

PARTNERS IN EMS



Regions Hospital®
Emergency Medical Services



Regions Hospital EMS

REGIONS HOSPITAL EMERGENCY MEDICAL SERVICES

INTRODUCTION:

The Emergency Medical Services (EMS) Program at Regions Hospital has developed these policies and guidelines. All statements contained in this manual are informative only and represent that which is believed to be the highest standard of care relating to any particular set of circumstances.

It is the intention of the Regions Hospital EMS medical director(s) that this manual be used as consultative material in striving for optimal patient care. It is recognized that any specific procedure is always subject to modification depending upon the circumstances of a particular case. Further, the medical control physician may deviate from these guidelines based on medical judgment.

This edition replaces all previous editions and becomes effective on May 15, 2014.

REGIONS HOSPITAL EMERGENCY MEDICAL SERVICES:

Regions Hospital Emergency Medical Services is a program of Regions Hospital. Our services encompass the full spectrum of out-of-hospital emergency care oversight including:

- Medical direction and consultation
- Quality management
- Education
- Research
- Legislative advocacy

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* Do NOT send mail to this address. For courier and classroom location purposes only.

Visit us at www.regionsems.com or on Facebook at Regions EMS

These guidelines and policies have been approved by:

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April 15, 2014

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April 15, 2014

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April 15, 2014

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Regions Hospital EMS

ACKNOWLEDGEMENTS

Regions EMS Medical Directors are pleased to provide this completely revised and updated version of EMS Guidelines to our providers. This work was accomplished with a dedicated group of providers who worked tirelessly to find a document that not only reflects a simpler more easily read document but it also incorporates the most current practice in medicine and trauma.

The 2014 Guidelines have taken on a new look utilizing the algorithm format, color incorporation that delineates BLS, ALS, and Medical consultation procedures.

- Updated guidelines on cardiac arrest resuscitation, back boarding, current stroke and burn care, and simplification for adult medication dosing.
- Separate pediatric guidelines
- Guidelines on special patients – LVAD, Tracheotomies, Ventilators
- Guidelines on mass gathering events and scene rehabilitation

The following groups of providers were instrumental in helping to shape these guidelines:

- Dave Clausen – Police Officer/Paramedic (Cottage Grove Public Safety Department)
- Mark Tuttila – Paramedic (Lakeview EMS)
- Mark Tiffany – Firefighter/Paramedic (Oakdale Fire Department)
- Ken Adams – Firefighter/Paramedic (St. Paul Fire and Safety Services)
- Rob Morris – Paramedic (White Bear Lake Fire Department)

Workgroup Coordinators:

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REGIONS HOSPITAL EMERGENCY MEDICAL SERVICES

Mission Statement

It is the mission of Regions Hospital Emergency Medical Services (EMS) to advance and improve the delivery of out-of-hospital patient care through education, medical oversight, research, and legislative advocacy.

System Philosophy

Regions Hospital EMS believes that all out-of-hospital providers are the on-scene extension of the medical directors. Further, we believe that:

1. Every patient has the right to a prompt and appropriate EMS response.
2. Strong internal and external customer relations are crucial to a quality system.
3. The development of strong partnerships between in-hospital and out-of-hospital providers will improve continuity of care for patients.
4. Every patient should have access to 911, emergency medical dispatch priority reference systems, prearrival instructions, and emergency medical dispatchers.
5. Systems should allow for transport to the most appropriate facility, based on patient choice or condition.
6. Every provider should demonstrate clinical excellence through strong patient care skills, continuing medical education, and sound medical judgment.
7. The EMS system should have an integrated continuum of care that provides for first response, basic life support (BLS), advanced life support (ALS), and specialized transportation. Services should also establish relationships for mutual aid response.
8. Every response should have the appropriate number of responders, vehicles and equipment to meet the needs of the patient.
9. Research provides evidence-based justification for critical decisions regarding out-of-hospital care.
10. All out-of-hospital providers (First Responder, BLS and ALS) should have community education plans to educate the public on issues of proper access, identification of medical emergencies, prearrival care (CPR and first aid), and injury/illness prevention.
11. Affiliations with institutions of higher learning will promote professionalism and advance the role of out-of-hospital providers in the health care environment.
12. Having a strong voice in local, state, and national legislative issues will promote EMS systems improvement.
13. Continuous quality improvement (CQI) practices will drive the quest for excellence.

Performance Standards

Based on current industry literature and trends, the following are components of a high performance EMS agency and are considered to be ideals to strive for. Regions Hospital EMS recommends that agencies attempt to incorporate the following performance standards into their EMS system as they plan for the future.

1. Response Times
 1. Metropolitan Area: Every request for emergency medical response will be answered by trained first responders within 4 minutes of the initial call. This will be followed by ALS care within 8 minutes of the initial call. A metropolitan area is defined as a primary service area (PSA) having a population density of ≥ 150 persons per square mile.
 2. Rural Area: Every request for emergency medical response will be answered by trained first responders within 8 minutes of the initial call. This will be followed by ALS care within 15 minutes. A rural area is defined as a PSA with a population density of < 150 persons per square mile.
2. All services will be accessed by 911 Public Service Answering Points (PSAP's). These PSAP's will have an emergency medical dispatch priority reference system with telecommunicators who have had emergency medical dispatch (EMD) training and who deliver pre-arrival instructions to callers.
3. EMS agencies at all levels should have a community education plan which addresses the following issues:
 1. How to access 911
 2. When to call 911
 3. Pre-arrival care (CPR & First Aid)
 4. Injury and illness prevention



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4. Each responding agency should have a service plan which includes the following elements:
 1. Dispatching criteria for first responder, basic life support (BLS) and advanced life support (ALS) units based on call triaging.
 2. ALS intercept criteria and agencies.
 3. Critical care transport guidelines for interfacility transfers.
 4. Guidelines for appropriate utilization of helicopter services for scene responses.
 5. A mutual aid response plan.
5. Within a particular EMS system, the following minimum staffing, training, and equipment levels shall be maintained for each response:
 1. First Responders: A minimum of one person trained to the level of First Responder (defined by the First Responder curriculum or other as approved by the EMSRB)
 2. In those communities providing BLS: Two state licensed EMT-Basics (EMT-B) shall accompany the patient during transport.
 3. In those communities providing ALS: One state licensed EMT-Paramedic (EMT-P) shall respond to every scene and whenever possible, two EMT-Ps shall accompany each patient who is unstable or potentially unstable.
 4. Vehicle: Will comply with state and local standards.
 5. Equipment: Will comply with state statute and medical direction requirements
6. All providers will meet continuing medical education (CME) requirements and annual skill check offs as set forth by state statute, regulatory rule, and/or medical direction. Each service will follow an established orientation plan for new employees, which includes a system orientation. Providers will maintain current recognition in the following areas:
 1. Telecommunicators: EMD and AHA Healthcare Provider CPR or its equivalent.
 2. First Responders: AHA Healthcare Provider CPR or equivalent, First Responder (with biannual refresher), and AED
 3. EMTs: AHA Healthcare Provider CPR or equivalent; recommended: BTLs
 4. EMT-Ps: AHA Healthcare Provider CPR or equivalent and ACLS; recommended: BTLs and PALS
7. Patients should be transported to the most appropriate facility based upon a patient's competent choice or emergent medical or traumatic condition
8. All service providers will collect, collate and share prospective and retrospective data for the purpose of continuous quality improvement and quality assurance.
9. Participation in research projects, identified by the medical director or individual services, is strongly encouraged and will be conducted using methods and design approved by the Regions Hospital Institutional Review Board (IRB). The Regions Hospital EMS Research Coordinator will supervise these projects. Product evaluations will also be conducted by Regions Hospital EMS and appropriate services to test the effectiveness and appropriateness of new pieces of equipment.
10. Regions Hospital will provide primary clinical training sites and educational support to those institutions that enhance the overall professional preparation of out-of-hospital care providers. Individual providers are encouraged to pursue academic degrees in the field of Emergency Health Services when appropriate.
11. Agencies and organizations within the EMS system will actively pursue strategies that positively impact the provision of out-of-hospital care through individual legislative contacts and membership in professional organizations that pursue similar goals.



Policies

Policies

Policies

Policy

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Communications/Med Control

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ISSUED BY:	Medical Director	No. 14-100
DATE:	April 1, 2014	Supersedes: 11-108; 09-114

All pre-hospital communications will be channeled through the East Metro MRCC. The MRCC is staffed 24 hours/day by specially trained paramedics; emergency medicine physicians are available at all times. Medical control shall be contacted any time an EMS agency is called to the scene of a medical emergency and a patient is evaluated by the ambulance crew, regardless of whether the patient is transported. A Regions Hospital Emergency Medicine physician, at the request of the ambulance crew or the MRCC operator, may monitor any call to MRCC. Certain cases are designated as mandatory physician-monitored calls. The MRCC operator or monitoring physician will relay patient information given by ambulance crews to the receiving hospital with as much advance notice as possible. Ambulance crews should give patient reports to medical control as soon as possible to allow receiving hospitals time to prepare for patient arrival or so that the crew may be notified early on of the need for diversion. **Contact with MRCC should be accomplished with at least a 5 minute ETA whenever possible.**

PROCEDURE:

1. The East Metro MRCC shall be referred to as "East Metro Medical Control." Initial contact with MRCC shall be made on 800 MHz EMRCC or VHF EMS Statewide (National), or by telephone (651-254-2990) as appropriate for each service. During an MCI, contact should be made by radio when possible. Ambulance crews should identify their service name, unit number, transport destination, criticality or type of call, and ETA. If crews have a critical patient or cath lab activation and EMRCC is busy, they may use REGMD as a back up. If calling on the phone or radio, announce immediately you have a critical patient.
2. Contact with medical control should be made after initial evaluation of the patient, especially if the EMS agency will have a short ETA or if they have a critical patient (i.e. TTA, Cath Lab Activation). If an ambulance is responding to a confirmed critical situation or will be attending to a patient a significant distance from the ambulance, contact may be made with medical control prior to arrival to arrange for on-scene communications or to alert a receiving hospital.
3. EMS agencies using 800 MHz may be assigned to REGMD to talk with a medical control physician. Assignment to REGMD includes but is not limited to the following circumstances:
 - A. The ambulance crew intends to give a lengthy report or will be relaying information on multiple patients and does not want to "tie up" the EMRCC channel for long periods of time.
 - B. The ambulance crew will be a significant distance from the ambulance and must set portable and vehicular radios to the same channel.
 - C. The ambulance crew will be involved in the care of a critically ill or injured patient and wishes exclusive use of a radio channel for physician medical control.
 - D. During MCI events (ME-TAC or R-POOL may be more appropriate).
4. If the ambulance crew wishes to consult with a physician they should state that request clearly to the medical control operator who will summon a physician to the radio. Crews are encouraged to follow written guidelines before seeking physician consultation, but EMS agencies can consult with a physician any time they have questions concerning patient care.
5. MRCC operators are available to state or clarify written guidelines as necessary.
6. Radio report format will vary, based on the condition of the patient:
 - A. Any report on a patient who the provider deems as stable (see definition below) and requires minimal interventions, does not requiring a specific transport destination, or specific alert criteria (TTA, Level 1 Trauma, Cath Lab Activation, or Code Stroke Activation), the report will include: the crew, agency, chief complaint, patient age, patient gender, destination hospital, and ETA. The following will be used to define the stable patient: Systolic 120-140; Diastolic 80-100, Pulse < 110, Temp < 103 or > 95, SaO₂ > 95%, no altered mental status, and provider impression of the patient.
 - B. Patients who are deemed unstable, defined as a patient needing specific interventions or outside of the ranges listed above, the report will be inclusive of the above information and will also include vital signs, response to treatments, and any other pertinent information the crew feels they should include. In these patients, MRCC may ask for more clarifying information. If the provider is very busy with patient care, the provider should alert MRCC as early possible so MRCC can alert the receiving hospital in a timely fashion.

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ISSUED BY:	Medical Director	No. 14-100
DATE:	April 1, 2014	Supersedes: 11-108; 09-114

7. Paramedics give radio reports on patients receiving ALS care. Either a Paramedic or EMT may give a radio report on a patient receiving BLS care.
8. The medical control operator number (and physician name if consulted) should be recorded on the run report.
9. In addition to the radio report, a verbal report from the crew to the receiving nurse or physician who accepts care of the patient must be made prior to departure. This report must include the above information and any changes that occurred in the patient's condition during transport. The receiving nurse or physician must sign off on the run report form.
10. When assigned a separate TAC or POOL channel for medical communications, the ambulance crew will notify medical control upon arrival at the hospital or when no further communication is anticipated, so that the channel in use may be reassigned as necessary.
11. In the following situations, consultation with a medical control physician is mandatory.
 - A. Non-transport of all pediatric patients < 2 years
 - B. Non-transport of all third trimester OB patients with trauma.
 - C. Non-transport of patients who have had a hypoglycemic episode who are on oral hypoglycemic medications
 - D. Administration of some medications for children and adults; see specific guidelines
 - E. Transport by BLS personnel without IV training once an IV has been established by ALS personnel
12. Requests to MRCC may have to be prioritized during periods of high activity. EMS personnel may be asked to "stand-by" until the MRCC operator can clear higher priority calls.

SPECIAL NOTES:

1. The emergency medicine staff physician has the authority to override the medical control operator and re-prioritize requests for service.
2. In the rare event that communication difficulty, significant delay, or failure results in the inability of EMS personnel to contact medical control for treatment orders that are normally administered only after medical control or physician consultation, the EMT or paramedic may initiate those treatments that, in the opinion of the provider, are life-saving or necessary to stabilize the patient and in which they have received training. The performance of those treatments must be carried out as outlined in the guidelines and must be consistent with the provider's level of training. Any pediatric treatments administered in this way, must be given after referring to a pediatric medication/treatment reference chart (weight-based resuscitation tape). Providers should attempt alternative communication methods (e.g. cellular phone) when difficulties arise. Treatments carried out without medical control or physician permission, due to communication failure, must be reported by the EMT or paramedic to the On Call Clinical Supervisor as soon as possible and to the medical director in writing within 24 hours using the EMS Quality Improvement Form.



Continuing Education

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ISSUED BY:	Medical Director	No. 14-101
DATE:	April 1, 2014	Supersedes: 11-100; 09-106; 09-107; 09-108

ALS Continuing Medical Education

As part of the medical direction agreement with your service, Regions EMS will offer a variety of continuing medical education opportunities that will meet Minnesota EMSRB, Wisconsin DHS, and NREMT requirements for recertification.

CME activities may include:

- Case Reviews
- Advanced Lab (critical thinking, cadaver, pediatric, airway etc)
- CME Education Sessions – up to 24 hours every two-year recertification cycle

The medical director or a representative from the Regions EMS office may require paramedics to attend a CME activity. This requirement will be communicated to your service ahead of time. Your service, however, may require you attend all or some CME activities. Consult your Training Officer for your service's attendance policy.

Additionally, Regions EMS offers other courses* that are required recertification such as:

- ACLS
- PALS
- BLS for HealthCare Providers

** Registration fee required*

All education activities attended through Regions EMS will be kept on record for a minimum of 10 years. Transcripts are available directly to the EMS provider. Training records for all the members of a service may be requested by the Service Director, Chief or EMS Training Officer.

National Registry Status

Regions EMS does not require paramedics to maintain National Registry status, however, individual services may require it. Therefore, the medical director from Regions EMS will affiliate with all its medical direction services. Paramedics are to affiliate with their own service, and upon training officer approval of education, the NREMT application will be forwarded to Regions EMS for medical director approval.

Regions Hospital Employees – not otherwise affiliated with an EMS service

If you are a Regions Hospital employee, hold a current Paramedic certification, and are not otherwise affiliated with an EMS service, you may request to affiliate with Regions EMS for NREMT purposes. As part of your recertification process, you will be required to set up a time to demonstrate skills competency for the medical director prior to NREMT approval. Our office may also request to see other training records. In addition, your employment status with Regions must be current at time of recertification, and your working skill set within your department must be deemed as competent by your immediate supervisor.



Continuing Education

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DATE:	April 1, 2014	Supersedes: 11-100; 09-106; 09-107; 09-108

BLS Continuing Education / Modular EMT Refresher

As part of the medical direction agreement with your service, Regions EMS will provide an EMT-refresher that will meet MN EMSRB or WI DHS and the NREMT. This refresher may be delivered in a modular format over a 2 –year recertification period. Components of this modular refresher may be categorized as distributed education. This refresher will include practical and written testing as required. BLS providers are required to attend each modular session in order to successfully complete the standard refresher. At least 1 make up session will be offered at the end of each quarter at no cost. BLS providers are also invited to attend a modular education session at another service location as long as it is the correct curricular content. Modular schedules will be available to the service and may be requested from the Regions EMS office at any time.

- If a modular session(s) is missed due to an approved leave, Regions EMS will work with your service to provide a make-up session prior to recertification.
- If a modular session(s) is missed, and NOT due to an approved leave, the BLS provider may have an opportunity to make up this session for a fee OR may be required to attend a standardized refresher prior to recertification for a fee.
- If a BLS provider is unable to attend all modular sessions required to meet the EMT recertification requirements, he/she may consider the sessions attended as “continuing medical education”.

Training records will be kept on file for a minimum of 10 years. Transcripts are available directly to the EMS provider. Training records for all the members of a service may be requested by the Service Director, Chief or EMS Training Officer.

National Registry Status

Regions EMS does not require EMTs to maintain National Registry status, however, individual services may require it. EMTs are to affiliate with their own service.

Regions Hospital Employees – not otherwise affiliated with an EMS service

If you are a Regions Hospital employee, hold a current EMT certification, and are not otherwise affiliated with an EMS service, you may request to affiliate with Regions EMS for NREMT purposes. As part of your recertification process, you may be required attend a Regions Hospital EMS standard refresher if you choose to recertify using this method. You may also be required to provide documentation of continuing medical education. Your employment status must be good at the time of recertification, and your required skill set within your department must be deemed competent by your immediate supervisor.



Controlled Substances

Regions Hospital EMS		
POLICY:	Controlled Substance Management	Page 1 of 1
ISSUED BY:	Medical Director	No. 14-102
DATE:	April 1, 2014	Supersedes: 11-105; 09-105

Each service is responsible for developing a policy addressing controlled substances relating to the following issues. A copy of this policy, and any subsequent changes to the policy, must be submitted to Regions Hospital EMS.

1. Storage

- A. Up to 16 mg morphine, 200 mcg fentanyl, 10 mg midazolam (Versed), 10 mg lorazepam (Ativan), and 1000 mg of ketamine (1500 mg for RSI services) may be kept in the paramedic "drug box."
- B. For services performing RSI, enough medication to administer two doses of each RSI medication should be available in the drug box and one reserve dose should be kept in the ambulance reserve.
- C. Additional doses of the above noted medications must be kept in a built-in locked area in the ambulance.
- D. A mechanism for key security should be documented.

2. Documentation of use/restock

- A. Medications dispensed to patients must be signed out by indicating the date, time, patient name or incident number, and dose administered. The remaining dose of medication should be indicated.
- B. If a full syringe of medication is not used, the remainder must be wasted, and entry cosigned by another paramedic.
- C. A paramedic will document medication count once per shift.

If a discrepancy exists on the medication count, the paramedic should investigate in an attempt to correct the error. If missing doses cannot be identified, an EMS Quality Improvement Form and Regions Hospital Medication Variance Report form is to be completed and submitted to the service's chief EMS officer immediately upon discovery of the incident. A copy of the EMS Inquiry should be forwarded to Regions Hospital EMS. Any possibility of tampered medications will be reported to the service director/manager and Medical Director or their designee upon discovery of tampered medications.

Do Not Resuscitate

Regions Hospital EMS

POLICY:	Do Not Resuscitate	Page 1 of 2
ISSUED BY:	Medical Director	No. 14-103
DATE:	April 1, 2014	Supersedes: 11-115; 09-119

PURPOSE:

Regions Hospital EMS recommends that the decision to withhold cardiopulmonary resuscitation (CPR) through a Do-Not-Resuscitate (DNR) order rest with the patient and his/her physician. This guideline is intended for patients receiving fully supervised medical care who might be expected to suffer cardiac or respiratory failure in the near future. Prehospital personnel under the medical direction of RHEMS will honor directives limiting CPR in individuals who have refused this treatment, according to the Patient's Bill of Rights (MN Stat. 144.651).

AUTHORIZED DEFINITIONS:

1. Do-Not-Resuscitate (DNR, No code, No CPR): This category does involve active and aggressive medical treatment intended to sustain life up to the point of beginning CPR. DNR does not mean that the medical care of any other medical condition will be changed or limited. In the event of an acute cardiopulmonary arrest, no CPR will be initiated. This order means that prehospital personnel will not initiate or continue CPR on a patient in cardiac arrest once a valid DNR order is identified. If the first person finding the patient has a question about whether or not a pulse or spontaneous breathing exists, 9-1-1 should be called and the paramedics summoned to determine the patient's status.
2. CPR (Cardiopulmonary Resuscitation) - This is the process of chest compression and artificial breathing as defined by the American Heart Association. Advanced levels of CPR mandate airway management, ventilatory assistance, chest compressions, defibrillation and giving appropriate drugs. The category of CPR implies full resuscitation, using any or all of the above techniques as appropriate.
3. Hospice or Comfort Care - This category is appropriate for patients who request death-allowing care, knowing that death is expected and prolongation of life is not a goal. Care is intended to provide comfort and attention to basic human needs, allowing life to continue "as is" without medical intervention to sustain or prolong life beyond the natural course of events. In general, calling 9-1-1 is not appropriate for patients in this category. In situations where there are immediate needs for choking, pain relief, or comfort, 9-1-1 may be called.

RIGHTS AND RESPONSIBILITIES:

1. Physician responsibilities:
 - A. The physician is responsible for obtaining DNR forms, discussing them with the family and ensuring that the form is properly completed with the necessary signatures
 - B. The physician should keep one copy in the permanent medical record and give the original to the patient.
 - C. The order should be written in the order section of the medical chart (if one is available), and signed by the physician.
2. Ambulance service responsibilities:
 - A. Each ambulance service in the Regions Hospital EMS system will operate in accordance with this guideline to allow prehospital personnel to honor the DNR orders.
 - B. Each ambulance service has the obligation to inform appropriate personnel of the procedural guidelines when presented with a DNR form or order written in the medical record.
 - C. Prehospital personnel will not assume any responsibility for evaluating the decision-making process or administrative procedures used to develop the DNR order. This responsibility rests with the attending physician and the licensed health care provider supervising care.
3. Patient Responsibilities and Rights:
 - A. A patient has the right to refuse cardiopulmonary resuscitation and should be involved to the greatest degree possible in the decision-making process. Patients are encouraged to discuss these decisions with family members, if appropriate.
 - B. The form should be in a readily accessible location and caregivers should make its presence known during the provision of emergency medical services in the home.
 - C. The patient may revoke the order at any time by destroying the form or informing prehospital providers or family members of their wish for CPR in the event of cardiac arrest.



Do Not Resuscitate

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ISSUED BY:	Medical Director	No. 14-103
DATE:	April 1, 2014	Supersedes: 11-115; 09-119

POLICY:

1. DNR orders are compatible with maximum therapeutic care and the patient should receive vigorous support (e.g. IV and drugs) up until the point of cardiac or respiratory arrest. Patients with DNR orders remain appropriate candidates for emergency evaluation, assistance, treatment and transport. 9-1-1 may still be used to summon emergency assistance for such patients who are suffering medical emergencies.
2. Prehospital cath lab and TTA activation remain appropriate as indicated.
3. DNR orders become valid on the day when the DNR form is properly completed, dated and signed by the patient or acceptable proxy, the physician and the witness. Prehospital personnel will not honor DNR orders if they are not legible or properly signed and dated. The DNR order remains in effect indefinitely, but should be reviewed periodically.
4. A DNR form is encouraged, but not required in the long-term care facility. In the nursing home, DNR orders written in the order section of the medical record are valid if signed by the physician.
5. When prehospital personnel arrive, the family, patient or staff should immediately present the resuscitation guidelines form. Until properly completed orders are presented, prehospital personnel will assume that no valid DNR orders exist and proceed with standing orders for resuscitation as medically indicated under medical control.
6. The DNR order may be rejected and overridden if prehospital personnel have substantive reason to believe the order is invalid or in cases of unusual, suspicious or unnatural causes of cardiac arrest.
7. In the event a patient changes his/her mind regarding the DNR order prior to cardiac arrest, or family members request resuscitation, or disagreement occurs at the time of cardiac arrest, resuscitative measures should be initiated by prehospital personnel and treatment decisions should be made by the physician responsible for care. In the event of uncertainty, resuscitative measures should be initiated and the Medical Control Physician contacted.
8. Telephone DNR orders will not be accepted by EMS personnel.
9. Documents with alternative wording used to limit medical care, e.g., Living Wills and Supportive Care Plans, will not be interpreted by EMS personnel or honored during the provision of emergency medical care.
10. Physicians present at the scene, who are willing to take responsibility for the emergency medical care, may verbally give orders to prehospital personnel to withhold or discontinue resuscitation. This should be documented on the ambulance report form with the physician's signature, name, address, and office telephone number.
11. DNR orders may be revoked at any time by the patient who, by destroying the request form, will prevent implementation of the DNR order. The patient is responsible for informing his/her physician and the agency supervising care, if any, of this decision.
12. It is recommended that the DNR form be reviewed periodically; however, it remains valid indefinitely unless revoked by the individual.
13. A DNI order is generally initiated if it is felt that long-term care ventilatory support is not in the patient's interest or desire. It is often not applicable to the short-term situations in which EMS will use an advanced airway. Prehospital personnel will not be expected to determine whether the apnea is due to a reversible condition so they may place an advanced airway if they believe the patient's condition warrants.
14. The Minnesota Medical Association DNR form, if used, requires three signatures with dates for the document to be valid and its intent carried out. This form does not expire with time, but must be revoked.
 - A. Patient/Client or authorized signature:
 - 1) The patient, when of sound mind, may knowingly limit his/her own care.
 - 2) A court-appointed guardian or conservator (with specific powers to make health care decisions) may sign on behalf of a legally incompetent person.
 - 3) Next-of-kin or knowledgeable loved one(s) may sign in consultation with physician using the concept of "substituted judgment" whereby the above individuals decide what the patient would want, were he/she able to express himself/herself.
 - B. Witness signature: This signature is to be obtained at the time a third party witnesses the signature of the patient, court-appointed guardian, or loved one. If a physician designate is involved in the actual discussion and form completion, that person should sign as witness.
 - C. Physician signature: This signature is required, but may be completed at a later date if a physician designate is involved in the actual discussion and form completion.

SPECIAL NOTES:

The MMA DNR or POLST Form is the *recommended* form but not the only acceptable one.

Documentation

Regions Hospital EMS		
POLICY:	Documentation	Page 1 of 2
ISSUED BY:	Medical Director	No. 14-104
DATE:	April 1, 2014	Supersedes: 11-109; 09-116

Every run report will contain the following information:

- General Information:** Name of the provider, responding unit, call number, crew members' last names, call date, reason for call, location, destination, first responding units, monitoring MD/medical control operator, receiving RN/MD signature, patient (or parent/guardian) signature, HIPAA acknowledgment.
- Patient Information:** Patient name, address, age, birth date, weight, sex, and personal physician
- Times:** Initial call, enroute, at scene, leave scene, and at destination.
- Chief Complaint:** Ideally in the patient's own words, what is their primary complaint? If the patient has none, write "none". If patient cannot give one, describe what the major problem appears to be, such as "unresponsive" or "cardiac arrest."
- History of Present Illness:** What events led up to the request for assistance? When did symptoms begin? What was the patient doing when they began? Has anything the patient taken or done changed the complaint? If pain, describe severity (0-10 scale), location, type, and radiation. Have there been any previous episodes? Has there been any loss of consciousness? If pregnant, include pregnancy number and due date. Use direct quotes when documenting drug or alcohol use.
--(or)--
History of Present Injury: What events led up to the request for assistance? What is the mechanism of injury? When did it occur? Include information on speed, accident type, vehicle damage, ejection, entrapment or loss of consciousness. Was safety equipment such as seatbelts, helmets, air bags, or car seats used? Attach instamatic photo if available.
- Past Medical History:** List pertinent history, especially heart and lung disease, diabetes, stroke, seizures, recent surgeries, psychological problems, communicable diseases, and DNR/DNI status.
- Allergies:** List allergies; especially drug, and food or insect if pertinent to call.
- Medications:** Document all current medications and when last taken, if pertinent. Bring medications to hospital if possible. Specifically ensure all medications pertinent to the chief complaint are listed on the run report.
- Physical Exam:** How was the patient found (positioning/obvious distress)? What was initial level of consciousness (AVPU)? Was patient oriented to person, place, and time? Document assessment of airway, breathing (dyspnea, lung sounds, JVD, O₂ sats), and circulation (pulses, skin color/temp, bleeding, capillary refill). Document findings of head-to-toe exam, including wounds, deformity, tenderness, edema, pupils, incontinence, and CMS findings before and after treatment. Include pertinent negatives. Include Glasgow Coma Scale (GCS). If chart is not on form, then document: GCS=12 (E-3, V-4, M-5). If newborn, include one and five-minute APGARs.
- Treatment:** Document all treatment administered, including treatment delivered by first responders. The following treatments/assessments have specific documentation requirements:
 - Oxygen: liter flow and route.
 - I.V.: time, fluid type and size, needle gauge, location, drip rate, amount infused.
 - ECG -3 and 12 lead (ALS): rhythm interpretation, rate, ectopy, and injury patterns. Attach ECG to run report and leave with patient in ED.
ECG -3 and 12 lead (BLS): attach strip only, do not interpret rhythms.
 - Medications: time, name, dosage, route, initials of person who administered, and SO (standing order) or VO (verbal order). Controlled substances must have a physician name documented.
 - Advanced airway: type, size, and evaluation. Confirm and document airway placement before entering ED.
 - Defibrillation: time and joules.
 - For signs/symptoms suggestive of stroke, document the Cincinnati Prehospital Stroke Scale and document the findings and time of onset on the run sheet.

Documentation

Regions Hospital EMS		
POLICY:	Documentation	Page 2 of 2
ISSUED BY:	Medical Director	No. 14-104
DATE:	April 1, 2014	Supersedes: 11-109; 09-116

11. **Response/Transport:** How did the patient respond to any treatment given? Were there any changes in the patient's condition enroute? How was the patient transported to the hospital (routinely or RLS, and whether stretcher was used)?
12. **Vital signs:** One complete set of vital signs every 15 minutes on each patient, including time, BP, pulse, respirations, and O₂ sats. More are required if patient is unstable (q. 5 min.), or receives medication or treatment that indicates the need to reassess more frequently. Most patients should have two complete sets of vital signs obtained before arrival to the hospital unless patient contact is < 10 min. If unable to obtain, document why.
13. **Rationale for allowing the patient to be transported BLS, if first evaluated by ALS.**
14. **Impression:** What is the provider's impression of what is wrong with the patient?
15. **Signatures:** Each run report must be signed by the person who wrote it. An EMT or paramedic may write BLS run reports. A paramedic must write ALS run reports. If the patient is transported, the receiving RN or MD must sign the form. If the patient refuses treatment or transport, they must sign a refusal statement. Document any instructions given to the patient. If patient is a minor, a parent or guardian must sign the form. If the patient refuses treatment/transport and also refuses to sign, then write "refused" in the box and have someone who witnessed the refusal co-sign the form.

SPECIAL NOTES:

1. All information obtained during the course of patient care delivery is confidential.
2. Services may use any run report that meets their needs as long as it is approved by Regions Hospital EMS and allows for the recording of the above information.
3. A run report must be filled out each time an EMS provider has any contact with an individual requesting medical assistance. The only exception to this is a mass casualty incident.
4. Complete one run report for each patient; e.g. mothers and newborns must each have separate run reports.
5. In severe trauma, where scene times are delayed longer than 10 minutes, document reasons for extended scene times, i.e. extrication or unsecured scene.
6. All reports should be written in black or blue ink.
7. For written run reports, correct errors by drawing one line through the incorrect item and initialing by it. Example: "Administered 4 mg morphine; ~~Narcan~~ IV push." For electronic patient care records, follow the protocol for correcting errors that has been established within each system.
8. Certain runs require additional documentation: code summaries are required on all ALS arrests. Copies of the code summary must be left at the hospital, and also filed with the service (either paper or electronic).
9. A medical control operator number or physician name is required on all runs where the patient is not transported.
10. If possible, all documentation should be completed prior to leaving the facility. If you need to leave, and have additional information important to patient care, this must be communicated to the ER staff before leaving.
11. Supplements or corrections to the run report already left at the hospital are accomplished using the standard process within each agency's EMR. Complete a second report with identifying information, additions or corrections, and date and time amended. Send a copy of the second report to medical records and attach the second run report to the original.
12. Any suspicious situation regarding child or vulnerable adult neglect/abuse must be reported, according to Minnesota State Law, to a licensed peace officer.

Regions Hospital EMS

POLICY:	East Metro Ambulance Diversion	Page 1 of 2
ISSUED BY:	Medical Director	No. 14-105
DATE:	April 1, 2014	Supersedes: <i>No prior policies</i>

PURPOSE:

To effectively handle situations in the East Metropolitan Twin Cities Area where the diversion of an ambulance may be necessary due to temporary shortages of hospital emergency department (ED) Resources or in-patient facilities when such diversions may have an adverse effect on patient care or the EMS system as a whole. The diversion of ambulance patients away from the closest or normally most appropriate ED should be considered undesirable, but may be occasionally necessary. This policy is intended to avoid the diversion of ambulances which may result in:

1. Unacceptably prolonged transport times.
2. Prolonged out-of-hospital care when definitive hospital based resources are needed especially for unstable or critically ill patients.
3. Inappropriate attempts by field personnel to predict the specific diagnostic and therapeutic resources needed by individual patients.
4. Delays in, or lack of, ambulance availability to the community because of diversion of units to distant hospitals.

PROCEDURE:

When it becomes necessary for a hospital in the East Metropolitan Area (Dakota, Ramsey, and Washington Counties) to place that facility on Divert Status or Trauma Center Limited Divert Status, the following procedure shall be used:

Hospital Responsibility

The Emergency Medicine physician on duty will contact the East Metropolitan Medical Resource Control Center (MRCC) at (651) 254-2990 or via the "red phone" and inform the MRCC operator of the specific details related to the diversion status, expected length of time on divert, suggested alternate destination for patients, and the name of the physician calling. Notification related to the closing of only the Labor and Delivery Department within the institution may be made by the senior physician in the labor and delivery unit as an alternative to ED notification.

If a designated Level 1 Trauma Center must declare a Trauma Center Limited Divert status the Emergency Medicine physician on duty will notify the MRCC as above and specifically define the type of patients that should be diverted to an alternate facility, expected length of time on divert, suggested alternate destination, and the name of the physician calling.

The Emergency Medicine physician on duty will contact MRCC as above and inform the MRCC operator when the hospital is off of divert status and normal transportation of patients to that facility may resume.

A hospital, regardless of its diversion status, must agree to care for any patient when medical control for the ambulance provider determines that it is the most appropriate transport destination (i.e. cardiac arrest patients).

MRCC Responsibility

When notified of a Divert, OB Divert or Trauma Center Limited Divert Status by an East Metro area hospital the MRCC operator will:

1. Log information relating to the current divert status on appropriate form in the MRCC including time and date of call and name of notifying physician.
2. Notify the other East Metro hospitals which may be affected by the diversion of patients.
3. Notify East Metro ambulance services not routinely using MRCC for relay of patient information.
4. Log information relating to any patient diversions that actually take place during the period of time a hospital is on a divert status on the appropriate form in the MRCC.
5. Contact the hospital every hour after the initiation of the divert status to confirm that the need for that status continues to exist and to assure that there is no confusion regarding the termination of status.
6. When notified a hospital is off a divert status the MRCC operator will re-contact those notified in steps #2 and #3 above and inform them of the change. The operator will also log the date and time the status was terminated on the appropriate form in the MRCC.
7. The East Metro MRCC will submit quarterly written summaries to the East Metro area hospitals indicating quarterly and year to date diversion status calls to the East Metro MRCC.



East Metro Ambulance Diversion

Regions Hospital EMS

POLICY:	East Metro Ambulance Diversion	Page 2 of 2
ISSUED BY:	Medical Director	No. 14-105
DATE:	April 1, 2014	Supersedes: <i>No prior policies</i>

Ambulance Responsibility

Ambulance crews should make every attempt to contact the MRCC or receiving facility as soon as possible when it is known that a hospital may be on a divert status to confirm the ability of that facility to receive the patient. Note: Any ambulance transporting a patient at the time a Divert Status is declared should continue transport to that hospital.

Multiple Hospital Diverts

When it becomes necessary for more than two hospitals in the East Metropolitan Area (Dakota, Ramsey, and Washington Counties) to place facilities on Divert Status:

1. The third hospital to declare a divert status will contact the MRCC and inform them of that need.
2. The MRCC operator will re-contact the other two hospitals to confirm that the Divert Status at those facilities is still required. If so, all East Metro Hospitals will be forced open and all East Metro Hospitals will remain open for 30 minutes. After the 30 minutes any East Metro Hospital may again request to declare their divert status.
3. The MRCC operator will make contacts as in steps #2, #3 and #6 of MRCC Responsibility to inform them of the situation.
4. The MRCC operator will contact all East Metro hospital emergency departments and obtain an in-house bed status count. This bed count will be kept in the MRCC and made available to all East Metro hospital emergency departments as requested, to assist with potential transfers of emergency department patients to other facilities. The MRCC operator will obtain counts on available beds in CCU, ICU, monitored beds (telemetry), pediatrics, and general medical/surgical at each East Metro hospital.
5. The MRCC operator will contact all hospitals that have indicated a need to be on Divert Status every hour after the initiation of the multiple hospital divert status to confirm that the need for this status continues to exist and to assure that there is no confusion regarding the continuation or termination of the multiple hospital divert status. If any one of the hospitals on closed status no longer needs to remain closed, the remaining two may once again be placed on closed status.
6. The MRCC operator will make all notifications and log all information as in MRCC Responsibilities as above.

DEFINITIONS

Diversion (Divert Status)

The diversion of an ambulance from the intended receiving facility to an alternate receiving facility due to a temporary lack of critical resources in the emergency department (for example: no monitoring capabilities in the emergency department and throughout the institution).

1. Hospitals wishing to declare divert status must do so prior to being notified of an ambulance's pending arrival.
2. When a hospital declares a divert status, it will not include non-traumatic obstetrics patients over 20 weeks gestation unless otherwise stated.
3. When Children's Hospital declares a divert status it will not include critical pediatric medical or complex pediatric medical patients.

Obstetrics

When Labor and Delivery units are on divert, hospitals may divert all non-traumatic obstetrics patients over 20 weeks gestation regardless of the Emergency Department Divert Status.

**** Patients under 34 weeks with active signs of labor should never be diverted to St Joseph's, Woodwinds or Regions (no specialized nurseries available at these facilities)**

Trauma Center Limited Divert

ACS Designated Level 1 Trauma Centers (Regions Hospital) may declare a Trauma Center Limited Divert. The limited diversion of an ambulance from an ACS Level 1 facility to another facility may occur in order to preserve critical resources for critical trauma patients. This limited divert may include specific classes of medical patients but will not include minor trauma patients.

Emergency Transport Hold

Regions Hospital EMS

POLICY:	Emergency Transport Hold	Page 1 of 1
ISSUED BY:	Medical Director	No. 14-106
DATE:	April 1, 2014	Supersedes: 11-111; 09-113

Minnesota Statute 253B, commonly known as the “Minnesota Commitment Act of 1982”, is the law that allows for a transport hold to be ordered by a licensed peace officer, for the transport of a patient to a medical facility, to protect that patient or others from imminent harm. A competent person of legal age has the right to both refuse and consent to medical assessment, treatment, and transportation. However, if there is reason to believe that the patient is mentally ill*, mentally retarded, chemically dependent or intoxicated and in imminent danger of injuring themselves or others if not immediately restrained, then a peace officer** may take the patient into custody and transport him/her to a medical facility for evaluation.

POLICY:

1. Every time a patient is transported against his/her will for the above-mentioned reasons, an Emergency Transportation Hold Form (example in Forms Section) must be completed.
2. If, after assessment, the patient is refusing treatment and transport and, in the judgment of the EMS provider, the patient requires further medical attention, but is incompetent and therefore incapable of giving informed consent or making an informed refusal, an emergency transport hold may be obtained by having either an on-scene peace officer or an on-line medical control physician authorize and sign the Emergency Transport Hold Form. The patient may then be transported against his/her will to an appropriate medical facility for further evaluation and treatment.
3. Whenever possible, attempts should be made to get an on-scene peace officer to sign the transport hold. If an officer refuses, or is not present to sign it, verbal authorization from an on-line physician may be obtained through medical control. The MRCC operator will then have the authorizing physician sign the transport hold form in MRCC.
 - A. If the patient is transported to Regions Hospital, the crew can pick up the form from MRCC when they arrive.
 - B. If the patient is transported to a facility other than Regions Hospital, the MRCC operator is responsible for obtaining the physician signature and then faxing a copy of the form to the receiving facility, where the crew may pick up the form upon arrival.
4. One copy of the form must be left with the patient run report form at the receiving hospital, one copy must remain attached to the original run report form, and one copy must be provided to the patient.
5. Physical restraints are recommended for all patients on transport holds.

SPECIAL NOTES:

1. **Mentally ill* includes those patients under the influence of their disease (e.g. stroke, diabetes, Alzheimer's), and those under the influence of their injury (e.g. head injury).
2. A *peace officer* is a sheriff, municipal or other local police officer, or a state patrol officer when engaged in the authorized duties of office.
3. An emergency transport hold authorizes the transport of an incompetent patient to a medical facility for further evaluation only. It *does not* automatically commit the patient to a 72-hour hold.
4. A transport hold is not necessary if the patient is under arrest and a peace officer is either accompanying the patient in the ambulance or following in a squad car.
5. Patients who are transported on a hold should be transported to a hospital where they have received care or within their own medical group/insurance company when ever possible.



On-Call Clinical Supervisor

Regions Hospital EMS		
POLICY:	EMS On-Call Clinical Supervisor	Page 1 of 1
ISSUED BY:	Medical Director	No. 14-107
DATE:	April 1, 2014	Supersedes: 11-101; 09-100

Regions Hospital EMS recognizes that providing EMS is a 24-hour/day, 7 day/week operation. An EMS On-Call Clinical Supervisor (OCCS) is available to respond to the medical direction needs of customers at all hours. The OCCS should also be contacted so that Medical Direction is kept informed of unusual circumstances or events that occur in services under their medical oversight. The OCCS should be contacted/notified as soon as possible for the following events:

1. Mass casualty incident/disaster (natural or manmade)
2. Prolonged extrication involving industrial or agricultural equipment
3. EMS vehicle accidents involving injury to the patient(s) or crew members
4. Death or serious injury of:
 - A. Any provider under the medical direction of Regions Hospital EMS
 - B. Any bystander on the scene of a call
5. Any patient care complaint/inquiry received by a service requiring immediate follow-up
6. Advanced procedures:
 - A. Unrecognized esophageal intubation
 - B. Inability to secure an advanced airway using RSI medications*
 - C. Chest decompression
 - D. Needle jet insufflation
 - E. Surgical cricothyrotomy
 - F. Research-defined events.
7. Any question of an emergent nature that requires immediate advice from Medical Direction
8. Any event that has high media profile
9. Any event with the potential need for CISM. This should be communicated from the EMS administration at each service to the EMS OCCS.

**Inability to secure an advanced airway without RSI DOES NOT require notification of the OCCS.*

Procedure:

1. Contact MRCC at (651) 254-2990 and ask them to contact the OCCS.
2. Provide MRCC with your name, service, and a callback number.
3. The OCCS will contact the service for further details.

Exposure Control

Regions Hospital EMS		
POLICY:	Exposure Control and Reporting	Page 1 of 1
ISSUED BY:	Medical Director	No. 14-108
DATE:	April 1, 2014	Supersedes: 11-106; 09-118

All prehospital care providers are at risk for exposure to communicable/infectious blood borne and airborne diseases such as HIV, hepatitis, meningitis, tuberculosis, etc. The following policy is an attempt to define those risks.

DEFINITIONS:

1. The following types of exposure can increase the risk of contracting a communicable/infectious disease:
 - A. Blood borne exposure: human blood or any body fluid visibly contaminated with blood
 - B. Other body fluid exposure:
 1. Human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva, emesis, stool, urine, draining wounds or lesions
 2. Other suspicious circumstances and/or generally unclean surroundings
 - C. Airborne exposure: Direct indoor contact with a patient with known or suspected active tuberculosis or any other pathogen transmitted by airborne routes. Inside a vehicle is considered indoors.
2. A significant exposure is defined as:
 - A. Blood borne:
 1. Contact of broken skin or mucous membrane of EMS personnel with a patient's blood, amniotic fluid, pericardial fluid, peritoneal fluid, pleural fluid, synovial fluid, cerebrospinal fluid, semen, vaginal secretions, or other body fluids grossly contaminated with blood.
 2. A needle stick, scalpel or instrument wound, or other wound infected by an object that is contaminated with blood, and that is capable of cutting or puncturing the skin of EMS personnel.
 - B. Airborne: Direct indoor contact with a patient with known or suspected active TB.
 - C. Other: An exposure that occurs by any other method of transmission recognized by contemporary epidemiological standards as a significant exposure.

POLICY:

1. Each service is responsible for compiling an exposure control plan and updating it annually.
2. Each service is responsible for providing annual continuing education of exposure control plan for all employees at risk.
3. Immunizations and screenings should be updated as recommended.
4. If a bystander at the scene reports a possible exposure, they should be given the written Good Samaritan Information on Blood or Body Fluid Exposures.
5. Under Minnesota State Law, EMS providers with a suspected exposure situation should seek treatment and evaluation at the hospital where they transported the patient suspected of the exposure (MN Statutes 144.7401-144.7415). That hospital is responsible for coordinating the exposure evaluation and post-exposure treatment regimen, but is not responsible for the cost of this treatment. In a situation where the patient is not transported, EMS providers may choose to be evaluated at the hospital of their choice.
6. Regions Hospital EMS reserves the right to examine these policies at any time, to ensure they are present and updated appropriately.

SPECIAL NOTES:

1. It is extremely important for EMS personnel to report potential or known exposures immediately following the exposure so that prophylactic treatment (if indicated) may begin immediately. Personnel who choose to have their exposure evaluated at Regions Hospital Emergency Department should report immediately to the charge nurse on duty.
2. This policy is intended to supplement and not substitute for the standards set for General Industry in the Code of Federal Regulations. Said guidelines are the standard for services under the medical direction of Regions Hospital EMS.



Field Amputation

Regions Hospital EMS		
POLICY:	Field Amputation	Page 1 of 1
ISSUED BY:	Medical Director	No. 14-109
DATE:	April 1, 2014	Supersedes: <i>No prior policies</i>

PURPOSE:

To provide a rapid and uniform response to requests for mobile amputation from EMS services in the field.

POLICY:

1. All requests for field amputation will be immediately conveyed to the Trauma Surgeon on call.
2. The Trauma Surgeon on call will immediately evaluate the request, and if they agree with the need for amputation, will immediately notify:
 - A. The Trauma Surgeon on backup call
 - B. The OR charge nurse
 - C. MRCC to arrange scene transport
 - D. Blood bank
3. The Trauma Surgeon on call will determine if it is more expeditious for himself/herself or the backup Trauma Surgeon to travel to the emergency scene. Travel time from home to hospital, and transit time for the Mobile Amputation Pack (see below) will be taken into consideration.
4. The Mobile Amputation Pack will be kept in the Emergency Center and clearly marked. Medications will be obtained by the Emergency Center Charge Nurse at the time the pack is requested.
5. A Trauma Surgeon will proceed to the scene. Need for field amputation will be reassessed and carried out if indicated. The patient will be immediately transported to the hospital, where the Trauma Team will then continue evaluation and definitive care.
6. Contents of the Mobile Amputation Pack:
 - A. 2 three quarter sheets
 - B. 3 #10 scalpel blades
 - C. 3 #20 scalpel blades
 - D. 2 #3 scalpel handles
 - E. 1 amputation knife (wrap in paper)
 - F. 2 4-packs of towels
 - G. 3 pairs of gloves - size 7-1/2
 - H. 3 packs 2-0 silk ties
 - I. 2 packs laparotomy pads
 - J. 1 hand saw (wrap in paper)
 - K. 2 Gigli saw handles
 - L. 1 Gigli saw blade
 - M. 8 Rankin clamps
 - N. 8 Carmalt clamps
 - O. 1 straight Mayo scissors
 - P. 1 curved Mayo scissors
 - Q. 1 tissue protector
 - R. 3 masks with eye shields
 - S. 1 needle holder
 - T. 2 2-0 silk stick tie V20 needle
 - U. 2 yellow gowns
 - V. Ketamine 50 mg/mL 10 mL bottle
 - W. Etomidate
 - X. Succinylcholine
 - Y. Morphine (optional)

PROCEDURE:

When an EMS crew is presented with a situation involving significant patient entrapment, where in the opinion of the on-scene providers, extrication is not physically possible without limb amputation or the patient is unstable and cannot wait for complete extrication, contact should be made with MRCC to request a field amputation team. The on-scene provider should be prepared to provide relevant patient and scene information to the MRCC operator and Trauma Surgeon as requested.

Helicopter Auto Launch

Regions Hospital EMS

POLICY:	Helicopter Auto Launch	Page 1 of 1
ISSUED BY:	Medical Director	No. 14-110
DATE:	April 1, 2014	Supersedes: <i>No prior policies</i>

This policy is provided as a reference for agencies having helicopter auto launch agreements with Life Link III.

PURPOSE

To provide, support, and facilitate partner EMS agencies with guidelines for safe and appropriate rapid transport of critically ill or injured patients to either the local hospital or designated trauma center as stipulated by the relevant state Trauma Guidelines.

SCOPE

The scope of this policy is all air operation and support personnel.

PROCEDURE

- The relevant Communication Center will simultaneously dispatch ground ambulance(s) and a helicopter when the following criteria exist:
 - Major motor vehicle accidents: bicycle, pedestrian, motorcycle, snowmobile, ATV, prolonged extrications, ejections, rollovers, and/or one known fatality on high-speed roads.
 - Logging, farm or industrial accidents.
 - Near drowning.
 - Area not easily accessed by road.
 - Penetrating trauma: gunshot wound, stabbing, etc.
 - Major burns
 - Falls over 20 feet or pediatric falls over 8 feet
 - Amputation, crushing, or degloving
 - EMS or Public Safety involved shooting, stabbing or other serious injury
 - Ventricular Assist Device (VAD) support
- Calls requiring any aircraft transport within the service areas of EMS units will be made to Life Link III ("LLIII") at 1-800-328-1377.
- LLIII will priority dispatch the closest available aircraft. It is understood that the responding aircraft may be any licensed air ambulance provider.
- The assigned Communications Center will immediately relay to all agencies responding that a helicopter is enroute and will confirm a ground contact to secure a landing zone.
- Ground contact for landing zones will be the responsibility of the designated Incident Commander, this role can be assigned to Law Enforcement, Fire/Rescue or EMS. Consideration should be made as to the number of available staff to safely set up and secure a landing zone. The same landing zone procedures will be followed by all agencies. Contact with the arriving helicopter will be done by requesting a local operational talk group be patched to State-wide law enforcement, State-wide EMS, or a mutually agreed upon ARMER talkgroup.
- For service area states with a designated Primary Service Area ("PSA"), in the event that a helicopter is responding to an auto launch where injuries are not confirmed, and a request for the same helicopter is received for a scene patient or (actual patient), in the same Primary Service Area ("PSA"), the helicopter will divert to the actual patient. All responding units will be notified that the helicopter will divert as directed. In the same scenario, if the helicopter is requested for a hospital transport while en route to the auto launch, the helicopter will continue to the scene until canceled by responding units. All responding units will be made aware of the second request pending.
- The designated Incident Commander may cancel or divert the helicopter at any time. The badge number and/or agency of the person requesting the cancellation/diversion should be listed on the CAD Initial Complaint Report. If the patient involved does not need air medical transport, LLIII dispatch will be notified immediately by the Incident Commander to cancel the incoming helicopter and all services will be advised of this.
 - If the helicopter is en route with five (5) minutes or less of the designated scene location, the PIC may elect to continue to the designated scene and perform a reconnaissance to assure the Incident Commander of service availability.
 - If the patient is in need of helicopter transport, the service in conjunction with the air crew and the patient or patient representative will discuss the destination of the patient. State guidelines will be followed regarding trauma transport.
 - If the helicopter is diverted to a hospital by the ambulance on scene, the helicopter service will contact the receiving hospital to advise on estimated time of arrival at the facility.



Medical Equipment

Regions Hospital EMS

POLICY:	Medical Equipment	Page 1 of 2
ISSUED BY:	Medical Director	No. 14-111
DATE:	April 1, 2014	Supersedes: 11-104; 09-101; 09-102

Required Medical Equipment:

The following equipment must be carried on all ALS and BLS ambulances. These are in addition to the requirements mandated by the Minnesota EMSRB.

1. All ALS and BLS ambulances are required to carry the following:
 - A. Adult airway and ventilation equipment:
 1. Portable oxygen with 50 Lpm flow restrictor on the PPV device
 2. Oral and nasal airways (assorted sized)
 3. BVM resuscitator with assorted masks
 4. Non-rebreather masks
 5. King LTS-D (Size 4) and lubricant
 6. Thomas tube restraint (dark blue version)
 7. Pocket mask with one-way valve
 8. CPAP device
 - B. Pediatric airway and ventilation equipment:
 1. Neonate, infant, and pediatric BVMs with neonate, infant, and pediatric masks
 2. Oral and nasal airways of various sizes
 - C. Suction equipment:
 1. Catheters of various sizes
 2. Yankauer tip
 3. Bulb syringe
 4. Manual and electric suction units
 - D. Splinting equipment:
 1. Adult and Pediatric Traction splints (Hare or Sager)
 2. Cervical collars
 3. Splint device to immobilize extremity fractures (SAM, long board, etc.)
 - E. Camera
 - F. Pulse oximeter
 - G. EZ-IO™ with LD (45mm) and AD (25mm) Needles
 - H. ResQPOD®
2. Additional equipment for BLS ambulances:
 - A. Defibrillators.
 - B. Services with training on IVs and medications must carry appropriate equipment for the starting and maintaining of IVs and for the administration of medications.
 - C. Stethoscope (Littman™ Classic II) or similar quality
 - D. Optional BLS equipment:
 1. Burn gel packs
 2. Glucometers (required for BLS services with medication training for Glucagon)
 3. 12-lead ECG monitor
 4. Pediatric EZ-IO needles
3. Additional equipment for ALS ambulances:
 - A. Adult airway and ventilation equipment:
 1. Nebulizer units
 2. Fiberoptic laryngoscope handles
 3. Fiberoptic laryngoscope blades (2 straight, 2 curved)
 4. ET tubes, sizes: 5.0, 6.0, 6.5, 7.0, 7.5 and 8.0 mm.
 5. Magill forceps
 6. Sklar hook
 7. Chest decompression kit
 8. Nasogastric tubes
 9. Quantitative electronic end-tidal CO₂ detector

Medical Equipment

Regions Hospital EMS

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DATE:	April 1, 2014	Supersedes: 11-104; 09-101; 09-102

10. Esophageal intubation detector (TubeChek-B™)
11. Thomas Tube Holder™ (dark blue version) or other similar screw down tube restraint device
12. Gum bougie (Tracheal Tube Introducer)
13. PEEP Valve
- B. Pediatric resuscitation equipment:
 1. Fiberoptic laryngoscope handles
 2. Fiberoptic laryngoscope blades (2 straight)
 3. Advanced pediatric supraglottic airway devices as approved by the Medical Director
 4. Meconium aspirator
 5. Pediatric weight-based resuscitation tape
- C. Stethoscope (Littman™ Cardiology) or similar quality
- D. Monitor/defibrillator (with pacing and 12-lead capabilities)
- E. Glucometer
- F. Pericardiocentesis kit
- G. Optional
 1. Burn gel packs
 2. Pediatric EZ-IO needles

Medical Equipment Purchases:

According to Minnesota Statutes, it is the responsibility of the Medical Director to “provide standards on upgrading and purchasing equipment.” Any new medical equipment purchases must be reviewed, prior to purchase, by the Regions Hospital EMS Medical Directors and/or the service’s designated EMS Clinical Supervisor. Medical equipment purchases under RHEMS medical direction have historically been made by consensus.

1. The service director or EMS coordinator will contact their respective EMS Clinical Supervisor to review the new equipment and education plan for service personnel. This information will be taken back to Medical Direction for their review and approval.
2. Following approval by Medical Direction, the service director can proceed with purchasing the equipment.
3. Service directors or EMS Coordinators must schedule training on each new device for all personnel. This training should be done by the product representative from whom the device was purchased (whenever possible). New equipment may not be put in service until the training has been completed. Only trained personnel may use the equipment.
4. Records documenting the training must be maintained by each individual service, and review of these records may be requested at any time by the Medical Director or their designee.

Mandatory Equipment Brought to the Scene/Patient Side:

The following equipment should be brought to the patient side on all calls:

1. Airway management equipment (basic and advanced), oxygen, ventilation equipment, and suction (manual).
2. A monitor/defibrillator (manual or automatic)
3. Equipment for the evaluation of vital signs
4. RSI capable services: manual and battery operated suction, RSI medications

On all known obstetrical calls:

1. All equipment listed in above, OB Kit, and airway equipment appropriate for the newborn.

On all known pediatric calls:

1. All equipment listed above and appropriate sized equipment for managing the airway and obtaining vital signs of the pediatric patient.



Metro Hospital Designations

Regions Hospital EMS

POLICY:	Metro Area Hospital Specialty Designations	Page 1 of 2
ISSUED BY:	Medical Director	No. 14-112
DATE:	April 1, 2014	Supersedes: 11-112; 09-114

Patients should be transported to the hospital of their or their physician's choice. There are certain circumstances in which the patient's choice must be over-ridden by the ambulance provider or on-line medical direction. The following is a list of those appropriate diversions:

Burn Center

All patients with the following burn injuries must be transported to a verified Burn Center:

1. Second and third degree burns > 10% TBSA
2. Burns to hands, face, feet, perineum, or major joints
3. Electrical burns, including lightening
4. Chemical burns, especially hydrofluoric acid burns
5. Inhalation injuries.

**Patients with underlying or pre-existing medical conditions that may prolong recovery, complicate management, or affect mortality may be diverted to a Burn Center. Patients with concomitant trauma must be taken to a Level 1 Trauma Center (Regions Hospital, Hennepin County Medical Center).

Adult Level 1 Trauma Center (patients ≥ 15 years old)

All adult patients meeting the following anatomic/physiologic criteria must be transported to an Level 1 Adult Trauma Center:

1. Profound shock or blood pressure < 90mm Hg systolic
2. Persistent post-traumatic unconsciousness
3. Neurologic injuries consisting of skull fracture (open or depressed), posturing, or limb paralysis
4. Penetrating trauma to head, neck, or torso
5. Severe burns
6. Partial or complete amputations above the ankle or wrist
7. Hypothermia (<90 degrees F.)
8. Traumatic airway compromise
9. Pelvic instability
10. Flail chest
11. Two or more long bone (humerus or femur) fractures
12. Traumatic cardiac arrest
13. Near drowning
14. Third trimester pregnant patients with bleeding or shock from trauma

All adult patients meeting the following significant mechanism of injury criteria must be transported to a Level 1 Adult Trauma Center:

1. Fall from > 20 feet (approximately 2 stories)
2. Evidence of high speed (>40mph),
3. Vehicle deformity (>20 inches)
4. Intrusion into the patient compartment (>12 inches)
5. Auto vs. pedestrian or biker (motorized or pedal) with significant impact (> 20 mph),
6. Pedestrian thrown or run over
7. Ejection from vehicle
8. Death in same patient compartment
9. Extrication time >20 minutes
10. High speed rollover
11. Any patient the EMS provider or MRCC operator feels will benefit from being transported to a Level 1 Trauma Center instead of a Level 3 or Level 4 facility.

Pediatric Level 1 Trauma Center (patients < 15 years old)

All pediatric patients meeting the following anatomic/physiologic criteria must be transported to a Level 1 Pediatric Trauma Center:

1. Profound shock (blood pressure < 90mm Hg systolic)
2. Unconsciousness due to trauma regardless of duration
3. Neurologic injuries consisting of skull fracture (open or depressed), posturing, or limb paralysis
4. Penetrating trauma to head, neck, or torso

Metro Hospital Designations

Regions Hospital EMS

POLICY:	Metro Area Hospital Specialty Designations	Page 2 of 2
ISSUED BY:	Medical Director	No. 14-112
DATE:	April 1, 2014	Supersedes: 11-112; 09-114

5. Second or third degree burns >10% TBSA or involving the face, hands, feet, genitals or any circumferential burns
6. Partial or complete amputations above the ankle or wrist
7. Hypothermia (<90 degrees F)
8. Traumatic airway compromise
9. Pelvic instability
10. Flail chest
11. One or more long bone (humerus or femur) fractures
12. Traumatic cardiac/respiratory arrest (All apneic children < 6 months should be considered trauma until proven otherwise)
13. Near drowning

All pediatric patients with the following significant mechanism of injury criteria must be transported to a Level 1 Pediatric Trauma Center:

1. Fall from 3 times patient height
2. Evidence of high speed (>40mph)
3. Vehicle deformity (>20 inches)
4. Intrusion into the patient compartment (>12 inches)
5. Auto vs. pedestrian or biker (motorized or pedal) with significant impact (> 20 mph)
6. Pedestrian thrown or run over
7. Ejection from vehicle
8. Death in same patient compartment
9. Extrication time >20 minutes
10. High speed rollover
11. Hanging
12. Any patient the EMS provider or MRCC operator feels will benefit from being transported to a Level 1 Pediatric Trauma Center.

Level 1 Cardiac Centers

Regions, United, St. Joseph's and the University of Minnesota hospitals allow prehospital providers to activate their cath labs from the scene using the Cath Lab Activation criteria (see **Prehospital Alert Criteria**). Contact MRCC and ask for a Cath Lab Activation for these hospitals.

Hyperbaric Centers

All patients (including pregnant patients) transported with symptoms of severe CO poisoning and **not** exposed to smoke or fire should be transported to a hyperbaric center (HCMC). All patients, including pregnant patients, transported with signs and symptoms of CO exposure due to exposure to smoke or fire should be taken to the closest burn center. Patients in respiratory or cardiac arrest should be transported to the closest facility.

Specialized OB Centers

United Hospital remains the only Level IIIA nursery in the east metro. All patients in **active labor** who are between **20 and 32 weeks gestation** (5-8 months) should be transported to United. Special requests by OB patients in **active labor** who are between **28 and 32 weeks** to be transported to St. John's Hospital must be facilitated through MRCC.

Adolescent Psychiatric Centers

Patients under 18 years old in need of evaluation and treatment for psychiatric/behavioral/chemical dependency problems must be transported to Fairview Riverside or United Hospital.

Stroke Centers

Any patient exhibiting signs of **acute stroke**, defined as exhibiting 1 of the 3 signs and symptoms measured on the Cincinnati stroke scale and symptom onset of 6 hours or less, must be transported to Regions, United, St. Joes, the University of Minnesota, or the VA (hospitals with a cath lab). Patients exhibiting signs and symptoms for **non-acute stroke** (positive Cincinnati stroke scale and symptom onset of greater than 6 hours) should be transported to United, Regions, the University of Minnesota, any hospital within the HealthEast system, or the VA (Primary Stroke Centers).



New Hire Orientation

Regions Hospital EMS		
POLICY:	New Hire System Orientation Requirements	Page 1 of 1
ISSUED BY:	Medical Director	No. 14-113
DATE:	April 1, 2014	Supersedes: 11-102; 09-103; 09-104

Paramedic Providers

The following minimum requirements for the newly hired paramedic must be completed/verified by the individual agency's EMS director or training officer. Documentation of this orientation must be maintained by the individual services. Regions Hospital EMS reserves the right to audit these records at any time for any reason. EMS directors and/or training officers are responsible for determining when individual providers are ready to operate independently.

1. Documentation of current EMT-P, CPR and ACLS certification
2. Review of Regions Hospital EMS Guidelines/complete guideline exercise
3. Review of exposure control plan with service infection control officer
4. Review of the Metro Region MCI Bag
5. Form/Procedure Review:
 - A. DNR Guideline
 - B. EMS Quality Improvement Form
6. Knowledge and skills evaluation:
 - A. Airway assessment/management (review of techniques, restraint devices, documentation)
 - B. Chest Decompression
 - C. Pericardiocentesis
 - D. Sklar Hook
 - E. Critical Thinking Lab (first available spot)
 - F. Intraosseous training (bariatric/adult/pediatric)
7. Review of intubation records and RSI skills test (special requirements for RSI medics, see your EMS Clinical Supervisor)
8. Optional – MRCC observance

EMT-Basic Providers

The following minimum requirements for the newly hired EMT must be completed/verified by the individual agency's EMS director or training officer. Documentation of this orientation must be maintained by the individual services. Regions Hospital EMS reserves the right to audit these records at any time for any reason. EMS directors and/or training officers are responsible for determining when individual providers are ready to operate independently.

1. Documentation of current EMT and Healthcare Provider CPR certification
2. Review of Regions Hospital EMS Guidelines/complete guideline exam.
3. Review of exposure control plan with service infection control officer
4. Review of the Metro Region MCI bag
5. Form/Procedure review:
 - A. DNR Guideline
 - B. EMS Quality Improvement Form
6. Knowledge and skills evaluation:
 - A. Trauma assessment/management including long spine boards and traction splint
 - B. Cardiac arrest assessment/management including CPR and AED
 - C. Airway management including the King LTS-D.
 - D. IV/IO and/or medication administration specific to your service.
 - E. CPAP
7. Optional – MRCC observance

Non-transportation

Regions Hospital EMS

POLICY:	Non-transportation	Page 1 of 2
ISSUED BY:	Medical Director	No. 14-114
DATE:	April 1, 2014	Supersedes: 11-110; 09-112

The following are the requirements for all non-transportation cases.

- Each patient (any person requesting medical assistance) shall be given a physical assessment consisting of a primary survey, vital signs (B/P, pulse, respirations, oxygen saturation and GCS core) and exam of the affected body part.
- Any refusal by the patient to submit to assessment should be documented on the patient care form. The run report of each patient refusal must include the following:
 - Results of physical assessment
 - Visual observations of the patient
 - Mental status assessment. Patient should be:
 - Alert: awake with eyes open
 - Oriented to person, time and place
 - Coherent: speaking in complete sentences with logical thought processes (not psychotic, manic, severely delusional or paranoid).
 - Able to understand the EMS provider, which may involve the use of a telephone interpreter.
 - Absence of any one of the above may indicate incompetent ability to make good decisions (incompetence). Incompetent patients cannot legally refuse medical care.
 - Reason for the patient's refusal, attempts to get others involved, and the consequences and alternatives to non-transport should be included.
 - Concluding statement to each incident of patient refusal shall be the following: "Patient was strongly advised to seek medical attention as soon as possible."
- Signature of the patient (or legal guardian if a minor) on the run form. If patient refuses to sign, write "refused" in signature area and have witness to refusal sign as well. A valid witness is any family member or bystander of legal age, a police officer, or minimally, a crewmember.
- Every** non-transport must be cleared through medical control by the highest EMS medical authority at the scene **before leaving the patient's side**. Document physician name or medical control operator number on the run form. All children < 2 years of age, third trimester OB patients involved with trauma, and those patients whose hypoglycemia is due to oral hypoglycemics must have clearance by a medical control physician for non-transport.
- Patients not transported for the following conditions have additional requirements: possible head injury, seizure, wounds or lacerations, hypoglycemia, motor vehicle accidents, syncope, choking or foreign object ingestion, and sprains or contusions.
 - If, after consultation with medical control, the decision is made to not transport a patient with any of the above conditions, the appropriate non-transportation information sheet must be left with and explained to the patient (or parent or caregiver).
 - The decision to not transport a patient with these conditions should be made independent of the fact that these information sheets are available.
 - Use great caution in leaving these instructions with non-English speaking patients, those who cannot read English, or minors.
 - Document on the run report which non-transport instruction sheet was left with patient.
- Medical control may clear a patient for non-transport following a hypoglycemic episode if the patient:
 - Is now conscious, alert, and oriented, and
 - Is able to manage their diabetes, and
 - Has a blood sugar of at least 80 mg/dL, and
 - Is left with written non-transport instructions for hypoglycemia, and
 - Is not currently taking oral hypoglycemic agents, and
 - Is at least 2 years of age (minors must be in the care of an adult)



Non-transportation

Regions Hospital EMS		
POLICY:	Non-transportation	Page 2 of 2
ISSUED BY:	Medical Director	No. 14-114
DATE:	April 1, 2014	Supersedes: 11-110; 09-112

SPECIAL NOTES:

1. Documentation of non-transportations should be as complete as transported runs because of the increased liability that is assumed when patients are left at the scene. From a legal standpoint, the run report will be the evidence that appropriate actions were taken. Patient care and assessment that is not documented can be easily challenged as to whether it actually occurred.
2. Alcohol or chemical intoxication does not justify inaction and may render a patient incompetent. If, after appropriate assessment and consultation with medical control, treatment and transport are deemed unnecessary, transportation to a detoxification facility may be arranged.
3. In the event that the parent or legal guardian of an uninjured or non-ill minor cannot be reached, the child may be left in the care of a responsible adult (> 18y.o.), after consulting with a medical control physician. Consult with medical control regarding non-transport of emancipated minors.
 - A. An emancipated minor is anyone under the age of 18 years who: (1) has been married; (2) is on active duty in the uniformed services of the United States; (3) has been emancipated by a court of competent jurisdiction; (4) is deemed financially independent; or (5) is otherwise considered emancipated under Minnesota State law.
4. An EMS run sheet should be written and medical control clearance obtained for each person requesting medical assistance at the scene. Signature sheets are acceptable forms of documentation for individuals at the scene who do not wish to have medical assistance.



Physician On Scene

Regions Hospital EMS

POLICY:	Physician On Scene	Page 1 of 1
ISSUED BY:	Medical Director	No. 14-115
DATE:	April 1, 2014	Supersedes: 11-114; 09-117

Regions EMS physicians, including the medical director, assistant medical director and EMS fellow, may act as on scene medical control on any call to which they respond. The following policy applies to non-Regions EMS physicians.

Medical control should be notified as early as possible that there is a physician at the scene.

1. Ambulance Personnel Responsibilities:
 - A. Identify self to the physician.
 - B. Inquire if physician is licensed to practice medicine in Minnesota and area of specialty.
 - C. Inquire if physician wishes to be responsible for patient. If so, explain that physician at scene must:
 1. Instruct/supervise prehospital personnel at scene.
 2. Accompany patient in ambulance to hospital.
 - D. Document the identification of any on-scene physician that participates in patient care.
2. Physician at Scene Responsibilities:
 - A. If physician declines responsibility, prehospital personnel should follow RHEMS established guidelines.
 - B. If physician accepts responsibility:
 1. Medical control is notified of physician at scene.
 2. No monitoring medical control physician is necessary.
 3. Radio communications are maintained.
 4. Physician at scene accompanies patient to hospital.
 5. Physician accompanying EMS will give a verbal report to the MD at receiving hospital.
 - C. If physician wishes to assist only:
 1. Communicates with medical control physician, however, physician at scene has no medical control.
 2. Physician at scene is not required to accompany patient to hospital.

SPECIAL NOTES:

1. If a physician makes requests of EMS personnel in a clinical setting that are contrary to these guidelines or appear, in the EMS personnel's judgment, to be contrary to the patient's best interests, or that a procedure is beyond the crew's level of training and scope of practice, EMS personnel should request that the physician carry out those orders or consult with a medical control physician. Once the on-scene physician is no longer physically present, EMS personnel should follow established care guidelines.



Prehospital Alert Criteria

Regions Hospital EMS		
POLICY:	Prehospital Alert Criteria (TTA, Stab Room, Cath Lab Activation, Code Stroke)	Page 1 of 1
ISSUED BY:	Medical Director	No. 14-116
DATE:	April 1, 2014	Supersedes: 11-113

Trauma Team Activation Criteria

ALS units can call a Trauma Team Activation (TTA) from the field when one or more of the signs and symptoms listed below are present or when the paramedic feels the patient is unstable due to a traumatic injury. BLS units should contact the medical control physician immediately for a TTA evaluation.

The following are TTA criteria:

- A. Glasgow coma score < 14
- B. Hemodynamically unstable (Adult: SPB < 90 mmHg; Pediatrics: 70+2*age)
- C. Airway compromise
- D. Penetrating trauma to the head, neck, torso, or proximal extremities (above elbow or knee)
- E. Two or more proximal (above elbow or knee) long bone fractures
- F. Pelvic instability
- G. Limb paralysis
- H. Amputation above the wrist or ankle
- I. Trauma with major burns
- J. Flail chest
- K. Temperature <90 degrees Fahrenheit
- L. Traumatic cardiac arrest
- M. Patients receiving transfusions of blood products to maintain hemodynamic stability following trauma
- N. ALS provider discretion

TTAs are called based on the anatomic and physiologic criteria listed above. They are not called based on mechanism of injury. Mechanism of injury may mandate that the patient be transported to a Level 1 Trauma Center but mechanism alone does not warrant a TTA. There may be times when patients have significant mechanisms of injury but appear to be stable. If the provider feels that a patient is a candidate for evaluation at the trauma center, the EMS provider should bring the patient to the trauma center.

MRCC Operators are not allowed to activate or deactivate a TTA, but may suggest to the EMS provider if appropriate. MRCC Operators are able to enforce the transportation of trauma patients who have significant mechanism of injury to a Level One Trauma Center. Stabilization Room (Regions Hospital Only): Patients transported by EMS to Regions Hospital who are critically ill or injured, in severe distress, do not meet the current TTA, Cath Lab, or Code Stroke criteria, and would benefit from immediate physician evaluation can be called a "STAB ROOM" patient. Examples of patients who are candidates for STAB ROOM requests include (but are not limited to): Status epilepticus, severe COPD on CPAP, open or severely painful fractures, hypotensive medical patients, unstable cardiac arrhythmias, any unstable vital signs in a non-trauma patient, choking patients, status asthmaticus, or OD with depressed LOC or unstable vital signs. This list is not all inclusive, and the paramedic should feel comfortable requesting a STAB ROOM on all patients meeting the above criteria.

Cath Lab Activation

Patients with cardiac symptoms who have ST elevation of > 2mm in two or more contiguous v-leads or >1mm in the limb leads, and the QRS complex is narrower than 0.12 (3 small boxes) seconds, should be transported to a Level 1 Cardiac Center as approved by the East Metro Physician Advisory Committee (EMPAC) (see Specialized Hospital Designation).

Code Stroke

Any patient exhibiting signs of acute stroke, defined as exhibiting 1 of the 3 signs and symptoms measured on the Cincinnati stroke scale score and symptom onset of 8 hours or less and a normal blood glucose qualifies for a Code Stroke prehospital alert. Patients exhibiting signs and symptoms for non-acute stroke (positive Cincinnati stroke scale and symptom onset of greater than 8 hours) DO NOT qualify for a Code Stroke prehospital alert. EMS providers should request that MRCC provide notification of Code Stroke status to receiving hospital prior to arrival.



QA / QI

Regions Hospital EMS

POLICY:	Quality Assurance / Quality Improvement	Page 1 of 1
ISSUED BY:	Medical Director	No. 14-117
DATE:	April 1, 2014	Supersedes: 11-103; 09-121

According to Minnesota Statutes, it is the responsibility of the Medical Director to “participate in the development and operation of continuous quality improvement programs including, but not limited to, case review and resolution of patient complaints.” Ambulance services who receive medical oversight from Regions Hospital EMS will have and operate continuous quality improvement programs that will include, but not be limited to: data collection, annual skill assessment, critical thinking lab, critical case review, patient care report review, continuing medical education, cardiac arrest and advanced procedures review, guideline comprehension and customer surveys. In addition each service will have a peer review committee to interact with other healthcare peer review committees in the resolution of concerns/complaints.



Specialized Systems

Regions Hospital EMS

POLICY:	Specialized EMS Transportation Systems	Page 1 of 1
ISSUED BY:	Medical Director	No. 14-118
DATE:	April 1, 2014	Supersedes: 11-107; 09-109; 09-110; 09-111

Combined Tiered Transport Systems

Patient with the following presentations may be transported by BLS: Brief and improving altered level of consciousness, patients with a GCS 14 or 15, minor burns (<20% TBSA) in adults, (<10% TBSA) in patients under 12 or over 60 years of age, simple fractures (not requiring pain management), uncomplicated OB, psychiatric or suicidal patients, syncopal episodes in patients < 30 years, and/or both ALS and BLS provider MUST agree that patient is BLS. Patients with uncontrolled moderate to severe pain despite appropriate treatment should be transported ALS. BLS providers who have had training in IV therapy may transport patients who have maintenance IVs. If there is any disagreement remaining, ALS should transport. Any issues should be dealt with after the incident through the department's peer review quality improvement process.

Interfacility Transports

Prehospital providers that participate in interfacility transfers must have written guidelines and appropriate training for the particular type of patient they will encounter. The provider should not take a transfer if he/she does not feel comfortable assuming responsibility for patient care, due to level of training or lack of knowledge regarding equipment in use on the patient. Any medications or treatments used in the transfer agreement must have the approval of the Medical Director. Prehospital providers shall have a written policy for their service regarding where they will transfer a patient to within the hospital (i.e. to the ED only or to the ED and ICU only). Services shall have a written policy for which hospitals they will transport patients and under which circumstances this will be implemented. All agency interfacility guidelines need to be approved by the Medical Director prior to implementation. A copy of these guidelines needs to be maintained in the Regions EMS office, and should be updated on an annual basis. Specially trained staff from the transferring facility may accompany the transporting ambulance if necessary to provide safe transport (ie respiratory therapists, RN's, MD's).

Red Lights and Siren Recommendations

After assessing the risk versus benefit to the patient, and finding them to be in one of the categories below, it is appropriate for these patients to be transported to a medical facility using lights and siren:

- Airway:** Inability to maintain an adequate patent airway, upper airway stridor
 - Breathing:** Severe respiratory distress that is unresponsive to treatment
 - Circulation:** Cardiac arrest, hypotension despite treatment, symptomatic tachycardia, or bradycardia, potential candidates for thrombolytics, or angioplasty
 - Trauma:** Any patient meeting the TTA criteria, penetrating trauma to head, neck or torso, major long bone fractures, major amputations, injuries that produce neurovascular compromise, uncontrolled bleeding, or severe burns
 - Neurologic:** GCS < 13, seizures unresponsive to treatment, symptoms of stroke that appear to be < 5 hours old
 - Obstetrical:** Prolapsed cord, premature labor, breech presentation, ectopic pregnancy, abnormal fetal presentation, 3rd trimester bleeding, or post birth complications for mother or baby
 - Pediatrics (<8 years):** Upper airway stridor, physical distress secondary to illness or injury
- Any patient felt to be in imminent danger upon discretion of the crew**

Each agency must maintain policies for emergency vehicle response that minimally adhere to state statutes. Medical Director expects these policies will be adhered to.

Bariatric Transportation

Regions Hospital EMS recognizes the special needs of bariatric patients and the challenge they present to caregivers:

1. No patient that requires immediate 911 emergency transport will be denied transportation. If the bariatric patient is too large to be transported by a service, the patient will receive medical care at the scene to attempt to stabilize the medical emergency until such time as the appropriate equipment and transport vehicle can be secured for transportation.
2. All EMS agencies should have equipment designed to monitor and treat the bariatric patient.
3. All EMS agencies should have a written policy to address the following concerns:
 - a. Weight limits of stretchers, backboards, lifting tarps, and ambulance load limits.
 - b. Number of providers to be utilized for lifting for patients weighing over 400 lbs.
 - c. Procedures and policies for extricating large patients from places of residence.
 - d. Mutual aid agreements with agencies with specialized transport capabilities.

Termination of Resuscitation

Regions Hospital EMS

POLICY:	Termination of Resuscitation	Page 1 of 1
ISSUED BY:	Medical Director	No. 14-119
DATE:	April 1, 2014	Supersedes: 11-116

Ambulance personnel may forego resuscitation on patients who are obviously dead at the scene or who have confirmed "Do Not Resuscitate" (DNR) orders. Obvious Death is indicated by no cardiac or respiratory activity in a warm patient combined with any of the following: rigor mortis, lines of lividity (pooling of blood in the dependant areas of the body), decapitation, severed trunk, or 100% BSA full thickness burns.

1. Obtain and document history including:
 - A. How long down or when last seen alive?
 - B. Expected or unexpected death?
 - C. Any resuscitative efforts prior to EMS arrival?
 - D. Medical history
2. Perform physical exam and document assessment of:
 - A. Absent pulses; the carotid and one other (radial, brachial, or femoral) pulse must be checked.
 - B. Absent respirations
 - C. Fixed and dilated pupils
 - D. Rigor mortis
 - E. Body temperature
 - F. Pooling of blood in the dependant (lowest areas of the body) due to gravity (AKA leividity)
 - G. Asystole in 2 or more leads (ALS only)
 - H. Injuries incompatible with life (decapitation, severed trunk, 100% BSA burns)
3. Medical control clearance
 - A. Medical control clearance is not required for patients who meet the criteria above.
 - B. Contact medical control with any questions/concerns; especially if possibility of hypothermia exists.
 - C. Once resuscitation* (CPR) has begun, it may be terminated only AFTER physician declaration (in person or via radio communication) unless there is a valid DNR order present.

To the extent possible, try to avoid disturbance of possible crime scenes and leave bodies at the scene in position found whenever possible and practical.

SPECIAL NOTES:

1. If there is any doubt about patient viability, initiate resuscitation measures immediately.
2. Patients found in cold environments may still be viable despite cold body temperature.
3. "Resuscitation" for the purposes of this guideline is defined as cardiopulmonary resuscitation (CPR) or any component of CPR, including cardiac compression, artificial ventilation (including mouth to mouth), defibrillation, administration of cardiac resuscitation medications and related procedures. "Resuscitation" does not include the Heimlich maneuver or similar procedure used to expel an obstruction from the throat, or the use of a cardiac monitor to perform a "quick look." It applies to any provider of "resuscitation," regardless of level of training, including, but not limited to, the lay public, first responders, EMS or other medical personnel. It does not obligate EMS personnel to attempt aggressive resuscitation in cases where the attempts will likely be futile, but rather to continue with basic life support (BLS) resuscitation until physician contact can be made.
4. The medical examiner or funeral home transports persons pronounced dead at the scene.
5. Patients not pronounced at the scene due to continued resuscitative efforts, family situations, or rescuer safety issues are transported to the designated hospital.
6. For patients transported to Regions Hospital:
 - A. If patient is brought into examination room for treatment and is later pronounced, hospital staff is responsible for body.
 - B. If no life saving measures are performed by hospital staff, and patient is pronounced only, the transport unit transfers body to Ramsey County Morgue.
 - C. If resuscitation is stopped before arrival to the hospital, **dispatch** should contact Ramsey County Medical Examiner for arrangement to transport to the Ramsey County Morgue.
7. Patients who die enroute to a hospital in Ramsey or Washington County - Medical Examiner must be called by dispatch and bodies transported to the Ramsey County Morgue.



Guidelines

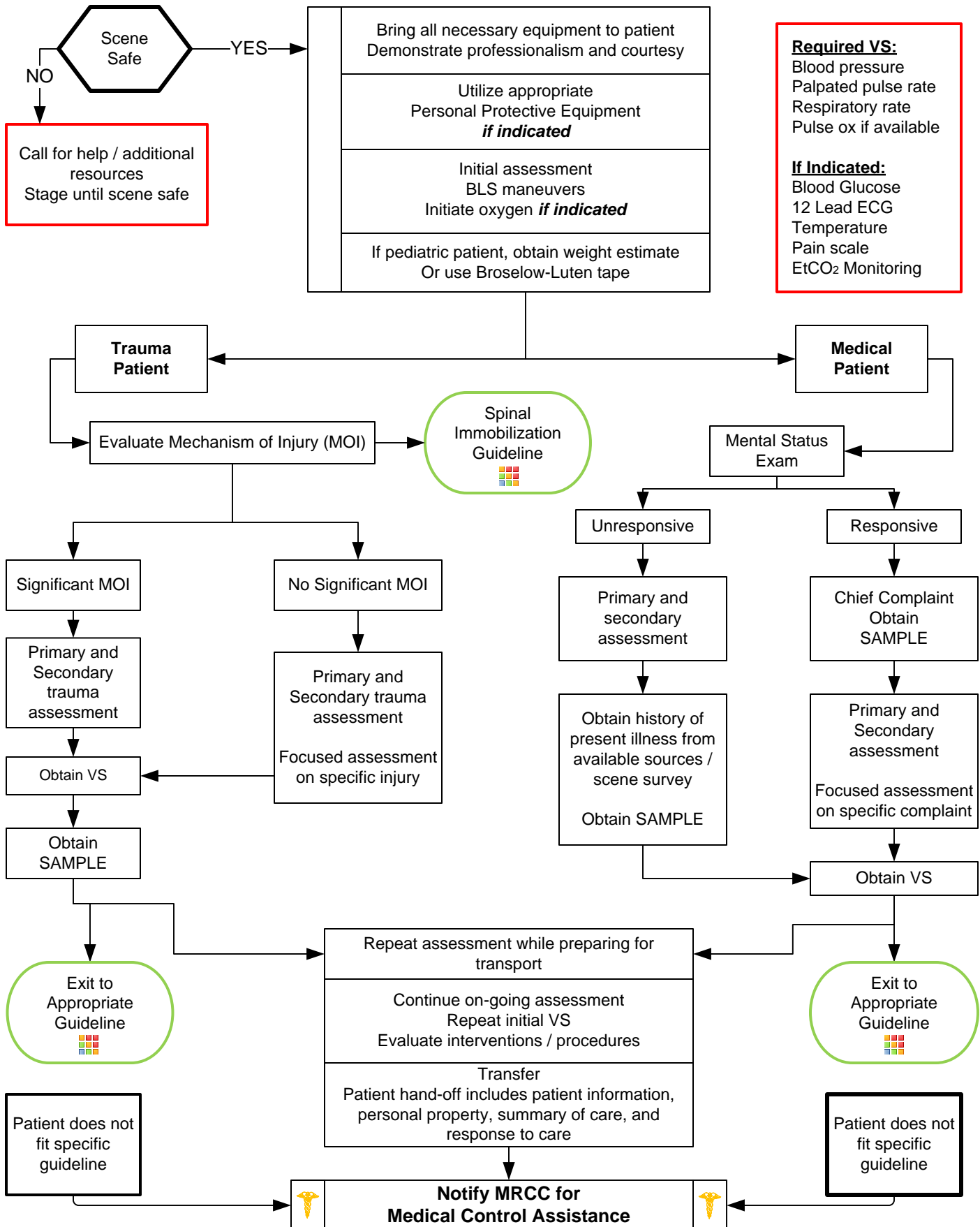
Patient Care Guidelines

Guidelines

Guideline

- 1 Universal Patient Care
- 2 Vascular Access
- 3 Adult Behavioral
- 4 Medical Clearance
- 5 Welfare Check
- 6 Adult Airway
- 7 Adult Failed Airway
- 8 Adult RSI / RSA
- 9 Adult Post Intubation Sedation
- 10 Adult Pain Control
- 11 Adult Cardiac Arrest
- 12 V-Fib / V-Tach
- 13 Asystole / PEA
- 14 Post Resuscitation
- 15 Tachycardia Narrow Complex
- 16 Tachycardia Wide Complex
- 17 Bradycardia
- 18 Chest Pain / STEMI
- 19 CHF / Pulmonary Edema
- 20 Abdominal Pain
- 21 Allergic Reaction
- 22 Altered Mental Status
- 23 CVA
- 24 Diabetic
- 25 Excited Delirium
- 26 Hypertension
- 27 Hypotension / Shock
- 28 Overdose / Ingestion
- 29 Respiratory Distress
- 30 Seizure
- 31 Syncope
- 32 Vomiting / Diarrhea
- 33 OB Emergency
- 34 Childbirth / Labor
- 35 Newborn Resuscitation
- 36 Pediatric Airway
- 37 Pediatric Failed Airway
- 38 Pediatric RSA
- 39 Pediatric Post Intubation Sedation
- 40 Pediatric Pain Control
- 41 Pediatric Cardiac Arrest
- 42 Pediatric V-Fib / V-Tach
- 43 Pediatric Asystole / PEA
- 44 Pediatric Post Resuscitation
- 45 Pediatric Tachycardia
- 46 Pediatric Bradycardia
- 47 Pediatric Allergic Reaction
- 48 Pediatric Altered Mental Status
- 49 Pediatric Diabetic
- 50 Pediatric Hypotension / Shock
- 51 Pediatric Overdose / Ingestion
- 52 Pediatric Respiratory Distress
- 53 Pediatric Seizure
- 54 Pediatric Vomiting / Diarrhea
- 55 Multiple Trauma
- 56 Head Trauma
- 57 Spinal Immobilization
- 58 Extremity Trauma
- 59 Crush Syndrome
- 60 Eye Injury / Complaint
- 61 Thermal Burns
- 62 Chemical Burns
- 63 Electrical Burns
- 64 Blast Injury
- 65 Radiation Incident
- 66 Drowning
- 67 Hyperthermia
- 68 Hypothermia
- 69 Bites / Envenomations
- 70 Carbon Monoxide
- 71 Cyanide
- 72 Nerve Agents
- 73 MCI / Triage
- 74 Special Event Rehabilitation
- 75 Responder Rehabilitation
- 76 LVAD
- 77 Tracheostomies
- 78 Ventilators

Universal Patient Care





Universal Patient Care

General Section Guidelines

Scene Safety Evaluation: Identify potential hazards to rescuers, patient and public. Identify number of patients and utilize triage guideline if indicated. Observe patient position and surroundings.

General: All patient care must be appropriate to your level of training and documented in the PCR. The PCR / EMR narrative should be considered a story of the circumstances, events and care of the patient and should allow a reader to understand the complaint, the assessment, the treatment, why procedures were performed and why indicated procedures were not performed as well as ongoing assessments and response to treatment and interventions.

Adult Patient: An adult should be suspected of being acutely hypotensive when Systolic Blood Pressure is less than 90 mmHg. Diabetic patients and women may have atypical presentations of cardiac related problems such as MI. General weakness can be the symptom of a very serious underlying process. Beta blockers and other cardiac drugs may prevent a reflexive tachycardia in shock with low to normal pulse rates.

Geriatric Patient: Hip fractures and dislocations have high mortality. Altered mental status is not always dementia. Always check Blood Sugar and assess for signs of stroke, trauma, etc. with any alteration in a patient's baseline mental status. Minor or moderate injury in the typical adult may be very serious in the elderly.

Pediatric Patient: Pediatric patient is defined by those which fit on the Broselow-Luten Resuscitation Tape, Age less than 12, weight 40 kg or less, or absence of signs of puberty. Patients off the Broselow-Luten tape should have weight based medications until age 12 or greater or weight greater than 40 kg. Special needs children may require continued use of Pediatric based guidelines regardless of age and weight. Initial assessment should utilize the Pediatric Assessment Triangle which encompasses Appearance, Work of Breathing and Circulation (skin appearance). The order of assessment may require alteration depending on the developmental state of the pediatric patient. Generally the child or infant should not be separated from the caregiver unless absolutely necessary during assessment and treatment.

