is an effective agent which blocks the effects of both narcotics and synthetic narcotics.
2. It may be helpful in coma due to alcohol ingestion.

INDICATIONS:

1. Suspected opiate narcotic and/or synthetic narcotic overdose.
2. Known narcotic overdose with respiratory depression.
3. Coma due to unknown origin.

CONTRAINDICATIONS:

1. Known hypersensitivity to the medication.

PRECAUTIONS/SIDE EFFECTS:

1. Should be administered cautiously to patients who are known or suspected to be physically dependent on narcotics.
2. Narcan has a shorter half life than most narcotics, hence the patient may return to an overdose state.

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. **0.4 mg** with a dose of **1.6 mg** administered 2 minutes later if the initial dose is unsuccessful. Up to **5.0 mg** may be required for Darvon OD, Oxycodone or ETOH coma. IV/IO/SQ or MAD **2.0 mg** for OD's. ET **2.0 mg** in 10cc NS.

PEDIATRIC:

1. **0.1 mg/kg** up to maximum dose of **2.0 mg**. IV, IO, SQ, ET **0.2 mg/kg** to max dose of **2.0 mg**. MAD **0.1 mg/kg** to total max dose of **2.0 mg**

NITROGLYCERIN

THERAPEUTIC EFFECTS:

1. A rapid acting smooth muscle relaxant which reduces cardiac workload and to a lesser degree, dilates the coronary arteries.

INDICATIONS:

1. Chest pain or symptoms suggestive of angina and or Acute Myocardial Infarction.
2. Acute Pulmonary Edema/CHF
3. Prevention of angina and/or improve myocardial perfusion in patients with CAD
4. Hypertensive Crisis

CONTRAINDICATIONS:

1. Hypotension
2. Suspected increased intracranial pressure.
3. Administration of sildenafil citrate (Viagra) or vardenafil (Levitra) within the last 24 hours, or Tadalafil (Cialis) within the last 96 hours.

PRECAUTIONS/SIDE EFFECTS:

1. Hypotension
2. May produce headaches
3. Patient may develop tolerances
4. Nitroglycerin is light sensitive

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. SL 0.4 mg tablet or SL 0.4 mg metered dose from NTG spray. B/P >100 mmhg give every 5 minutes to total of 3 doses. 2" paste TD may be substituted for SL dose and IV Drip.
2. For angina or AMI and CAD induced perfusion problems see NITROGLYCERIN INFUSION DOSE (page)

PEDIATRIC:

NOT RECOMMENDED IN CHILDREN:

NOREPINEPHRINE
(Levophed)

THERAPEUTIC EFFECTS:

1. Norepinephrine (Levophed) is a sympathomimetic amine which functions as a peripheral vasoconstrictor. Has Alpha andrenergic actions and inotropic stimulation effects (beta).

INDICATIONS:

1. Hypotension caused by Sepsis or Septic Shock.
2. Cardiogenic Shock

CONTRAINDICATIONS:

1. Known hypersensitivity to the medication or sulfite allergies.
2. Hypotension due to hemorrhage
3. Patient with suspected vascular thrombosis

PRECAUTIONS/SIDE EFFECTS:

1. Extreme caution with patient receiving MAOI's
2. Extravasation necrosis at injection site
3. Side effects can cause bradycardia or other arrhythmias

ADMINISTRATION/DOSAGE/ROUTES:

Adult

2—16 mcg/min initially (**10 mcg/min** suggested) initially, once desired blood pressure of low normal 80 or 100 SBP is reached adjust dosage to maintain pressure. (**2—4 mcg/min.** suggested)

NOREPINEPHRINE (Levophed)																	
DRUG AMOUNT 8 mg	DILUENT 250 mL D5W								CONCENTRATION 32 mcg/mL								
USUAL DOSE 2—16 mcg/min			MAXIMUM DOSE 20 mcg/min						DIRECTIONS Mix 8 mg into 250 mL D5W								
DOSE mcg/min	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20
RATE mL/hr	3.8	6	8	9	11	13	15	17	19	21	23	24	26	28	30	34	38

Pediatric

0.1—0.2 mcg/kg/min initially, once desired blood pressure of low normal for age range is reached adjust dosage to maintain pressures. (**0.025—0.05 mcg/kg/min** suggested.)