Patient Refusal: Patient refusal is a high risk situation. Encourage your patient to accept transport to medical facility. Encourage patient to allow an assessment, including vital signs. Documentation of the event is very important including a mental status assessment describing the patient's capacity to refuse care. Guide to Assessing capacity:

- **Patient should be able to communicate a clear choice:** This should remain stable over time. Inability to communicate a choice or an inability to express the choice consistently demonstrates incapacity.
- **Relevant information is understood:** Patient should be able to display a factual understanding of their illness or situation that requires further medical attention, the options and risks and benefits.
- **Appreciation of the situation:** Ability to communicate an understanding of the facts of the situation. Patient should be able to recognize the significance of the potential outcome from his or her decision.
- **Manipulation of information in a rational manner:** Demonstrate a rational process to come to a decision. Should be able to describe the reasoning they are using to come to the decision, whether or not the EMS provider agrees with decision.

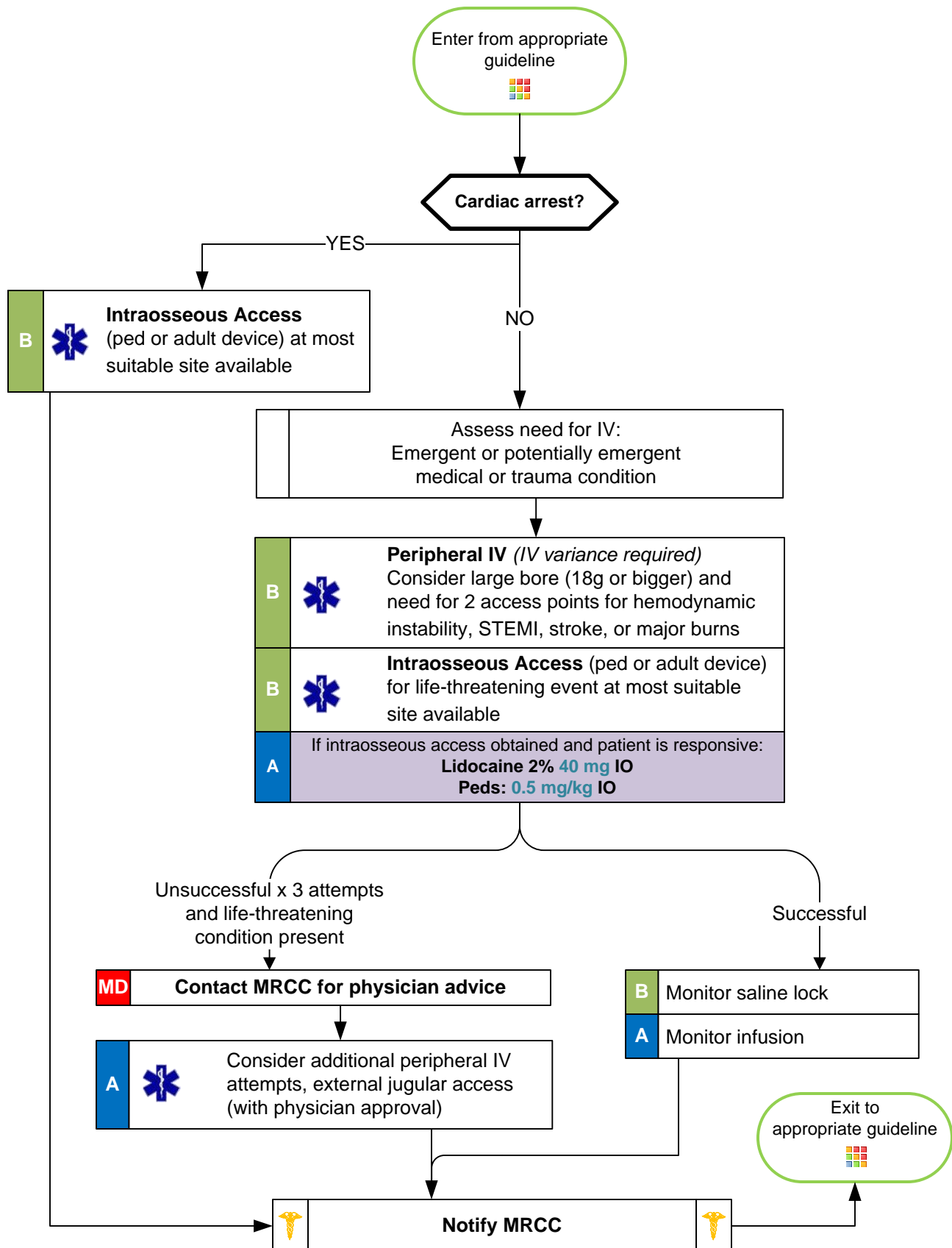
Contact MRCC for assistance with any high-risk refusal. Law enforcement should be involved with any involuntary transport unless patient condition and scene safety warrant rapid transport. A Folstein Mini-Mental Status Exam (MMSE) is a simple clinical tool to help assess cognitive capacity for high-risk refusals.

Special note on oxygen administration and utilization: Oxygen is ubiquitous in prehospital patient care and probably over utilized. Oxygen is a pharmaceutical with indications, contraindications as well as untoward side effects. Utilize oxygen when indicated and not because it is available. A reasonable target SpO₂ for most patients is 94-99 % regardless of delivery device.

Pearls

- **Minimal exam if not otherwise noted is vital signs, mental status with GCS, and location of injury or complaint.**
- **Any patient contact which does not result in transport must have a completed patient care record with explicit disposition information, MRCC operator number, patient signature, and instructions provided, or documentation as to why this information was not obtained.**
- **Patients who refuse care prior to a full assessment should be logged together in a single PCR for the incident. It should be clear that contact was made with the patient, an assessment was offered, the patient refused, and no obvious impairment was suspected (medical, traumatic, or chemical).**
- **A pediatric patient is defined by fitting on the Broselow-Luten tape, Age < 12, Weight ≤ 49 kg, or absence of signs of puberty.**
- Timing of transport should be based on patient's clinical condition and the transport policy.
- Blood Pressure is defined as a Systolic / Diastolic reading. A palpated Systolic reading may be necessary at times.
- SAMPLE: Signs / Symptoms; Allergies; Medications; PMH; Last oral intake; Events leading up to illness / injury

Vascular Access



Vascular Access

General Section Guidelines

Pearls

- In patients who are hemodynamically unstable or in extremis, **contact medical control** prior to accessing dialysis shunts or external central venous catheters.
- Any working venous catheter already accessed prior to EMS arrival may be used for EMS IV fluids and medications.
- Any prehospital fluids or medications approved for IV use may also be given through an intraosseous IV.
- All IV rates should be at KVO (minimal rate to keep vein open) unless administering fluid bolus.
- Use micro drip sets for all patients 6 years old or less.
- Upper extremity IV sites are preferable to lower extremity (LE) sites
- Lower extremity IVs are discouraged in patients with vascular disease or diabetes.
- In post-mastectomy patients and patients with a working dialysis fistula, avoid IV attempts, blood draws, injections, and blood pressure measurements in the upper extremity on the affected side.

Adult Behavioral

History

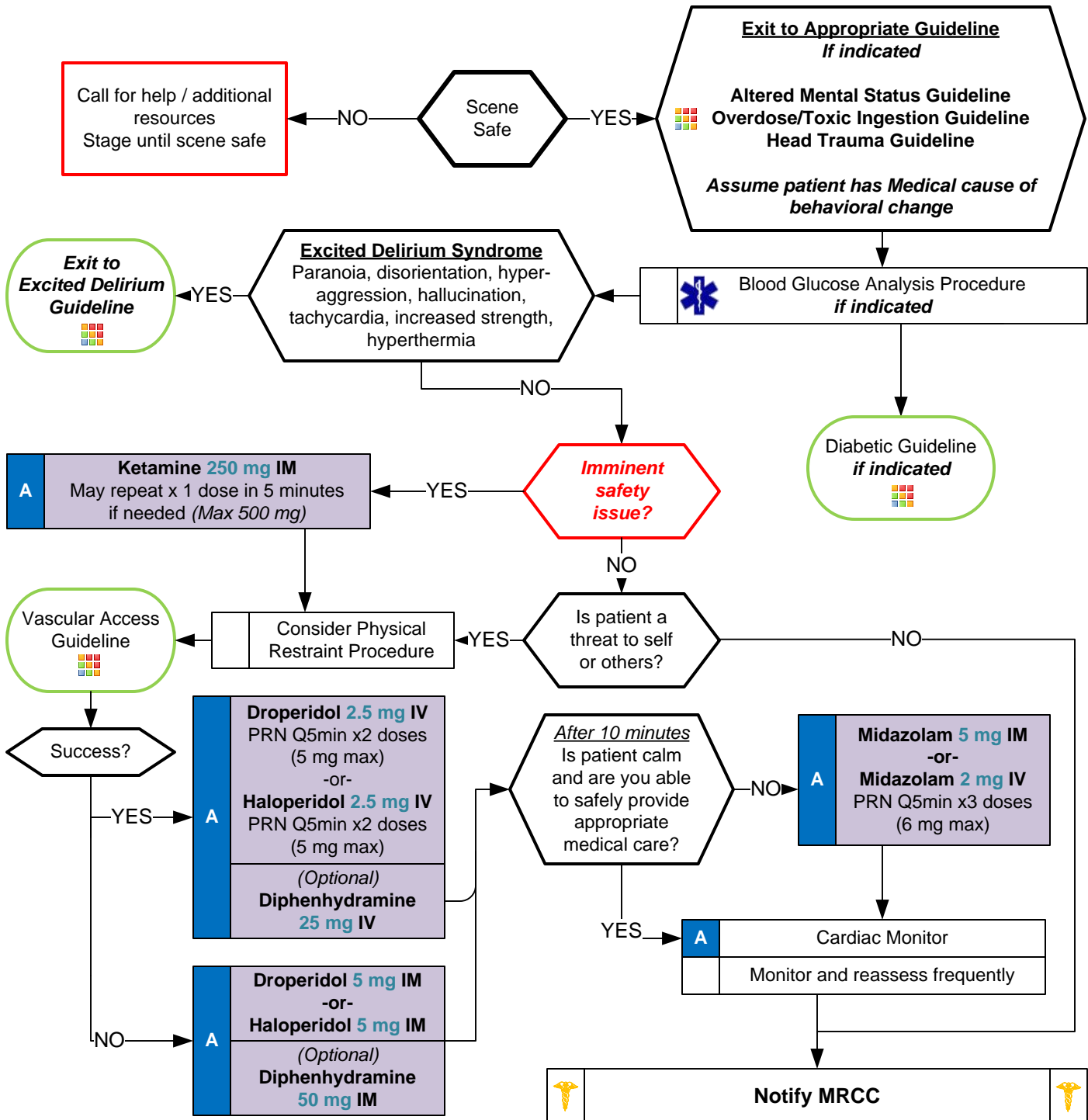
- Situational crisis
- Psychiatric illness/medications
- Injury to self or threats to others
- Medic alert tag
- Substance abuse / overdose
- Diabetes

Signs and Symptoms

- Anxiety, agitation, confusion
- Affect change, hallucinations
- Delusional thoughts, bizarre behavior
- Combative violent
- Expression of suicidal / homicidal thoughts

Differential

- Altered Mental Status differential
- Alcohol Intoxication
- Toxin / Substance abuse
- Medication effect / overdose
- Withdrawal syndromes
- Depression
- Bipolar (manic-depressive)
- Schizophrenia
- Anxiety disorders



Adult Behavioral

General Section Guidelines

This guideline should only be used on adult patients:

- Older than age 12
- Greater than 40 kg
- Signs of puberty
- Longer than the Broselow-Luten tape

Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Neuro**
- **Crew / responder safety is the main priority**
- **Any patient who is handcuffed or restrained by Law Enforcement and transported by EMS must be accompanied by law enforcement in the ambulance.**
- **Consider antipsychotics (Droperidol, Haloperidol) for patients with history of psychosis or extreme alcohol intoxication, or a benzodiazepine for patients with other presumed substance abuse. While benzodiazepines may be indicated for patients with alcohol intoxication, consider that alcohol and benzodiazepines together may lead to respiratory depression.**
- **All patients who receive either physical or chemical restraint must be continuously observed by ALS personnel on scene or immediately upon their arrival.**
- **If cardiac rhythm changes, evaluate QTc interval with a 12-lead EKG. If > 500ms, consider administering magnesium sulfate (2g). Consult with medical control if appropriate.**
- Be sure to consider all possible medical/trauma causes for behavior (hypoglycemia, overdose, substance abuse, hypoxia, head injury, etc.)
- Do not irritate the patient with a prolonged exam.
- Do not overlook the possibility of associated domestic violence or child abuse.
- If patient is suspected of excited delirium suffers cardiac arrest, consider a fluid bolus and sodium bicarbonate early
- Do not position or transport any restrained patient in such a way that could impact the patient's respiratory or circulatory status.
- **Excited Delirium Syndrome:**
Medical emergency: Combination of delirium, psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent / bizarre behavior, insensitivity to pain, hyperthermia and increased strength. Potentially life-threatening and associated with use of physical control measures, including physical restraints and Tasers. Most commonly seen in male subjects with a history of serious mental illness and/or acute or chronic drug abuse, particularly stimulant drugs such as cocaine, crack cocaine, methamphetamine, amphetamines or similar agents. Alcohol withdrawal or head trauma may also contribute to the condition.
- **Extrapyramidal reactions:**
Condition causing involuntary muscle movements or spasms typically of the face, neck and upper extremities. May present with contorted neck and trunk with difficult motor movements. Typically an adverse reaction to antipsychotic drugs like Haloperidol and may occur with your administration. When recognized give **Diphenhydramine 50 mg IV / IO / IM / PO** in adults or **1 mg/kg IV / IO / IM / PO** in pediatrics.

Medical Clearance

History

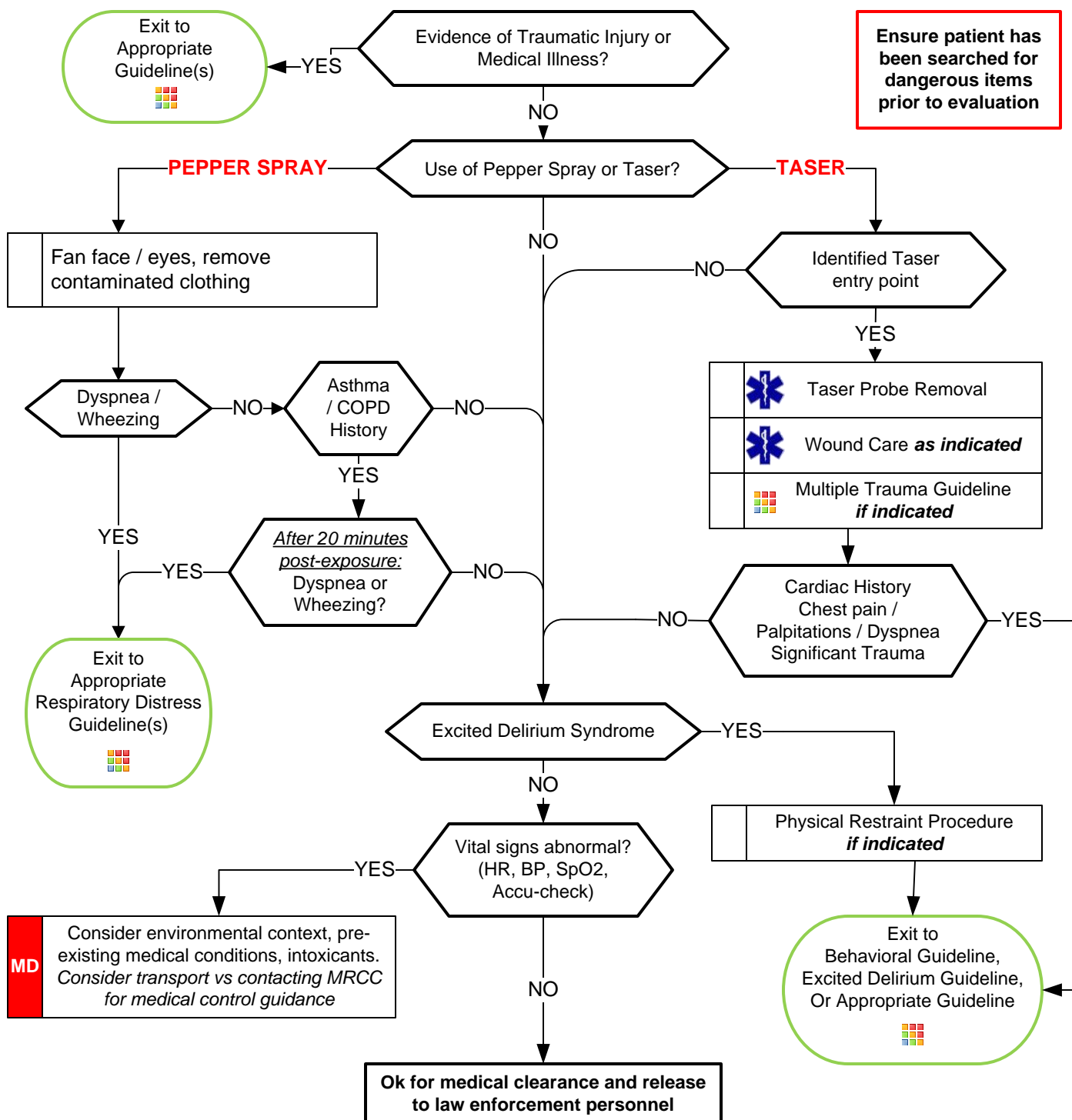
- Traumatic Injury
- Drug Abuse
- Cardiac History
- History of Asthma
- Psychiatric History

Signs and Symptoms

- External signs of trauma
- Palpitations
- Shortness of breath
- Wheezing
- Altered Mental Status
- Intoxication/Substance Abuse

Differential

- Excited Delirium Secondary to Psychiatric Illness
- Excited Delirium Secondary to Substance Abuse
- Traumatic Injury
- Closed Head Injury
- Asthma Exacerbation
- Cardiac Dysrhythmia





Medical Clearance

General Section Guidelines

Pearls

- **Patient does not have to be in police custody or under arrest to utilize this protocol.**
- **Patients restrained by law enforcement devices must be transported accompanied by a law enforcement officer in the patient compartment who is capable of removing the devices. However when rescuers have utilized restraints in accordance with the Restraint Procedure, the law enforcement agent may follow behind the ambulance during transport if there are no safety concerns and the arrangement is agreeable to both EMS and Law Enforcement personnel on scene.**
- The responsibility for patient care rests with the highest authorized medical provider on scene.
- If an asthmatic patient is exposed to pepper spray and released to law enforcement, all parties should be advised to immediately contact EMS if wheezing/difficulty breathing occurs.
- All patients in police custody retain the right to participate in decision making regarding their medical care and may request or refuse medical care of EMS.
- If extremity / chemical / law enforcement restraints are applied, follow Restraint Procedure.
- **Consider utilizing the behavioral guideline as indicated for patients in police custody.**
- **All patients who receive either physical or chemical restraint must be continuously observed by ALS personnel on scene or immediately upon their arrival.**
- Do not position or transport any restrained patient in such a way that could impact the patient's respiratory or circulatory status.

Well Person Check / Lift Assist

History

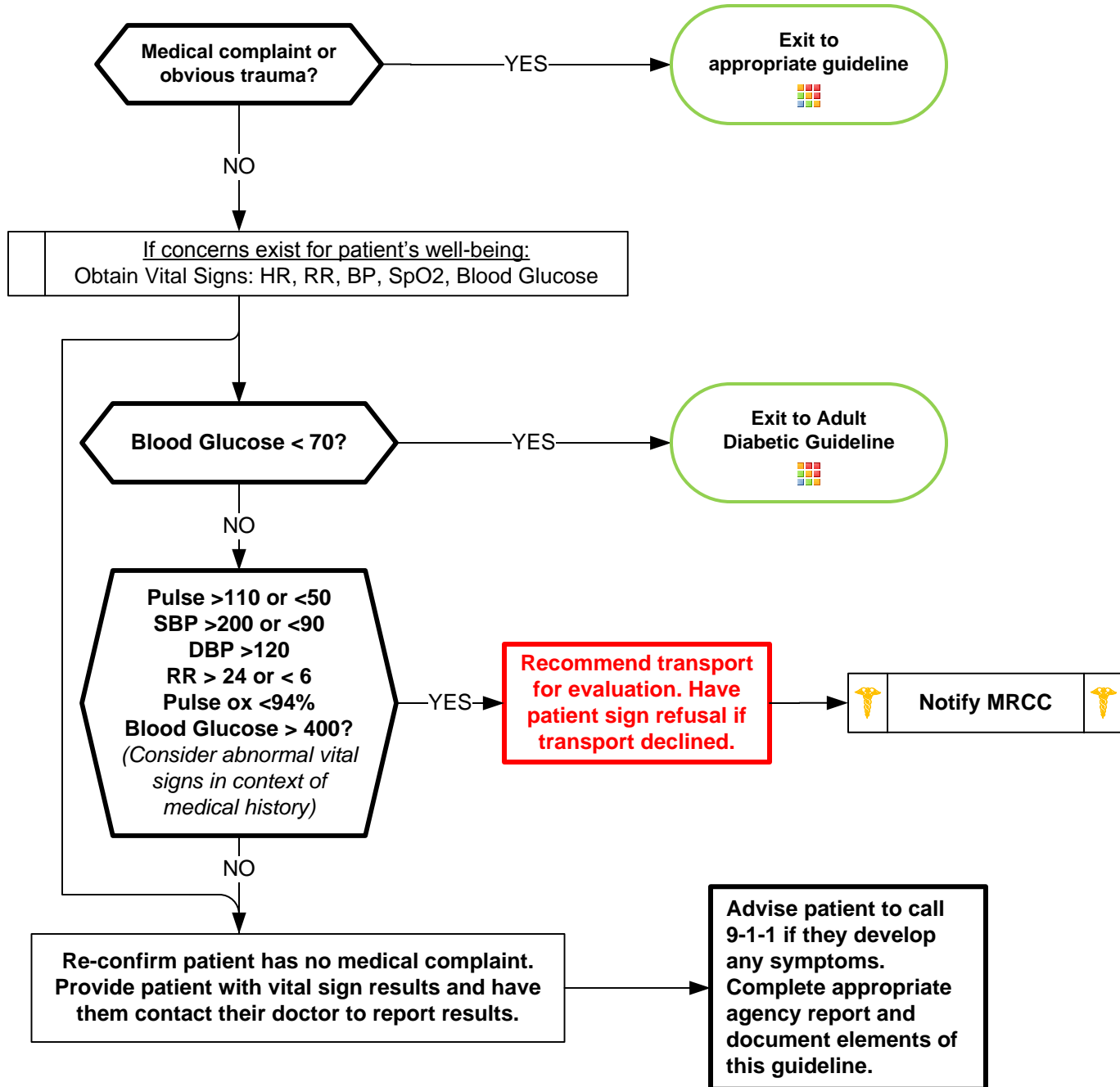
- Patient presents requesting "blood pressure check"
- EMS responds to "lift assist"
- Third party called 911; patient did not request
- Other situation in which patient does not have a medical complaint or obvious injury

Signs and Symptoms

- Assess for medical complaint
- For patients with hypertension, particularly check for chest pain, shortness of breath, and/or neurologic changes
- For citizen assist calls, particularly check for syncope, trauma from fall, or inability to ambulate

Differential

- Hypertensive urgency
- Hypertensive emergency
- Syncope
- Cardiac ischemia
- Cardiac dysrhythmia
- Fracture
- Head trauma





Well Person Check / Lift Assist

General Section Guidelines

Pearls

- This guideline applies to **ALL responders**
- Patients who are denying more severe symptoms may initially present for a “routine check”. Please confirm with the patient at least twice that they have no medical complaints.
- All persons who request a medical evaluation are considered patients and shall have a PCR completed.
- Should a patient refuse evaluation and/or decline further evaluation once begun, document as much as you can. Even patients who refuse vital signs can be observed and respirations measured. The PCR narrative (if required) is key in these and all cases, and must accurately and thoroughly describe the patient encounter.

Adult Airway

This guideline, the Adult Failed Airway Guideline, and the Adult RSI Guideline should be utilized together as they contain very useful information for airway management, even for services without RSI capabilities.

Assess Respiratory Rate, Effort, Oxygenation (SpO2)
Is Airway / Breathing Adequate?

YES

Supplemental oxygen
Goal oxygen saturation
>93%



Exit to
Appropriate Guideline

NO

Basic Maneuvers First

- open airway chin lift / jaw thrust
- nasal or oral airway
- Bag-valve mask (BVM)

Initiate SpO2 monitoring

A

Initiate cardiac monitoring **if appropriate**



Consider Spinal Immobilization Guideline



Consider Adult Altered Mental Status Guideline

Adult / Pediatric Respiratory Distress With a Tracheostomy Tube Guideline **if indicated**



Airway Patent?

YES

Breathing / Oxygenation Support needed?

YES

Supplemental oxygen
BVM

B

Consider CPAP

NO

Monitor / Reassess Supplemental Oxygen **if indicated**



Exit to appropriate guideline

Complete Obstruction?

NO

YES

A Airway Cricothyrotomy Surgical Procedure

Heimlich Procedure

A Direct Laryngoscopy, suction, McGill's forceps, ET intubation

Unable to Ventilate or Oxygenate (>93%) during or after one (1) or more unsuccessful intubation attempts.

Anatomy inconsistent with continued attempts -OR- Two (2) unsuccessful attempts.

Exit to Adult Failed Airway Guideline



A Initiate EtCO2 monitoring

B SGA (King) Airway Procedure

A Intubation / SGA Procedure or RSI Guideline

A Consider Post-Intubation Sedation Guideline

Notify MRCC

BVM / CPAP Effective?

NO

YES

Adult Airway

Always weigh the risks and benefits of endotracheal intubation in the field against transport. All prehospital endotracheal intubations are considered high risk. If ventilation / oxygenation is adequate, transport may be the best option. The most important airway device and the most difficult to use correctly and effectively is the Bag Valve Mask (not the laryngoscope).

Few prehospital airway emergencies cannot be temporized or managed with proper BVM techniques.

Difficult Airway Assessment

Difficult BVM Ventilation - MOANS:

- Mask seal inadequate due to facial hair, anatomy, blood or secretions / trauma
- Obese or late pregnancy
- Age > 55
- No teeth (roll gauze and place between gums and cheeks to improve seal)
- Stiff or increased airway pressures (Asthma, COPD, Obese, Pregnant)

Difficult Laryngoscopy - LEMON:

- Look externally for anatomical distortions (small mandible, short neck, large tongue)
- Evaluate 3-3-2 Rule (Mouth should fit 3 fingers, chin to neck should be 3 fingers, neck to thyroid should be 2 fingers)
- Mallampati (difficult to assess in the field)
- Obstruction / Obese or late pregnancy
- Neck mobility

Difficult King / SGA - RODS:

- Restricted mouth opening
- Obstruction / Obese or late pregnancy
- Distorted or disrupted airway
- Stiff or increased airway pressures (Asthma, COPD, Obese, Pregnant)

Difficult Cricothyrotomy / Surgical Airway - SHORT:

- Surgery or distortion of airway
- Hematoma over lying neck
- Obese or late pregnant
- Radiation treatment skin changes
- Tumor overlying neck

Trauma: Utilize in-line cervical stabilization during intubation, King/SGA or BVM use. During airway placement the cervical collar front should be open or removed to facilitate translation of the mandible / mouth opening.

Pearls

- **This guideline is only for use in patients with signs of puberty or longer than the Broselow Tape.**
- **Continuous capnography (EtCO₂) is mandatory for the monitoring of all patients with an airway device.**
- **If effective oxygenation and ventilation is being maintained by BVM and/or basic airway adjuncts, it is acceptable to continue with basic airway measures. Consider CPAP if appropriate.**
- **An airway is considered secure when the patient is receiving appropriate oxygenation and ventilation.**
- **An Intubation Attempt is defined as passing the laryngoscope blade beyond the teeth.**
- **An appropriate ventilatory rate is one that maintains an EtCO₂ of 35-45. Avoid hyperventilation.**
- Paramedics should use an SGA device (King) if orotracheal intubation is unsuccessful.
- Do not assume hyperventilation is psychogenic— use oxygen for goal SpO₂ of 94-99%, not a paper bag.
- Cricoid pressure, external laryngeal manipulation, and BURP maneuver may assist with difficult intubations. They may worsen view in some cases.
- Hyperventilation in deteriorating head trauma should only be done to maintain a EtCO₂ of 30-35.
- A gastric tube should be placed in all intubated patients if time allows.
- It is important to secure the endotracheal tube well and consider c-collar (in absence of trauma) to better maintain ETT placement. Manual stabilization of endotracheal tube should be used during all patient moves / transfers.

Adult Failed Airway

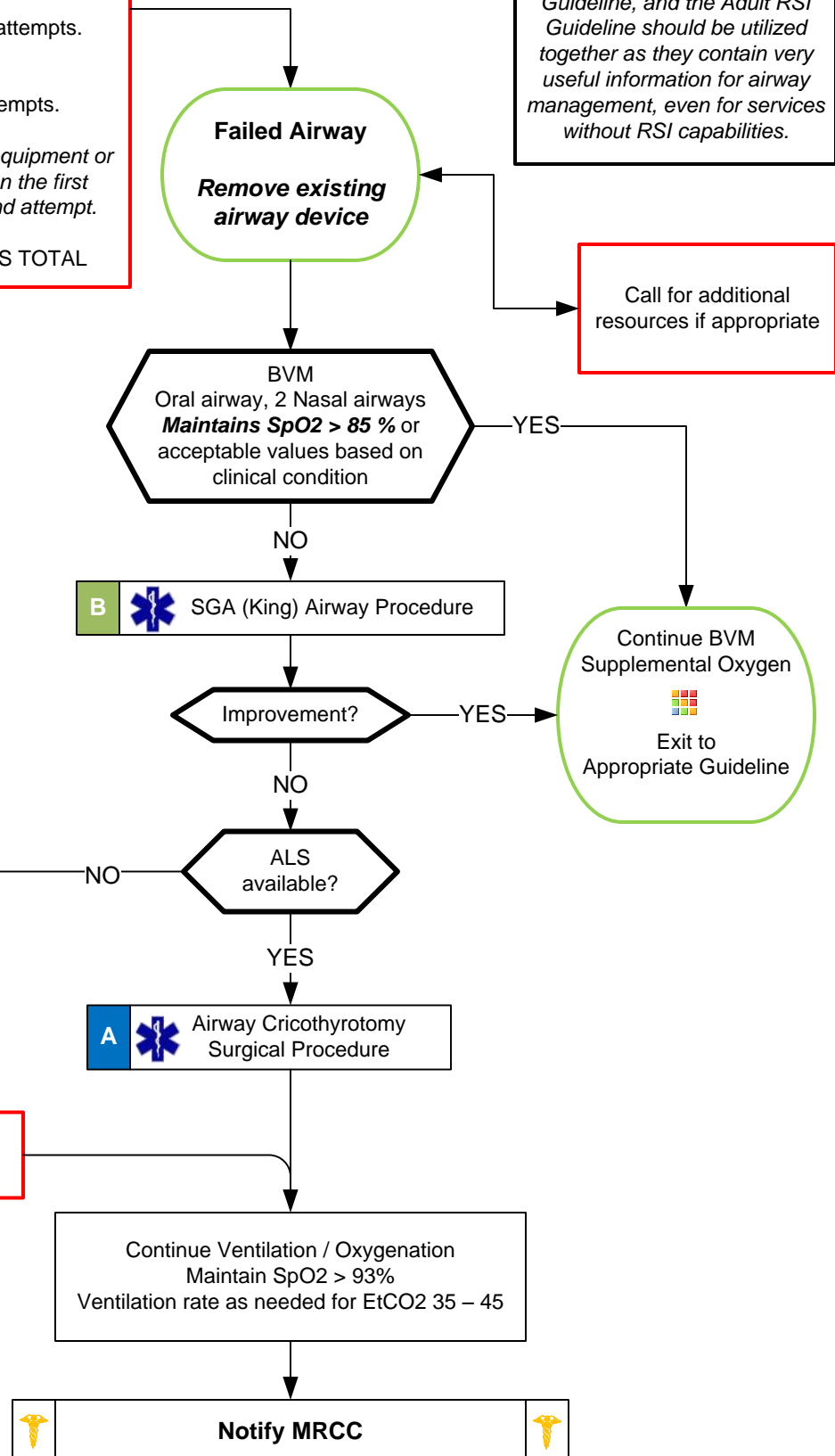
This guideline, the Adult Airway Guideline, and the Adult RSI Guideline should be utilized together as they contain very useful information for airway management, even for services without RSI capabilities.

Unable to Ventilate and Oxygenate >93% during or after one or more unsuccessful intubation attempts .
AND
Anatomy inconsistent with continued attempts.

OR
Two (2) unsuccessful intubation attempts.

Each attempt should include change of equipment or technique. If a bougie was not used on the first attempt, it should be used on the second attempt.

NO MORE THAN TWO (2) ATTEMPTS TOTAL





Adult Failed Airway

A failed airway occurs when a provider begins a course of airway management and identifies that standard airway management techniques (per the Adult Airway Guideline) will not succeed. Conditions which define a Failed Airway:

- Failure to maintain adequate oxygen saturation after advanced airway attempts, OR
- Two (2) failed attempts at intubation by the most experienced prehospital provider on scene in a patient who requires an advanced airway to prevent death, OR
- Unable to maintain adequate oxygen saturation with BVM techniques and insufficient time to attempt alternative maneuvers. This should include appropriate airway adjuncts (oropharyngeal airway and 2 nasopharyngeal airways).

It should be noted that a patient with a “failed airway” is one who is near death or dying, not stable or improving. Patients who cannot be intubated or who do not have an Oxygen Saturation greater than 93% do not necessarily have a failed airway. Many patients who cannot be intubated may be easily sustained by basic airway techniques and BVM, with stable or optimal Oxygen Saturation, i.e. **stable (not dropping) SpO2 values as expected based on the underlying pathophysiologic condition with otherwise reassuring vital signs.**

The most important way to avoid a failed airway is to identify patients with expected difficult airway, difficult BVM ventilation, difficult King or SGA placement, difficult laryngoscopy and / or difficult cricothyrotomy. Please refer to the Adult Airway Guideline for information on how to identify the patient with a potentially difficult airway.

Positioning of patient: In the field, improper positioning of the patient and rescuer are responsible for many failed and difficult intubations. Often this is dictated by uncontrolled conditions present at the scene and we must adapt. However many times the rescuer does not optimize patient and rescuer positions. The sniffing position or the head simply extended upon the neck are probably the best positions. The goal is to align the ear canal with the suprasternal notch in a straight line parallel to the ground.

In the **obese or late pregnant patient** elevating the torso by placing blankets, pillows or towels will optimize the position. This can be facilitated by raising the head of the cot.

Use of cot to achieve optimal patient / rescuer position: The cot can be elevated and lowered to facilitate intubation. With the patient on the cot raise until the patients nose is at the level of your umbilicus which will place you at the optimal position.

Trauma: *Utilize in-line cervical stabilization during intubation, King/SGA placement, or BVM use. During airway placement the cervical collar front should be open or removed to facilitate translation of the mandible / mouth opening.*

Cricothyrotomy / Surgical Airway Procedure: Use in adult patients only, defined as signs of puberty present or longer than the Broselow Tape. Relative contraindications include: Pre-existing laryngeal or tracheal tumors, infections or abscess overlying the cricoid area, or hematoma or other anatomical landmark destruction / injury.

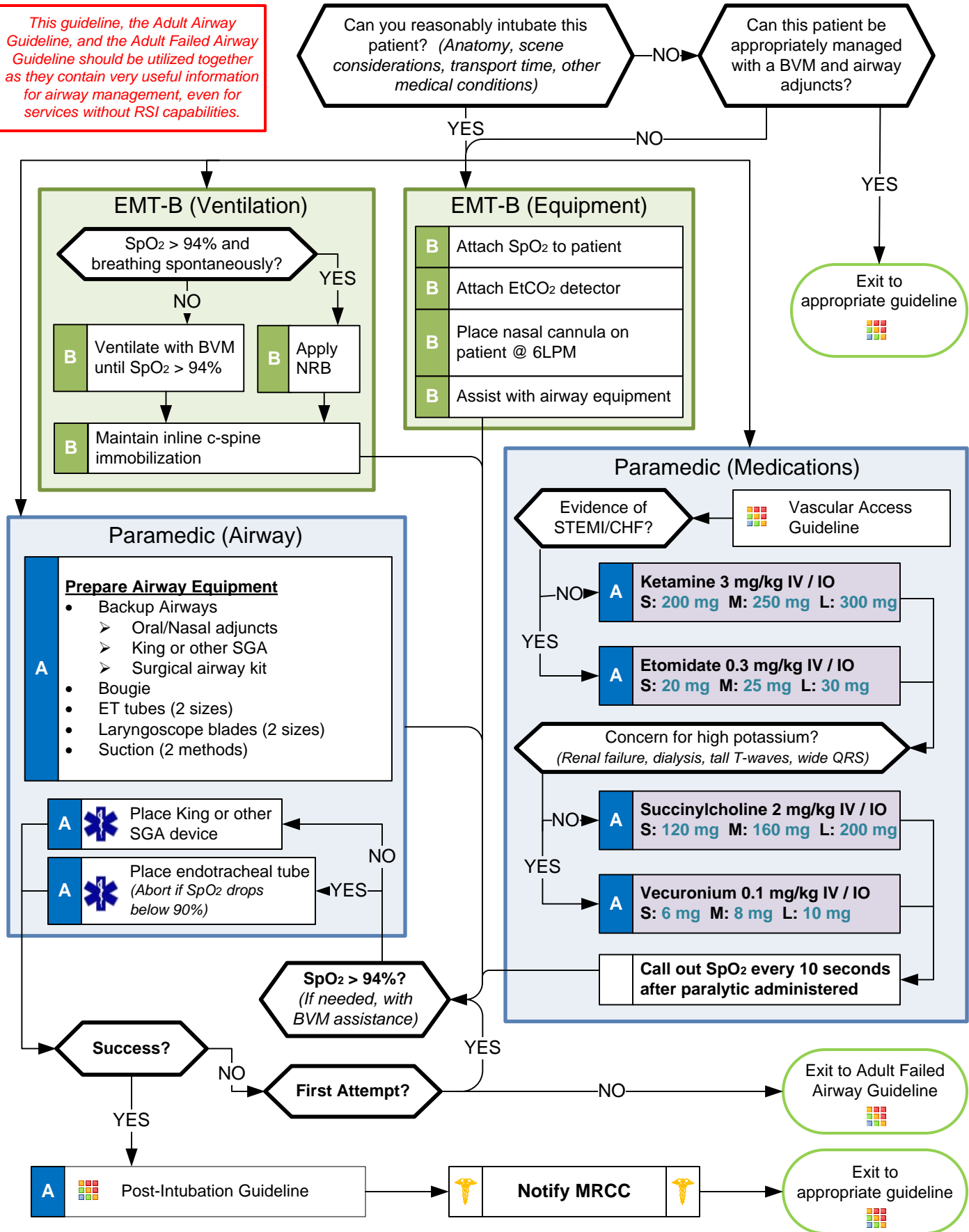
A patient with a failed airway may warrant diversion to the closest emergency department for airway management and stabilization prior to transfer to a facility capable of definitive care. You must consider the benefits of immediate airway management versus the risks of a delay in definitive care for the underlying condition when making this decision.

Pearls

- **If first intubation attempt fails, make an adjustment and then consider:**
 - Different laryngoscope blade / Video or other optical laryngoscopy device if available
 - Gum Elastic Bougie if not already used
 - Different ETT size
 - Change cricoid pressure, request external laryngeal manipulation, or apply BURP maneuver (Push trachea Back [posterior], Up, and to patient's Right)
 - Change head positioning
- Continuous pulse oximetry should be utilized in all patients with an inadequate respiratory function.
- Continuous EtCO₂ should be utilized in all patients with respiratory failure and in all patients with advanced airways.
- **Notify MRCC AS EARLY AS POSSIBLE about a difficult / failed airway.**
- **If scene resources allow, do not hesitate to contact MRCC for Medical Control assistance regarding decision-making for patients with a difficult/failed airway.**

Rapid Sequence Intubation

This guideline, the Adult Airway Guideline, and the Adult Failed Airway Guideline should be utilized together as they contain very useful information for airway management, even for services without RSI capabilities.



Rapid Sequence Intubation

Always weigh the risks and benefits of endotracheal intubation in the field against transport. All prehospital endotracheal intubations are considered high risk. If ventilation / oxygenation is adequate, transport may be the best option. The most important airway device and the most difficult to use correctly and effectively is the Bag Valve Mask (not the laryngoscope).

Few prehospital airway emergencies cannot be temporized or managed with proper BVM techniques.

Difficult Airway Assessment

Difficult Laryngoscopy - LEMON:

- Look externally for anatomical distortions (small mandible, short neck, large tongue)
- Evaluate 3-3-2 Rule (Mouth should fit 3 fingers, chin to neck should be 3 fingers, neck to thyroid should be 2 fingers)
- Mallampati (difficult to assess in the field)
- Obstruction / Obese or late pregnancy
- Neck mobility

Difficult King / SGA - RODS:

- Restricted mouth opening
- Obstruction / Obese or late pregnancy
- Distorted or disrupted airway
- Stiff or increased airway pressures (Asthma, COPD, Obese, Pregnant)

Indications for RSI

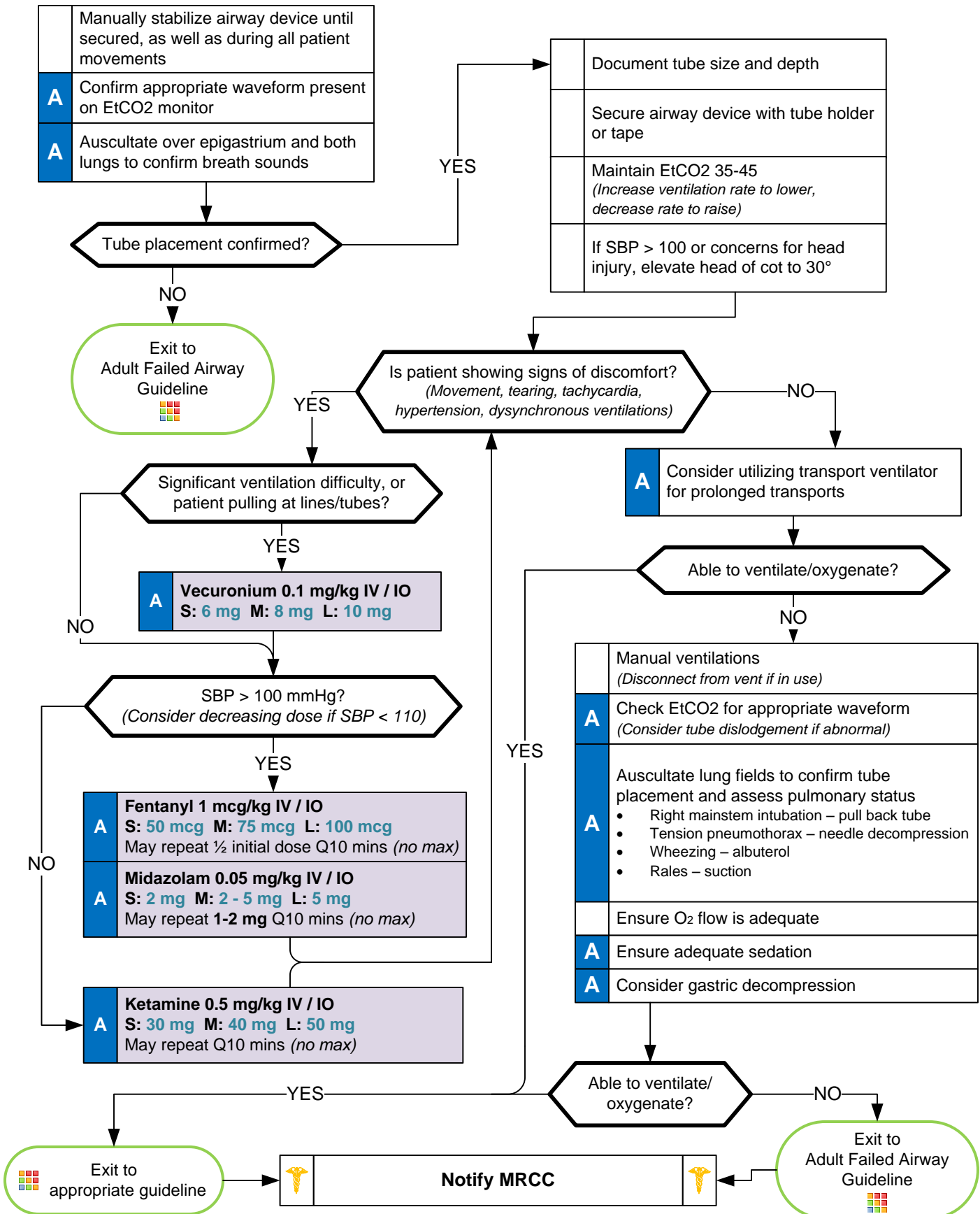
Failure to protect the airway
Inability to oxygenate
Inability to ventilate
Unstable hemodynamics/shock
GSC < 9 in trauma
Impending airway compromise
Adult patient

Trauma: Utilize in-line cervical stabilization during intubation, King/SGA or BVM use. During airway placement the cervical collar front should be open or removed to facilitate translation of the mandible / mouth opening.

Pearls

- **This guideline requires at least 2 Paramedics**
- **Divide the workload – ventilate, suction, cricoid pressure, drugs, intubation**
- **Succinylcholine should not be given to dialysis or renal failure patients, crush injuries, history of neuromuscular disease, or burn patients more than 24 hours out from the initial injury due to the risk of potassium release. It is ok to use in patients with acute burn injuries.**
- **Once a patient has been given a paralytic drug, YOU ARE RESPONSIBLE FOR VENTILATIONS if desaturation occurs**
- **Continuous Waveform Capnography and Pulse Oximetry are required for intubation verification and ongoing patient monitoring**
- **An airway is considered secure when the patient is receiving appropriate oxygenation and ventilation.**
- **An Intubation Attempt is defined as passing the laryngoscope blade or endotracheal tube past the teeth.**
- **An appropriate ventilatory rate is one that maintains an EtCO₂ of 35-45. Avoid hyperventilation.**
- If First intubation attempt fails, make an adjustment and try again
 - Different ETT size
 - Different laryngoscope blade
 - Change head positioning
 - Change cricoid pressure; Not routinely recommended and may worsen your view
 - Use bougie or video device
 - Consider applying BURP maneuver (Back [posterior], Up, and to patient's Right)
- Protect the patient from self extubation when the drugs wear off. Longer acting paralytics may be needed post-intubation
- A gastric tube should be placed in all intubated patients to limit aspiration and decompress stomach if time allows
- Hyperventilation in deteriorating head trauma should only be done to maintain a EtCO₂ of 30-35.
- It is important to secure the endotracheal tube well and consider c-collar (in absence of trauma) to better maintain ETT placement. Manual stabilization of endotracheal tube should be used during all patient moves / transfers.

Post-Intubation Sedation



Post Intubation Sedation

Always weigh the risks and benefits of endotracheal intubation in the field against transport. All prehospital endotracheal intubations are considered high risk. If ventilation / oxygenation is adequate, transport may be the best option. The most important airway device and the most difficult to use correctly and effectively is the Bag Valve Mask (not the laryngoscope).

Few prehospital airway emergencies cannot be temporized or managed with proper BVM techniques.

Difficult Airway Assessment

Difficult BVM Ventilation - MOANS:

- Mask seal inadequate due to facial hair, anatomy, blood or secretions / trauma
- Obese or late pregnancy
- Age > 55
- No teeth (roll gauze and place between gums and cheeks to improve seal)
- Stiff or increased airway pressures (Asthma, COPD, Obese, Pregnant)

Difficult Laryngoscopy - LEMON:

- Look externally for anatomical distortions (small mandible, short neck, large tongue)
- Evaluate 3-3-2 Rule (Mouth should fit 3 fingers, chin to neck should be 3 fingers, neck to thyroid should be 2 fingers)
- Mallampati (difficult to assess in the field)
- Obstruction / Obese or late pregnancy
- Neck mobility

Difficult King / SGA - RODS:

- Restricted mouth opening
- Obstruction / Obese or late pregnancy
- Distorted or disrupted airway
- Stiff or increased airway pressures (Asthma, COPD, Obese, Pregnant)

Trauma: Utilize in-line cervical stabilization during intubation, King/SGA or BVM use. During airway placement the cervical collar front should be open or removed to facilitate translation of the mandible / mouth opening.

Pearls

- **Continuous capnography (EtCO₂) is mandatory for the monitoring of all patients with an airway device.**
- **An airway is considered secure when the patient is receiving appropriate oxygenation and ventilation.**
- **An Intubation Attempt is defined as passing the laryngoscope blade or endotracheal tube past the teeth.**
- **An appropriate ventilatory rate is one that maintains an EtCO₂ of 35-45. Avoid hyperventilation.**
- Do not assume hyperventilation is psychogenic— use oxygen for goal SpO₂ of 94-99%, not a paper bag.
- Hyperventilation in deteriorating head trauma should only be done to maintain a EtCO₂ of 30-35.
- A gastric tube should be placed in all intubated patients if time allows.
- It is important to secure the endotracheal tube well and consider c-collar (in absence of trauma) to better maintain ETT placement. Manual stabilization of endotracheal tube should be used during all patient moves / transfers.

Pain Control: Adult

History

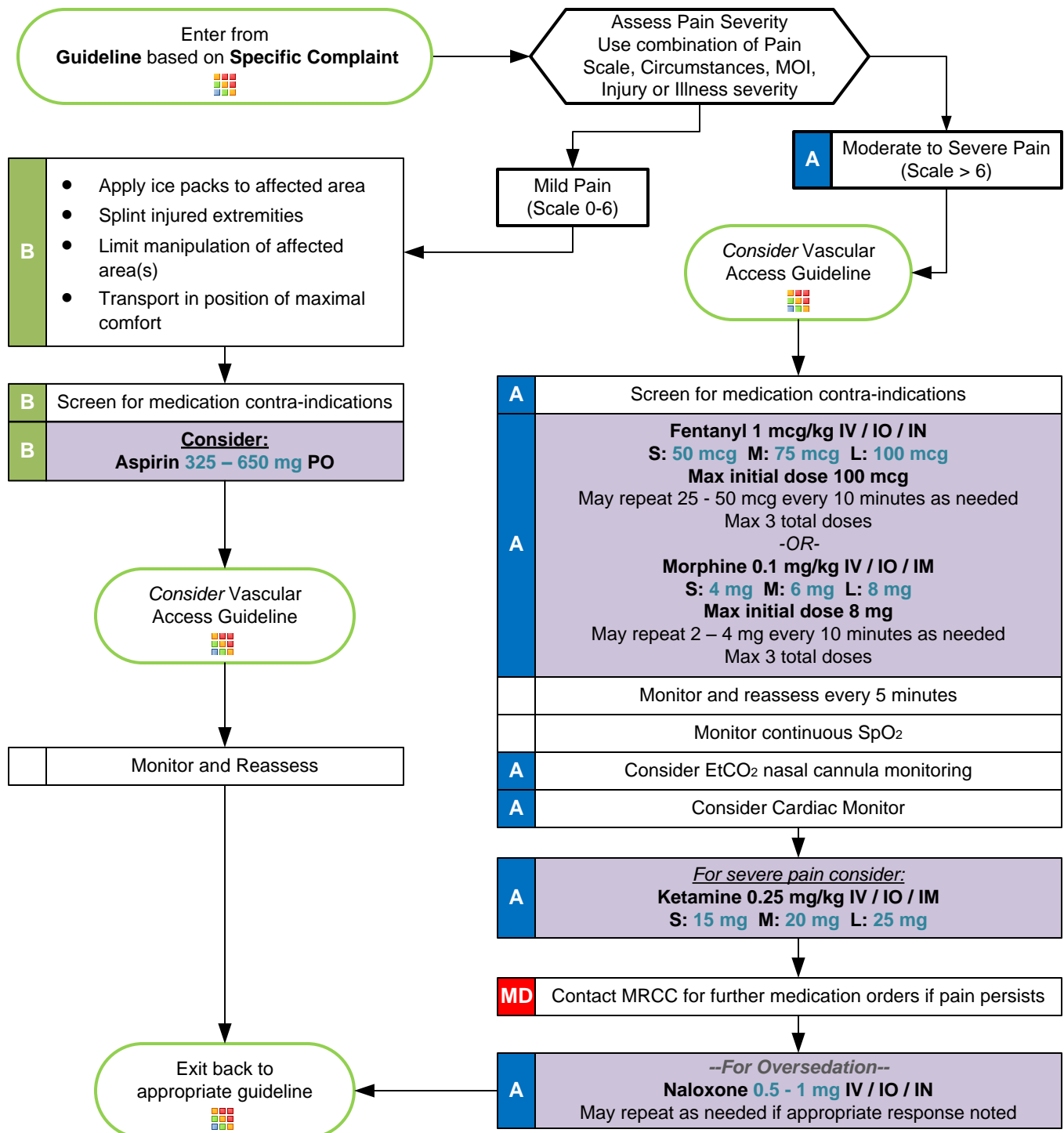
- Age
- Location, Duration
- Severity (1 - 10)
- If child or non-verbal use Wong-Baker faces scale
- Past medical history
- Pregnancy Status
- **Drug Allergies** and Medications

Signs and Symptoms

- Severity (pain scale)
- Quality (sharp, dull, etc.)
- Radiation
- Relation to movement, respiration
- Increased with palpation of area

Differential

- Per the specific protocol
- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleural / Respiratory
- Neurogenic
- Renal (colic)



Pain Control: Adult

Pearls

- **Recommended Exam: Respiratory Status, Mental Status, Area of Pain, Neuro**
- **Pain severity (0-10) is a vital sign to be recorded before and after PO, IV, IO, IM or IN medication delivery and at patient hand off. Monitor BP and respirations closely as sedative and pain control agents may cause hypotension and/or respiratory depression.**
- **Patients may display a wide variation of response to opioid pain medication (Morphine and Fentanyl, aka “narcotics”). Consider the patient’s age, weight, clinical condition, other recent drugs or alcohol, and prior exposure to opiates when determining initial opioid dosing. Weight-based dosing may provide a standard means for dose calculation, but does NOT predict patient response.**
- **Smaller than expected doses of opioids may cause respiratory depression or hypotension in the elderly, opiate naïve, volume depleted, and possibly intoxicated patients.**
- **DO NOT administer aspirin (or other NSAIDS) to patients who are pregnant.**
- **Both arms of the treatment may be used in concert. For patients in Moderate pain for instance, you may use the combination of an oral medication and parenteral if no contraindications are present.**
- **Aspirin should not be used in patients with known renal transplant, patients who are taking blood thinners such as warfarin (Coumadin) or Plavix (unless given for symptoms of cardiac ischemia), in patients who have known drug allergies to NSAIDs (non-steroidal anti-inflammatory medications), with active bleeding, when intracranial bleeding is suspected, when GI Bleeding is suspected, or in patients who may need acute surgical intervention such as abdominal pain (other than suspected kidney stone), open fractures, or obvious deformities.**
- **Vital signs should be obtained before administration, 10 minutes after administration, and before patient hand off with all pain medications.**
- **All patients who receive IM or IV medications must be observed 15 minutes for drug reaction in the event no transport occurs.**
- **Burn patients may require higher than usual opioid doses to effect adequate pain control. Do not hesitate to contact MRCC regarding the pain management strategy for patients in severe pain despite appropriate medications or those with significant burns.**

Adult Cardiac Arrest

History

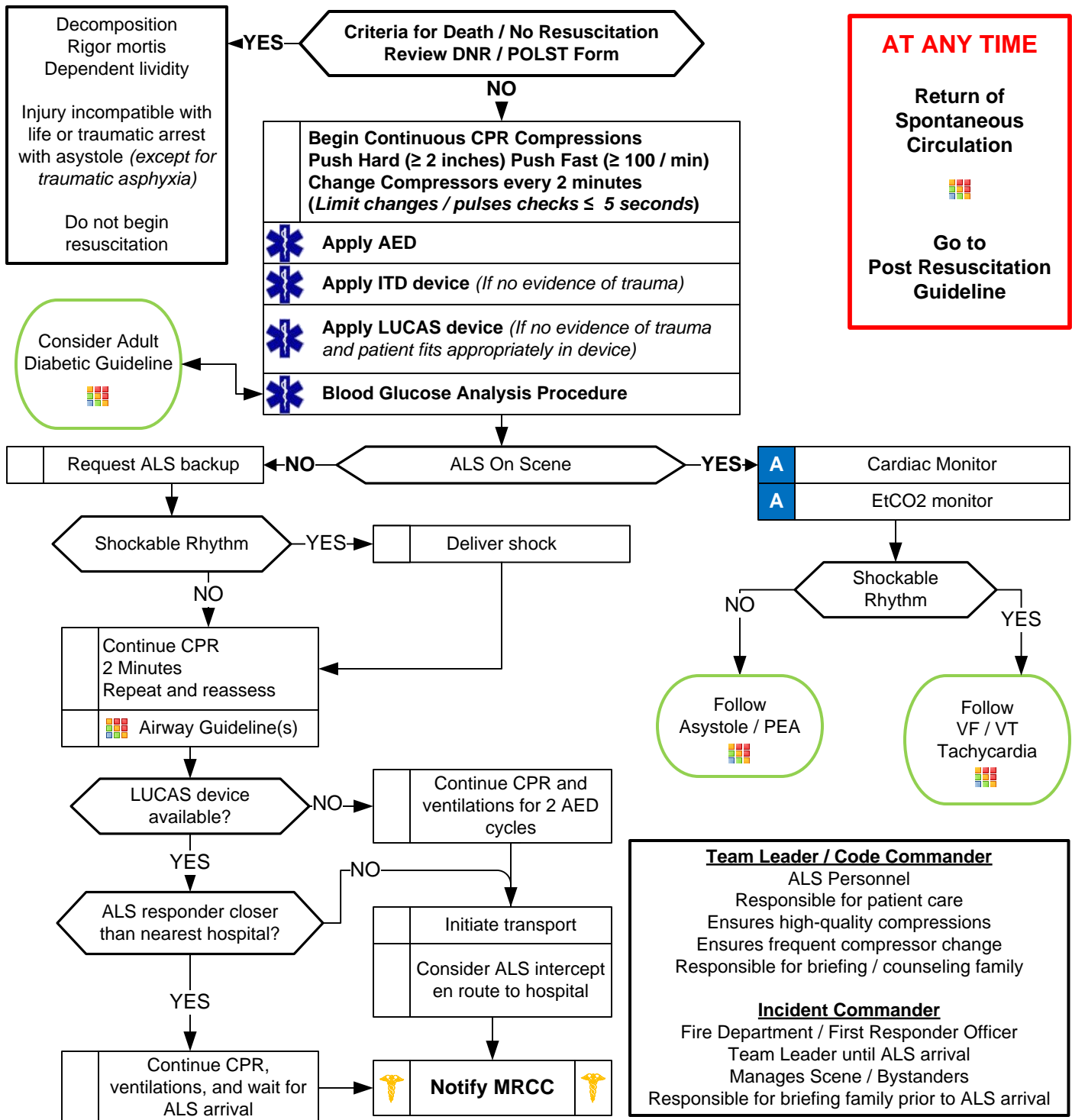
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness

Signs and Symptoms

- Unresponsive
- Apneic
- Pulseless

Differential

- Medical vs. Trauma
- VF vs. Pulseless VT
- Asystole
- PEA
- Primary Cardiac event vs. Respiratory arrest or Drug Overdose



Adult Cardiac Arrest

Cardiac Arrest Code Commander Checklist

- ☐ Code Commander is identified
- ☐ Monitor is visible and a dedicated provider is viewing the rhythm with all leads attached
- ☐ Confirm that continuous compressions are ongoing at 100-120 beats per minute
- ☐ Defibrillations occurring at 2 minute intervals for shockable rhythms
- ☐ O₂ cylinder with adequate oxygen is attached to BVM
- ☐ EtCO₂ waveform is present and value is being monitored
- ☐ ITD (Res-Q-Pod) is in place
- ☐ Vascular access has been obtained (IV or IO) with IV fluids being administered
- ☐ Underlying causes (including tension PTX) are considered and treated early in arrest
- ☐ Gastric distention is not a factor
- ☐ Family is receiving care and is at the patient's side if desired

Post ROSC Cardiac Arrest Checklist

- ☐ ITD has been removed, ASSESS EtCO₂ (should be >20 with good waveform)
- ☐ Assign a provider to maintain FINGER on pulse during all patient movements
- ☐ Continuous visualization of cardiac monitor rhythm
- ☐ Check O₂ supply and SpO₂, TITRATE to > 93%
- ☐ Do not try to obtain a "normal" EtCO₂ by increasing respiratory rate
- ☐ Obtain 12 lead EKG; if STEMI evident, call CODE STEMI to the hospital
- ☐ Assess for & TREAT bradycardias < 60 bpm
- ☐ Obtain Blood Pressure -- Pressor agent(s) indicated for SBP < 90 or MAP < 60
- ☐ Evaluate for post-resuscitation airway placement (e.g. ETT).
- ☐ Unless patient is following verbal commands, consider hypothermia therapy
- ☐ When patient is moved, perform CONTINUOUS PULSE CHECK and monitoring of rhythm
- ☐ Mask is available for BVM in case advanced airway fails
- ☐ Once in ambulance, confirm pulse, breath sounds, SpO₂, EtCO₂, and cardiac rhythm
- ☐ Appropriate personnel available in the back of the ambulance for transport

Pearls

- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation. Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: If no advanced airway (King, ETT) compressions to ventilations are 30:2. If advanced airway in place ventilate 8–10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider SGA first to limit interruptions.**
- **Delay Breathing / Airway management until after second shock and / or 2 rounds of compressions.**
- Resuscitation is based on proper planning and organized execution. Procedures require space and patient access. Make room to work. Utilize team approach by assigning responders to predetermined tasks.
- Reassess, document endotracheal tube placement and EtCO₂ frequently, after every move, and at transfer of care.
- **Maternal Arrest** - Treat mother per appropriate protocol with immediate notification to MRCC and rapid transport. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient's left side. IV / IO access preferably above diaphragm. Defibrillation is safe at all energy levels.
- When faced with dialysis / renal failure patient experiencing cardiac arrest, consider early administration of Calcium Chloride and Sodium Bicarbonate to treat presumed hyperkalemia as possible etiology of arrest.
- Consider Opioid Overdose: Naloxone 2 mg IM / IV / IO / IN.
- Consider possible **CAUSE** of arrest early: For example, resuscitated VF may be STEMI and more rapid transport is indicated. Consider traditional "Hs and Ts" for PEA: Hypovolemia, Hypoxia, Hydrogen ions (acidosis), Hyperkalemia, Hypothermia, Hypo/Hyperglycemia, Tablets/Toxins/Tricyclics, Tamponade, Tension pneumothorax, Thrombosis (MI), Thromboembolism (Pulmonary Embolism), Trauma

Ventricular Fibrillation Pulseless Ventricular Tachycardia

History

- Estimated down time
- Past Medical History
- Medications
- Events leading to arrest
- Renal failure / Dialysis
- DNR or MOST form

Signs and Symptoms

- Unresponsive, apneic, pulseless
- Ventricular fibrillation or ventricular tachycardia on EKG

Differential

- Asystole
- Artifact / Device Failure
- Cardiac
- Endocrine / Medicine
- Drugs
- Pulmonary



Enter from Cardiac Arrest Guideline

B	Charge AED, deliver shock
A	Defibrillate 200 Joules
	After Defibrillation resume CPR immediately Apply LUCAS device as soon as possible (Limit changes / pulses checks ≤ 5 seconds)
	Vascular Access Guideline
	Airway Guideline(s)

AT ANY TIME

Return of
Spontaneous
Circulation

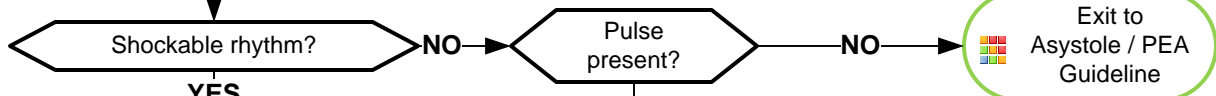


Go to
Post Resuscitation
Guideline

	Resume Continuous CPR Compressions Push Hard (≥ 2 inches) Push Fast (≥ 100 / min) Limit pauses to < 5 seconds
A	Epinephrine (1:10,000) 1 mg IV / IO Repeat every 5 CPR cycles (10 minutes) -or- Vasopressin 40 units IV / IO May replace first or second dose of epinephrine
A	Amiodarone 300mg IV / IO May repeat once at 150 mg IV / IO
	After 2 minutes, check pulse and rhythm Limit pauses to < 5 seconds

	Torsades de Pointes Low Magnesium States (Malnourished / alcoholic) Suspected Digitalis Toxicity
A	Magnesium Sulfate 2g IV / IO

	Renal failure, dialysis, or suspicion for hyperkalemia (wide QRS, tall T-waves)
A	Calcium Chloride 1g IV / IO
A	Sodium Bicarbonate 50 mEq IV / IO



B	Charge AED, deliver shock
A	Defibrillate 200 Joules
	Consider early transport for shockable rhythms, especially if good EtCO ₂ values and/or favorable neurologic signs

YES

	Every 10 minutes
A	Sodium Bicarbonate 50 mEq IV / IO

Return of
Spontaneous Circulation **YES** → Exit to Post Resuscitation Guideline

1. Consider new defib pads in a new location
2. Consider Medical Control
3. Consider termination of efforts vs. transport after 30 minutes

NO

Notify MRCC
Consider Medical Control

Ventricular Fibrillation Pulseless Ventricular Tachycardia

Shockable Rhythm Timeline V-Fib / V-Tach

	BLS Provider Compressions	BLS Provider Ventilations	ALS Provider Monitor / Airway	ALS Provider Medications
Arrival	Start CPR	BVM + ITD (ResQPod)	Shock Apply cardiac monitor	Vascular Access Infuse normal saline
2 minutes	Apply LUCAS device	Monitor EtCO ₂	Shock	Epinephrine 1mg (1:10,000)
4 minutes	Restart CPR immediately after pulse/rhythm check	Consider SGA (King) or ET tube	Shock Assist with advanced airway	Amiodarone 300 mg
6 minutes	Restart CPR immediately after pulse/rhythm check	Ongoing ventilations 8 - 10 bpm	Shock	Sodium Bicarbonate 50 mEq <i>Repeat every 10 minutes</i>
8 minutes	Restart CPR immediately after pulse/rhythm check		Shock	Amiodarone 150 mg
10 minutes	Restart CPR immediately after pulse/rhythm check		Shock	
12 minutes	Restart CPR immediately after pulse/rhythm check		Shock	Epinephrine 1mg (1:10,000) <i>Repeat every 10 minutes</i>

H's/T's

- **Hypovolemia**
- **Hypoxia**
- Hydrogen ion (acidosis)
- Hypothermia
- Hypo / Hyperkalemia
- Hypoglycemia
- Tension pneumothorax
- Tamponade; cardiac
- **Toxins**
- Thrombosis; pulmonary (PE)
- Thrombosis; coronary (MI)

It is always important to perform a thorough physical exam and obtain a SAMPLE history to identify any reversible causes of cardiac arrest.

Pearls

- **Recommended Exam: Mental Status**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Consider early IO placement if available and difficult IV anticipated.**
- **DO NOT HYPERVENTILATE: Ventilate 8 – 10 breaths per minute or as guided by EtCO₂, with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider SGA first to limit interruptions.**
- **Consider Breathing / Airway management after second shock and / or 2 rounds of compressions.**
- High quality CPR and prompt defibrillation are the keys to successful resuscitation.
- Reassess and document endotracheal tube placement and EtCO₂ frequently, after every move, and at transfer of care.
- Do not stop CPR to check for placement of ET tube or to give medications.
- If BVM is ventilating the patient successfully, intubation should be deferred until other interventions have been completed.

Adult Asystole / PEA

History

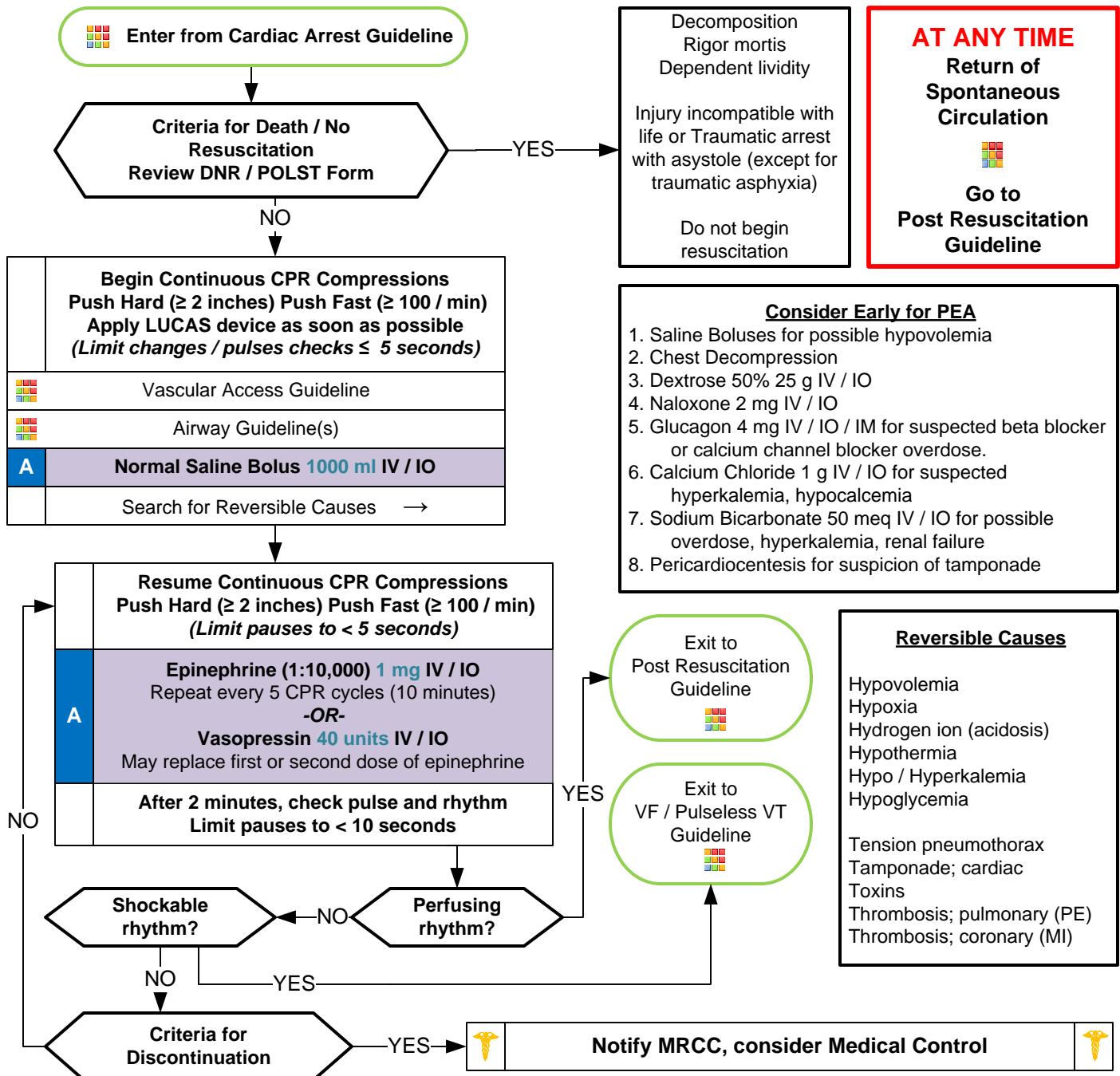
- Past medical history
- Medications
- Events leading to arrest
- End stage renal disease
- Estimated downtime
- Suspected hypothermia
- Suspected overdose
 - Tricyclic
 - Digitalis
 - Beta blockers
 - Calcium channel blockers
- DNR, POLST, or Living Will

Signs and Symptoms

- Pulseless
- Apneic
- No electrical activity on ECG
- No heart tones on auscultation

Differential

- Hypovolemia (Trauma, AAA, other)
- Cardiac tamponade
- Hypothermia
- Drug overdose (Tricyclic, Digitalis, Beta blockers, Calcium channel blockers)
- Massive myocardial infarction
- Hypoxia
- Tension pneumothorax
- Pulmonary embolus
- Acidosis
- Hyperkalemia



Adult Asystole / PEA

Non-shockable Rhythm Timeline Asystole / PEA

	BLS Provider Compressions	BLS Provider Ventilations	ALS Provider Monitor / Airway	ALS Provider Medications
Arrival	Start CPR	BVM + ITD (ResQPod)	Apply cardiac monitor	Vascular Access Infuse normal saline
2 minutes	Apply LUCAS device	Monitor EtCO ₂	Check monitor	Epinephrine 1mg (1:10,000)
4 minutes	Restart CPR immediately after pulse/rhythm check	Consider SGA (King) or ET tube	Check monitor Assist with advanced airway	Review H's/T's Interventions as indicated
6 minutes	Restart CPR immediately after pulse/rhythm check	Ongoing ventilations 8 - 10 bpm	Check monitor	Sodium Bicarbonate 50 mEq <i>Repeat every 10 minutes</i>
8 minutes	Restart CPR immediately after pulse/rhythm check		Check monitor	
10 minutes	Restart CPR immediately after pulse/rhythm check		Check monitor	
12 minutes	Restart CPR immediately after pulse/rhythm check		Check monitor	Epinephrine 1mg (1:10,000) <i>Repeat every 10 minutes</i>

Pearls

- SURVIVAL FROM PEA OR ASYSTOLE is based on identifying and correcting the CAUSE: consider a broad differential diagnosis with early and aggressive treatment of possible causes.
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: Ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions, or as guided by ETCO₂.**
- **Do not interrupt compressions to place endotracheal tube. Consider SGA first to limit interruptions.**
- **Defer Breathing / Airway management until after 2 rounds of compressions (2 minutes each round)**
- Success is based on proper planning and execution. Procedures require space and patient access; make room to work.
- There is a potential association of PEA with hypoxia so placing a definitive airway with oxygenation early may provide benefit.
- PEA caused by sepsis or severe volume loss may benefit from higher volume of normal saline administration.
- Return of spontaneous circulation after Asystole / PEA requires continued search for underlying cause of cardiac arrest.
- Treatment of hypoxia and hypotension are important after resuscitation from Asystole / PEA.
- Asystole is commonly an end-stage rhythm following prolonged VF or PEA with a poor prognosis.
- Consider sodium bicarbonate early in the dialysis / renal patient, known hyperkalemia, or tricyclic overdose at 50 mEq IV / IO.
- Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.
- Consider early use of the Overdose / Toxic Ingestion Protocol to guide interventions if appropriate.

Post-Resuscitation

History

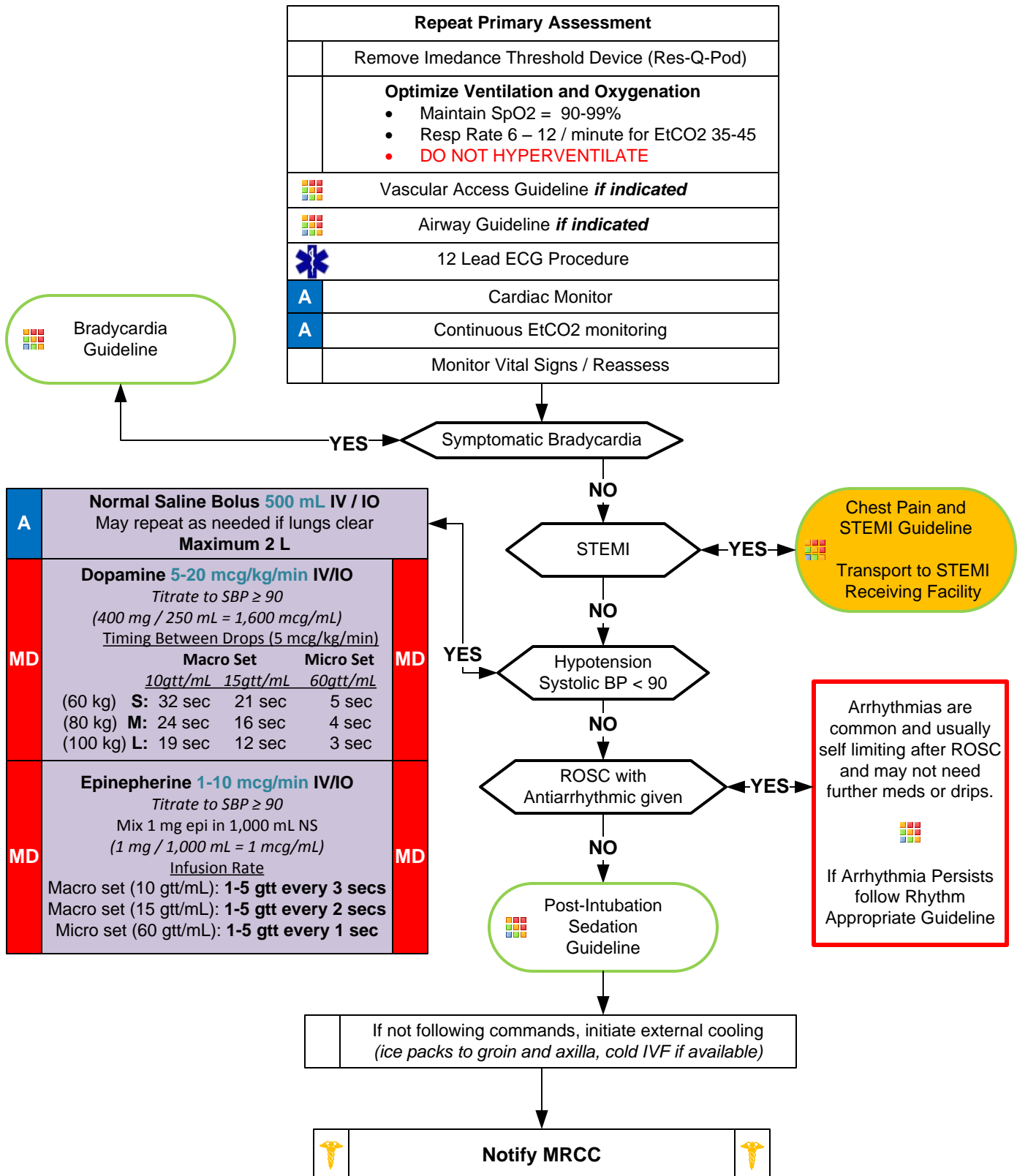
- Respiratory arrest
- Cardiac arrest

Signs/Symptoms

- Return of pulse

Differential

- Continue to address specific differentials associated with the original dysrhythmia



Post ROSC Cardiac Arrest Checklist

- ☐ ITD has been removed, ASSESS EtCO₂ (should be >20 with good waveform)
- ☐ Assign a provider to maintain FINGER on pulse during all patient movements
- ☐ Continuous visualization of cardiac monitor rhythm
- ☐ Check O₂ supply and SpO₂ to TITRATE to 94-99%
- ☐ Do not try to obtain a "normal" EtCO₂ by increasing respiratory rate
- ☐ Obtain 12 lead EKG; if STEMI evident, call CODE STEMI to the hospital
- ☐ Assess for & TREAT bradycardias < 60 bpm
- ☐ Obtain Blood Pressure -- Pressor agent(s) indicated for SBP < 90 or MAP < 60
- ☐ Evaluate for post-resuscitation airway placement (e.g. ETT).
- ☐ Unless patient is following verbal commands, initiate external cooling.
- ☐ When patient is moved, perform CONTINUOUS PULSE CHECK and continuous monitoring of cardiac rhythm
- ☐ Mask is available for BVM in case advanced airway fails
- ☐ Once in ambulance, confirm pulse, breath sounds, SpO₂, EtCO₂, and cardiac rhythm
- ☐ Appropriate personnel present in the back of the ambulance for transport

Pearls

- **Recommended Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro**
- **Continue to search for potential cause of cardiac arrest during post-resuscitation care.**
- **Hyperventilation is a significant cause of hypotension and recurrence of cardiac arrest in the post resuscitation phase and must be avoided at all costs.**
- **Initial EtCO₂ may be elevated immediately post-resuscitation but will usually normalize. While goal is 35 – 45 mm Hg, avoid hyperventilation.**
- **Transport to facility capable of managing the post-arrest patient including hypothermia therapy, cardiac catheterization and intensive care service.**
- Most patients immediately post resuscitation will require ventilatory assistance.
- The condition of post-resuscitation patients fluctuates rapidly and continuously and they require close monitoring. Appropriate post-resuscitation management may require consultation with medical control.
- Common causes of post-resuscitation hypotension include hyperventilation, hypovolemia, pneumothorax, and medication reaction to ALS drugs.
- Titrate Dopamine or other vasopressors to maintain SBP ≥ 90. Ensure adequate fluid resuscitation is ongoing.

Adult Tachycardia Narrow Complex (QRS < 120 ms)

History

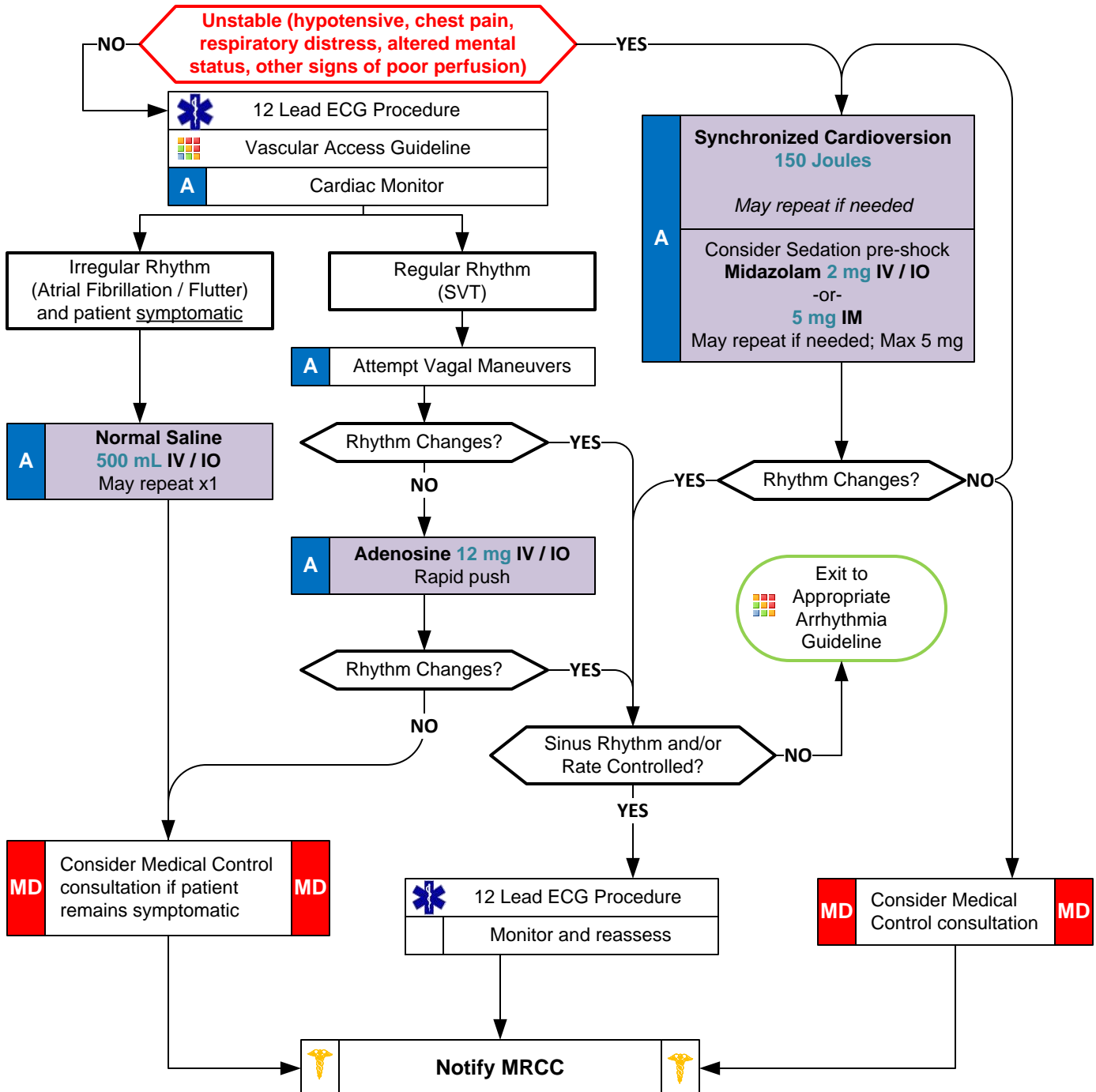
- Medications
(Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin)
- Diet (caffeine, chocolate)
- Drugs (nicotine, cocaine)
- Past medical history
- History of palpitations / heart racing
- Syncope / near syncope

Signs and Symptoms

- Heart Rate > 150
- Systolic BP < 90
- Dizziness, CP, SOB, AMS, Diaphoresis
- CHF
- Potential presenting rhythm
Atrial/Sinus tachycardia
Atrial fibrillation / flutter
Multifocal atrial tachycardia
Ventricular Tachycardia

Differential

- Heart disease (WPW, Valvular)
- Sick sinus syndrome
- Myocardial infarction
- Electrolyte imbalance
- Exertion, Pain, Emotional stress
- Fever
- Hypoxia
- Hypovolemia or Anemia
- Drug effect / Overdose (see HX)
- Hyperthyroidism
- Pulmonary embolus



Adult Tachycardia

Narrow Complex (QRS < 120 ms)

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Most important goal is to differentiate the type of tachycardia (regular vs irregular) and if STABLE or UNSTABLE.**
- **If at any point patient becomes unstable move to unstable arm in algorithm.**
- **For ASYMPTOMATIC PATIENTS (or those with only minimal symptoms, such as palpitations) and any tachycardia with rate approximately 100-120 and a normal blood pressure, consider CLOSE OBSERVATION and/or fluid bolus rather than immediate treatment with an anti-arrhythmic medication. A patient's "usual" atrial fibrillation, for example, may not require emergent treatment.**
- **Symptomatic tachycardia usually occurs at rates of 120 -150 and typically ≥ 150 beats per minute. Patients symptomatic with heart rates < 150 likely have impaired cardiac function such as CHF.**
- **Serious Signs / Symptoms:**
Hypotension. Acutely altered mental status. Signs of shock / poor perfusion. Chest pain with evidence of ischemia (STEMI, T wave inversions or depressions.) Acute CHF. Significant breathing difficulty.
- **Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.**
- **If patient has history of or 12 Lead ECG evidence of Wolfe Parkinson White (WPW) syndrome, DO NOT GIVE Adenosine. Cardioversion should be performed if patient becomes unstable.**
- **Typical sinus tachycardia is in the range of 100 to [200 - patient's age] beats per minute.**
- **Regular Narrow-Complex Tachycardias:**
 - Vagal maneuvers and adenosine are preferred. Vagal maneuvers may convert up to 25 % of SVT.
 - Adenosine should be pushed rapidly via proximal IV site followed by 10 mL Normal Saline rapid flush.
- **Irregular Tachycardias:**
 - Adenosine will not be effective in atrial fibrillation / flutter. It may help identify rhythm but generally is not helpful.
- **Synchronized Cardioversion:**
Recommended to treat UNSTABLE Atrial Fibrillation, Atrial Flutter and Monomorphic-Regular Tachycardia (SVT.)
- **Monitor for respiratory depression and hypotension associated with Midazolam.**
- **Continuous pulse oximetry is required for all SVT patients.**
- **Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.**

Adult Tachycardia Wide Complex (QRS ≥ 120 ms)

History

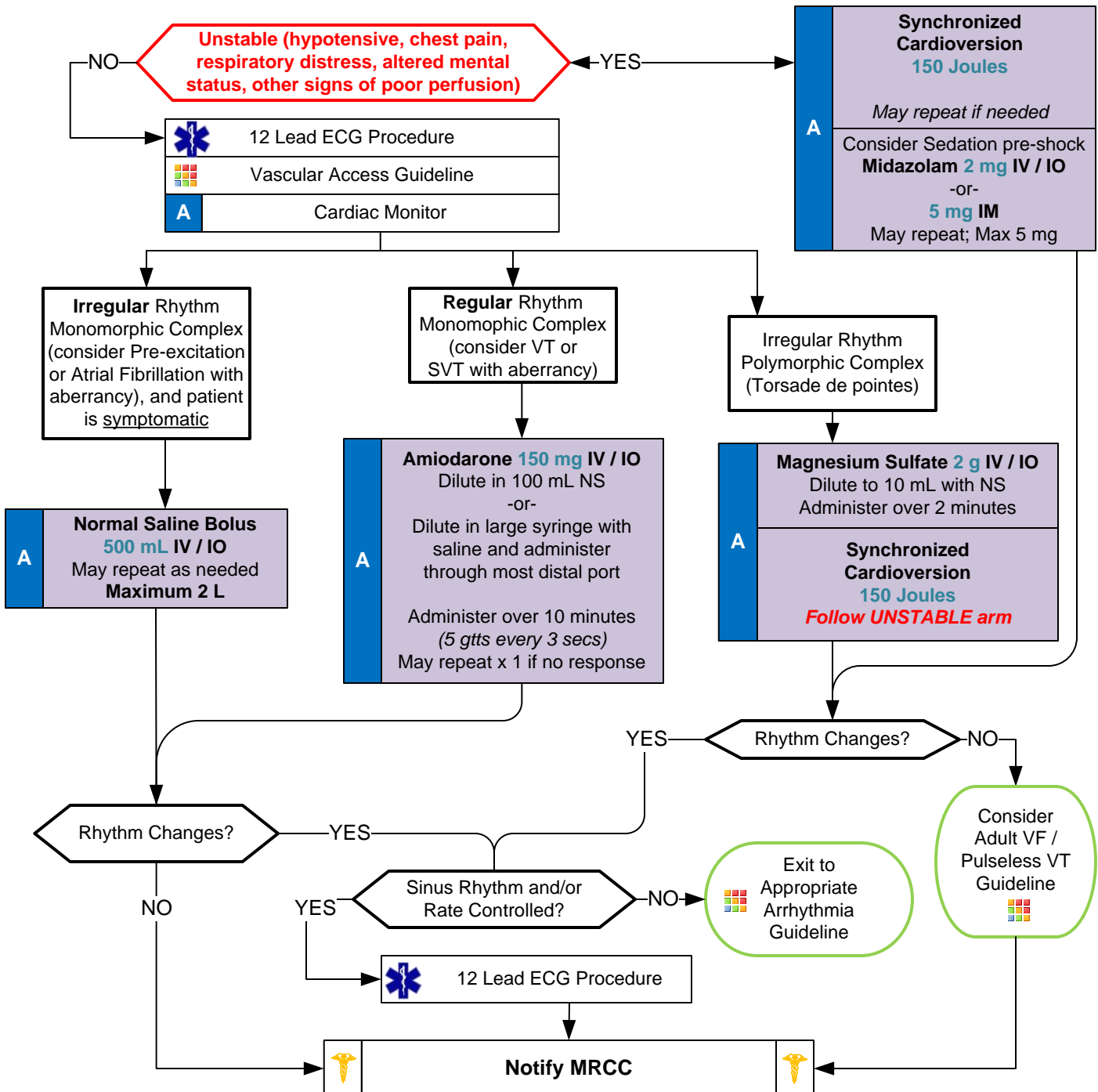
- Medications (Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin)
- Diet (caffeine, chocolate)
- Drugs (nicotine, cocaine)
- Past medical history
- History of palpitations / heart racing
- Syncope / near syncope

Signs and Symptoms

- Heart Rate > 150
- Systolic BP < 90
- Dizziness, CP, SOB, AMS, Diaphoresis
- CHF
- Potential presenting rhythm
 - Atrial/Sinus tachycardia
 - Atrial fibrillation / flutter
 - Multifocal atrial tachycardia
 - Ventricular Tachycardia

Differential

- Heart disease (WPW, Valvular)
- Sick sinus syndrome
- Myocardial infarction
- Electrolyte imbalance
- Exertion, Pain, Emotional stress
- Fever
- Hypoxia
- Hypovolemia or Anemia
- Drug effect / Overdose (see HX)
- Hyperthyroidism
- Pulmonary embolus



Adult Tachycardia Wide Complex (QRS \geq 120 ms)

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Most important goal is to differentiate the type of tachycardia (regular vs irregular) and if STABLE or UNSTABLE.**
- **If at any point patient becomes unstable move to unstable arm in algorithm.**
- **For ASYMPTOMATIC PATIENTS (or those with only minimal symptoms, such as palpitations) and any tachycardia with rate approximately 100-120 and a normal blood pressure, consider CLOSE OBSERVATION and/or fluid bolus rather than immediate treatment with an anti-arrhythmic medication. A patient's "usual" atrial fibrillation with aberrancy, for example, may not require emergent treatment.**
- **A single-lead ECG is adequate to diagnose and treat an arrhythmia. A 12-lead ECG is not necessary to diagnose and treat, but is preferred when the patient is stable.**
- **Symptomatic tachycardia usually occurs at rates of 120 – 150 and typically \geq 150 beats per minute. Patients symptomatic with heart rates $<$ 150 likely have impaired cardiac function such as CHF.**
- **Serious Signs / Symptoms:**
 - Hypotension. Acutely altered mental status. Signs of shock / poor perfusion. Chest pain with evidence of ischemia (STEMI, T wave inversions or depressions.) Acute congestive heart failure.**
- **Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.**
- **Typical sinus tachycardia is in the range of 100 to (220 – patients age) beats per minute.**
- **Regular Wide-Complex Tachycardias:**
 - Unstable condition:**
 - Immediate cardioversion
 - Stable condition:**
 - Typically VT (most common) or SVT with aberrancy. Amiodarone is the appropriate treatment for stable patients. Defibrillate unstable patients.
 - Arrhythmias with suspicion of WPW should only be treated with medical control orders.
- **Irregular Tachycardias:**
 - Wide-complex, irregular tachycardia will usually require cardioversion. Consider medical control.
- **Polymorphic / Irregular Wide- Complex Tachycardia:**
 - This situation is usually unstable and immediate defibrillation is warranted.
 - When associated with prolonged QT this may be Torsades de pointes: Give 2g of Magnesium Sulfate slow IV / IO. Without prolonged QT, likely related to ischemia and Magnesium may not be helpful.
- **Monitor for respiratory depression and hypotension associated with Midazolam.**
- **Continuous pulse oximetry is required for all Wide Complex Tachycardia Patients.**
- **Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.**

Adult Bradycardia

History

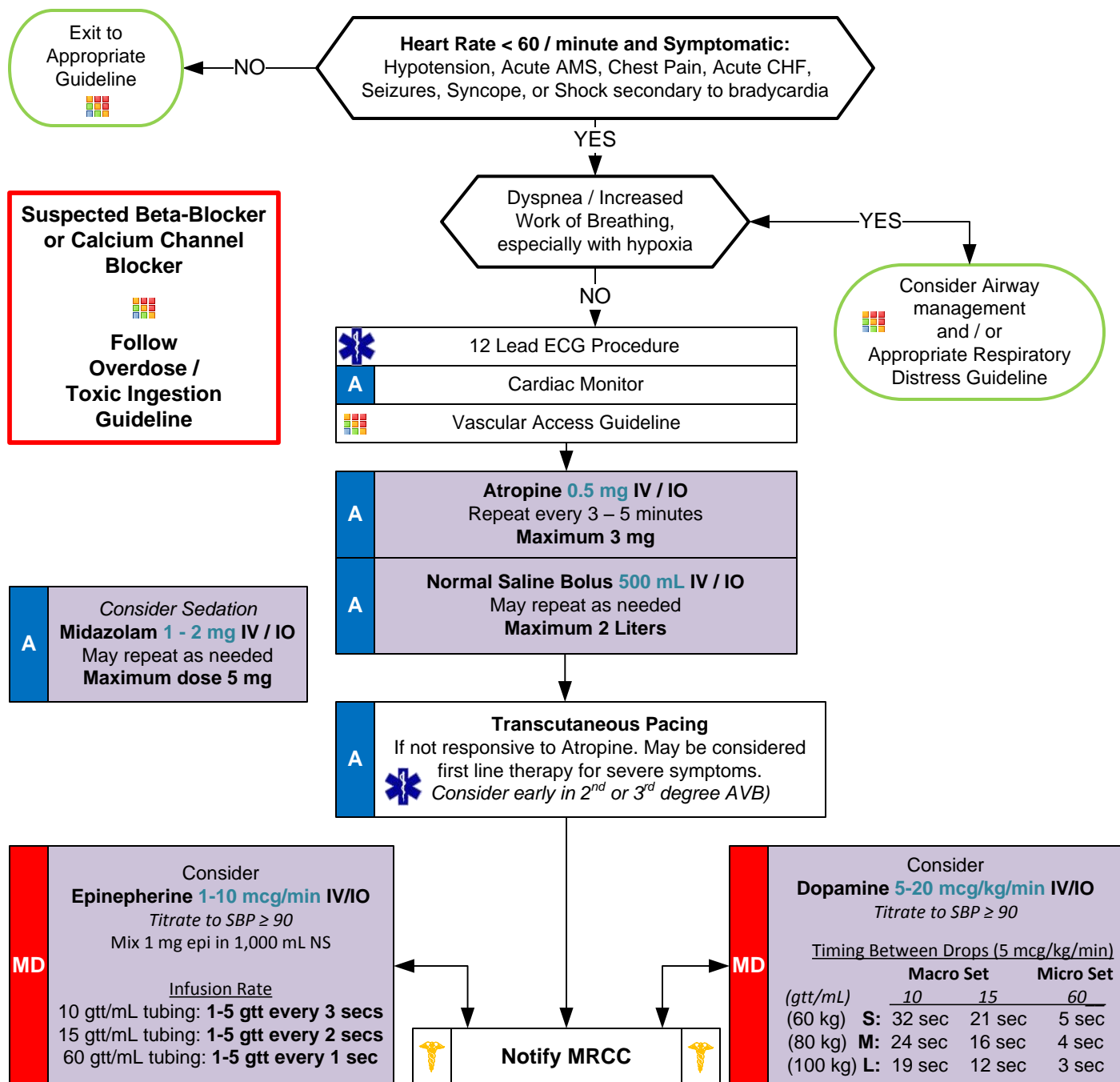
- Past medical history
- Medications
 - Beta-Blockers
 - Calcium channel blockers
 - Clonidine
 - Digoxin
- Pacemaker

Signs and Symptoms

- HR < 60/min with hypotension, acute altered mental status, chest pain, acute CHF, seizures, syncope, or shock secondary to bradycardia
- Chest pain
- Respiratory distress
- Hypotension or Shock
- Altered mental status
- Syncope

Differential

- Acute myocardial infarction
- Hypoxia
- Pacemaker failure
- Hypothermia
- Sinus bradycardia
- Athletes
- Head injury (elevated ICP) or Stroke
- Spinal cord lesion
- Sick sinus syndrome
- AV blocks (1°, 2°, or 3°)
- Overdose



Adult Bradycardia

Pearls

- **Recommended Exam: Mental Status, Neck, Heart, Lungs, Neuro**
- **Bradycardia causing symptoms is typically < 50/minute. Rhythm should be interpreted in the context of symptoms and pharmacological treatment given only when symptomatic, otherwise monitor and reassess**
- **Identifying signs and symptoms of poor perfusion caused by bradycardia are paramount.**
- **Atropine vs. Pacing: Caution in setting of acute MI. The use of Atropine for PVCs in the presence of an MI may worsen heart damage. Providers should **NOT DELAY Transcutaneous Pacing** for patients with poor perfusion in the setting of acute MI or second or third degree heart block.**
- **Atropine is ineffective in cardiac transplantation.**
- For patients who are not in second or third degree heart block, either dopamine or pacing or both may be considered for bradycardia not responsive to atropine. Prepare to utilize transcutaneous pacing early if no response to atropine; dopamine may be an effective adjunct for hypotensive patients.
- Wide complex or bizarre appearance of QRS complex with slow rhythm may indicate hyperkalemia.
- Consider treatable causes for bradycardia (Beta Blocker OD, Calcium Channel Blocker OD, etc.)
- Hypoxemia is a common cause of bradycardia. Be sure to oxygenate the patient and support respiratory effort.