ONDANSETRON (Zofran)

THERAPEUTIC EFFECTS:

1. Ondansetron is a selective 5-HT₃ receptor antagonist blocking serotonin, both peripherally on vagal nerve terminals and centrally in the chemoreceptor trigger zones.
2. Onset of action is 10 min with peak effects at 30 min. Duration of action is long lasting 6-8 hours per dosage.
3. Ondansetron does not cause sedation however there may be dizziness associated with administration.

INDICATIONS:

1. Nausea and Vomiting

CONTRAINDICATIONS:

1. Known Hypersensitivity to Ondansetron or other 5-HT₃ agents.
2. Patients with QT prolongation issues.
3. Patient with ventricular arrhythmias.
4. Bradycardia
5. Patients taking antiarrhythmic agents (class I and III i.e. Amiodarone)

PRECAUTIONS/SIDE EFFECTS:

1. Headaches, Dizziness,
2. Fatigue
3. Gastrointestinal problems (constipation, diarrhea)
4. Rash
5. Urinary retention
6. Pain at injection site.
7. Hypoxia
8. Can precipitate a seizure in known seizure patients.
9. Hepatic Failure patients should receive reduced dosage.

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. **Ondansetron (zofran) 4-8 mg IV, IM or IO.** May repeat X 1 in 15 minutes. Slow administration over 2-3 min.
Any patient with hepatic failure is to receive half dosage, with 8 mg being total 24 hour dose.

PEDIATRIC:

1. **Child consult Medical Control up to 6 years of age.**
Under 40kg **0.1 mg/kg**

OXYTOCIN (Pitocin)

THERAPEUTIC EFFECTS:

1. Oxytocin is a naturally occurring hormone, which is secreted by the posterior pituitary gland. It causes contraction of uterine smooth muscle and lactation.
2. Oxytocin is used to induce labor in selected cases and is also effective in inducing uterine contractions following delivery, thereby controlling postpartum hemorrhage.
3. When a baby is placed on the breast, the sucking action causes the posterior pituitary to release Oxytocin. It is important to remember this inherent mechanism whenever confronted by a patient suffering moderate to severe postpartum bleeding.

INDICATIONS:

1. Postpartum hemorrhage

CONTRAINDICATIONS:

1. Any condition other than postpartum bleeding. Baby and placenta have to be delivered. Make sure there are not additional fetus in the uterus to deliver.
2. Previous C-Sections (relative)

PRECAUTIONS/SIDE EFFECTS:

1. Excess Oxytocin can cause over stimulation of the uterus and possible ruptures.

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. **Oxytocin (Pitocin) 20—40 units into 1000 mL NS and infuse at 200 mL/hr.**

PHENERGAN
(Promethazine)

THERAPEUTIC EFFECTS:

1. Phenergan has antihistamine and blocks H-1 receptor for histamines, which cause antiemetic and mild sedative effects.
2. Effects are apparent within 3-5 minutes IV and 15-20 minutes IM, duration effects are generally 3-6 hours.
3. CNS depressant.

INDICATIONS:

1. Antiemetic
2. Potentiate the effects of Opiates and prophylactically for Nausea/Vomiting
3. Sedation.

CONTRAINDICATIONS:

1. Hypersensitivity to phenergan or other antihistamine medications.
2. GI obstruction/perforations/hemorrhage.
3. Acute Glaucoma.
4. Asthma attacks.
5. No IV antiemetic for children less than 6 yrs old.
6. Reyes syndrome.
7. Peripheral vascular disease.

PRECAUTIONS/SIDE EFFECTS:

1. Potential for EPS.

ADMINISTRATION/DOSAGE/ROUTES

ADULT:

1. Phenergan 6.5-25mg IV, slow over 2 minutes or IM, Do not administer greater than 25mg/cc. Should not be given undiluted into vein, but with IV solution. When given IM, do not give near a nerve.

PEDIATRIC:

1. Child consult Medical Control up to 6 yrs old.

RACEMIC EPINEPHRINE

THERAPEUTIC EFFECTS:

1. A potent alpha and beta stimulant containing equal amounts of the d and l isomer of epinephrine.
2. When administered via inhalation, it reduces upper airway edema associated with stridor in pediatric patients suffering from viral croup.

INDICATIONS:

1. Croup patients with stridor at rest.
2. Bronchospasms
3. Laryngospasms

CONTRAINDICATIONS:

1. Should be used cautiously in adult patients with history of Heart:

PRECAUTIONS/ SIDE EFFECTS:

1. Should not be used instead of assisted ventilations in patient in respiratory failure.
2. Tachycardia can result.
3. Effects are temporary and a resurgence of symptoms can occur from minutes to hours after initial treatment dose.

ADMINISTRATION/DOSAGE/ROUTES:

Adult:

1. 0.5 ml (2.25%) diluted in 3 mL NS. Nebulized.

PEDIATRIC:

1. 0.5 ml (2.25%) diluted in 3 mL NS. Nebulized.
Under 20 kg 0.25 mL (2.25%) diluted in 3 mL NS. Nubulized.

ROCEPHIN
(Ceftriaxone Sodium)

THERAPEUTIC EFFECTS:

Rocephin is a broad-Spectrum antibiotic effect for both anaerobic and aerobic bacteria. Rocephin is suitable for use with sepsis and can be administered intravenously or intramuscularly.

INDICATIONS:

Rocephin is used for the treatment of severe sepsis when associated with the following: Respiratory infections; Skin infections; Bone and Joint infections; Urinary Tract Infections; Pelvic Inflammatory Disease; Intra-Abdominal infections; Meningitis.

CONTRAINDICATIONS:

Rocephin is contraindicated for patients with a known allergy to Cephalosporin class of antibiotics.

RELATIVE CONTRAINDICATIONS:

Patients suffering from both Hepatic and Renal failures.

PRECAUTIONS/SIDE EFFECTS:

Rocephin can cause changes in the normal flora of the colon. Rocephin can cause or aggravate colitis. Pain can be associated with the administration of Rocephin. Diarrhea, headaches and dizziness have been occasionally reported with use of Rocephin.

ADMINISTRATION/DOSAGE/ROUTES:

Rocephin must be reconstituted, and easily dissolves in water.

Adult:

2 grams IV over 30 minutes up to a total of 4 grams per day.

Pediatric:

50-75 mg/kg IV over 30 minutes.

ROMAZICON (Flumazenil)

THERAPEUTIC EFFECTS:

1. Romazicon , an imidazobenzodiazepine derivative, antagonizes the actions of benzodiazepines on the central nervous system. Romazicon competitively inhibits the activity at the benzodiazepine recognition site on the receptor complex.

INDICATIONS:

1. Romazicon is indicated for the complete or partial reversal of the sedative effects of benzodiazepines.

CONTRAINDICATIONS:

1. Patients with a known hypersensitivity to Romazicon or benzodiazepines.
2. Patients who have been given a benzodiazepine for control of a potentially life-threatening condition (eg. control of intracranial pressure or status epilepticus).
3. Patients who are showing signs of serious cyclic antidepressant overdose.

WARNINGS: *The use of Romazicon has been associated with the occurrence of seizures. These are most frequent in patients who have been on benzodiazepines for long-term sedation or in overdose cases where patients are showing signs of serious cyclic antidepressant overdoses.*

PRECAUTIONS/SIDE EFFECT:

1. Risk of seizures.
2. Hypoventilation, (re-sedation respiratory depression).
3. Return of sedation.
4. Should not be used until the effects of neuromuscular blockade have been fully reversed.

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. Initial dose **0.2 mg** IV over 15 sec. If not responding, **repeat dose in 1 min intervals to total of 1 mg**. In cases or re-sedation repeat same dose after 20 min. **Not to exceed 3 mg in one hour**.