Chest Pain: Cardiac and STEMI

History

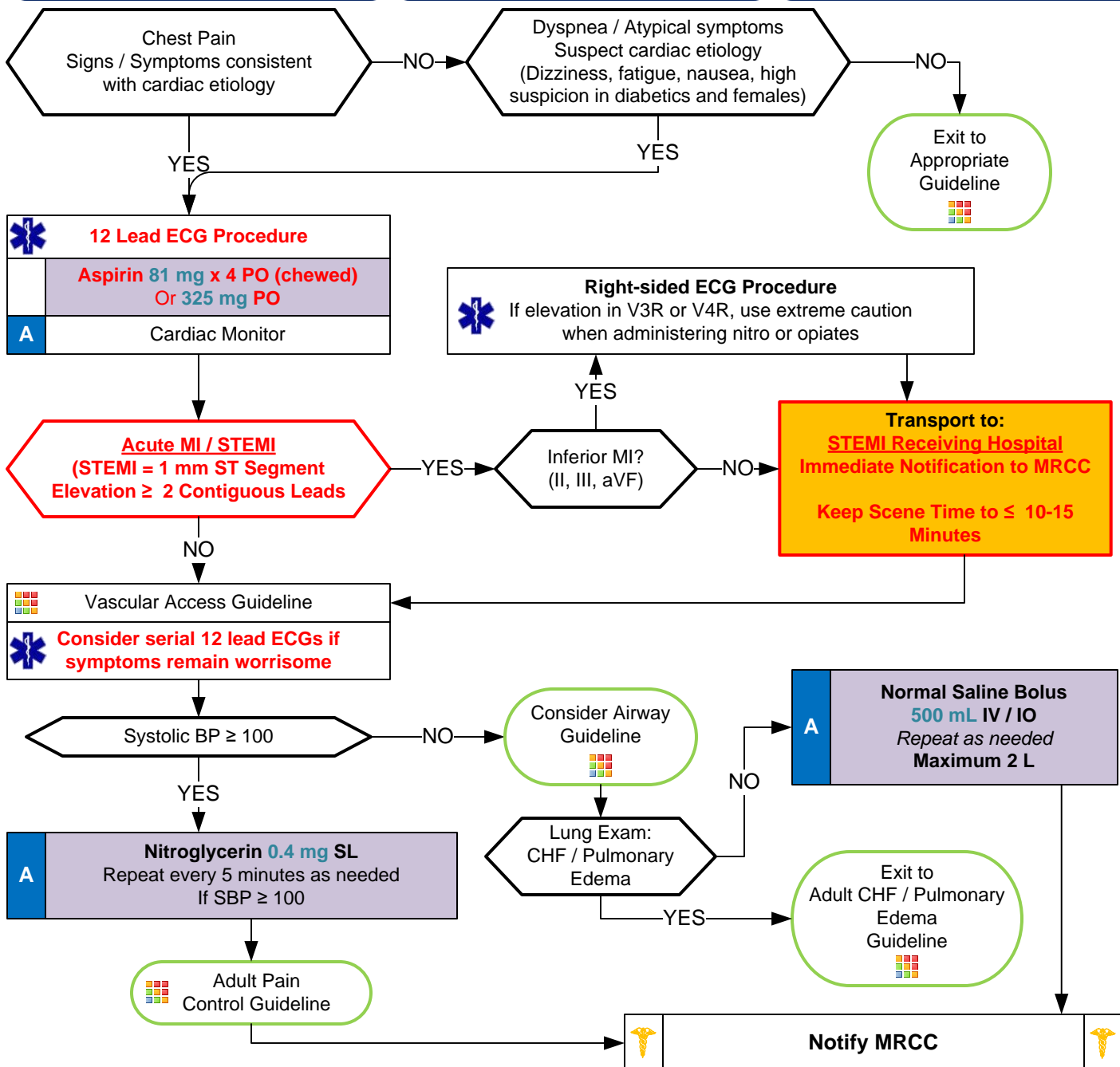
- Age
- Medications (Viagra / sildenafil, Levitra / vardenafil, Cialis / tadalafil)
- Past medical history (MI, Angina, Diabetes, post menopausal)
- Allergies
- Recent physical exertion
- **Palliation / Provocation**
- **Quality** (crampy, constant, sharp, dull, etc.)
- **Region / Radiation / Referred**
- **Severity** (1-10)
- **Time** (onset /duration / repetition)

Signs and Symptoms

- CP (pain, pressure, aching, vice-like tightness)
- Location (substernal, epigastric, arm, jaw, neck, shoulder)
- Radiation of pain
- Pale, diaphoresis
- Shortness of breath
- Nausea, vomiting, dizziness
- **Time of Onset**

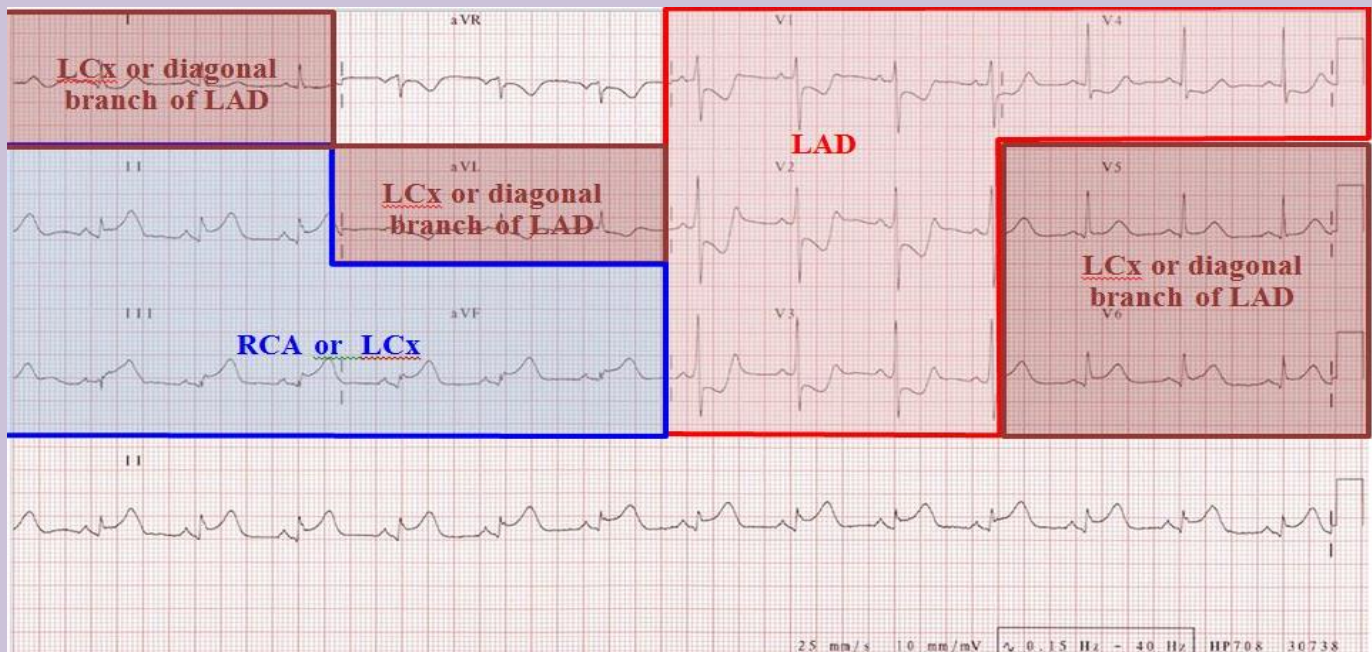
Differential

- Trauma vs. Medical
- Angina vs. Myocardial infarction
- Pericarditis
- Pulmonary embolism
- Asthma / COPD
- Pneumothorax
- Aortic dissection or aneurysm
- GE reflux or Hiatal hernia
- Esophageal spasm
- Chest wall injury or pain
- Pleural pain
- Overdose (Cocaine) or Methamphetamine



Chest Pain: Cardiac and STEMI

STEMI/Culprit Vessel Localization Aid:



ST Elevation in 2 or more leads: II, III, aVF = Inferior wall MI (vessel likely RCA or LCx)

ST Elevation in 2 or more leads: I, aVL, V5, V6 = Lateral wall MI (vessel likely LCx or LAD branch)

ST Elevation in 2 or more leads: V1, V2, V3, V4 = Septal/Anterior wall MI (vessel likely LAD)

**Look for ST DEPRESSION in reciprocal leads (opposite wall) to confirm diagnosis.

STEMI Criteria for pre-hospital cath lab activation:

- Narrow QRS complex (< 120 ms or 0.12 sec)
- ST elevation \geq 2mm in 2 or more anatomically adjacent V-leads
- ST elevation \geq 1mm in 2 or more anatomically adjacent limb leads (I, II, III, aVF, aVL)
- Reciprocal ST depression
- New left bundle branch block (if confirmed to be new) with symptoms of cardiac ischemia

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Consider applying defibrillation patches to patients with LAD territory MI's due to high risk for cardiac arrest. RCA territory MI's have a high risk of cardiogenic shock and/or bradycardia requiring treatment.**
- **Avoid Nitroglycerin in any patient who has used Viagra (sildenafil) or Levitra (vardenafil) in the past 24 hours or Cialis (tadalafil) in the past 36 hours due to potential severe hypotension.**
- **Patients with STEMI (ST-Elevation Myocardial Infarction) should be transported to a STEMI receiving facility.**
- **If CHF / Cardiogenic shock resulting from inferior (II, III, aVF) MI, consider right Sided ECG. If ST elevation noted in transposed V3 or V4, nitroglycerin and / or opioids may cause hypotension requiring fluid boluses.**
- If patient has taken his own nitroglycerin without relief, consider potency of the medication.
- Monitor for hypotension after administration of nitroglycerin and narcotics.
- Nitroglycerin and opioids may be repeated per dosing guidelines.
- Diabetics, geriatric and female patients often have atypical pain, or only generalized complaints. Have a low threshold to perform a 12 lead EKG in these patients.
- Document the time of the 12-Lead ECG in the PCR as a Procedure along with the interpretation (EMT-P.)
- **EMT-B may administer Nitroglycerin to patients who are already prescribed this medication.**

CHF / Pulmonary Edema

History

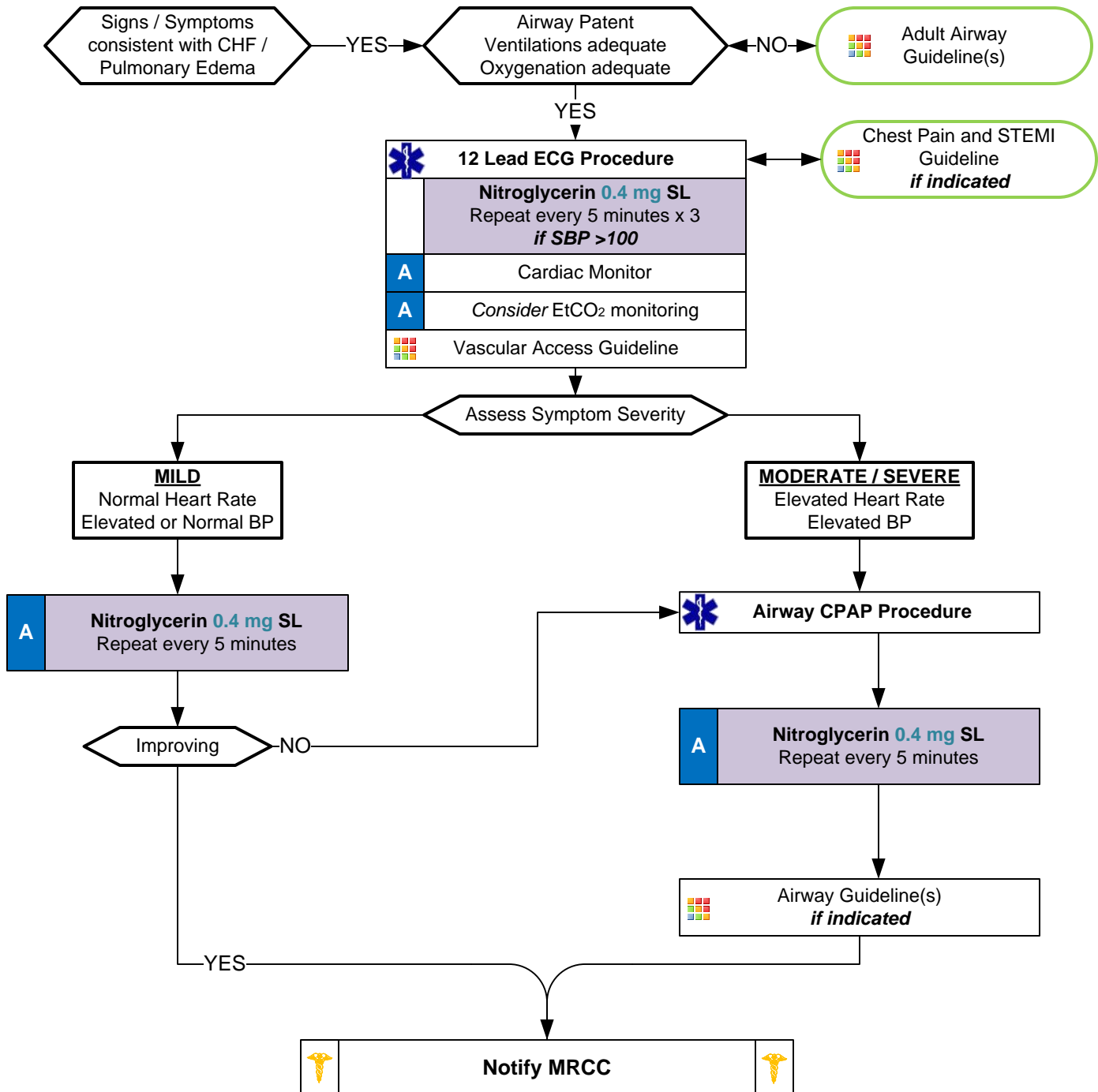
- Congestive heart failure
- Past medical history
- Medications (digoxin, Lasix, Viagra / sildenafil, Levitra / vardenafil, Cialis / tadalafil)
- Cardiac history --past myocardial infarction

Signs and Symptoms

- Respiratory distress, bilateral rales
- Apprehension, orthopnea
- Jugular vein distention
- Pink, frothy sputum
- Peripheral edema, diaphoresis
- Hypotension, shock
- Chest pain

Differential

- Myocardial infarction
- Congestive heart failure
- Asthma
- Anaphylaxis
- Aspiration
- COPD
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pericardial tamponade
- Toxic Exposure



Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Avoid Nitroglycerin in any patient who has used Viagra (sildenafil) or Levitra (vardenafil) in the past 24 hours or Cialis (tadalafil) in the past 36 hours due to potential severe hypotension.**
- **Carefully monitor the level of consciousness, BP, and respiratory status with the above interventions.**
- **If CHF / Cardiogenic shock is resulting from inferior (II, III, aVF) MI, consider right sided ECG. If ST elevation is noted in transposed V3 or V4, nitroglycerin and / or opioids may cause hypotension requiring fluid boluses.**
- If patient has taken his own nitroglycerin without relief, consider potency (or lack of potency) of the medication.
- Consider myocardial infarction in all of these patients. Diabetics, geriatric and female patients often have atypical pain, or only generalized complaints.
- Allow the patient to be in a position of comfort to maximize their breathing effort.
- Document CPAP application using the CPAP procedure in the PCR. Document 12 Lead ECG using the 12 Lead ECG procedure.
- **EMT-B may administer Nitroglycerin to patients who are already prescribed this medication.**
- Consider Midazolam 1-2 mg IV to assist with CPAP compliance. Benzodiazepines may precipitate respiratory depression or may actually worsen compliance with CPAP in patients who are already tired, already with altered mental status, or who have recent history of alcohol or drug ingestion. All efforts at verbal coaching should be utilized prior to giving benzodiazepines for patients in respiratory distress.

Abdominal Pain

History

- Age
- Past medical / surgical history
- Medications
- Onset
- Palliation / Provocation
- Quality (crampy, constant, sharp, dull, etc.)
- Region / Radiation / Referred
- Severity (1-10)
- Time (duration / repetition)
- Fever
- Last meal eaten
- Last bowel movement / emesis
- Menstrual history (pregnancy)

Signs and Symptoms

- Pain (location / migration)
- Tenderness
- Nausea
- Vomiting
- Diarrhea
- Dysuria
- Constipation
- Vaginal bleeding / discharge
- Pregnancy

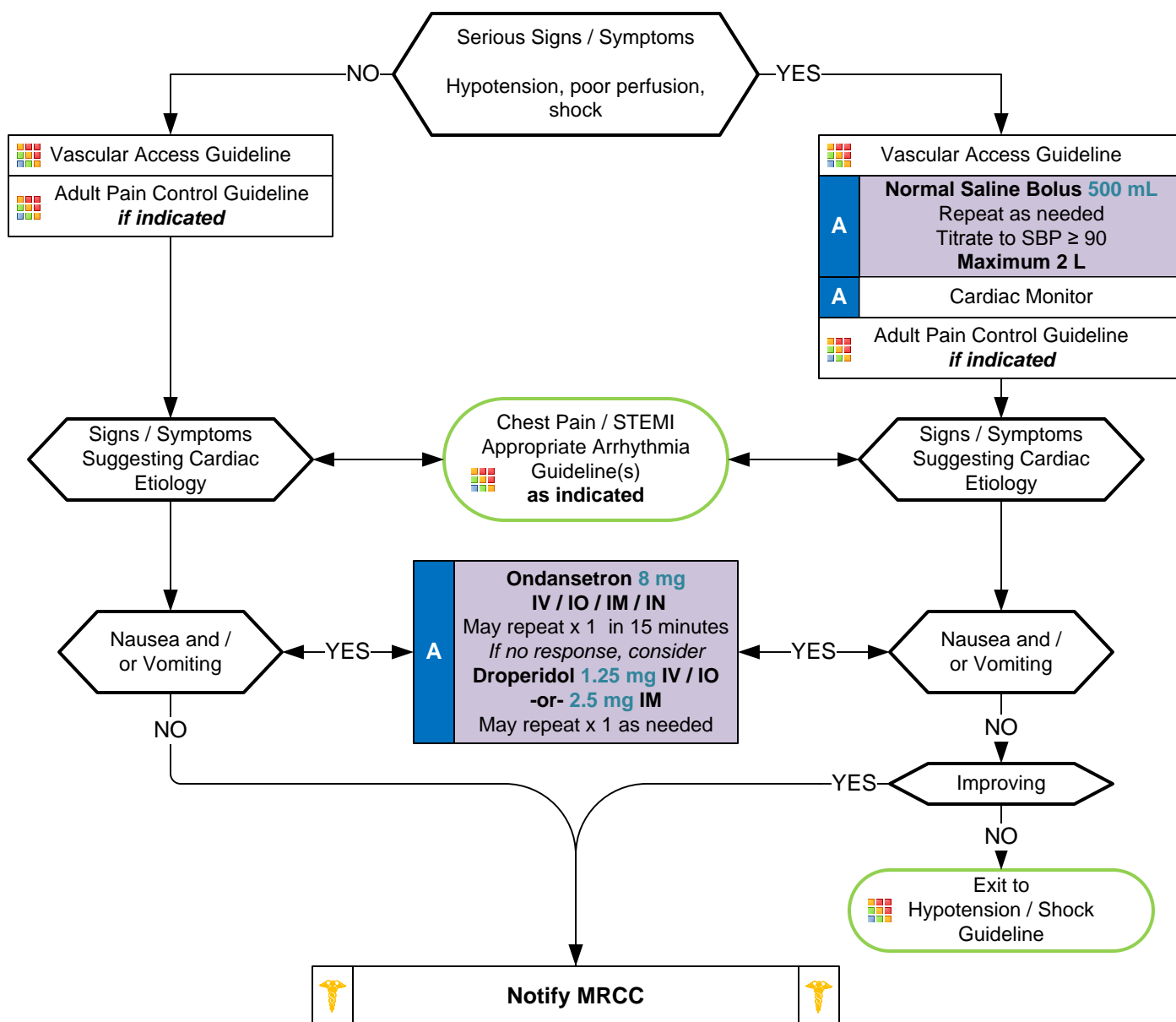
Associated symptoms:

(Helpful to localize source)

Fever, headache, weakness, malaise, myalgias, cough, headache, mental status changes, rash

Differential

- Pneumonia or Pulmonary embolus
- Liver (hepatitis, CHF)
- Peptic ulcer disease / Gastritis
- Gallbladder
- Myocardial infarction
- Pancreatitis
- Kidney stone
- Abdominal aneurysm
- Appendicitis
- Bladder / Prostate disorder
- Pelvic (PID, Ectopic pregnancy, Ovarian cyst)
- Spleen enlargement
- Diverticulitis
- Bowel obstruction
- Gastroenteritis (infectious)
- Ovarian and Testicular Torsion



Abdominal Pain

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lung, Abdomen, Back, Extremities, Neuro**
- Document the mental status and vital signs prior to administration of anti-emetics
- Abdominal pain in women of childbearing age should be treated as pregnancy related until proven otherwise.
- The diagnosis of abdominal aneurysm should be considered with abdominal pain or back pain especially in patients over 50, elderly males complaining of testicular pain, and / or patients with shock/ poor perfusion.
- Repeat vital signs after each fluid bolus.
- Consider cardiac etiology in patients > 50, diabetics and / or women especially with upper abdominal complaints. Have a low threshold to perform a 12-lead EKG on these patients.
- Use caution with administration of Droperidol in elderly patients; may cause extra sedation.

Allergic Reaction / Anaphylaxis

History

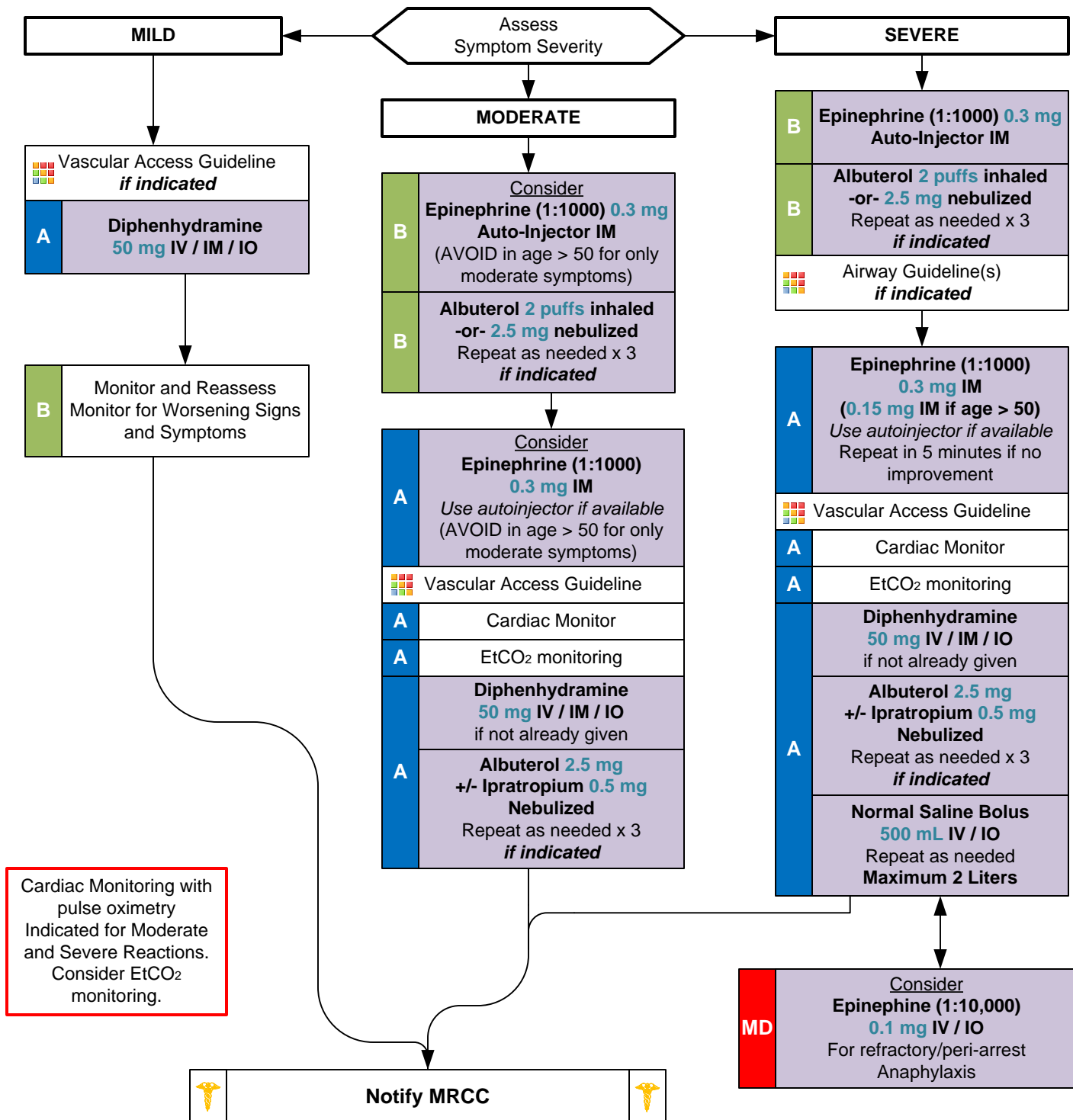
- Onset and location
- Insect sting or bite
- Food allergy / exposure
- Medication allergy / exposure
- New clothing, soap, detergent
- Past history of reactions
- Past medical history
- Medication history

Signs and Symptoms

- Itching or hives
- Coughing / wheezing or respiratory distress
- Chest or throat constriction
- Difficulty swallowing
- Hypotension or shock
- Edema
- N/V

Differential

- Urticarial (rash only)
- Anaphylaxis (systemic effect)
- Shock (vascular effect)
- Angioedema (drug induced)
- Aspiration / Airway obstruction
- Vasovagal event
- Asthma or COPD
- CHF



Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs**
- **Anaphylaxis is an acute and potentially lethal multisystem allergic reaction.**
- **Epinephrine is the drug of choice and the first drug that should be administered in acute anaphylaxis (Moderate / Severe Symptoms.) IM Epinephrine should be administered in priority before or during attempts at IV or IO access.**
- **To improve patient safety, Use an autoinjector to deliver IM epinephrine any time one is available.**
- **Anaphylaxis unresponsive to repeat doses of IM epinephrine may require epinephrine administration by IV push or epinephrine infusion. Contact Medical Control for refractory anaphylaxis.**
- **Symptom Severity Classification:**
 - Mild symptoms:**
Flushing, hives, itching, erythema with normal blood pressure and perfusion.
 - Moderate symptoms:**
Flushing, hives, itching, erythema plus mild respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with normal blood pressure and perfusion.
 - Severe symptoms:**
Skin symptoms may or may not be present, depending on perfusion. Possible Itching, erythema plus severe respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with hypotension and poor perfusion.
- Allergic reactions may occur with only respiratory and gastrointestinal symptoms and have no rash / skin involvement.
- Angioedema is seen in moderate to severe reactions and is swelling involving the face, lips or airway structures. This can also be seen in patients taking ACE-inhibitor blood pressure medications like Prinivil / Zestril (lisinopril)-typically end in -il.
- Patients who are ≥ 50 years of age, have a history of cardiac disease, take Beta-Blockers / Digoxin or patients who have heart rates ≥ 150 ; **give one-half the dose of epinephrine (0.15 mg of 1:1000)** for the initial dose and any repeated doses. Epinephrine may precipitate cardiac ischemia. These patients should receive a 12 lead ECG at some point in their care, but this should NOT delay administration of epinephrine.
- EMT-B may administer Epinephrine IM as Auto-injector only.
- EMT-B may administer Albuterol inhaler if patient already prescribed, or nebulized if appropriately trained.
- Any patient with respiratory symptoms or extensive reaction should receive IV or IM diphenhydramine.
- The shorter the onset from symptoms to contact, the more severe the reaction.

Altered Mental Status

History







- Known diabetic, medic alert tag
- Drugs, drug paraphernalia
- Report of illicit drug use or toxic ingestion
- Past medical history
- Medications
- History of trauma
- Change in condition
- Changes in feeding or sleep habits

Signs and Symptoms

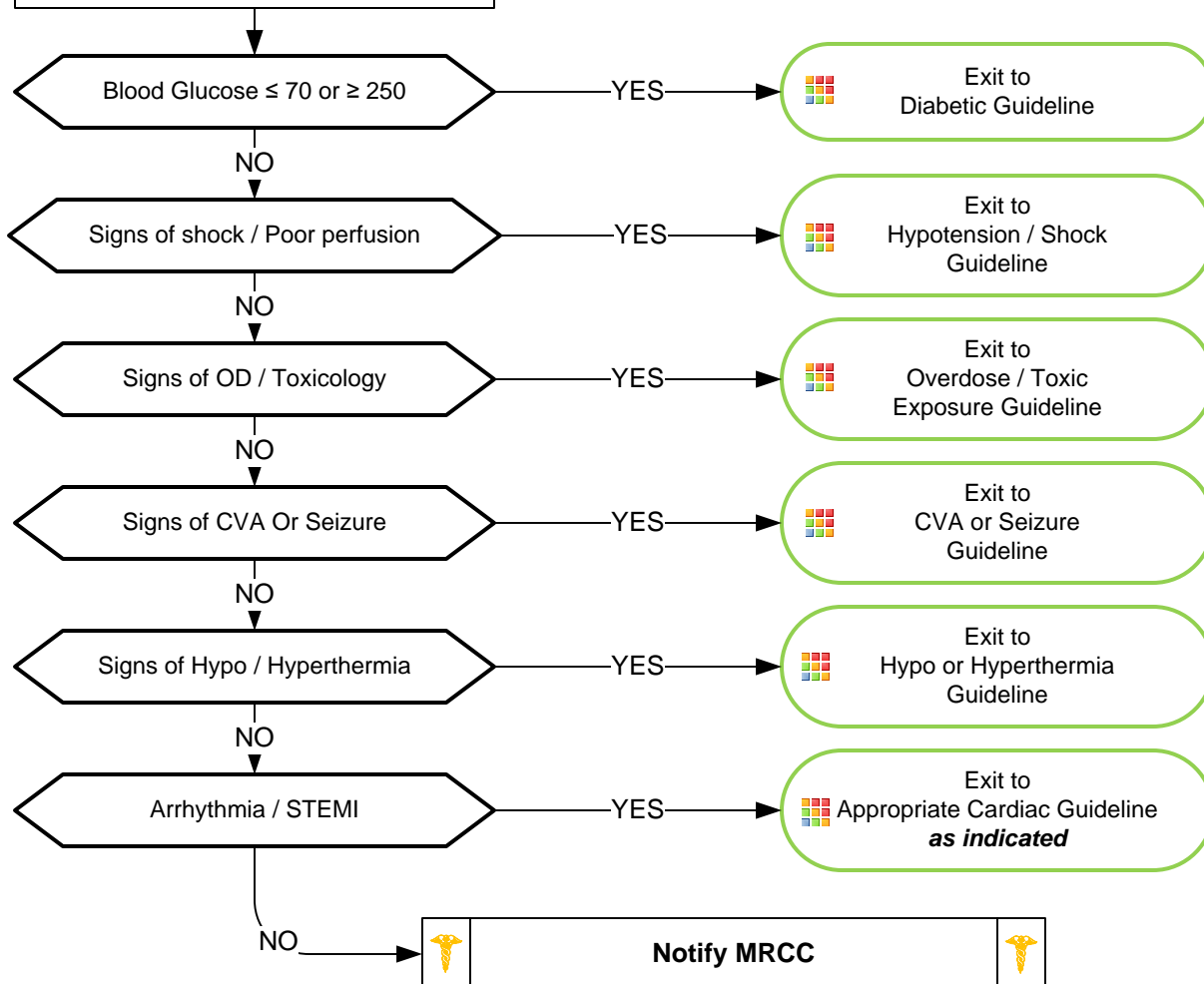
- Decreased mental status or lethargy
- Change in baseline mental status
- Bizarre behavior
- Hypoglycemia (cool, diaphoretic skin)
- Hyperglycemia (warm, dry skin; fruity breath; Kussmaul respirations; signs of dehydration)
- Irritability

Differential

- Head trauma
- CNS (stroke, tumor, seizure, infection)
- Cardiac (MI, CHF)
- Hypothermia
- Infection (CNS and other)
- Thyroid (hyper / hypo)
- Shock (septic, metabolic, traumatic)
- Diabetes (hyper / hypoglycemia)
- Toxicological or Ingestion
- Acidosis / Alkalosis
- Environmental exposure
- Pulmonary (Hypoxia)
- Electrolyte abnormality
- Psychiatric disorder

	Airway Guideline(s) <i>if indicated</i>
	Blood Glucose Analysis Procedure
	12 Lead ECG Procedure
	Cardiac Monitor
	EtCO ₂ monitoring
	Vascular Access Guideline

Utilize Spinal Immobilization Guideline where circumstances suggest a mechanism of injury.





Altered Mental Status

Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro.**
- **Pay careful attention to the head exam for signs of bruising or other injury.**
- Be aware of AMS as presenting sign of an environmental toxin or Haz-Mat exposure and protect personal safety and that of other responders who may already be exposed.
- It is safer to assume hypoglycemia than hyperglycemia if doubt exists. Recheck blood glucose after Dextrose or Glucagon.
- Do not let alcohol confuse the clinical picture. Alcoholics frequently develop hypoglycemia and may have unrecognized injuries.
- Consider Restraints if necessary for patient's and/or personnel's protection per the restraint procedure.

CVA / Suspected Stroke

History

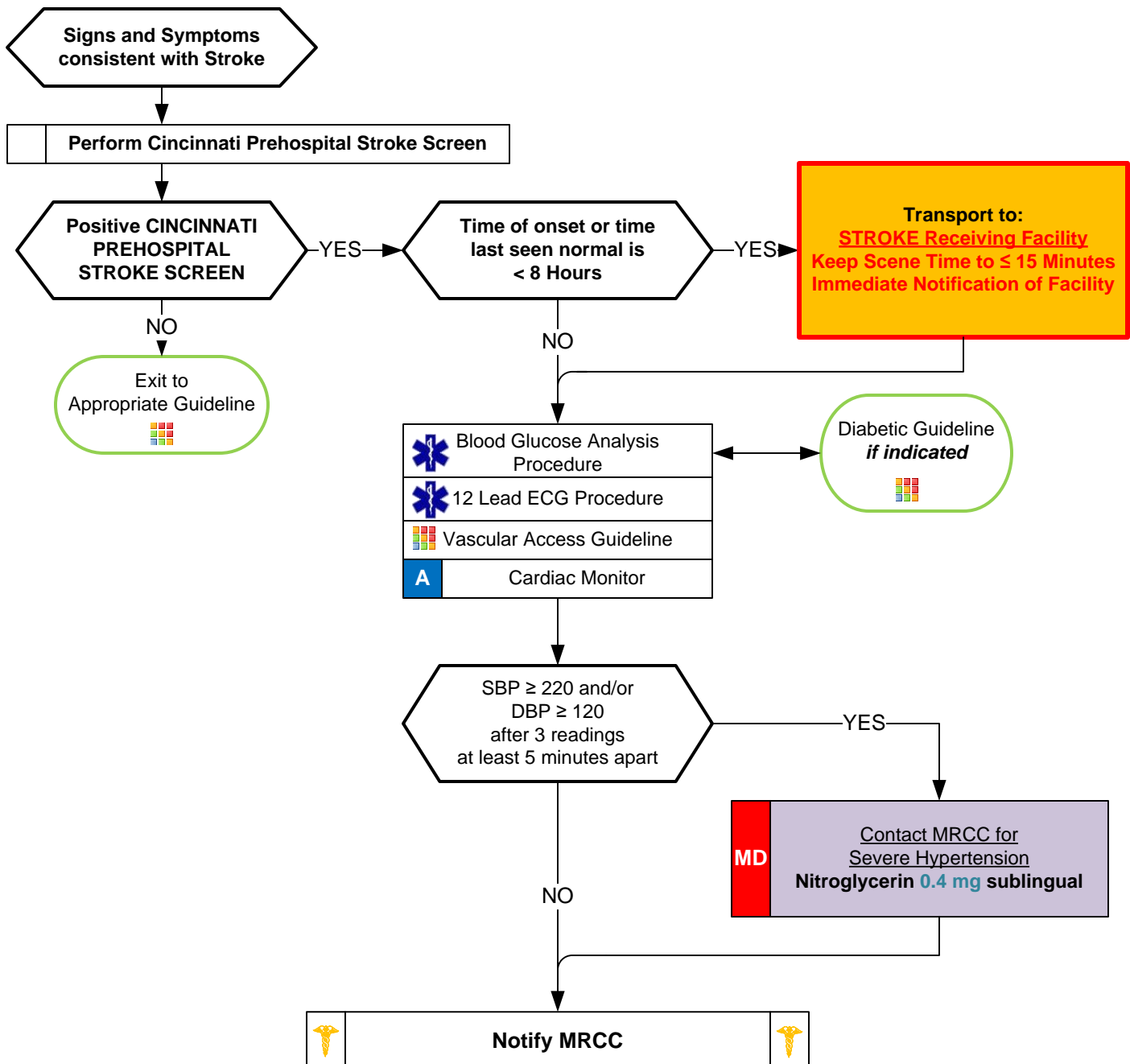
- Previous CVA, TIAs
- Previous cardiac / vascular surgery
- Associated diseases: diabetes, hypertension, CAD
- Atrial fibrillation
- Medications (blood thinners)
- History of trauma

Signs and Symptoms

- Altered mental status
- Weakness / Paralysis
- Blindness or other sensory loss
- Aphasia / Dysarthria
- Syncope
- Vertigo / Dizziness
- Vomiting
- Headache
- Seizures
- Respiratory pattern change
- Hypertension / hypotension

Differential

- See Altered Mental Status
- TIA (Transient ischemic attack)
- Seizure
- Todd's Paralysis
- Hypoglycemia
- Stroke
 - Thrombotic or Embolic (~85%)
 - Hemorrhagic (~15%)
- Tumor
- Trauma
- Dialysis / Renal Failure



CVA / Suspected Stroke

For further information on current recommendations regarding stroke care, including the rationale to treat or not treat hypertension in the setting of possible stroke, see the current version of:

“Guidelines for the Early Management of Patients With Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association”

Available at: <http://stroke.ahajournals.org/content/early/2013/01/31/STR.0b013e318284056a>

Cincinnati Pre-hospital Stroke Scale

1. FACIAL DROOP: Have patient show teeth or smile.



Normal:
both sides
of the face
move equally



Abnormal:
one side of
face does not
move as well
as the other
side

2. ARM DRIFT: Patient closes eyes & holds both arms out for 10 sec.



Normal:
both arms
move the
same or both
arms do not
move at all



Abnormal:
one arm does
not move or
drifts down
compared to
the other

3. ABNORMAL SPEECH: Have the patient say “you can’t teach an old dog new tricks.”

Normal: patient uses correct words with no slurring

Abnormal: patient slurs words, uses the wrong words, or is unable to speak

INTERPRETATION: If any 1 of these 3 signs is abnormal, the probability of a stroke is 72%.

Metro area Stroke Receiving Facilities

Regions Hospital
United Hospital
St. Joseph’s Hospital
Fairview-University Medical Center
Minneapolis VA Hospital

Pearls

- **Recommended Exam:** Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro
- **Items in Red Text** are key performance measures used in the EMS Acute Stroke Care Toolkit.
- **Acute Stroke care is evolving rapidly.** Time of onset / last seen normal parameters may be changed at any time depending on the capabilities and resources of the Stroke Receiving Hospital.
- **Time of Onset or Last Seen Normal:** One of the most important items the pre-hospital provider can obtain, on which all treatment decisions are based. Be very precise in gathering data to establish the time of onset and report as an actual time (i.e. 13:47 NOT “about 45 minutes ago.”) Without this information patient may not be able to receive thrombolytics at facility. For patients with “Woke up and noticed stroke,” Time starts when patient went to sleep or was last awake.
- **With a duration of symptoms of less than EIGHT (8) HOURS**, scene times should be limited to ≤ 15 minutes, early notification of receiving facility should be performed and transport times should be minimized.
- The differential listed on the Altered Mental Status Protocol should also be considered.
- Be alert for airway problems (swallowing difficulty, vomiting/aspiration).
- Hypoglycemia can present as a LOCALIZED neurologic deficit, especially in the elderly.
- Document the Cincinnati Prehospital Stroke Screen results in the PCR.

Diabetic

History

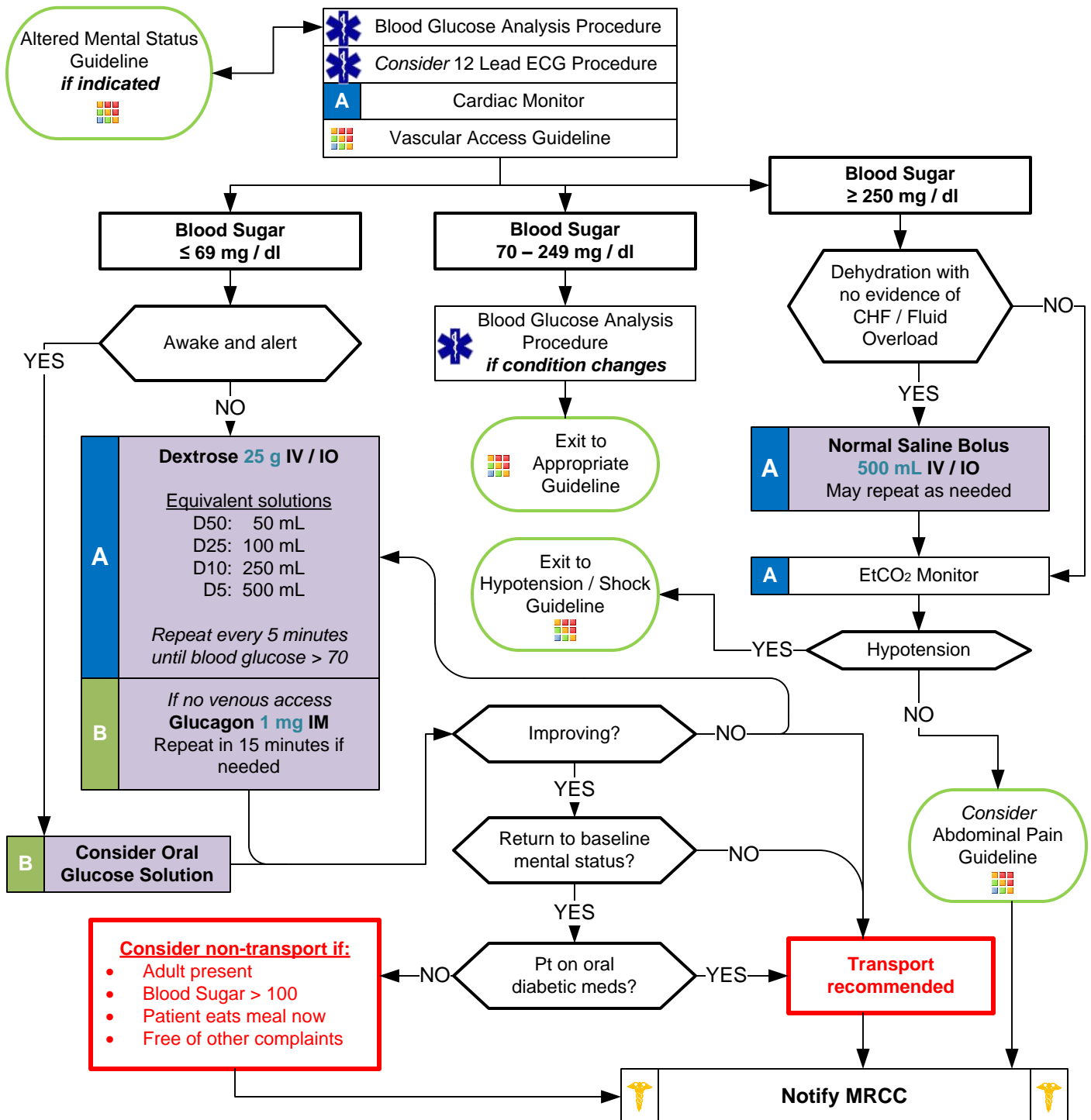
- Past medical history
- Medications
- Recent blood glucose check
- Last meal

Signs and Symptoms

- Altered mental status
- Combative / irritable
- Diaphoresis
- Seizures
- Abdominal pain
- Nausea / vomiting
- Weakness
- Dehydration
- Deep / rapid breathing

Differential

- Alcohol / drug use
- Toxic ingestion
- Trauma; head injury
- Seizure
- CVA
- Altered baseline mental status.



Pearls

- **Recommended exam: Mental Status, Skin, Respirations and effort, Neuro.**
- Patients with prolonged hypoglycemia may not respond to glucagon.
- Response to Glucagon can take 15-20 minutes. Consider the entire clinical picture when treating hypoglycemia, including a patient's overall clinical condition and other vital signs. It may be safe to wait for some time for Glucagon to work, instead of pursuing the more aggressive course of performing IO access to give faster acting IV/IO Dextrose solution. On the other hand, consider IO access to give Dextrose early in patients who are critically ill or peri-arrest and hypoglycemic.
- DKA is a serious condition resulting from a lack of insulin production and uncontrolled blood sugars. Patients are typically severely dehydrated and display signs of hypovolemic shock (tachycardia, hypotension, dry membranes, poor skin turgor). In addition to aggressive IV fluid resuscitation (some patients will require > 5 liters of saline in the ED) providers should consider other medical conditions that triggered the episode, such as infections or cardiac events. Have a low threshold to obtain an EKG on a diabetic patient with abnormal vital signs.
- Consider EtCO2 monitoring when glucose levels are > 250.
- Do not administer oral glucose to patients that are not able to swallow or protect their airway.
- Quality control checks should be maintained per manufacturers recommendation for all glucometers.
- Patients refusing transport to medical facility after treatment of hypoglycemia:
- Oral Agents:
 - Patients taking oral diabetic medications should be strongly encouraged to allow transportation to a medical facility. They are at risk of recurrent hypoglycemia that can be delayed for hours and require close monitoring even after normal blood glucose is established. Not all oral agents have prolonged action so Contact Medical Control for advice. Patients who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal with complex carbohydrates and protein.
- Insulin Agents:
 - Many forms of insulin now exist. Longer acting insulin places the patient at risk of recurrent hypoglycemia even after a normal blood glucose is established. Patients who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal with complex carbohydrates and protein.

Excited Delirium

History

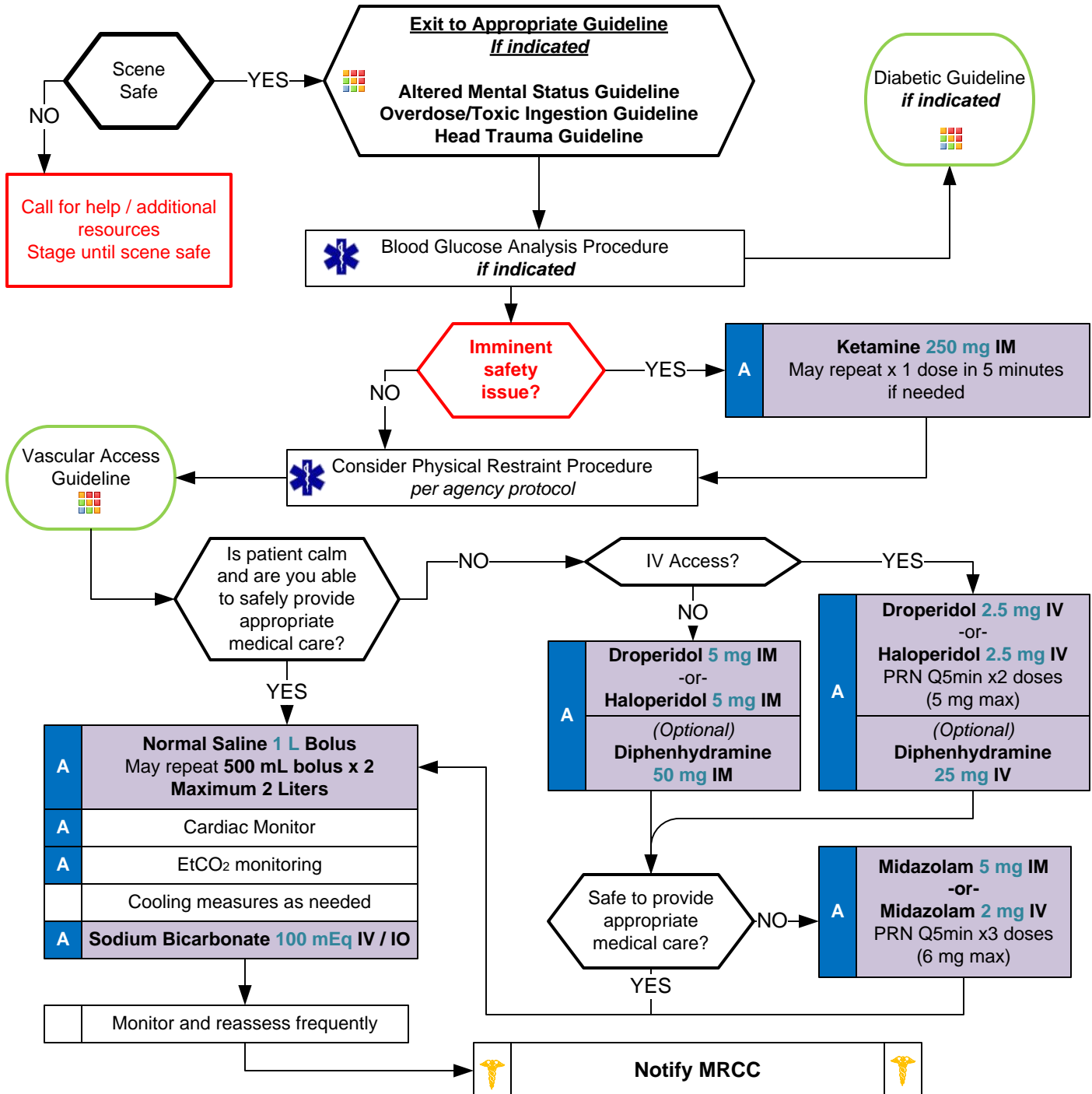
- Psychiatric illness/medications
- Injury to self or threats to others
- Substance abuse / overdose
- Diabetes
- Bizarre behavior

Signs and Symptoms

- Anxiety, agitation, confusion
- Affect change, hallucinations
- Delusional thoughts, bizarre behavior
- Combative violent
- Expression of suicidal / homicidal thoughts
- Impervious to pain
- Often naked, hyperthermic, profusely diaphoretic

Differential

- Altered Mental Status differential
- Alcohol Intoxication
- Toxin / Substance abuse
- Medication effect / overdose
- Withdrawal syndromes
- Depression
- Bipolar (manic-depressive)
- Schizophrenia
- Anxiety disorders



Excited Delirium

Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Neuro**
- **Crew / responders safety is the main priority.**
- **Any patient who is handcuffed or restrained by Law Enforcement and transported by EMS must be accompanied by law enforcement in the ambulance.**
- **Consider antipsychotics (Droperidol, Haloperidol) for patients with history of psychosis or extreme alcohol intoxication, or a benzodiazepine for patients with other presumed substance abuse. While benzodiazepines may be indicated for patients with alcohol intoxication, consider that alcohol and benzodiazepines together may lead to respiratory depression.**
- **All patients who receive either physical or chemical restraint must be continuously observed by ALS personnel on scene or immediately upon their arrival.**
- Be sure to consider all possible medical/trauma causes for behavior (hypoglycemia, overdose, substance abuse, hypoxia, head injury, etc.)
- Do not irritate the patient with a prolonged exam.
- Do not overlook the possibility of associated domestic violence or child abuse.
- If patient is suspected of agitated delirium suffers cardiac arrest, consider a fluid bolus and sodium bicarbonate early
- Do not position or transport any restrained patient in such a way that could impact the patient's respiratory or circulatory status.
- **Excited Delirium Syndrome:**
Medical emergency: Combination of delirium, psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent / bizarre behavior, insensitivity to pain, hyperthermia and increased strength. Potentially life-threatening and associated with use of physical control measures, including physical restraints and Tasers. Most commonly seen in male subjects with a history of serious mental illness and/or acute or chronic drug abuse, particularly stimulant drugs such as cocaine, crack cocaine, methamphetamine, amphetamines or similar agents. Alcohol withdrawal or head trauma may also contribute to the condition.
- **Extrapyramidal reactions:**
Condition causing involuntary muscle movements or spasms typically of the face, neck and upper extremities. May present with contorted neck and trunk with difficult motor movements. Typically an adverse reaction to antipsychotic drugs like Haloperidol and may occur with your administration. When recognized give **Diphenhydramine 50 mg IV / IO / IM** in adults or **1 mg/kg IV / IO / IM** in pediatrics.

Hypertension

History

- Documented Hypertension
- Related diseases: Diabetes; CVA; Renal Failure; Cardiac Problems
- Medications for Hypertension
- Compliance with Hypertensive Medications
- Erectile Dysfunction medications
- Pregnancy

Signs and Symptoms

One of these

- Systolic BP 220 or greater
- Diastolic BP 120 or greater

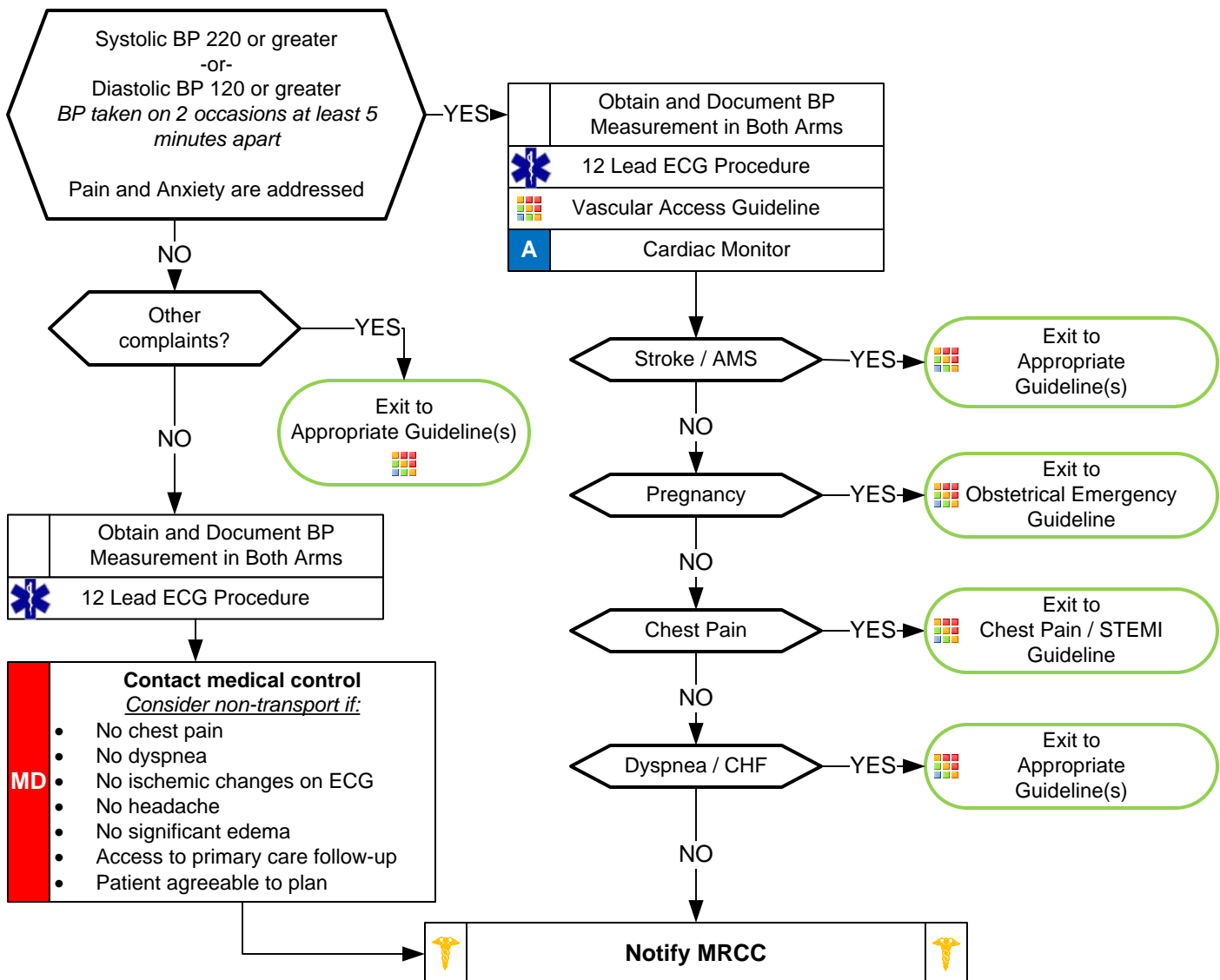
AND at least one of these

- Severe Headache
- Chest Pain
- Dyspnea
- Altered Mental Status
- Seizure

Differential

- Hypertensive encephalopathy
- Primary CNS Injury
Cushing's Response with
Bradycardia and
Hypertension
- Myocardial Infarction
- Aortic Dissection / Aneurysm
- Pre-eclampsia / Eclampsia

Hypertension is not uncommon especially in an emergency setting. Hypertension is usually transient and in response to stress and / or pain. A hypertensive emergency is based on blood pressure along with symptoms which suggest an organ is suffering damage such as MI, CVA or renal failure. This is very difficult to determine in the pre-hospital setting in most cases. Aggressive treatment of hypertension can result in harm. **Most patients, even with significant elevation in blood pressure, need only supportive care. Specific complaints such as chest pain, dyspnea, pulmonary edema or altered mental status should be treated based on those specific protocols.**



Hypertension

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- Elevated blood pressure is based on at least two sets of vital signs, each several minutes apart.
- Defined as systolic > 140 or diastolic > 90.
- If patient is pregnant and in third trimester, consider pre-eclampsia and follow Obstetrical Emergencies Protocol.
- Symptomatic hypertension is typically revealed through end organ dysfunction to the cardiac, CNS or renal systems.
- All symptomatic patients with hypertension should be transported with their head elevated at 30 degrees.
- Ensure appropriate size blood pressure cuff utilized for body habitus.
- Reassure asymptomatic patients that high blood pressure is not an emergent problem, but rather a risk to health over a long period of time (months to years). This is a condition that can be safely managed in an outpatient setting.

Hypotension / Shock

History

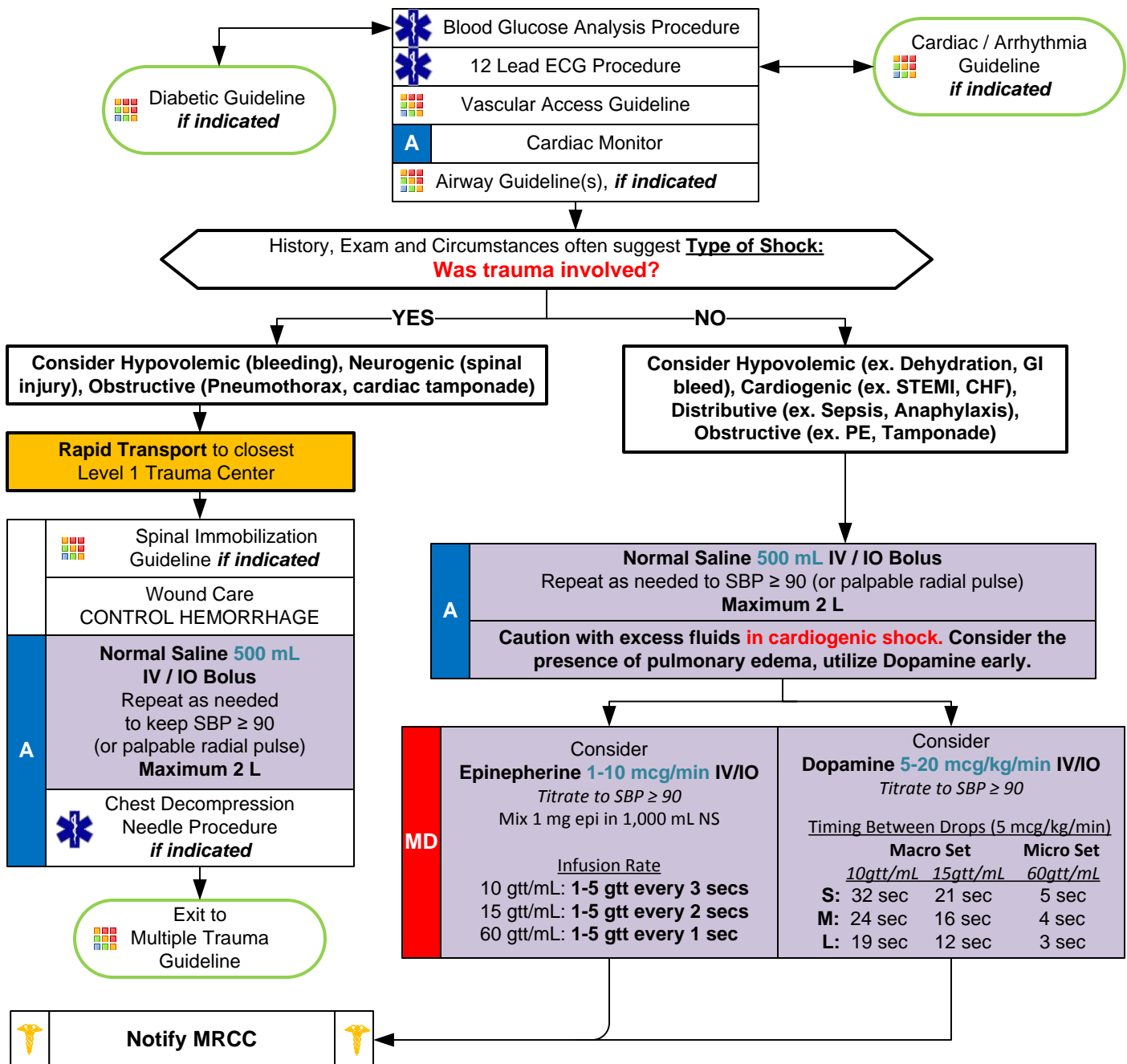
- Blood loss - vaginal or gastrointestinal bleeding, AAA, ectopic
- Fluid loss - vomiting, diarrhea, fever
- Infection
- Cardiac ischemia (MI, CHF)
- Medications
- Allergic reaction
- Pregnancy
- History of poor oral intake

Signs and Symptoms

- Restlessness, confusion
- Weakness, dizziness
- Weak, rapid pulse
- Pale, cool, clammy skin
- Delayed capillary refill
- Hypotension
- Coffee-ground emesis
- Tarry stools

Differential

- Shock
 - Hypovolemic
 - Cardiogenic
 - Septic
 - Neurogenic
 - Anaphylactic
- Ectopic pregnancy
- Dysrhythmias
- Pulmonary embolus
- Tension pneumothorax
- Medication effect / overdose
- Vasovagal
- Physiologic (pregnancy)



Hypotension / Shock

Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- Hypotension is often defined as a systolic blood pressure of less than 90. This is not always reliable and should be interpreted in context and patient's typical BP if known. Shock may be present with a normal blood pressure initially. Fundamentally, shock is inadequate perfusion of body tissues.
- Shock often is present with normal vital signs and may develop insidiously. Tachycardia may be the only manifestation.
- Patients on beta-blocker medications may not demonstrate tachycardia. Conversely, tachycardia in a patient who is on beta-blockers should warrant aggressive shock management.
- Consider all possible causes of shock and treat per appropriate protocol.
- **Hypovolemic Shock:**
Hemorrhage, trauma, GI bleeding, ruptured aortic aneurysm or pregnancy-related bleeding.
- **Cardiogenic Shock:**
Heart failure: MI, Cardiomyopathy, Myocardial contusion, Ruptured ventricular / septum / valve / toxins.
- **Distributive Shock:**
Sepsis (systemic infection)
Anaphylactic
Neurogenic: Hallmark is warm, dry, pink skin with normal capillary refill time and typically alert.
Toxins
- **Obstructive Shock:**
Pericardial tamponade. Pulmonary embolus. Tension pneumothorax.
Signs may include hypotension with distended neck veins, tachycardia, unilateral decreased breath sounds or muffled heart sounds.
- For non-cardiac hypotension, Pressors should only be started after 2 liters of NS have been given.

Overdose / Toxic Ingestion

History

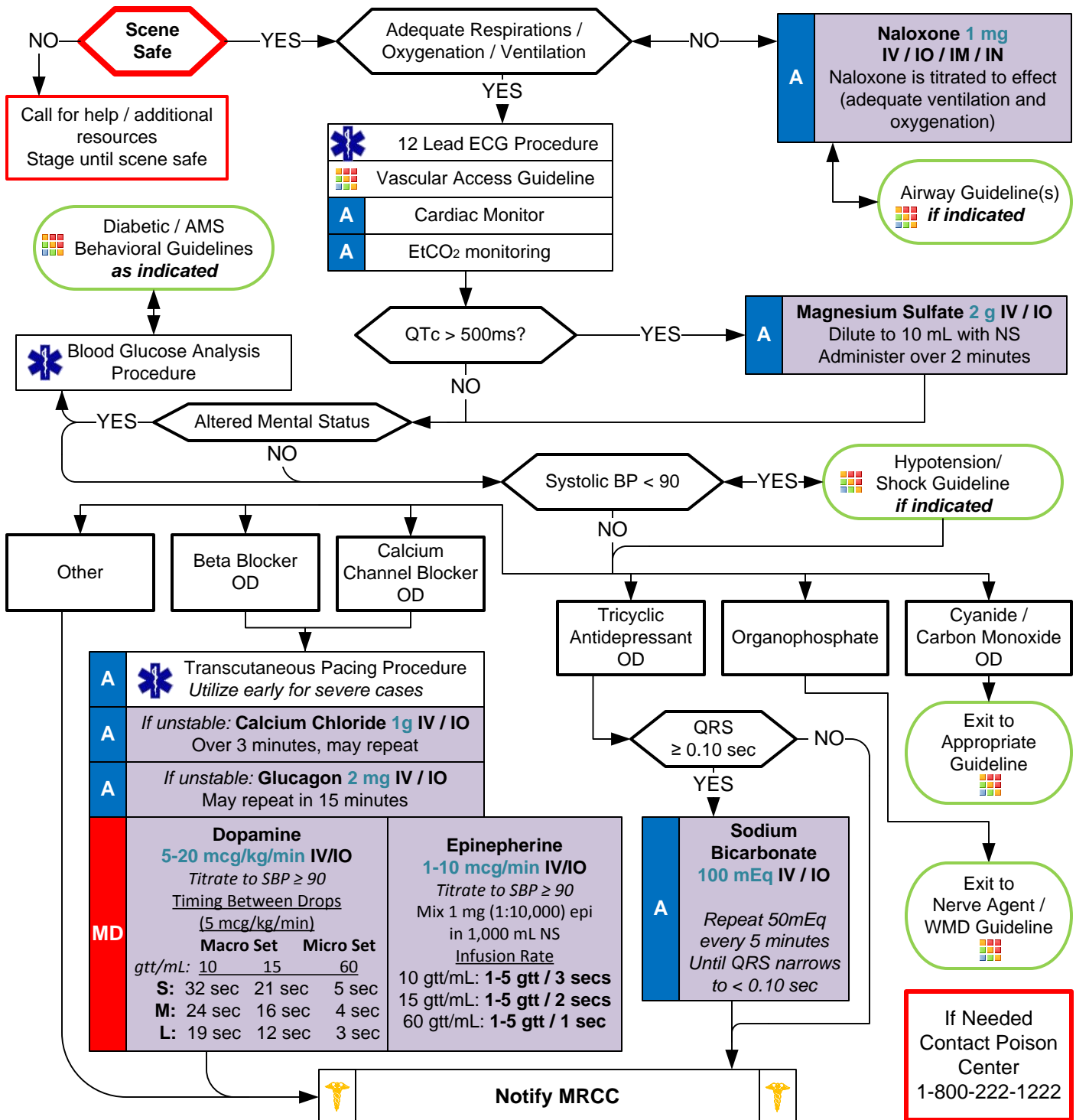
- Ingestion or suspected ingestion of a potentially toxic substance
- Substance ingested, route, quantity
- Time of ingestion
- Reason (suicidal, accidental, criminal)
- Available medications in home
- Past medical history, medications

Signs and Symptoms

- Mental status changes
- Hypotension / hypertension
- Decreased respiratory rate
- Tachycardia, dysrhythmias
- Seizures
- S.L.U.D.G.E.
- D.U.M.B.B.E.L.S

Differential

- Tricyclic antidepressants (TCAs)
- Acetaminophen (Tylenol)
- Aspirin
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents, Alcohols, Cleaning agents
- Insecticides (organophosphates)



Overdose / Toxic Ingestion

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro**
- Overdose or Toxin patients with significant ingestions/exposures should be monitored very closely and aggressively treated as indicated. Do not hesitate to contact medical control for advice as certain critically ill overdose patients may quickly overwhelm medication supplies. For example, patients with a tricyclic overdose with a wide QRS and altered mental status should receive multiple sodium bicarbonate boluses until QRS narrowing and clinical improvement; patients with organophosphate toxicity with SLUDGE syndrome may require more atropine than is usually carried on the ambulance.
- For patients with Beta-blocker and Calcium Channel blocker overdoses and hemodynamic instability, high-dose insulin is an effective treatment which should be started early. Ensure adequate pre-notification is given for such patients as it takes time to obtain and prepare medications and equipment at the receiving hospital.
- Consider the need for law enforcement to assist with involuntary transport if suicidal intent is suspected or if patient does not appear to be in a state of mind conducive to making appropriate decisions for personal safety.
- **Do not rely on patient history of ingestion, especially in suicide attempts. Make sure patient is not carrying other medications or weapons.**
- **Bring pill bottles, contents, emesis to the emergency department.**
- **S.L.U.D.G.E: Salivation, Lacrimation, Urination, Defecation, GI distress, Emesis**
- **D.U.M.B.B.E.L.S: Diarrhea, Urination, Miosis, Bradycardia, Bronchorrhea, Emesis, Lacrimation, Salivation.**
- **Tricyclic:** 4 major areas of toxicity: decreased mental status, dysrhythmias, seizures, hypotension, then coma and death. There may be a rapid progression from alert mental status to death.
- **Acetaminophen:** initially normal or nausea/vomiting. If not detected and treated, causes irreversible liver failure
- **Aspirin:** Early signs consist of abdominal pain and vomiting. Tachypnea and altered mental status may occur later. Renal dysfunction, liver failure, and or cerebral edema among other things can take place later.
- **Depressants:** decreased HR, decreased BP, decreased temperature, decreased respirations, non-specific pupils
- **Stimulants:** increased HR, increased BP, increased temperature, dilated pupils, seizures
- **Anticholinergic:** increased HR, increased temperature, dilated pupils, mental status changes
- **Cardiac Medications:** dysrhythmias and mental status changes
- **Solvents:** nausea, coughing, vomiting, and mental status changes
- **Insecticides:** increased or decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils
- Consider restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.
- **Nerve Agent Antidote kits** contain 2 mg of Atropine and 600 mg of pralidoxime in an autoinjector for self administration or patient care. These are available in larger quantities as part of the CHEMPACK program. Deployment is coordinated through MRCC.
- **Consider contacting the Regional Poison Center for guidance, either directly (1-800-222-1222) or through MRCC.**

Respiratory Distress

History

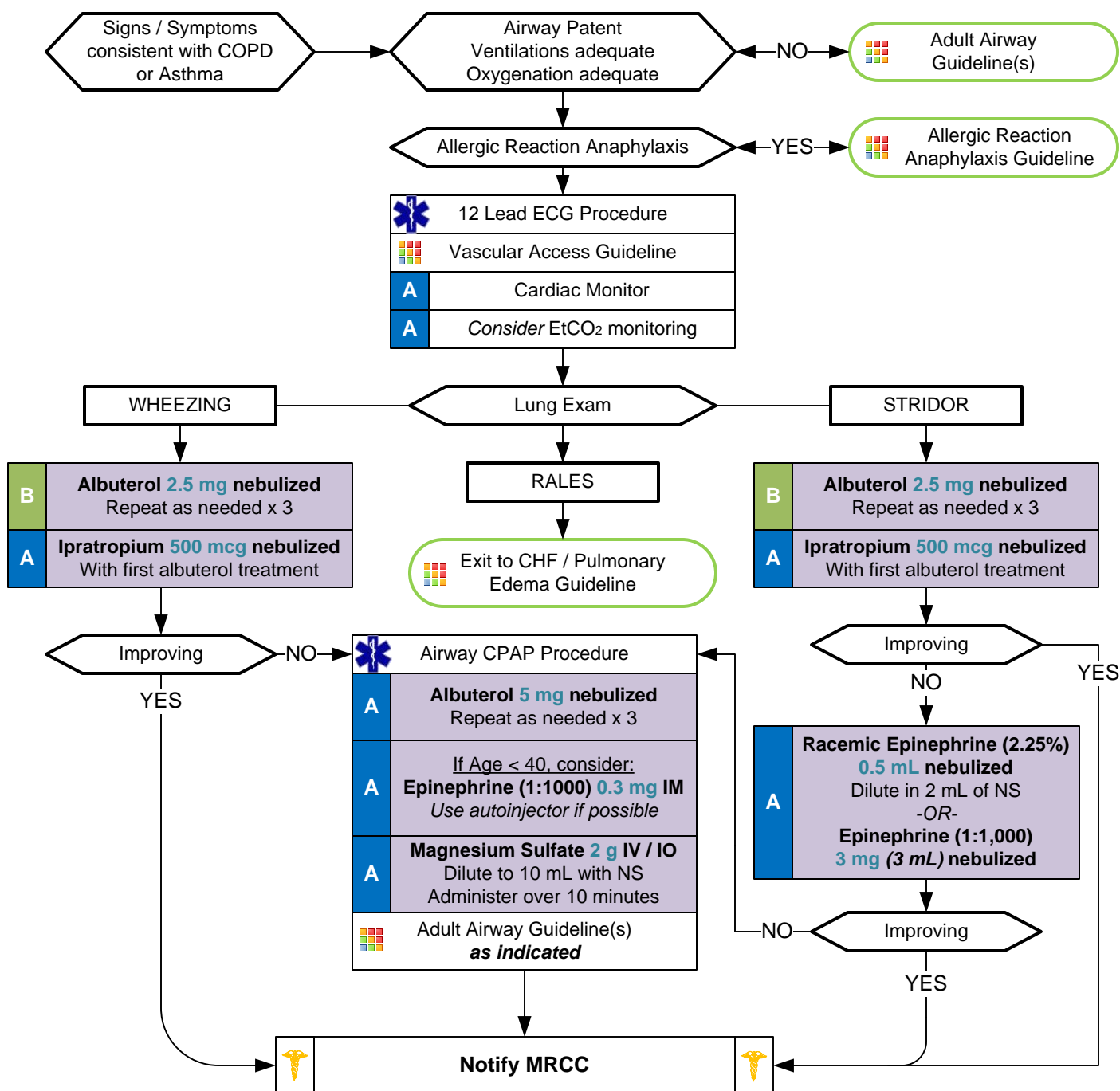
- Asthma; COPD -- chronic bronchitis, emphysema, congestive heart failure
- Home treatment (oxygen, nebulizer)
- Medications (theophylline, steroids, inhalers)
- Toxic exposure, smoke inhalation

Signs and Symptoms

- Shortness of breath
- Pursed lip breathing
- Decreased ability to speak
- Increased respiratory rate and effort
- Wheezing, rhonchi
- Use of accessory muscles
- Fever, cough
- Tachycardia

Differential

- Asthma
- Anaphylaxis
- Aspiration
- COPD (Emphysema, Bronchitis)
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pneumothorax
- Cardiac (MI or CHF)
- Pericardial tamponade
- Hyperventilation
- Inhaled toxin (Carbon monoxide, etc.)



Respiratory Distress

Factors	Asthma	COPD
Age when it starts	<ul style="list-style-type: none"> • Typically in childhood • Does not generally worsen with age 	<ul style="list-style-type: none"> • Usually in later adulthood (but as soon as the early 40s) • Worsens over time
Triggers/Causes	<ul style="list-style-type: none"> • Allergens (dust, plants, animals, etc.) • Weather • Heredity 	<ul style="list-style-type: none"> • Directly linked to smoking • Less commonly caused by inhaled fumes, pollution, dust, and chemicals
Symptoms	<ul style="list-style-type: none"> • Patient is often symptom free between attacks 	<ul style="list-style-type: none"> • Chronic (occur almost all the time)
Airflow	<ul style="list-style-type: none"> • Usually treatment can quickly and fully restore airflow 	<ul style="list-style-type: none"> • Can be partly restored by quitting smoking and taking prescribed medicines

Key Points:

- Asthma is reversible and typically responds well to medications (albuterol, steroids, epinephrine for severe symptoms), as the underlying problem is inflammation and smooth muscle constriction.
- COPD is generally not reversible and responds poorly to medications, as the underlying problem is chronic inflammation leading to destruction of the airway supportive tissues. This results in less elasticity which leads to decreased effectiveness of bronchodilator medications.

Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Neck, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Pulse oximetry and End-Tidal Waveform Capnography should be monitored continuously for patients in persistent distress.**
- ETCO₂ should be used when Respiratory Distress is significant and does not respond to initial Beta-Agonist dose.
- A silent chest in respiratory distress is a pre-respiratory arrest sign.
- **EMT-B may administer Albuterol inhaler if patient already prescribed, or nebulized if appropriately trained.**
- Consider Midazolam 1-2 mg IV to assist with CPAP compliance. Benzodiazepines may precipitate respiratory depression or may actually worsen compliance with CPAP in patients who are already tired, already with altered mental status, or who have recent history of alcohol or drug ingestion. All efforts at verbal coaching should be utilized prior to giving benzodiazepines for patients in respiratory distress.

Seizure - Adult

History




- Reported / witnessed seizure activity
- Previous seizure history
- Medical alert tag information
- Seizure medications
- History of trauma
- History of diabetes
- History of pregnancy
- Time of seizure onset
- Document number of seizures
- Alcohol use, abuse or abrupt cessation
- Fever

Signs and Symptoms

- Decreased mental status
- Sleepiness
- Incontinence
- Observed seizure activity
- Evidence of trauma
- Unconscious

Differential

- CNS (Head) trauma
- Tumor
- Metabolic, Hepatic, or Renal failure
- Hypoxia
- Electrolyte abnormality (Na, Ca, Mg)
- Drugs, Medications, Non-compliance
- Infection / Fever
- Alcohol withdrawal
- Eclampsia
- Stroke
- Hyperthermia
- Hypoglycemia

	Airway Guideline(s) as indicated
	Blood Glucose Analysis Procedure
	Loosen any constrictive clothing Protect patient and providers
	Vascular Access Guideline

Diabetic Guideline
if indicated

A	Cardiac Monitor <i>if indicated</i>
A	EtCO ₂ monitoring <i>if indicated</i>

Consider
Head Injury
or Overdose
Guidelines

Awake, Alert
Normal Mental Status

YES

NO

NO

Consider
Altered Mental Status
Guideline

Monitor and Reassess

Notify MRCC

A	If patient is seizing upon EMS Arrival Midazolam 5 mg IM (Do not wait to obtain vascular access)
A	If seizure begins in the presence of EMS and treatment is indicated Midazolam 2 mg IV / IO, 5 mg IM, or 2 mg IN May repeat every 3 to 5 minutes for continued seizure activity to Max 10 mg
A	If Midazolam not available Lorazepam 2 mg IV / IO or 2 mg IM Repeat 2 mg every 3 to 5 minutes for continued seizure activity, Max 8 mg

Active Seizure in Known or
Suspected Pregnancy > 20 Weeks

A **Magnesium Sulfate**
4 g IV / IO
Dilute to 10 mL with NS,
push over 2 – 3 minutes
For persistent seizure after 5-
10 minutes, May repeat 2 g.

Seizure - Adult

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Extremities, Neuro**
- **Midazolam 5 mg IM is effective in termination of seizures. Do not delay IM administration to obtain IV or IO access in an actively seizing patient.**
- **For a seizure that begins in the presence of EMS, if the patient was previously conscious, alert, and oriented, take time to assess and protect the patient and providers and consider the cause. The seizure may stop, especially in patients who have prior history of self-limiting seizures. However, do not hesitate to treat recurrent or prolonged (> 1 minute) seizure activity.**
- For the purposes of this protocol, **status epilepticus** is defined as two or more successive seizures without a period of consciousness or recovery, or one prolonged seizure lasting longer than 5 minutes. This is a true emergency requiring rapid airway control, treatment, and transport. The true definition of status epilepticus requires 30 minutes of uninterrupted seizure activity, or multiple seizures without return to baseline in between.
- **Grand mal seizures (generalized)** are associated with loss of consciousness. Often incontinence and/or tongue trauma is also present.
- **Focal seizures (petit mal)** affect only a part of the body and are not usually associated with a loss of consciousness
- Be prepared for airway problems and continued seizures.
- Assess for the possibility of occult trauma or substance abuse.
- Be prepared to assist ventilations and/or manage the airway especially if lorazepam or midazolam is used.
- For any seizure in a pregnant patient, follow the OB Emergencies Protocol.

Syncope

History

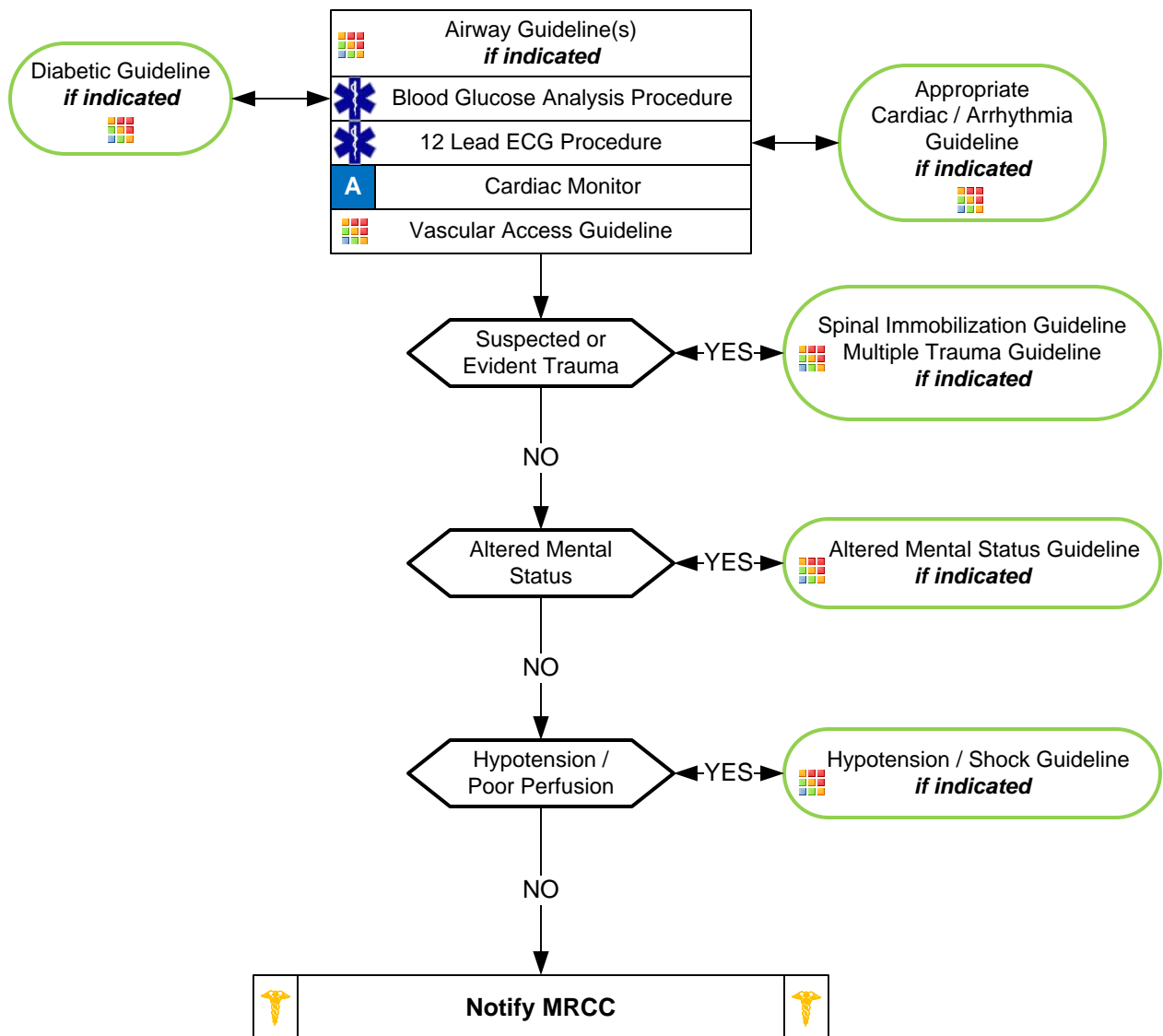
- Cardiac history, stroke, seizure
- Occult blood loss (GI, ectopic)
- Females: LMP, vaginal bleeding
- Fluid loss: nausea, vomiting, diarrhea
- Past medical history
- Medications

Signs and Symptoms

- Loss of consciousness with recovery
- Lightheadedness, dizziness
- Palpitations, slow or rapid pulse
- Pulse irregularity
- Decreased blood pressure

Differential

- Vasovagal
- Orthostatic hypotension
- Cardiac syncope
- Micturition / Defecation syncope
- Psychiatric
- Stroke
- Hypoglycemia
- Seizure
- Shock (see Shock Protocol)
- Toxicological (Alcohol)
- Medication effect (hypertension)
- PE
- AAA



San Francisco Syncope Rule

Can be used to predict patients having a high-risk for serious outcome (*defined as death, myocardial infarction, arrhythmia, pulmonary embolism, stroke, subarachnoid hemorrhage, significant hemorrhage, or return visit to the hospital*).

- History of CHF
- Hematocrit < 30% (not usually known to EMS providers)
- Any ECG abnormality
- Any shortness of breath
- SBP < 90 mm Hg on initial evaluation

Patients with 1 or more of the above findings should be evaluated in an emergency department.

For patients under the age of 30 with none of the above findings and no other concerning symptoms or pre-existing medical conditions, non-transport may be a reasonable consideration.

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- Assess for signs and symptoms of trauma and/or head injury if associated with fall or if it's questionable whether the patient fell due to syncope.
- Consider dysrhythmias, GI bleed, ectopic pregnancy, and seizure as possible causes of syncope.
- Syncope patients should be transported as there is often a treatable etiology.
- Near-syncope is equivalent to syncope from a medical perspective.
- More than 25% of geriatric syncope is cardiac dysrhythmia based.

Vomiting and Diarrhea - Adult

History

- Age
- Time of last meal
- Last bowel movement/emesis
- Improvement or worsening with food or activity
- Duration of problem
- Other sick contacts
- Past medical history
- Past surgical history
- Medications
- Menstrual history (pregnancy)
- Travel history
- Bloody emesis / diarrhea

Signs and Symptoms

- Abdominal Pain?
- Character of pain (constant, intermittent, sharp, dull, etc.)
- Distention
- Constipation
- Diarrhea
- Anorexia
- Radiation

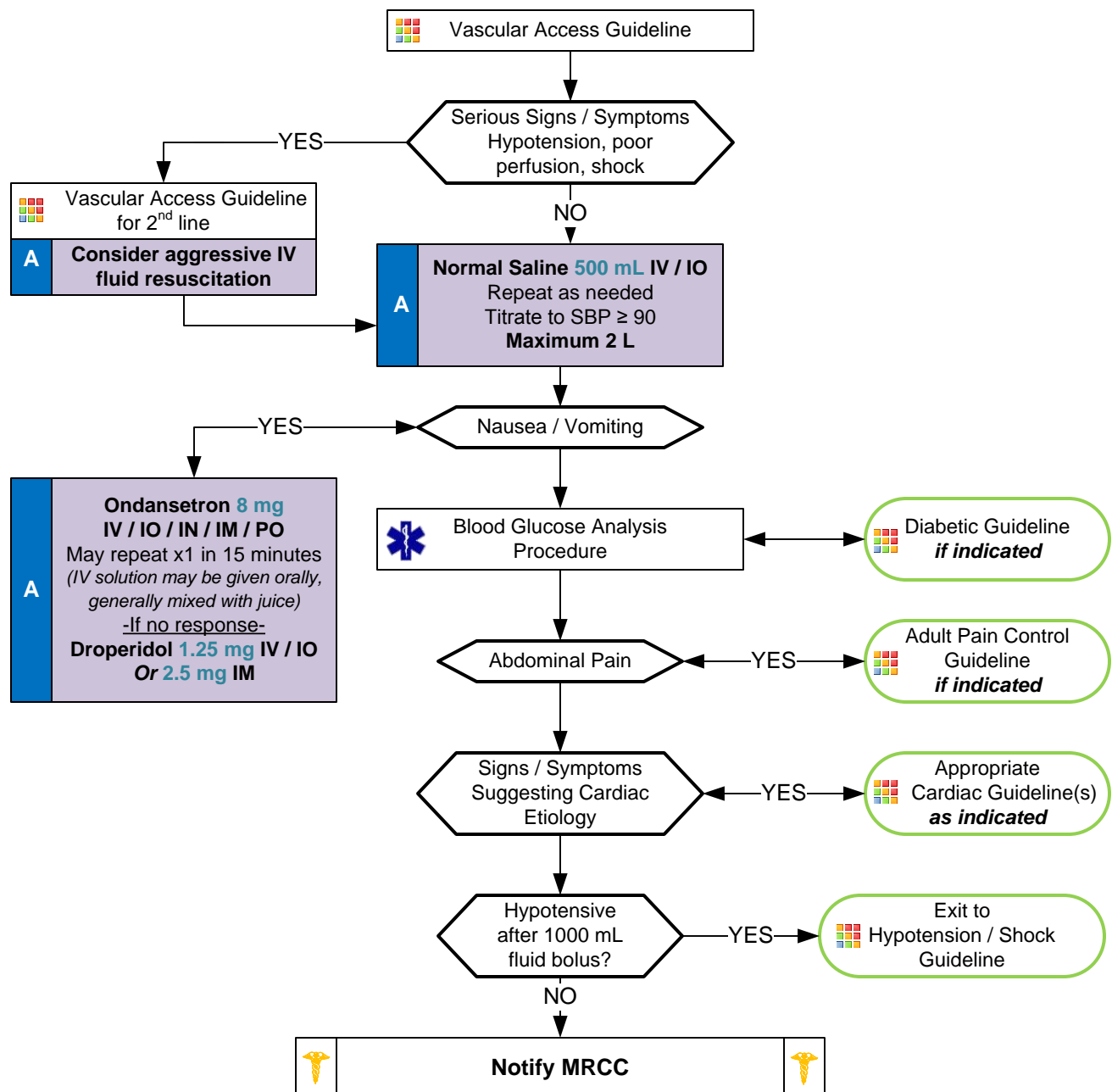
Associated symptoms:

(Helpful to localize source)

Fever, headache, blurred vision, weakness, malaise, myalgias, cough, headache, dysuria, mental status changes, rash

Differential

- CNS (increased pressure, headache, stroke, CNS lesions, trauma or hemorrhage, vestibular)
- Myocardial infarction
- Drugs (NSAID's, antibiotics, narcotics, chemotherapy)
- GI or Renal disorders
- Diabetic ketoacidosis
- Gynecologic disease (ovarian cyst, PID)
- Infections (pneumonia, influenza)
- Electrolyte abnormalities
- Food or toxin induced
- Medication or Substance abuse
- Pregnancy
- Psychological



Vomiting and Diarrhea - Adult

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- Document mental status and vital signs prior to administration of Droperidol.
- Isolated vomiting may be caused by pyloric stenosis (in pediatrics), bowel obstruction, and CNS processes (bleeding, tumors, or increased CSF pressures).
- IV Ondansetron (Zofran) solution may be given by any route. When giving orally, mix with juice.
- There is a risk of QT interval prolongation with many anti-emetic medications, but specifically with ondansetron and droperidol. Although not required, providers should consider cardiac monitoring and obtaining a 12-lead ECG prior to administration of these medications, especially in patients who are also taking anti-psychotic, antibiotic, cardiac, or neurologic medications. If the QTc interval is close to or greater than 500ms, medical control authorization should be obtained prior to administration of medications.

Obstetrical Emergency

History

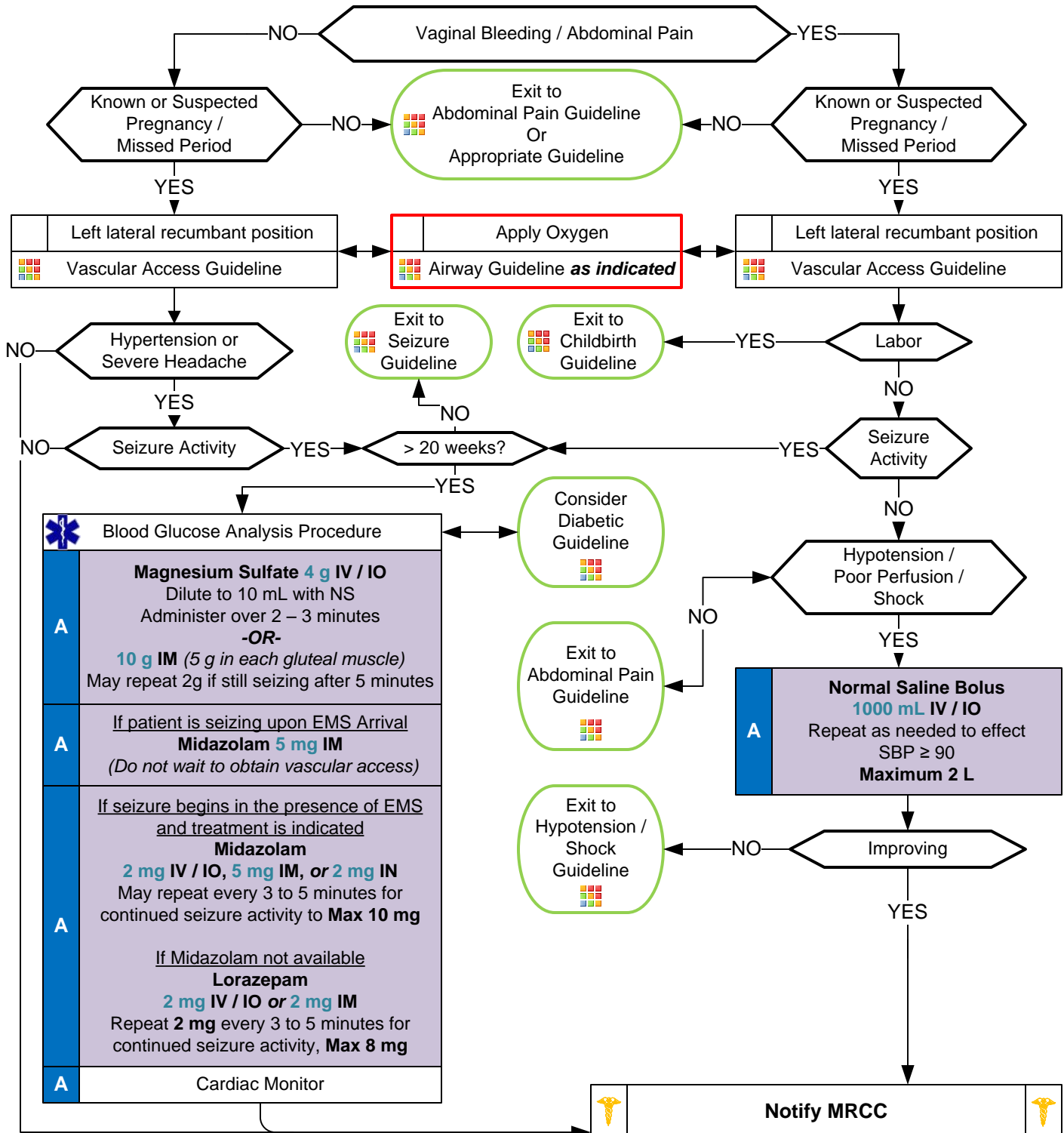
- Past medical history
- Hypertension meds
- Prenatal care
- Prior pregnancies / births
- Gravida / Para

Signs and Symptoms

- Vaginal bleeding
- Abdominal pain
- Seizures
- Hypertension
- Severe headache
- Visual changes
- Edema of hands and face

Differential

- Pre-eclampsia / Eclampsia
- Placenta previa
- Placenta abruptio
- Spontaneous abortion



Obstetrical Emergency

Pearls

- **Recommended Exam: Mental Status, Abdomen, Heart, Lungs, Neuro**
- Severe headache, vision changes, or RUQ pain may indicate preeclampsia.
- In the setting of pregnancy, hypertension is defined as a BP greater than 140 systolic or greater than 90 diastolic, or a relative increase of 30 systolic and 20 diastolic from the patient's normal (pre-pregnancy) blood pressure.
- Maintain patient in a left lateral position to minimize risk of supine hypotensive syndrome, which may occur as the fetus gets large enough to compress the vena cava.
- Ask patient to quantify bleeding - number of pads used per hour.
- **Any pregnant patient involved in a MVC should be seen immediately by a physician for evaluation. Greater than 20 weeks generally require several hours of fetal monitoring. *DO NOT suggest that the patient needs an ultrasound.***
- Magnesium may cause hypotension and decreased respiratory drive.
- A patient who is pregnant and seizing should be presumed to have eclampsia, a true medical emergency. Magnesium administration should be a priority in these patients. However, IM benzodiazepines may be given first due to rapidity of IM administration. For crews with two ALS providers, one provider should administer IM benzodiazepine while the other provider establishes IV access for Magnesium.
- **Do not delay IM administration of Midazolam with difficult IV or IO access.**

Childbirth / Labor

History

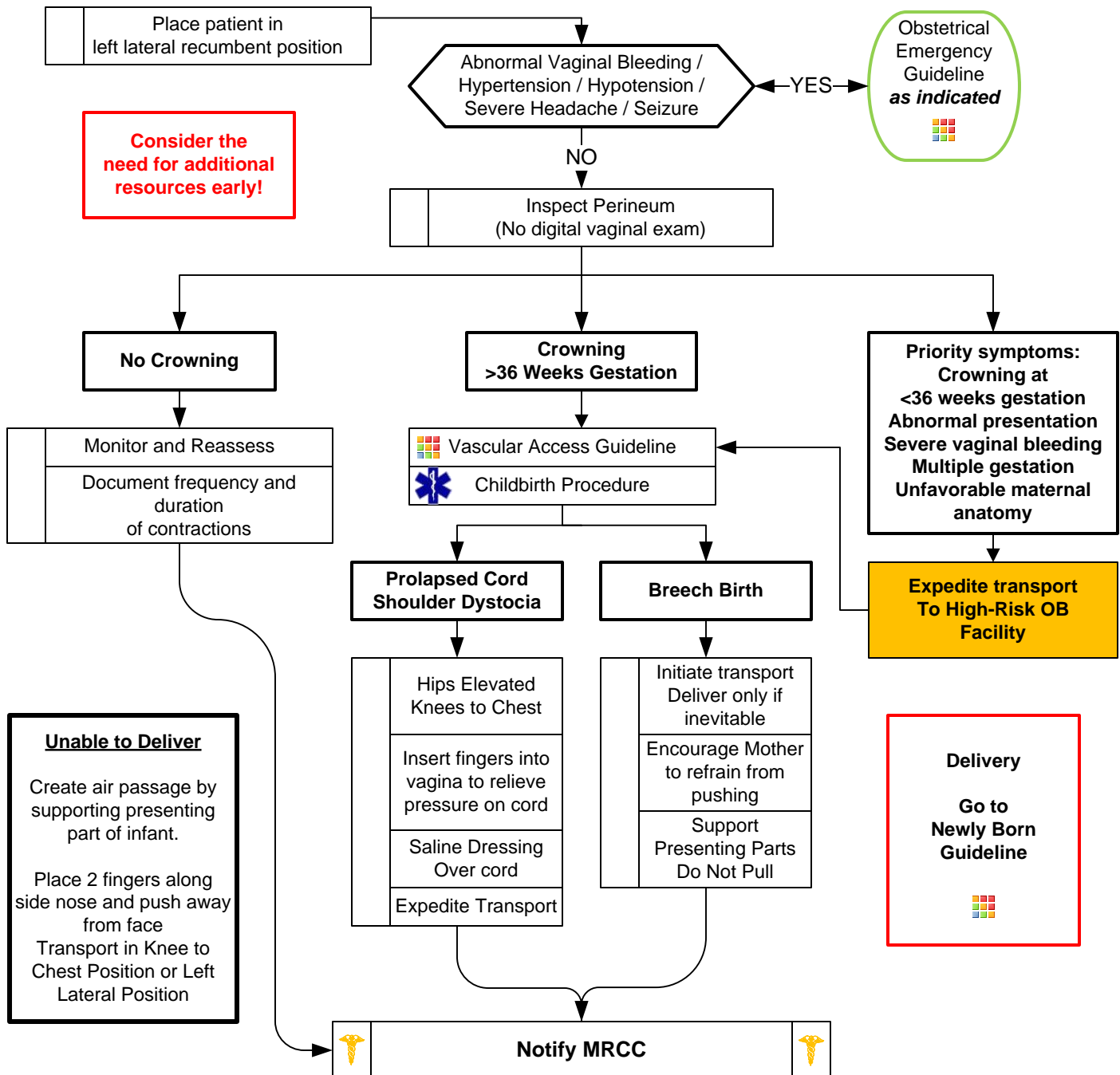
- Due date
- Time contractions started / how often
- Rupture of membranes
- Time / amount of any vaginal bleeding
- Sensation of fetal activity
- Past medical and delivery history
- Medications
- Gravida / Para Status
- High Risk pregnancy

Signs and Symptoms

- Spasmodic pain
- Vaginal discharge or bleeding
- Crowning or urge to push
- Meconium

Differential

- Abnormal presentation
Buttock
Foot
Hand
- Prolapsed cord
- Placenta previa
- Abruptio placenta



APGAR SCORING

INDICATOR	0	1	2
HR	Absent	<100	>100
RR	Absent	Slow, irregular weak cry	Good vigorous cry
MUSCLE TONE	Flaccid, limp	Some flexion of extremities	Good flexion, active motion
REFLEX IRRITABILITY	NR	Weak cry and grimace	Vigorous cry, cough, sneeze
SKIN COLOR	Blue	Acrocyanosis	Pink

High Risk OB Receiving Facilities

20 – 32 weeks: United Hospital

28 – 32 weeks: St. John's Hospital (with approval)

> 32 weeks: Closest appropriate facility

Pearls

- **Recommended Exam (of Mother): Mental Status, Heart, Lungs, Abdomen, Neuro**
- Document all times (delivery, contraction frequency, and length).
- If maternal seizures occur, refer to the Obstetrical Emergencies Protocol.
- After delivery, massaging the uterus (lower abdomen) will promote uterine contraction and help to control post-partum bleeding.
- Some perineal bleeding is normal with any childbirth. Large quantities of blood or free bleeding are abnormal.
- Record APGAR at 1 minute and 5 minutes after birth.

Newly Born

History

- Due date and gestational age
- Multiple gestation (twins etc.)
- Meconium
- Delivery difficulties
- Congenital disease
- Medications (maternal)
- Maternal risk factors
substance abuse
smoking

Signs and Symptoms

- Respiratory distress
- Peripheral cyanosis or mottling (normal)
- Central cyanosis (abnormal)
- Altered level of responsiveness
- Bradycardia

Differential

- Airway failure
Secretions
Respiratory drive
- Infection
- Maternal medication effect
- Hypovolemia
- Hypoglycemia
- Congenital heart disease
- Hypothermia

Care of mother
Appropriate Guideline



Term Gestation
Breathing or Crying
Good Muscle Tone

YES

Provide warmth / Dry infant
Clear airway **if necessary**

Monitor and Reassess

NO

Warm, Dry and Stimulate
Clear airway if necessary

Heart Rate < 100
Agonal breathing or Apnea

NO

Labored breathing /
Persistent Cyanosis

YES

BVM Ventilations (every 2 secs)

Pulse Oximetry

A Cardiac Monitor

Heart Rate < 100

NO

YES

BVM Ventilations

If repeating cycle take corrective action: Change in position or BVM Technique. If no improvement move down algorithm to intubation

Heart Rate < 60

NO

YES

Chest Compressions

 Pediatric Airway Guideline(s)

 Vascular Access Guideline

Heart Rate < 60

NO

YES

Supplemental Oxygen
Maintain SpO₂ ≥ 94 %

Maintain warmth

Monitor and Reassess

Epinephrine 1:10,000
0.01 mg/kg IV / IO
Every 3 to 5 minutes as needed

Normal Saline Bolus
10 mL/kg IV / IO
May repeat x 1

A

Notify MRCC



Airway Suctioning
Routine suctioning of the newborn is no longer recommended

Clear amniotic fluid:

Suction only when obstruction is present and / or if BVM is needed.

Meconium present:

Non-vigorous newborns may require deep suction if no response to initial resuscitation efforts

Most newborns requiring resuscitation will respond to ventilations / BVM, compressions and / or epinephrine.

If not responding consider hypovolemia, pneumothorax and / or hypoglycemia (< 40.)

Hypoglycemia can be treated with 5 mL of D10 (dilute 1 mL of D50 with 4 mL of NS)

APGAR SCORING

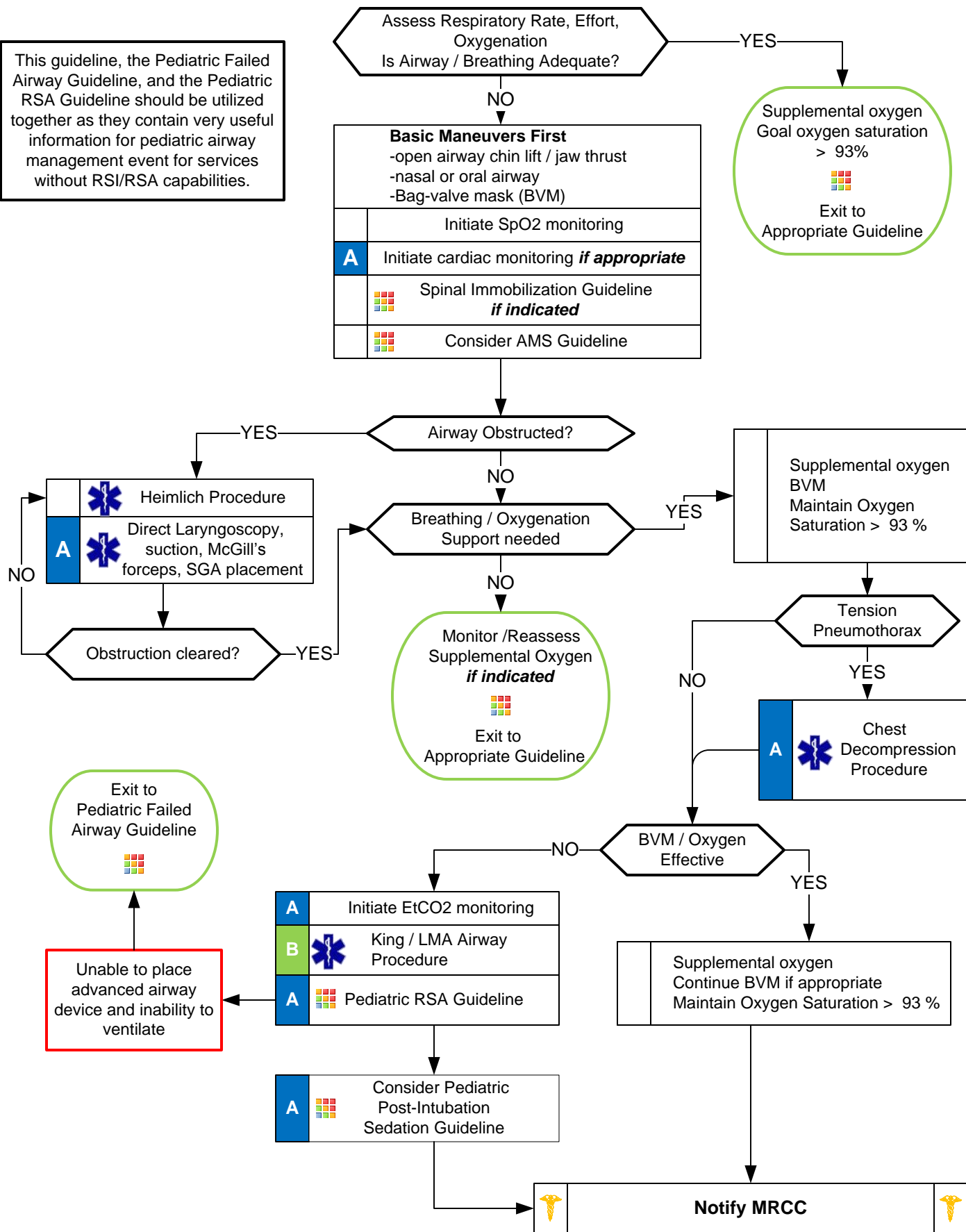
INDICATOR	0	1	2
HR	Absent	<100	>100
RR	Absent	Slow, irregular weak cry	Good vigorous cry
MUSCLE TONE	Flaccid, limp	Some flexion of extremities	Good flexion, active motion
REFLEX IRRITABILITY	NR	Weak cry and grimace	Vigorous cry, cough, sneeze
SKIN COLOR	Blue	Acrocyanosis	Pink

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Chest, Heart, Abdomen, Extremities, Neuro**
- **Transport mother WITH infant when at all possible.**
- **Term gestation, strong cry / breathing and with good muscle tone generally will need no resuscitation.**
- **Most important vital signs in the newly born are respirations / respiratory effort and heart rate.**
- Heart rate best assessed by auscultation of the precordial pulse followed palpation of the umbilical pulse.
- Pulse oximetry should be applied to the right side of the body.
- **Expected pulse oximetry readings:** Following birth at 1 minute = 60 - 65 %, 2 minutes = 65 – 70%, 3 minutes = 70 – 75 %, 4 minutes = 75 – 80 %, 5 minutes = 80 – 85 % and 10 minutes = 85 – 95%.
- CPR in newborns is 120 compressions/minute with a **3:1** compression to ventilation ratio.
- It is extremely important to keep infant warm
- Maternal sedation or narcotics will sedate infant (Naloxone NO LONGER recommended - supportive care only).
- Consider hypoglycemia in infant (Heel stick < 40).
- D10 = D50 diluted (1 ml of D50 with 4 ml of Normal Saline)
- Document 1 and 5 minute APGARs in PCR

Pediatric Airway

This guideline, the Pediatric Failed Airway Guideline, and the Pediatric RSA Guideline should be utilized together as they contain very useful information for pediatric airway management event for services without RSI/RSA capabilities.

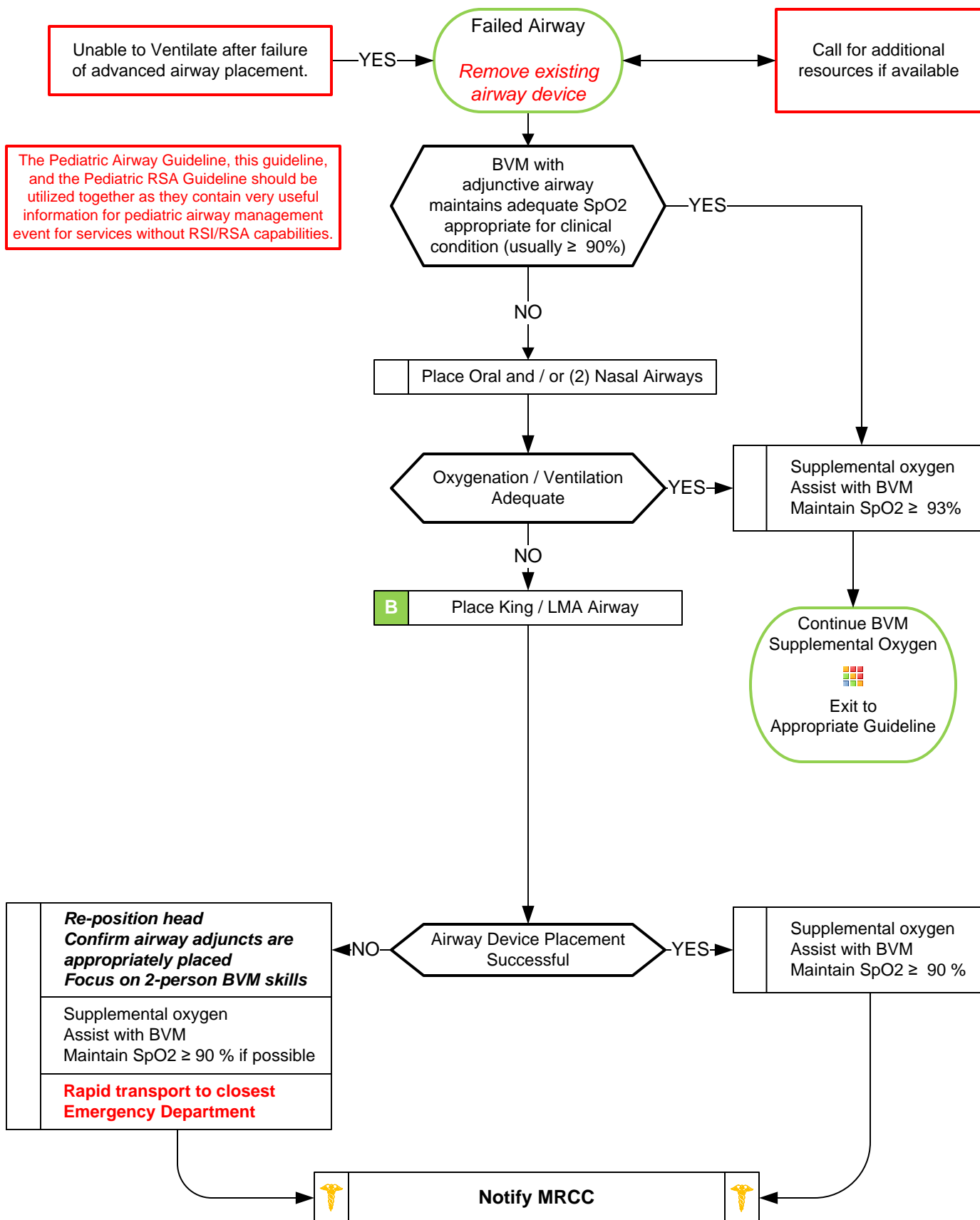


Pediatric Airway

Pearls

- For this guideline, pediatric is defined as < 12 years of age, < 40 kg in weight, lack of signs of puberty, or any patient who can be measured within the Broselow-Luten tape.
- Continuous waveform capnography (EtCO₂) is mandatory with all advanced airway placements. Document results.
- If an effective airway is being maintained by BVM with continuous pulse oximetry values of > 93% or stable/improving values consistent with clinical condition (e.g. pulse oximetry in the mid 80s post-drowning), it would be most appropriate to continue with basic airway measures instead of placing a King or LMA airway.
- For the purposes of this guideline, a secure airway is when the patient is receiving appropriate oxygenation and ventilation.
- Ventilatory rate should generally be 30 for Neonates, 25 for Toddlers, 20 for School Age, and for Adolescents the normal Adult rate of 8-12 per minute. Goal ventilation rate should maintain EtCO₂ between 35 and 45; AVOID HYPERVENTILATION.
- Hyperventilation in deteriorating head trauma should only be done to maintain an EtCO₂ of 30-35.
- Do not attempt advanced airway placement in patients who maintain a gag reflex.
- A gastric tube should be placed in all patients with a supraglottic airway.
- It is important to secure the airway device well and consider c-collar (even in absence of trauma) to better maintain airway placement. Manual stabilization of the airway device should be used during all patient moves / transfers.

Pediatric Failed Airway



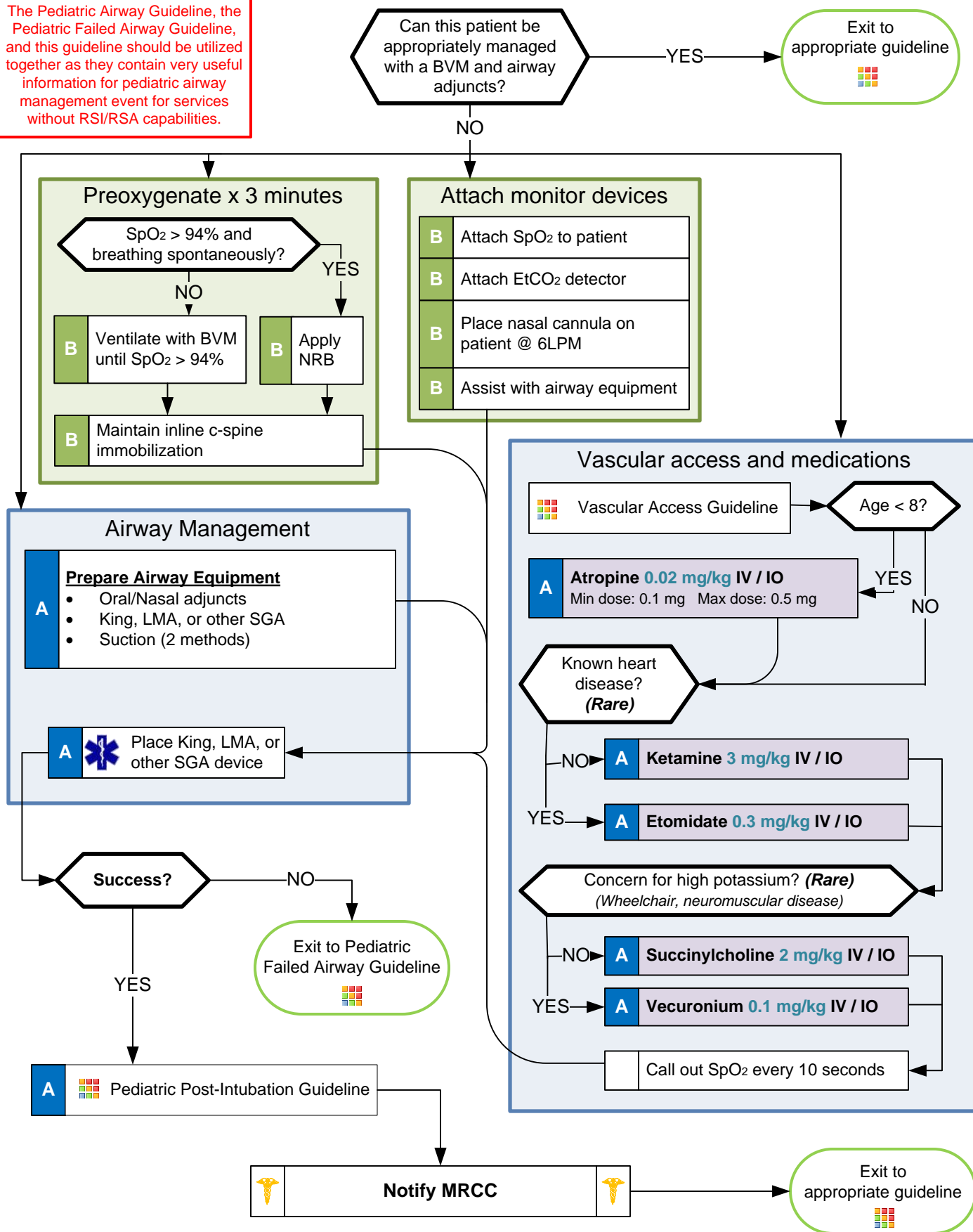
Pediatric Failed Airway

Pearls

- For this guideline, pediatric is defined as less than 12 years of age, < 40 kg in weight, lack of signs of puberty, or any patient which can be measured within the Broselow-Luten tape.
- Continuous waveform capnography (EtCO₂) is mandatory with all advanced airway devices. Document results.
- If an effective airway is being maintained by BVM with continuous pulse oximetry values of $\geq 93\%$ or stable/improving values appropriate to clinical condition (e.g. values in the mid 80s with a post-drowning patient), it would be most appropriate to continue with basic airway measures instead of using a King or LMA airway device.
- For the purposes of this guideline a secure airway is when the patient is receiving appropriate oxygenation and ventilation.
- Ventilatory rate should generally be 30 for Neonates, 25 for Toddlers, 20 for School Age, and for Adolescents the normal Adult rate of 8-12 per minute. The goal rate maintains an EtCO₂ between 35 and 45 and avoid hyperventilation.
- Hyperventilation in deteriorating head trauma should only be done to maintain an EtCO₂ of 30-35.
- A gastric tube placement should be placed in all patients with a supraglottic airway device.
- It is important to secure the airway device well and consider c-collar (even in absence of trauma) to better maintain device placement. Manual stabilization of the airway device should be used during all patient moves / transfers.

Pediatric RSA

The Pediatric Airway Guideline, the Pediatric Failed Airway Guideline, and this guideline should be utilized together as they contain very useful information for pediatric airway management event for services without RSI/RSA capabilities.



Pediatric RSA

Always weigh the risks and benefits of advanced airway management in the field against transport. All prehospital RSI/RSA interventions are considered high risk. If ventilation / oxygenation is adequate, transport may be the best option. The most important airway device and the most difficult to use correctly and effectively is the Bag Valve Mask.

Few prehospital airway emergencies cannot be temporized or managed with proper BVM techniques.

Difficult Airway Assessment

Difficult King / SGA - RODS:

- Restricted mouth opening
- Obstruction / Obese or late pregnancy
- Distorted or disrupted airway
- Stiff or increased airway pressures (Asthma, COPD, Obese, Pregnant)

Trauma: Utilize in-line cervical stabilization during King/SGA or BVM use. During airway placement the cervical collar front should be open or removed to facilitate translation of the mandible / mouth opening.

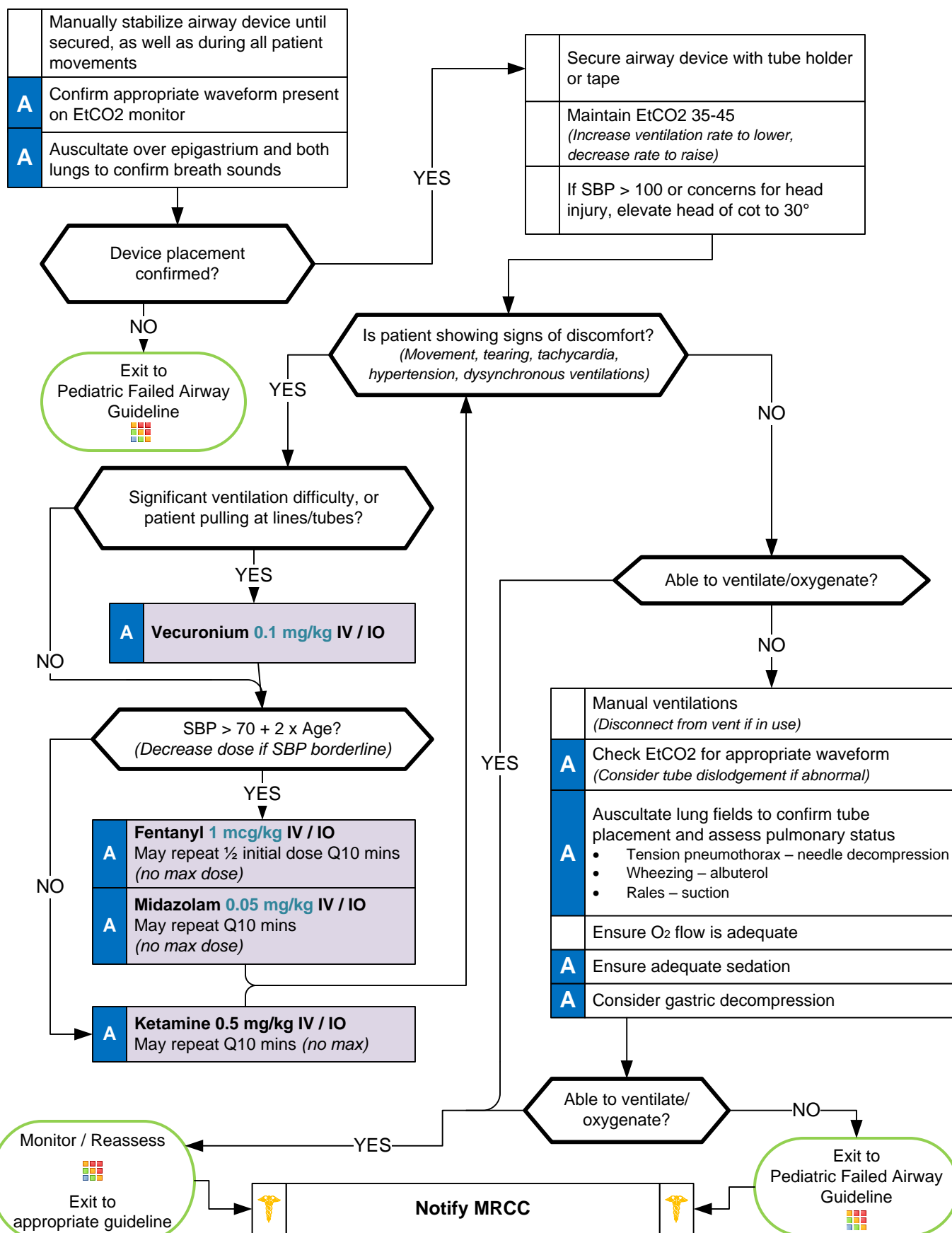
Indications for RSA

Failure to protect the airway
Inability to oxygenate
Inability to ventilate
Unstable hemodynamics/shock
GSC < 9 in trauma
Impending airway compromise

Pearls

- **This procedure requires at least 2 EMT-Paramedics**
- **Divide the workload – ventilate, suction, drugs, airway device placement**
- **Once a patient has been given a paralytic drug, YOU ARE RESPONSIBLE FOR VENTILATIONS if desaturation occurs**
- **Continuous Waveform Capnography and Pulse Oximetry are required for airway device verification and ongoing patient monitoring**
- **An airway is considered secure when the patient is receiving appropriate oxygenation and ventilation.**
- **An appropriate ventilatory rate is one that maintains an EtCO₂ of 35-45. Avoid hyperventilation.**
- Protect the patient from self extubation when the drugs wear off. Longer acting paralytics may be needed post-airway placement.
- A gastric tube should be placed with all supraglottic airway devices to limit aspiration and decompress stomach
- Hyperventilation in deteriorating head trauma should only be done to maintain a EtCO₂ of 30-35.
- It is important to secure the airway device well and consider c-collar (in absence of trauma) to better maintain airway device placement. Manual stabilization of the airway device should be used during all patient moves / transfers.

Pediatric Post Intubation Sedation



Pediatric Post Intubation Sedation

Always weigh the risks and benefits of advanced airway management in the field against transport. All prehospital RSI/RSA interventions are considered high risk. If ventilation / oxygenation is adequate, transport may be the best option. The most important airway device and the most difficult to use correctly and effectively is the Bag Valve Mask.

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- Restricted mouth opening
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Trauma: Utilize in-line cervical stabilization during King/SGA or BVM use. During airway placement the cervical collar front should be open or removed to facilitate translation of the mandible / mouth opening.

Indications for RSA

Failure to protect the airway
Inability to oxygenate
Inability to ventilate
Unstable hemodynamics/shock
GSC < 9 in trauma
Impending airway compromise

Pearls

- **Continuous Waveform Capnography and Pulse Oximetry are required for airway device verification and ongoing patient monitoring**
- **An airway is considered secure when the patient is receiving appropriate oxygenation and ventilation.**
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- Hyperventilation in deteriorating head trauma should only be done to maintain a EtCO₂ of 30-35.
- It is important to secure the airway device well and consider c-collar (in absence of trauma) to better maintain airway device placement. Manual stabilization of the airway device should be used during all patient moves / transfers.

Pediatric Pain Control

History

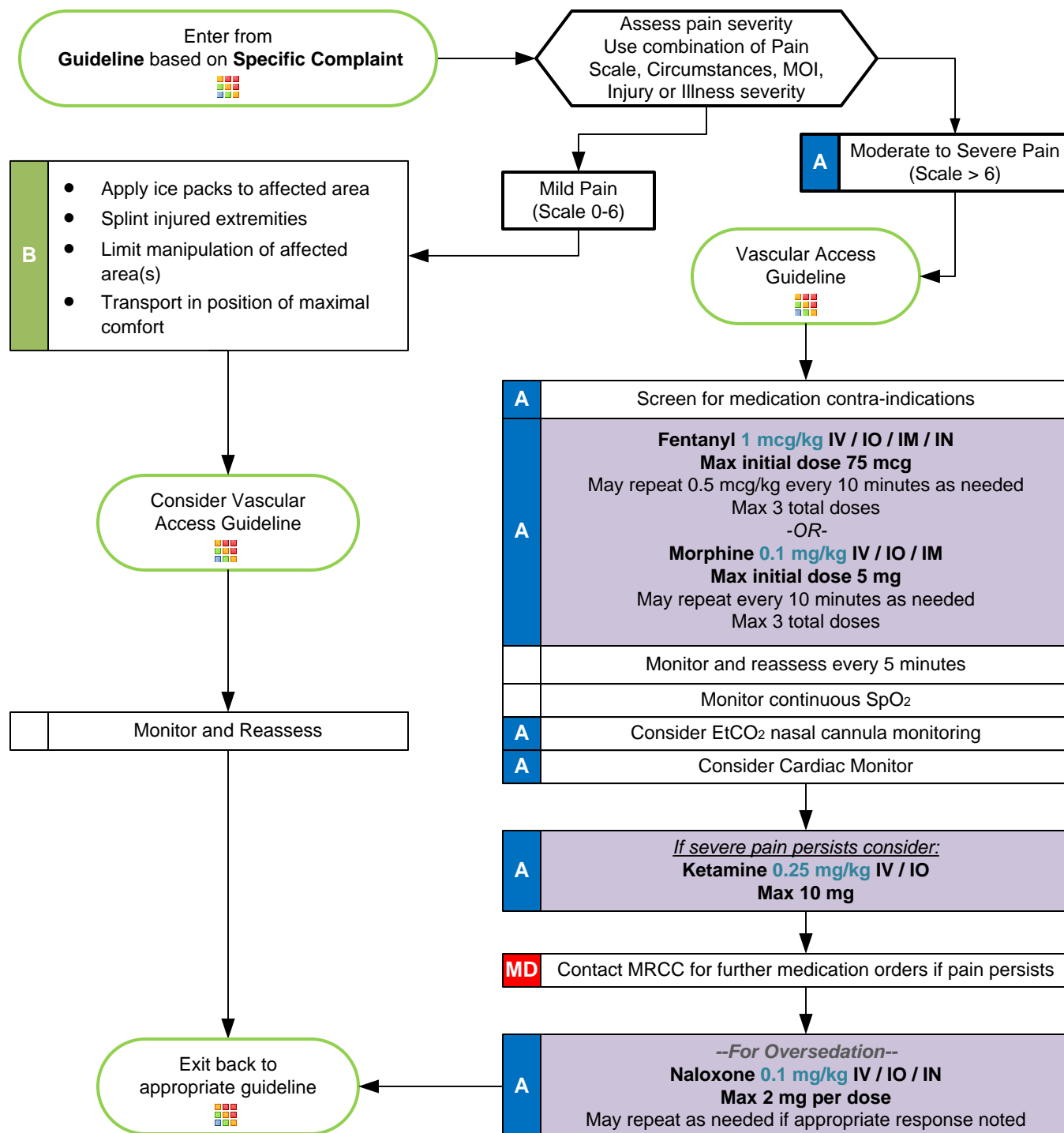
- Age
- Location
- Duration
- Severity (1 - 10)
- If child use Wong-Baker faces scale
- Past medical history
- Medications
- Drug allergies

Signs and Symptoms

- Severity (pain scale)
- Quality (sharp, dull, etc.)
- Radiation
- Relation to movement, respiration
- Increased with palpation of area

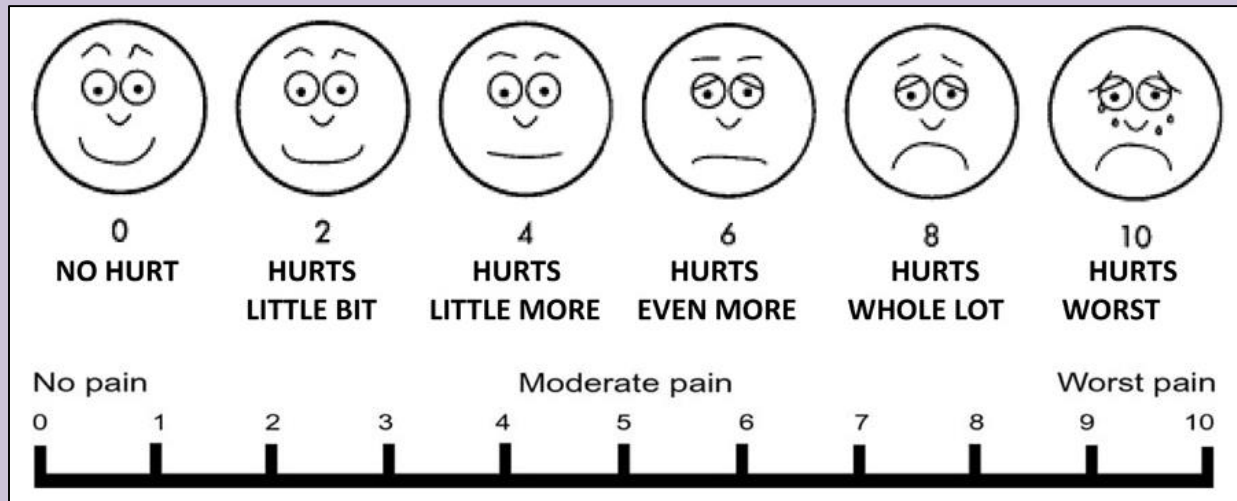
Differential

- Per the specific protocol
- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleural / Respiratory
- Neurogenic
- Renal (colic)



Pediatric Pain Control

Wong-Baker Faces Scale



FLACC Pain Assessment Score

Parameter	0	1	2
Face	No expression	Occasional grimace	Frequent to constant quivering chin
Legs	Normal position or relaxed	Uneasy restless, tense	Kicking or legs drawn up
Activity	Lying quiet	Squirming, shifting back and forth, tense	Arched, rigid or jerking
Cry	No cry	Moans or whimpers	Crying steadily
Consolability	Content, relaxed	Reassurance, hugging	Difficult to console

Score: 0, no pain; 1-3, mild pain; 4-7, moderate pain; 8-10, severe pain, FLACC: Face, legs, activity, cry, consolability

Pearls

- **Recommended Exam: Mental Status, Area of Pain, Neuro**
- **USE EXTREME CAUTION** in administering opioids to patients less than 10kg
- **This guideline applies to patients less than 12 years of age, weight < 40 kg, lack of signs of puberty, or who can be measured on the Broselow-Luten tape. If a patient is larger than the Broselow-Luten tape, you may use the adult pain control guideline, realizing that the adult pain control guideline is also weight-based.**
- Pain severity (0-10) is a vital sign to be recorded pre and post IV or IM medication delivery and at disposition.
- For children use Wong-Baker faces scale or the FLACC score
- Vital signs should be obtained pre, 5 minutes post, and at disposition with all pain medications.
- Contraindications to opioid use include hypotension, altered mental status, or respiratory distress.
- All patients who receive IM or IV medications must be observed 15 minutes for drug reaction.
- Use Numeric (> 9 yrs), Wong-Baker faces (4-16yrs) or FLACC scale (0-7 yrs) as needed to assess pain

Pediatric Pulseless Arrest

History

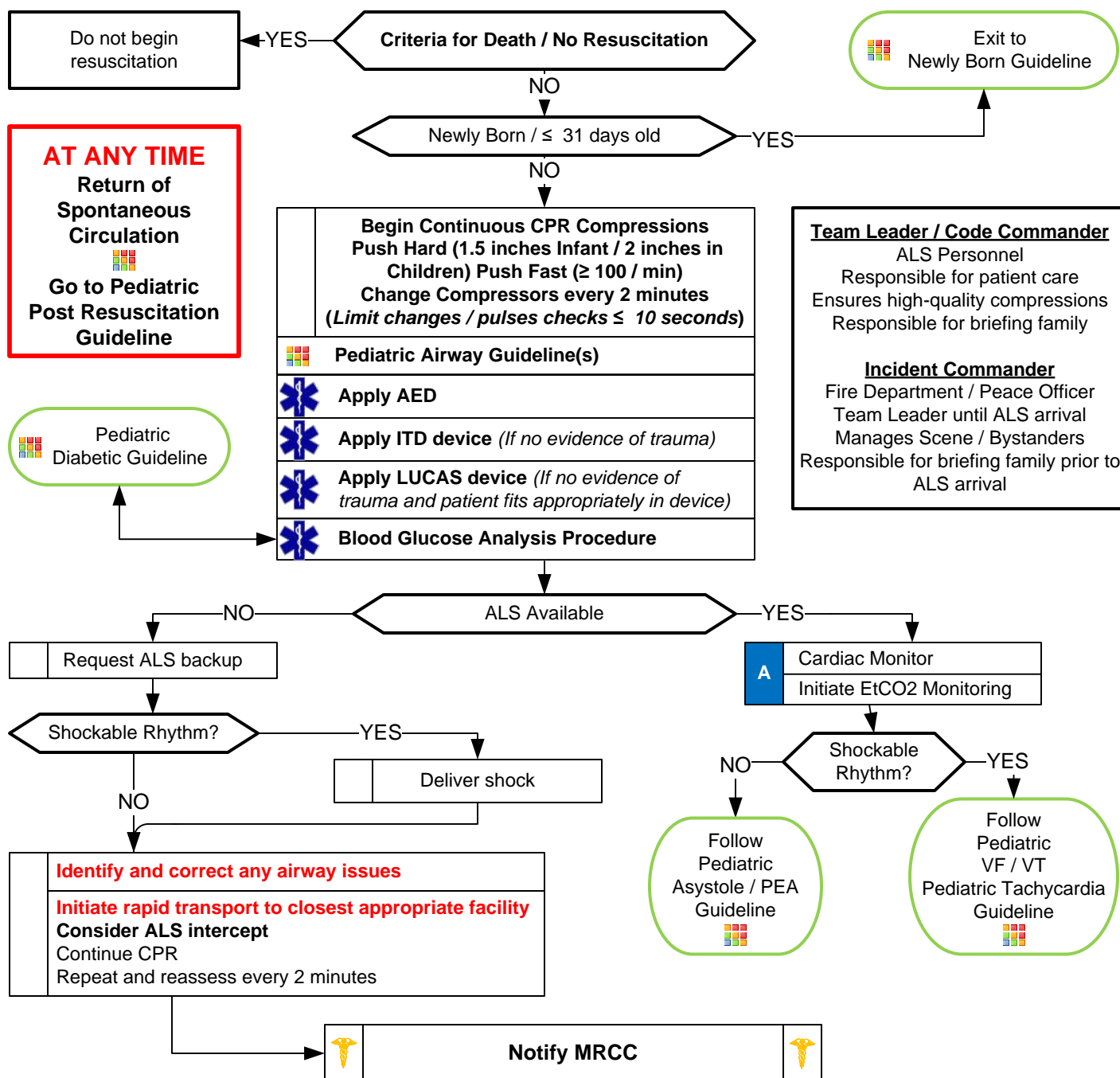
- Time of arrest
- Medical history
- Medications
- Possibility of foreign body
- Hypothermia

Signs and Symptoms

- Unresponsive
- Cardiac arrest

Differential

- Respiratory failure
Foreign body, Secretions, Infection (croup, epiglottitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax, cardiac tamponade, pulmonary embolism
- Hypothermia
- Toxin or medication
- Electrolyte abnormalities (Glucose, Potassium)
- Acidosis



Pediatric Pulseless Arrest

If pediatric defibrillation patches are not available, adult patches may be used.

Cardiac Arrest Code Commander Checklist

- ☐ Code Commander is identified
- ☐ Monitor is visible and a dedicated provider is viewing the rhythm with all leads attached
- ☐ Confirm that continuous compressions are ongoing at 100-120 beats per minute
- ☐ ITD device in use (ResQPod)
- ☐ Defibrillations occurring at 2 minute intervals for shockable rhythms
- ☐ O₂ cylinder with adequate oxygen is attached to BVM
- ☐ EtCO₂ waveform is present and value is being monitored
- ☐ Vascular access has been obtained (IV or IO) with IV fluids being administered
- ☐ Underlying causes have been considered and treated early in arrest
- ☐ Gastric distention is not a factor
- ☐ Family is receiving care and is at the patient's side if desired

Post ROSC Cardiac Arrest Checklist

- ☐ Remove ITD device (ResQPod)
- ☐ ASSESS EtCO₂ (should be >20 with good waveform)
- ☐ Assign a provider to maintain FINGER on pulse during all patient movements
- ☐ Continuous visualization of cardiac monitor rhythm
- ☐ Check O₂ supply and SpO₂, TITRATE to > 93%
- ☐ Do not try to obtain a "normal" EtCO₂ by increasing respiratory rate
- ☐ Assess for & TREAT bradycardias < 60 bpm
- ☐ Obtain Blood Pressure -- Pressor agent(s) indicated for SBP < 70 + 2 x Age
- ☐ Evaluate for post-resuscitation airway placement
- ☐ When patient is moved, perform CONTINUOUS PULSE CHECK and continuous monitoring of cardiac rhythm
- ☐ Mask is available for BVM in case advanced airway fails
- ☐ Once in ambulance, confirm pulse, breath sounds, SpO₂, EtCO₂, and cardiac rhythm
- ☐ Appropriate personnel available in the back of the ambulance for transport

Pearls

- **Recommended Exam: Mental Status**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Compress \geq 1/3 anterior-posterior diameter of chest, in infants 1.5 inches and in children 2 inches. Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: Ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place airway device. A King or LMA device should be used.**
- Airway is the most important intervention in pediatric arrests. This should be accomplished quickly with BVM or King / LMA supraglottic device. Patient survival is often dependent on proper ventilation and oxygenation / airway interventions.
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work. Utilize Team Focused "Code Commander" Approach assigning responders to predetermined tasks.
- Team Focused Approach / Pit-Crew Approach.
- Reassess and document airway device and EtCO₂ frequently, after every move, and at transfer of care.
- In order to be successful in pediatric arrests, a cause must be identified and corrected.

Pediatric Ventricular Fibrillation Pulseless Ventricular Tachycardia

History

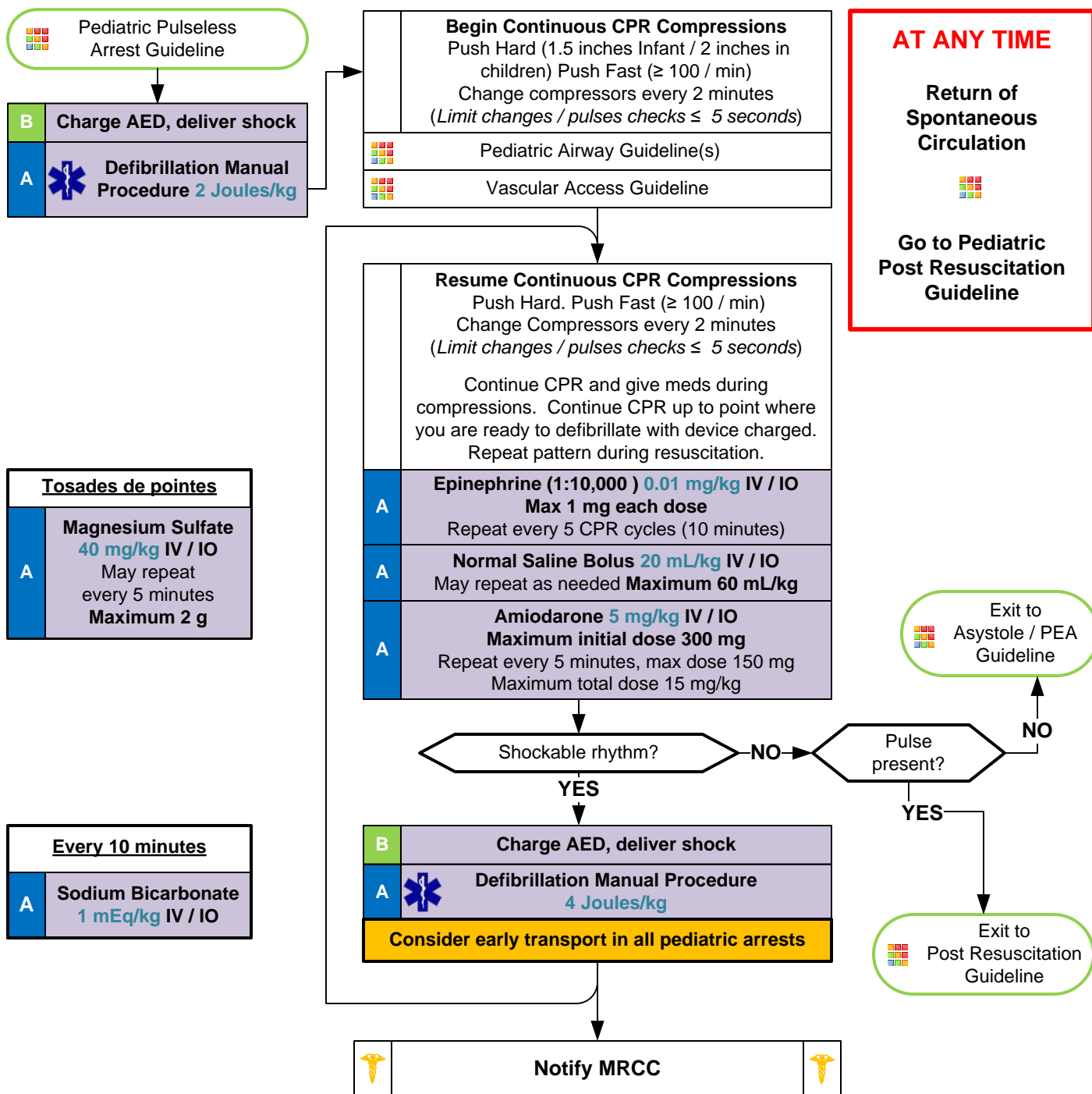
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness
- Airway obstruction
- Hypothermia

Signs and Symptoms

- Unresponsive
- Cardiac Arrest

Differential

- Respiratory failure / Airway obstruction
- Hyper / hypokalemia
- Hypovolemia
- Hypothermia
- Hypoglycemia
- Acidosis
- Tension pneumothorax
- Tamponade
- Toxin or medication
- Thrombosis: Coronary / Pulmonary Embolism
- Congenital heart disease



Pediatric Ventricular Fibrillation Pulseless Ventricular Tachycardia

Pediatric Shockable Rhythm Timeline V-Fib / V-Tach

	BLS Provider Compressions	BLS Provider Ventilations	ALS Provider Monitor / Airway	ALS Provider Medications
Arrival	Start CPR	BVM + ITD (ResQPod)	Shock 2 J/kg Apply cardiac monitor	Vascular Access Infuse normal saline
2 minutes	Apply LUCAS device If patient fits appropriately	Monitor EtCO ₂	Shock 4 J/kg	Epinephrine 0.01mg/kg (1:10,000) Max 1 mg
4 minutes	Restart CPR immediately after pulse/rhythm check	Consider SGA (King) or ET tube	Shock 4 J/kg Assist with advanced airway	Amiodarone 5 mg/kg Max 300 mg
6 minutes	Restart CPR immediately after pulse/rhythm check	Ongoing ventilations 8 - 10 bpm	Shock 4 J/kg	Sodium Bicarb 1 mEq/kg Repeat every 10 minutes
8 minutes	Restart CPR immediately after pulse/rhythm check		Shock 4 J/kg	Amiodarone 5 mg/kg Max 150 mg
10 minutes	Restart CPR immediately after pulse/rhythm check		Shock 4 J/kg	
12 minutes	Restart CPR immediately after pulse/rhythm check		Shock 4 J/kg	Epi 0.01mg/kg, max 1 mg Repeat every 10 minutes

H's/T's

- **Hypovolemia**
- **Hypoxia**
- Hydrogen ion (acidosis)
- Hypothermia
- Hypo / Hyperkalemia
- Hypoglycemia
-
- Tension pneumothorax
- Tamponade; cardiac
- **Toxins**
- Thrombosis; pulmonary (PE)
- Thrombosis; coronary (MI)

It is always important to perform a thorough physical exam and obtain a SAMPLE history to identify any reversible causes of cardiac arrest.

Pearls

- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Compress \geq 1/3 anterior-posterior diameter of chest, in infants 1.5 inches and in children 2 inches. Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: Ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.**
- **Limit chest compression interruptions when placing King or LMA airway.**
- Airway is a more important intervention in pediatric arrests. This should be accomplished quickly with BVM or supraglottic device. Patient survival is often dependent on proper ventilation and oxygenation / airway interventions
- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- Respiratory arrest is a common cause of cardiac arrest. Unlike adults early airway intervention is critical.
- In most cases pediatric airways can be managed by basic interventions and/or BVM.
- Reassess and document airway device placement and EtCO₂ frequently, after every move, and at transfer of care.

Pediatric Asystole / PEA

History

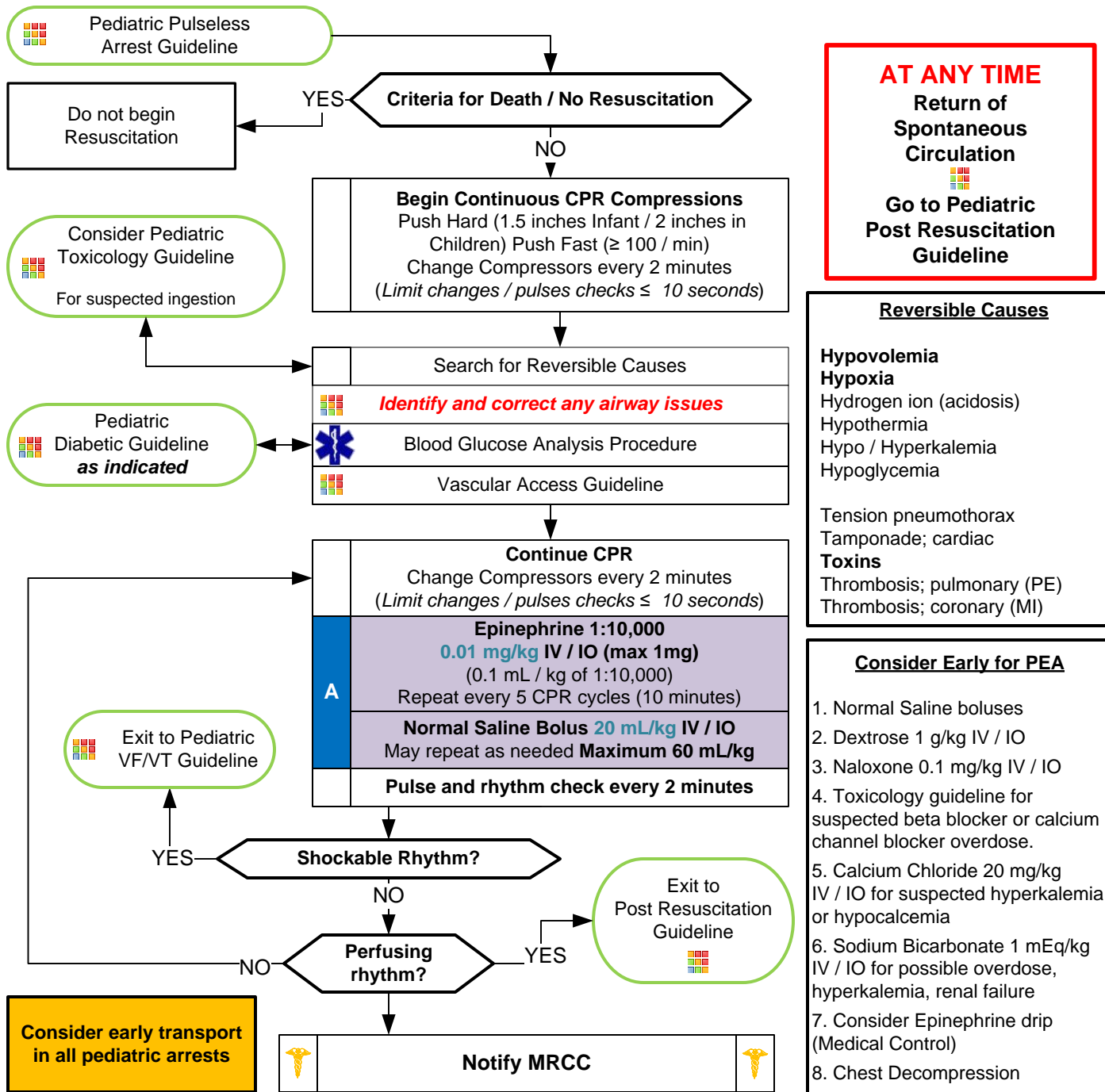
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness
- Airway obstruction
- Hypothermia
- Suspected abuse; shaken baby syndrome, pattern of injuries
- SIDS

Signs and Symptoms

- Unresponsive
- Cardiac Arrest
- Signs of lividity or rigor

Differential

- Respiratory failure
- Foreign body
- Hyperkalemia
- Infection (croup, epiglottitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxin or medication
- Hypoglycemia
- Acidosis



Pediatric Asystole / PEA

Pediatric Non-shockable Rhythm Timeline Asystole / PEA

	BLS Provider Compressions	BLS Provider Ventilations	ALS Provider Monitor / Airway	ALS Provider Medications
Arrival	Start CPR	BVM + ITD (ResQPod)	Apply cardiac monitor	Vascular Access Infuse normal saline
2 minutes	Apply LUCAS device If patient fits appropriately	Monitor EtCO ₂	Check monitor	Epinephrine 0.01mg/kg (1:10,000) Max 1 mg
4 minutes	Restart CPR immediately after pulse/rhythm check	Consider SGA (King) or ET tube	Check monitor Assist with advanced airway	Review H's/T's Interventions as indicated
6 minutes	Restart CPR immediately after pulse/rhythm check	Ongoing ventilations 8 - 10 bpm	Check monitor	Sodium Bicarb 1 mEq/kg <i>Repeat every 10 minutes</i>
8 minutes	Restart CPR immediately after pulse/rhythm check		Check monitor	
10 minutes	Restart CPR immediately after pulse/rhythm check		Check monitor	
12 minutes	Restart CPR immediately after pulse/rhythm check		Check monitor	Epi 0.01mg/kg, max 1 mg <i>Repeat every 10 minutes</i>

H's/T's

- **Hypovolemia**
- **Hypoxia**
- Hydrogen ion (acidosis)
- Hypothermia
- Hypo / Hyperkalemia
- Hypoglycemia
- Tension pneumothorax
- Tamponade; cardiac
- **Toxins**
- Thrombosis; pulmonary (PE)
- Thrombosis; coronary (MI)

It is always important to perform a thorough physical exam and obtain a SAMPLE history to identify any reversible causes of cardiac arrest.

Pearls

- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Compress \geq 1/3 anterior-posterior diameter of chest, in infants 1.5 inches and in children 2 inches. Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: Ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.**
- **Limit chest compression interruptions when placing King or LMA airway.**
- Airway is a more important intervention in pediatric arrests. This should be accomplished quickly with BVM or supraglottic device. Patient survival is often dependent on proper ventilation and oxygenation / airway interventions
- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- Respiratory arrest is a common cause of cardiac arrest. Unlike adults early ventilation intervention is critical.
- In most cases pediatric airways can be managed by basic interventions and/or BVM.
- Reassess and document airway device placement and EtCO₂ frequently, after every move, and at transfer of care.

Pediatric Post Resuscitation

History

- Respiratory arrest
- Cardiac arrest

Signs/Symptoms

- Return of pulse

Differential

- Continue to address specific differentials associated with the original dysrhythmia

Arrhythmias are common and usually self limiting after ROSC



If Arrhythmia Persists follow Pediatric Rhythm Appropriate Guideline

Repeat Primary Assessment	
Optimize Ventilation and Oxygenation <ul style="list-style-type: none"> Goal SpO₂ ≥ 94%, ETCO₂ 35 – 45 mm Hg DO NOT HYPERVENTILATE 	
A	Cardiac Monitor
	Vascular Access Guideline <i>if indicated</i>
	Airway Guideline <i>if indicated</i>
	12 Lead ECG Procedure
Monitor Vital Signs / Reassess	

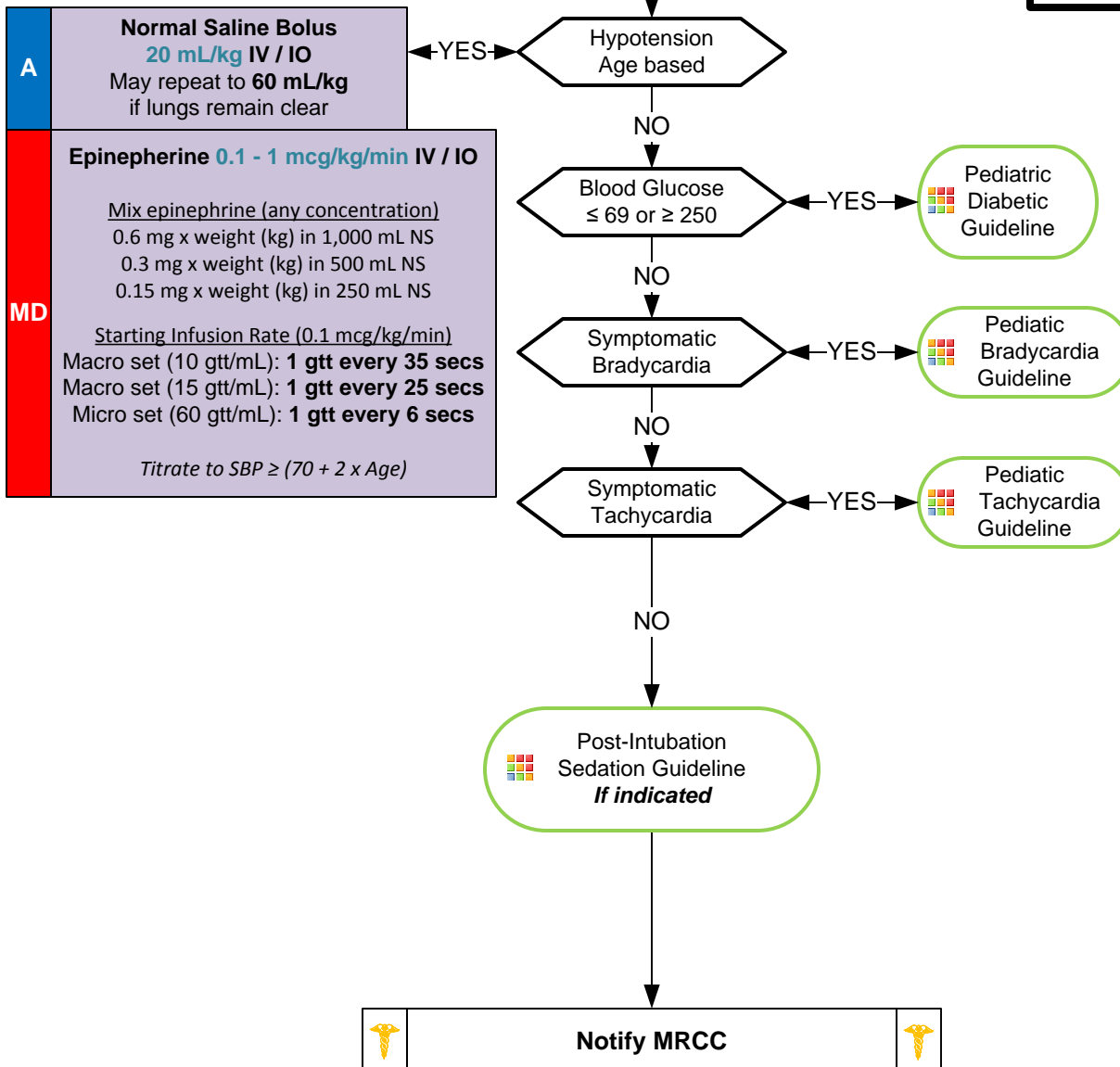
Hypotension Age Based

0 – 28 Days
< 60 mmHg

1 Month to 1 Year
< 70 mmHg

1 to 10 Years
< 70 + (2 x age) mmHg

11 Years and older
< 90 + (2 x age) mmHg



Pediatric Post Resuscitation

Post ROSC Cardiac Arrest Checklist

- ☐ ASSESS EtCO₂ (should be >20 with good waveform)
- ☐ Remove ITD device (ResQPod)
- ☐ Assign a provider to maintain FINGER on pulse during all patient movements
- ☐ Continuous visualization of cardiac monitor rhythm
- ☐ Check O₂ supply and SpO₂ to TITRATE to SpO₂ 94-99%
- ☐ Do not try to obtain a "normal" EtCO₂ by increasing respiratory rate
- ☐ Obtain 12 lead EKG
- ☐ Assess for & TREAT bradycardias < 60 bpm. Resume chest compressions if pulse drops below 60 bpm.
- ☐ Obtain Blood Pressure – Consider pressor agent(s) for SBP < 70 + 2 x Age
- ☐ Evaluate for post-resuscitation airway placement (King or LMA).
- ☐ When patient is moved, perform CONTINUOUS PULSE CHECK and continuous monitoring of cardiac rhythm
- ☐ Mask is available for BVM in case advanced airway fails
- ☐ Once in ambulance, confirm pulse, breath sounds, SpO₂, EtCO₂, and cardiac rhythm
- ☐ Appropriate personnel present in the back of the ambulance for transport

Pearls

- **Recommended Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro**
- Hyperventilation is a significant cause of hypotension and recurrence of cardiac arrest in the post resuscitation phase and must be avoided at all costs.
- Initial EtCO₂ may be elevated immediately post-resuscitation but will usually normalize. While goal is 35 – 45 mm Hg, avoid hyperventilation.
- Transport to regional Children's Hospital if appropriate. Under 1 year of age consider transport to Level 1 Pediatric Trauma Center due to high incidence of child abuse and concurrent injuries.
- Most patients immediately post resuscitation will require ventilatory assistance.
- The condition of post-resuscitation patients fluctuates rapidly and continuously and they require close monitoring. Appropriate post-resuscitation management may require consultation with medical control.
- Common causes of post-resuscitation hypotension include hyperventilation, hypovolemia, pneumothorax, and medication reaction to ALS drugs.
- If utilized, titrate epinephrine drip to maintain age-appropriate SBP. Ensure adequate fluid resuscitation is ongoing.

Pediatric Tachycardia

History

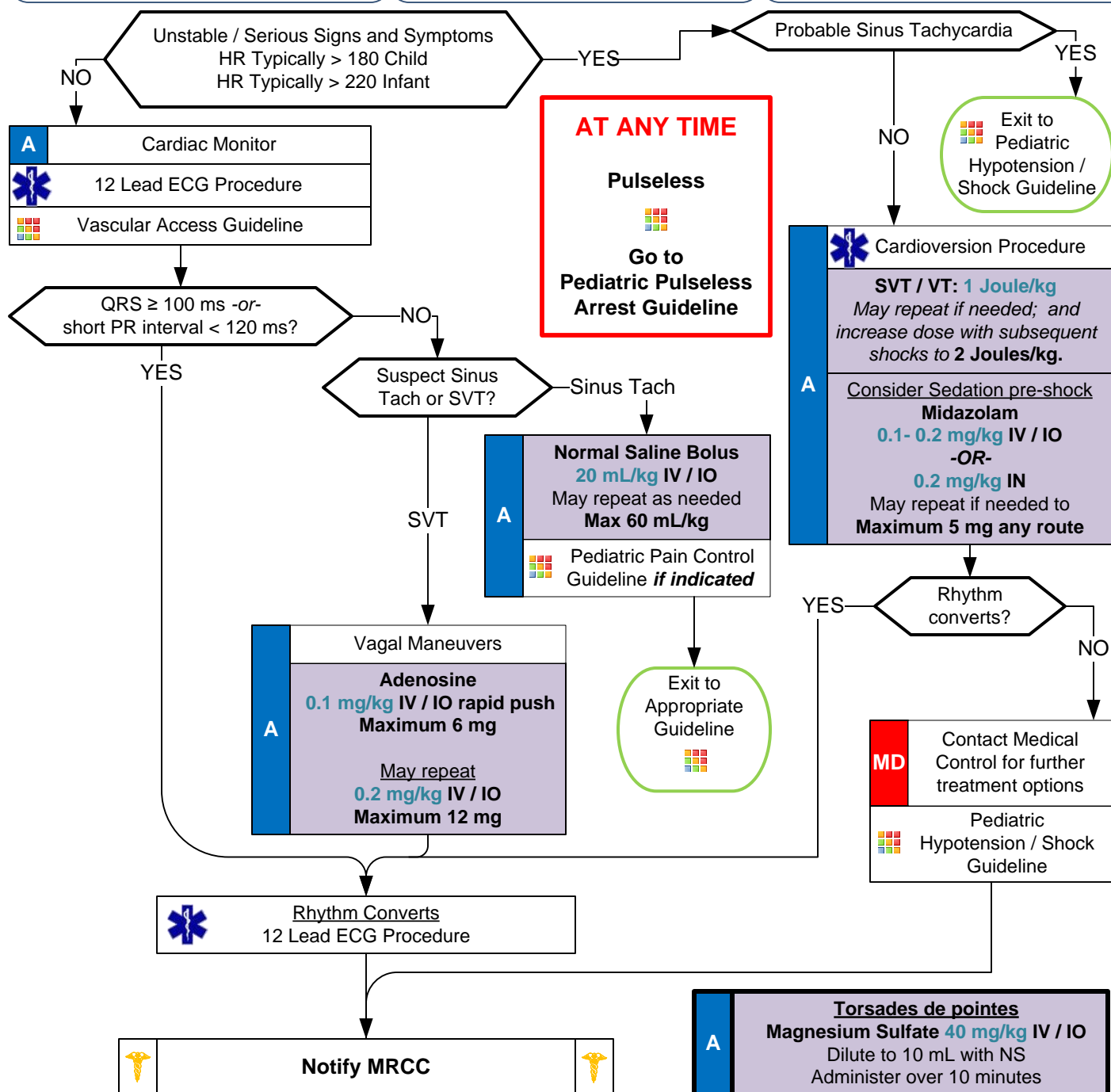
- Past medical history
- Medications or Toxic Ingestion (Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin)
- Drugs (nicotine, cocaine)
- Congenital Heart Disease
- Respiratory Distress
- Syncope or Near Syncope

Signs and Symptoms

- Heart Rate: Child > 180/bpm
Infant > 220/bpm
- Pale or Cyanosis
- Diaphoresis
- Tachypnea
- Vomiting
- Hypotension
- Altered Level of Consciousness
- Pulmonary Congestion
- Syncope

Differential

- Heart disease (Congenital)
- Hypo / Hyperthermia
- Hypovolemia or Anemia
- Electrolyte imbalance
- Anxiety / Pain / Emotional stress
- Fever / Infection / Sepsis
- Hypoxia
- Hypoglycemia
- Medication / Toxin / Drugs (see HX)
- Pulmonary embolus
- Trauma
- Tension Pneumothorax



Pediatric Tachycardia

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Serious Signs and Symptoms:**
 - Respiratory distress / failure.
 - Signs of shock / poor perfusion with or without hypotension.
 - Altered Mental Status
 - Sudden collapse with rapid, weak pulse
- **Narrow Complex Tachycardia (≤ 100 ms):**
 - Sinus tachycardia: P waves present. Variable R-R waves. Infants usually < 220 beats / minute. Children usually < 180 beats / minute.
 - SVT: > 90 % of children with SVT will have a narrow QRS (≤ 0.09 seconds.) P waves absent or abnormal. R-R waves not variable. Usually abrupt onset. Infants usually > 220 beats / minute. Children usually > 180 beats / minute.
 - Atrial Flutter / Fibrillation
- **Wide Complex Tachycardia (≥ 0.09 seconds):**
 - SVT with aberrancy.
 - VT: Uncommon in children. Rates may vary from near normal to > 200 / minute. Most children with VT have underlying heart disease / cardiac surgery / long QT syndrome / cardiomyopathy.
- **Torsades de Pointes / Polymorphic (multiple shaped) Tachycardia:**
 - Rate is typically 150 to 250 beats / minute.
 - Associated with long QT syndrome, hypomagnesaemia, hypokalemia, many cardiac drugs.
 - May quickly deteriorate to VT.
- **Vagal Maneuvers:**
 - Breath holding. Blowing a glove into a balloon. Have child blow out "birthday candles" or through an obstructed straw. Infants: May put a bag of ice water over the upper half of the face careful not to occlude the airway.
- Separating the child from the caregiver may worsen the child's clinical condition.
- Pediatric pads should be used in children < 10 kg or Broselow-Luten color Purple if available.
- Monitor for respiratory depression and hypotension if Midazolam is used.
- Continuous pulse oximetry is required for all SVT Patients if available.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.
- Generally, the maximum sinus tachycardia rate is 220 – the patient's age in years.

Pediatric Bradycardia

History

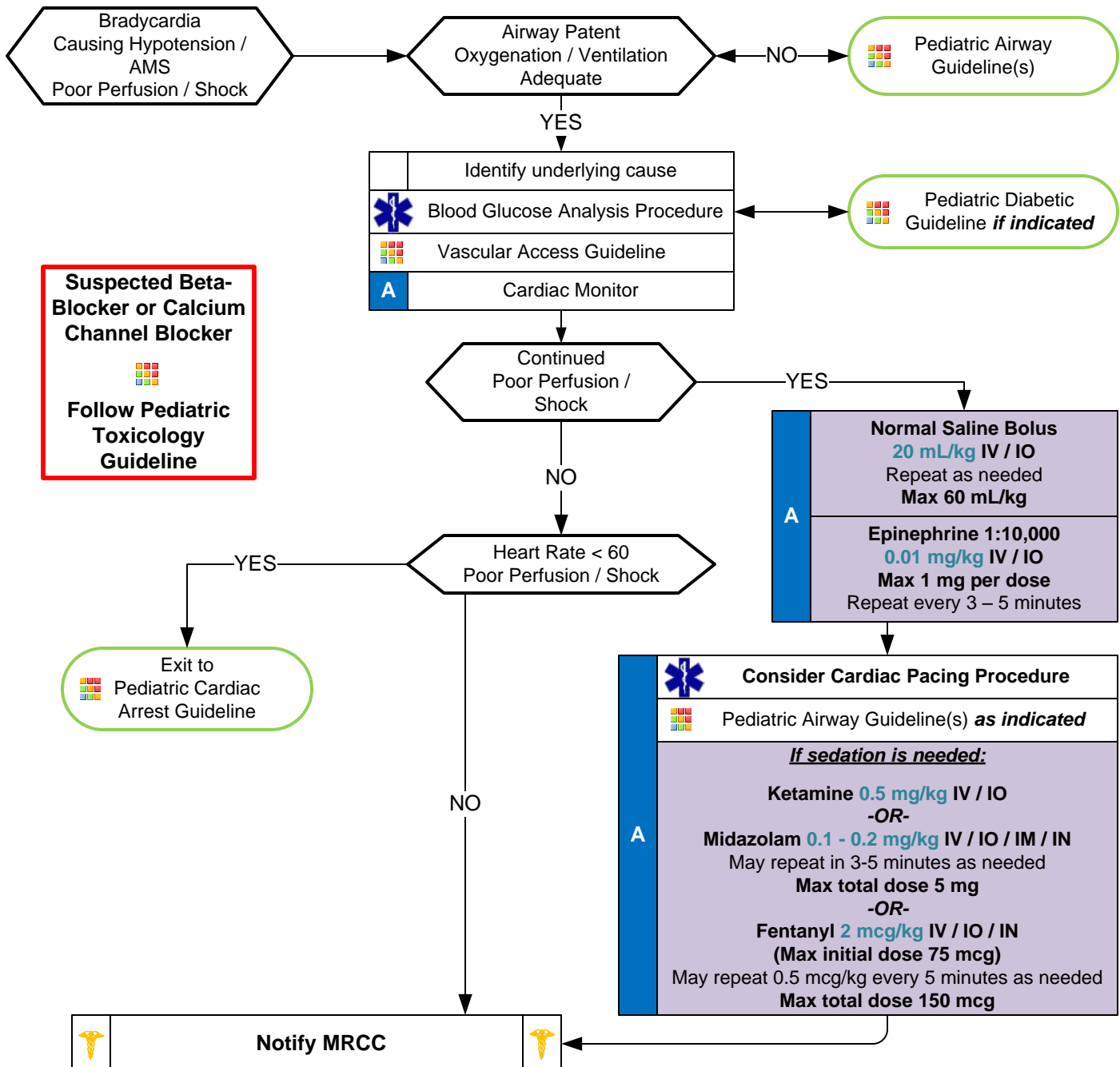
- Past medical history
- Foreign body exposure
- Respiratory distress or arrest
- Apnea
- Possible toxic or poison exposure
- Congenital disease
- Medication (maternal or infant)

Signs and Symptoms

- Decreased heart rate
- Delayed capillary refill or cyanosis
- Mottled, cool skin
- Hypotension or arrest
- Altered level of consciousness

Differential

- Respiratory failure
 - Foreign body
 - Secretions
 - Infection (croup, epiglottitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxin or medication
- Hypoglycemia
- Acidosis



Pediatric Bradycardia

Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Use pre-made Drug dosage reference for drug dosages if applicable.**
- The majority of pediatric arrests are due to airway problems.
- Most maternal medications pass through breast milk to the infant, consider narcotic overdose.
- Hypoglycemia, severe dehydration and narcotic effects may produce bradycardia.
- Pediatric patients requiring transcutaneous pacing require the use of pads appropriate for pediatric patients when available
- Transcutaneous pacing should be considered **early** in bradycardic patients with shock.