PEDIATRIC:

1. One year or older: **0.01 mg/kg** IV or 15 sec. If not responding repeat doses in 1 min intervals to total of **0.05 mg/kg, or 1 mg maximum dose** which ever is greater.

SODIUM BICARBONATE (NaHCO₃)

THERAPEUTIC EFFECTS:

1. Provides bicarbonate to assist the buffer system in reducing the effects of acidosis.

INDICATIONS:

1. Prolonged cardiac arrest (after ventilation and other problems have been treated)
2. Cyclic anti-depressant overdose with QRS duration > 100 milliseconds.
3. Post-resuscitation hypotension.
4. Hyperkalemia
5. Suspected Hypoxic Arrest give early in treatment course. Arrest > 5 min.

CONTRAINDICATIONS:

1. None when used in severe hypoxia or cardiac arrest.

PRECAUTIONS/SIDE EFFECTS:

1. May cause alkalosis if given too aggressively
2. It may deactivate vasopressors
3. Will precipitate with calcium chloride and calcium gluconate.

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. Cardiac arrest: 1 mEq/kg initially and may be followed by 0.5 mEq/kg every 10 minutes IV, IO.
2. Cyclic anti-depressant therapy is 1 mEq/kg IV slowly and may repeat every 10 minutes X 3; IV slowly IO. Alternative Dose (50 mEq into 1000 mL NS)
3. Hyperkalemia; 1 mEq/kg IV slowly and may repeat 0.5 mEq/kg in 10 minutes X 1 only.

PEDIATRIC:

1. Same as with adult 1 mEq/kg

SOLU-MEDROL
(Methylprednisone)

THERAPEUTIC EFFECTS:

1. Natural occurring glucocorticoid with potent anti-inflammatory effects in disorders of many organs.
2. Decreases inflammation by stabilizing leukocyte lysosomal membranes.

INDICATIONS:

1. Acute Asthma Attack.
2. Severe COPD.
3. Anaphylaxis.

CONTRAINDICATIONS:

1. Patients with known hypersensitivity to Solu-Medrol.

PRECAUTIONS/SIDE EFFECTS:

1. Hypertension
2. GI ulcerations and GI bleeding
3. Renal disease

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. Asthma: Solu-Medrol 125 mg IV, IO
2. Severe COPD Solu-Medrol 125 mg IV, IO
3. Anaphylaxis: Solu-Medrol 125 mg IV, IO

CHILD:

1. Asthma: Solu-Medrol 2 mg/kg IV, IO
2. Anaphylaxis: Solu-Medrol 2 mg/kg IV, IO

SUCCINYLCHOLINE (Anectine)

THERAPEUTIC EFFECTS:

1. A non potassium sparing biphasic skeletal muscle relaxant with rapid onset and short duration of action.
2. Paralyzes all skeletal muscles including respiratory muscles and gag reflex

INDICATIONS:

1. Inadequate oxygenation or unprotected airway where intubation is indicated but difficult due to gag reflex, clenched teeth, or other complications.

CONTRAINDICATIONS:

1. Contraindications are always relative to the life threat of the patient.
2. Succinylcholine should only be used if an airway cannot be established by other methods.
3. Should not be used with patient who have atrophy of muscles due to neurogenic illnesses. i.e. MS.

PRECAUTIONS/SIDE EFFECTS:

1. Patient with severe cellular damage, i.e. crush injuries or burns greater than 8 hours old.
2. Patient requiring a second dose may experience increased intracranial pressure and bradycardia.
3. Can cause cardiac arrhythmias
4. Can cause fasciculations, may need to administer defasciculation dose of Norcuron.

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. 1.0—1.5 mg/kg. IV/IO. May repeat X 1. refer to RSI protocols for additional preliminary drug therapy: (page D 13)

PEDIATRIC:

1. Same as with adult:

* NOTE: Not recommended to give succinylcholine IM since effects of action last longer and patient experience profound side effects.