Pediatric Allergic Reaction

History

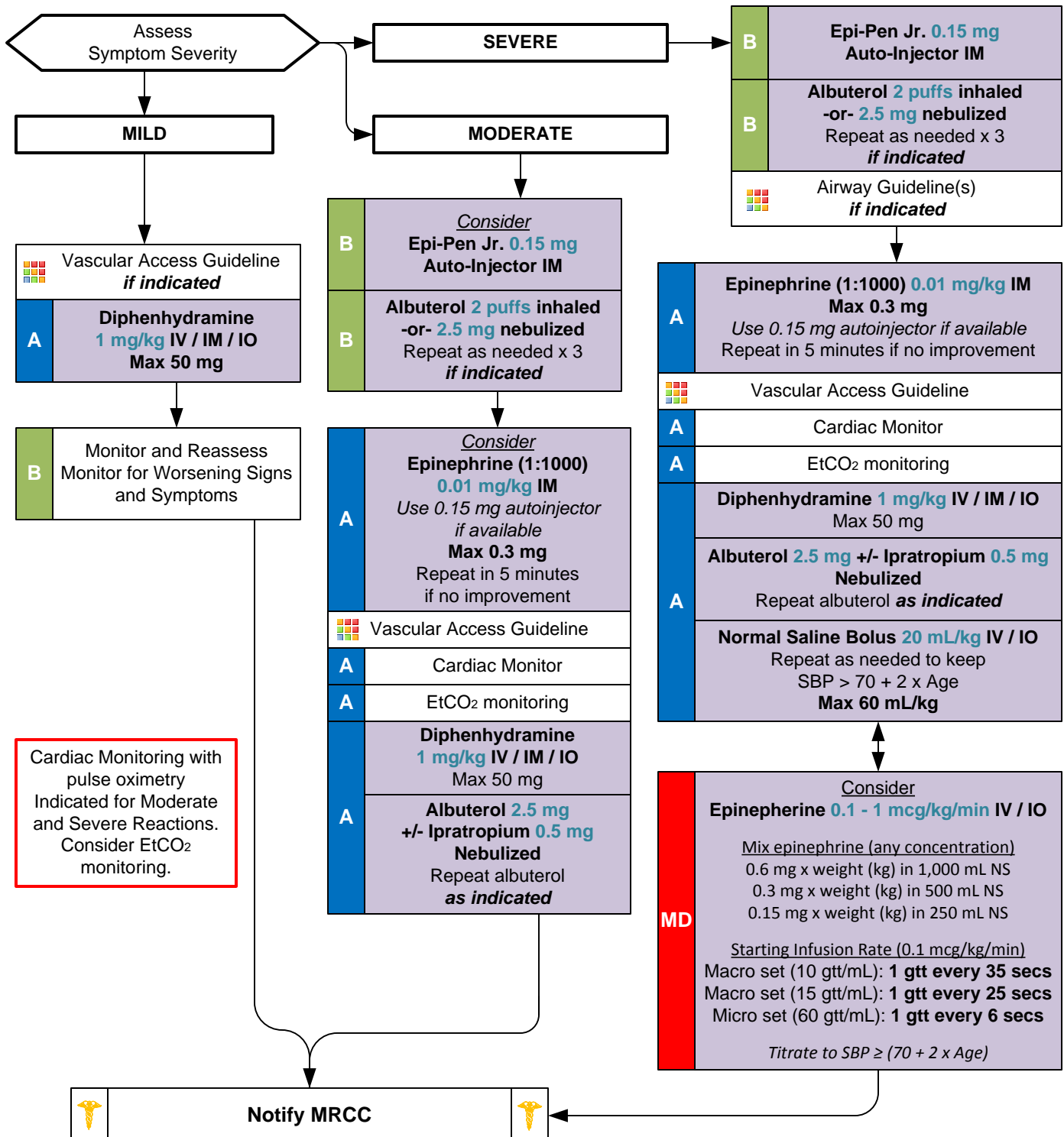
- Onset and location
- Insect sting or bite
- Food allergy / exposure
- Medication allergy / exposure
- New clothing, soap, detergent
- Past medical history / reactions
- Medication history

Signs and Symptoms

- Itching or hives
- Coughing / wheezing or respiratory distress
- Chest or throat constriction
- Difficulty swallowing
- Hypotension or shock
- Edema

Differential

- Urticaria (rash only)
- Anaphylaxis (systemic effect)
- Shock (vascular effect)
- Angioedema (drug induced)
- Aspiration / Airway obstruction
- Vasovagal event
- Asthma / COPD / CHF



Pediatric Allergic Reaction

Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs**
- **Anaphylaxis is an acute and potentially lethal multisystem allergic reaction.**
- **Epinephrine is the drug of choice and the first drug that should be administered in acute anaphylaxis (Moderate / Severe Symptoms – airway involvement and/or hypotension.) IM Epinephrine should be administered in priority before or during attempts at IV or IO access.**
- **To increase patient safety, Use an autoinjector if available to deliver epinephrine. For pediatric patients, either the 0.15mg dose (“epi-pen jr”) or 0.3mg dose (“epi-pen”) may be used. Either may be repeated for severe symptoms that have not improved or are worsening 5 minutes after the first dose.**
- **Anaphylaxis unresponsive to repeat doses of IM epinephrine may require IV epinephrine administration by IV push or epinephrine infusion. Contact MRCC for medical control orders if indicated.**
- **Symptom Severity Classification:**
 - Mild symptoms:**
Flushing, hives, itching, erythema with normal blood pressure and perfusion.
 - Moderate symptoms:**
Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with normal blood pressure and perfusion.
 - Severe symptoms:**
Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with hypotension and poor perfusion. Skin symptoms may not be present due to poor perfusion.
- Allergic reactions may occur with only respiratory and gastrointestinal symptoms and have no rash / skin involvement.
- Angioedema is seen in moderate to severe reactions and is defined as swelling involving the face, lips or airway structures. This can also be seen in patients taking blood pressure medications like Prinivil, Zestril, or lisinopril (typically end in -il).
- Fluids and Medication should be titrated to maintain a SBP $>70 + (\text{age in years} \times 2)$ mmHg.
- EMT-B may administer Epinephrine IM as Auto-injector only.
- EMT-B may administer Albuterol if patient already prescribed, or nebulized if appropriately trained.
- Patients with moderate and severe reactions should receive a 12 lead ECG and should be continually monitored, but this should NOT delay administration of epinephrine.
- The shorter the onset from exposure to symptoms the more severe the reaction.

Pediatric Altered Mental Status

History




- Past medical history
- Medications
- Recent illness
- Irritability
- Lethargy
- Changes in feeding / sleeping
- Diabetes
- Potential ingestion
- Trauma

Signs and Symptoms

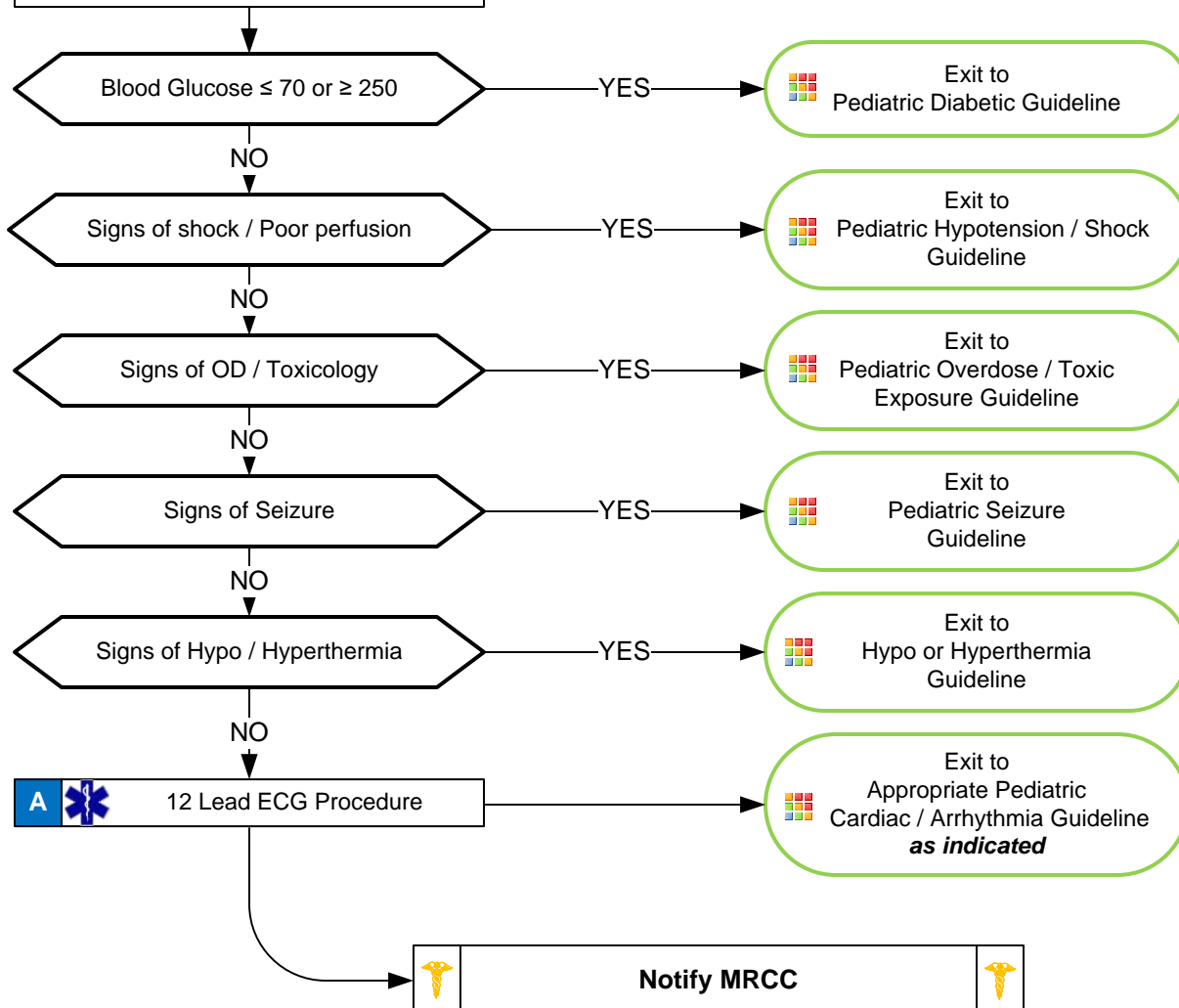
- Decrease in mentation
- Change in baseline mentation
- Decrease in Blood sugar
- Cool, diaphoretic skin
- Increase in Blood sugar
- Warm, dry, skin, fruity breath, kussmaul respirations, signs of dehydration

Differential

- Hypoxia
- CNS (trauma, stroke, seizure, infection)
- Thyroid (hyper / hypo)
- Shock (septic-infection, metabolic, traumatic)
- Diabetes (hyper / hypoglycemia)
- Toxicological
- Acidosis / Alkalosis
- Environmental exposure
- Electrolyte abnormalities
- Psychiatric disorder

	Pediatric Airway Guideline(s) if indicated
	Blood Glucose Analysis Procedure
A	Cardiac Monitor
A	EtCO ₂ monitoring
	Vascular Access Guideline

Utilize Spinal Immobilization Guideline where circumstances suggest a mechanism of injury.





Pediatric Altered Mental Status

Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Pay careful attention to the head exam for signs of bruising or other injury.**
- Be aware of AMS as presenting sign of an environmental toxin or Haz-Mat exposure and protect personal safety.
- It is safer to assume hypoglycemia than hyperglycemia if doubt exists. Recheck blood glucose after Dextrose or Glucagon
- Consider alcohol, prescription drugs, illicit drugs and Over the Counter preparations as a potential etiology.
- Consider Restraints if necessary for patient's and/or personnel's protection per the restraint procedure.

Pediatric Diabetic

History

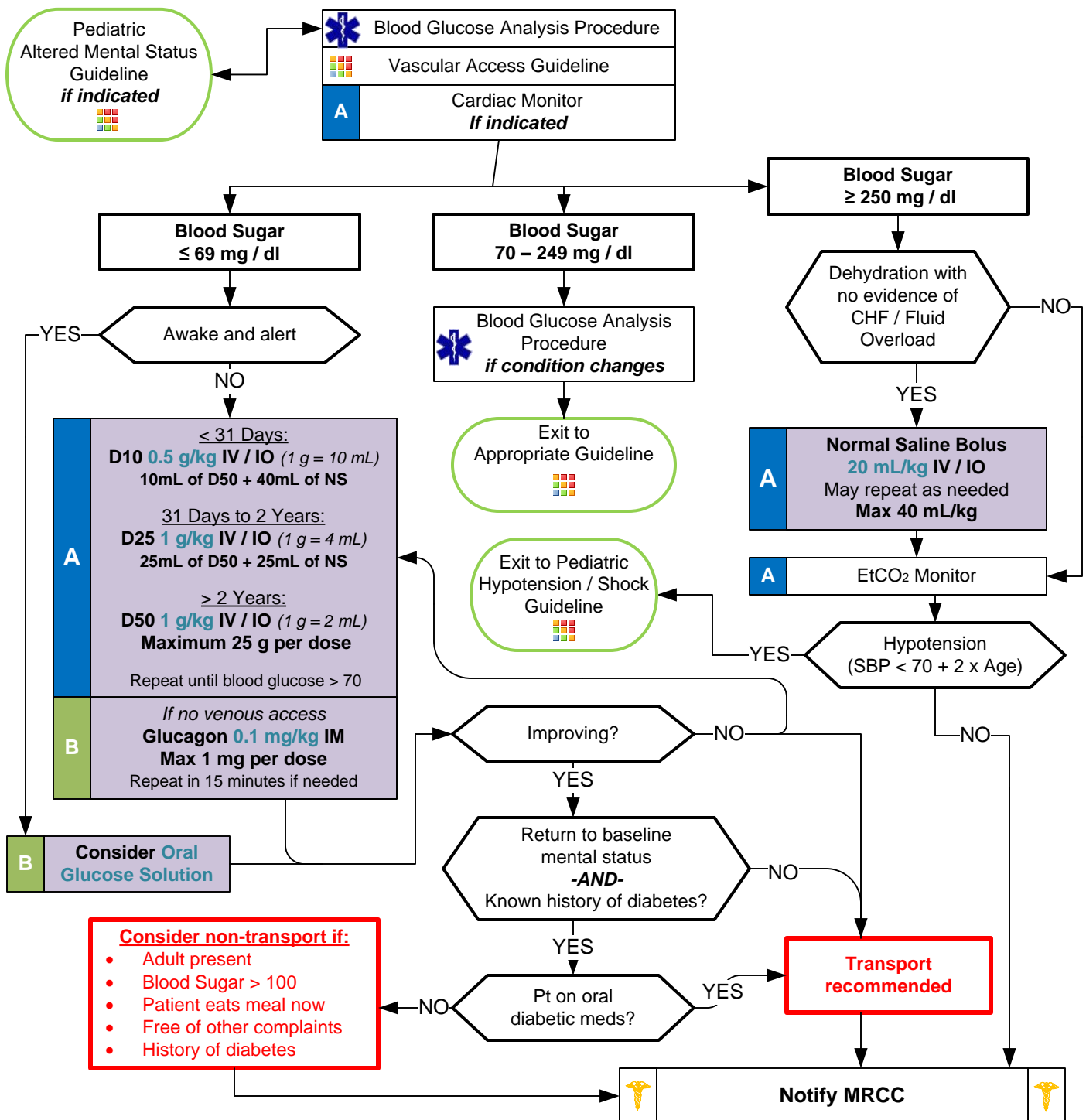
- Past medical history
- Medications
- Recent blood glucose check
- Last meal

Signs and Symptoms

- Altered mental status
- Combative / irritable
- Diaphoresis
- Seizures
- Abdominal pain
- Nausea / vomiting
- Weakness
- Dehydration
- Deep / rapid breathing

Differential

- Alcohol / drug use
- Toxic ingestion
- Trauma; head injury
- Seizure
- CVA
- Altered baseline mental status.



Pediatric Diabetic

- **Pearls**

- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- Patients with prolonged hypoglycemia may not respond to glucagon.
- Do not administer oral glucose to patients that are not able to swallow or protect their airway.
- **It may be necessary to utilize different concentrations of dextrose in clinical practice. Make D10 by taking 10 mL of D50 and dilute with 40 mL of NS (i.e. squirt out dextrose in the D50 syringe until you have 10mL left. Then in the same syringe draw up 40mL of NS. You now have 50mL of D10.) Make D25 by taking 25 mL of D50 and dilute with 25 mL of NS (i.e. squirt out dextrose in the D50 syringe until you have 25mL left. Then in the same syringe draw up 25mL of NS. You now have 50mL of D25.)**
- Quality control checks should be maintained per manufacturers recommendation for all glucometers.
- **Patient Refusal:**
Adult caregiver must be present with pediatric patient. Blood sugar must be 100 or greater and patient has ability to eat and availability of food with responders on scene. Patient must have a known history of diabetes and not be taking any oral diabetic agents (i.e. insulin only). Otherwise contact MRCC for medical control advice.

Pediatric Hypotension / Shock

History

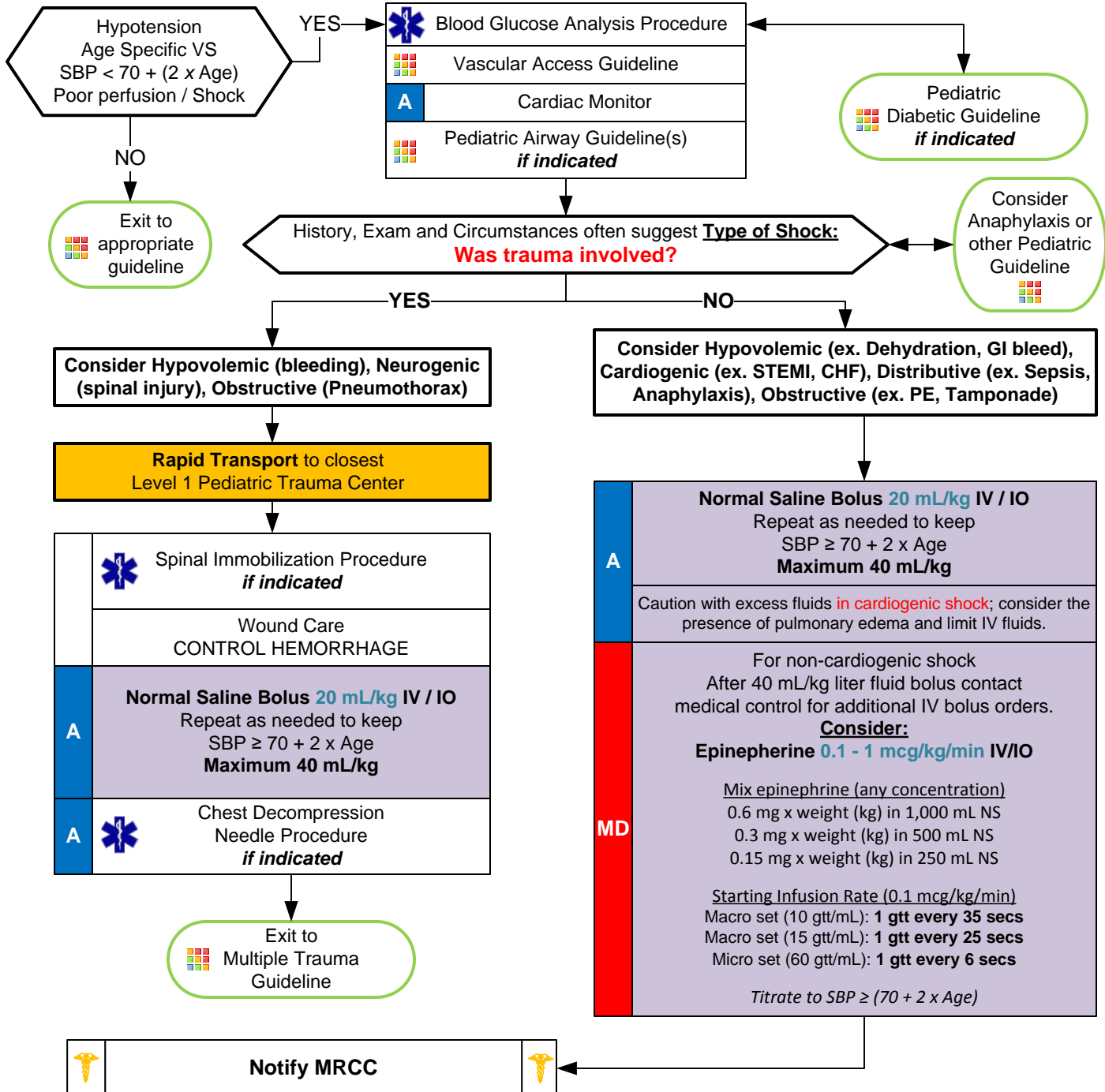
- Blood loss
- Fluid loss
- Vomiting
- Diarrhea
- Fever
- Infection

Signs and Symptoms

- Restlessness, confusion, weakness
- Dizziness
- Tachycardia
- Hypotension (Late sign)
- Pale, cool, clammy skin
- Delayed capillary refill
- Dark-tarry stools

Differential

- Shock
 - Hypovolemic
 - Cardiogenic
 - Septic
 - Neurogenic
 - Anaphylactic
- Trauma
- Infection
- Dehydration
- Congenital heart disease
- Medication or Toxin



Pediatric Hypotension / Shock

Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Lowest normal blood pressure by age: < 31 days: > 60 mmHg. 31 days to 1 year: > 70 mmHg. Greater than 1 year: 70 + 2 x age in years.**
- **Consider all possible causes of shock and treat per appropriate guideline. Majority of decompensation in pediatrics is airway related.**
- **Decreasing heart rate and hypotension occur late in children and are signs of imminent cardiac arrest.**
- **Shock may be present with a normal blood pressure initially.**
- **Shock often is present with normal vital signs and may develop insidiously. Tachycardia may be the only manifestation.**
- **Consider all possible causes of shock and treat per appropriate guideline.**
- **Hypovolemic Shock:**
Hemorrhage, trauma, dehydration, excessive vomiting or diarrhea.
- **Cardiogenic Shock:**
Heart failure: Congenital heart disease, Cardiomyopathy, Myocardial contusion, Ruptured ventricular / septum / valve / toxins.
- **Distributive Shock:**
Sepsis
Anaphylactic
Neurogenic: Hallmark is warm, dry, pink skin with normal capillary refill time and typically alert.
Toxins
- **Obstructive Shock:**
Pericardial tamponade. Pulmonary embolus. Tension pneumothorax.
Signs may include hypotension with distended neck veins, tachycardia, unilateral decreased breath sounds or muffled heart sounds.

Pediatric Overdose / Toxic Ingestion

History

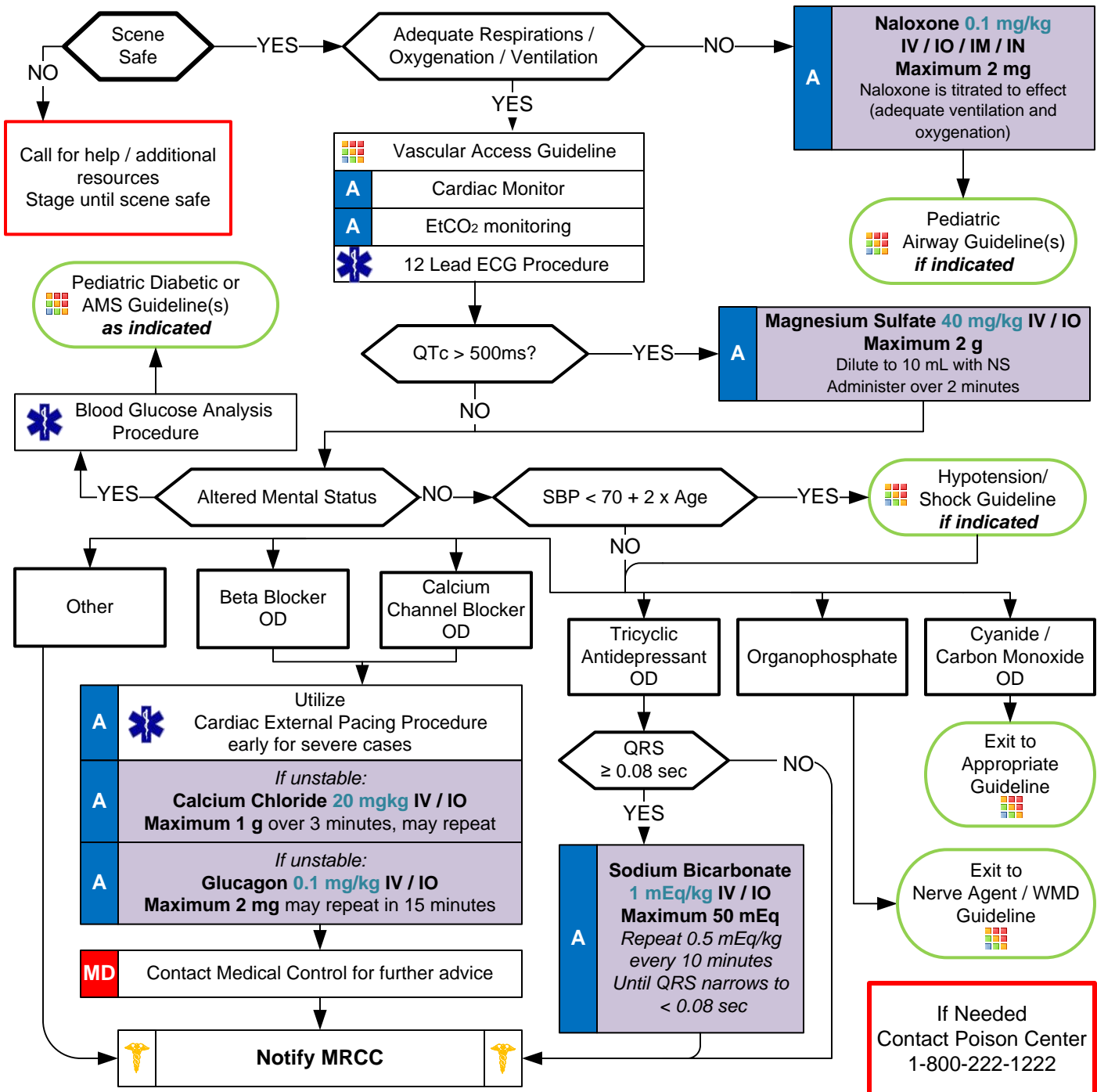
- Ingestion or suspected ingestion of potentially toxic substance
- Substance ingested, route, quantity
- Time of Ingestion is important
- Reason (suicidal, accidental, criminal)
- Available medications in home
- Past medical history, medications, past psychiatric history

Signs and Symptoms

- Mental status changes
- Hypotension / hypertension
- Decreased respiratory rate
- Tachycardia, dysrhythmias
- Seizures
- Salivation, Lacrimation, Urination; increased, loss of control, Defecation / Diarrhea, GI Upset; Abdominal pain / cramping, Emesis, Muscle Twitching

Differential

- Tricyclic antidepressants
- Acetaminophen
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents, Alcohols, Cleaning agents
- Insecticides (organophosphates)



Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Do not rely on patient history of ingestion, especially in suicide attempts. Make sure patient is still not carrying other medications or has any weapons. Bring bottles, contents, emesis to ED.**
- **Age specific blood pressure** 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age)mmHg and 11 years and older > 90 mmHg.
- **Tricyclic:** 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma; rapid progression from alert mental status to death.
- **Acetaminophen:** initially normal or nausea/vomiting. If not detected and treated, causes irreversible liver failure
- **Aspirin:** Early signs consist of abdominal pain and vomiting. Tachypnea and altered mental status may occur later. Renal dysfunction, liver failure, and or cerebral edema among other things can take place later.
- **Depressants:** decreased HR, decreased BP, decreased temperature, decreased respirations, non-specific pupils
- **Stimulants:** increased HR, increased BP, increased temperature, dilated pupils, seizures
- **Anticholinergic:** increased HR, increased temperature, dilated pupils, mental status changes
- **Cardiac Medications:** dysrhythmias and mental status changes
- **Solvents:** nausea, coughing, vomiting, and mental status changes
- **Insecticides:** increased or decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils
- Consider restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.
- **Nerve Agent Antidote kits** contain 2 mg of Atropine and 600 mg of pralidoxime in an autoinjector for self administration or patient care. These kits may be available as part of the domestic preparedness for Weapons of Mass Destruction.
- Consider contacting the Regional Poison Control Center (1-800-222-1222) for guidance. Any advice given should be relayed to Medical Control for definitive orders.

Pediatric Respiratory Distress

History

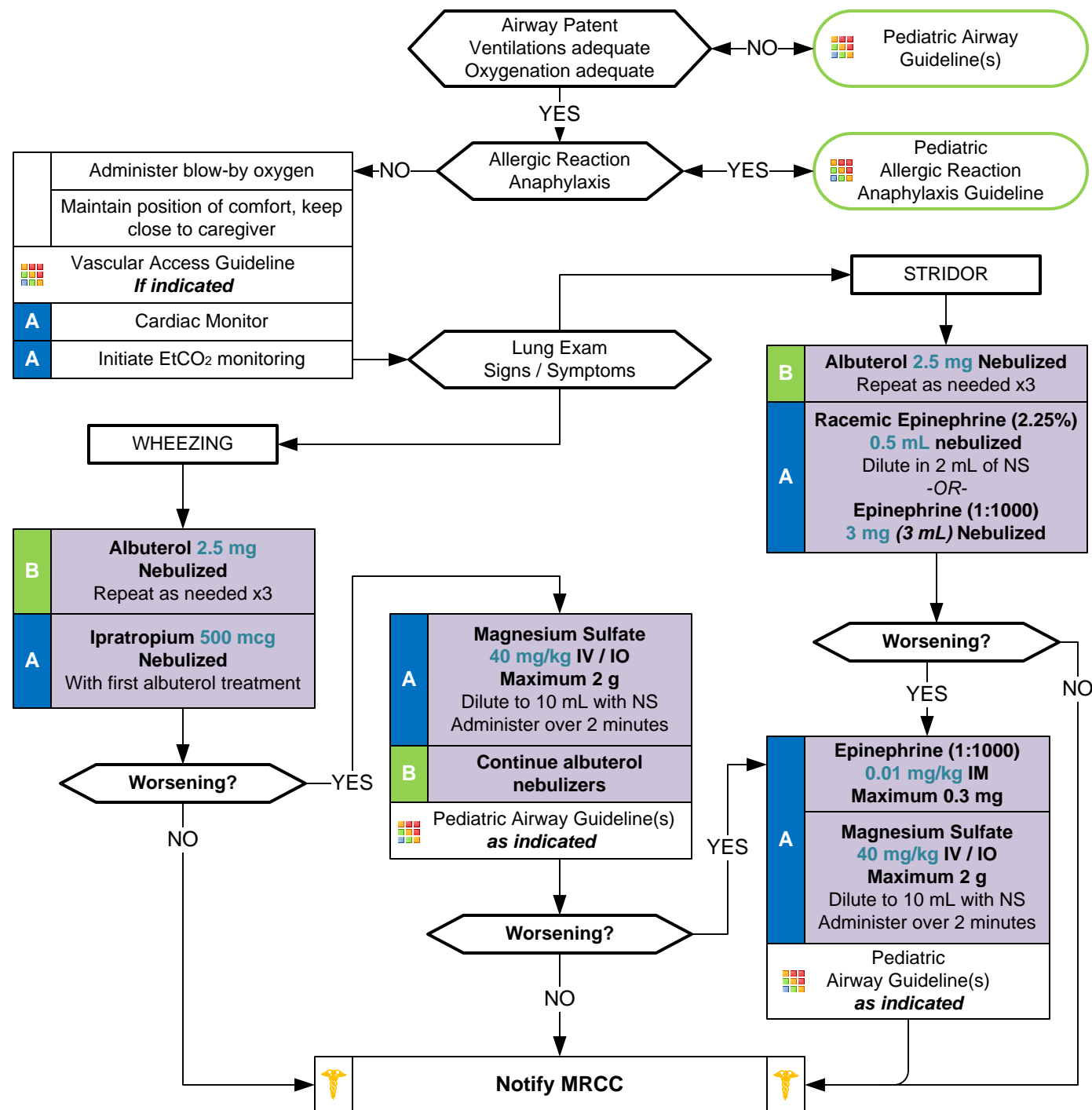
- Time of onset
- Possibility of foreign body
- Past Medical History
- Medications
- Fever / Illness
- Sick Contacts
- History of trauma
- History / possibility of choking
- Ingestion / OD
- Congenital heart disease

Signs and Symptoms

- Wheezing / Stridor / Crackles / Rales
- Nasal Flaring / Retractions / Grunting
- Increased Heart Rate
- AMS
- Anxiety
- Attentiveness / Distractability
- Cyanosis
- Poor feeding
- JVD / Frothy Sputum
- Hypotension

Differential

- Asthma / Reactive Airway Disease
- Aspiration
- Foreign body
- Upper or lower airway infection
- Congenital heart disease
- OD / Toxic ingestion / CHF
- Anaphylaxis
- Trauma



Pediatric Respiratory Distress

Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Neck, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Pulse oximetry should be monitored continuously in the patient with respiratory distress.**
- **EMT-B may administer Albuterol if patient appropriately trained.**
- **Consider IV access when Pulse oximetry remains $\leq 92\%$ after first beta agonist treatment. Also consider saline bolus of 20 mL/kg in pediatric patients in respiratory distress; these patients are often dehydrated.**
- Do not force a child into a position, allow them to assume position of comfort. They will protect their airway by their body position.
- The most important component of respiratory distress is airway control.
- Bronchiolitis is a viral infection typically affecting infants which results in wheezing which may not respond to beta-agonists. Consider Epinephrine if patient < 18 months and not responding to initial beta-agonist treatment.
- Croup typically affects children < 2 years of age. It is a viral infection with possible fever, gradual onset, and no drooling is noted.
- Epiglottitis typically affects children > 2 years of age. It is a bacterial infection with fever, rapid onset, and often stridor. The patient typically wants to sit up to keep airway open, drooling is common. **Airway manipulation may worsen the condition. Avoid airway device insertion in patients with suspected epiglottitis.**
- In patients using levalbuterol (Xopenex) you may use substitute the patient's levalbuterol for Albuterol in the protocol.

Pediatric Seizure

History

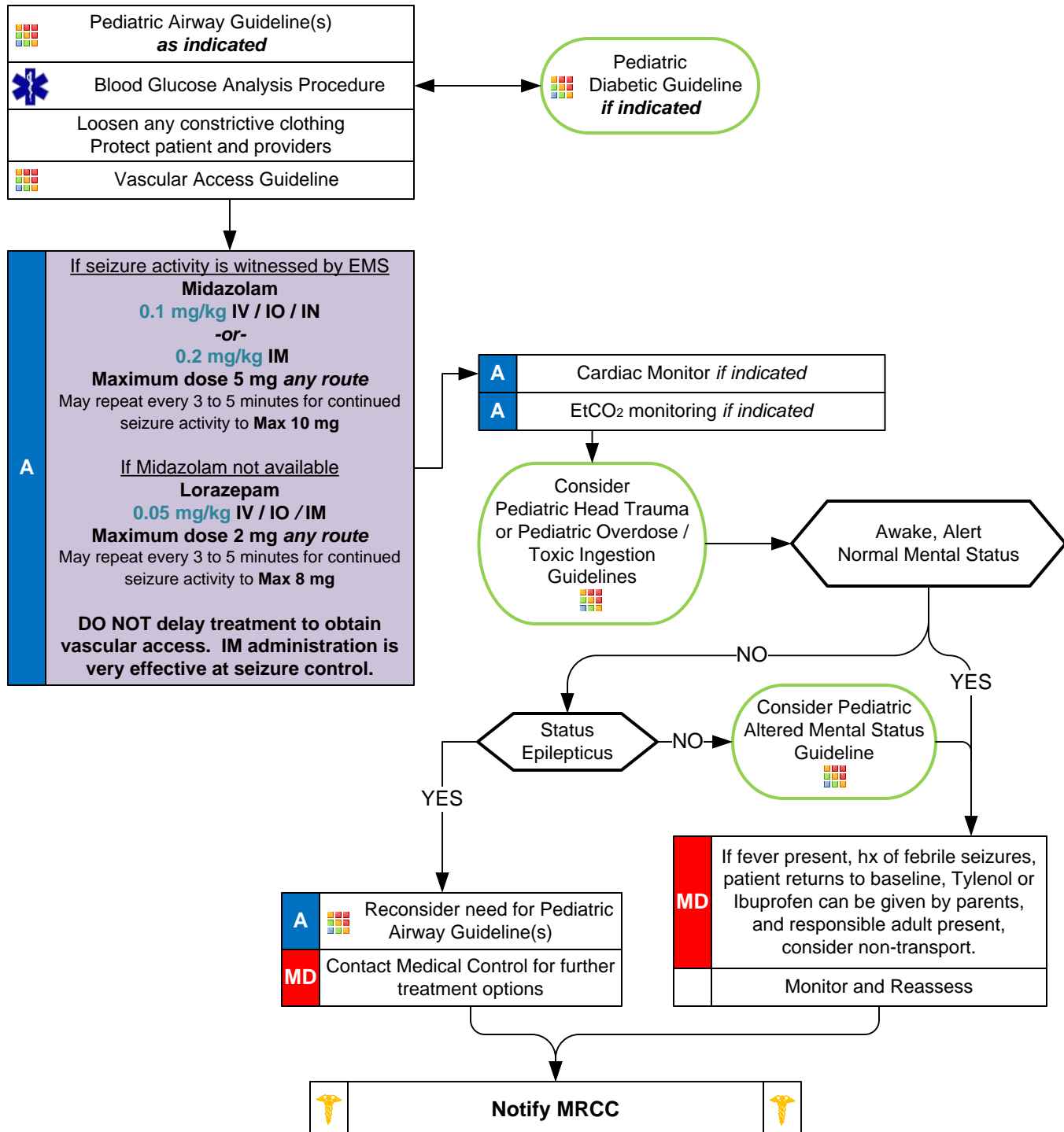
- Fever, Sick contacts
- Prior history of seizures
- Medication compliance
- Recent head trauma
- Whole body vs unilateral seizure activity
- Duration, Single/multiple
- Congenital Abnormality

Signs and Symptoms

- Fever; hot, dry skin
- Seizure activity
- Incontinence
- Tongue trauma
- Rash
- Nuchal rigidity
- Altered mental status

Differential

- Simple Febrile seizure
- Infection
- Head trauma, Medication or Toxin
- Hypoxia or Respiratory failure
- Hypoglycemia
- Metabolic abnormality / acidosis
- Tumor



Pediatric Seizure

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Extremities, Neuro**
- Simple Febrile Seizures are most common in ages 6mos – 5 years. They are by definition generalized seizures with no seizure history in the setting of any grade of fever, with an otherwise normal neurologic and physical exam and recent history. It may be reasonable to observe these seizures, while treating fever with acetaminophen or ibuprofen and passive cooling measures (i.e. undressing), for up to five minutes. Any seizure confirmed to last for more than five minutes should be treated with medication.
- All first time seizures should be transported for evaluation at a hospital. Consult with Medical Control if any questions arise.
- **Midazolam 0.2 mg/kg IM is effective in termination of seizures. Do not delay IM administration with difficult IV or IO access. IM Preferred over IO.**
- Addressing the ABCs and verifying blood glucose is as important as stopping the seizure.
- Be prepared to assist ventilations especially if a benzodiazepine is used. Avoiding hypoxemia is extremely important.
- In an infant, a seizure may be the only evidence of a closed head injury.
- Status epilepticus is defined as two or more successive seizures without a period of consciousness or recovery. This is a true emergency requiring rapid airway control, treatment, and transport.
- Assess for possibility of occult trauma and substance abuse, overdose or ingestion / toxins.

Pediatric Vomiting / Diarrhea

History

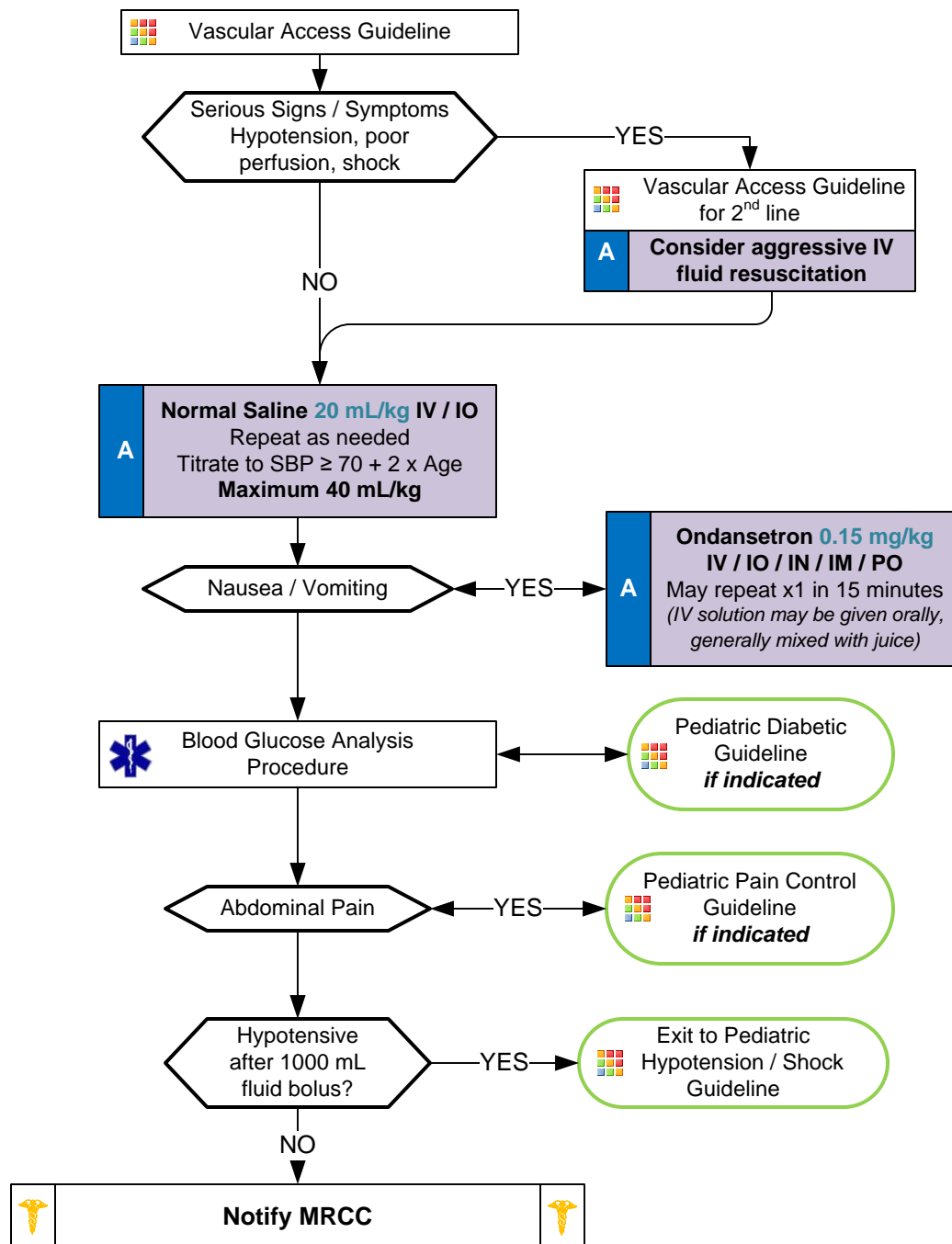
- Age
- Time of last meal
- Last bowel movement / emesis
- Improvement or worsening with food or activity
- Other sick contacts
- Past Medical History
- Past Surgical History
- Medications
- Travel history
- Bloody Emesis or diarrhea

Signs and Symptoms

- Pain
- Distension
- Constipation
- Diarrhea
- Anorexia
- Fever
- Cough,
- Dysuria

Differential

- CNS (Increased pressure, headache, tumor, trauma or hemorrhage)
- Drugs
- Appendicitis
- Gastroenteritis
- GI or Renal disorders
- Diabetic Ketoacidosis
- Infections (pneumonia, influenza)
- Electrolyte abnormalities



Pediatric Vomiting / Diarrhea

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Heart Rate:** One of the first clinical signs of dehydration is almost always increased heart rate. Tachycardia increases as dehydration becomes more severe, very unlikely to be significantly dehydrated if heart rate is close to normal.
- **Age specific blood pressure** 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age) mmHg and 11 years and older > 90 mmHg.
- Beware of only vomiting (i.e. no diarrhea) in children. Pyloric stenosis, bowel obstruction, and CNS processes (bleeding, tumors, or increased CSF pressures) all often present with isolated vomiting.

Multiple Trauma

History

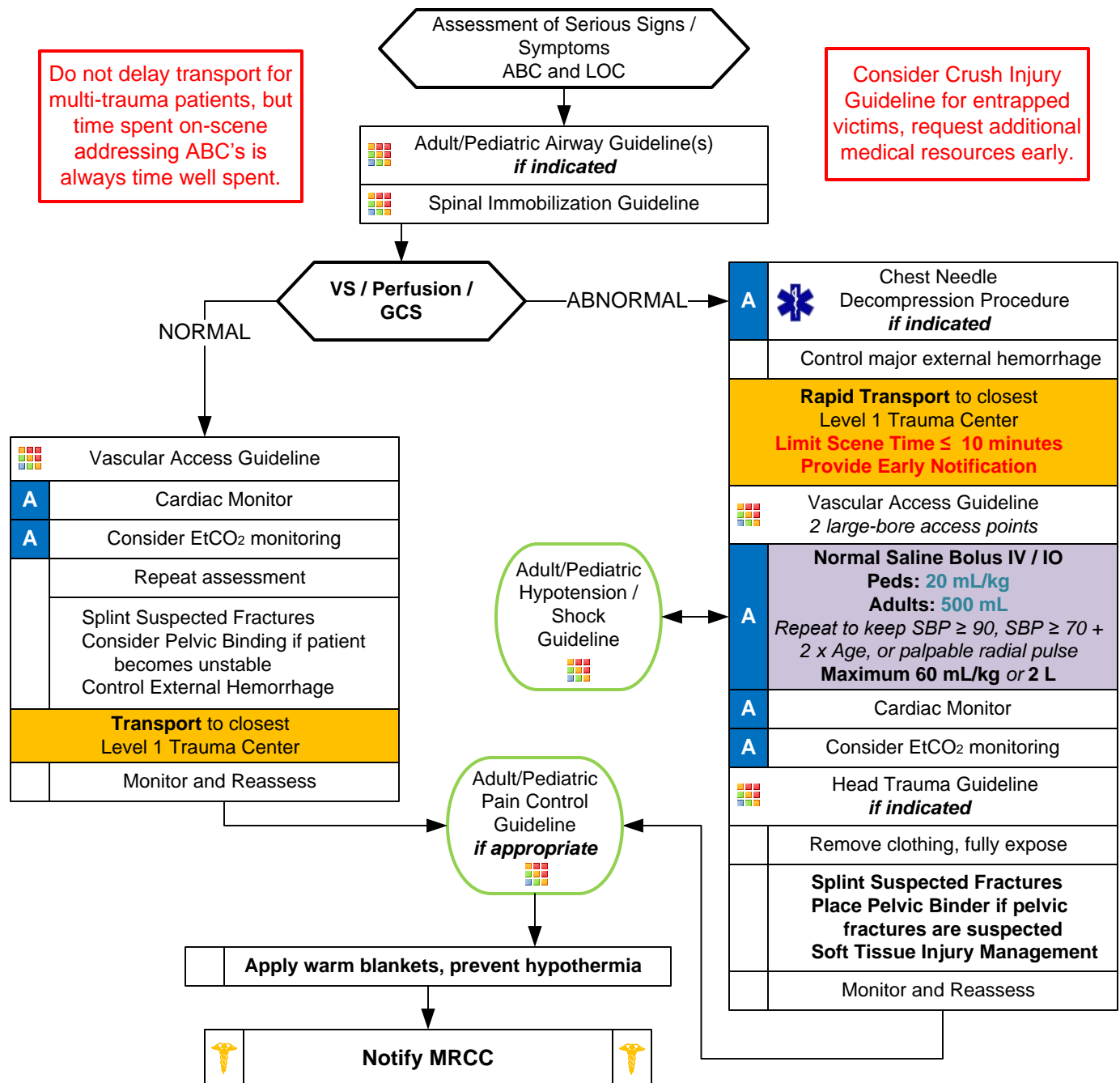
- Time and mechanism of injury
- Damage to structure or vehicle
- Location in structure or vehicle
- Others injured or dead
- Speed and details of MVC
- Restraints / protective equipment
- Past medical history
- Medications

Signs and Symptoms

- Pain, swelling
- Deformity, lesions, bleeding
- Altered mental status or unconscious
- Hypotension or shock
- Arrest

Differential (Life threatening)

- Chest: Tension pneumothorax
Flail chest
Pericardial tamponade
Open chest wound
Hemothorax
- Intra-abdominal bleeding
- Pelvis / Femur fracture
- Spine fracture / Cord injury
- Head injury (see Head Trauma)
- Extremity fracture / Dislocation
- HEENT (Airway obstruction)
- Hypothermia



Multiple Trauma

TRAUMA CENTER CRITERIA

A Trauma Team Activation ("TTA") may be requested by an ALS provider if any of the following criteria are met:

- Glasgow coma score ≤ 13
- Depressed skull fracture
- Hemodynamically unstable (Adult: SPB < 90 mmHg; Pediatrics: $70 + 2 \times \text{age}$)
- Airway compromise
- Penetrating trauma to the head, neck, torso, or proximal extremities (above elbow or knee)
- Two or more proximal (above elbow or knee) long bone fractures
- Limb paralysis
- Amputation above the wrist or ankle
- Trauma with major burns
- Flail chest
- Temperature <90 degrees Fahrenheit
- Traumatic cardiac arrest
- Patient receiving blood product transfusions for traumatic injuries
- Provider discretion

TTAs are called based on the anatomic and physiologic criteria listed above. They are not called based on mechanism of injury. Mechanism of injury may mandate that the patient be transported to a Level 1 Trauma Center but mechanism alone does not warrant a TTA. There may be times when patients have significant mechanisms of injury but appear to be stable. If the provider feels that a patient is a candidate for evaluation at a trauma center, the EMS provider should bring the patient to the Trauma Center even if the patient does not meet TTA criteria.

MRCC Operators are not allowed to activate or deactivate a TTA, but may suggest to the EMS provider if appropriate. MRCC Operators are able to enforce the transportation of trauma patients who have a significant mechanism of injury to a Level One Trauma Center.

Patients meeting any of the following criteria should be transported to the nearest Level 1 Trauma Center even if specific TTA criteria above are not met:

- Fall from > 20 feet (approximately 2 stories) or 3 times the patient's height (pediatric)
- Evidence of high speed (>40mph),
- Vehicle deformity (>20 inches)
- Intrusion into the patient compartment (>12 inches)
- Auto vs. pedestrian or biker (motorized or pedal) with significant impact (> 20 mph),
- Pedestrian thrown or run over
- Ejection from vehicle
- Death in same patient compartment
- Extrication time >20 minutes
- High speed rollover
- Hanging
- Any patient the EMS provider or MRCC operator feels will benefit from transport to a Level 1 Trauma Center

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro**
- **Scene times should not be delayed for procedures. These should be performed en route when possible.**
- **Rapid transport of the unstable trauma patient to the appropriate facility IS the goal.**
- **Bag valve mask is an acceptable method of managing the airway if pulse oximetry can be maintained $\geq 93\%$**
- Geriatric patients should be evaluated with a high index of suspicion. Often occult injuries are more difficult to recognize and patients can decompensate unexpectedly with little warning.
- Mechanism is the most reliable indicator of serious injury.
- Do not overlook the possibility of associated domestic violence or abuse.
- Sucking chest wounds should be managed with an occlusive dressing. Monitor the patient for signs of a developing tension pneumothorax and treat as indicated.
- Abdominal eviscerations should be treated by covering the exposed abdominal contents with moistened gauze.

Head Trauma

History

- Time of injury
- Mechanism (blunt vs. penetrating)
- Loss of consciousness
- Bleeding
- Past medical history
- Medications
- Evidence for multi-trauma

Signs and Symptoms







- Pain, swelling, bleeding
- Altered mental status
- Unconscious
- Respiratory distress / failure
- Vomiting
- Major traumatic mechanism of injury
- Seizure

Differential

- Skull fracture
- Brain injury (Concussion, Contusion, Hemorrhage or Laceration)
- Epidural hematoma
- Subdural hematoma
- Subarachnoid hemorrhage
- Spinal injury
- Abuse

**DO NOT
HYPERVENTILATE**

Ventilate to maintain
EtCO₂ 35 – 40 mmHg

	Spinal Immobilization Guideline <i>if indicated</i>
	Multiple Trauma Guideline <i>if indicated</i>
	Vascular Access Guideline
	Adult / Pediatric Altered Mental Status Guideline <i>if indicated</i>
	Adult / Pediatric Seizure Guideline <i>if indicated</i>
	Blood Glucose Analysis Procedure
A	Consider EtCO ₂ monitoring

Brain Herniation

Unilateral or bilateral dilation of pupils /
posturing with unconsciousness

- Hyperventilate to maintain EtCO₂ no
less than 30 – 35 mmHg
Adult: 14-16 breaths / minute
Peds: 25 breaths / minute
Infants: 35 breaths / minute
- Elevate head of cot or backboard
- Ensure sedation and pain control is
adequate

Adult / Pediatric
Diabetic Guideline
if indicated

**Assess Mental Status
Record GCS and
spontaneous extremity
movements**

GCS ≤ 8

**Rapid Transport to closest
Level 1 Trauma Center (TTA)**

Monitor and Reassess

If GCS ≤ 13, transport to closest Level
1 Trauma Center

Supplemental oxygen
Maintain SpO₂ ≥ 94 %

Adult / Pediatric
Airway Guideline(s)

Maintain EtCO₂
35 – 45 mmHg

Monitor and Reassess

Notify MRCC

Head Trauma

Secondary brain injury is an indirect result of the injury. It results from processes initiated by the initial trauma. It occurs in the hours and days following the primary injury and plays a large role in the brain damage and death that result from TBI.

- Ischemia (insufficient blood flow)
- Cerebral hypoxia (insufficient oxygen in the brain)
- Hypotension (low blood pressure)
- Cerebral edema (swelling of the brain)
- Raised intracranial pressure (the pressure within the skull).
- Hypercapnia (excessive carbon dioxide levels in the blood)
- Acidosis (excessively acidic blood)
- Infection (generally delayed)

If intracranial pressure gets too high, it can lead to deadly brain herniation, in which parts of the brain are squeezed past structures in the skull.

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neuro**
- Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushing's Response).
- Hypotension usually indicates injury or shock unrelated to the head injury and should be aggressively treated.
- An important item to monitor and document is a change in the level of consciousness by serial examination.
- Consider Restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.
- Limit IV fluids unless patient is hypotensive.
- Concussions are traumatic brain injuries involving any of a number of symptoms including confusion, LOC, vomiting, or headache. Any prolonged confusion or mental status abnormality which does not return to normal within 15 minutes or any documented loss of consciousness should be evaluated by a physician ASAP.

Spinal Immobilization

History

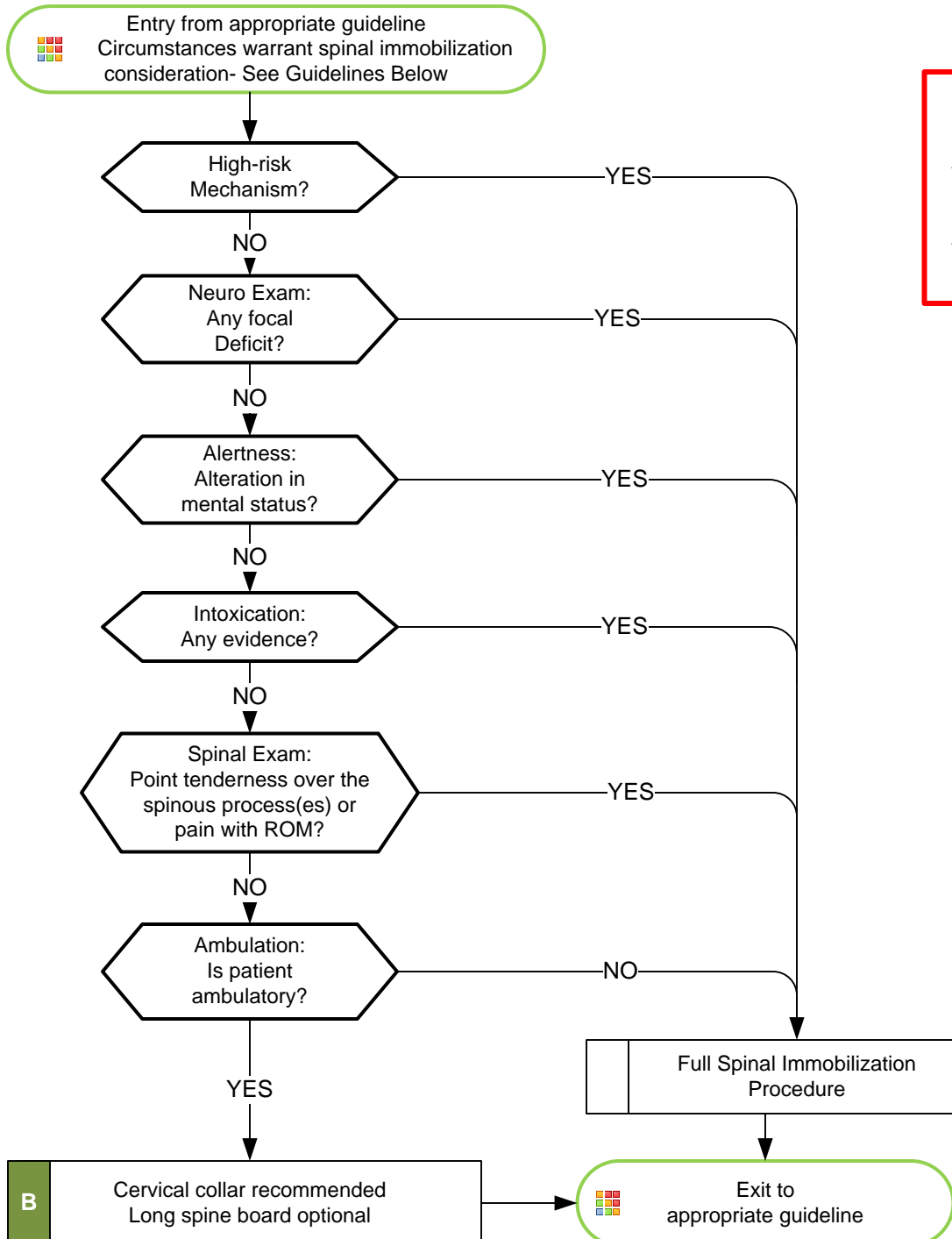
- Type of injury
- Mechanism: blunt / fall / penetrating
- Time of injury
- LOC
- Medical history
- Medications

Signs and Symptoms

- Pain, swelling
- Deformity / step-off
- Altered sensation / motor function
- Bradycardia
- Hypotension
- Paralysis
- Headache
- Shooting pain

Differential

- Fracture
- Spinal cord injury
- Muscle strain
- Muscle spasm
- Ligamentous injury



Default:
Always immobilize

Any doubt:
Always immobilize

Spinal Immobilization

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Consider immobilization in any patient with arthritis, cancer, dialysis or other underlying spinal or bone disease.**
- **The decision to NOT implement spinal immobilization in a patient is the responsibility of the paramedic solely.**
- **In very old and very young, a normal exam may not be sufficient to rule out spinal injury.**
- Significant mechanism includes high-energy events such as ejection, high falls, and abrupt deceleration crashes and may indicate the need for full spinal immobilization.
- Range of motion should NOT be assessed if there is any concern for a neck or back injury. Patient's range of motion should not be assisted.

Spinal Immobilization Guidelines:

1. Long spine boards (LSB) have both risks and benefits for patients and have not been shown to improve outcomes. The best use of the LSB may be for extricating the unconscious patient, or providing a firm surface for compressions. However, several devices may be appropriate for patient extrication and movement, including the scoop stretcher and soft body splints.
2. Utilization of the LSB should occur in consideration of the individual patient's benefit vs. risk.
3. Patients who should be immobilized with a LSB include: Patients with blunt trauma and distracting injury, intoxication, altered mental status, or neurologic complaint (e.g. numbness or weakness), and non-ambulatory blunt trauma patients with spinal pain, tenderness, or spinal deformity.
4. Patients with penetrating trauma and no evidence of spinal injury do not require spinal immobilization. Patients who are ambulatory at the scene of blunt trauma in general do not require immobilization via LSB, but may require cervical collar and spinal precautions.
5. Whether or not a LSB is utilized, spinal precautions are STILL VERY IMPORTANT in patients at risk for spinal injury. Adequate spinal precautions may be achieved by placement of a hard cervical collar and ensuring that the patient is secured tightly to the stretcher, ensuring minimal movement and patient transfers, and manual in-line stabilization during any transfers.

Extremity Trauma

History

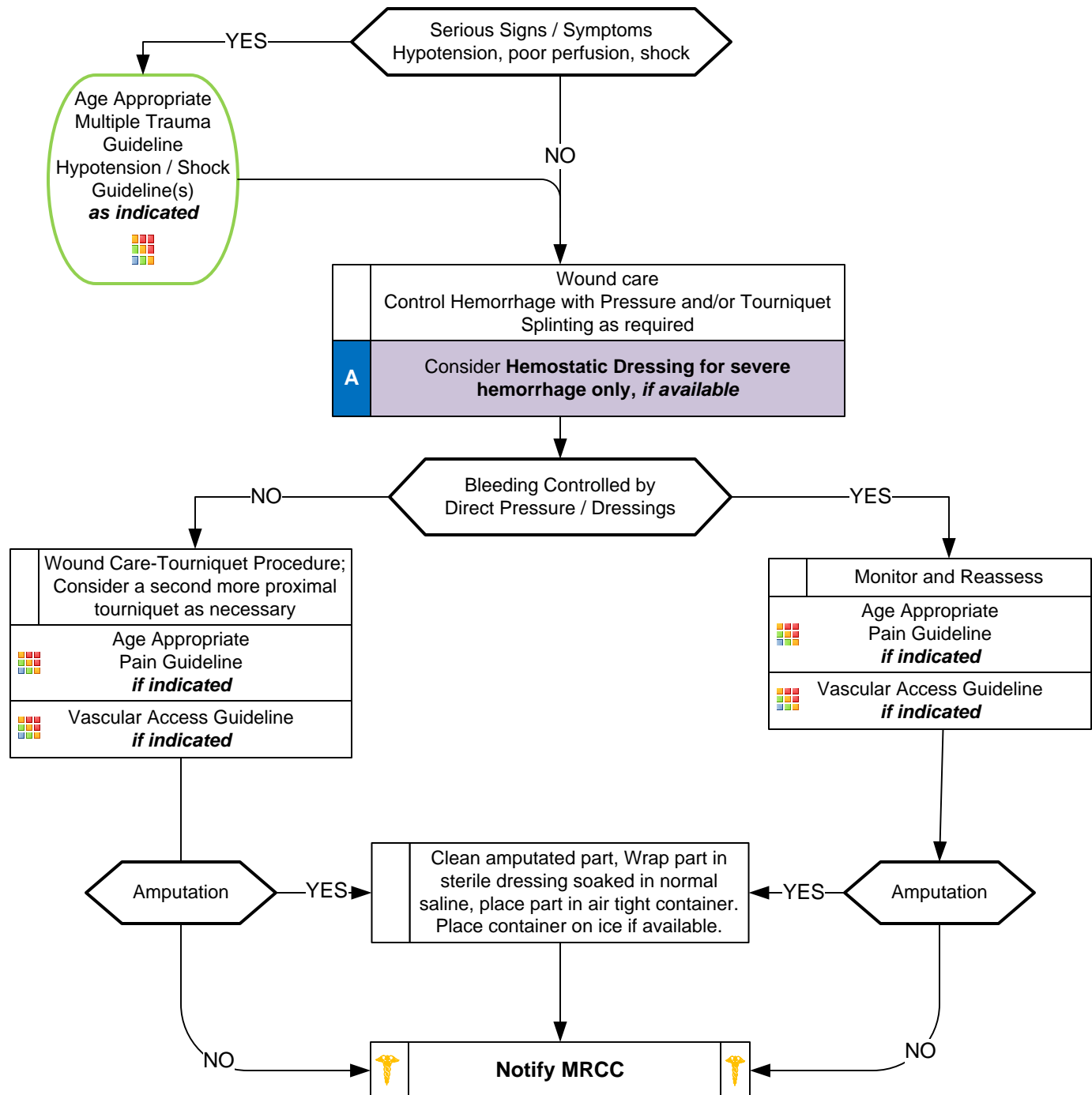
- Type of injury
- Mechanism: crush / penetrating / amputation
- Time of injury
- Open vs. closed wound / fracture
- Wound contamination
- Medical history
- Medications

Signs and Symptoms

- Pain, swelling
- Deformity
- Altered sensation / motor function
- Diminished pulse / capillary refill
- Decreased extremity temperature

Differential

- Abrasion
- Contusion
- Laceration
- Sprain
- Dislocation
- Fracture
- Amputation





Extremity Trauma

Pearls

- **Recommended Exam: Mental Status, Extremity, Neuro**
- **Tourniquets should be applied to the proximal extremity over a single bone (femur or humerus)**
- Peripheral neurovascular status is important and should be examined and recorded.
- Time is critical in amputation injuries. Notify MRCC early for destination planning.
- Hip dislocations and knee and elbow fracture / dislocations have a high incidence of vascular compromise.
- Urgently transport any injury with vascular compromise and any amputation; time is especially critical in these cases.
- Blood loss may be concealed or not apparent with extremity injuries.
- Lacerations should be evaluated for repair within 8 hours from the time of injury.
- **Multiple casualty incident or obvious life threat: Consider Tourniquet Procedure FIRST instead of direct pressure.**

Crush Syndrome Trauma

History

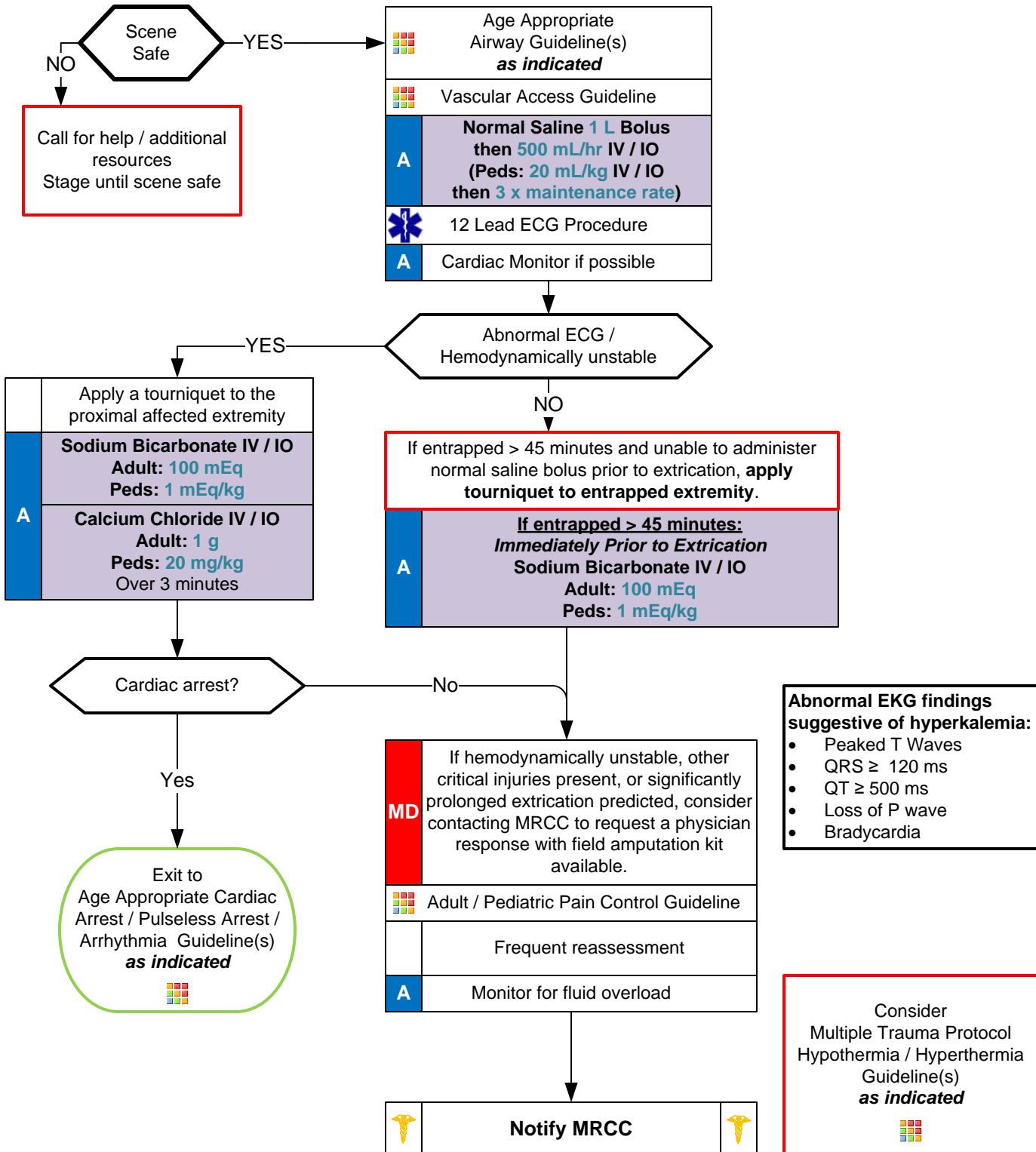
- Entrapped and crushed under heavy load > 30 minutes
- Extremity / body crushed
- Building collapse, trench collapse, industrial accident, pinned under heavy equipment

Signs and Symptoms

- Hypotension
- Hypothermia
- Abnormal ECG findings
- Pain
- Anxiety

Differential

- Entrapment without crush syndrome
- Entrapment without significant crush
- Altered mental status



Crush Syndrome Trauma

Pearls

- **Recommended exam: Mental Status, Musculoskeletal, Neuro**
- **Scene safety is of paramount importance as typical scenes pose hazards to rescuers. Call for appropriate resources.**
- For entrapment greater than 45 minutes, significant fluid shifts can occur after extrication resulting in hemodynamic instability. If unable to administer fluid bolus per protocol prior to extrication, apply a tourniquet to the entrapped extremity.
- Hyperkalemia from crush syndrome can produce ECG changes described in protocol, but may also cause a bizarre, wide complex rhythm. Wide complex rhythms should also be treated using the VF/Pulseless VT Protocol.
- Patients may become hypothermic even in warm environments.
- Pediatric IV Fluid maintenance rate: 4 mL per first 10 kg of weight + 2 mL per second 10 kg of weight + 1 mL for every additional kg in weight.
- **For prolonged extrication situations or patients with hemodynamic instability or other life-threatening injuries, consider requesting a physician field response with amputation kit via MRCC.**

Eye Injury / Complaint

History:

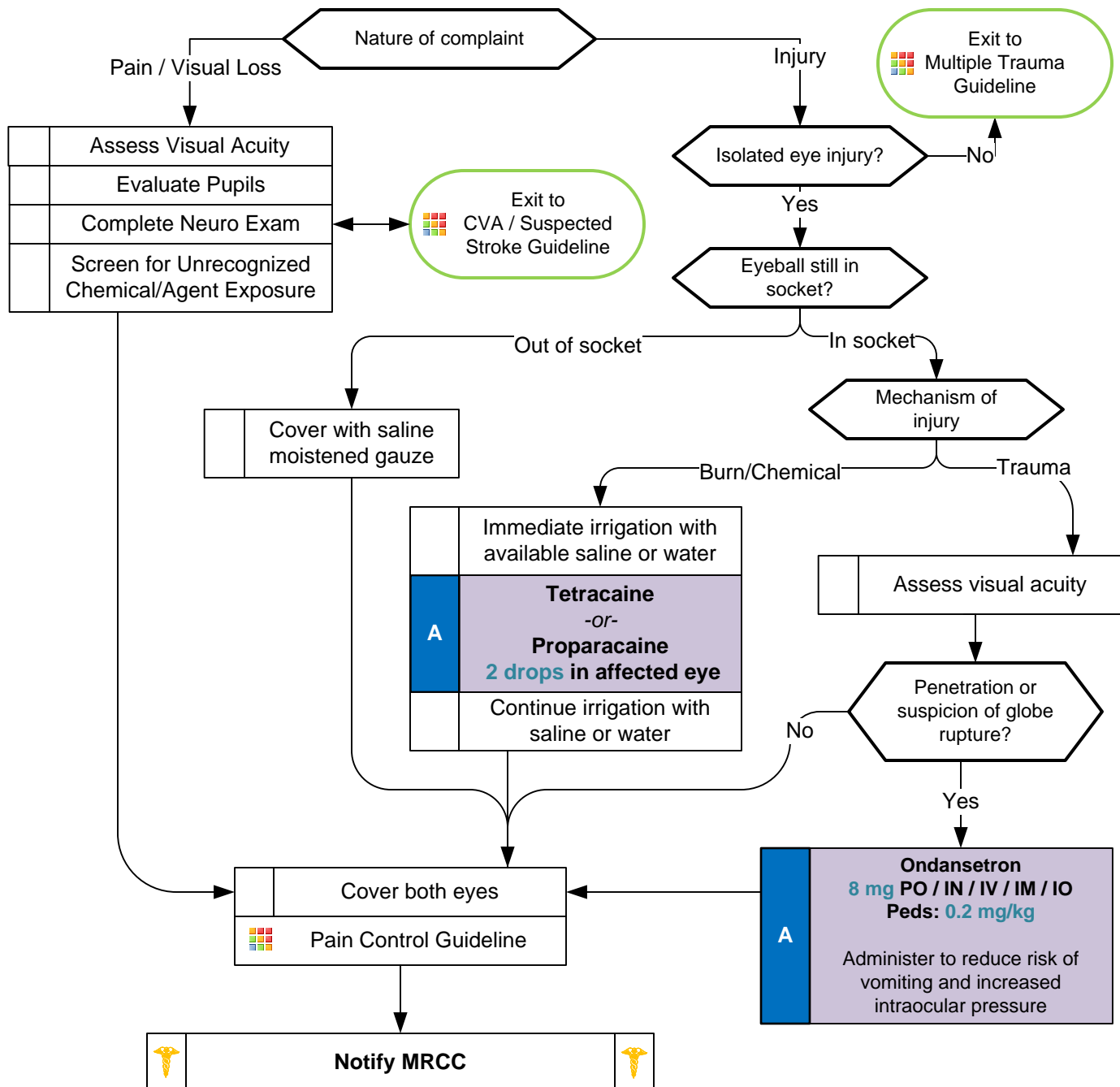
- Time of injury/onset
- Blunt/penetrating/chemical
- Open vs. closed injury
- Involved chemicals/MSDS
- Wound Contamination
- Medical History
- Tetanus status
- Normal visual acuity
- Medications

Signs and Symptoms:

- Pain, swelling, blood
- Deformity, contusion
- Visual deficit
- Leaking aqueous/vitreous humor
- Upwardly fixed eye
- "Shooting" or "streaking" light
- Visible contaminants
- Rust ring
- Lacrimation

Differential:

- Abrasion/Laceration
- Globe rupture
- Retinal nerve damage/detachment
- Chemical/thermal burn/agent of terror
- Orbital fracture
- Orbital compartment syndrome
- Neurological event
- Acute glaucoma
- Retinal artery occlusion



Eye Injury / Complaint

Visual Acuity Testing

- Have the patient read normal-sized text at arm's length
- Have the patient count fingers held in front of their face
- Assess for recognition of motion (hand waving)
- Assess for light perception

Visual acuity should be tested in each eye individually, then both eyes together. Allow patient to wear glasses (if available) if they normally would wear them, and document whether or not vision was tested with corrective eyewear (including contacts).

Pearls:

- **Remove contact lens whenever possible.**
- Normal visual acuity can be present even with severe eye injury
- Any chemical or thermal burn to the face/eyes should raise suspicion of respiratory insult
- Orbital fractures raise concern of globe or nerve injury and need repeated assessments of visual status
- Always cover both eyes to prevent further injury due to coordinated eye movements.
- Use shields, not pads, for physical trauma to eyes. Pads can be used for the unaffected eye.
- Do not remove impaled objects
- Suspected globe rupture or compartment syndrome requires emergent hospital intervention.

Thermal Burns

History

- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history and Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

Signs and Symptoms

- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/wheezing

Differential

- Superficial (1st Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2nd Degree) blistering
- Full Thickness (3rd Degree) painless/charred or leathery skin
- Thermal injury
- Chemical – Electrical injury
- Radiation injury
- Blast injury

Assess Burn / Concomitant Injury Severity

Minor Burn

< 5% TBSA Partial Thickness
Or any isolated Superficial Burn
No inhalation injury, Not Intubated,
Normotensive, GCS 14 or Greater

Serious Burn

5-15% TBSA Partial Thickness
Or < 5% TBSA Full Thickness Burn
Suspected inhalation injury or requiring
intubation for airway stabilization
Hypotension or GCS 13 or Less
(Transport to a Burn Center)

Critical Burn

>15% TBSA Partial Thickness
Or ≥ 5% Full Thickness Burn
Burns with Multiple Trauma
Burns with definitive airway
compromise
(Transport to a Burn Center)

Remove Rings, Bracelets /
Constricting Items

Dry Clean Sheet or Dressings

Multiple Trauma Guideline
if indicated

Adult / Pediatric Airway
Guideline(s) *as indicated*

Vascular Access Guideline
if indicated

Adult / Pediatric Pain
Control Guideline *if indicated*

Remove Rings, Bracelets / Constricting Items

Dry Clean Sheet or Dressings

Multiple Trauma Guideline
if indicated

Adult / Pediatric Airway Guideline(s)
as indicated
(Aggressive management for inhalational burns,
stridor, respiratory distress, or hoarseness)

Vascular Access Guideline
Consider 2 sites if greater than 15 % TBSA

If hypotensive:
Normal Saline Bolus 1 L IV / IO
Peds: 20 mL/kg
May repeat ½ initial bolus as needed x 2

Adult / Pediatric Pain Control Guideline

Carbon Monoxide /
Cyanide Exposure

NO

Transport to facility of choice; Consider Burn Center
for burns on the face, hands, perineum, or feet.

Carbon
Monoxide /
Cyanide
Guideline(s)

YES

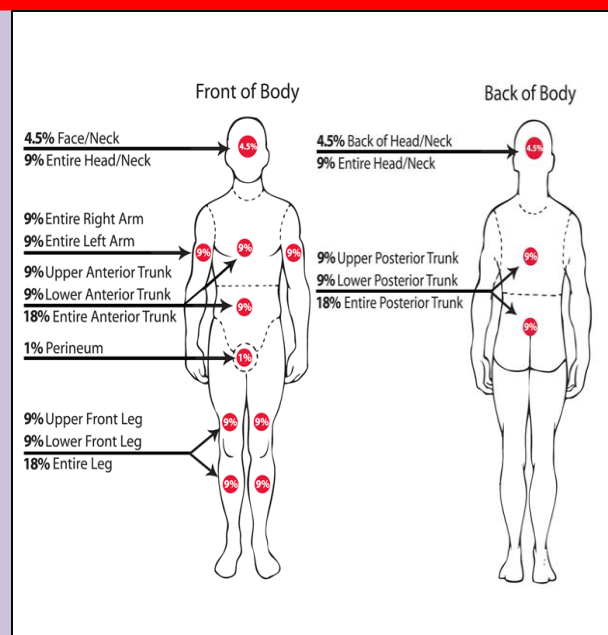
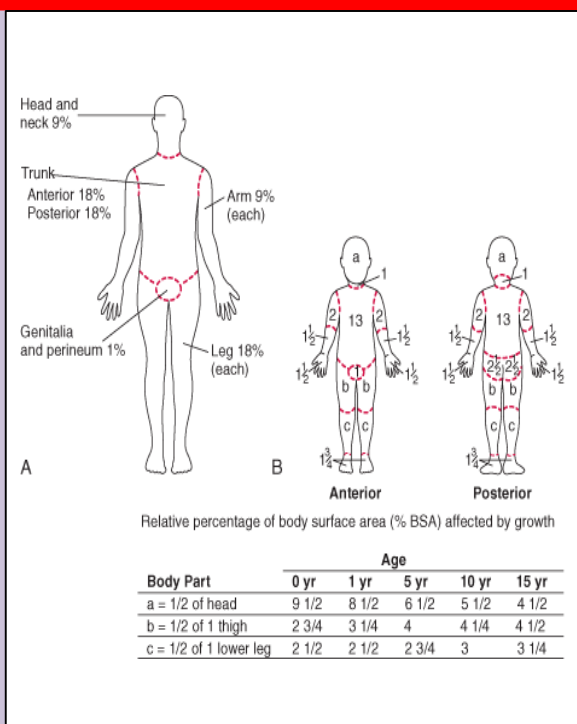
Carbon Monoxide /
Cyanide Exposure

NO

Rapid Transport to Burn Center

Notify MRCC

Thermal Burns



Estimate spotty areas of burn by using the size of the patient's palm as 1 %

Rule of Nines

- Seldom do you find a complete isolated body part that is injured as described in the Rule of Nines.
- More likely, it will be portions of one area, portions of another, and an approximation will be needed.
- For the purpose of determining the extent of serious injury, differentiate the area with minimal or superficial (1st) burn from those of partial (2nd) or full (3rd) thickness burns.
- For the purpose of determining Total Body Surface Area (TBSA) of burn, include only Partial and Full Thickness burns. Report the observation of other superficial (1st degree) burns but do not include those burns in your TBSA estimate.

Pearls

- Recommended Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, and Neuro**

Critical or Serious Burns:

- > 5-15% total body surface area (TBSA) partial or full thickness burns, or
- Full thickness burns > 5% TBSA for any age group, or
- Circumferential burns of extremities, or
- Electrical or lightning injuries, or
- Suspicion of abuse or neglect, or
- Inhalation injury, or
- Chemical burns, or
- Burns of face, hands, perineum, or feet

These patients require direct transport to a Burn Center. Local facility should be utilized only if critical interventions such as airway management are not possible in the field.

- Burn patients are often trauma patients, evaluate for multisystem trauma.
- Assure whatever has caused the burn is no longer contacting the injury. (Stop the burning process!)
- Early intubation is required when the patient experiences significant inhalation injuries.** If appropriate airway management cannot be achieved in the field, go to the nearest emergency department for stabilization prior to transfer to the Burn Center.
- Circumferential burns to extremities are dangerous due to potential vascular compromise secondary to soft tissue swelling.
- Burn patients are prone to hypothermia** - never apply ice or cool the burn, must maintain normal body temperature.
- Evaluate the possibility of child abuse with children and burn injuries.
- Never administer IM pain injections to a burn patient.
- IO access through burns is allowed if no other vascular access site is available
- Always consider the possibility of child abuse in children with burn injuries

Chemical Burns / Exposures

History

- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history / Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

Signs and Symptoms

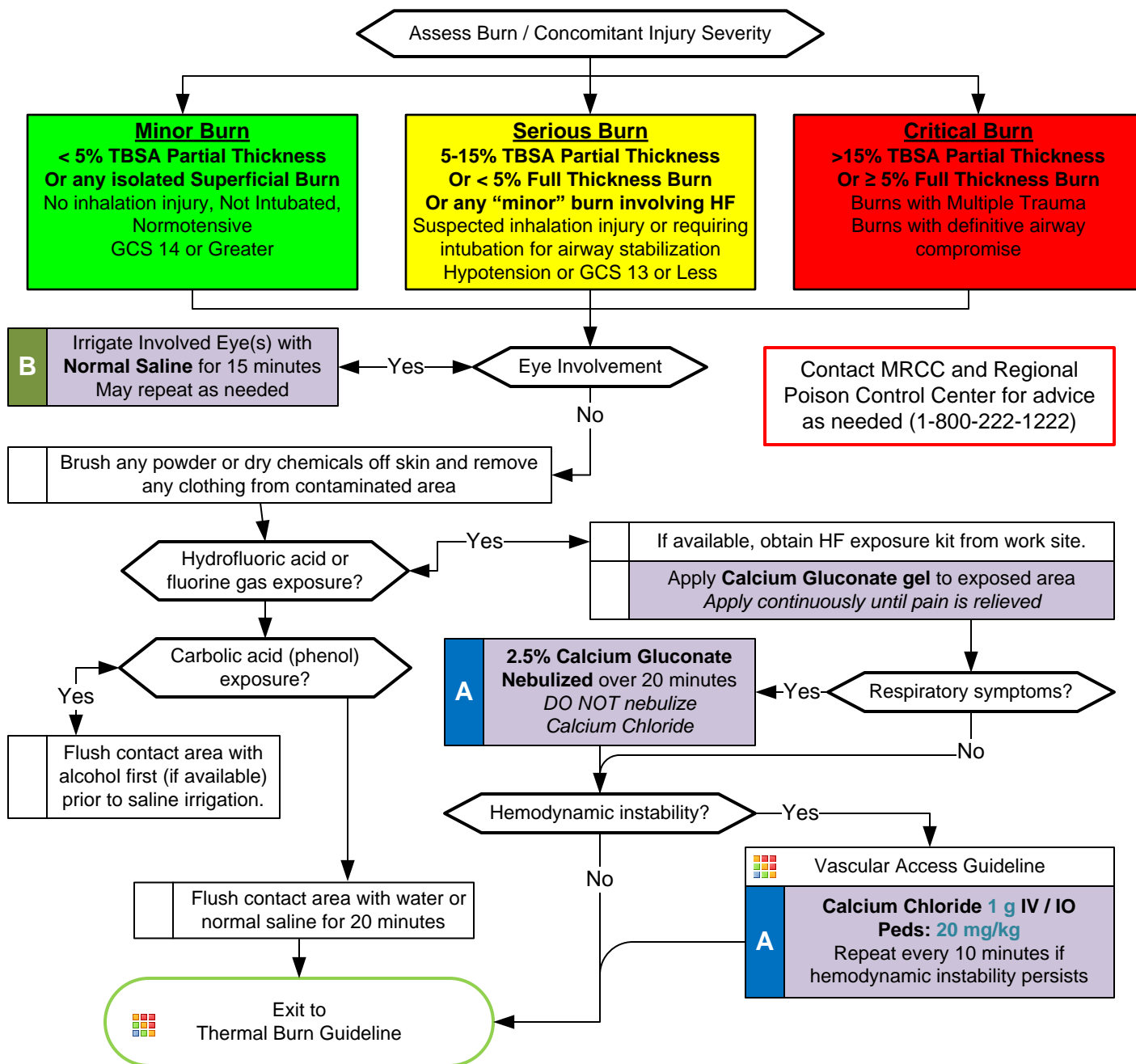
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/ wheezing / Hypotension

Differential

- Superficial (1st Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2nd Degree) blistering
- Full Thickness (3rd Degree) painless/charred or leathery skin
- Thermal injury
- Chemical injury
- Radiation injury
- Blast injury

Assure Chemical Source is NOT Hazardous to Responders. Follow departmental Decontamination Procedures.

All chemical burns should be transported to a Burn Center. Provide pre-notification if decon was performed.



Chemical Burns / Exposures

- **Pearls**

- **Recommended Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, and Neuro**

- **Refer to Rule of Nines to estimate total body surface area affected by exposure**

- **Chemical Burns:**

Refer to Decontamination Procedure.

Normal Saline or Sterile Water is preferred, however if not available, do not delay irrigation using tap water. Other water sources may be used based on availability. Flush the area as soon as possible with the cleanest readily available water or saline solution using copious amounts of fluids.

- **Carbolic Acid (phenol)** – This chemical is hydrophobic, therefore will not be efficiently decontaminated by water/saline irrigation alone. Alcohol (any form) should be used as the initial flush if available, however do not unnecessarily delay copious irrigation with water or saline.
- **Hydrofluoric acid / fluorine gas** – These substances cause extensive tissue destruction due to their ability to penetrate tissues more easily than other substances. All exposures to these chemicals should be considered serious or critical and transported to a burn center for evaluation due to potential delayed toxicity. Calcium ions are readily bound by the fluoride ions, which contributes to pain and possible hemodynamic instability (even cardiac arrest). Calcium chloride should be given intravascularly for any signs of hemodynamic instability. Pain is an indication of ongoing tissue destruction, for which the most effective treatment is calcium gluconate gel. Even small areas of exposure can be incredibly painful. Ideally, narcotics should be withheld in preference to calcium gluconate gel which should be repeatedly applied to the affected area until the pain subsides. DO NOT nebulize calcium chloride as this can cause further tissue damage. Calcium gluconate should be given via nebulizer if available for respiratory symptoms.