<p style="text-align: center;">TERBUTALINE (Brethane)</p>
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THERAPEUTIC EFFECTS:

Terbutaline Sulfate is a beta-adrenergic receptor agonist which relieves bronchospasms in both acute and chronic pulmonary diseases. Onset is rapid and similar to Epinephrine but with fewer side effects. Half life is 3 hours.

INDICATIONS:

1. Asthma
2. COPD exacerbations.
3. Short Term use Tocolysis with Medical Control Approval

CONTRAINDICATIONS:

1. Hypersensitivity to Terbutaline
2. Prolonged Tocolysis

PRECAUTIONS/SIDE EFFECTS:

1. Use of Beta-Adrenergic agents alone may not be adequate to control Asthma in patients. Early consideration should be given to anti-inflammatory agents like Solu-Medrol.
2. Precautions should be used when administering when patients take Tricyclic Antidepressants and Monoamine Oxidase Inhibitors (MOI)

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

0.25 mg SQ may repeat 0.25 mg within 15-30 min if desired effects not achieved.

PEDIATRIC:

Not recommended for children under age 12.

THIAMINE HCL
(Vitamin B1, Betalin)

THERAPEUTIC EFFECTS:

Required for carbohydrate metabolism. Deficiency leads to anemia, polyneuritis, Wernicke's encephalopathy, cardiomyopathy. Administration may reverse symptoms of deficiency, but effects are dependent upon duration of illness and severity of disease.

INDICATIONS:

1. Alcoholism, delirium tremens
2. Coma of unknown origin, especially if alcohol or malnourishment may be involved.
3. Suspect Wernicke or Korsakoff Syndrome.
4. Other thiamine deficiency syndromes
5. Severe congestive heart failure.

CONTRAINDICATIONS:

1. Do not give intra-arterial

PRECAUTIONS/SIDE EFFECTS:

1. Hypotension (rare)

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. Thiamine 100 mg IV.

PEDIATRIC:

Rarely Given:

TRANEXAMIC ACID (TXA, Cyclokapron)

THERAPEUTIC EFFECTS:

Tranexamic acid is a class 1a medication, useful in promoting clotting in moderate to severe trauma.

INDICATIONS:

Adults in hemorrhagic shock with suspected need for massive blood transfusion.

CONTRAINDICATIONS:

1. Non-hemorrhagic shock
2. Non-traumatic hemorrhagic shock
3. GCS = 3 with unreactive pupils
4. Injury occurring > 2 hours ago or injury of unknown time.
5. Cardiac Arrest or active AMI/CVA
6. Seizures (including history of)
7. Burns greater than 20% BSA
8. Known Dialysis patient
9. Other pro-coagulants

PRECAUTIONS/SIDE EFFECTS:

STOP infusion if seizures, AMI, CVA, or cardiac arrest occur.

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

At least 15 years of age or 50kg with unknown age.

Tranexamic acid 1 gm. mix into 100 mL bag of NS, infuse in over 10 minutes by **IV ONLY.**

(Tranexamic acid cannot be administered via IO)

Once first gram administered, mix **Tranexamic acid 1 gm** into 250 mL NS and administer over 8 hours.

PEDIATRICS:

Not recommended in Pediatrics.

VASOPRESSIN

THERAPEUTIC EFFECTS:

Vasopressin is a pituitary (antidiuretic) hormone. Vasopressin causes vasoconstriction (pressor effect) of peripheral, cerebral, pulmonary, and coronary vessels. This action increases coronary artery perfusion.

INDICATIONS:

1. Refractory ventricular fibrillation/pulseless ventricular tachycardia

CONTRAINDICATIONS:

1. Responsive patient with coronary artery disease
2. Hypertension

RELATIVE CONTRAINDICATIONS:

1. There are none in the settings of cardiac arrest.

PRECAUTIONS/SIDE EFFECTS:

1. Can increase peripheral vascular resistance and provoke cardiac ischemia
2. Abdominal distress
3. Nausea and vomiting
4. Tremors
5. Tissue necrosis if extravasation occurs

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

Vasopressin 40 units IV, IO or ET. Given only once. Can give before or after **Epinephrine**. **Epinephrine** can follow 20 min post Vasopressin.