Electrical Burns / Electrocutation

History

- Type of exposure (lightning, residential power, high-voltage)
- Voltage exposure
- Time of Injury
- Past medical history / Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

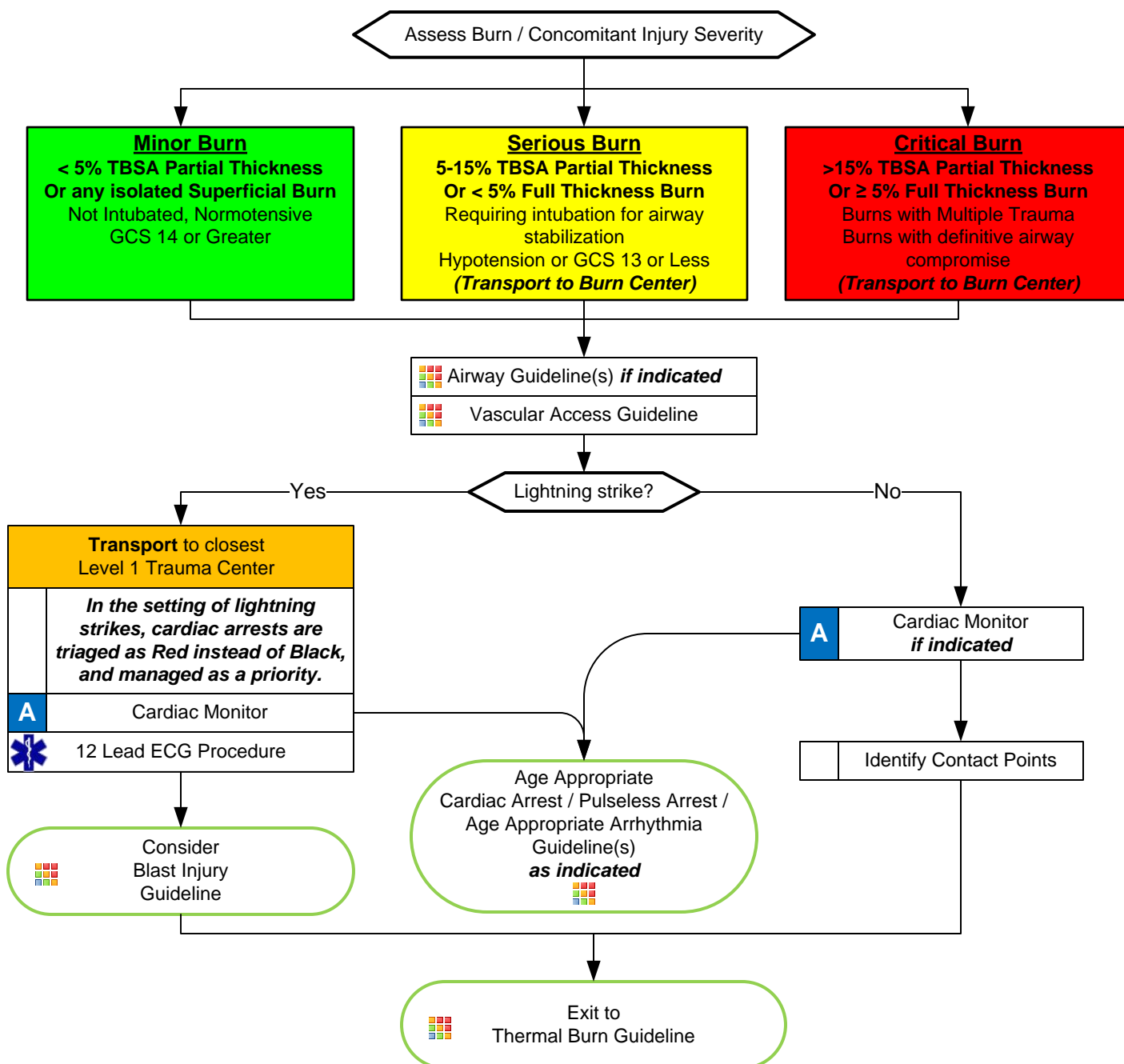
Signs and Symptoms

- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/ wheezing / Hypotension

Differential

- Superficial (1st Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2nd Degree) blistering
- Full Thickness (3rd Degree) painless/charred or leathery skin
- Thermal injury
- Internal electrical injury
- Blast injury

Assure Electrical Source is NO longer in contact with patient before touching patient.



Pearls

- **Recommended Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, and Neuro**
- **Refer to Rule of Nines: Remember the extent of the obvious external burn from an electrical source, does not always reflect more extensive internal damage not seen.**
- **Lightning Strikes:**
Lightning strikes should be treated as electrical burns, blast injuries, and multiple trauma due to the extreme forces produced. Cardiac arrests are often easily resuscitated with defibrillation attempts with resultant good neurologic outcomes, therefore should be triaged as Red in the setting of a mass casualty incident.
- **Electrical Burns:**
DO NOT contact patient until you are certain the source of the electrical shock is disconnected.
Attempt to locate contact points (generally there will be two or more.) A point where the patient contacted the source and a point(s) where the patient is grounded. Sites will generally be full thickness. **Do not refer to as entry and exit sites or wounds.**
Cardiac Monitor: Anticipate ventricular or atrial irregularity including VT, VF, atrial fibrillation and / or heart blocks.
Attempt to identify the nature of the electrical source (AC / DC), the amount of voltage, and the amperage the patient may have been exposed to during the electrical shock.

Blast Injury / Incident

History

- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history / Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

Signs and Symptoms

- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/ wheezing / Hypotension

Differential

- Superficial (1st Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2nd Degree) blistering
- Full Thickness (3rd Degree) painless/charred or leathery skin
- Thermal injury
- Chemical – Electrical injury
- Radiation injury
- Blast injury

Nature of Device: Agent / Amount. Industrial Explosion. Terrorist Incident. Improvised Explosive Device.

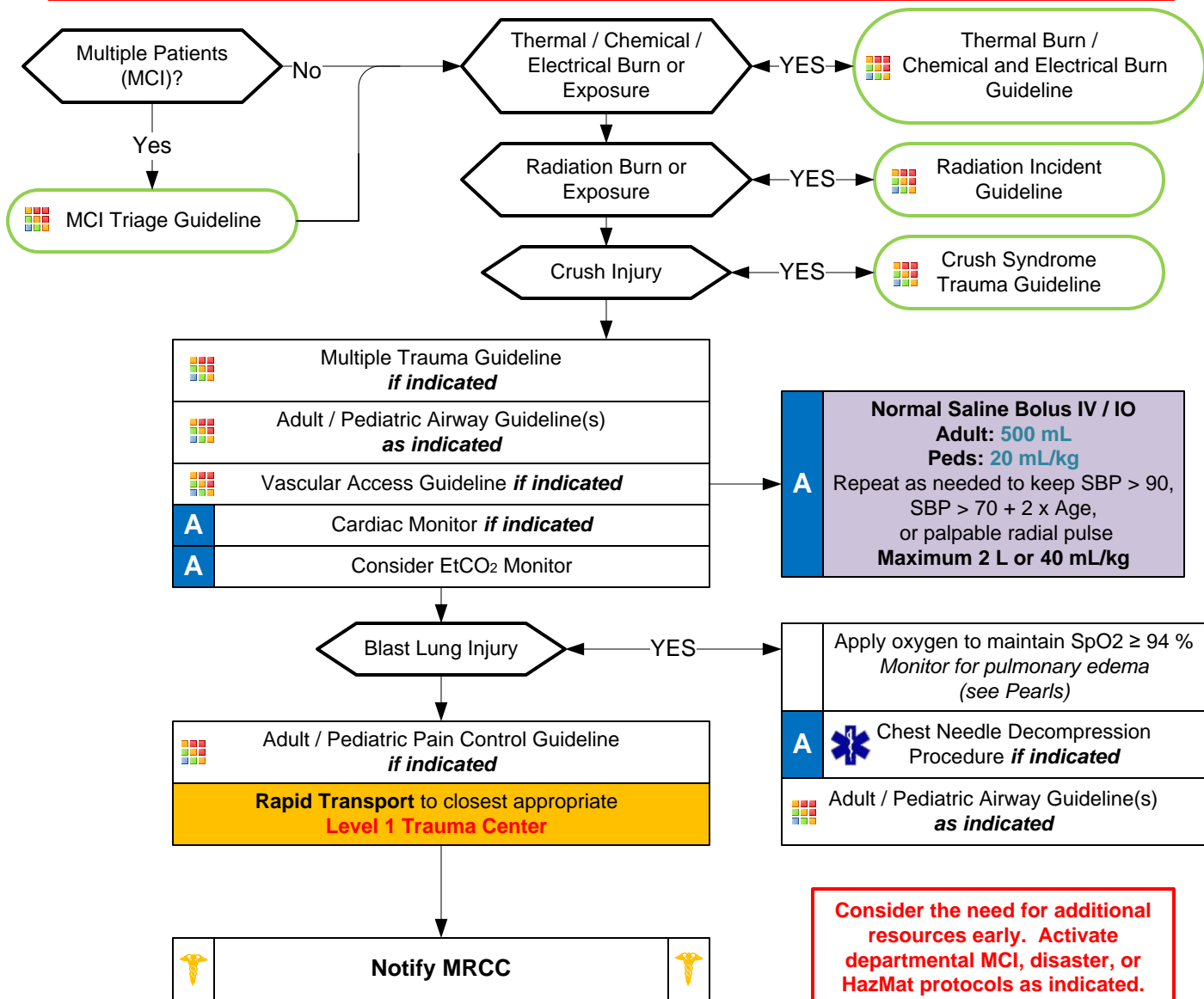
Method of Delivery: Incendiary / Explosive

Nature of Environment: Open / Closed.

Distance from Device: Intervening protective barrier. Other environmental hazards,

Evaluate for: Blunt Trauma / Crush Injury / Compartment Syndrome / Traumatic Brain Injury / Concussion / Tympanic Membrane Rupture / Abdominal hemorrhage or Evisceration, Blast Lung Injury and Penetrating Trauma.

Scene Safety / Quantify and Triage Patients / Load and Go with Assessment & Treatment Enroute



Blast Injury / Incident

Pearls

- **Types of Blast Injury:**
 - Primary Blast Injury: From pressure wave.
 - Secondary Blast Injury: Impaled objects. Debris which becomes missiles / shrapnel.
 - Tertiary Blast Injury: Patient falling or being thrown / pinned by debris.
 - Most Common Cause of Death: Secondary Blast Injuries.
- **Triage of Blast Injury patients:**
 - Blast Injury Patients with Burn Injuries Must be Triageed using the Thermal / Chemical / Electrical Burn Destination Guidelines for Critical / Serious / Minor Trauma and Burns
- **Blast Lung Injury:**
 - Blast Lung Injury is characterized by respiratory difficulty and hypoxia. Can occur (rarely) in patients without external thoracic trauma. More likely in enclosed space or in close proximity to explosion.
 - Symptoms: Dyspnea, hemoptysis cough, chest pain, wheezing and hemodynamic instability.
 - Signs: Apnea, tachypnea, hypopnea, hypoxia, cyanosis and diminished breath sounds.
 - Blast Lung Injury patients may require early intubation but positive pressure ventilation may exacerbate the injury, avoid hyperventilation.
 - Air transport may worsen lung injury as well and close observation is mandated. Tension pneumothorax may occur requiring chest decompression. Be judicious with fluids as volume overload may worsen lung injury.
- **Safety Considerations:**
 - Attempt to determine source of the blast to include any potential threat for partialization of hazardous materials.
 - Evaluate scene safety to include the source of the blast that may continue to spill explosive liquids or gases.
 - Conditions that led to the initial explosion may be returning and lead to a second explosion.
 - Patients who can, typically will attempt to move as far away from the explosive source as they safely can.
 - If concern exists for intentional explosion, consider potential threat for a secondary device.
 - Evaluate surroundings for suspicious items; unattended back packs or packages, or unattended vehicles.
 - Protect the airway and cervical spine, however, beyond the primary survey, care and a more detailed assessment should be deferred until the patient is in the ambulance.
 - If there are signs the patient was carrying the source of the blast, notify law enforcement immediately and most likely, a law enforcement officer will accompany your patient to the hospital.
 - Consider the threat of structural collapse, contaminated particles and / or fire hazards.

Radiation Incident

History

- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history / Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

Signs and Symptoms

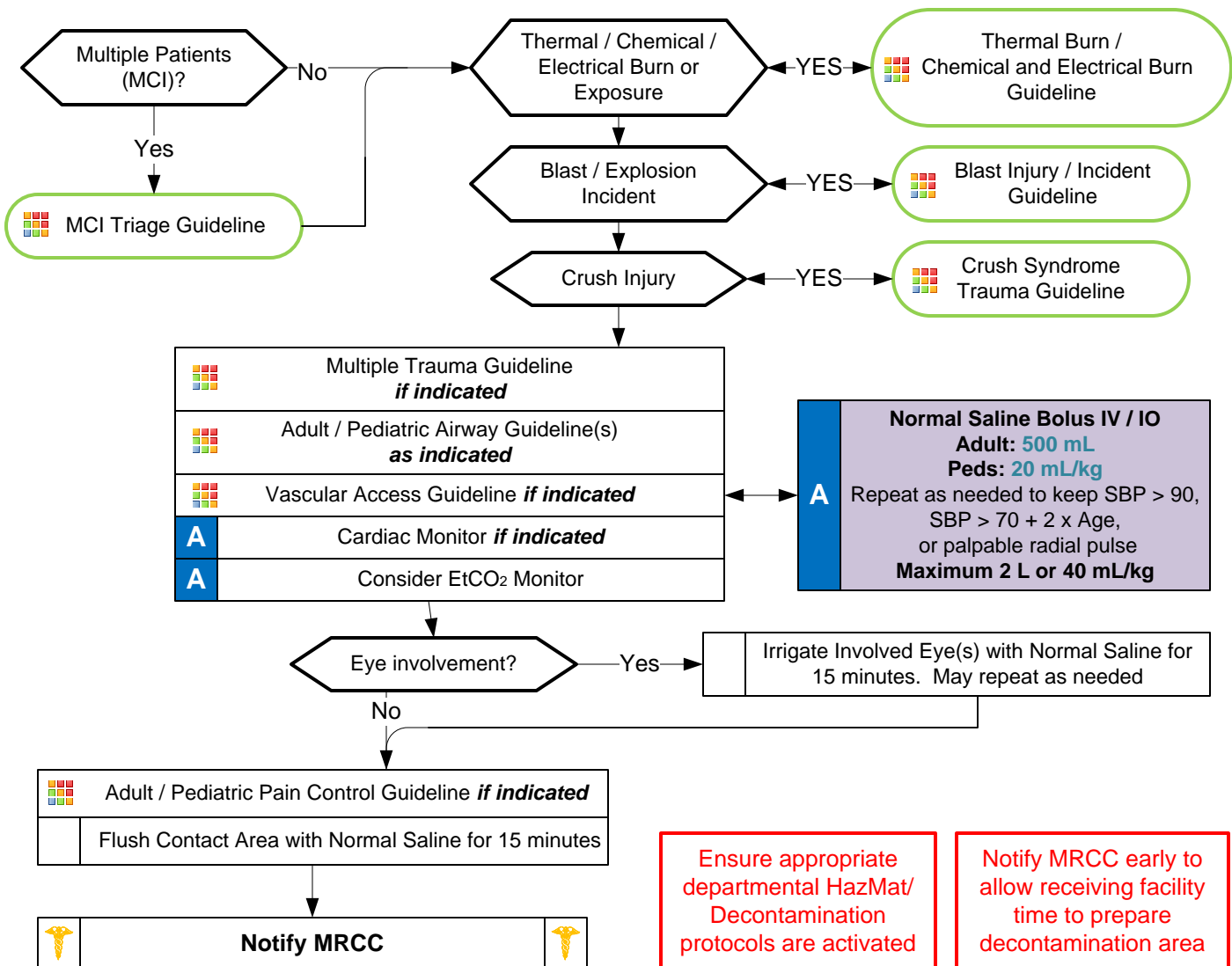
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/ wheezing / Hypotension

Differential

- Superficial (1st Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2nd Degree) blistering
- Full Thickness (3rd Degree) painless/charred or leathery skin
- Thermal injury
- Chemical – Electrical injury
- Radiation injury
- Blast injury

Radiation Exposure does not change the acute treatment of patients.
Evaluate and treat traumatic and medical complaints per appropriate guidelines.

Scene Safety / Quantify and Triage Patients / Load and Go with Assessment & Treatment Enroute

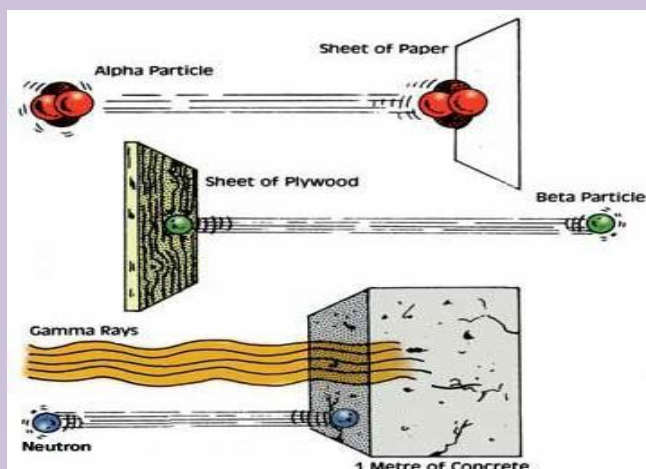


Collateral Injury: Most all injuries immediately seen will be a result of collateral injury, such as heat from the blast, trauma from concussion, treat collateral injury based on typical care for the type of injury displayed.

Qualify: Determine exposure type; external irradiation, external contamination with radioactive material, internal contamination with radioactive material.

Quantify: Determine exposure (generally measured in Grays/Gy). Information may be available from those on site who have monitoring equipment, do not delay transport to acquire this information.

Radiation Incident



Time Phases of Radiation Injury
(Exposure Dose vs Clinical Outcome)

Exposure Dose (Gy)	Prodrome Severity	Manifest Illness - Symptom Severity			Prognosis
		Hematologic	Gastrointestinal	Neurologic	
0.5 to 1.0	+	+	0	0	Survival almost certain
1.0 to 2.0	+/++	+	0	0	Survival >90 percent
2.0 to 3.5	++	++	0	0	Probable survival
3.5 to 5.5	+++	+++	+	0	Death in 50% at 3.5 to 6 wks
5.5 to 7.5	+++	+++	++	0	Death probable in 2-3 wks
7.5 to 10	+++	+++	+++	0*	Death probable in 1-2.5 wks
10 to 20	+++	+++	+++	+++	Death certain in 5-12 days
> 20	+++	+++	+++	+++**	Death certain in 2-5 days

Abbreviations: Gy: dose in Grey;
0: no effects; +: mild; ++: moderate; +++: severe or marked

* Hypotension
** Also cardiovascular collapse, fever, shock

Modified from: Waselenko, JK, MacVittie, TJ, Blakely, WF, et al. Medical management of the acute radiation syndrome: Recommendations of the strategic national stockpile radiation working group. Ann Int Med 2004; 140:1039.

Pearls

- If appropriate, life-saving interventions may be performed in the Hot or Warm zones, but should be restricted to critical interventions such as King airway placement, chest needle decompression, and tourniquet application.**
- Dealing with a patient with a radiation exposure can be a frightening experience. Do not ignore the ABC's, a dead but decontaminated patient is not a good outcome.
- Normal Saline or Sterile Water is preferred, however if not available, do not delay irrigation using tap water. Other water sources may be used based on availability. Flush the area as soon as possible with the cleanest readily available water or saline solution using copious amounts of fluids.
- Three methods of exposure:**
 - External irradiation
 - External contamination
 - Internal contamination
- Two classes of radiation:**
 - Ionizing radiation** (greater energy) is the most dangerous and is generally in one of three states: Alpha Particles, Beta Particles and Gamma Rays.
 - Non-ionizing** (lower energy) examples include microwaves, radios, lasers and visible light.
- Radiation burns with early presentation are unlikely, it is more likely this is a combination event with either thermal or chemical burn being presented as well as a radiation exposure. Where the burn is from a radiation source, it indicates the patient has been exposed to a significant source, (> 250 rem).
- Patients experiencing radiation poisoning are not contagious. Cross contamination is only a threat with external and internal contamination.
- Typical ionizing radiation sources in the civilian setting include soil density probes used with roadway builders and medical uses such as x-ray sources as well as radiation therapy. Sources used in the production of nuclear energy and spent fuel are rarely exposure threats as are military sources used in weaponry. Nevertheless, these sources are generally highly radioactive and in the unlikely event they are the source, consequences could be significant and the patient's outcome could be grave.
- The three primary methods of protection from radiation sources:**
 - Limiting time of exposure
 - Distance from
 - Shielding from the source
- Dirty bombs ingredients generally include previously used radioactive material and combined with a conventional explosive device to spread and distribute the contaminated material.
- Refer to WMD / Nerve Agent Guideline for dirty contamination events.
- If there is a time lag between the time of exposure and the encounter with EMS, key clinical symptom evaluation includes: Nausea/ Vomiting, hypothermia/hyperthermia, diarrhea, neurological/cognitive deficits, headache and hypotension.
- Inform MRCC early to mobilize hospital resources at receiving facilities**

Drowning / Submersion Injury

History

- Submersion in water regardless of depth
- Possible history of trauma ie: diving board
- Duration of immersion
- Temperature of water or possibility of hypothermia
- Degree of water contamination

Signs and Symptoms

- Unresponsive
- Mental status changes
- Decreased or absent vital signs
- Vomiting
- Coughing, Wheezing, Rales, Rhonci, Stridor
- Apnea

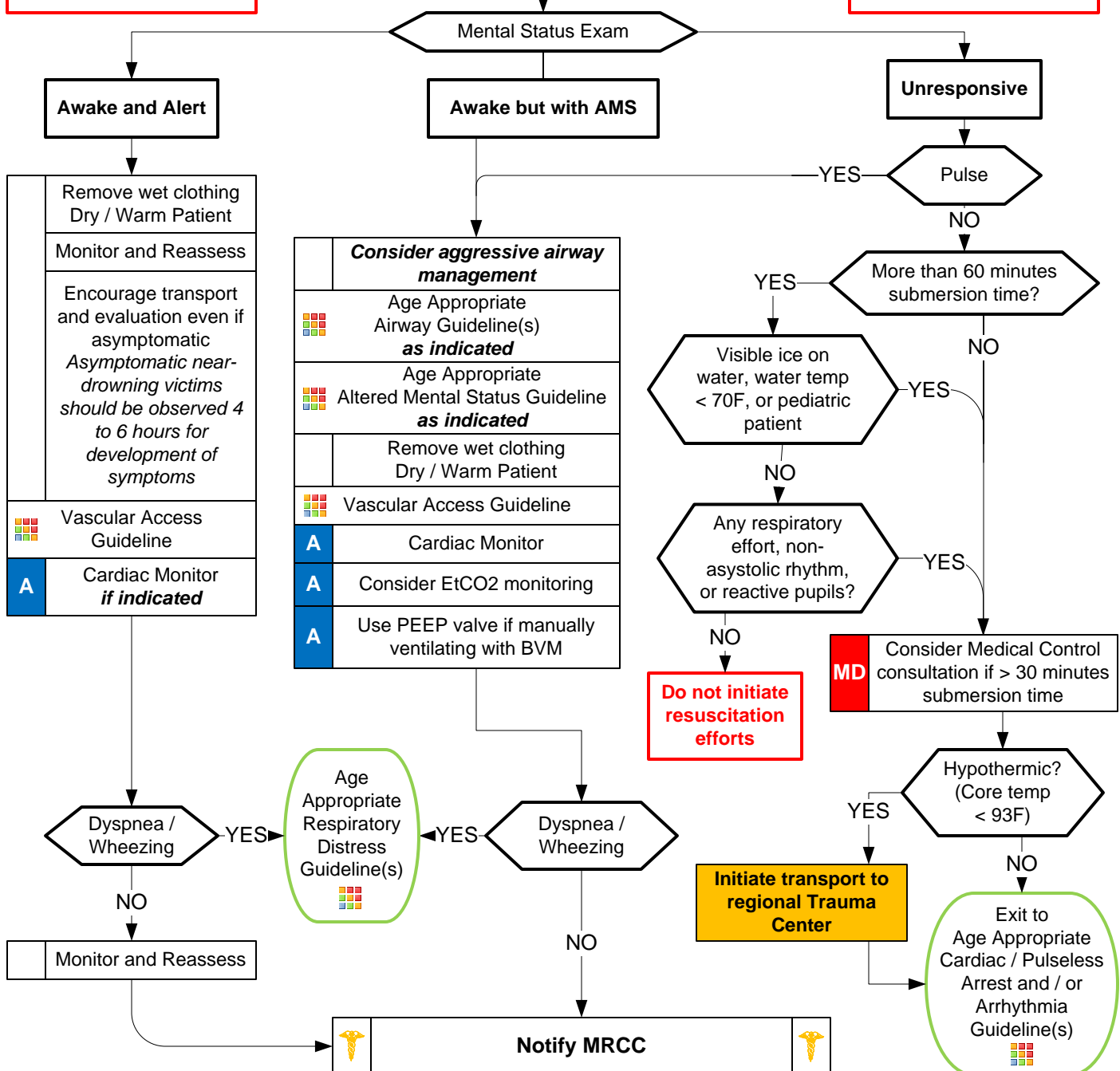
Differential

- Trauma
- Pre-existing medical problem
- Pressure injury (diving)
- Barotrauma
- Decompression sickness
- Post-immersion syndrome

See Pearls for Scuba Diver considerations

Spinal Immobilization Guideline

Consider Hypothermia Guideline if indicated



Drowning / Submersion Injury



Diver's Alert Network
(919)-684-9111
24-hour emergency medical consultation

Decompression injuries (i.e. "The Bends", nitrogen narcosis, air emboli) can occur after an ascent from any depth when using SCUBA equipment. Typical symptoms include severe joint pain, chest pain, breathing difficulty, or altered mental status.

These patients should be transported to the nearest hyperbaric facility unless other confounding injuries are present (burns, major trauma). Avoid air transport (unless low altitudes can be maintained) as this will exacerbate the decompression injury further. Consider Diver's Alert Network and medical control consultation to assist with the management of these patients.

After 60 minutes of submersion the likelihood of successful resuscitation approaches zero, and the risk to rescuers increases. Unless special circumstances are present (i.e. visible ice on water, pediatric victim) consider transitioning efforts from rescue to recovery after 60 minutes. Utilize MRCC for medical control consultation as appropriate.

Positive pressure ventilation should be considered for any drowning victim with respiratory difficulty or unresponsiveness. CPAP would be appropriate for the awake patient, and a PEEP valve should be used in conjunction with a BVM for any patient requiring ventilatory assistance following a submersion/drowning injury.

Pearls

- **Recommended Exam: Trauma Survey, Head, Neck, Chest, Abdomen, Pelvis, Back, Extremities, Skin, Neuro**
- **Ensure scene safety. Drowning is a leading cause of death among would-be rescuers.**
- **Allow appropriately trained and certified rescuers to remove victims from areas of danger.**
- **With cold water submersion there is an increased chance of survival even with cardiac arrest and prolonged submersion. Have a low threshold to initiate resuscitation, consider medical control consultation early.**
- Have a high index of suspicion for possible spinal injuries
- Hypothermia is often associated with drowning and submersion injuries.
- All victims should be transported, even if asymptomatic, for evaluation due to potential for worsening over the next several hours.
- With pressure injuries (decompression / barotrauma), consider transport to or availability of a hyperbaric chamber.
- Post-drowning patients who are awake and cooperative but with respiratory distress may benefit from CPAP.

Hyperthermia

History

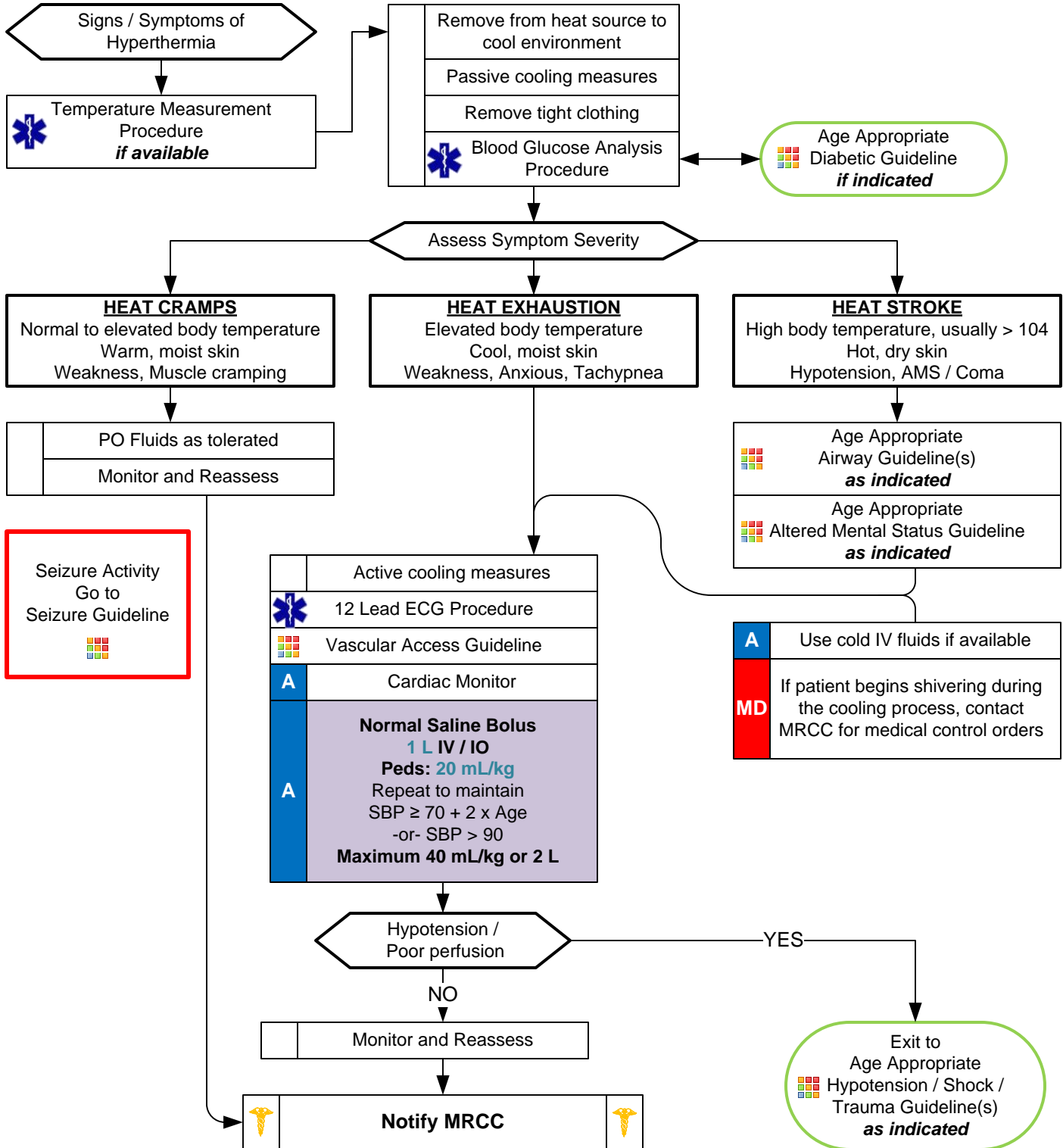
- Age, very young and old
- Exposure to increased temperatures and / or humidity
- Past medical history / Medications
- Time and duration of exposure
- Poor PO intake, extreme exertion
- Fatigue and / or muscle cramping

Signs and Symptoms

- Altered mental status / coma
- Hot, dry or sweaty skin
- Hypotension or shock
- Seizures
- Nausea

Differential

- Fever (Infection)
- Dehydration
- Medications
- Hyperthyroidism (Storm)
- Delirium tremens (DT's)
- Heat cramps, exhaustion, stroke
- CNS lesions or tumors



Hyperthermia

Passive Cooling

- Extricate to cooler environment
- Remove all clothing
- Limit physical activity

Active Cooling

- Ice packs to axilla, groin, and neck
- Cold IV fluids
- Fan with cold air
- Mist with water
- Immersion in cold water
- Cold oral fluids if alert

Most cases of heat exhaustion do not require intensive treatment.

Consider using the Scene Rehabilitation protocol for mild cases of heat exhaustion without confounding medical issues.

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Neuro**
- Extremes of age are more prone to heat emergencies (i.e. young and old). Obtain and document patient temperature if able.
- Predisposed by use of: tricyclic antidepressants, phenothiazines, anticholinergic medications, and alcohol.
- Cocaine, Amphetamines, and Salicylates may elevate body temperatures.
- Sweating generally disappears as body temperature rises above 104° F (40° C).
- Intense shivering may occur as patient is cooled. Treat with benzos and/or vecuronium per guidelines.
- **Heat Cramps** consists of benign muscle cramping 2° to dehydration and is not associated with an elevated temperature.
- **Heat Exhaustion** consists of dehydration, salt depletion, dizziness, fever, mental status changes, headache, cramping, nausea and vomiting. Vital signs usually consist of tachycardia, hypotension, and an elevated temperature.
- **Heat Stroke** consists of dehydration, tachycardia, hypotension, temperature >104° F (40° C), and an altered mental status.

Hypothermia / Frostbite

History

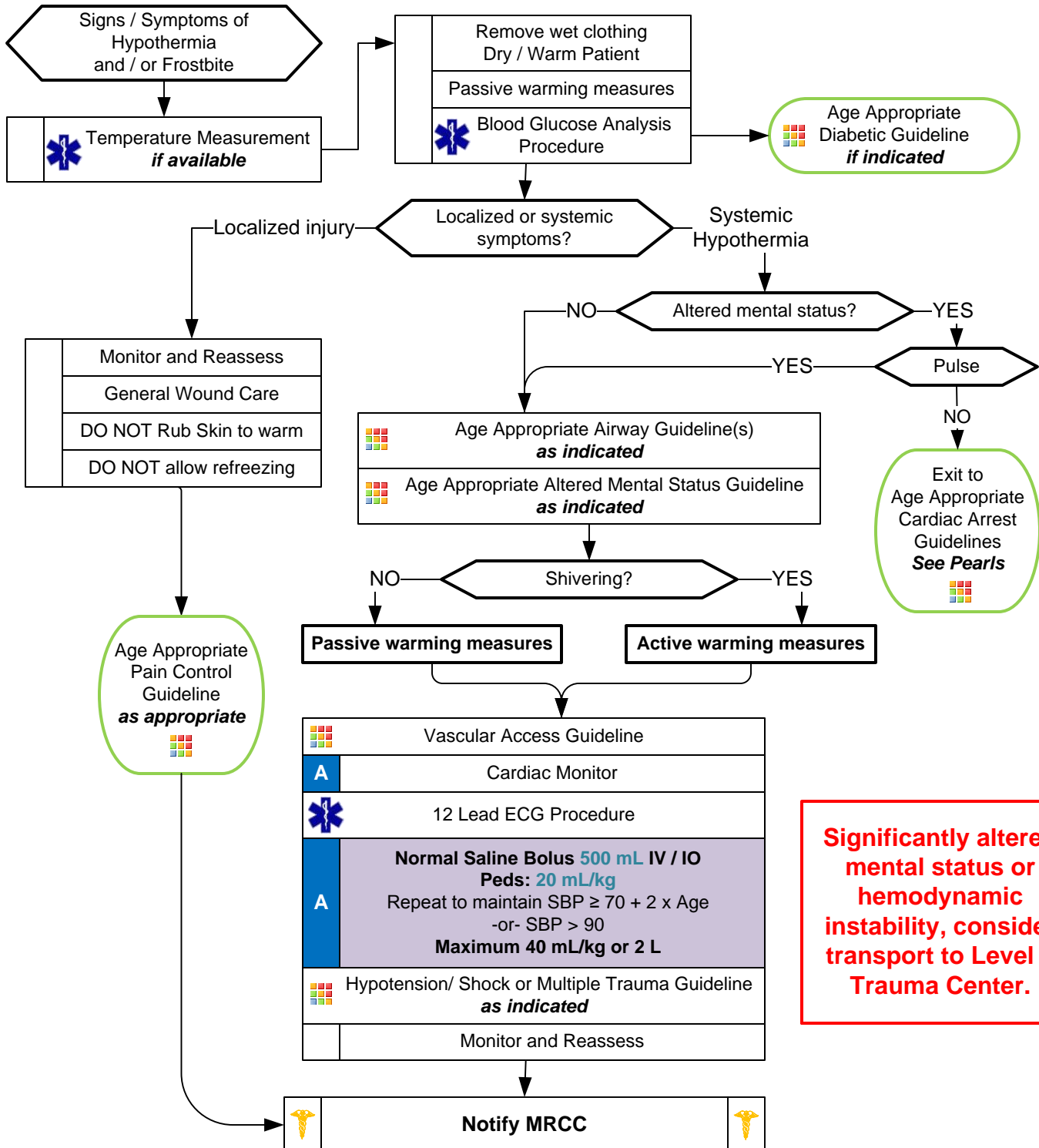
- Age, very young and old
- Exposure to decreased temperatures but may occur in normal temperatures
- Past medical history / Medications
- Drug use: Alcohol, barbituates
- Infections / Sepsis
- Length of exposure / Wetness / Wind chill

Signs and Symptoms

- Altered mental status / coma
- Cold, clammy
- Shivering
- Extremity pain or sensory abnormality
- Bradycardia
- Hypotension or shock

Differential

- Sepsis
- Environmental exposure
- Hypoglycemia
- CNS dysfunction
 - Stroke
 - Head injury
 - Spinal cord injury



Hypothermia / Frostbite

Passive Rewarming

- Extricate from cold environment
- Remove wet clothing

Active Rewarming

- Increase ambient temperature
- Apply blankets
- Administer warm IV fluids
- Heating packs to axilla and groin
- Warm humidified oxygen

Hypothermic cardiac arrests should be transported to a regional Trauma Center with active CPR if core temperature is < 93 degrees F (32 degrees C). After the first round of ACLS meds, delay any further cardiac medications or defibrillation attempts until the patient's temperature is at least 86 degrees F (30 degrees C).

After Drop

After drop, otherwise known as rewarming collapse (or rewarming shock) is a sudden drop in blood pressure in combination with a low cardiac output which may occur during active treatment of a severely hypothermic person. This occurs when vasodilation in response to warming forces cold blood from the extremities to be recirculated back to the core, resulting in a further drop in the core body temperature. This can result in ventricular fibrillation or sudden cardiovascular collapse. There is theoretical concern that external rewarming rather than internal rewarming may increase the risk. Since internal rewarming is logistically challenging in the pre-hospital environment, ***active rewarming should not be performed if the patient has cooled beyond the point of shivering.***

Pearls

- **Recommended Exam: Mental Status, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Hypothermia categories:**
 - Mild 90 – 95 degrees F (32 – 35 degrees C)
 - Moderate 82 – 90 degrees F (28 – 32 degrees C)
 - Severe < 82 degrees F (< 28 degrees C)
- **Mechanisms of hypothermia:**
 - Radiation: Heat loss to surrounding objects via infrared energy (60 % of most heat loss.)
 - Convection: Direct transfer of heat to the surrounding air.
 - Conduction: Direct transfer of heat to direct contact with cooler objects (important in submersion.)
 - Evaporation: Vaporization of water from sweat or other body water losses.
- Contributing factors of hypothermia: Extremes of age, malnutrition, alcohol or other drug use.
- If the temperature is unable to be measured, treat the patient based on the suspected temperature.
- **CPR:**
 - Severe hypothermia may cause cardiac instability. Rough handling of the patient theoretically could cause ventricular fibrillation. This is controversial and not clearly supported in research studies. Intubation and CPR techniques should not be withheld due to this concern, but in severe hypothermia airway management should be performed by the most experienced provider.
 - Below 86 degrees F (30 degrees C) ACLS medications may not be effective. One initial round of medications may be administered, however further treatments (other than chest compressions and airway management) should be deferred until the patient has been warmed to at least 86 degrees F (30 degrees C). Contact medical control for direction.
 - If the patient's temperature is below 86 degrees F (30 degrees C) then defibrillate 1 time if indicated. Further defibrillation attempts should be deferred until the patient has been warmed to at least 86 degrees F (30 degrees C). Contact medical control for direction.
 - Hypothermia may produce severe bradycardia so take at least 45 seconds to palpate for a pulse.
 - Hot packs can be activated and placed in the armpit and groin area if available. Care should be taken not to place the packs directly against the patient's skin.

Bites and Envenomations

History

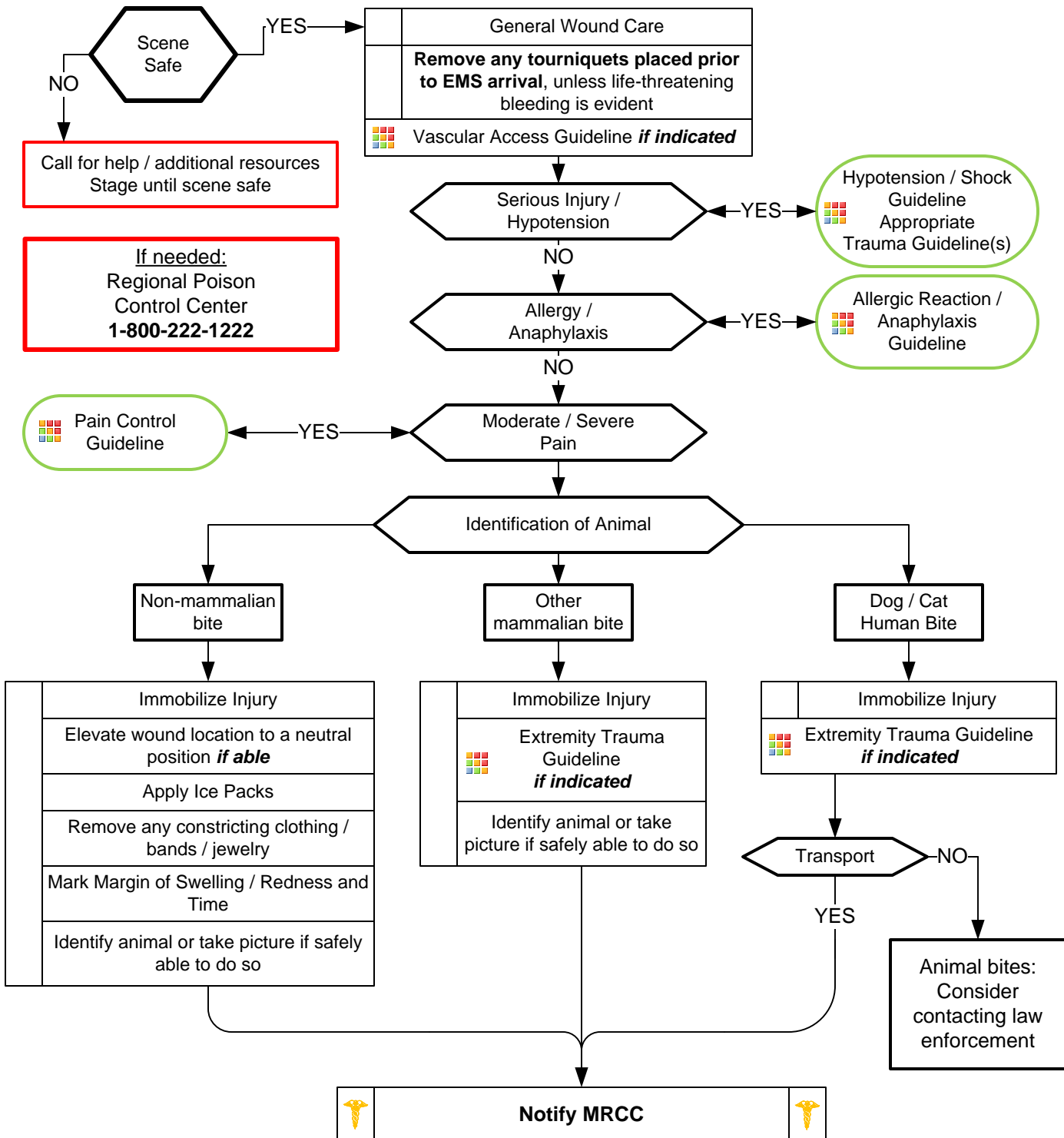
- Type of bite / sting
- Description or bring creature / photo with patient for identification
- Time, location, size of bite / sting
- Previous reaction to bite / sting
- Domestic vs. Wild
- Tetanus and Rabies risk
- Immunocompromised patient

Signs and Symptoms

- Rash, skin break, wound
- Pain, soft tissue swelling, redness
- Blood oozing from the bite wound
- Evidence of infection
- Shortness of breath, wheezing
- Allergic reaction, hives, itching
- Hypotension or shock

Differential

- Animal bite
- Human bite
- Snake bite (poisonous)
- Spider bite (poisonous)
- Insect sting / bite (bee, wasp, ant, tick)
- Infection risk
- Rabies risk
- Tetanus risk



Bites and Envenomations

Environmental Guidelines

Pearls

- **Recommended Exam: Mental Status, Skin, Extremities (Location of injury), and a complete Neck, Lung, Heart, Abdomen, Back, and Neuro exam if systemic effects are noted**
- Human bites have higher infection rates than animal bites due to normal mouth bacteria.
- Carnivore bites are much more likely to become infected and all have risk of Rabies exposure.
- Cat bites may progress to infection rapidly due to a specific bacteria (*Pasteurella multocida*).
- Poisonous snakes in this area are generally of the pit viper family (rattlesnake). Other poisonous exotic species may be found at zoos, pet stores, or in rare cases at private residences (legally or illegally).
- Coral snake bites are rare: Very little pain but very toxic. "Red on yellow - kill a fellow, red on black - venom lack."
- If no pain or swelling, envenomation is unlikely. About 25 % of snake bites are "dry" bites.
- Black Widow spider bites tend to be minimally painful, but over a few hours, muscular pain and severe abdominal pain may develop (spider is black with red hourglass on belly).
- Brown Recluse spider bites are minimally painful to painless. Little reaction is noted initially but tissue necrosis at the site of the bite develops over the next few days (brown spider with fiddle shape on back).
- Evidence of infection: swelling, redness, drainage, fever, red streaks proximal to wound.
- Immunocompromised patients are at an increased risk for infection: diabetes, chemotherapy, transplant patients.
- Consider contacting the Regional Poison Control Center or MRCC for guidance (1-800-222-1222).

Carbon Monoxide Exposure

History

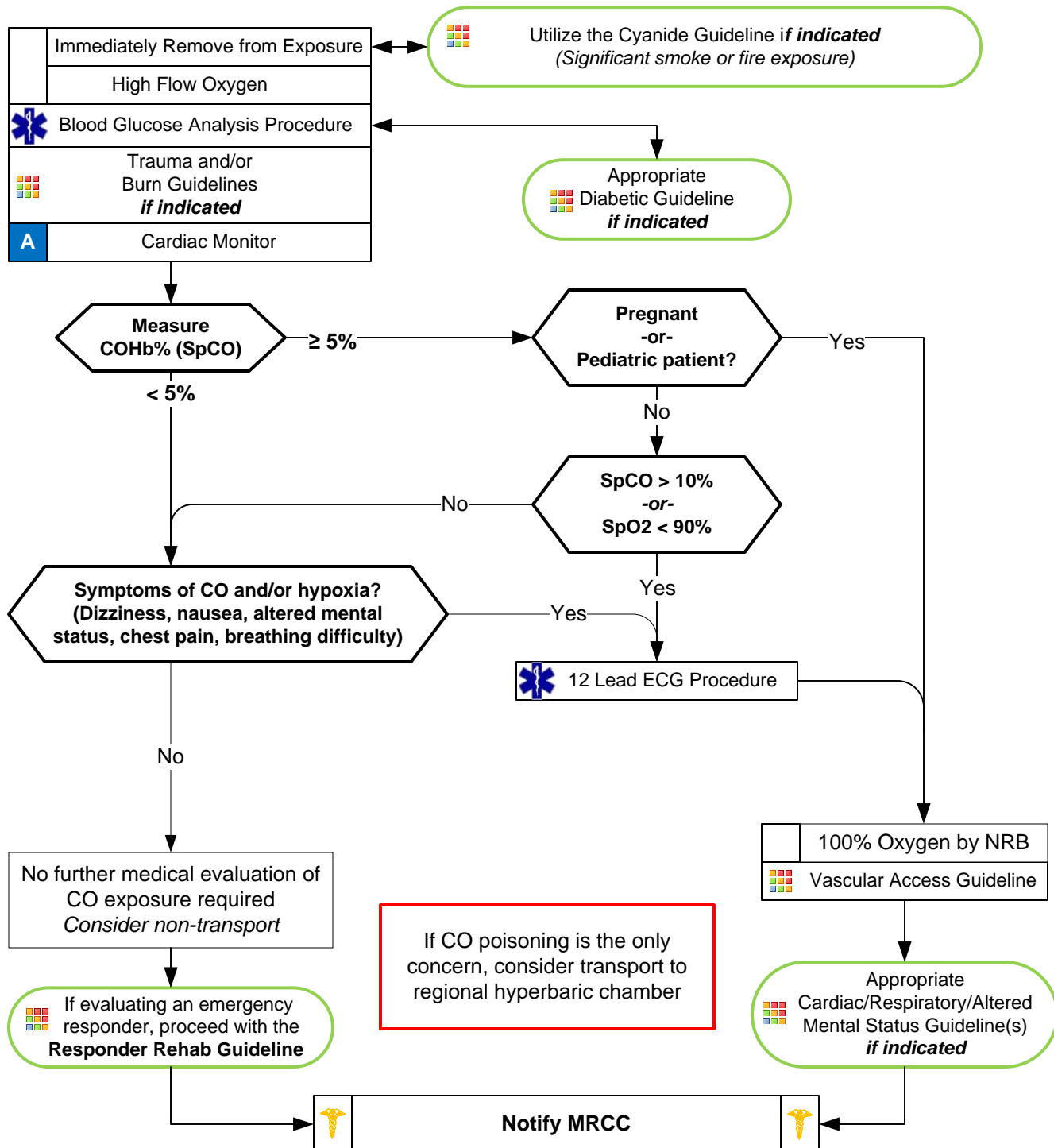
- Firefighter/Structure Fire victim
- Suspected CO exposure
- Suspected source/duration exposure
- Age, possible pregnancy
- Reason (accidental, suicidal)
- Measured atmospheric levels
- Past medical history, meds

Signs and Symptoms

- Altered mental status/dizziness
- Headache, Nausea/Vomiting
- Chest Pain/Respiratory distress
- Neurological impairments
- Vision problems/reddened eyes
- Tachycardia/tachypnea
- Arrhythmias, seizures, coma

Differential

- Effects of other toxic fire byproduct
- Acute cardiac event
- Acute neurological event
- Flu/GI illness
- Acute intoxication
- Diabetic Ketoacidosis
- Headache of non-toxic origin



Carbon Monoxide Exposure

Environmental Guidelines

Pearls

- **Recommended exam: Neuro, Skin, Heart, Lungs, Abdomen, Extremities**
- **Scene safety is priority.**
- Consider CO and Cyanide with any product of combustion
- Normal environmental CO level does not exclude CO poisoning.
- **Fetal hemoglobin has a greater attraction for CO than maternal hemoglobin. Females who are known to be or possibly pregnant should be advised that EMS-measured SpCO levels reflect the adult's level, and that fetal COHb levels may be higher. Recommend Hospital eval for any CO exposed pregnant person.**
- The absence (or low detected levels of) of COHb is not a reliable predictor of firefighter or victim exposure to other toxic byproducts of fire
- In obtunded fire victims, consider Cyanide treatment protocol
- The differential list for CO Toxicity is extensive. Attempt to evaluate other correctable causes when possible
- Chronic CO exposure is clinically significant; therefore advice on smoking cessation is important medical instruction

Cyanide Exposure

History

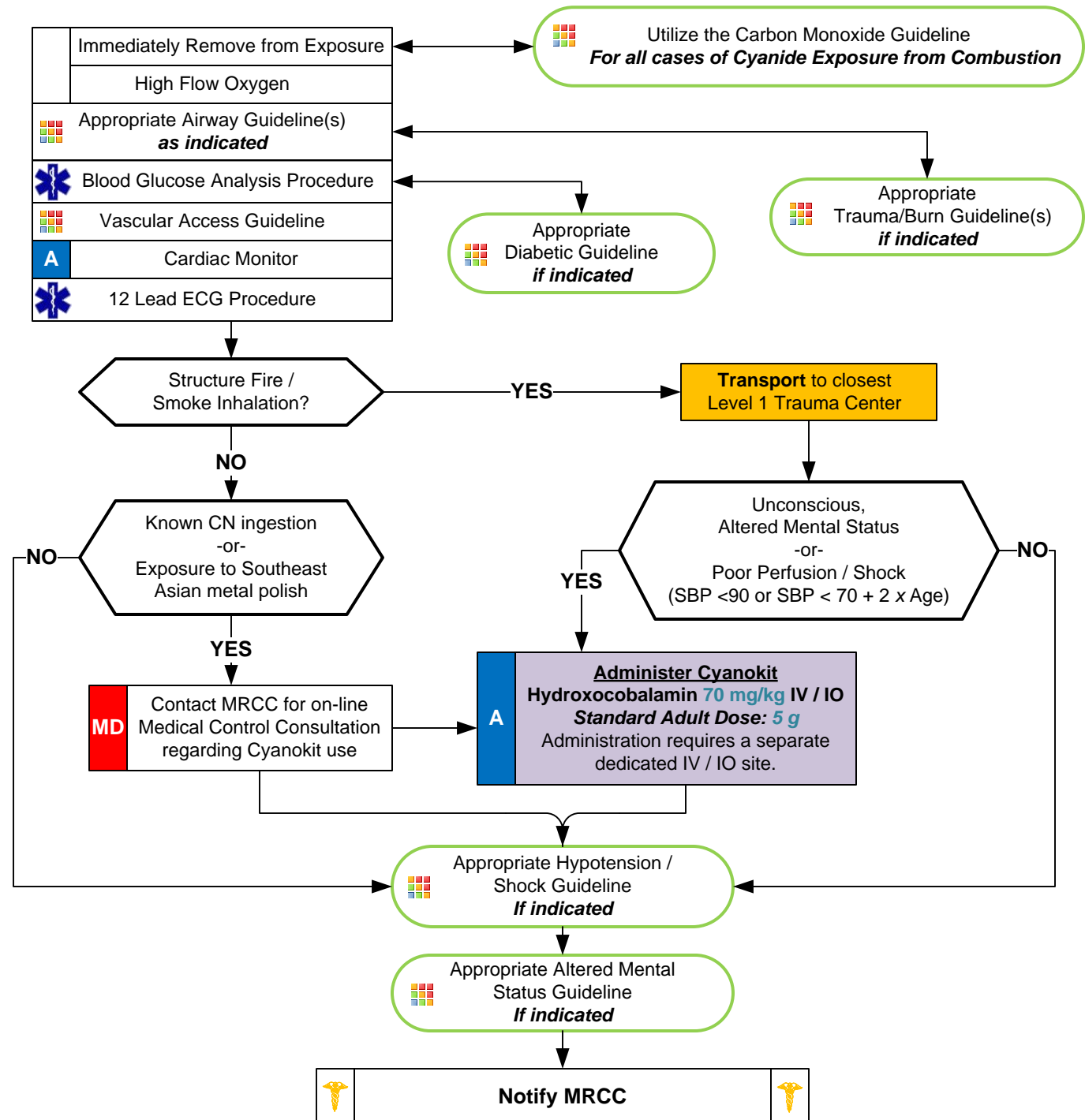
- Smoke inhalation
- Ingestion of cyanide
- Eating large quantity of fruit pits
- Industrial exposure
- Trauma
- Reason: Suicide, criminal, accidental
- Past Medical History
- Time / Duration of exposure

Signs and Symptoms

- AMS
- Malaise, weakness, flu like illness
- Dyspnea
- GI Symptoms; N/V; cramping
- Dizziness
- Seizures
- Syncope
- Reddened skin
- Chest pain

Differential

- Diabetic related
- Infection
- MI
- Anaphylaxis
- Renal failure / dialysis problem
- Head injury / trauma
- Co-ingestant or exposures



Cyanide Exposure

Cyanokit® Administration

- **Reconstitute:** Add 200 mL of 0.9% Sodium Chloride to the vial using the transfer spike. Fill to the line.
- **Mix:** The vial should be repeatedly inverted or rocked, not shaken, for at least 60 seconds prior to infusion.
- **Infuse:** Use vented intravenous tubing, hang and infuse over 15 minutes.

Pearls

- **Recommended exam: Neuro, Skin, Heart, Lungs, Abdomen, Extremities**
- **Scene safety is priority. Do not enter a suspected cyanide ingestion scene without proper SCBA equipment.**
- Consider CO and Cyanide with any product of combustion.
- Continue high flow oxygen regardless of pulse ox readings.
- MRCC can facilitate toxicology consultation to assist with treatment recommendations.
- Hydroxocobalamin is not compatible with most medications. A separate dedicated vascular access point is required for administration.

WMD – Nerve Agent Exposure

History

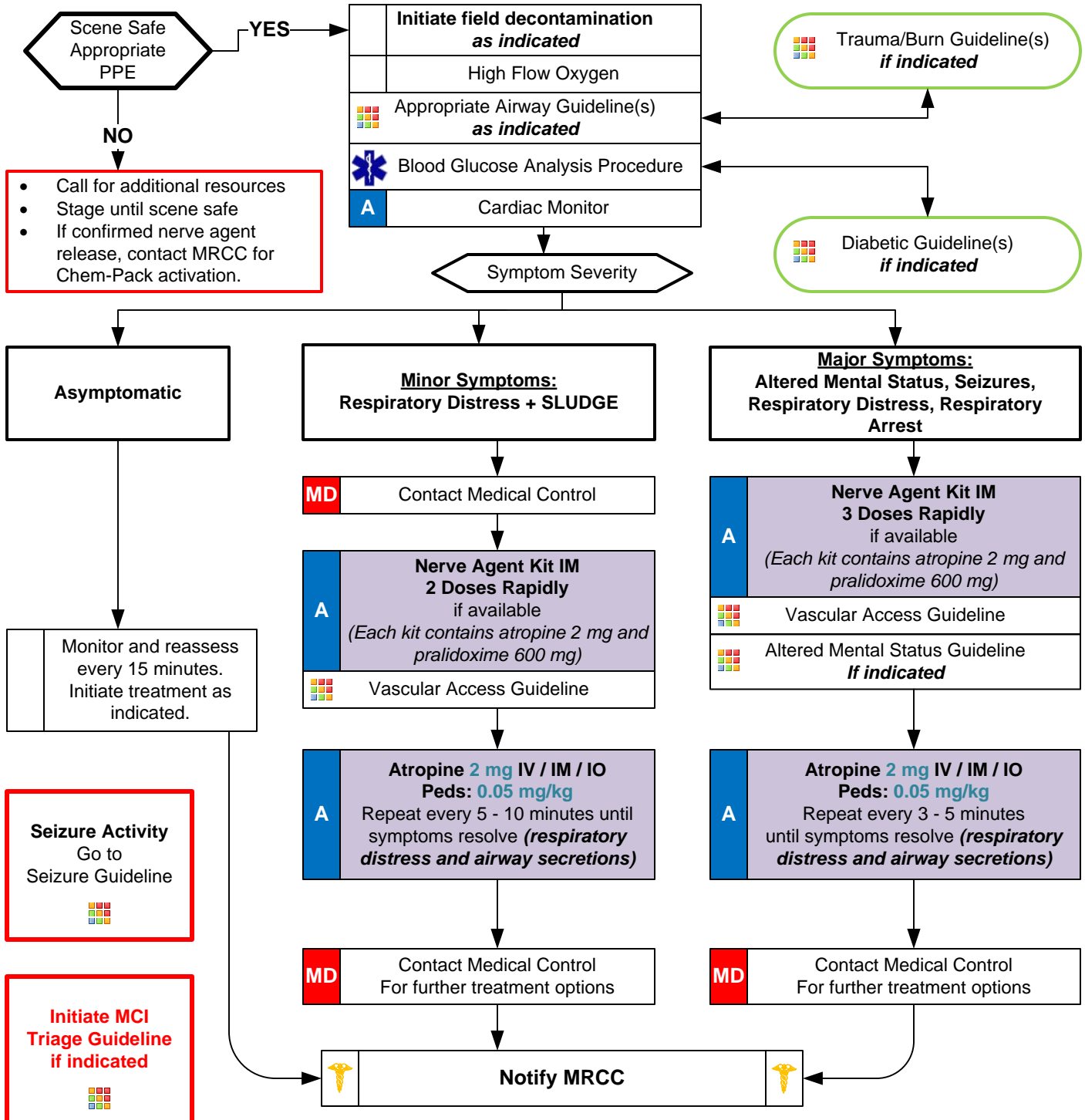
- Exposure to chemical, biologic, radiologic, or nuclear hazard
- Potential exposure to unknown substance/hazard
- Farmer with exposure to pesticide**

Signs and Symptoms

- Salivation
- Lacrimation
- Urination; increased, loss of control
- Defecation / Diarrhea
- GI Upset; Abdominal pain / cramping
- Emesis
- Muscle Twitching
- Seizure Activity
- Respiratory Arrest

Differential

- Nerve agent exposure (e.g., VX, Sarin, Soman, etc.)
- Organophosphate exposure (pesticide)**
- Vesicant exposure (e.g., Mustard Gas, etc.)
- Respiratory Irritant Exposure (e.g., Hydrogen Sulfide, Ammonia, Chlorine, etc.)





WMD – Nerve Agent Protocol

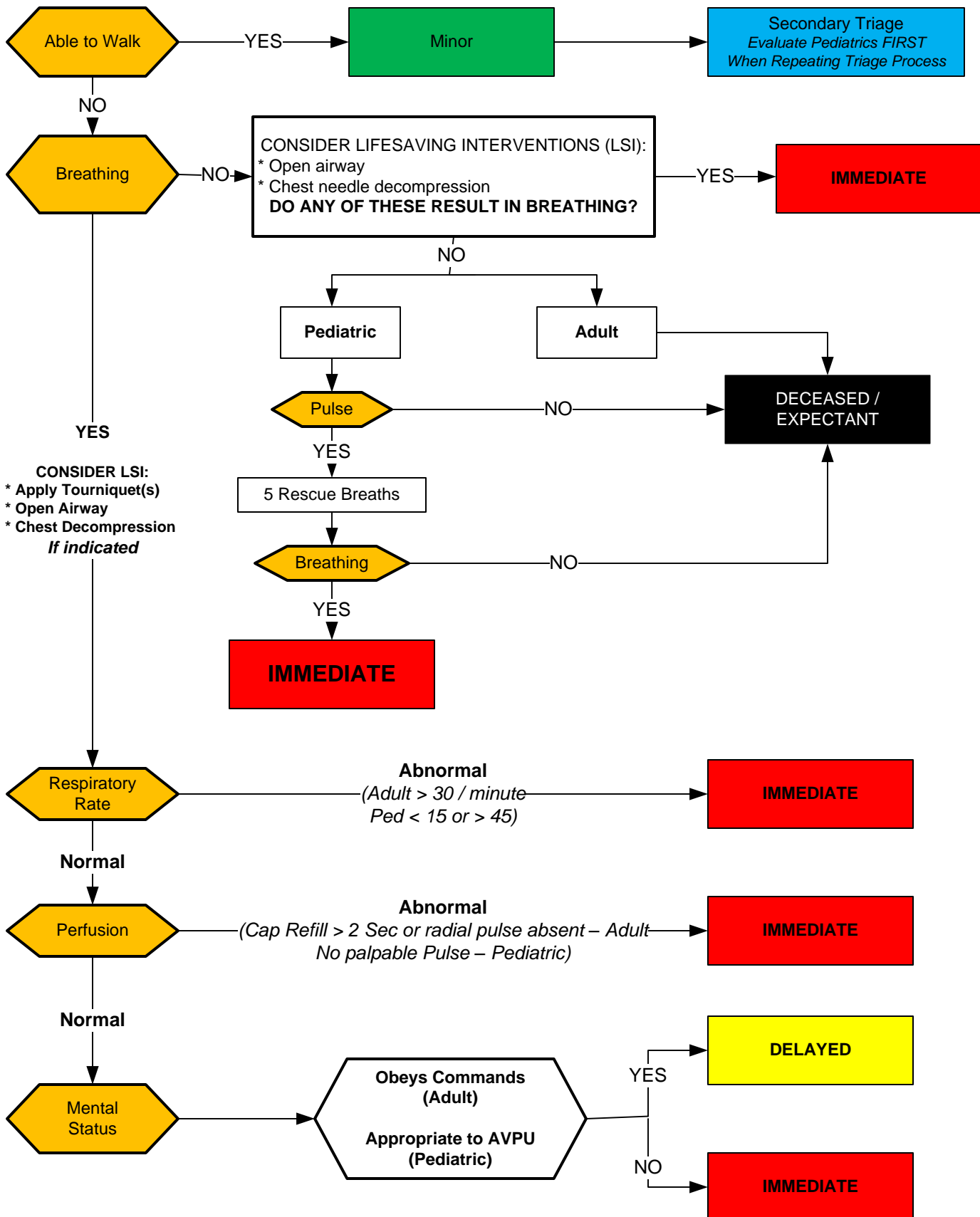
Environmental Guidelines

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Gastrointestinal, Neuro**
- **Follow local HAZMAT protocols for decontamination and use of personal protective equipment.**
- Nerve Agent Kits should only be administered for symptomatic treatment. **DO NOT** administer Nerve Agent Kits for prophylaxis even in asymptomatic patients with a known nerve agent exposure.
- In the face of a bona fide attack, begin with 1 Nerve Agent Kit for patients less than 7 years of age, 2 Nerve Agent Kits from 8 to 14 years of age, and 3 Nerve Agent Kits for patients 15 years of age and over.
- **Contact Medical Control early for treatment advice**
- Each Nerve Agent Kit contains 600 mg of Pralidoxime (2-PAM) and 2 mg of Atropine. Also known as Mark I kits.
- **Seizure Activity: Any benzodiazepine by any route is acceptable.**
- For patients with major symptoms, there is no limit for atropine dosing.
- Carefully evaluate patients to ensure they not from exposure to another agent (e.g., narcotics, vesicants, etc.)
- The main symptom that the atropine addresses is excessive secretions so atropine should be given until salivation improves.
- EMS personnel, public safety officers and Medical Responders / EMT-B may carry, self-administer or administer a Mark I auto-injector kit to themselves or a fellow responder per protocol.

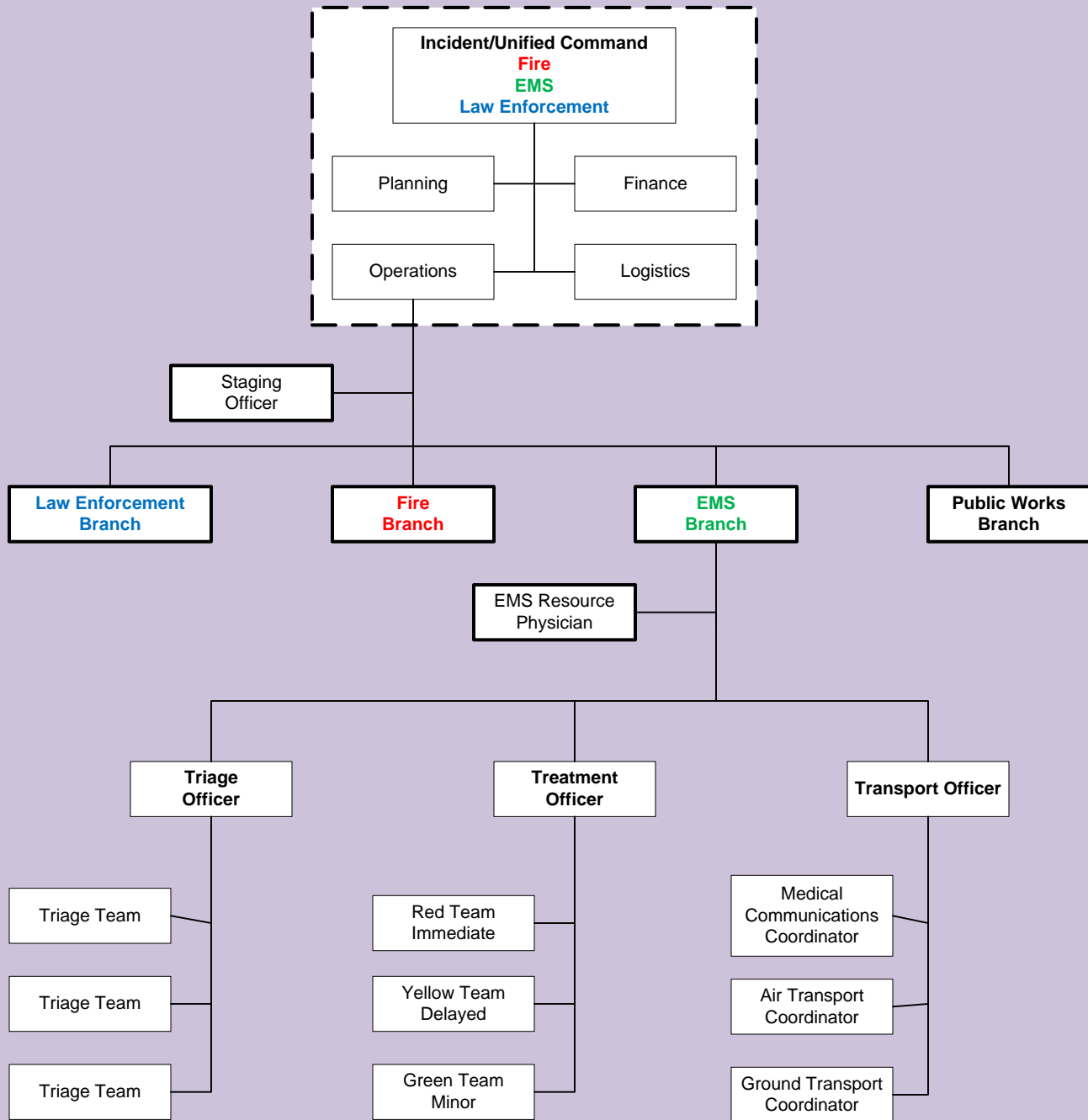
MCI – Triage

* All **infants** with signs of life who are patients in an MCI are automatically triaged as “**IMMEDIATE**” or “**red tag**”



MCI – Triage

Sample Medical Incident Command Structure



Pearls

- Follow local HAZMAT protocols for decontamination and use of personal protective equipment.
- Notify MRCC as soon as possible to activate hospital resources and to assist with distribution and tracking of patients.
- Begin triage with the patient closest to you.
- Be aware of safety hazards and request additional resources early.
- All infants with signs of life should be triaged category RED.

Special Event Rehabilitation

Injury / Illness / Complaint should be treated using appropriate treatment guideline beyond need for oral or IV hydration.

Initial Process

1. Patients logged into Event Rehabilitation Documentation
2. VS Assessed / Recorded (If HR > 110 then obtain Temp)
3. Patients assessed for signs / symptoms

Significant Complaint

Cardiac Complaint: Signs / Symptoms
Respiratory Complaint: Serious Signs / Symptoms
Respiratory Rate < 8 or > 40
Systolic Blood Pressure ≤ 90 (or $\leq 70 + 2 \times \text{Age}$)

Exit to
Appropriate
Guideline

NO

Heat
or
Cold stress

HEAT STRESS

Active Cooling Measures

Forearm immersion, cool shirts, cool mist fans etc. for 10 – 20 Minutes.
Remove all protective gear and unnecessary clothing.

COLD STRESS

Active Warming Measures

Dry patient, place in warm area
Hot packs to axilla and / or groin
Remove wet clothing

NO

Rehydration Techniques

12 – 32 oz Oral Fluid over 20 minutes
Oral Rehydration may occur along with Active Cooling Measures

Rehydration Techniques

12 – 32 oz Oral Fluid over 20 minutes
Oral Rehydration may occur along with Active Warming Measures

Reassess individual after 20 Minutes
Recheck Vital Signs

Nausea /
Vomiting?

Vomiting / Diarrhea
Guideline

NO

Temp ≥ 100.6
HR ≥ 110
SBP ≤ 90 (or $\leq 70 + 2 \times \text{Age}$)
-or-
Persistent symptoms

Extend rehabilitation
time until VS improve
Consider transport

NO

OK to discharge
Individual

VITAL SIGN CAVEATS

Blood Pressure:

Prone to inaccuracy in noisy or chaotic environments. Must be interpreted in context.

Individuals with Systolic BP ≥ 160 or Diastolic BP ≥ 100 may need extended rehabilitation. However this does not necessarily prevent them from returning to the event.

Temperature:

Individuals may have increased temperature during rehabilitation.

Special Event Rehabilitation

General Principles of event rehabilitation:

- Remove patient to a controlled environment
- Warm/Cool as appropriate
- Rest, limit physical exertion
- Encourage oral hydration

Most patients will improve significantly after 15-20 minutes.

If unable to tolerate oral hydration, vital signs are significantly abnormal, or symptoms persist after 15-20 minutes in rehab, consider transport to a hospital, IV hydration, or extend time in rehab.

Utilize warming and cooling techniques from the Hyperthermia and Hypothermia protocols.

Pearls

- This guideline should be utilized for evaluating patrons of certain special events that may or may not otherwise meet the definition of a patient.
- Ranking medical officer on-scene has full authority in deciding when individuals meet the definition of a patient and/or require further treatment or transport.
- Regarding documentation under this guideline, individuals who are evaluated only at the rehabilitation center require a narrative-based patient log entry under one PCR for all of these individuals (provided they do not receive IV therapy, cardiac monitoring, or other ALS interventions). However, if a patient receives ALS care above and beyond over-the-counter medications and/or is transported to an emergency department, the patient requires a separate run number and full PCR like any other patient.
- Those taking anti-histamines, blood pressure medication, diuretics or stimulants are at increased risk for cold and heat stress.
- Establish rehab location such that it provides shelter, privacy and freedom from smoke or other hazards.
- Event circumstances may warrant special protocols as approved by the Medical Director.

Responder Rehabilitation

This Guideline should be considered for any incident posing exertional risk or unusual danger to emergency responders. Examples would include working fires, prolonged search/rescue/recovery operations, prolonged law enforcement or EMS operations, or extreme weather conditions.

Use of this guideline is optional and should be superseded by agency-specific rehabilitation protocols. It is provided as a resource for situations where an appropriate agency-specific rehabilitation policy or guideline does not exist, or at the discretion of the Rehab Sector Commander.

Remove:

PPE
Body Armor
Chemical Suits
SCBA
Turnout Gear
Other equipment as indicated

Continue:

Heat and Cold Stress
treatment techniques
from Special Event
Rehab Guideline

**Specific Injury / Illness /
Complaint should be treated
using appropriate treatment
guideline beyond need for
oral or IV hydration.**

**Rehab Sector Commander
has full authority to
determine when responders
may return to duty.**

NFPA Age Predicted 85 % Maximum Heart Rate

20 - 25	170
26 - 30	165
31 - 35	160
36 - 40	155
41 - 45	152
46 - 50	148
51 - 55	140
55 - 60	136
61 - 65	132

Initial Process

1. Personnel logged into Responder Rehabilitation Section log
2. VS assessed and recorded
3. Pulse oximetry, respirations and SpCO (if available)
4. Personnel assessed for signs / symptoms

Rehab personnel should use
this Guideline in combination
with the Special Event
Rehabilitation Guideline



20 Minute Rest Period

(Responders should consume at least 8 ounces of fluid)

Pulse Rate > 85% NFPA
Age Predicted Maximum
-or-
SBP ≤ 90

YES

NO

Systolic BP ≥ 160
Or
Diastolic BP ≥ 100

YES

NO

Respirations < 8 or > 40

YES

NO

Pulse oximetry < 90 %
SpCO > 10 %

YES

NO

Temperature ≥ 100.6

YES

NO

**Discharge Responder from
Rehabilitation Section**

Vascular Access Guideline
Normal Saline Bolus
500 mL IV / IO
May repeat up to 2 L
Until Pulse Rate is 110 or less
And
Systolic BP is 100 or greater

Re-evaluate in
15-20 minutes.

Improvement?

Consider
transport if no
improvement.

NO

YES

Mandatory Rest Period
Encourage oral hydration

Responder Rehabilitation

Special Response Guidelines

Pearls

- **This guideline is to be utilized for public safety responders (usually firefighters) on the scene of an incident.**
- **Rehabilitation officer has full authority in deciding when responders may return to duty.**
- Utilize this guideline in conjunction with the rehab steps and guidance in the Special Event Rehabilitation Guideline.
- May be utilized with adult responders on fire, law enforcement, rescue, EMS, and training scenes.
- Responders taking anti-histamines, blood pressure medication, diuretics or stimulants are at increased risk for cold and heat stress.
- Rehabilitation Section is an integral function within the Incident Management System.
- Establish section such that it provides shelter, privacy and freedom from smoke or other hazards.

Emergencies involving Ventricular Assist Devices (LVAD)

History

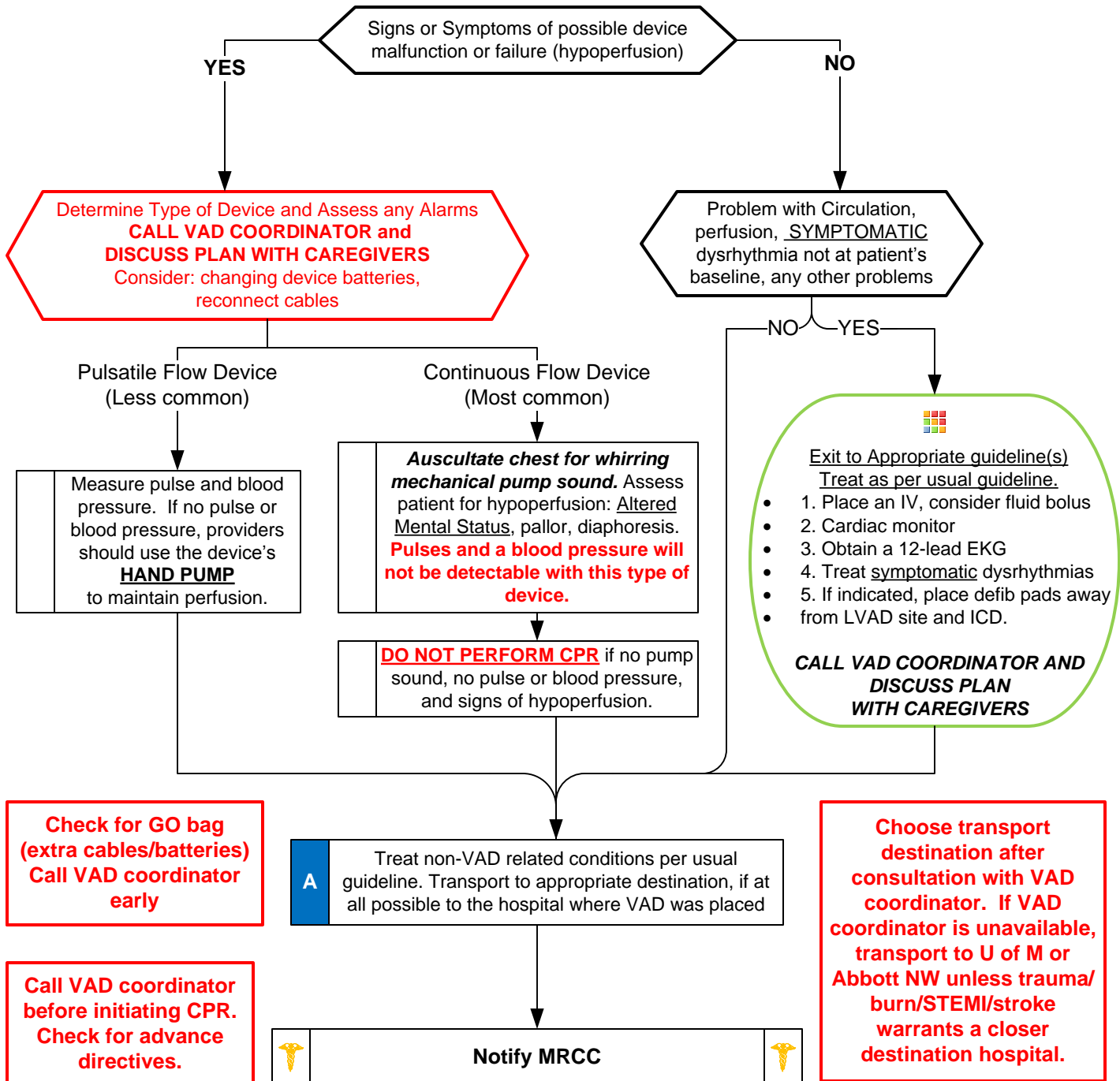
- End-Stage Heart Failure
- Patient has surgically-implanted pump that assists the action of one or both ventricles.
- Patient may or may not be on a list for cardiac transplantation

Signs and Symptoms

- The flow through many of these devices is not pulsatile, therefore THE PATIENT MAY NOT HAVE A PULSE AT BASELINE. For this reason pulse oximetry readings may also be inaccurate
- Altered Mental Status may be the only indicator of a problem
- Consider both VAD-related and non-VAD-related problems

Differential

- Stroke
- Cardiac Arrest
- Dysrhythmia different from patient's baseline
- Infection
- Bleeding (VAD patients are anticoagulated)
- Dehydration
- Cardiac Tamponade
- Device problem such as low battery or disconnected cable



Emergencies involving Ventricular Assist Devices (LVAD)



Pearls

- **ALWAYS** talk to family/caregivers as they have specific knowledge and skills. **CALL THE VAD COORDINATOR EARLY** as per patient/family instructions or as listed on the device. They are available 24/7 and should be an integral part of the treatment plan.
- **QUESTIONS TO ASK: DOES THE PATIENT HAVE A DNR?** Can the patient be cardioverted or defibrillated if needed? Can **CHEST COMPRESSIONS** be performed in case of pump failure?
- Deciding when to initiate Chest Compressions is very difficult. Consider that chest compressions may cause death by exsanguination if the device becomes dislodged. However, if the pump has stopped the heart will not be able to maintain perfusion and the patient will likely die. Ideally, plan the decision in advance with a responsive patient and the VAD coordinator. If a VAD patient is unresponsive and pulseless with a non-functioning pump and has previously indicated a desire for resuscitative efforts, begin compressions. Contact the VAD coordinator and medical control.
- Common complications in VAD patients include Stroke and TIA (incidence up to 25%), bleeding, dysrhythmia, and infection.
- The Cardiac Monitor and 12 lead EKG are not affected by the VAD and will provide important information.
- VAD patients are preload dependent. Consider that a FLUID BOLUS can often reverse hypoperfusion.
- Transport patients with ALL device equipment including any instructions, hand pumps, backup batteries, primary and secondary controllers, as well as any knowledgeable family members or caregivers.

Respiratory Distress With a Tracheostomy Tube

History

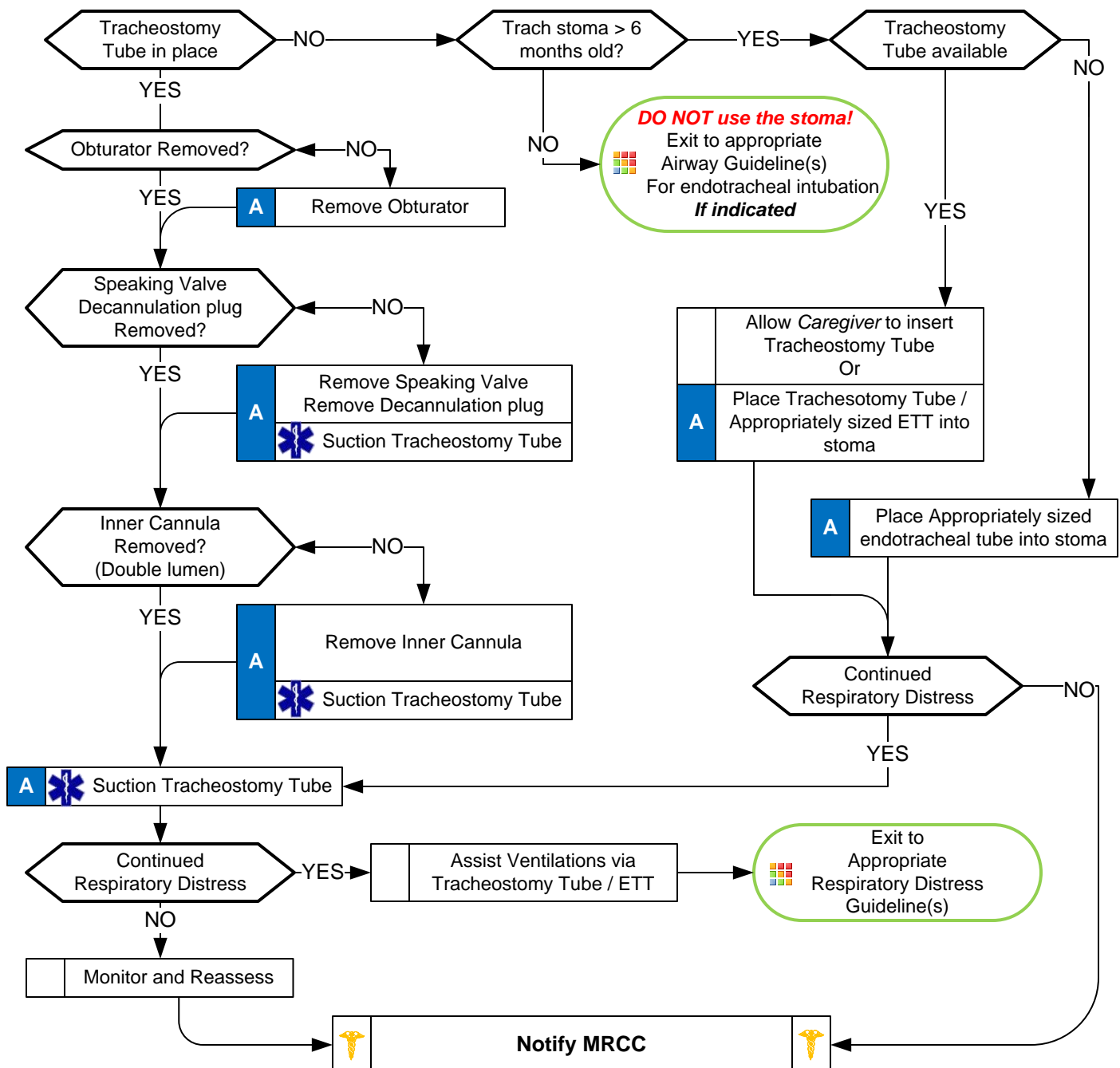
- Birth defect (tracheal atresia, tracheomalacia, craniofacial abnormalities)
- Surgical complications (accidental damage to phrenic nerve)
- Trauma (post-traumatic brain or spinal cord injury)
- Medical condition (bronchial or pulmonary dysplasia, muscular dystrophy)

Signs and Symptoms

- Nasal flaring
- Chest wall retractions (with or without abnormal breath sounds)
- Attempts to cough
- Copious secretions noted coming out of the tube
- Faint breath sounds on both sides of chest despite significant respiratory effort
- AMS
- Cyanosis

Differential

- Allergic reaction
- Asthma
- Aspiration
- Septicemia
- Foreign body
- Infection
- Congenital heart disease
- Medication or toxin
- Trauma



Respiratory Distress With a Tracheostomy Tube

Special Response Guidelines

Pearls

- Always talk to family / caregivers as they have specific knowledge and skills.
- A tracheostomy stoma that is less than 6 months old should not be manipulated. The stoma has not fully matured and there is an increased risk of creating a false passage outside of the trachea if attempts are made to replace a dislodged tube.
- Use patient's equipment if available and functioning properly.
- Estimate suction catheter size by doubling the inner tracheostomy tube diameter and rounding down.
- Suction depth: Ask family/caregiver. No more than 3 to 6 cm typically. Instill 2 – 3 mL of NS before suctioning.
- Do not suction more than 10 seconds each attempt and pre-oxygenate before and between attempts.
- DO NOT force suction catheter. If unable to pass, then tracheostomy tube should be changed.
- Always deflate tracheal tube cuff before removal. Continual pulse oximetry and EtCO₂ monitoring if available.
- **DOPE:** Displaced tracheostomy tube / ETT, **O**bststructed tracheostomy tube / ETT, **P**neumothorax and **E**quipment failure.

Emergencies Involving Ventilators

History

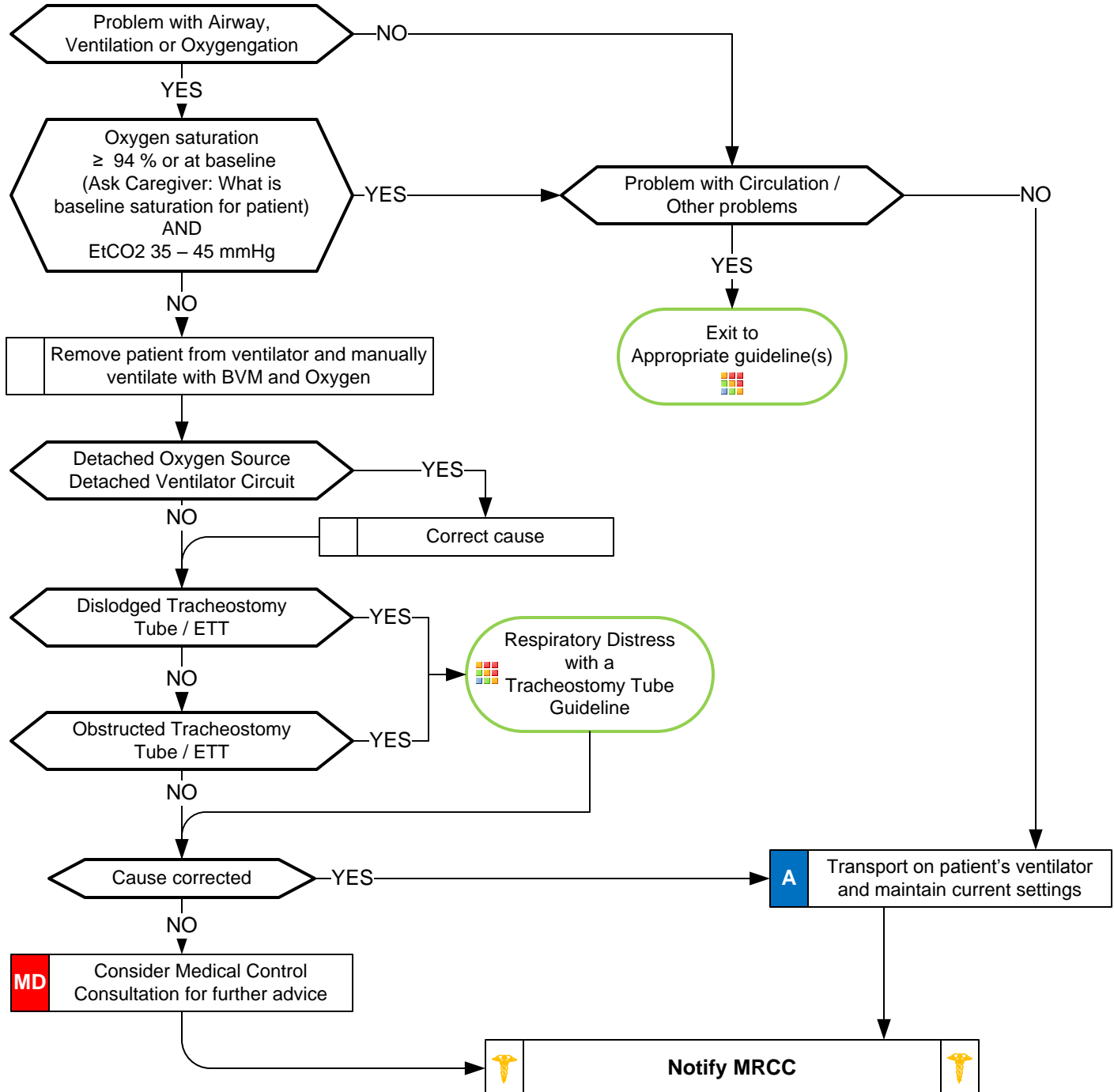
- Birth defect (tracheal atresia, tracheomalacia, craniofacial abnormalities)
- Surgical complications (damage to phrenic nerve)
- Trauma (post-traumatic brain or spinal cord injury)
- Medical condition (bronchopulmonary dysplasia, muscular dystrophy)

Signs and Symptoms

- Transport requiring maintenance of a mechanical ventilator
- Power or equipment failure at residence

Differential

- Disruption of oxygen source
- Dislodged or obstructed tracheostomy tube
- Detached or disrupted ventilator circuit
- Cardiac arrest
- Increased oxygen requirement / demand
- Ventilator failure





Emergencies Involving Ventilators

Special Response Guidelines

Pearls

- **Always talk to family / caregivers as they have specific knowledge and skills.**
- Always use patient's equipment if available and functioning properly.
- Continuous pulse oximetry and end tidal CO2 monitoring must be utilized during assessment and transport.
- **DOPE:** Displaced tracheostomy tube / ETT, **O**bststructed tracheostomy tube / ETT, **P**neumothorax and **E**quipment failure.
- Unable to correct ventilator problem: Remove patient from ventilator and manually ventilate using BVM. Take patient's ventilator to hospital even if not functioning properly.
- Typical alarms:
 - Low Pressure / Apnea: Loose or disconnected circuit, leak in circuit or around tracheostomy site.
 - Low Power: Internal battery depleted.
 - High Pressure: Plugged / obstructed airway or circuit.