PEDIATRIC:

Not for Pediatric Administration:

VECURONIUM
(Norcuron)

THERAPEUTIC EFFECTS:

1. Vecuronium Bromide is an adjunct to general anesthesia to facilitate endotracheal intubations and relax skeletal muscles during mechanical ventilations.
2. Nondepolarizing drug that prevents acetylcholine from binding to receptors on the motor end plate, thus blocking neuromuscular transmission.

INDICATIONS:

1. For use in post intubated patients needing paralytic actions with greater duration than Succinylcholine.
2. Can be used to facilitate endotracheal intubation when Succinylcholine is contraindicated.
3. Is recommended as a defasciculating agent (1/10th normal dose) when using Succinylcholine.

CONTRAINDICATIONS:

1. Patient with known hypersensitivity to Vecuronium or to bromides.

PRECAUTIONS/SIDE EFFECTS:

1. Elderly patients
2. Patient with CVS disorders and edema
3. Hepatic Disease
4. Severe obesity
5. Electrolyte disturbances and neuromuscular diseases.

ADMINISTRATION DOSAGES AND ROUTES:

ADULT:

1. Vecuronium Bromide is given **0.08-0.1 mg/kg** (Usual dose **10 mg**) IV bolus. Second maintenance dose is **0.01 to 0.015 mg/kg** within 25—40 minutes.
2. Defasciculating dose is **0.01 mg/kg**

INFANT:

1. Older than 9 years of age: **Same as adult**
2. 1-9 years old slightly higher dose and more often: **0.1—0.12 mg/kg**

Alternate Maintenance Therapy: IV Infusion:

VECURONIUM BROMIDE INFUSION RATE - mL/min

Amount of Drug mcg/kg/min	Patient Weight - kg						
	40	50	60	70	80	90	100
0.7	0.28	0.35	0.42	0.49	0.56	0.63	0.70
0.8	0.32	0.40	0.48	0.56	0.64	0.72	0.80
0.9	0.36	0.45	0.54	0.63	0.72	0.81	0.90
1.0	0.40	0.50	0.60	0.70	0.80	0.90	1.00
1.1	0.44	0.55	0.66	0.77	0.88	0.99	1.10
1.2	0.48	0.60	0.72	0.84	0.96	1.08	1.20
1.3	0.52	0.65	0.78	0.91	1.04	1.17	1.30

NOTE: If a concentration of 0.2 mg/mL is used (20 mg in 100 mL), the rate should be decreased by one-half.

VERSED
(Midazolam)

THERAPEUTIC EFFECTS:

1. Sedation

INDICATIONS:

1. Premedication prior to cardioversion
2. Premedication prior to endotracheal intubation
3. Severe anxiety interfering with medical treatment
4. Seizures
5. To facilitate external pacing

CONTRAINDICATIONS:

1. Hypersensitivity to the medication
2. Acute Narrow Angle Glaucoma
3. Shock

RELATIVE CONTRAINDICATIONS:

1. Respiratory depression
2. Hypotension
3. Bradycardia

PRECAUTIONS/SIDE EFFECTS:

1. May cause respiratory depression
2. May need to be re-administered

ADMINISTRATION/DOSAGE/ROUTES:

ADULT:

1. **Sedation:** 0.5—1.0 mg IV slowly/IO or 1.0 mg IM
2. **Premedication** 2.5—5.0 mg IV slowly/IO
3. **Seizures:** 0.5—1.0 mg IV slowly every 3 minutes to max dose of 5.0mg or IO or 2.0 mg IM or 5.0 MAD
4. **Versed maintenance infusion.** 25 mg Versed added to 100cc NS, (0.5 mg/mL NS) infused at 0.02—0.10 mg/kg/hr. or 1—7mg/hr. Generally 5 mg/hr (20gtts/min).

PEDIATRIC:

1. **Seizure:** 0.05—0.1mg/kg IV slowly every 3 minutes to max dose of 2.0mg IO, or IM or MAD at 0.2 mg/kg up to maximum dose of 2.0 mg.