Medications

Medications

Medications

Medication Name

- Adenosine
- Albuterol
- Amiodarone
- Aspirin
- Atropine
- Calcium Chloride
- Dextrose 50%
- Dextrose
- Diphenhydramine
- Dopamine
- Droperidol
- Epinephrine 1:1,000
- Epinephrine 1:10,000
- Epinephrine Auto-Injector
- Epinephrine, Racemic 2.5%
- Etomidate
- Fentanyl
- Glucagon
- Haloperidol
- Hydroxocobalamin
- Ipratropium
- Ketamine
- Lidocaine
- Lorazepam
- Magnesium sulfate
- Mark 1 Kit
- Midazolam
- Morphine
- Naloxone
- Nitroglycerine
- Ondansetron
- Oxygen
- Proparacaine
- Sodium bicarbonate
- Succinylcholine
- Tetracaine
- Vasopressin
- Vecuronium

Medications

Generic Name	Brand Name	Indication
Adenosine	Adenocard	Conversion of PSVT to normal sinus rhythm
Albuterol	Proventil; Ventolin	For relief of acute bronchospasm
Amiodarone	Coradarone	VF/VT WPW or PSVT with MD order
Aspirin	Bayer	Suspected cardiac ischemia
Atropine	N/A	Symptomatic bradycardia Organophosphate overdose
Calcium Chloride	N/A	Suspected hyperkalemia in cardiac arrest Beta blocker or calcium channel blocker OD/toxicity Hemodynamic instability following HF acid exposure
Dextrose 50%	N/A	Suspected or known hypoglycemia
Dextrose	Glucose	Suspected or known hypoglycemia
Diphenhydramine	Benadryl	Allergic reaction Anaphylaxis Agitation
Dopamine	Dopastat; Intropin	Symptomatic hypotension in the absence of hypovolemia
Droperidol	Inapsine	Agitation Nausea/vomiting
Epinephrine 1:1,000	Adrenaline	Allergic reactions/anaphylaxis
Epinephrine 1:10,000	Adrenaline	VF/VT, asystole, and PEA Severe anaphylaxis or asthma
Epinephrine Auto-Injector	EpiPen	Severe allergic reaction
Epinephrine, Racemic 2.5%	N/A	Moderate to severe croup Bronchial asthma Laryngeal edema
Etomidate	Amidate	Induction of anesthesia for RSI
Fentanyl	Sublimaze	Pain control
Glucagon	N/A	Hypoglycemia Beta blocker or calcium channel OD/toxicity
Haloperidol	Haldol	Acute psychotic disorders
Hydroxocobalamin	CyanoKit	Known or suspected cyanide poisoning
Ipratropium	Atrovent	Relief of acute bronchospasm
Ketamine	Ketalar	Induction of anesthesia for RSI Pain control Control of the aggressive excited delirium patient
Lidocaine	N/A	Anaesthesia for IO infusion
Lorazepam	Ativan	Anxiety Seizure control
Magnesium sulfate	N/A	Torsades de pointes Severe asthma Seizures associated with eclampsia Prolonged QT interval
Mark 1 Kit	N/A	Antidotes used for symptomatic exposure to nerve or organophosphate agent
Midazolam	Versed	Agitation/discomfort of external pacing and cardioversion Agitation Status seizures Anxiety Combative behavior that compromises patient care
Morphine	N/A	Pain control

Medications

<u>Generic Name</u>	<u>Brand Name</u>	<u>Indication</u>
Naloxone	Narcan	Respiratory depression from narcotic overdoses
Nitroglycerine	Nitrol	Diagnostic tool in coma of unknown origin Chest pain of suspected cardiac origin Pulmonary edema Hypertension
Ondansetron	Zofran	Nausea or vomiting
Oxygen	N/A	Increase arterial oxygen tension (SaO ₂)
Proparacaine	Ophthene	Suspected corneal abrasion or foreign body in eye
Sodium bicarbonate	N/A	Acidosis/acidemia from cardiac arrest Pre-existing metabolic acidosis or hyperkalemia Excited delirium Crush syndrome Wide QRS due to ingestion
Succinylcholine	N/A	Paralysis for RSI
Tetracaine	Pontocaine	Suspected corneal abrasion or foreign body in eye
Vasopressin	Pitressin	VF, pulseless VT, asystole, and (PEA)
Vecuronium	Norcuron	Maintenance of paralysis following RSI

MEDICATION ADMINISTRATION POLICY:

- Basic life support services carry and administer the following medications: oxygen and dextrose (oral). EMTs may assist the patient in taking certain medications as prescribed by their personal physician after consulting with Medical Control Physician.
- In addition to those listed above, basic life support services with medication training may carry and administer the following medications: albuterol, aspirin, glucagon, nitroglycerin and an epinephrine autoinjector. EMTs may not change their scope of practice until appropriate training and medical direction approval have been obtained.
- In addition to those listed in #1, advanced life support services may carry and administer the following medications: adenosine, albuterol, amiodarone, atropine, calcium chloride, 50% dextrose, diphenhydramine, dopamine, droperidol, 1:1000 epinephrine, 1:10,000 epinephrine, racemic 2.5% epinephrine, fentanyl, glucagon, haloperidol, hydroxocobalamin, ipratropium, ketamine, lidocaine 2%, lorazepam, magnesium sulfate, Mark – 1 Kits, midazolam, morphine, naloxone, nitroglycerin, ondansetron, proparacaine, sodium bicarbonate, tetracaine, and vasopressin. Oral dextrose is optional for ALS agencies and the epinephrine autoinjector may be carried.
- In addition to those listed above, agencies performing RSI may carry and administer the following additional medications: etomidate, succinylcholine, and vecuronium.
- General guidelines to be followed when giving medications:
 - Perform patient assessment.
 - Manage ABCs as indicated.
 - Establish IV of normal saline.
 - Attach monitor and obtain ECG if indicated.
 - Obtain complete set of vitals: BP, pulse, respirations, and O₂ sats.
 - Inquire about patient allergies.
 - Obtain/estimate patient weight.
 - Obtain physician order if required, and repeat the order back to the physician.
 - Check medication for correct concentration, correct dose and expiration date.
 - Administer medication.
 - If administering during cardiac arrest, circulate drugs with chest compressions.
 - Repeat assessment (e.g. lung sounds, pain scale) and vitals.
 - Notify medical control that drug has been given and any changes in patient condition.
 - Document drug, dosage, route, time, initials of person administering, SO (standing order) or VO (verbal order) and patient response.
- Use caution when administering medications to pregnant women. Consult with Medical Control Physician if there are any questions.
- In the intubated patient, albuterol and ipratropium should be administered with an adapter that permits in-line nebulization.
- ALS: Controlled substances: fentanyl, morphine, ketamine, lorazepam, and midazolam have special documentation requirements.
- ALS: Any medication that may be administered via the IV route may also be administered IO at the same dose.

Adenosine

ADENOSINE (ADENOCARD)

ACTION: Slows conduction through AV node of the heart. It is cleared very rapidly, having a half-life of less than 10 seconds.

INDICATIONS:

- Conversion of paroxysmal supraventricular tachycardia (narrow complex tachycardia) to normal sinus rhythm (NSR)
- Conversion of regular wide complex tachycardia (Ventricular tachycardia or uncertain).

CONTRAINDICATIONS:

- Heart block
- Sick sinus syndrome, atrial fibrillation or atrial flutter

PRECAUTIONS:

- Frequently followed by several seconds of asystole. Provide emotional support to the patient.

ADVERSE REACTIONS/SIDE EFFECTS: (usually very short-lived)

- Dyspnea and bronchoconstriction (especially in patients with asthma and COPD)
- Palpitations and chest pain
- Hypotension
- Facial flushing and headache
- At the time of conversion, a variety of new rhythms may appear on the ECG. Short-lasting first, second or third degree heart block or *transient* asystole may result after administration. Due to the drug's short half-life, these effects are *generally* self-limiting.
- At a dose of 12 mg, there are usually no hemodynamic side effects, i.e. hypotension.

ADMINISTRATION:

Adenosine IV/IO injection must be given rapidly. This can be facilitated by: 1) using the IV/IO med port closest to the patient, 2) following the med with a fluid flush to assure all of the drug has cleared the IV tubing, 3) using a larger bore IV catheter, and 4) elevating the arm during administration. Further orders must come from a medical control physician.

Narrow complex tachycardia

- 12 mg IV/IO bolus may be given before contacting medical control. Document effect on rhythm on ECG strip.
- If rhythm does not convert or does not slow enough to allow diagnosis, a second dose of 12 mg may be given prior to medical control contact.

PEDIATRIC CONSIDERATIONS:

- First dose is 0.1 mg/kg (max 6 mg single dose) IV/IO rapid push.
- Second dose can be given if no response (or transient response) at a dose of 0.2 mg/kg (max 12 mg single dose).

SPECIAL NOTES:

- After the administration of adenosine, a rhythm other than PSVT may be evident. This should result in the selection of a different form of treatment.

ALBUTEROL (PROVENTIL, VENTOLIN)

ACTION: Sympathomimetic bronchodilator (beta₂-adrenergic agonist)

INDICATIONS:

- For relief of acute bronchospasm (reversible airway obstruction)

CONTRAINDICATIONS:

- Allergy or known hypersensitivity to albuterol

PRECAUTIONS:

- Beta-receptor blocking agents and albuterol inhibit the effect of each other.
- Use with caution in patients with heart disease, hypertension, diabetes, the elderly and those being treated with antidepressants.

ADVERSE REACTIONS/SIDE EFFECTS:

- Hypertension and headache
- Arrhythmias and chest pain
- Nervousness and shakiness
- Rare: May produce immediate allergic reactions or paradoxical bronchospasm, which can be life threatening. Discontinue treatment immediately if this occurs.

ADMINISTRATION:

BLS with medication training

- Pour one unit dose bottle (2.5 mg = 3 ml of 0.083% solution) into nebulizer reservoir.
- Connect nebulizer to oxygen source at 6 or 8 liters per minute (depending on manufacturer).
- Have patient breathe as calmly and deeply as possible until no more mist is found in the nebulizer chamber (5 - 15 minutes). Routine nebulizer therapy should be accomplished by instructing the patient to close his/her lips tightly around the mouthpiece. An acceptable alternative to using the mouthpiece would be to attach the nebulizer reservoir to an oxygen mask, i.e. remove the bag from a non-rebreather nebulizer reservoir and do not use the T-piece or the mouthpiece.
- Continuous nebulizer treatments (with reassessment in between) may be given to all ages as indicated.
- Restart patient on oxygen at appropriate concentration if indicated.

ALS

- Same as above except that ipratropium 500 mcg is added to the first (only) neb, unless contraindicated.
- In the intubated patient, albuterol should be administered with an adapter that permits in-line nebulization.

PEDIATRIC CONSIDERATIONS:

BLS with medication training

- Continuous nebs, at adult strength, may be given on standing order.

ALS

- Continuous nebs (with Atrovent added to first neb) at adult strength, may be given on standing order.

SPECIAL NOTES:

- May begin treatment prior to IV therapy. This may decrease anxiety in the patient.
- Nebulizer treatments for a patient with active tuberculosis should be performed in well-ventilated areas (outside patient compartment if possible). Providers should use appropriate respiratory protection.
- ALS providers can provide in-line nebs during CPAP therapy as appropriate.

AMIODARONE (CORDARONE)

ACTION: Amiodarone is considered a “broad spectrum” antiarrhythmic medication. It has multiple and complex effects on the electrical activity of the heart such as: 1) A delay in the rate at which the heart repolarizes. 2) A prolongation in the action potential of the heart. 3) A slowing of the speed of electrical conduction. 4) A reduction in the SA nodal firing rate. 5) A slowing of conduction through accessory pathways. In addition to being an antiarrhythmic, Amiodarone also causes blood vessels to dilate. This effect can result in a drop in blood pressure.

INDICATIONS:

- Ventricular tachycardias (with and without a pulse)
- Ventricular fibrillation (VF)
- As prophylaxis following successful conversion of VF or VT or ICD firing
- WPW and PSVT with physician order

CONTRAINDICATIONS:

- Allergy or known hypersensitivity to Amiodarone or its components including iodine
- Patients in cardiogenic shock
- Sinus bradycardia and second or third degree AV block (be ready to pace patient if severe bradycardia occurs)

PRECAUTIONS:

- As with all antiarrhythmics, Amiodarone may cause a worsening of existing arrhythmias or precipitate a new arrhythmia.
- May produce vasodilation and hypotension.
- May have negative inotropic effects
- Watch for prolongation of QT interval
- ½ life is extremely long (up to 40-60 days)
- Use with caution if renal failure is present due to extremely long ½ life.
- May interact with beta-blockers such as atenolol, propranolol, metoprolol, or certain calcium-channel blockers such as verapamil or diltiazem, resulting in excessively slow heart rates.

ADVERSE REACTIONS/SIDE EFFECTS:

- Hypotension, bradycardia, and arrhythmias
- Prolonged QT interval
- Cardiac arrest

ADMINISTRATION:

Patient must be on ECG monitor and Vital signs should be monitored at least every 5 minutes.

VF/ Pulseless VT

- Administer 300 mg IV/IO push, repeat 150 mg IV/IO push after 2 rounds of CPR (total dose of 450 mg). Further orders must come from Medical Control Physician.

Wide QRS Complex Rhythms (usually VT with a pulse)

- Administer 150 mg IV/IO slowly (over 10 minutes). Dilute into 100cc NS, or dilute with NS in large syringe (60 mL) and administer through most distal port. Further orders must come from Medical Control Physician.

PEDIATRIC CONSIDERATIONS:

As an antiarrhythmic in Pediatrics

- Do not use in neonates!
- Contact Medical Control Physician for possible initial bolus of 5 mg/kg IV/IO over 20-60 minutes.

VF/Pulseless VT

- 5mg/kg IV/IO push

SPECIAL NOTES:

1. Draw up slowly, Amiodarone will foam and you will not be able to use it. Flush line with saline after use

Aspirin

ASPIRIN (BAYER)

ACTION: Analgesic; anticoagulant that slows the blood clotting mechanism in the body, and may help to reduce the damage caused by an acute myocardial infarction

INDICATIONS:

- Suspected cardiac ischemia
- Pain control for mild pain symptoms

CONTRAINDICATIONS:

- Allergy to aspirin or other non-steroidal anti-inflammatory agents (includes many non-aspirin/non-Tylenol pain relievers such as Advil and Alleve)
- Active GI bleeding
- Aortic dissection

PRECAUTIONS:

- Recent internal bleeding (within last 3 months)
- Known bleeding diseases
- Recent surgery
- Possibility of pregnancy
- Allergies to ANY pain medication
- Patients with a history of asthma may take if they have tolerated ASA in the past and are not currently having asthma-related symptoms.

ADVERSE REACTIONS/SIDE EFFECTS:

- Bleeding

ADMINISTRATION:

When used for pain control, aspirin does not need to be chewed.

BLS

- An EMT may assist the patient in taking aspirin as directed by the patient's personal physician.

BLS with medication training or ALS

- Have the patient chew 324 mg (generally one adult or four children's) aspirin.
- The patient may drink a small amount of liquid after chewing the tablets, if desired.
- Further orders must come from a medical control physician.

PEDIATRIC CONSIDERATIONS:

- Do not give to patients < 12 years without physician order.

SPECIAL NOTES:

- It is unnecessary to administer aspirin to a patient that has taken it within the last 12 hours. If unsure, it is preferable to administer aspirin as above.
- Being on current anticoagulant therapy (e.g. Coumadin) is not necessarily a reason to withhold aspirin. Consult with Medical Control Physician if there are questions.

Atropine

ATROPINE

ACTIONS: Antiarrhythmic, anticholinergic-antimuscarinic; blocks action of acetylcholine in parasympathetic nervous system

INDICATIONS:

- For symptomatic bradyarrhythmias (< 50/minute), either supraventricular or ventricular in origin
- In RSI to pre-treat for prevention of bradycardia in children
- AV block with narrow QRS complex
- Organophosphate poisoning
- Bradycardia due to beta-blocker and/or calcium channel blocker overdose/toxicity

CONTRAINDICATIONS:

- Acute hemorrhage

PRECAUTIONS:

- Should be given rapidly to avoid paradoxical effect.

ADVERSE REACTIONS/SIDE EFFECTS:

- Supraventricular or ventricular tachycardia, ventricular fibrillation
- Blurred vision, dry eyes, dilated pupils

ADMINISTRATION:

For perfusing symptomatic bradycardia

- Administer atropine 0.5 mg IV/IO push every 5 minutes as needed to a total dose of 3 mg.
- May be repeated once (total dose 1.0 mg) if first dose is not effective after five minutes.

Organophosphate poisoning or nerve agent exposure with respiratory symptoms

- Administer atropine 2 mg IV/IO push every 5-10 minutes until respiratory distress and airway secretions resolve
- Contact Medical Control Physician for further orders. Doses may be considerably larger than standard dosing.

PEDIATRIC CONSIDERATIONS:

For symptomatic bradycardia (including beta-blocker and/or calcium channel blocker OD)

- Administer 0.02 mg/kg IV/IO
- For premedication in RSI (Newborn - 7 years)

- Administer 0.02 mg/kg IV/IO push
- Minimum dose is 0.1 mg and maximum dose of 0.5 mg.

For organophosphate poisoning or nerve agent exposure with respiratory symptoms

- Administer 0.05 mg/kg IV/IO push every 5-10 minutes until respiratory distress and airway secretions resolve

SPECIAL NOTES:

- Atropine is not indicated in the ACLS algorithm for pulseless (asystole/PEA) adult or pediatric patients.
- Second degree and complete heart block are generally unresponsive to atropine. In these situations, external pacing is the treatment of choice.

Calcium Chloride

CALCIUM CHLORIDE

ACTION: Electrolyte modifier; essential for the transmission of nerve impulses in cardiac muscle contraction

INDICATIONS:

- Symptomatic hyperkalemia
- Hypocalcemia, especially from acute causes such as hydrofluoric acid or fluorine gas exposure
- Calcium channel blocker overdose or toxicity; including: verapamil (Calan, Isoptin), diltiazem (Cardizem), nifedipine (Procardia, Adalat), nicardipine (Cardene, Vasonase), nimodipine (Nimotop), amlodipine, felodipine, flunarizine, bepridil, isradipine, nisoldapine, nitrendapine
- Respiratory depression following administration of magnesium sulfate

CONTRAINDICATIONS:

- Not to be used routinely during resuscitation unless hyperkalemia, hypocalcemia, or calcium channel blocker toxicity is suspected.

PRECAUTIONS:

- Rapid administration of calcium in a beating heart may produce slowing of the cardiac rate.
- Patients taking digitalis may have increased ventricular irritability and calcium may produce digitalis toxicity.
- In the presence of sodium bicarbonate, it will precipitate calcium salts or carbonates.

ADVERSE REACTIONS/SIDE EFFECTS:

- Syncope
- Arrhythmias, bradycardia, and cardiac arrest
- Tissue necrosis at injection site

ADMINISTRATION:

- Dosage in adults: 1,000 mg (1 g) of 10% solution (1.0 ml = 100 mg).
- Administer as a slow push over 2-5 minutes in a critical situation.

PEDIATRIC CONSIDERATIONS:

- Initial dose is 0.2 ml/kg (20 mg/kg) *slowly* IV or IO. Repeat doses for pediatric patients are not recommended.

SPECIAL NOTES:

- If infiltration occurs, notify physician at receiving hospital immediately upon arrival so that antidotal therapy can begin immediately.



Dextrose 50%

DEXTROSE 50% IN WATER (D₅₀W)

ACTION: Hyperglycemic; increases circulating blood sugar levels

INDICATIONS:

- Suspected or known hypoglycemia (BS < 80 mg/dL)

CONTRAINDICATIONS:

- Intracranial hemorrhage

PRECAUTIONS:

- May cause CNS symptoms in the alcoholic patient.
- Should not be used as a diagnostic agent in the patient with altered LOC unless the BS is known to be < 80 mg/dL or, if the BS cannot be determined and patient is known to be diabetic.
- If CVA or head trauma is suspected as the cause of altered mental status, contact medical control physician prior to administration.

ADVERSE REACTIONS/SIDE EFFECTS:

- May aggravate HTN and CHF
- May cause tissue necrosis at injection site if infiltration occurs

ADMINISTRATION:

Repeat blood sugar measurement 5-10 minutes after administration.

Blood sugar between 40 and 80mg/dL in a conscious, alert patient

- Administer 1 amp 50% dextrose orally or ½ amp IV/IO and recheck a blood sugar. Administer remaining amp if no change.

Blood sugar < 40 mg/dL with or without altered LOC

- Establish IV/IO of NS TKO in large vein.
- Administer 1 amp D₅₀W IV/IO x 1.

PEDIATRIC CONSIDERATIONS:

For neonates between birth and 29 days old

- 0.5 g/kg (5 mL/kg) IV/IO of 10% dextrose in water (D₁₀W). **D₅₀W must be diluted 1:4 with NS to achieve D₁₀W.**

For infants between 1 month and 2 years old

- 1.0 g/kg (4 mL/kg) IV/IO of 25% dextrose in water (D₂₅W). **D₅₀W must be diluted 1:1 with NS to achieve D₂₅W.**

SPECIAL NOTES:

- All patients whose hypoglycemia is due to oral hypoglycemic agents should be transported. Medical Control Physician consult required before patient can refuse transport.
- If infiltration occurs, notify physician at receiving hospital immediately upon arrival so that antidotal therapy can begin immediately.

ALS services

- In patients with BGL < 40 mg/dL, IV/IO dextrose and/or glucagon are considered first/second line treatments over oral agents.

ORAL DEXTROSE, GLUCOSE (GLUTOSE)

ACTION: Hyperglycemic; increases circulating blood sugar levels

INDICATIONS:

- Suspected or known hypoglycemia (BS < 80 mg/dL)

CONTRAINDICATIONS:

- Intracranial hemorrhage

PRECAUTIONS:

- Airway must be carefully maintained.
- Should not be used as a diagnostic agent in the patient with altered LOC unless the BS is known to be < 80 mg/dL or, if the BS cannot be determined and patient is known to be diabetic.

ADMINISTRATION

- Logroll patient to prevent aspiration and place in the recovery position.
- Check blood sugar.
- Administer 1 tube (Approximately 25 - 31 gm per tube) in downside cheek of log-rolled patient.
- Administer slowly, monitoring absorption. Maintain adequate airway.
- Repeat BS measurement.
- Further orders must come from a medical control physician.

PEDIATRIC CONSIDERATIONS:

- The initial dosage is one half of the adult dose.

SPECIAL NOTES:

- All patients whose hypoglycemia is due to oral hypoglycemic agents should be transported. Medical Control Physician consult required before patient can refuse transport.

BLS with medication training

- In patients with decreased level of consciousness from hypoglycemia, glucagon is considered first-line treatment.

ALS

- In patients with BS < 40 mg/dL, IV/IO dextrose and/or glucagon are considered first/second line treatment over oral agents.

Diphenhydramine

DIPHENHYDRAMINE (BENADRYL)

ACTION: Antihistamine (H₁ receptor antagonist); blocks the effects of histamine

INDICATIONS:

- In anaphylaxis as an adjunct to epinephrine
- In allergic reactions
- Combative/aggressive patients
- Extrapyramidal (Parkinsonian-like, thick tongue, neck distorsion) symptoms

CONTRAINDICATIONS:

- Allergy or known hypersensitivity to diphenhydramine HCL
- Acute asthma attacks
- Newborn or premature infants

PRECAUTIONS:

- Benadryl has an atropine-like action, therefore use with caution in patients with bronchial asthma, hyperthyroidism, cardiovascular disease, hypertension, and COPD.

ADVERSE REACTIONS/SIDE EFFECTS:

- Drowsiness and sedation
- Dizziness and headache
- Blurred vision
- Palpitations and chest tightness
- Wheezing and thickening of bronchial secretions
- Hypotension
- Hallucinations, paradoxical excitement and convulsions (especially in children)

ADMINISTRATION:

- Administer Benadryl 25 mg IV/IO or 50 mg deep IM.

PEDIATRIC CONSIDERATIONS:

- Initial dose is 1.0 mg/kg slow IV/IO or deep IM.

SPECIAL NOTES:

- Benadryl in the injectable form has a rapid onset of action.
- IV route is preferred. Deep IM route can be used if unable to establish an IV.

Dopamine

DOPAMINE (DOPASTAT, INTROPIN)

ACTION: Chemical precursor of norepinephrine that stimulates dopaminergic, α_1 -adrenergic, and β -adrenergic receptors in a dose-related fashion; inotropic, vasopressor; increases BP and cardiac output, and improves blood flow through the kidneys

INDICATIONS:

- Symptomatic hypotension in the absence of hypovolemia

CONTRAINDICATIONS:

- Hypotension due to hypovolemia

ADVERSE REACTIONS/SIDE EFFECTS:

- Arrhythmias (supraventricular or ventricular tachycardia), palpitations and chest pain
- Dyspnea
- Hypotension
- Dilated pupils
- Tissue necrosis at IV site

ADMINISTRATION:

- Comes prepared 400 mg dopamine in 250 ml D₅W bags (1600 mcg/ml). May infuse 2-20 micrograms/kg/min titrated to satisfactory hemodynamic performance prior to medical control contact.
- When administering a dopamine infusion, 60 gtt tubing should be used.

For 400 mg dopamine hydrochloride in 250 ml D₅W bags (1600 mcg/ml) using 60 gtt tubing set

Weight	5 mcg/kg/min	10 mcg/kg/min	15 mcg/kg/min	20 mcg/kg/min
50 kg or 110 lb	9 gtts/min	18 gtts/min	28 gtts/min	38 gtts/min
60 kg or 132 lb	11 gtts/min	22 gtts/min	34 gtts/min	45 gtts/min
70 kg or 154 lb	13 gtts/min	26 gtts/min	39 gtts/min	53 gtts/min
80 kg or 176 lb	15 gtts/min	30 gtts/min	45 gtts/min	60 gtts/min
90 kg or 198 lb	18 gtts/min	34 gtts/min	51 gtts/min	68 gtts/min
100 kg or 220 lb	19 gtts/min	37 gtts/min	56 gtts/min	75 gtts/min
110 kg or 242 lb	21 gtts/min	41 gtts/min	62 gtts/min	83 gtts/min
120 kg or 242 lb	23 gtts/min	45 gtts/min	68 gtts/min	90 gtts/min

Small adult

Medium adult

Large adult

Manual drip rate calculation

- Dose (mg/hr) = [(desired mcg x kg) / 1000] X 60** (Desired mcg = 2-10 per standing order as described above)
- Volume (mL/hr) = (dose x 250 mL) / 400 mg** (Dose is mg/hr from previous calculation)
- Drip rate (gtt/min) is the same as volume (mL/hr) if 60 gtt tubing set is used.
- If a different tubing set is used, multiple the volume (mL/hr) value by the tubing set drip factor and divide by 60 to get drips per minute.

PEDIATRIC CONSIDERATIONS:

- May infuse 2-10 micrograms/kg/min titrated to satisfactory hemodynamic performance prior to medical control contact.

SPECIAL NOTES:

- If infiltration occurs, discontinue medication and notify physician at receiving hospital immediately upon arrival so that antidotal therapy can begin immediately.

DROPERIDOL (INAPSINE)

ACTION: Droperidol is a butyrophenone derivative closely related to haloperidol. Droperidol produces a dopaminergic blockage, a mild alpha-adrenergic blockage, and causes peripheral vasodilation. Its major actions are sedation, tranquilization, and a potent anti-emetic effect. Onset of action is 3-10 after IM or IV administration with peak effect in 30 minutes. Duration of the sedative effect is 2-4 hours.

INDICATIONS:

- To provide sedation in agitated or combative patients.
- Intractable vomiting not responding to ondansetron.

CONTRAINDICATIONS:

- Suspected acute coronary syndrome
- SBP < 100 mm/Hg
- Signs of sedation or respiratory depression
- Known kidney or liver dysfunction
- Known Parkinson's Disease
- Known prolonged QT interval

PRECAUTIONS:

- Due to the vasodilation effect, droperidol can cause a transient hypotension and/or tachycardia which usually does not require pharmacologic intervention.
- Some patients may experience dysphoria manifested as restlessness, hyperactivity, or anxiety following droperidol administration. Diphenhydramine 25 mg may be administered to alleviate these side effects.
- Rare instances of neuroleptic malignant syndrome (very high fever, muscular rigidity) have been known to occur after the use of Droperidol.

ADMINISTRATION:

- Initiate continuous cardiac monitoring as soon as possible.

For sedation of the agitated or combative patient

- Administer 2.5 mg slow IV/IO push or 5 mg IM

For nausea and/or vomiting

- Administer 1.25 mg slow IV/IO push or 2.5 mg IM.

PEDIATRIC CONSIDERATIONS:

- Droperidol should not be given to pediatric patients without a Medical Control Physician order.
- Zofran and IV fluids are the treatment of choice for nausea and vomiting.

SPECIAL CONSIDERATIONS:

- Droperidol administration has been associated with QT prolongation and the potential for ventricular arrhythmias including torsades de pointes.
- Although extra-pyramidal reactions have an incidence less than 1% and usually present after the pre-hospital phase, be prepared to administer 25-50 mg diphenhydramine IV/IO/IM.
- The elderly patient over 65 will respond more readily to droperidol and a reduced dose should be considered.
- Zofran and IV fluids are the preferred treatment for nausea and vomiting in children 12 and under.

Epinephrine 1:1,000

EPINEPHRINE 1:1,000 (ADRENALINE)

ACTION: Stimulates both α and β receptors; bronchodilator, cardiac stimulator, and peripheral vasoconstrictor

INDICATIONS:

- Allergic reaction from stings, and ingested, inhaled, injected, or absorbed allergens resulting in the following: increased heart rate, decreased BP, respiratory distress, hives, facial or airway swelling.
- Anaphylaxis with evidence of difficulty communicating, muscle retraction, nasal flaring, and/or swelling of tongue or throat.
- Asthma, as a second line treatment after nebulization

CONTRAINDICATIONS:

- None during cardiac arrest; otherwise tachyarrhythmias
- Do not administer IV bolus.

PRECAUTIONS:

- Do not use in patients > 50 years of age without physician order.

ADVERSE REACTIONS/SIDE EFFECTS:

- Nervousness, restlessness, and tremors
- Headache and HTN
- Arrhythmias and angina

ADMINISTRATION:

- Obtain MD order before administering epinephrine in patients > 50 years of age unless an imminent life-threat is present.

For severe or life-threatening reactions (anaphylactic shock or impending respiratory or cardiac arrest)

- Administer 0.3 mg (0.3 mL) of epinephrine 1:1,000 IM.
- Follow with Benadryl 25 mg IV or 50 mg IM prior to Medical Control Physician contact.

For acute asthma attacks, if albuterol neb(s) have been unsuccessful

- 0.3 mg (0.3 mL) of epinephrine 1:1,000 IM may be given to patients (ages 12 - 50 years) prior to medical control contact.

For refractory symptoms (anaphylaxis, severe shock, severe asthma) with concern for imminent respiratory or cardiac arrest

- An epinephrine drip should only be established on physician order.
- To mix a drip, add 1 mg of epinephrine 1:1,000 to 1,000 mL of NS (1 mcg/mL). The initial dose for adults is 1 mcg/min titrated to desired hemodynamic response (2 - 10 mcg/min). This can be infused IV or IO.

Infusion rate gtts/min (w/ 60 gtt tubing)

1 mcg/min 60 gtts/min

If other tubing sets are used, multiply the gtts/min value above by the tubing set drip factor and divide by 60.

For smaller volume saline carriers, multiply the gtts/min value above by the saline carrier volume in liters.

PEDIATRIC CONSIDERATIONS:

For severe reactions (see above for definition)

- May administer 0.01 mg/kg (ml/kg) IM prior to physician contact.

For acute asthma attacks with unsuccessful neb treatment

- Administer 0.01 mg/kg IM prior to physician contact.

Epinephrine infusions

- Mix 0.6 mg X weight (in kg) in 1,000 mL NS and initiate infusion at 0.1 mcg/kg/min (10 gtts/min or 1 gtt every 6 seconds)
- For smaller volume saline carriers, multiply epinephrine dose (0.6 mg X weight) by saline carrier volume (in liters) to determine dose of epinephrine to mix. Initiate infusion as above.

SPECIAL NOTES:

- IM is the initial route of choice for anaphylactic shock and should be administered in the 1:1,000 concentration.
- Epinephrine 1:1,000 concentration should never be given intravenously



Epinephrine 1:10,000

EPINEPHRINE 1:10,000 (GENERIC), ADRENALINE (BRAND)

ACTION: Stimulates both α and β adrenergic receptors; bronchodilator, cardiac stimulator, and peripheral vasoconstrictor

INDICATIONS:

- Cardiac arrest rhythms: VF, pulseless VT, asystole, and pulseless electrical activity (PEA)
- Severe anaphylaxis or asthma

CONTRAINDICATIONS:

- None during cardiac arrest or profound anaphylaxis

PRECAUTIONS:

- In severe anaphylaxis, may only be given IV/IO on standing order.
- May precipitate with sodium bicarbonate if tubing is not flushed between drugs.

ADVERSE REACTIONS/SIDE EFFECTS:

- Nervousness, restlessness, and tremors
- Headache and HTN
- Arrhythmias and angina
- May induce or exacerbate ventricular ectopy, especially in patients receiving digitalis

ADMINISTRATION:

Adult cardiac arrest (V-fib, V-tach, asystole, PEA)

- Administer 1 mg IV/IO push and circulate with CPR.
- Follow drug administration with defibrillation if indicated.
- May repeat 1.0 mg IV/IO every 5 CPR cycles (10 minutes) if rhythm has not converted.

Severe anaphylaxis

- If impending respiratory or cardiac arrest, administer 0.1 (1 cc) IV/IO, repeat per Medical Control Physician orders.

For refractory symptoms (anaphylaxis, severe shock, severe asthma) with concern for imminent respiratory or cardiac arrest

- An epinephrine drip should only be established on physician order.
- To mix a drip, add 1 mg of epinephrine 1:10,000 to 1,000 mL of NS (1 mcg/mL). The initial dose for adults is 1 mcg/min titrated to desired hemodynamic response (2 - 10 mcg/min). This can be infused IV or IO.

<u>Infusion rate</u>	<u>gtts/min (w/ 60 gtt tubing)</u>
1 mcg/min	60 gtts/min

If other tubing sets are used, multiply the gtts/min value above by the tubing set drip factor and divide by 60.
For smaller volume saline carriers, multiply the gtts/min value above by the saline carrier volume in liters.

PEDIATRIC CONSIDERATIONS:

In cardiac arrest

- Refer to the weight based resuscitation tape and administer one dose of 0.01 mg/kg IV/IO push every 5 CPR cycles (10 minutes)

Severe anaphylaxis

- Contact Medical Control after IM epinephrine for orders to initiate infusion if indicated

Epinephrine infusions

- Mix 0.6 mg X weight (in kg) in 1,000 mL NS and initiate infusion at 0.1 mcg/kg/min (10 gtts/min or 1 gtt every 6 seconds)
- For smaller volume saline carriers, multiply epinephrine dose (0.6 mg X weight) by saline carrier volume (in liters) to determine dose of epinephrine to mix. Initiate infusion as above.

SPECIAL NOTES:

- Epinephrine infusions should only be initiated after contact with a Medical Control Physician.
- 1:10,000 is the only epinephrine concentration appropriate for intravascular administration.

Epinephrine Autoinjector

EPINEPHRINE: PREMEASURED INJECTION DEVICE (EpiPen)

ACTION: Stimulates both α and β receptors; bronchodilator, cardiac stimulator, and peripheral vasoconstrictor

INDICATIONS:

- Patients experiencing a severe allergic reaction from stings or other allergens (anaphylactic shock or impending respiratory or cardiac arrest)

PRECAUTIONS:

- Patients who have known allergic reactions to insect bites or other allergens will often have epinephrine prescribed in the form of an EpiPen (or other similar device) that delivers an injection of pre-measured epinephrine.
- **Use with caution in patients > 40 years.**
- At the time when a request to deliver or assist a patient with their epinephrine is made, any suspected complicating conditions, such as the following, should be reported: Heart disease, Age > 40 years, Pulmonary edema, Psychosis, COPD, Hyperthyroidism, Hypertension history, Glaucoma, Pregnancy

CONTRAINDICATIONS:

- There are no absolute contraindications to the use of epinephrine in a life-threatening situation.

ADMINISTRATION:

- In severe anaphylaxis, EMTs may assist a patient in administering their own prescribed EpiPen. BLS services with medication training may administer an EpiPen carried by that service to a patient in severe anaphylaxis. BLS providers should consult with the Medical Control Physician for orders in patients with non-severe anaphylaxis. Paramedics can administer as they would epi 1:1,000 solution.
- If possible, immediately remove insect stinger, but do not squeeze, pinch, or push it deeper into the skin.

EpiPen administration

- Pull off safety cap.
- Wipe injection site with alcohol.
- Place tip of EpiPen on exposed thigh (anterior/lateral) at right angle to the leg. Apply in this area regardless of what area of the body has been stung.
- Press hard into thigh until autoinjector mechanism triggers, and hold in place for several seconds. Remove the EpiPen and discard into sharps container.
- Massage injection site for 10 seconds to enhance absorption.
- With persistent severe anaphylaxis, additional injections may be necessary. Consult with Medical Control Physician if a second dose is indicated.

Document any changes in patient condition.

PEDIATRIC CONSIDERATIONS:

- In severe anaphylaxis, EMTs may assist a patient in administering their own prescribed EpiPen.
- BLS services with medication training should contact medical control prior to administering an EpiPen carried by that service to a pediatric patient in severe anaphylaxis.
- The EpiPen comes in two available dosing options: EpiPen delivers 0.3 mg (in 0.3 cc) of 1:1,000 epinephrine IM. EpiPen Jr. delivers 0.15 mg (in 0.3 cc) of 1:2,000 epinephrine IM and is intended for use in patients < 60 lbs.

Epinephrine Racemic 2.25%

EPINEPHRINE RACEMIC 2.25%

ACTION: Stimulates both α - and β - adrenergic receptors; bronchodilator, and helps relieve the subglottic edema with laryngotracheobronchitis (Croup). Racemic Epinephrine causes local effects on the upper airway as well as systemic effects from absorption.

INDICATIONS:

- Moderate to severe laryngotracheobronchitis (croup)
- Bronchial asthma
- Laryngeal edema

CONTRAINDICATIONS:

- Hypertension
- Significant underlying cardiovascular disease

PRECAUTIONS:

- Mask and noise may be frightening to small children. Agitation will aggravate symptoms.
- Monitor vital signs, ECG, and lung sounds every 5 minutes
- Given only by inhalation
- Should only be used once prehospital.
- Excessive use may cause bronchospasms
- May develop "rebound worsening" within 30-60 minutes

ADVERSE REACTIONS/SIDE EFFECTS:

- Nervousness, restlessness, and tremors
- Headache
- Tremors
- Tachycardia
- Dysrhythmias, palpitations and angina
- Nausea/vomiting

ADMINISTRATION:

- Add 0.5 ml of racemic epinephrine in 2 ml of saline placed into nebulizer reservoir.
- Connect nebulizer to oxygen source at 6 or 8 liters per minute (depending on manufacturer).
- Have patient breathe as calmly and deeply as possible until no more mist is found in the nebulizer chamber (5 - 15 minutes). Routine nebulizer therapy should be accomplished by instructing the patient to close his/her lips tightly around the mouthpiece. An acceptable alternative to using the mouthpiece would be to attach the nebulizer reservoir to an oxygen mask, i.e. remove the bag from a non-rebreather nebulizer reservoir and do not use the T-piece or the mouthpiece.
- Restart patient on oxygen at appropriate concentration.

SPECIAL NOTES:

- Effects can last from 90-120 minutes.
- Nebulizer treatment may cause blanching of the skin in the mask area due to local epinephrine absorption.
- If respiratory arrest occurs, it is most likely due to fatigue, not obstruction.
- Patient must be transported after receiving Racemic Epinephrine.
- Racemic epinephrine is heat and light sensitive and should be stored in a dark cool place. Do not use if it becomes discolored.

Etomidate

ETOMIDATE (AMIDATE)

ACTION: Nonbarbiturate hypnotic and general anesthetic without analgesic activity; has a minimal effect on myocardial activity, BP and respirations; onset: 30 – 60 seconds; duration: 3 – 5 min.

INDICATIONS:

- For general anesthesia in conjunction with pharmacological paralysis in rapid sequence induction (RSI) in patients who have a systolic BP > 80.
- For premedication secondary to cardioversion, as an option for RSI medics.

CONTRAINDICATIONS:

- Hypersensitivity
- Systolic BP < 80 (adults)
- Labor and delivery

PRECAUTIONS:

- Make sure all RSI medications and airway equipment are prepared prior to induction.

ADVERSE REACTIONS/SIDE EFFECTS:

- Hypotension
- Transient pain at IV site
- Transient clonic jerking of skeletal muscle
- Nausea and/or vomiting
- Hiccoughs
- Laryngospasm
- Transient adrenal suppression (seen mostly with repeat dosing)
- Allergic reactions (rare)

ADMINISTRATION:

RSI

- May be administered prior to medical control contact. Administer 0.3 mg/kg IV/IO over ½ to 1 minute.
- Approved simplified adult dosing: Small (20 mg), Medium (25 mg), and Large (30 mg)

Cardioversion (RSI only)

- Administer Etomidate 0.1 mg/kg IV/IO over ½ to 1 minute.
- Maintain patent airway, and assist respirations as necessary with bag-mask and O2.

PEDIATRIC CONSIDERATIONS:

- May be administered prior to medical control contact. Administer 0.3 mg/kg IV/IO.

FENTANYL (SUBLIMAZE)

ACTION: Binds with opiate receptors in the CNS altering the perception of and emotional response to pain.

INDICATIONS:

- Musculoskeletal pain
- Burns
- Chest pain
- Sedation of intubated patients

CONTRAINDICATIONS:

- Allergy or known hypersensitivity to Fentanyl
- Hypotension (SBP < 90 in adults, or 70 + (2 X age) in pediatrics)

PRECAUTIONS:

- Use with caution in asthma, COPD, hepatic or renal disease and bradyarrhythmias.
- Because this drug can decrease respirations, be prepared to assist ventilations and to administer the narcotic antagonist Naloxone (Narcan).
- May cause skeletal and/or thoracic muscle rigidity if given rapidly.

ADVERSE REACTIONS/SIDE EFFECTS:

- Respiratory depression, apnea, sedation, and confusion
- Bradycardia
- Seizures may occur
- Hypertension or hypotension
- Dry eyes, blurred vision, and vomiting

ADMINISTRATION:

Pain Control

- Initial dose: 1 mcg/kg (max single dose 100 mcg) may be administered IV, IO, IM, or IN
- Approved simplified dosing: Small (50 mcg), Medium (75 mcg), and Large (100 mcg)
- May repeat ½ of initial dose every 10 minutes if pain remains uncontrolled, for a total of 3 doses
- Further orders must come from a Medical Control Physician

Sedation

- Same as above, except not necessary to obtain Medical Control Physician authorization for repeat dosing beyond 3 doses

SPECIAL NOTES:

- Vital signs must be checked before and after dose.
- If respiratory depression or hypotension occurs after using, ventilate the patient and administer 2 mg of naloxone (Narcan) IV/IO push.
- MRCC must be notified when Fentanyl is given, and authorizing physician name must be documented on run form.
- Fentanyl is a controlled substance and its use must be documented according to the "Controlled Substance" policy.
- The maximum fluid volume for IN delivery is 1 cc per nostril.

PEDIATRIC CONSIDERATIONS:

- Intranasal fentanyl is an excellent method of controlling acute musculoskeletal pain in pediatric patients who otherwise do not need vascular access.

Glucagon

GLUCAGON

ACTION: Antihypoglycemic; converts stored liver glycogen to glucose, resulting in circulating blood sugar

INDICATIONS:

- Suspected or known hypoglycemia (BS < 80 mg/dL) in diabetic patients, if symptomatic and IV cannot be established.
- Beta blocker overdose or toxicity; including: acebutolol (Sectral), alprenolol, atenolol (Tenormin), betaxolol (Betoptic, Kerlone), bevantolol, bisoprolol, carteolol (Cartrol), fleistolol, labetalol (Normadyne, Trandate), levobumolol (Betagan), metoprolol (Lopressor), nadolol (Corgard), oxprenolol, penbutolol (Levatol), pindolol (Visken), propranolol (Inderal, Blocadren, Timoptic), sofalol, timolol
- Calcium channel blocker overdose or toxicity; including: verapamil (Calan, Isoptin), diltiazem (Cardizem), nifedipine (Procardia, Adalat), nicardipine (Cardene, Vasonase), nimodipine (Nimotop), amlodipine, felodipine, flunarizine, bepridil, isradipine, nisoldapine, nitrendapine

CONTRAINDICATIONS:

- Allergy or known hypersensitivity to glucagon

ADVERSE REACTIONS/SIDE EFFECTS:

- Occasional nausea and vomiting

ADMINISTRATION:

For hypoglycemia

- When IV access is unavailable, an initial dose of glucagon may be given prior to contact with medical control.
- Glucagon comes with one unit (1 mg) of powdered glucagon and 1 ml of diluting solution.
- Inject diluting solution into powdered glucagon vial. Shake gently until solution is clear and draw up medication into syringe.
- Inject SQ or IM into abdomen, buttocks, thigh or upper arm.
- Turn patient to one side in case vomiting should occur.
- If patient wakes up and is able to swallow, give a fast acting carbohydrate immediately.
- Repeat blood glucose measurement.
- Further orders must come from monitoring physician.

For beta-blocker or calcium channel blocker overdose or toxicity

- Administer 2 mg IV or IO if hemodynamic instability is present
- Higher doses may be required, contact a Medical Control Physician for further orders

PEDIATRIC CONSIDERATIONS:

For hypoglycemia

- Administer 0.1 mg/kg (max 1 mg in a single dose)

For beta-blocker or calcium channel blocker overdose or toxicity

- Administer 0.1 mg/kg (max 2 mg in a single dose)

SPECIAL NOTES:

- For conscious patients, simple, oral carbohydrates are most effective.
- If the family has already given patient glucagon, a dose may be administered prior to Medical Control Physician contact if still unconscious after 15 minutes.
- All patients whose hypoglycemia is due to oral hypoglycemic agents should be transported.

ALS

- For severe hypoglycemia (blood sugar < 40 mg/dL), 50% dextrose IV/IO is treatment of choice.

BLS with medication training

- In the patient with decreased LOC, glucagon is preferred over oral dextrose.
- Services with medication training must have glucometry capabilities.



Haloperidol

HALOPERIDOL (HALDOL)

ACTIONS: Antipsychotic. Acts on CNS to depress subcortical areas, mid-brain and ascending Reticular Activating System.

INDICATIONS:

- Acute psychotic disorders including manic states, drug-induced psychoses and schizophrenia.
- Agitation
- Severe behavior problems in children (only after obtaining orders from Medical Control Physician)

CONTRAINDICATIONS:

- Allergy or known hypersensitivity to Haloperidol.
- Agitation secondary to hypoxia or shock.
- Prolonged QT interval

PRECAUTIONS:

- Be prepared to ventilate the patient and support cardiovascular system.
- Use with caution when used concomitantly with barbiturates, narcotics, and/or any other CNS depressants.
- Use with extreme caution, or not at all, in clients with Parkinsonism.
- Obtain physician order before administering to any patient with hypotension (BP < 90 systolic).

ADVERSE REACTIONS/SIDE EFFECTS:

- May cause mental, respiratory and cardiovascular depression.
- Hypotension
- ECG changes (torsades de pointes) with IV use.

ADMINISTRATION:

- Ensure safety of the patient and EMS providers.
- Prepare to manage airway and assist ventilations
- Administer 5 mg IM or 2.5 mg IV/IO.
- Monitor vital signs every 5 minutes after receiving Haldol.
- Notify medical control that Haldol has been given.

PEDIATRIC CONSIDERATIONS:

- Contact Medical Control Physician for orders in children < 12 years old.

SPECIAL NOTES:

- Use caution when giving Haldol to elderly patients as side effects may be more pronounced.

Hydroxocobalamin

HYDROXOCOBALAMIN (CYANOKIT)

ACTIONS: When given IV, hydroxocobalamin binds cyanide ions to form Cyanocobalamin (vitamin B12) which is then excreted in the urine.

INDICATIONS:

- Known cyanide poisoning.
- Smoke inhalation victims who show clinical evidence of closed-space smoke exposure (soot in mouth or nose, sooty sputum) and are either comatose, in shock, or in cardiac arrest.

CONTRAINDICATIONS:

- None in the prehospital setting.

PRECAUTIONS:

- May cause transient elevation of blood pressure.
- Will cause red colored urine (for up to 5 weeks) and red colored skin (for up to 2 weeks). The red color of the blood serum and urine will interfere with colorimetric laboratory tests for several days.

ADVERSE REACTIONS/SIDE EFFECTS:

- Redness of skin and mucous membranes may be prominently noted.
- Other less common reactions include headache, dizziness, restlessness, eye irritation, throat irritation, dyspnea, pulmonary edema, chest tightness, hypertension, tachycardia, palpitations, nausea, vomiting, diarrhea, abdominal pain, dysphagia, red urine, and hives.

ADMINISTRATION:

- Administer 5 gm IV/IO over 15 min
- The 5 gram Cyanokit consists of 2 vials, each with 2.5 grams of hydroxocobalamin powder. Some kits contain a single 5 g vial so check concentration before administering. Each 2.5 g must be reconstituted with 100 mL of Normal Saline (or 200 mL if a single 5 g vial is provided. Saline is not included in the kit). Five grams (two vials) should be given IV over 15 minutes.
- Follow full instructions accompanying the CYANOKIT® for preparation and administration, including use of a transfer spike for normal saline addition to the vial(s), rocking, but not shaking the vial for 60 seconds prior to administration, and administering the infusion from the vial(s).

PEDIATRIC CONSIDERATIONS:

- Hydroxocobalamin has not been approved for pediatric use, but in a life-threatening situation should be considered.
- Standard pediatric dose is 70 mg/kg (max single dose 5 g). Follow administration procedure as above.

SPECIAL NOTES:

- Hydroxocobalamin is incompatible with many other medications, therefore a separate dedicated vascular access site should be obtained and used for the infusion.

Ipratropium

IPRATROPIUM BROMIDE (ATROVENT)

ACTION: Anticholinergic bronchodilator

INDICATIONS:

- For relief of acute bronchospasm (reversible airway obstruction) in COPD patients only

CONTRAINDICATIONS:

- Allergy or known hypersensitivity to Atrovent
- Hypersensitivity to atropine (chemically related)

PRECAUTIONS:

- Use with caution in patients with heart disease, hypertension, glaucoma and the elderly.
- Ipratropium may worsen the condition of glaucoma if it gets into the eyes. Having the patient close their eyes during nebulization may prevent this.

ADVERSE REACTIONS/SIDE EFFECTS:

- More common: cough, dry mouth or unpleasant taste
- Less common or rare: vision changes, eye burning or pain, dizziness, headache, nausea, nervousness, palpitations, sweating, trembling, increased wheezing or dyspnea, chest tightness, rash, hives or facial swelling

ADMINISTRATION:

- Atrovent is used only in combination with albuterol in the prehospital setting.
- Dosage for adults: Pour one unit dose bottle (500 mcg = 2.5 ml of 0.02% solution) into nebulizer reservoir with one unit dose of albuterol.
- Connect nebulizer to oxygen source at 6 or 8 liters per minute (depending on manufacturer).
- Have patient breathe as calmly and deeply as possible until no more mist is found in the nebulizer chamber (5-15 minutes). An acceptable alternative to using the mouthpiece would be to attach the nebulizer reservoir to an oxygen mask, i.e. remove the bag from a non-rebreather nebulizer reservoir and do not use the T-piece or the mouthpiece. If a mask is used, adjust the mask to prevent mist from getting into the patient's eyes.
- One nebulizer treatment with ipratropium may be given to COPD patients prior to contact with medical control. If further nebulization is indicated, albuterol-only nebs should be given.
- In the intubated patient, Atrovent should be administered with an adapter that permits in-line nebulization.

PEDIATRIC CONSIDERATIONS:

- One Atrovent/albuterol neb treatment at adult strength may be given to children suffering from asthma prior to contact with medical control. If further nebulization is indicated, albuterol-only nebs should be given.

SPECIAL NOTES:

- Nebulizer treatments for patients with active tuberculosis should be performed in well-ventilated areas (outside patient compartment if possible). Providers should use approved respiratory protection.

Ketamine

KETAMINE (KETALAR)

ACTION: Dissociative anesthetic

INDICATIONS:

- Induction of anesthesia for RSI procedures
- For pain control as an adjunct to narcotic medications
- For sedation of the intubated patient with a systolic BP < 100
- Control of the aggressive excited delirium or severe agitation patient when an imminent safety threat is posed to providers, bystanders, or patients

CONTRAINDICATIONS:

- Patients in whom significant blood pressure elevation would be a serious hazard
- Known hypersensitivity to the drug

PRECAUTIONS:

- Emergence reactions occur in approximately 12% of patients. The incidence is least in young patients (< 15 years of age) and the elderly (> 65 years of age). Emergence also occurs less frequently when given IM.
- Use with caution in patients with known cardiac disease or evidence of cardiac strain (STEMI, CHF).
- Monitor vital signs frequently in patients with hypertension.

ADVERSE REACTIONS/SIDE EFFECTS:

- Hypertension, tachycardia, hypotension, bradycardia, arrhythmia
- Increased intracranial pressure, emergence reaction (vivid imagery, hallucinations, delirium, confusion, excitement, irrational behavior)
- Anorexia, nausea, vomiting, hypersalivation
- Respiratory stimulation, respiratory depression, apnea (after rapid injection), laryngospasm, other airway obstruction.

ADMINISTRATION:

For RSI/RSA induction

- Administer 3 mg/kg IV via slow infusion (over 60 sec.)
- Approved simplified dosing: Small (200 mg), Medium (250 mg), Large (300 mg)

For pain control as an adjunct to narcotic medications

- Administer 0.25 mg/kg IV/IO/IM as a single dose any time after narcotics have been given for severe pain
- Approved simplified dosing: Small (15 mg), Medium (20 mg), Large (25 mg)

For sedation of the intubated patient with systolic BP < 100

- Administer 0.5 mg/kg IV/IO/IM, may repeat every 10 minutes on standing orders
- Approved simplified dosing: Small (30 mg), Medium (40 mg), Large (50 mg)

For use in controlling aggressive patients who pose an imminent safety threat

- Administer 250 mg IM. May repeat x1 if adequate sedation not achieved in 5 minutes

PEDIATRIC CONSIDERATIONS:

- Contact medical control for orders in children < 12 when considering use for behavioral chemical restraint.

SPECIAL NOTES:

- Store ketamine at a controlled room temperature 60-86° F and protect from light.
- If an emergence reaction is recognized, administer a dose of a benzodiazepine (midazolam or lorazepam)
- This is a controlled substance and should be handled and documented as such.



Lidocaine

LIDOCAINE

ACTION: Anesthetic agent

INDICATIONS:

- Pain reduction and anesthesia for the conscious patient who has had an intraosseous needle placed

CONTRAINDICATIONS:

- Hypersensitivity to lidocaine
- SA, AV, or intraventricular blocks

ADVERSE REACTIONS/SIDE EFFECTS:

- CNS effects including seizure
- CV effects including bradycardia

ADMINISTRATION:

- Slowly administer 40 mg of 2% preservative free lidocaine into the IO site

PEDIATRIC CONSIDERATIONS:

- Slowly administer 0.5 mg/kg of 2% preservative free lidocaine into the IO site

Special Considerations:

- Insertion of the IO in conscious patients has been noted to cause moderate to severe discomfort from fluids flowing into the medullary space. It is recommended to slowly infuse lidocaine into the site allowing a few minutes for the lidocaine to work before pushing the bolus of saline to clear the site.

LORAZEPAM (ATIVAN)

ACTION: Enhances inhibitory neurotransmitter GABA at CNS; produces anxiolytic, muscle relaxant, anticonvulsant, sedative, and antiemetic effect.

INDICATIONS:

- Anxiety
- Seizure control

CONTRAINDICATIONS:

- Pre-existing CNS depression
- Narrow-angle glaucoma
- Severe uncontrolled pain
- Severe hypotension
- Pregnancy (unless actively seizing)

PRECAUTIONS:

- Renal or hepatic impairment
- Compromised pulmonary function
- Concomitant CNS depressant use

ADVERSE REACTIONS/SIDE EFFECTS:

- Drowsiness
- Confusion
- Blurred vision
- Slurred speech
- Hypotension
- Headache

ADMINISTRATION:

For anxiety

- Administer 1-2 mg IV/IO/IM. Contact Medical Control for additional doses.

For seizure control

- Administer 2 mg IV/IO/IM. May repeat 2 mg if no effect seen 5 minutes after initial administration. Max 8 mg may be given, then contact Medical Control for additional doses.

PEDIATRIC CONSIDERATIONS:

For anxiety

- Administer 0.05 mg/kg IV/IO/IM to a maximum dose of 2 mg.

For seizure control

- Administer 0.05 mg/kg IV/IO/IM (max single dose 2 mg) every 5-10 minutes to a maximum dose of 8 mg. Contact Medical Control for additional doses.

Magnesium Sulfate

MAGNESIUM SULFATE

ACTION: Electrolyte; central nervous system depressant; anticonvulsant; antiarrhythmic

INDICATIONS:

- Torsades de pointes
- Severe asthma
- Obstetrical: to resolve seizures associated with eclampsia; contractions in premature labor
- Digitalis toxicity
- Tricyclic overdose

CONTRAINDICATIONS:

- Heart block
- Shock
- Hypocalcaemia
- Renal disease
- Hypermagnesemia

PRECAUTIONS:

- Be prepared to give calcium chloride if respiratory depression occurs.
- Use with caution in renal failure.

ADVERSE REACTIONS/SIDE EFFECTS:

- Dizziness or drowsiness; altered level of consciousness
- Respiratory depression
- Hypotension (from rapid administration)
- Arrhythmias

ADMINISTRATION:

- If respiratory depression develops after administration, consult with medical control physician regarding calcium chloride administration.

For severe asthma, or Torsades de pointes

- Administer 2 gm (4 cc of a 50% solution) diluted in 10 cc of NS and administer by slow IV/IO.

For eclampsia

- Administer 4 grams of magnesium sulfate diluted in 100cc NS over 20 minutes before contacting Medical Control Physician

PEDIATRIC CONSIDERATIONS:

- Do not give to patients < 12 years without Medical Control Physician order.
- Initial dose is 40 mg/kg IV or IO.

MARK 1 KITS

A MARK 1 Chemical Agent Treatment Kit contains an auto-injector with 2 mg of atropine and an auto-injector with 600 mg of pralidoxime (2-PAM) chloride. These are antidotes to be used when a patient or provider becomes symptomatic from contact with a nerve agent or organophosphate agent (i.e. pesticides, herbicides).

ACTIONS:

Atropine = blocks muscarinic effects of nerve agents (e.g. bronchorrhea, bronchoconstriction).

2-PAM Chloride = Reactivates cholinesterase outside the CNS which has been inactivated by organophosphate pesticides and related compounds.

INDICATIONS:

- Recognition of the existence of a potential chemical or organophosphate agent release.
- Some or all of the signs and symptoms consistent with exposure to a nerve agent, including:
 - SLUDGE: S-salivation, L-lacrimation, U-urination, D-defecation, G-GI symptoms & cramps, E-emesis.
 - Difficulty breathing.
 - Agitation: confusion, seizures or coma.

CONTRAINDICATIONS:

- Not to be used as a prophylactic mode of protection.

PRECAUTIONS:

- Atropine must be administered before 2-PAM CL

ADVERSE REACTIONS/SIDE EFFECTS:

- Blurred or double vision
- Dizziness
- Headache
- Tachycardia
- Weakness
- Nausea

ADMINISTRATION:

- Scene safety – Use appropriate PPE and assure adequate decontamination of the patient.
- Manage airway, breathing, circulation as needed
- Start IV with normal saline to sustain systolic BP over 90 mm/hg.
- Monitor ECG.

For moderate symptoms (respiratory distress, SLUDGE)

- Administer 2 kits rapidly, then repeat the atropine auto-injector every 5-10 minutes (if available) until symptoms improve.

For severe symptoms (altered mental status, seizures, respiratory arrest)

- Administer 3 kits rapidly, then repeat the atropine auto-injector every 3-5 minutes (if available) until symptoms improve.

PEDIATRIC CONSIDERATIONS:

- Use pediatric Mark-1 if available, or contact Medical Control Physician.

SPECIAL NOTES:

- Some patients will need high-pressure ventilation to successfully ventilate them. Because these patients may need up to 70 cm/H₂O to provide adequate ventilation, use a Bag Valve Mask instead of the demand valve to ventilate the patient.
- Hold each auto-injector in place for 10 seconds so the medication can be completely injected.
- If a MARK 1 Kit is not available, atropine should be administered IM/IV/IO per the Nerve Agent Exposure guideline.
- The use of a MARK 1 Kit is based on the patient's signs and symptoms, not the suspicion or presence of a nerve agent.

MIDAZOLAM (VERSED)

ACTIONS: Sedative/hypnotic; provides conscious sedation/amnesia; anticonvulsant

INDICATIONS:

- Sedation of the intubated patient or for procedures such as external pacing or cardioversion
- Status seizures
- Combative behavior that compromises patient care
- Anxiety associated with trauma and burns

CONTRAINDICATIONS:

- Allergy or known hypersensitivity to midazolam or benzodiazepines
- Pregnancy (unless actively seizing)
- Sustained SBP < 90 mm Hg

PRECAUTIONS:

- Be prepared to ventilate the patient and support cardiovascular system.
- Use with caution when used concomitantly with narcotics, EtOH, or any other CNS depressant.
- Obtain physician order before administering to any patient with hypotension (BP < 90 systolic).

ADVERSE REACTIONS/SIDE EFFECTS:

- Headache
- May cause mental, respiratory and cardiovascular depression
- Arrhythmias; cardiac arrest
- Hypotension

ADMINISTRATION:

External Pacing and Cardioversion

- 2 mg IV/IO/IN (1/2 dose in each nostril)

Post-intubation sedation

- 0.5 mg IV/IO initial dose, may repeat 1-2 mg every 5-10 minutes as needed
- Approved simplified dosing: Small (2 mg), Medium (2-5 mg), Large (5 mg)

Status seizures

- 2 mg IV/IO/IN or 5 mg IM, may repeat every 3-5 minutes until cessation of seizure activity. Max total dose 10 mg.
- Contact Medical Control Physician for further orders

Anxiety or agitation

- 2.0 mg IV/IO/IM/IN

PEDIATRIC CONSIDERATIONS:

- Dosage listed on the Broselow-Luten tape is an induction dose (0.3 mg/kg) and is not for seizures.

Post-intubation sedation

- 0.05 mg/kg IV/IO, may repeat every 10 minutes as needed, no max

Status seizures

- 0.1 – 0.2 mg/kg (max dose = 5 mg) IV/IO/IM or 0.2 mg/kg (max dose = 5 mg) intranasal

Anxiety or agitation

- 0.05 mg/kg (max dose = 2 mg) IV/IO/IM or 0.1 mg/kg (max dose = 2 mg) intranasal

SPECIAL NOTES:

- Midazolam is a controlled substance and its use must be documented according to the "Controlled Substance" policy.
- Patients being paced may tolerate procedures without sedation. Administer only if indicated.
- Versed is carried in several concentrations, most commonly 2 mg/ 5 mL and 5 mg/1 mL concentration. For the 5 mg/1 mL concentration, to obtain a 5mg/5ml concentration, add 4 mL of normal saline.

Morphine

MORPHINE SULFATE

ACTION: Narcotic analgesic; increases venous capacity and decreases systemic vascular resistance

INDICATIONS:

- Chest pain of suspected cardiac origin
- Musculoskeletal pain
- Kidney stones
- Pulmonary edema
- Burns

CONTRAINDICATIONS:

- Allergy or known hypersensitivity to morphine sulfate
- Hypotension (systolic BP < 90 systolic in adults)

PRECAUTIONS:

- Use with caution in asthma and COPD.
- Be prepared to assist ventilations and to administer the narcotic antagonist naloxone (Narcan).

ADVERSE REACTIONS/SIDE EFFECTS:

- Respiratory depression, hypotension, sedation, and confusion
- Bradycardia, dry eyes, blurred vision, and vomiting

ADMINISTRATION:

- Administer 0.1 mg/kg (max initial dose = 8 mg) IV/IO/IM slowly. 2 additional doses of 2-4 mg each can be administered if pain management has not been achieved with initial dose. Vital signs must be checked after each dose.
- Approved simplified dosing: Small (4 mg), Medium (6 mg), Large (8 mg)
- If respiratory depression or hypotension occurs after using, ventilate the patient and administer 0.5-1 mg of naloxone (Narcan) IV/IO push. This dose may be repeated every 2 - 3 minutes if necessary and desired effects are noted.
- MRCC must be notified when morphine is given, and authorizing physician's name must be documented on run form.

PEDIATRIC CONSIDERATIONS:

- Patients < 12 years may be given an initial dose of 0.1 mg/kg (max initial dose 5 mg) IV/IO/IM on standing order. 2 additional half doses may be given every 10 minutes if pain management has not been achieved with initial dose.

SPECIAL NOTES:

- Morphine is a controlled substance and its use must be documented according to the "Controlled Substance" policy.

NALOXONE (NARCAN)

ACTION: Narcotic antagonist

INDICATIONS:

- Respiratory depression (< 12/min.) from narcotic overdoses such as: morphine (Roxanol, Duramorph), fentanyl, meperidine (Demerol), heroin, codeine, hydrocodone (Vicodin, Vicoprofen, Norco), oxycodone (Percodan, Percocet, OxyContin), oxymorphone (Numorphan), hydromorphone (Dilaudid), diphenoxylate (Lomotil), propoxyphene (Darvon, Darvocet), and pentazocine (Talwin)
- As a diagnostic tool in coma of unknown origin

CONTRAINDICATIONS:

- Allergy or known hypersensitivity to Naloxone

PRECAUTIONS:

- Short half-life; monitor patient closely and prepare to re-dose if deterioration occurs.
- Naloxone should be titrated to the patient's respiratory status, not the level of consciousness. In the patient with a protected airway (i.e. gag reflex, or advanced airway present), adequate respirations, and GCS of 10 - 14, use discretion regarding the administration of naloxone.
- Patient restraints may be required following reversal of some narcotics. Consider applying these prior to the administration of naloxone.
- IN naloxone does not always work, and is less likely to be effective in someone who is inhaling vasoconstrictors (cocaine, meth).

ADVERSE REACTIONS/SIDE EFFECTS:

- In the chronic narcotic abuser, may precipitate withdrawal symptoms, including seizures, violent behavior, nausea/vomiting, miscarriage or premature labor.
- Hypotension or hypertension

ADMINISTRATION:

Respiratory depression from narcotic overdose

- 1 mg IV/IO/IN, titrate to effect

PEDIATRIC CONSIDERATIONS:

Respiratory depression from narcotic overdose

- 0.1 mg (max 2 mg) IV/IO/IN, titrate to effect

SPECIAL NOTES:

- Follow-up dosing will generally be 1-2 mg every 2-3 minutes up to a total 10 Mg.
- If no response after 10 mg, it is unlikely to be effective.
- Remarkably safe and effective.

Nitroglycerine

NITROGLYCERINE (NITRO-BID, NITRO-DUR, IMDUR, NITROL)

ACTION: Antianginal, coronary and peripheral vasodilator

INDICATIONS:

- Chest pain of suspected cardiac origin
- Pulmonary edema
- Hypertension (only on physician order)

CONTRAINDICATIONS:

- Allergy or known hypersensitivity to nitroglycerin
- Head trauma
- Hypovolemia, hypotension (BP < 90 systolic in adults), and shock
- Recent sildenafil [Viagra, Levitra (24 hrs.) or Cialis (48 hrs.)] ingestion

PRECAUTIONS:

- BLS: May be administered only to patients for whom it is prescribed.

ADVERSE REACTIONS/SIDE EFFECTS:

- Headache, dizziness, and weakness
- Tachycardia, fainting, and hypotension

ADMINISTRATION:

- Establish IV NS TKO.
- Inquire about Viagra, Levitra or Cialis use.

BLS

- Assist patient in taking nitroglycerine as prescribed by personal physician.
- If systolic BP drops < 90 after any nitroglycerine, discontinue nitroglycerine and administer a 250 cc fluid bolus if appropriately trained.

BLS with IV training

- If IV is established and systolic BP is at least 110, contact medical control operator for orders to administer up to 2 nitroglycerine SL 3 – 5 minutes apart. Further nitroglycerine orders must come from Medical Control Physician.

ALS: For myocardial ischemia or pulmonary edema:

- Give 0.4 mg nitroglycerine tablet or one metered dose NITROGLYCERINE spray sublingually. Repeat vitals.
- Repeat tablet or spray sublingually every 5 minutes as long as pain or pulmonary edema persists and patient is not hypotensive, regardless if patient has taken own prescription.
- Notify medical control that nitroglycerine has been given.

ALS: CHF/Pulmonary Edema

- If SBP \geq 140 give 0.4 mg nitroglycerine SL every 3-5 min to patient response.

ALS: For hypertension

- Obtain physician order.

PEDIATRIC CONSIDERATIONS:

- Do not give to patients < 12 years without physician order.

SPECIAL NOTES:

- Consider utilizing the age-appropriate pain control guideline if pain is unrelieved by nitroglycerine.
- Nitroglycerine is effective in relieving angina pectoris. Other conditions such as esophageal spasm can respond as well, thus improvement of symptoms following nitroglycerine administration is not necessarily diagnostic of cardiac ischemia.



Ondansetron

ONDANSETRON (ZOFRAN)

ACTION: Antinausea, antiemetic. Blocks serotonin, both peripherally on vagal nerve terminals and centrally in chemoreceptor trigger zone.

INDICATIONS:

- Patients experiencing nausea or vomiting

PRECAUTIONS:

- Use with caution in setting of prolonged QT interval

CONTRAINDICATIONS:

- There are no absolute contraindications to the use of Zofran.

ADVERSE EVENTS

- Overdose may produce a combination of CNS stimulation or depressant effects.
- QT interval prolongation

SIDE EFFECTS

- Frequent: Anxiety, dizziness, drowsiness, headache, fatigue, constipation, diarrhea, hypoxia, and urinary retention.
- Occasional: Abdominal pain, fever, feeling of cold, paresthesia, weakness, headache
- Rarely: hypersensitivity reaction, blurred vision, QT prolongation

ADMINISTRATION:

- Administer 8 mg IV/IO/IM/IN/PO push over 2-5 minutes. May repeat x1 if no improvement in 15 minutes
- Monitor patient for vomiting and potential airway compromise.

PEDIATRIC CONSIDERATIONS:

- Pediatric dose is 0.15 mg/kg (max dose = 8 mg).

SPECIAL CONSIDERATIONS:

- The IV formulation of zofran can be given orally and is very effective, especially in infants and young children. It can be mixed with juice to improve the likelihood of ingestion.

Oxygen

OXYGEN

ACTION: Increases arterial oxygen tension (SaO_2) and hemoglobin saturation

INDICATIONS:

- Pre-existing baseline oxygen needs
- Smoke, carbon monoxide, or toxic gas inhalation
- Hypoxia ($\text{SpO}_2 < 94\%$) from any cause
- Respiratory distress, poor capillary refill or other indications of poor oxygenation
- Unresponsive patient
- Obstetric patients with known or suspected complications

CONTRAINDICATIONS:

- None in the prehospital setting

PRECAUTIONS:

- This guideline refers to spontaneously breathing and adequately ventilating patients only.
- High concentration O_2 in some cases (emphysema and asthma) may depress respiratory drive; be prepared to assist ventilation, but don't allow patients to become severely hypoxic for fear of respiratory arrest.
- Agitation or restlessness can be a sign of hypoxia.
- Do not use in the presence of open flames.
- Treatment for anxiety or hyperventilation should be directed at reassurance and coaching to slow breathing prior to oxygen administration. If the possibility of another underlying cause exists (i.e. pulmonary embolus, asthma, MI) then the patient should be treated with oxygen. DO NOT treat any patient by having them breathe into a paper bag or O_2 mask that is not supplied with O_2 .

ADVERSE REACTIONS/SIDE EFFECTS:

- Nonhumidified oxygen can dry mucous membranes, but humidified O_2 is not indicated in the prehospital setting.

ADMINISTRATION:

- Deliver via nasal cannula @ 1 - 6 lpm or non-rebreather mask @ 6 - 15 lpm as condition warrants.
- Attempt to obtain and document pulse oximetry readings before and during oxygen therapy.

PEDIATRIC CONSIDERATIONS:

- Use pediatric mask or blow-by if mask is not tolerated.

SPECIAL NOTES:

- If oximetry is unavailable, patients should receive oxygen if suspicion of hypoxia or poor perfusion.

Proparacaine

PROPARACAINE (OPHTHANE, ALACANE)

ACTION: Topical ophthalmic anesthetic

INDICATIONS:

- Suspected corneal abrasion
- Burns to the eye
- Foreign body in eye

CONTRAINDICATIONS:

- Hypersensitivity
- Ruptured globe

PRECAUTIONS:

- The patient should never be allowed to rub or touch eyes.
- After administration, remaining medication should be discarded to minimize the risk of infection.

ADVERSE REACTIONS/SIDE EFFECTS:

- Transient burning or stinging sensation

ADMINISTRATION:

- 1-2 drops in each affected eye
- May repeat every 15 minutes

PEDIATRIC CONSIDERATIONS:

- Administer 1-2 drops in each affected eye; may repeat every 15 minutes as needed.

SPECIAL CONSIDERATIONS:

- Patient should be transported if this medication has been given. If patient refuses transportation by ambulance, explain that they need to have additional medical care and need to be seen at an emergency department.
- Do not give the remaining medication to the patient for later use. Repeated use of topical eye anesthetics can result in delayed healing and infection.
- Solution must be kept refrigerated prior to use.
- Solution must be clear. If solution is yellow, do not use.

Sodium Bicarbonate

SODIUM BICARBONATE

ACTION: Systemic hydrogen ion buffer; aids in the correction of metabolic acidosis

INDICATIONS:

- Tissue acidosis and acidemia resulting from cardiac arrest and cardiopulmonary resuscitation
- Pre-existing metabolic acidosis or hyperkalemia
- Excited delirium associated with cocaine or methamphetamine use
- QRS widening due to ingestion of a substance with sodium channel blockade properties
- Prophylaxis for systemic acidemia prior to extrication following prolonged entrapment with crush injury

CONTRAINDICATIONS:

- None; when used in the treatment of metabolic acidosis

PRECAUTIONS:

- EtCO₂ readings will temporarily elevate following administration of sodium bicarbonate. In cardiac arrest, this does not necessarily imply that tissues have adequate metabolic function.
- May precipitate with concurrent administration of other medications. Flush tubing well between administrations of other drugs.

ADVERSE REACTIONS/SIDE EFFECTS:

- May cause hyponatremia, hyperosmolality, hypokalemia, and hypocalcaemia
- Fluid retention

ADMINISTRATION:

For tricyclic overdose

- If bradyarrhythmias, multifocal PVC's, V-tach, hypotension, or widened QRS (>100 ms) are present, administer 100 mEq (2 ampules) IV/IO of sodium bicarbonate. Administer an additional 50 mEq (1 ampule) every 5 minutes until QRS narrows to < 100 ms.

In cardiac arrest

- After 10 minutes in non-perfusing rhythm, administer initial dose of 1 amp (50 mEq) IV or IO push. Administer an additional amp (50 mEq) every 10 minutes until ROSC or until the arrest is called in the field.

For crush syndrome or prolonged entrapment

- Administer 100 mEq (2 ampules) IV/IO immediately prior to extrication.
- Ensure adequate saline hydration has been initiated.

For excited delirium symptoms

- Administer 100 mEq (2 ampules) IV/IO once patient has been safely restrained and vascular access has been obtained.
- Ensure adequate saline hydration has been initiated.

PEDIATRIC CONSIDERATIONS:

- Initial dose is 1.0 mEq/kg IV/IO.
- Repeated doses are 0.5 mEq/kg IV/IO.

SPECIAL NOTES:

- In cardiac arrests of short duration, adequate ventilation and effective chest compressions limit accumulation of CO₂, thus, in the early phases of resuscitation, buffer agents are generally unnecessary.

Succinylcholine

SUCCINYLCHOLINE (ANECTINE)

ACTION: Depolarizing neuromuscular block; onset: 30 – 60 seconds (peak 2 – 3 min.); duration: 3 – 10 min.

INDICATIONS:

- When rapid muscle paralysis is necessary to facilitate emergency endotracheal intubation

CONTRAINDICATIONS:

- Hypersensitivity
- Neuromuscular disease - (i.e. ALS, chronic para/quadriplegia, myasthenia gravis, multiple sclerosis, muscular dystrophy)
- Hyperkalemia
- Penetrating eye injury
- History of malignant hyperthermia
- Burns, multiple traumatic and soft tissue injuries > 24 hours old
- Acute or chronic renal failure with K⁺ > 5.0 mEq/L
- Suspected or known fractured larynx that prevents proper performance of Sellick's maneuver
- Known anatomical airway anomalies
- Increased intraocular pressure (relative contraindication)

PRECAUTIONS:

- Make sure all RSI medications are prepared prior to induction.
- Pre-oxygenate the patient as much as possible.
- Must be prepared to intubate the patient immediately. An alternative method of ventilation (BVM with 100% O₂) must be available.
- Have an assistant prepare to perform Sellick's maneuver to prevent regurgitation/aspiration.
- Be prepared to treat arrhythmias appropriately according to ACLS protocols.
- Measures to control anxiety (i.e. Versed) and pain must be utilized for the patient receiving paralytics.

ADVERSE REACTIONS/SIDE EFFECTS:

- Dysrhythmias
- Prolonged apnea, respiratory depression, or bronchospasm
- Malignant hyperthermia (rare)
- Increase in serum potassium
- Increased intracranial pressure (ICP)
- Inability to perform adequate neurological exam

ADMINISTRATION:

- Administer 2.0 mg/kg IV/IO in adults.
- Approved simplified dosing: Small (120 mg), Medium (160 mg), Large (200 mg)
- Continuous SpO₂ monitoring and BP monitoring must be utilized and documented.
- If additional paralysis is needed consider vecuronium.
- If consistent and dramatic rise in temperature is observed, utilize whatever means available to lower the patient's body temperature. Open external windows (weather permitting) or turn on air conditioning. Apply cold packs to the patient. Notify medical control and the receiving physician of the occurrence.
- If transport distance to the receiving facility is significant (>10 minutes), the crew may elect to divert to the closest facility that has the antidote to treat malignant hypothermia (dantrolene).

PEDIATRIC CONSIDERATIONS:

- Initial dose is 2.0 mg/kg IV/IO.

SPECIAL NOTES:

- If succinylcholine is contraindicated, vecuronium should be considered.

Tetracaine

TETRACAINE (PONTOCAINE)

ACTION: Topical ophthalmic anesthetic

INDICATIONS:

- Suspected corneal abrasion
- Burns to the eye
- Foreign body in eye

CONTRAINDICATIONS:

- Hypersensitivity
- Ruptured globe

PRECAUTIONS:

- The patient should never be allowed to rub or touch eyes.
- After administration, remaining medication should be discarded to minimize the risk of infection.

ADVERSE REACTIONS/SIDE EFFECTS:

- Transient burning or stinging sensation

ADMINISTRATION:

- 1-2 drops in each affected eye
- May repeat every 15 minutes

PEDIATRIC CONSIDERATIONS:

- Administer 1-2 drops in each affected eye; may repeat every 15 minutes as needed.

SPECIAL CONSIDERATIONS:

- Patient should be transported if this medication has been given. If patient refuses transportation by ambulance, explain that they need to have additional medical care and need to be seen at an emergency department.
- Do not give the remaining medication to the patient for later use. Repeated use of topical eye anesthetics can result in delayed healing and infection.
- Solution must be clear. If crystals are present, do not use.



Vasopressin

VASOPRESSIN (PITRESSIN)

ACTION: Vasopressin causes vasoconstriction and also functions as an antidiuretic.

INDICATIONS:

- Cardiac Arrest.
- Vasopressin is given as a one-time dose and may substitute for the 1st or 2nd dose of epinephrine in the setting of cardiac arrest. After Vasopressin is given, further doses of Epinephrine should continue to be given as indicated in the Cardiac Arrest Guidelines.

CONTRAINDICATIONS:

- None in prehospital setting.

PRECAUTIONS:

- Potent vasoconstrictor

ADVERSE REACTIONS/SIDE EFFECTS:

- Can precipitate peripheral ischemia, cardiac ischemia, and angina.

ADMINISTRATION:

- Administer 40 units IV/IO as a single dose.
- May be given in lieu of first or second epinephrine dose during cardiac arrest.
- Vasopressin dosing should not be repeated. Further vasoconstrictor doses should be given as epinephrine 1:10,000.

PEDIATRIC CONSIDERATIONS:

- Not indicated, should only be given if ordered by Medical Control Physician

SPECIAL CONSIDERATIONS:

- None

VECURONIUM BROMIDE (NORCURON)

ACTION: Non-depolarizing neuromuscular blocking agent; onset: 1.5 - 4 min.; duration: 30 – 60 min; paralysis onset decreases and duration of maximal effect increases with increasing doses

INDICATIONS:

- When further muscle paralysis is necessary following RSI
- Head injuries with agitation or uncontrolled motor activity that may threaten the airway or spine, or increase intracranial pressure
- As an initial paralytic when succinylcholine is contraindicated

CONTRAINDICATIONS:

- Hypersensitivity
- Concern for inability to provide appropriate airway management

PRECAUTIONS:

- Clinicians must provide total ventilatory support after vecuronium has been administered.
- The safety of this drug in pregnancy has not been established.
- Measures to control anxiety (i.e. Versed) and pain must be utilized for the patient receiving paralytics.

ADVERSE REACTIONS/SIDE EFFECTS:

- Prolonged apnea/respiratory paralysis
- Inability to perform adequate neurological exam
- Quinidine, magnesium and certain antibiotics may intensify paralysis.

ADMINISTRATION:

- Must be reconstituted with diluent provided.
- Administer 0.1 mg/kg IV/IO.
- Approved simplified dosing: Small (6 mg), Medium (8 mg), Large (10 mg)
- May be given on standing order if further paralysis is needed following intubation.

PEDIATRIC CONSIDERATIONS:

- Administer 0.1 mg/kg.
- May be given on standing order if further paralysis is needed following intubation.



Procedures

Procedures

Procedures

Procedure

- 12-Lead ECG Monitoring
- AED (Automatic External Defibrillation)
- Automated Chest Compression Device: LUCAS
- Blood Glucose Analysis
- Carbon Monoxide Oximetry Device
- Cardioversion
- Chest Decompression
- Childbirth
- Continuous Positive Airway Pressure (CPAP)
- Defibrillation
- Donut Magnet
- Endotracheal Intubation
- Endotracheal Tube Locator (TubeChek-B™)
- End-Tidal Carbon Dioxide Detection (Easy Cap™)
- Heimlich Maneuver
- Hemorrhage Control Agents
- Intranasal Medication Administration
- Intraosseous (IO) Infusion: LD, AD, and PD EZ-IO™
- Intravenous Infusion
- ITD (ResQPod™)
- Oximetry
- Pericardiocentesis
- Supraglottic Airway: King LTS-D
- Surgical Cricothyrotomy – Sklar Hook
- Taser Probe Removal
- Tourniquets
- Tracheal Tube Introducer
- Transcutaneous Pacing
- Wound Care

12 LEAD ECG MONITORING

INDICATIONS

1. Conscious, stable patients presenting with presumed signs and symptoms of cardiac origin
2. Chest pain or pressure of presumed cardiac etiology
3. Shortness of breath of presumed cardiac etiology
4. Syncope
5. Resuscitated cardiac arrest patient
6. Suspected CVA patients
7. Post synchronized cardioversion

CONTRAINDICATIONS

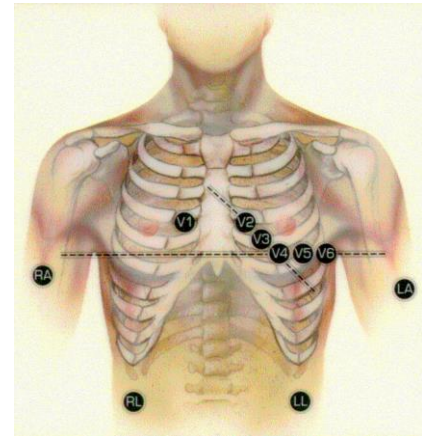
1. Cardiac arrest (on-going)

PRECAUTIONS

1. Do not significantly delay transport to conduct test.
2. On female patients, always place leads V3 – V6 under the breast rather than on the breast.
3. Never use the nipples as reference points for electrode location as nipple locations may vary widely.
4. A “normal” ECG does not definitively rule out a MI nor should it be justification for nontransport.
5. Women, the elderly, and persons with diabetes may present with atypical S&S of AMI.

PROCEDURE

1. Whenever possible, attempt to obtain 12-lead with patient in supine position. If patient does not tolerate, place in semi-reclining or sitting position. Document the patient's position.
2. Document patient name, sex, and age. Leave ECG size preset at x 1.
3. Prep the skin and shave hair as necessary.
4. Apply electrodes as follows and attach the appropriate lead to an electrode:
Limb (extremity) Leads: Precordial (chest) Leads:
Right arm (RA) – Right forearm
Right leg (RL) – Right calf
Left arm (LA) – Left forearm
Left leg (LL) – Left calf
V1 – Fourth intercostal space to the right of the sternum
V2 – Fourth intercostal space to the left of the sternum
V3 – Directly between leads V2 and V4
V4 – Fifth intercostal space at midclavicular line
V5 – Level with V4 at left anterior axillary line
V6 – Level with V5 at left midaxillary line
5. Secure the cable with the cable clasp to an item of the patient's clothing.
6. Attempt to obtain the 12-lead while the vehicle is not moving. Ask the patient to remain motionless and breathe normally for 10 seconds. Acquire and print two copies of the 12-lead ECG report.
7. If the monitor detects signal noise (such as patient motion or a disconnected electrode), the 12-lead acquisition is interrupted until noise is removed. Take appropriate action as required (such as reconnecting leads).
8. Interpretation should be relayed to receiving hospital during patient report. Document “Obtained 12-lead ECG.” on patient run report and attach one copy to run report.
9. Notify receiving hospital immediately after 12-lead has been performed and found to meet Cath Lab Activation Criteria. Leave one copy of 12-lead with receiving physician.
10. Replace supplies and service per manufacturer recommendations.



SPECIAL NOTES

1. Locating the V1 position (fourth intercostal space) is critically important because it is the reference point for locating the placement of remaining V leads. To locate the V1 position:
 - A. Place your finger at the notch in the top of the sternum. Move your finger slowly downward about 1.5 inches until you feel a slight horizontal ridge or elevation. This is the “angle of Louis” where the manubrium joins the body of the sternum.
 - C. Locate second intercostal space on the right side, lateral to and just below the angle of Louis.
 - D. Move your finger down two more intercostal spaces to the fourth intercostal space, which is the V1 position.
3. Because treatment can affect how ST-elevation looks on a 12-Lead, the 12-Lead should be performed with the initial set of vital signs and before the administration of nitroglycerine.
4. Patients with ST-Elevation should be transported to a facility that can have the patient in their cath lab within 60 minutes and have balloon inflation under 90 minutes. Regions Hospital EMS has received confirmation from Regions, United, St. Joseph's, University of Minnesota, and the VA of their ability to meet the above criteria.

AUTOMATED EXTERNAL DEFIBRILLATION (AED)

INDICATIONS

1. Patients in cardiac arrest (pulseless, non-breathing).

CONTRAINDICATIONS

1. Pediatric patients who are so small that the pads cannot be placed without touching one another.

PROCEDURE

1. If multiple rescuers available, one rescuer should provide uninterrupted chest compressions while the AED is being prepared for use.
2. Apply defibrillator pads per manufacturer recommendations. Avoid placing directly over an implanted device (pacemaker, AICD).
3. Remove any medication patches on the chest and wipe off any residue.
4. If necessary, connect defibrillator leads: white to the anterior chest pad and the red to the posterior or lateral pad.
5. Activate AED for analysis of rhythm.
6. Stop CPR and clear the patient for rhythm analysis. Keep interruption in CPR as brief as possible.
7. Defibrillate if appropriate by depressing the "shock" button. Assertively state "CLEAR" and visualize that no one, including yourself, is in contact with the patient prior to defibrillation. The sequence of defibrillation charges is preprogrammed for monophasic defibrillators. Biphasic defibrillators will determine the correct joules accordingly.
8. Begin CPR (chest compressions and ventilations) immediately after the delivery of the defibrillation.
9. After 2 minutes of CPR, analyze rhythm and defibrillate if indicated. Repeat this step every 2 minutes.
10. If "no shock advised" appears, perform CPR for two minutes and then reanalyze.
11. Transport and continue treatment as indicated.
12. Keep interruption of CPR compressions as brief as possible. High-quality CPR is a key to successful resuscitation.
13. If pulse returns please use the Post Resuscitation Guideline.

PEDIATRIC CONSIDERATIONS

1. Age < 8 years, use Pediatric Pads if available and can be placed appropriately without touching each other.
2. If pediatric pads are not available, adult pads may be used if they can be placed appropriately without touching each other.



Automated CPR

AUTOMATED CHEST COMPRESSION DEVICE: LUCAS

INTRODUCTION

LUCAS is an automated device designed to deliver uninterrupted chest compressions to a victim of cardiac arrest.

INDICATIONS

1. Patients at least 12 years of age (or appropriately fits in the device with ability to have the CPR pad make contact with the chest)
2. Patients in cardiac arrest from **non-traumatic causes**

CONTRAINDICATIONS

1. Traumatic cardiac arrest
2. Patients who are too large to fit in the device
3. Patients in which the compression pad does not contact the chest when fully extended (generally pediatrics)
4. Pregnant patients (2nd trimester and greater)

GENERAL INSTRUCTIONS (Refer to user guide for specifics)

1. Begin manual CPR compressions while preparing the patient for the LUCAS
2. Remove clothing from the chest and ensure skin contact with the plunger pad
3. Open the LUCAS pack and peel back the sides of the case
4. Ensure the LUCAS device is turned to "adjust"
5. Place the yellow back plate under the patient, back plate should be just below the patient's armpits and centered on the patient's nipples
6. Attach the claw hook to the back plate, first on the side opposite the rescuer performing manual CPR, then place across patient and connect to the opposite side
7. With both hands on the suction pad, place fingers on compression pad and pull suction pad down until compression pad touches the chest. Align lower edge of the suction pad with the xiphoid.
8. Turn LUCAS to the lock position
9. Check the placement of the compression pad/suction pad
10. Turn the LUCAS device on (the device will now deliver continuous compressions. Ventilate the patient per the prompts of the ResQPod or other ITD device)
11. Upon return of ROSC or to check pulse, press Turn LUCAS device to Lock (no need to remove the device)
12. If there is failure or malfunction of device return to manual CPR

SPECIAL NOTES

1. Make sure defibrillation pads are not positioned under the suction pad/compression pad
2. Patients may be transported under LUCAS CPR without a return of spontaneous circulation at any time.

Blood Glucose Analysis

BLOOD GLUCOSE ANALYSIS

CLINICAL INDICATIONS

Patients with suspected hypoglycemia (diabetic emergencies, change in mental status, bizarre behavior, etc.)

PROCEDURE

1. Gather and prepare equipment.
2. Insert test strip into glucometer and verify that display is waiting for a blood sample.
3. Blood samples for performing glucose analysis can be obtained through a finger-stick or when possible simultaneously with intravenous access.
4. Place correct amount of blood on reagent strip or site on glucometer per the manufacturer's instructions.
5. Time the analysis as instructed by the manufacturer.
6. Document the glucometer reading and treat the patient as indicated by the analysis and appropriate guideline.
7. Repeat glucose analysis as indicated for reassessment after treatment and as per appropriate guideline.
8. Perform Quality Assurance on glucometers at least once every 7 days, if any clinically suspicious readings are noted, and/or as recommended by the manufacturer and document in the log.

PEDIATRIC CONSIDERATIONS

1. For neonates, obtain blood sample via a heel-stick rather than finger-stick.



Carbon Monoxide Oximetry

CARBON MONOXIDE OXIMETRY DEVICE

INTRODUCTION

Carbon monoxide oximetry devices, such as the Rad57, can be use to evaluate potential carbon monoxide poisoning in patients or firefighters.

INDICATIONS

Patients exhibiting the following signs and symptoms:

1. Flu-like symptoms
2. Dyspnea
3. Headache
4. Chest pain
5. Lethargy
6. Nausea/vomiting
7. Hallucinations or giddiness

PROCEDURE

1. Obtain a history of potential carbon monoxide exposure and history of smoking.
2. Secure or maintain the airway
3. Provide oxygenation and ventilation as needed
4. Consider ALS response.
5. Apply finger probe to patient using the correct technique.
 - A. If patient SpCO = 0-5%, no further evaluation for carbon monoxide exposure is necessary.
 - B. If patient SpCO = 5-10% with no altered mental status and no symptoms, no further evaluation necessary.
 - C. If patient SpCO = 5-10% with symptoms listed above (regardless of the presence of altered mental status), treat with 100% O₂ and transport for further evaluation.
 - D. If patient SpCO > 10%, treat with 100% O₂ and transport for further evaluation.

SPECIAL NOTE

1. Patients requiring further evaluation should be transported according to the destination recommendations in the Carbon Monoxide Exposure Guideline.

Cardioversion

SYNCHRONIZED CARDIOVERSION

INDICATIONS

1. Unstable patient with a tachydysrhythmia (rapid atrial fibrillation, supraventricular tachycardia, ventricular tachycardia)
2. Patient is not pulseless (the pulseless patient requires unsynchronized cardioversion, i.e. defibrillation)

PROCEDURE

1. Ensure the patient is attached properly to a monitor/defibrillator capable of synchronized cardioversion.
2. Have all equipment prepared for unsynchronized cardioversion/defibrillation if the patient fails synchronized cardioversion and the condition worsens.
3. Consider the use of pain or sedating medications per guideline.
4. Set energy selection to the appropriate setting.
5. Set monitor/defibrillator to synchronized cardioversion mode (press the "Sync" button once pads are connected).
6. Make certain all personnel are clear of patient.
7. Press and hold the shock button to cardiovert. Stay clear of the patient until you are certain the energy has been delivered. NOTE: It may take the monitor/defibrillator several cardiac cycles to "synchronize", so there may a delay between activating the cardioversion and the actual delivery of energy.
8. Note patient response and perform immediate unsynchronized cardioversion/defibrillation if the patient's rhythm has deteriorated into pulseless ventricular tachycardia/ventricular fibrillation.
9. If the patient's condition is unchanged, repeat steps 2 to 8 above, using escalating energy settings.
10. Repeat until maximum setting or until efforts succeed. Consider discussion with Medical Control if cardioversion is unsuccessful after 2 attempts.
11. Note procedure, response, and time in the patient care report (PCR).



Chest Needle Decompression

CHEST NEEDLE DECOMPRESSION

INDICATIONS

1. To relieve a tension pneumothorax evidenced by:
 - A. Absent breath sounds
 - B. Distended neck veins
 - C. Falling systolic blood pressure
 - D. Narrowing pulse pressure
 - E. Central cyanosis
 - F. Tracheal deviation
 - G. Pulseless electrical activity
 - H. Increased tympany
 - I. Increased respiratory difficulty

PRECAUTIONS

1. Crepitus and/or subcutaneous air may be present with a simple or tension pneumothorax.
2. Always insert needle over (cephalad to) rib to avoid neurovascular bundle.
3. The Protectiv™ IV catheter must **not** be used for this procedure.

PROCEDURE

1. This procedure may be performed on a patient when indications are present prior to physician order.
2. On the appropriate side:
 - A. Identify 2nd intercostal space.
 - B. Swab with Povidone Iodine (Betadine) at midclavicular line.
 - C. Create small incision with scalpel over the 3rd rib.
3. Needle insertion
 - A. In adults, use a 10 g. 3" needle through catheter or Cook Needle.
 - B. Position tip of needle in incision over 3rd rib and insert.
 - C. Advance needle into chest walking the needle up over the inferior rib at 45° angle to the chest wall and parallel to sternum. At pleural cavity a slight "give" is felt.
 - D. Advance further into chest until bevel clears pleura. Do not advance the needle any further than is necessary to advance the catheter.
4. Advance the catheter over the needle and then remove needle.
5. Connect tubing, making sure to pay attention to proper flow direction of the Heimlich valve.
6. Secure catheter to chest.
7. Catheter may be connected to LOW suction to assist evacuation of pneumothorax. Do not clamp tubing. Suction may be applied intermittently.
8. Contact the EMS On-Call Clinical Supervisor following performance of the procedure.

PEDIATRIC CONSIDERATIONS

1. In children < 12 years, use a 14 g. 1 3/4" needle through catheter instead.

SPECIAL NOTES

1. Rush of air and/or tube fogging and/or patient improvement indicates correct placement.
2. In the majority of circumstances, bilateral decompression will be required.
3. Once needle is placed, prehospital personnel should not remove it.

CHILDBIRTH

INDICATIONS

Imminent delivery with crowning

CONTRAINDICATIONS

If umbilical cord is the presenting part, **DO NOT DELIVER**. Use a gloved finger to relieve pressure on the cord and transport emergently to the closest appropriate facility.

PRECAUTIONS

If the infant is in a breech position, transport rapidly, discourage mother from pushing, but do not attempt to prevent delivery by applying direct pressure to the infant.

PROCEDURE

1. Delivery should be controlled so as to allow a slow controlled delivery of the infant. This will prevent injury to the mother and infant.
2. Support the infant's head as needed.
3. Check the umbilical cord surrounding the neck. If it is present, slip it over the head. If unable to free the cord from the neck, double clamp the cord and cut between the clamps.
4. Routine suctioning of the airway with a bulb syringe is not recommended, unless respiratory distress is evident.
5. Grasping the head with hands over the ears, gently pull down to allow delivery of the anterior shoulder.
6. Gently pull up on the head to allow delivery of the posterior shoulder.
7. Slowly deliver the remainder of the infant.
8. Clamp the cord 2 inches from the abdomen with 2 clamps and cut the cord between the clamps.
9. Record APGAR scores at 1 and 5 minutes.
10. Follow the **Newly Born Guideline** for further treatment.
11. The placenta will deliver spontaneously, usually within 5 minutes of the infant. Do not force the placenta to deliver.
12. Massaging the uterus may facilitate delivery of the placenta and decrease bleeding by facilitating uterine contractions.
13. Continue rapid transport to the hospital.

CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)

INTRODUCTION

Continuous Positive Airway Pressure has been shown to rapidly improve vital signs, gas exchange, the work of breathing, decrease the sense of dyspnea, and decrease the need for endotracheal intubation in patients who suffer from shortness of breath from asthma, COPD, pulmonary edema, CHF, and pneumonia. In patients with CHF, CPAP improves hemodynamics by reducing preload and afterload.

INDICATIONS

1. Any patient who is complaining of shortness of breath for reasons other than pneumothorax and:
 - A. Is awake and oriented
 - B. Is over 12 years old and is able to fit the CPAP mask
 - C. Has the ability to maintain an open airway (GCS > 10)
 - D. A respiratory rate greater than 25 breaths per minute
 - E. Has a systolic blood pressure above 90 mmHg
 - F. Uses accessory muscles during respirations
 - G. Sign and Symptoms consistent with asthma, COPD, pulmonary edema, CHF, or pneumonia

CONTRAINDICATIONS

1. Patient is in respiratory arrest
2. Patient is suspected of having a pneumothorax
3. Patient has a tracheostomy

PRECAUTIONS

1. Use caution if patient:
 - A. Has impaired mental status and is not able to cooperate with the procedure
 - B. Has failed at past attempts at noninvasive ventilation
 - C. Has active upper GI bleeding or history of recent gastric surgery
 - D. Complains of nausea or vomiting
 - E. Has inadequate respiratory effort
 - F. Has excessive secretions
 - G. Has a facial deformity that prevents the use of CPAP
2. Intubation should be performed if:
 - A. Respiratory or cardiac arrest
 - B. Unresponsive to verbal stimuli (GCS is < 9) and attending paramedic is able to perform RSI or attempt intubation.

PROCEDURE

1. Make sure patient does not have a pneumothorax!
2. **EXPLAIN THE PROCEDURE TO THE PATIENT**
3. Ensure adequate oxygen supply to ventilation device (100% when starting therapy and until SaO₂ is >95%)
4. Place the patient on continuous pulse oximetry
5. Place the delivery device over the mouth and nose
6. Secure the mask with provided straps or other provided devices
7. Use 10 cm H₂O of PEEP
8. Check for air leaks
9. Monitor and document the patient's respiratory response to treatment
10. Monitor vital signs at least every 5 minutes. CPAP can cause BP to drop.
11. Continue to coach patient to keep mask in place and readjust as needed
12. If respiratory status deteriorates, remove device and consider intermittent positive pressure ventilation with or without endotracheal intubation.

REMOVAL PROCEDURE

1. CPAP therapy needs to be continuous and should not be removed unless the patient can not tolerate the mask or experiences continued or worsening respiratory failure.
2. Intermittent positive pressure ventilation and/or intubation should be considered if the patient is removed from CPAP therapy.

PEDIATRIC CONSIDERATIONS:

CPAP should not be used in children under 12 years of age

SPECIAL NOTES:

1. Advise MRCC so receiving hospital can be prepared for patient.
2. Do not remove CPAP until hospital therapy is ready to be placed on patient.
3. Most patients will improve in 5-10 minutes. If no improvement within this time, consider intermittent positive pressure ventilation.
4. Watch patient for gastric distention.
5. Use nitroglycerine tablets to avoid nitroglycerine spray from being dispersed on medics.
6. May be the treatment of choice in a patient with a DNI order.
7. In-line nebs can be delivered with CPAP as appropriate



Defibrillation

DEFIBRILLATION - MANUAL

INDICATIONS

Cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia

CONTRAINDICATIONS

None in cardiac arrest

PROCEDURE

1. **Ensure that Chest Compressions are adequate and interrupted only when absolutely necessary.**
2. Clinically confirm the diagnosis of cardiac arrest and identify the need for defibrillation.
3. After application of an appropriate conductive agent if needed, apply defibrillation hands free pads (recommended to allow more continuous CPR) or paddles to the patient's chest in the proper position. These can be applied either anterior-posterior (over sternum and middle of back), or anterior-lateral (over upper right chest and lower lateral left chest). Attempt to avoid placing paddles or pads directly over implanted devices or medication patches.
4. Set the appropriate energy level
5. Charge the defibrillator to the selected energy level. **Continue chest compressions while the defibrillator is charging.**
6. If using paddles, assure proper contact by applying 25 pounds of pressure on each paddle.
7. **Hold Compressions, assertively state, "CLEAR" and visualize that no one, including yourself, is in contact with the patient.**
8. Deliver the countershock by depressing the discharge button(s) when using paddles, or depress the **shock button** for hands free operation.
9. Immediately resume chest compressions and ventilations for 2 minutes. After 2 minutes of CPR, analyze rhythm and check for pulse only if appropriate for rhythm.
10. Repeat the procedure every two minutes as indicated by patient response and ECG rhythm.
11. Keep interruption of CPR compressions as brief as possible. High quality CPR is a key to successful resuscitation.

Donut Magnet

DONUT MAGNET

INDICATIONS

1. ICD shocks not preceded by Ventricular Tachycardia or Ventricular Fibrillation
2. Multiple shocks in a patient with a suspect ICD (Medtronic with Fidelis lead 2008)
3. Multiple shocks without warning symptoms, such as, palpitations, fainting, or near fainting

CONTRAINDICATIONS

1. Patients who have evidence of Ventricular Tachycardia or Ventricular Fibrillation

PRECAUTIONS

1. If external defibrillation or cardioversion is required external magnet should be removed.
2. **ALL patients in which the magnet is to be utilized need to be on the cardiac monitor with external defibrillation pads applied.**
3. Magnet will abort the ability of the ICD to deliver shocks for Ventricular Tachycardia or Ventricular Fibrillation.

PROCEDURE

1. Place the patient on the cardiac monitor with external defibrillation pads.
2. Locate the patients ICD battery pack in the subclavicular area and tape the magnet directly over the device on the skin.
3. Magnet will not affect the programmed pacing mode for bradycardia.
4. If evidence of VT or VF is present, removal of the magnet reactivates the ICD and will result in therapy delivery of shock for VT or VF.

SPECIAL NOTES

1. Medtronic ICDs should emit a constant tone for 30 seconds when the magnet is first applied.
2. Boston Scientific (formerly Guidant) ICDs will continue to emit a beep on the R wave as long as the magnet is in place.
3. St. Jude ICDs do not emit any tones when the magnet is applied.

ENDOTRACHEAL INTUBATION

INDICATIONS

Endotracheal intubation is an appropriate method of airway control in the following patients:

1. Patients with a decreased level of consciousness (GCS of < 8)
2. Cardiac or respiratory arrest
3. Profound respiratory depression, especially in:
 - A. Pulmonary edema, chronic obstructive pulmonary disease, or asthma
 - B. Cerebral insult or injury (use C-spine precautions)

PRECAUTIONS

1. Intubation should be done with in-line spinal stabilization in trauma victims.
2. Take appropriate universal precautions, including facial protection.
3. Good continuous compressions and ventilations should be the priority during a cardiac arrest with manageable airway. During cardiac arrest, intubation should not take place until after the second defibrillation or four minutes of high quality CPR.

INSERTION PROCEDURE

1. Begin positive pressure ventilation with 100% oxygen and oral airway. Ventilate initially, attempting to maximize oxygen saturation, and giving ventilations slowly, over 1.5 - 2 seconds
2. Clear airway of foreign bodies/secretions. Have suction available.
3. Check equipment, insert stylet, and lubricate tube.
4. Place patient in sniffing position. In trauma, manually maintain in-line stabilization and remove anterior portion of c-collar.
5. Hold laryngoscope in left hand; insert in right side of mouth and move the tongue to the left.
6. Visualize vocal cords. Attempts at intubation should last no longer than 30 seconds. Use of the tracheal tube introducer is expected.
7. Insert tube until proximal end of cuff lies 1/2"-1" beyond cords. Manually secure the tube until it has been properly secured. Note tube depth at teeth.
8. Remove stylet/introducer and inflate cuff with 5 - 10 cc air.
9. Secure tube with one hand and confirm placement with auscultation, waveform capnography, colorimetric capnography, or TubeChek-B™.
10. Ventilate patient with 100% oxygen while assessing for stomach sounds, chest rise and lung sounds.
11. After 6 – 7 ventilations, attach electronic EtCO₂ to continuously monitor patient and record number in report.
12. Other indications that the tube is placed correctly include:
 - A. The patient's SpO₂ reading and color improvement.
 - B. Condensation collects inside the tube with each breath.
13. A maximum of two attempts is allowed. In non-cardiac or respiratory arrest patients, the patient's SpO₂ should not drop below 90%, regardless of the number of attempts.
 - A. Patient should be ventilated for 2 minutes between attempts.
 - B. If intubation is not successful after 2 attempts, other means of airway management should be utilized, i.e. King LTS-D or oral/nasal airway with a BVM.
14. Ventilate patient for at least 2 minutes
15. Apply 5cm PEEP in all intubated respiratory arrests with a pulse. DO NOT use if suspected pneumothorax. Stop use if patient becomes hypotensive
16. Secure tube with appropriate screw down or slip lock device (tape is unacceptable unless mechanical device cannot be used), again noting tube depth.
17. Position patient on backboard and immobilize head with C-collar and V-block.
18. If evidence of gastric distention, consider inserting a gastric tube:
 - A. Lubricate tube.
 - B. Place head in neutral or slightly flexed position (non-trauma only) to facilitate passage into esophagus.
 - C. Insert gastric tube into mouth and advance to the second black line.
 - D. Aspirate gastric contents with catheter-tipped syringe to confirm correct tube placement. If no return, advance tube to third marker and repeat aspiration attempt.
 - E. If unable to aspirate stomach contents, assess tube placement by quickly injecting about 25 cc of air while auscultating over epigastrium. If no air gurgling is heard, remove tube and reinsert.
19. Frequently reassess ET tube placement (especially when patient is moved and before entering the ED) and document on patient care report. Use direct visualization if necessary.
20. If sedation is necessary following intubation, refer to the Post Intubation Sedation Guideline. Sedation is generally preferred to extubation for improved level of consciousness.

Endotracheal Intubation

REMOVAL PROCEDURE

The ET tube should not be removed unless placement cannot be determined or position is felt to be nontracheal.

1. Have suction equipment ready.
2. Log roll the patient to the side.
3. Deflate the distal cuff. The pilot balloon should completely collapse.
4. Remove ET tube during inspiration (if patient is spontaneously breathing) while suctioning the airway.

PEDIATRIC CONSIDERATIONS

Endotracheal intubation should not be performed on pediatric patients. Research has demonstrated that the risks of ET intubation in pediatric patients are high, and generally these patients are more appropriately managed with BLS airway skills including oral/nasal airways and a BVM. Supraglottic airway devices should be utilized if advanced airways are felt to be necessary.

SPECIAL NOTES

1. When appropriate and indicated, paramedics should attempt intubation. The tracheal tube introducer can greatly facilitate placement.
2. Supraglottic airway devices are considered equivalent to endotracheal tubes for the purposes of airway management, except in the following situations:
 - A. Inhalational burns, especially if vocal changes or stridor are present
 - B. Anaphylaxis or angioedema with respiratory symptoms
2. The ET tube must be left in place when a patient is pronounced dead in the field.
3. If intubation was unsuccessful, document difficulties such as "jaws clenched" or "copious vomiting". Also, document reasons why intubation was not performed if it was indicated.
4. Proper placement of an ET tube in an adult is calculated as 3 times the tube size, or approximately:
 - A. Males: 23 cm at the lips and 22 cm at the teeth
 - B. Females: 22 cm at the lips and 21 cm at the teeth
 - C. If in doubt, 22 cm at the lips should work for most adults.



ET Tube Locator (TubeChek-B)

ENDOTRACHEAL TUBE LOCATOR (TUBECHek-B™)

INTRODUCTION

The TubeChek-B is a device used to verify proper endotracheal tube placement. By applying a vacuum to the endotracheal tube, the TubeChek-B takes advantage of anatomical differences between the trachea and the esophagus. Following intubation, the rigid trachea remains patent, allowing free aspiration of air into the TubeChek-B. The muscular esophagus, however, will collapse around the ET tube, preventing aspiration of air.

INDICATIONS

1. To assist in the initial verification of ET tube placement in adult patients.

CONTRAINDICATIONS

1. Children < 5 years of age or < 20 kg (44 lb.)
2. The TubeChek-B is not approved for use with the King LTS-D.

PRECAUTIONS

1. Aspirated food particles or tracheal compression may prevent free bulb filling.
2. Severe pulmonary edema, asthma, or obesity may lead to equivocal results from delayed bulb filling.
3. If ventilation is performed through the ET tube prior to TubeChek-B, use extreme caution and use direct laryngoscopy to confirm tube placement.
4. Care should be taken if temperature is near freezing. The bulb will not function properly if it becomes very cold due to loss of self-inflating capabilities.
5. The TubeChek-B is not helpful for confirming on-going tube placement as ventilations can give a false positive result.
6. This device is meant to be an adjunct to assess tracheal intubation. Its purpose is not to eliminate clinical judgment. If TubeChek-B results are not conclusive, the ET tube should be confirmed by alternative methods (fog in tube, equal bilateral chest rise, absent epigastric sounds, appropriate waveform capnography).

PROCEDURE

1. Test the device for air leak. Compress the bulb, then apply gloved thumb over tracheal adapter and release compression. If air fills bulb or any leak is detected, do not use.
2. Insert endotracheal tube. Stabilize the tube with one hand, remove stylet, and inflate cuff.
3. Compress the TubeChek-B bulb and attach it to the ET tube PRIOR to ventilation.
4. Allow the TubeChek-B bulb to self-inflate.
 - A. If air returns and fills bulb rapidly (< 5 seconds), the ET tube is likely in the trachea. Remove TubeChek-B and proceed with further assessment (lung sounds, chest rise, etc.)
 - B. If air slowly fills the bulb (5 - 30 seconds), the tube is likely in the trachea, but one of the following conditions possibly exists. Confirm ET tube location with direct laryngoscope visualization. If question exists, remove ET tube and reattempt after hyperventilating patient.
 1. The tube size is too large relative to the tracheal lumen.
 2. There is something partially obstructing the end of the tube.
 3. There is laryngospasm.
 4. The bevel of the tube is partially against the tracheal wall, or
 5. The tube slipped too deep as the stylet was withdrawn and the TubeChek attached; check placement again at 21 - 22 cm at lip.
 - C. If air does not fill the bulb or vomit returns, the ET tube is likely in the esophagus. Remove the ET tube and reattempt intubation after hyperventilating patient.

END-TIDAL CARBON DIOXIDE DETECTION (EASY CAP™)

INTRODUCTION:

Carbon dioxide (CO₂) is a byproduct of respiration. Approximately 5% of the exhaled air of a healthy patient is carbon dioxide. End-tidal CO₂ (EtCO₂) detection devices are useful in identifying the correct placement of an advanced airway (ETT, King LTS-D). The Easy Cap CO₂ detector is a disposable chemical indicator that can be used for up to three hours. It works by detecting EtCO₂ on the following color scale:

- Range A (purple): < 0.5% EtCO₂
- Range B (tan): 0.5 - 2.0% EtCO₂
- Range C (yellow): > 2.0% EtCO₂

INDICATIONS

1. To assist in determining correct advanced airway placement patients > 15 kg (33 lb.)

PRECAUTIONS

1. In low perfusion states, such as cardiac arrest, the production of CO₂ is significantly diminished and therefore, dramatic color changes may not be evident. In these cases, if the detector remains purple, reassessment of other correct tube placement indicators is crucial.
2. EtCO₂ detectors should always be used in conjunction with other assessments such as lung sounds, chest rise, ET tube locator, absence of gastric sounds, tube fogging, pulse oximetry, syringe aspiration technique, and direct visualization (in the case of ET intubation). Never rely entirely on EtCO₂ detection as the sole method of assessment for tube placement.
3. A patient who has received mouth to mouth ventilation may exhibit false positive readings.
4. A patient that has recently consumed carbonated beverages may cause a false positive reading if ventilation is attempted through a tube placed in the esophagus.

PROCEDURE

1. Perform advanced airway management per guideline.
2. Assess tube placement by using TubeChek, listening for lung sounds, gastric sounds, and looking for chest rise.
3. After 6 - 7 ventilations, place the Easy Cap device on the ET tube, appropriate ventilation port of the King LTS-D and continue ventilating the patient. If placement is correct, the device should change color from purple to tan (or possibly yellow) with each ventilation. A color change is a positive indication of correct tube placement.
4. If the color does not change, and other assessment indicators are positive or questionable for correct tube placement, IMMEDIATELY USE DIRECT VISUALIZATION TO DETERMINE TUBE POSITION. REMOVE ANY TUBE WHOSE POSITION CANNOT BE CONFIRMED.
5. The EtCO₂ detector should be removed after placement has been confirmed, but may be used again to reassess tube placement. This is a single patient use device.
6. Document results of EtCO₂ detection on run report form.

PEDIATRIC CONSIDERATIONS

1. The Pedi-CAP™ EtCO₂ detector should be used on patients 1 - 15 kg.

SPECIAL NOTES

1. Ensure package has not been opened and the detector is not expired.



Heimlich Maneuver

HEIMLICH MANEUVER

INDICATIONS

Sudden onset of respiratory distress often with coughing, wheezing, gagging, or stridor due to a foreign-body obstruction of the upper airway.

PROCEDURE

1. Assess the degree of foreign body obstruction
 - A. Do not interfere with a mild obstruction allowing the patient to clear their airway by coughing.
 - B. In severe foreign-body obstructions, the patient may not be able to make a sound. The victim may clutch his/her neck in the universal choking sign.
2. **For an infant**, deliver 5 back blows (slaps) followed by 5 chest thrusts repeatedly until the object is expelled or the victim becomes unresponsive.
3. **For a child**, perform a subdiaphragmatic abdominal thrust (Heimlich Maneuver) until the object is expelled or the victim becomes unresponsive.
4. **For adults**, a combination of maneuvers may be required.
 - A. First, subdiaphragmatic abdominal thrusts (Heimlich Maneuver) should be used in rapid sequence until the obstruction is relieved.
 - B. If abdominal thrusts are ineffective, chest thrusts should be used. Chest thrusts should be used primarily in morbidly obese patients and in the patients who are in the late stages of pregnancy.
5. If the victim becomes unresponsive, begin CPR immediately but look in the mouth before administering any ventilations. If a foreign-body is visible, remove it.
6. **Do not perform blind finger sweeps in the mouth and posterior pharynx. This may push the object farther into the airway.**
7. In unresponsive patients, ALS providers should visualize the posterior pharynx with a laryngoscope to potentially identify and remove the foreign-body using Magill forceps.
8. Document the methods used and result of these procedures in the patient care report (PCR).

Hemorrhage Control Agents

HEMORRHAGE CONTROL AGENTS

INTRODUCTION

Hemorrhage control agents provide rapid hemostasis at the wound site, even when there is profuse bleeding.

INDICATIONS

1. Hemorrhage control agents are to be used as a topical application to control and manage a wound with severe bleeding.
2. Hemorrhage control agents can be used for actively bleeding open wounds.

PRECAUTIONS

1. Indicated for topical use only
2. Do not use on:
 - A. Sucking chest wounds
 - B. Open brain injuries
 - C. Open fractures with exposed bone
3. Do not use if foil package has been opened or damaged
4. Hemorrhage control agents are not intended for intravenous application

PROCEDURE – EXCELARREST XT FOAM HEMOSTAT PAD

1. Tear open the ExcelArrest pouch and remove the pad.
2. Blot excess blood from the wound with a gauze pad.
3. Apply ExcelArrest foam to cover the wound **with the tan backing face up**.
4. Apply gauze over foam and press firmly for 5 minutes.
5. With foam in place, wrap and secure bandage around wound to maintain pressure.
6. Discard any unused product after opening.

PROCEDURE – BLEEDARREST CP

1. Tear open BleedArrest pouch.
2. Blot excess blood from the wound with gauze pad.
3. Apply liberal amount of BleedArrest particles to cover wound.
4. Using gauze, firmly apply pressure to the wound for 5 minutes. If bleeding continues, apply more BleedArrest and repeat step 4.
5. Wrap and secure bandage around wound to maintain pressure.
6. Discard any unused product after opening.

PEDIATRIC CONSIDERATIONS

Both products can be used on all pediatric patients

SPECIAL NOTES – EXCELARREST XT FOAM HEMOSTAT PAD

1. This product comes in 2x2, 2x4, and 4x4 sizes. This guideline covers the use of all sizes commercially available.
2. If this product need to be removed in the emergency department, please instruct the ED staff to irrigate one edge of the dressing with normal saline in a standard syringe and apply firm upward pressure slowly.
3. Removal of this product may cause the clot to dislodge, leading to additional bleeding at the wound site.

SPECIAL NOTES – BLEEDARREST CP

1. This product comes in a 20g bellows, a 100g pouch, and a 225g pouch.
2. Thorough irrigation of the product from the wound can be accomplished with normal saline in the emergency department prior to wound closure.



Intranasal Administration

INTRANASAL MEDICATION ADMINISTRATION

INDICATIONS

1. For use in adult and pediatric patients for whom IV/IO access is anticipated or known to be difficult to obtain.
2. Naloxone, midazolam, fentanyl, and ondansetron are the ONLY medications approved for administration via IN. See the respective medication guideline for correct dosing.

PRECAUTIONS

1. Do not use in patients with epistaxis or with excessive nasal discharge or congestion.

PROCEDURE

1. Determine the appropriate medication dose per medication protocol.
2. Draw the medication into the syringe and place the atomizer device on the end of syringe and screw into place.
3. Gently place the atomizer into the nares, stop when resistance is met.
4. Rapidly administer the medication.
5. Document the results in the patient care record.

SPECIAL NOTES

Maximum volume delivery per nostril should be no greater than 1mL.

Intraosseous (IO) Infusion

INTRAOSSIOUS (IO) INFUSION: LD, AD, AND PD EZ-IO™

INDICATIONS

1. Patients in critical need of vascular access for volume replacement or medication administration and who have either poor vein selection or in whom one or two intravenous attempts have failed. If a patient needs immediate access for medications or fluid therapy, the EZ-IO may be used in patients who are alert and oriented.
2. Pediatric needle (PD) weight guide = 3-39 kg, Adult needle (AD) >40 kg, bariatric needle (LD) as indicated by patient tissue depth over insertion site.
3. Decreased level of consciousness (GCS < 6 with no purposeful movement) due to medical or traumatic insult or injury.

CONTRAINDICATIONS

1. Patients known, or appearing to be, under 3 kg.
2. Fracture of bone to be used for insertion
3. Joint replacement adjacent to insertion bone
4. Severe osteoporosis or tumor of the selected extremity
5. Infection over the insertion site
6. Inability to locate landmarks for insertion
7. Excessive tissue over the insertion site which precludes identification of landmarks

PROCEDURE

1. Assemble and prepare all equipment and BSI, including a bag of normal saline with tubing purged.
2. Prep site with Betadine or alcohol prep.
3. Locate the appropriate landmarks for insertion site:
 - A. **Proximal Tibia** – Insertion site is approximately 2 cm below the patella and approximately 2 cm (depending on patient anatomy) medial to the tibial tuberosity.
 - B. **Distal Tibia** - Insertion site is located approximately 3 cm proximal to the most prominent aspect of the medial malleolus. Place one finger directly over the medial malleolus; move approximately 2 cm (depending on patient anatomy) proximal and palpate the anterior and posterior borders of the tibia to assure that your insertion site is on the flat center aspect of the bone.
 - C. **Proximal Humerus** – Insertion site is located directly on the most prominent aspect of the greater tubercle. Slide thumb up the anterior shaft of the humerus until you feel the greater tubercle, this is the surgical neck. Approximately 1 cm (depending on patient anatomy) above the surgical neck is the insertion site. *Ensure that the patient's hand is resting on the abdomen and that the elbow is adducted (close to the body).*
4. Open the EZ-IO cartridge and attach the needle set to the driver (there should be a snap).
5. Remove the cap from the needle by rotating clockwise until loose and pulling it free.
6. Stabilizing the bone with one hand, position the driver over the site at a 90 degree angle to the bone surface and power the needle through the skin **only to the bone surface**.
7. Ensure the 5 mm mark (closest to the flange) on the catheter is visible. If the mark is not visible, do not proceed as the needle set is not long enough to penetrate the IO space.
8. Apply gentle pressure to drill and power needle set into the bone until a sudden lack of resistance is felt.
9. While supporting the needle set with one hand, pull straight back on the driver to detach it from the needle set.
10. Grasping the hub firmly with one hand, rotate the stylet counter clockwise until loose, pull it from the hub, place it in the stylet cartridge, and place in a biohazard container.
11. Confirm placement by: visible blood at the tip of the stylet, free flow of IV fluid without evidence of leakage or extravasation. A cold and hard area on the extremity below the insertion site is sign of extravasation.
12. If the patient responds to pain (GCS>8), administer Lidocaine, 40 mg IO slowly (30 sec.) (Pediatric dose – 0.5 mg/kg).
13. Rapidly infuse a 10 cc flush of N.S.
14. Secure catheter and IV tubing with tape.
15. Watch for soft tissue swelling.

Intraosseous (IO) Infusion

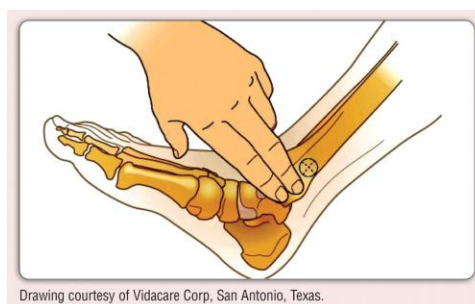
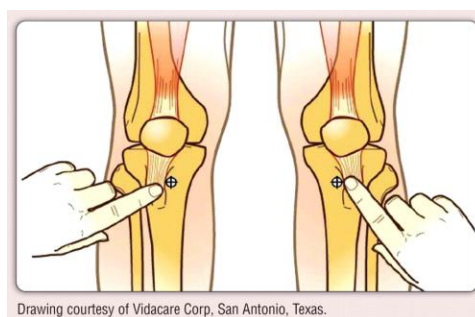
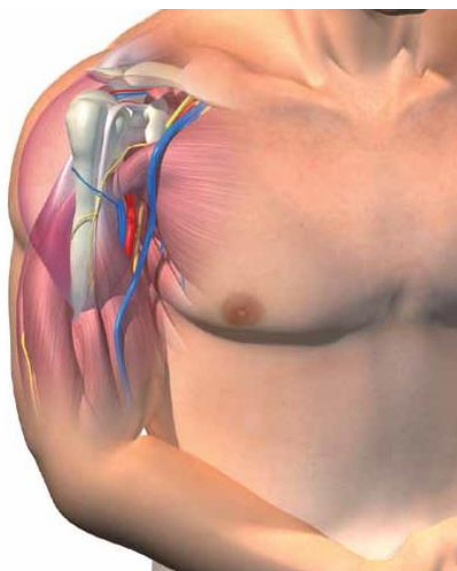
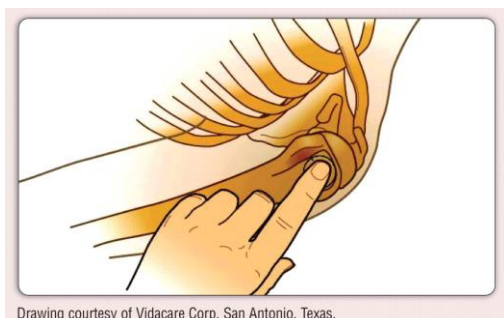
PEDIATRIC CONSIDERATIONS

In addition to the tibial site, the distal femur is an approved site by RHEMS for placement of the EZ-IO. The placement procedure is the same as above except for the following:

1. Locate the appropriate landmarks for insertion site:
 - a. Femoral placement = patella, distal condyles of femur.
 - b. Appropriate placement location = 3 finger widths above and exactly between the distal condyles of the femur. If placement of the EZ-IO at the femoral site fails with the driver, manual insertion is permitted. The technique for manual insertion is identical to driver placement, with the following exception:
 1. After locating the appropriate landmark and insertion site, attach large syringe with a luer-lock end to the needle.
 2. Keeping the needle perpendicular to the bone surface, manually twist the needle and syringe through the skin to the bone surface.
 3. Ensure the 5 mm mark (closest to the flange) on the catheter is visible. If the mark is not visible, do not proceed as the needle set is not long enough to penetrate the IO space.
 4. Apply firm pressure and twist the syringe in a clockwise fashion into the bone until a sudden lack of resistance is felt.

SPECIAL NOTES

1. If drip rate is slow, flush with 10 cc normal saline. If slow drip continues, consider inflating BP cuff on bag to 300 mm/Hg.
2. All medications and blood or blood products that are given via the IV route may be given IO.
3. Device may be left in place for up to 24 hours.
4. Use caution giving lidocaine in the patient who only has a ventricular rhythm.
5. The device can be removed by grasping the catheter hub and rotating while pulling gently. A syringe can be attached if a larger handle is desired (rotate clockwise).



Intravenous Infusion

INTRAVENOUS (IV) INFUSION

INDICATIONS/NORMAL SALINE 1000 cc BAG

1. Bleeding or potential bleeding from traumatic or non-traumatic causes, e.g. ectopic pregnancy, GI bleed, abdominal pain
2. Hypotension/dehydration from other causes, i.e. septicemia, hypothermia, anaphylaxis, spinal cord injury, protracted vomiting or diarrhea
3. Burn patients with arrhythmia, hypotension, delayed transport times, or need for analgesia
4. Diabetics with BS > 240 mg/dL, with signs of dehydration or when it is unclear if the situation is diabetic ketone acidosis.
5. Fluid challenges
6. Cardiac or respiratory arrest.

INDICATIONS/NORMAL SALINE 250 or 500 cc BAG

1. Anticipated need for medication administration in nonhypovolemic medical conditions such as chest pain, isolated head injuries with brief LOC, confusion or amnesia, seizures, hypoglycemia, shortness of breath, drug overdose, tachycardia > 120, hypertension with systolic BP > 200 and CVAs.
2. All non-traumatic pediatric patients (\leq 12 years) requiring IV.

INDICATIONS/SALINE LOCK

1. Any patient > 12 years, not requiring volume replacement or multiple medication administration.

PEDIATRIC CONSIDERATIONS

1. In the arrested or unconscious patient < 8 years, IO is the preferred vascular access route.

SPECIAL NOTES

1. Vascular access may be established prior to medical control contact.
2. For penetrating, thoracic, or abdominal trauma and all trauma patients with a systolic BP < 90 or pulse > 120, attempts at IV insertion should not delay transport. Obtain IV access enroute in these patients unless there is prolonged extrication.
3. The Needle-Lock™ device should be used on all piggyback IVs. It eliminates the need for a separate needle and secures the piggyback line better than tape.
4. Distal sites, such as the forearm, are preferred in non-critical patients. The antecubital and external jugular site can be used in cases where rapid cannulation is required, i.e. cardiac arrest or severe trauma.
5. Hickman catheters®, peripherally inserted central catheter (PICC), implanted central venous access lines (Portacath®) and AV shunts should not be used for prehospital venous access, except by trained paramedics only, when the patient is in critical need of venous access and an IV is unavailable. Avoid placing IVs in the same extremity as shunts if possible.
6. Document site, type fluid, rate, needle gauge, and total volume infused.
7. If IV solutions have been “setup” (tubing inserted into bag) prior to use, the date and time of the setup must be documented on the IV bag. This setup must be used within 24 hours of the time it was prepared.

IMPEDANCE THRESHOLD DEVICE (ITD) - ResQPod™

INTRODUCTION

An inspiratory impedance threshold device is a valve used in cardiopulmonary resuscitation (CPR) to decrease intrathoracic pressure and improve venous return to the heart.

INDICATIONS

1. The ITD should be utilized to assist with control of ventilatory rate and improve cardiac preload for patients who are receiving CPR.
2. It may be utilized with an endotracheal tube, supraglottic airway device, or with a BVM.

CONTRAINDICATIONS

1. The ITD should not be utilized for patients who have spontaneous respirations. It should be removed from the endotracheal tube/BVM once spontaneous respirations have returned.
2. The ITD should not be used for traumatic cardiac arrest.

PROCEDURE

1. Ensure airway is adequate per airway/failed airway guideline.
2. Place the ITD between the airway device and the EtCO₂ detector (for intubated/BIAD patients) or between the bag and mask (for patients ventilated with the BVM).
3. Flip the red switch to the "on" position so that the respiratory timing lights flash.
4. Provide a ventilation after each flash of the LED timing lights.
5. Perform chest compressions as indicated.
6. Once there is return of spontaneous circulation, remove the ITD. Place the device near the patient's head so that it may be replaced if the patient rearrests, and can be used to guide ventilations once removed. The ITD should also be removed if the patient has spontaneous respirations.
7. Carefully monitor the placement of the endotracheal tube after movement of the patient, placement of the ITD, and/or removal of the ITD.
8. Document the procedure and results in the Patient Care Report (PCR).

OXIMETRY

INTRODUCTION

The use of pulse oximetry aids in the assessment of respiratory function in the field. The pulse oximeter allows for non-invasive monitoring of oxygen saturation (the percent of hemoglobin saturated with oxygen; referred to as SpO₂ or O₂ sat. A normal SpO₂ for healthy individuals is 95-100%. A low ($\leq 93\%$) or falling SpO₂ indicates that the airway or ventilatory status may be compromised.

INDICATIONS

1. Respiratory distress/complaints
2. Cardiac problems
3. Multiple system trauma
4. Poor color
5. Patients requiring use of airway adjuncts and/or assisted ventilations
6. Suspected shock
7. Altered level of consciousness

PRECAUTIONS

1. Patients with hemoglobin disorders such as CO poisoning, anemia, and methemoglobinemia may give artificially high SpO₂ readings. Readings in such patients should be interpreted with extreme caution.
2. Pulse oximetry readings may be difficult to obtain in states of low perfusion.

PROCEDURE FOR PATIENTS WITH SpO₂ < 90% OR FALLING SpO₂

1. Check airway and manage as indicated.
2. Increase oxygen delivery (increase liter flow) and/or assist ventilation.
3. Check pulse oximetry device placement. Possible causes of inaccurate readings include:
 - A. Excessive probe movement
 - B. Optical interference by bright light (direct sunlight, fluorescent and xenon arc lighting). Cover the sensor.
 - C. Poor waveforms/signals (hypovolemia, hypothermia, profound hypotension, or vasoconstriction)
 - D. Artificial fingernails and certain dark colored nail polishes may interfere with use.

PEDIATRIC CONSIDERATIONS

1. Special probes may be required to obtain readings in pediatric patients.

SPECIAL NOTES

1. Best probe site in adults is usually the middle fingertip with nail polish removed.
2. Attempt to obtain and document pulse oximetry readings before and during oxygen therapy.
3. The use of pulse oximetry as a vital sign is encouraged, as the oximeter may be helpful in detecting hypoxia not evidenced by signs or symptoms.



Pericardiocentesis

PERICARDIOCENTESIS

INDICATIONS

For use on adult patients with suspected cardiac tamponade or pericardial effusion as evidenced by:

1. Pulsus paradoxus: decline > 10 mmHg systolic pressure during normal inspiration
2. Narrowing of pulse pressure: falling systolic BP with rising diastolic BP
3. Hypotension (late sign)
4. Jugular vein distention
5. Pulseless electrical activity (PEA)
6. Faint heart sounds on auscultation

PRECAUTIONS

1. Pneumothorax or hemopneumopericardium may result from leaving needle open to air.
2. The Protectiv™ IV catheter must not be used for this procedure.

PROCEDURE

1. This procedure may be performed on any patient in extremis prior to physician order.
2. Identify landmarks (costal margin, xiphoid process).
3. Prepare site (attempt to maintain sterility as much as possible).
4. Cleanse site with povidone-iodine (Betadine).
5. Use a 16 or 18 gauge cardiac needle (6").
6. Insert the needle at the xiphocostal angle approximately 30° aiming at the left nipple.
7. Advance the needle toward the ipsilateral nipple while applying a slight negative pressure on the syringe.
8. As you advance the needle into the pericardial sac you may feel a slight give. Begin to withdraw 50-100 cc of blood or fluid.
9. Remove the needle following procedure. Apply direct pressure as necessary to control bleeding.
10. Monitor patient for cardiac ectopy. Assess for any improvement in hemodynamic status.
11. Notify medical control that procedure has been performed.
12. Contact the EMS on-call clinical supervisor for procedure follow-up.

PEDIATRIC CONSIDERATIONS

1. Use the same size needle (6") for children.

SUPRAGLOTTIC AIRWAY: KING LTS-D

INTRODUCTION

Supraglottic airways are designed to provide a patent airway in a cardiac arrest, or as a rescue airway when endotracheal intubation is unsuccessful. Regions EMS currently recommends use of the KING LTS-D airway as the supraglottic airway for providers to use within the system. It is designed to provide a patent airway for patients without an intact gag reflex as an alternative to endotracheal intubation or when endotracheal intubation is not possible. This device is designed to be placed blindly. The gastric access lumen allows for passage of a gastric tube up to 18 Fr.

INDICATIONS

1. Patients in cardiac arrest
2. Patients with respiratory arrest
3. Medication assisted airway management when ETI is not used

CONTRAINDICATIONS

1. Intact gag reflex
2. Patient's height less than manufacturer's recommendations for device
3. Known esophageal disease
4. Caustic substance ingestion
5. Known or suspected airway burns
6. Anaphylaxis with respiratory symptoms
7. Known or suspected airway obstruction.

PROCEDURE

1. Apply chin lift and introduce the KING airway into the corner of the mouth
2. Advance the tip under the base of the tongue while rotating the tube back to the midline
3. Without exerting excessive force, advance tube until the base of the connector is aligned on the teeth or gums
4. Inflate the cuff to 60–80 ml
5. Attach the BVM. While gently bagging the patient to assess ventilation, simultaneously withdraw the airway until ventilation is easy and free flowing (large tidal volume with minimal airway resistance)
6. Secure the device using the larger Thomas tube holder
7. Lubricate and insert a 16 Fr. gastric tube into the gastric access lumen

SPECIAL NOTE

1. It may be advisable to partially insert the gastric tube before introduction of the device into the patient, in an attempt to slow any return of gastric contents through the gastric lumen. There is no check valve on that lumen to prevent backflow.



Surgical Airway

SURGICAL CRICOTHYROTOMY – SKLAR HOOK

ACTION

To ventilate a patient who has a complete airway obstruction that cannot be ventilated adequately by any other means.

INDICATIONS

Complete airway obstruction caused by:

1. Foreign body obstruction of the proximal airway
2. Laryngeal fracture
3. Laryngeal edema caused by inhaled materials, burns, or anaphylaxis
4. Epiglottitis
5. Massive Maxillofacial injury causing complete upper airway obstruction

CONTRAINDICATIONS

1. Ability to ventilate patient by any other means (BVM, oral airways, rescue airway, ETI)
2. Laryngeal fractures that have distorted or obliterated landmarks
3. Less than 8 years of age

PRECAUTIONS

1. May cause false passage, subcutaneous emphysema, and bleeding.
2. Use with caution in patients with bleeding disorders.

PROCEDURE

1. If possible, provide optimal O₂ saturation of the patient before starting the procedure.
2. Take appropriate BSI precautions
3. Identify the cricothyroid membrane and clean with Betadine, followed by alcohol.
4. Make a vertical mid-line incision approximately 1.5" long with a #10 scalpel over the cricothyroid membrane into the underlying strap of muscle.
5. Insert the Sklar hook into the membrane perpendicular to the trachea. Once the Sklar hook is in the trachea, rotate towards the patient's feet and lift upward and caudad (towards the patient's feet) traction.
6. Use the scalpel to open transversely into the trachea through the cricothyroid membrane, keeping the blade near or against the Sklar hook.
7. Using cricoid pressure, insert index finger into the incision.
8. Introduce a 6.0 ETT perpendicular to the trachea, rotating as it is advanced (Tracheal Tube introducer may be used).
9. Inflate the cuff with 5-10 cc of air.
10. Confirm placement with the Endotracheal Tube Locator (Tubeshock-B), electronic EtCO₂, auscultating epigastric area and bilateral lung sounds.
11. Secure tube with appropriate ET tube securing method or device.
12. Position patient on backboard and secure head with V-block.
13. Monitor patient for evidence of subcutaneous air.
14. Contact the on-call EMS Clinical Supervisor for procedure follow-up.

PEDIATRIC CONSIDERATIONS

1. Contraindicated in children under 8 years of age.

SPECIAL NOTES

1. The ET tube must be left in place when a patient is pronounced dead in the field.
2. Clean, disinfect, and return Sklar hook, according to your services policies.

Taser Probe Removal

TASER PROBE REMOVAL

INTRODUCTION

Taser probes are barbed metal projectiles that may embed themselves up to 13 mm into the skin.

INDICATIONS

1. Patient with uncomplicated conducted electrical weapon (Taser®) probes embedded subcutaneously in non-sensitive areas of skin.

CONTRAINDICATIONS

1. Patients with conducted electrical weapon (Taser®) probe penetration in vulnerable areas of body as mentioned below should be transported for further evaluation and probe removal
 - A. Skin above level of clavicles
 - B. Female breasts
 - C. Genitalia
 - D. Suspicion that probe might be embedded in bone, blood vessel, or other sensitive structure.

PROCEDURE

1. Ensure wires are disconnected from weapon.
2. Stabilize skin around probe using non-dominant hand.
3. Grasp probe by metal body with pliers or hemostats to prevent puncture wounds to EMS personnel.
4. Remove probe in single quick motion.
5. Wipe wound with antiseptic wipe and apply dressing.



Tourniquets

TOURNIQUETS

INTRODUCTION

Tourniquets have long been a source of controversy because of the problems associated with their use (ischemia, nerve injury, etc). Recent advances in military medicine have improved the design and allowed for increased use for civilian EMS.

INDICATIONS

1. Penetrating trauma from firearms and stabbings involving severe hemorrhage
2. Incidents involving blast injuries to extremities
3. Incidents resulting from industrial or farm accidents involving severe hemorrhage
4. Multiple causality injuries and lack of resources to handle hemorrhage control

CONTRAINDICATIONS

1. Any bleeding that can be managed by direct pressure, elevation, or cold pack administration.
2. Major bleeding to a non-extremity

PROCEDURE

1. Recognition that bleeding is uncontrollable with direct pressure
2. Apply tourniquet to the proximal segment of the bleeding limb
3. Tighten device until bleeding is stopped and secure device
4. Transport patient to trauma center and report time of placement

SPECIAL NOTE

If transport to trauma center will be greater than 30 minutes, reassess tourniquet for possible removal

Tracheal Tube Introducer

TRACHEAL TUBE INTRODUCER

INTRODUCTION

The tracheal tube introducer is a gum-elastic bougie (intubating bougie) that is an adjunct for difficult endotracheal intubations.

INDICATIONS

1. For directional control during routine or difficult endotracheal intubations when the laryngeal inlet cannot be completely seen
2. May be used as a tracheal tube exchanger.

PRECAUTIONS

1. Excessive force, passage beyond the carina, or blind introduction may result in soft tissue damage or rupture the bronchus.
2. ET tube should not be threaded over the introducer without the laryngoscope in place.

CONTRAINDICATIONS

1. None

PROCEDURE

1. A 15 French introducer should be used for ET tube sizes 6.0 to 11.0.
2. Lubricate introducer with KY jelly.
3. Perform laryngoscopy. If cords not visible, identify landmarks to aid intubation.
4. Place introducer into the pharynx and direct into larynx. If necessary, bend the introducer to negotiate the corner. Correct placement may be confirmed by detection of tracheal "clicks".
5. Leave laryngoscope in place while assistant threads ET tube over introducer into trachea. If tube stick at laryngeal inlet, a 90° counterclockwise rotation may help.
6. Hold the tube firmly in place and gently withdraw the introducer.
7. Remove laryngoscope and confirm tube placement as usual.
8. If preferred, the ET tube may be placed over the introducer prior to intubation, instead of using stylet.

PEDIATRIC CONSIDERATIONS

1. A 10 French introducer should be used for ET tube sizes 4.0 to 5.5. This is a recommended but optional piece of equipment for ALS services.



Transcutaneous Pacing

TRANSCUTANEOUS PACING

INDICATIONS

1. Patients with symptomatic bradycardia (less than 60 per minute) with signs and symptoms of inadequate cerebral or cardiac perfusion such as:
 - A. Chest Pain
 - B. Hypotension
 - C. Pulmonary Edema
 - D. Altered Mental Status, Confusion, etc.
 - E. Ventricular Ectopy
2. In Asystole, pacing must be done early to have any chance of effectiveness.
3. In PEA, where the underlying rhythm is bradycardic and reversible causes have been treated.

PROCEDURE

1. Attach standard three-lead monitor.
2. Apply defibrillation/pacing pads to chest and back:
 - A. One pad to left mid chest next to sternum
 - B. One pad to mid left posterior chest next to spine.
3. Select pacing option on monitor unit.
4. Adjust heart rate to 70 BPM for an adult and 100 BPM for a child.
5. Note pacer spikes on EKG screen.
6. Slowly increase output until capture of electrical rhythm on the monitor.
7. If unable to capture while at maximum current output, stop pacing immediately.
8. If capture observed on monitor, check for corresponding pulse and assess vital signs.
9. Consider the use of sedation or analgesia if patient is uncomfortable.
10. Document the dysrhythmia and the response to external pacing with ECG strips in the PCR.

WOUND CARE

INDICATIONS

Protection and care for open wounds prior to and during transport.

GENERAL WOUND CARE PROCEDURES

1. Use personal protective equipment, including gloves, gown, and mask as indicated.
2. If active bleeding, elevate the affected area if possible and hold direct pressure. Do not rely on "compression" bandage to control bleeding, unless you are able to frequently re-evaluate the wound for adequate hemostasis. Direct manual pressure is much more effective.
3. Consider tourniquet early for extremity bleeding unable to be controlled with direct pressure.
4. Once bleeding is controlled, irrigate severely contaminated wounds with saline as appropriate (this may have to be avoided due to extreme pain or if bleeding was difficult to control). Consider analgesia per protocol prior to irrigation.
5. Cover wounds with sterile gauze/dressings. Check distal pulses, sensation, and motor function to ensure the bandage is not too tight.
6. Monitor wounds and/or dressings throughout transport for bleeding.
7. Document the wound and assessment and care in the patient care report (PCR).



Forms

Forms

Forms



Forms

Form

- Emergency Transport and/or Treatment Hold Form
- EMPAC Quality Improvement Form
- Good Samaritan Information: Blood or Body Fluid Exposure
- Medication Variance Report
- Minnesota Medical Association Emergency Resuscitation Guidelines
- Minnesota Medical Association POLST Form

For use when applying for admission of a person on an emergency hold order. The term "Peace Officer" means a sheriff, municipal or other local police officer, or state patrol officer. The term "Health Officer" means a licensed physician, licensed psychologist, licensed social worker, psychiatric or public health nurse, advance practice registered nurse, emergency room registered nurse, or a formally designated member of a pre-petition screening unit.

Health or Peace Officer's Statement (M.S. 253B.05 (subd. 2))

I am a _____ with _____ and am hereby making a written application
(Title or Position) (Agency)
to the head of the treatment facility for the admission of _____ of _____.
(Patient's Full Name) (County)

I believe that this person is mentally ill, developmentally disabled or chemically dependent and in danger of injuring self or others if not immediately detained; or is intoxicated in public.

THE REVERSE SIDE OF THIS FORM MUST ALSO BE COMPLETED BY THE HEALTH OR PEACE OFFICER.

Printed Name and Signature	Title	Date	Time <input type="checkbox"/> AM <input type="checkbox"/> PM
----------------------------	-------	------	--

Medical Officer on Duty Statement (M.S. 253B.05 (subd. 2(b)))

I am a medical officer on duty at _____ treatment facility and upon preliminary examination find that this patient **(has) (does not have)** symptoms of mental illness or developmental disability and **(appears) (does not appear)** to be in danger of injuring self or others if not immediately detained, and thereby **(recommend admission) (do not recommend admission)** to this treatment facility.

OR:

I am the institution program director, or designee on duty at _____ treatment facility, and upon preliminary examination find that this patient **(has) (does not have)** symptoms of chemical dependency and **(appears) (does not appear)** to be in danger of injuring self or others if not immediately detained or **(is) (is not)** intoxicated in public, and thereby **(recommend admission) (do not recommend admission)** to this treatment facility.

Printed Name and Signature	Title	Date	Time <input type="checkbox"/> AM <input type="checkbox"/> PM
----------------------------	-------	------	--

Consent of Head of Treatment Facility

I am the head of the _____ treatment facility or designee and
(consent) (do not consent) to the admission of _____ to this treatment facility.
(Patient's Full Name)

Printed Name and Signature	Title	Date	Time <input type="checkbox"/> AM <input type="checkbox"/> PM
----------------------------	-------	------	--

Initial Assessment (M.S. 253B.06)

Pursuant to M.S. 253B.06 (subd. 1), I hereby declare that I am a physician knowledgeable and trained in the diagnosis of the alleged disability and have examined this person within 48 hours of admission to this treatment facility, and in my opinion there is an apparent need for care, treatment, and evaluation as a person with a mental illness or developmental disability.

OR:

Pursuant to M.S.253B.06 (subd. 2.), I hereby declare that this person has been examined according to procedures established by a physician and that I am a staff person knowledgeable and trained in the diagnosis of the alleged disability and in my opinion there is an apparent need of admission as a person with chemical dependency.

Printed Name and Signature	Title	Date	Time <input type="checkbox"/> AM <input type="checkbox"/> PM
----------------------------	-------	------	--

If you ask, we will give you this information in another format, such as Braille, large print or audiotape.

Facility Name:

Patient Name:

Birthdate:

Sex:

In the space provided below, please identify the specific reasons for the circumstances under which the person was taken into custody. **You must include a statement with identifying information regarding any individuals who might be endangered if this person is not held.** Please print.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

<p>If you ask, we will give you this information in another format, such as Braille, large print or audiotape.</p>	<p>Facility Name:</p> <p>Patient Name:</p> <p>Birthdate:</p> <p>Sex:</p>	
<p>Side Two Created 03/2006 – Updated 08/2009</p>		

EAST METRO PREHOSPITAL
ADVISORY COMMITTEE
QUALITY IMPROVEMENT FORM

PEER REVIEW
CONFIDENTIAL

This form should be used to document any comments involving patient care within the East Metro System. If additional space is needed, please use a separate piece of paper and attach it to this form. **Submit this form to YOUR AGENCY'S PEER REVIEW COMMITTEE. Your peer review committee will examine the form and determine whether or not this form will be forwarded to the other involved agency's peer review committee.**

Date of Occurrence: _____ Time of Occurrence: _____ EMS Run Number: _____

Agency Involved: _____

Personnel Involved: _____

Patient Name: _____ Receiving Hospital: _____

Describe Incident (attach pertinent additional documentation):

Please address the following:

(Form will not be processed without the information listed below)

Requested By (print): _____

Address: _____ Zip: _____

Phone: _____ Pager: _____

This form has blue and red lettering and is on the host organizations letterhead.

DO NOT COPY

Considered privileged and confidential per MN Statute 145.61

GOOD SAMARITAN INFORMATION: BLOOD OR BODY FLUID EXPOSURE

Blood and body fluids from one person may be capable of transmitting certain diseases to another person. Some of the diseases that are of special concern include human immunodeficiency virus (HIV) infection (which causes AIDS), hepatitis and tetanus.

A person may become exposed to disease if they get blood or body fluids

- Into their eyes, mouth, nose or other mucous membrane
- On non-intact skin such as rashes or cuts
- Exposed to them by puncture of the skin with a needle or other contaminated object

If you believe that you have been exposed to someone else's blood or body fluids, it is important for you to be promptly evaluated by a doctor. Most exposures will not cause an infection, but it is important to determine the risk of your exposure. There are medications available that can reduce the likelihood that you will become infected if your exposure was significant. The sooner you are evaluated and treated, the more likely a doctor will be able to prevent or reduce the risk of your exposure. **If there is a chance that you have been exposed, you should take the following actions immediately:**

Actions:

1. If you were exposed in your mouth, eyes, nose or other mucous membrane, flush the areas with lots of water as soon as possible. If you were exposed through non-intact skin, wash the area with soap and water as soon as possible.
2. Seek medical attention at a hospital emergency room as soon as possible. Inform the doctor treating you that the patient you were exposed to was transported by ambulance. You will be given instructions for how to follow-up on your test results and the results of the source patient with your own doctor. It will be helpful to the hospital if you know which vaccines (such as tetanus and Hepatitis B) you have had.

MEDICATION VARIANCE REPORT

Date of discrepancy: _____ *to* _____ *(if date is different)*

Station/Location of discrepancy: _____

ERROR OCCURRED IN

___ Pyxis Med Station

___ CII Safe

___ EMS

___ Patient Medication Drawer

___ Hospital Tube System

Date of Report: _____

Medication involved: _____

(One form needed for each medication)

Access to Medication during same time period:

Name (print)

Signature

History of incident (attach any documentation and resolution research)

Completed by: _____

Name

Signature

MINNESOTA MEDICAL ASSOCIATION EMERGENCY RESUSCITATION GUIDELINES

CHECK ONE BOX: CATEGORY	RECOMMENDED ACTION	MEDICAL RESPONSE WILL PROVIDE	MEDICAL RESPONSE NOT PROVIDED
<input type="checkbox"/> CPR	Call 9-1-1	Full Treatment As Appropriate	
<input type="checkbox"/> DNR (No CPR)*	No 9-1-1 for Cardio- pulmonary Arrest May call 9-1-1 for Urgent Needs May Call Ambulance for Routine Transport Call M.D. or R.N.	Active Treatment up to the Point of Cardiopulmonary Arrest	If in Cardiopulmonary Arrest No Intubation No Ventilatory Assistance No Chest Compressions No Defibrillation
<input type="checkbox"/> Hospice or Comfort Care including DNR*	No 9-1-1 for Cardio- pulmonary Arrest Call M.D. or R.N. May Call Ambulance for Routine Transport or 9-1-1 for Urgent Needs	Comfort and Hygiene Care	If in Cardiopulmonary Arrest No Intubation No Ventilatory Assistance No Chest Compressions No Defibrillation

Patient/Client Name (Please print):

Optional Identifying Information: DOB Sex Race Eye Color Hair Color Height Weight

I understand this document identifies the level of care to be rendered in situations where death may be imminent. I make this request knowingly and I am aware of the alternatives. I expressly release, on behalf of my family, and myself all persons who shall in the future attend to my medical care of any and all liability whatsoever for acting in accordance with this request of mine. Furthermore, I direct these guidelines be enforced even though I may develop a diminished mental capacity at some future time. I am aware that I can revoke these guidelines at any time by simply expressing my request verbally or in writing to my caretaking family, physician, or designated health care provider, or by destroying this form with the intent to revoke it.

Patient/Client/Proxy/Agent or Authorized Signature Printed Name Relationship Date

I have witnessed the above signature:

Witness Signature Printed Name Address Phone # Date

Physician's Signature Printed Name Address Phone # Date

**THE ABOVE 3 SIGNATURES AND 3 DATES ARE REQUIRED FOR THIS FORM TO BE VALID AND ITS
INTENT CARRIED OUT!**

POLST: Provider Orders for Life Sustaining Treatment POLST

HIPAA PERMITS DISCLOSURE OF POLST TO OTHER HEALTH CARE PROVIDERS AS NECESSARY

PROVIDER ORDERS FOR LIFE-SUSTAINING TREATMENT (POLST)

FIRST follow these orders, THEN contact the patient's provider. This is a provider order sheet based on the patient's medical condition and wishes. POLST translates an advance directive into provider orders. Any section not completed implies the most aggressive treatment for that section. Patients should always be treated with dignity and respect.

Last Name

First/Middle Initial

Date of Birth

Primary Care Provider/Phone

A

Check
One

CARDIOPULMONARY RESUSCITATION (CPR):

Patient has no pulse and is not breathing.

☐

CPR/ATTEMPT RESUSCITATION

☐

DNR/DO NOT ATTEMPT RESUSCITATION (Allow Natural Death)

An automatic external defibrillator (AED) should not be used for a patient who has chosen "Do Not Attempt Resuscitation."

When not in cardiopulmonary arrest, follow orders in B and C.

B

Check
One
Goal

GOALS OF TREATMENT:

Patient has pulse and/or is breathing. See Section A regarding CPR if pulse is lost.

Additional Orders (e.g. dialysis, etc.)

☐

COMFORT CARE — Do not intubate but use medication, oxygen, oral suction, and manual clearing of airways, etc. as needed for immediate comfort.

Check all that apply:

☐ Avoid calling 911, call _____ instead

☐ If possible, do not transport to ER (when patient can be made comfortable at residence)

☐ If possible, do not admit to the hospital from the ER (e.g. when patient can be made comfortable at residence)

☐

LIMIT INTERVENTIONS AND TREAT REVERSIBLE CONDITIONS — Provide interventions aimed at treatment of new or reversible illness / injury or non-life threatening chronic conditions. Duration of invasive or uncomfortable interventions should generally be limited. (Transport to ER presumed)

Check one:

☐ Do not intubate

☐ Trial of intubation (e.g. _____ days) or other instructions: _____

☐ Intubate long-term if necessary

☐

PROVIDE LIFE SUSTAINING TREATMENT

Intubate, cardiovert, and provide medically necessary care to sustain life. (Transport to ER presumed)

C

Check
All That
Apply

INTERVENTIONS AND TREATMENT

ANTIBIOTICS (check one):

☐ No Antibiotics (Use other methods to relieve symptoms whenever possible.)

☐ Oral Antibiotics Only (No IV/IM)

☐ Use IV/IM Antibiotic Treatment

NUTRITION/HYDRATION (check all that apply):

☒ Offer food and liquids by mouth (Oral fluids and nutrition must always be offered if medically feasible)

☐ Tube feeding through mouth or nose

☐ Tube feeding directly into GI tract

☐ IV fluid administration

☐ Other: _____

Additional Orders:

Provider Name (MD/DO/NP/PA when delegated, are acceptable)

Provider Signature

Date

FAXED COPIES AND PHOTOCOPIES OF THIS FORM ARE VALID.

TO VOID THIS FORM, DRAW A LINE ACROSS SECTIONS A - D AND WRITE "VOID" IN LARGE LETTERS.

POLST

DCheck
All That
Apply**SUMMARY OF GOALS****DISCUSSED WITH:**☐**PATIENT**☐**PARENT(S) OF MINOR**☐**HEALTH CARE AGENT:** _____☐**COURT-APPOINTED GUARDIAN**☐**NONE**☐**OTHER:** _____**THE BASIS FOR THESE ORDERS IS PATIENT'S** (check *all* that apply):☐**REQUEST**☐**BEST INTEREST**☐**KNOWN PREFERENCE**☐**OTHER:** _____☐**HEALTH CARE DIRECTIVE/
LIVING WILL**

Name of Health Care Professional Preparing Form

Preparer Title

Phone Number

Date Prepared

E**SIGNATURE OF PATIENT OR HEALTH CARE AGENT / GUARDIAN / SURROGATE****THESE ORDERS REFLECT THE PATIENT'S TREATMENT WISHES**

Name

Date

Relationship to Patient

Phone Number

Signature*

DIRECTIONS FOR HEALTH CARE PROFESSIONALS**COMPLETING POLST**

- Must be completed by a health care professional based on patient preferences and medical indications.
 - If the goal is to support quality of life in last phases of life, then DNR must be selected in Section A.
 - If the goal is to maintain function and quality of life, then either CPR or DNR may be selected in Section A.
 - If the goal is to live as long as possible, then CPR must be designated in Section A.
- POLST must be signed by a physician, nurse practitioner, Doctor of Osteopathy, or Physician Assistant (when delegated). * The signature of the patient or health care agent / guardian/ surrogate is strongly encouraged.

USING POLST

- Any section of POLST not completed implies most aggressive treatment for that section.
- An automatic external defibrillator (AED) should not be used for a patient who has chosen "Do Not Attempt Resuscitation."
- Oral fluids and nutrition must always be offered if medically feasible.
- When comfort cannot be achieved in the current setting, the patient, including someone with "Comfort Measures Only," should be transferred to a setting able to provide comfort.
- An IV medication to enhance comfort may be appropriate for a patient who has chosen "Comfort Measures Only".
- Artificially-administered hydration is a measure which may prolong life or create complications. Careful consideration should be made when considering this treatment option.

- A patient with capacity or the surrogate (if patient lacks capacity) can revoke the POLST at any time and request alternative treatment.
- **Comfort care only:** At this level, provide only palliative measures to enhance comfort, minimize pain, relieve distress, avoid invasive and perhaps futile medical procedures, all while preserving the patients' dignity and wishes during their last moments of life. This patient must be designated DNAR status in section A for this choice to be applicable in section B.
- **Limit Interventions and Treat Reversible Conditions:** The goal at this level is to provide limited additional interventions aimed at the treatment of new and reversible illness or injury or management of non life-threatening chronic conditions. Treatments may be tried and discontinued if not effective.
- **Provide Life-Sustaining Care:** The goal at this level is to preserve life by providing all available medical care and advanced life support measures when reasonable and indicated. For patient's designated DNR status in section A above, medical care should be discontinued at the point of cardio and respiratory arrest.

REVIEWING POLST

This POLST should be reviewed periodically and a new POLST completed if necessary when:

1. The patient is transferred from one care setting or level to another, **or**
2. There is a substantial change in the patient's health status.
3. A new POLST should be completed when the patient's treatment preferences change.

Minnesota POLST — October, 2011



MINNESOTA
MEDICAL
ASSOCIATION

FAXED COPIES AND PHOTOCOPIES OF THIS FORM ARE VALID.

TO VOID THIS FORM, DRAW A LINE ACROSS SECTIONS A - D AND WRITE "VOID" IN LARGE LETTERS.

POLST**POLST**



Reference

Reference Section

Reference



Reference

Reference Topic

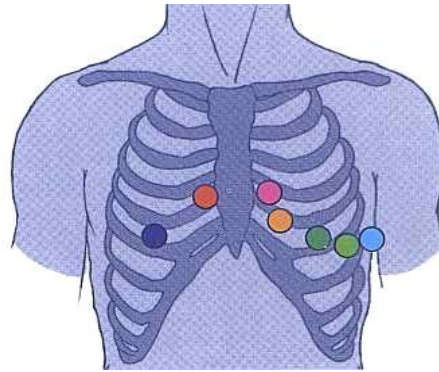
- 12-Lead ECG Systematic Approach
- Commonly Prescribed Medications
- Helicopter Landing Zone
- Important Phone Numbers
- Normal Peds Vital Signs
- Radio Report Format
- Regions EMS Contact List

12 LEAD ECG SYSTEMATIC APPROACH

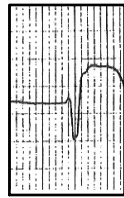
1) RATE, RHYTHM, R TO R

2) PLACE ELECTRODES

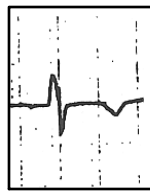
- Right Arm (RA)** = Right forearm
Right Leg (RL) = Right calf
Left Arm (LA) = Left forearm
Left Leg (LL) = Left calf
V₁ = 4th ICS right of sternum
V₂ = 4th ICS left of sternum
V₃ = Between V₂ and V₄
V₄ = 5th ICS at left midclavicular line
V₅ = Level with V₄ at left anterior axillary line
V₆ = Level with V₄ at left midaxillary line
V_{4R} - V_{6R} = Same positioning as V₄-V₆ only **RIGHT** side



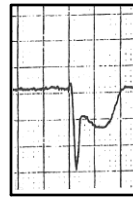
3) FIND INJURY PATTERNS



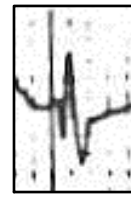
ST Elevation



Flipped T



ST Depression



Q-wave



Posterior in V₁-V₂

4) IDENTIFY LOCATION

I LATERAL	aV_R	V₁ SEPTAL	V₄ ANTERIOR
II INFERIOR	aV_L LATERAL	V₂ SEPTAL	V₅ LATERAL
III INFERIOR	aV_F INFERIOR	V₃ ANTERIOR	V₆ LATERAL

5) ARE THERE RECIPROCAL CHANGES?

Location	Arterial Supply	Injury / Ischemia changes in:	Reciprocal
Septal	LAD	V ₁ - V ₂	None
Anterior	LCA/LAD	V ₃ -V ₄	I, III, & AV _F
Inferior	RCA	II, III, AV _F	I, AV _L
Lateral	Circumflex	, AV _L , V ₅ , V ₆	V ₁ -V ₃
Right Ventricle	RCA	V _{4R} , V _{5R} , V _{6R}	V ₂ -V ₄
Posterior	RCA/Circumflex	None	V ₁ -V ₂

6) IF INFERIOR MI - IS IT RIGHT SIDED?

Right Side MI:

- Inferior MI on standard 12-Lead ECG
- ST ↑ > in lead III than in II
- ST ↑ in V₁ (could go through V₆)
- ST ↓ in V₂ (less than ½ ↑ in AV_F)
- ST ↑ in V_{4R} - V_{6R}

7) IF INFERIOR MI - IS IT POSTERIOR?

Posterior MI:

- Inferior MI on Standard 12-Lead ECG
- Tall & wide R-wave in V₁ & V₂
- ST ↓ with upright T wave in V₁ & V₂

Common Medications

COMMONLY PRESCRIBED MEDICATIONS

Generic Name

Acetaminophen/butalbital/caffeine
Acetaminophen/codeine
Acetaminophen/hydrocodone
Acetaminophen/oxycodone
Acetaminophen/propoxyphene-N
Acetaminophen/tramadol
Acyclovir
Albuterol Aerosol
Albuterol/ipratropium
Alendronate
Allopurinol
Alprazolam
Amitriptyline
Amlodipine
Amlodipine/benazepril
Amoxicillin
Amoxicillin/potassium clavulanate
Amphetamine/dextroamphetamine
Aspirin, enteric-coated
Atenolol
Atomoxetine
Atorvastatin
Azithromycin
Benazepril
Benzonate
Bisoprolol/hydrochlorothiazide
Budesonide
Bupropion
Buspirone HCl
Captopril
Carisoprodol
Carvediol
Cefdinir
Cefprozil
Celecoxib
Cephalexin
Cetirizine
Chlorpheniramine maleate/hydrocodone
Ciprofloxacin
Citalopram
Clarithromycin extended-release
Clindamycin
Clonazepam
Clonidine
Clopidogrel
Clotrimazole/betamethasone
Codeine/promethazine
Cyclobenzaprine
Desloratadine
Desogestrel/ethinyl estradiol
Diazepam
Diclofenac
Digoxin
Diltiazem
Divalproex Sodium
Donepezil
Doxazosin
Doxycycline
Drospirenone/ethinyl estradiol
Enalapril
Escitalopram
Esomeprazole
Estradiol
Estrogens, conjugated

Brand Name

Americet
Tylenol with Codeine
Vicodin, Norco
Endocet, Oxycet, Percocet
Darvocet
Ultracet
Zovirax; Zovirax Topical
Proventil, Ventolin, Volmax Vospire
Combivent
Fosamax
Aloprim; Zyluprim
Xanax
Elavil; Vanatrip
Norvasc
Lotrel
Amoxicot, Trimox
Augmentin
Adderall
Entaprin
Tenormin
Strattera
Lipitor
Zithromax, Z-Pak
Benazepril Hydrochloride
Tessalon
Ziac
Nasal Rhinocort
Sustained-Release Wellbutrin
BuSpar
Capoten
Soma
Coreg
Ornicef
Cefzil
Celebrex
Keflex
Zyrtec
S-T Forte 2
Cipro
Celexa
Biaxin
Cleocin HCl
Klonopin
Catapres
Plavix
Lotrisone
Codeine
Flexeril
Clarinet
Apri
Valium
Cataflam
Lanoxin
Cardizem
Depakote
Aricept
Cardura
Adoxa
Yasmin
Vasotec
Lexapro
Nexium
Alora, Climara
Cenestin

Typical Use

Analgesics, non-narcotic
Analgesics, narcotic
Analgesics, narcotic
Analgesics, narcotic
Analgesics, narcotic
Analgesics, non-narcotic
Antivirals, herpes genitalis
Adrenergic agonists, bronchodilators
Anticholinergics, bronchodilators
Bisphosphonates, osteoporosis
Antigout agents
Anxiety disorder
Depression
Hypertension, angina
Hypertension
Antibiotics, penicillins
Antibiotics, penicillins
Adrenergic agonists, amphetamines
Analgesics, non-narcotic, antipyretics
Antiadrenergics, beta blocking, HTN
ADHD
Antihyperlipidemics
Antibiotics, macrolide
Antihypertension
Cough
Hypertension
Rhinitis, allergic, asthma
Depression, smoking cessation
Anxiety disorder
Hypertension, heart failure
Pain, musculoskeletal
Hypertension, heart failure
Antibiotics, cephalosporin
Antibiotics, cephalosporin
Arthritis, osteoarthritis, pain
Antibiotics, cephalosporin
Rhinitis, allergic, urticaria
Cough, common cold
Infection, fluoroquinolones
Depression
Antibiotics, macrolide
Antibiotic
Seizures, absence, panic disorder
Hypertension, withdrawal, pain-cancer
Stroke, myocardial infarction
Antifungals
Cough, common cold
Pain, musculoskeletal
Rhinitis, allergic
Contraception
Anxiety disorder, seizures
Arthritis, osteoarthritis
Heart failure, atrial fibrillation
Hypertension, atrial fibrillation
Seizures, mood stabilization
Alzheimer's disease
Hypertension
Antibiotics
Contraception
Hypertension, heart failure
Depression
Ulcer, esophagitis
Menopause, breast cancer
Menopause, prostate cancer

Common Medications

COMMONLY PRESCRIBED MEDICATIONS

Generic Name

Estrogens, conjugated/medroxyprogesterone
Ethinyl estradiol/levonorgestrel
Ethinyl estradiol/norelgestromin
Ethinyl estradiol/norgestimate
Ezetimibe
Famotidine
Fenofibrate
Fentanyl (transdermal)
Ferrous Sulfate
Fexofenadine
Fluconazole
Fluoxetine
Fluticasone
Fluticasone/salmeterol
Folic Acid
Fosinopril
Furosemide
Gabapentin
Gemfibrozil
Glimepiride
Glipizide
Glyburide
Glyburide/metformin
Insulin
Hydrochlorothiazide
Hydroxyzine
Ibuprofen
Insulin Glargine
Insulin Lispro
Irbesartan
Isosorbide Mononitrate
Lansoprazole
Latanoprost
Levofloxacin
Levothyroxine
Lisinopril
Lisinopril/hydrochlorothiazide
Lorazepam
Losartan
Losartan/hydrochlorothiazide
Lovastatin
Meclizine
Medroxyprogesterone
Metaxalone
Metformin
Methylphenidate
Methylprednisolone
Metoclopramide
Metoprolol Succinate
Metronidazole
Minocycline
Mometasone
Montelukast
Mupirocin
Naproxen
Nifedipine extended-release
Nitrofurantoin
Nortriptyline
Olanzapine
Olopatadine
Omeprazole
Oxybutynin
Oxycodone

Brand Name

Premphase, Prempro
Alesse, Aviane
Ortho Evra
Mononessa
Zetia
Pepcid
Lipidil Supra
Actiq
N/A
Allegra
Diflucan
Prozac
Flonase, Flovent
Advair Diskus
N/A
Monopril
Lasix
Neurontin
Lopid
Amaryl
Glucotrol
DiaBeta, Glycron
Glucovance
Isophane, Humulin
Aquazide
Atarax, Hyzine
Advil, Motrin
N/A
Humalog
Avapro
Imdur
Prevacid
Xalatan
Levaquin
Synthroid
Prinivil, Zestril
Prinzide
Ativan
Cozaar
Hyzaar
Altacor
Antivert
Depo-Provera
Skelaxin
Glucophage
Ritalin
Solu-Medrol
Reglan
Lopressor
Flagyl
Arestin
Nasonex
Singulair
Bactroban
Aflaxen, Anaprox
Procardia
Macrobid
Aventyl, Pamelor
Zyprexa
Patanol
Prilosec
Ditropan
OxyContin

Typical Use

Menopause
Contraception
Contraception
Contraception
Hypercholesterolemia
Ulcer
Hypercholesterolemia
Analgesics, narcotic
Anemia
Rhinitis, allergic
Candidiasis, meningitis, antifungals
Panic disorder, depression
Rhinitis, allergic, asthma
Asthma, COPD
Anemia
Hypertension
Hypertension
Seizures, pain
Hypercholesterolemia
Diabetes mellitus
Diabetes mellitus
Diabetes mellitus
Diabetes mellitus
Diabetes mellitus
Hypertension
Anxiety, urticaria
Arthritis, osteoarthritis, analgesics, non-narcotic
Diabetes mellitus
Diabetes mellitus
Hypertension
Angina pectoris
Ulcer, esophagitis
Glaucoma
Antibiotics, fluoroquinolones
Hypothyroidism
Hypertension
Hypertension
Anxiety disorder
Hypertension
Hypertension
Hypercholesterolemia
Motion sickness, vertigo
Contraception
Pain
Diabetes mellitus
ADHD, ADD
Corticosteroids
Nausea, GERD, acid reflux
Hypertension, MI
Antibiotics
Antibiotics
Rhinitis
Rhinitis, asthma
Skin infections
Arthritis, osteoarthritis, analgesics, non-narcotic
Hypertension, angina
Antibiotics
Depression
Schizophrenia, bipolar, mania
Conjunctivitis
Ulcer
Dysuria
Analgesics, narcotic

Common Medications

COMMONLY PRESCRIBED MEDICATIONS

Generic Name

Pantoprazole
Paroxetine
Penicillin VK
Phenazopyridine
Phenytoin
Pimecrolimus
Pioglitazone
Polyethylene Glycol 3350
Potassium Chloride
Pravastatin
Prednisone
Promethazine
Propranolol
Quetiapine
Quinapril
Rabeprazole
Raloxifene
Ramipril
Ranitidine
Risedronate
Risperidone
Rofecoxib
Rosiglitazone
Sertraline
Sildenafil
Simvastatin
Spironolactone
Sumatriptan
Tamsulosin
Temazepam
Terazosin
Tizanidine
Tolterodine
Topiramate
Tramadol
Trazodone
Triamcinolone
Triamterene/hydrochlorothiazide
Trimethoprim/Sulfamethoxazole
Valacyclovir
Valdecocixib
Valsartan
Venlafaxine
Verapamil
Warfarin
Zolpidem

Brand Name

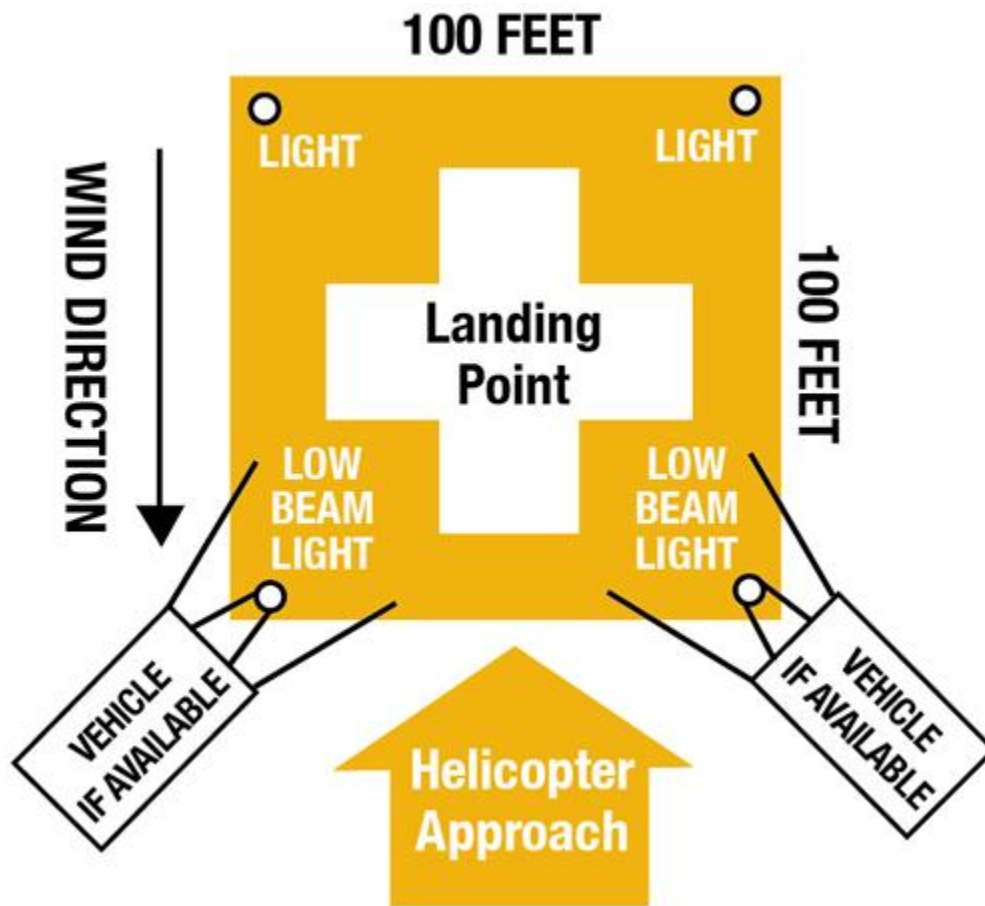
Protonix
Paxil
N/A
Pyridium, Eridium
Dilantin
Elidel
Actos
N/A
Cena K, K-Dur, K-Lor, Klor-con
Pravachol
Deltasone
Adgan
Inderal
Seroquel
Accupril
Aciphex
Evista
Altace
Zantac
Actonel
Risperdal
Vioxx
Avandia
Zoloft
Viagra
Zocor
Aldactone
Imitrex
Flomax
Restoril
Hytrin
Zanaflex
Detrol
Topamax
Ultram
Desyrel
Acetonide Nasal, Aristocort
Dyazide
Bactrim
Valtrex
Bextra
Diovan
Effexor
Calan
Coumadin
Ambien

Typical Use

Esophagitis
Anxiety
Antibiotics, penicillin
Dysuria
Seizures
Dermatitis
Diabetes mellitus
Constipation
Hypokalemia
Stroke, hypercholesterolemia
Corticosteroids
Nausea
Hypertension, anxiety, tremors
Schizophrenia, mood disorder
Hypertension
Ulcer, esophagitis
Osteoporosis
Hypertension, CHF
Ulcer, esophagitis
Paget's disease
Schizophrenia, bipolar, mania
Arthritis, osteoarthritis
Diabetes mellitus
Panic disorder, depression
Erectile dysfunction
Stroke, hypercholesterolemia
Hypertension
Migraine
Benign prostatic hyperplasia
Insomnia
Hypertension
Spasticity
Incontinence
Seizures
Analgesics, non-narcotic
Depression
Rhinitis
Hypertension
Antibiotics
Herpes genitalis
Osteoarthritis
Hypertension, CHF
Anxiety disorder, depression
Arrhythmia, ventricular, HTN
DVT/PE treatment or prevention, atrial fibrillation
Insomnia

Helicopter Landing Zone

HELICOPTER LANDING ZONE



WARNING
PILOTS MUST BE NOTIFIED OF
POWER LINES AS THEY ARE
INVISIBLE FROM THE AIR!

Illuminate night landing areas. Headlights should be directed into the wind and on to the landing area.
Approach and departure path should be clear of trees, power lines and loose debris.



Important Phone Numbers

IMPORTANT PHONE NUMBERS

CISD (Metro Region Team):	(612) 347-5710
Children's Home Crisis Nursery:	(651) 646-4033
East Metro MRCC:	(651) 254-2990
EMSRB:	(612) 627-6000
Fairview Lakes Region ER:	(651) 982-7320
Fairview Ridges ER:	(952) 892-2022
HCMC ER:	(612) 347-3132
Lakeview ER:	(651) 430-4554
Life Link III:	(612) 778-0416, (800) 328-1377
NREMT:	(614) 888-4484
Poison Control:	(800) 222-1222
Ramsey County Coroner:	(651) 224-7627
Ramsey County Child Protection:	(651) 266-4500
Ramsey County Adult Crisis Program:	(651) 523-7900
Regions Hospital ER:	(651) 254-3307
Regina ER:	(651) 480-4340
Sexual Offense Services (SOS):	(651) 643-3006
St. Joseph's ER:	(651) 232-3108
St. John's ER:	(651) 232-7073
St. Paul Children's ER:	(651) 220-6988
St. Paul Domestic Abuse Hotline:	(651) 645-2824
State Duty Officer:	(651) 649-5451, (800) 422-0798
United ER:	(651) 241-5184
Washington County Child Protection:	(651) 430-6457
Washington County Mental Health-Crisis:	(651) 777-4455
West Metro MRCC:	(612) 347-2123
Woman's Advocates:	(651) 227-8284
Woodwinds Health Campus:	(651) 232-0020

Pediatric Vital Signs

NORMAL PEDIATRIC VITAL SIGNS

Pediatric Vital Signs

Age	Weight (kilograms)	Pulse	Respirations	Systolic BP	Diastolic BP
Premature	1	145	< 40	42 +/- 10	21 +/- 8
Premature	1-2	135	--	50 +/- 10	28 +/- 8
Newborn	2-3	125	--	60 +/- 10	37 +/- 8
1 month	4	120	24-35	80 +/- 16	46 +/- 16
6 month	7	130	--	89 +/- 29	60 +/- 10
1 year	10	120	20-30	96 +/- 30	66 +/- 25
2-3 years	12-14	115	--	99 +/- 25	64 +/- 25
4-5 years	16-18	100	--	99 +/- 20	65 +/- 20
6-9 years	20-26	100	12-25	100 +/- 20	65 +/- 15
10-12 years	32-42	75	--	112 +/- 20	68 +/- 15
Over 14 years	> 50	70	12-18	120 +/- 20	75 +/- 15



Radio Report Format

MRCC RADIO REPORT FORMAT

Initial contact with MRCC should include:

1. Ambulance service and unit #
2. Radio frequency
3. Destination
4. Estimated time of arrival (ETA)
5. Stable or unstable patient

Once MRCC has acknowledged, report should include:

1. Any report on a patient who the provider deems as **stable (see definition below)** and requires minimal interventions, does not requiring a specific transport destination, or specific alert criteria (TTA, Level 1 Trauma, Cath Lab Activation, or Code Stroke Activation), the report will include the crew, agency, chief complaint, patient age, patient gender, destination hospital, and ETA. The following will be used to define the stable patient:
 - A. Systolic 120-140; Diastolic 80-100
 - B. Pulse < 110
 - C. Temp < 103 or > 95
 - D. SaO₂ > 95%
 - E. No altered mental status
 - F. Provider impression of the patient
2. Patients who are deemed unstable, defined as a patient needing specific interventions or outside of the ranges listed above, the report will be inclusive of the above information and will also include vital signs, response to treatments, and any other pertinent information the crew feels they should include. In these patients, MRCC may ask for more clarifying information. If the provider is very busy with patient care, the provider should alert MRCC as early possible so MRCC can alert the receiving hospital in a timely fashion.

Consultation with MRCC MD is mandatory prior to:

1. Non-transport of all pediatric patients <2 yrs. Patients > 2 y.o. can be cleared by MRCC Operator.
2. Non-transport of all 3rd trimester OB pts subjected to any trauma
3. Non-transport of certain patients who have had a hypoglycemic episode
4. Administration of certain medications; see specific guidelines
5. Transport of BLS personnel once IV has been established by ALS personnel if BLS personnel have not received training in IVs.



Regions EMS Contacts

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Fax Number: (651) 778-3778

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