CITY OF BEAUFORT/TOWN OF PORT ROYAL FIRE DEPARTMENT EMS ALS PROTOCOLS

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SOUTH CAROLINA PREHOSPITAL EMS TREATMENT PROTOCOLS

Authors' Statement:

Attached are the 2017 revised SC DHEC Bureau of EMS Prehospital Treatment Protocols. This is one section of a multi-section manual that will be continually updated and revised. In addition to the Protocol Section, other sections related to Prehospital Procedures and Interventions, Prehospital Policies, etc. will be forthcoming.

These protocols have been developed and implemented through the combined efforts of the SC DHEC Bureau of EMS, the SC EMS Advisory Committee, the SC Trauma Advisory Committee, the SC Stroke Advisory Committee, the SC EMS for Children's Committee, and other specialty groups and providers. They have been approved by the Bureau of EMS Medical Control Committee.

In developing these protocols input was sought from all the committees listed above, EMS field personnel, as well as private and academic specialists in areas related to specific protocols. These then are "consensus" protocols.

The question often arises as to why a specific protocol does not follow ***verbatim*** a similar protocol published by a national body. For example, why does the South Carolina protocol on Asystole/ Pulseless Electrical Activity not follow the AHA/ECC Protocol of similar title ***"exactly"***? This is a reasonable question and has been much debated. First – all protocols are consensus documents – and this applies to national organization protocols as much as it does to State or local protocols. The goal of the protocol is to utilize the best information known at the time and to account for "generally accepted medical practice". Often the final answer is based on the precept of "will this activity harm the patient" versus the less defined "will this activity possibly help the patient". In the case of life-threatening situations we tend to err on the side of activities that may possibly help the patient – even if evidence to that result is not firm. Second – often conclusions regarding the benefit (or lack of benefit) are gathered from large, combined meta-studies where the application of that particular intervention was not directly studied but the results were "inferred". Third - national guidelines generally reflect the "most basic, minimum" care that we expect to be provided to a patient in a certain situation. National guidelines are not intended to be promoted as a rule to limit what can be done for patients and should not be thought of as such. Finally, national guidelines often err on the side of not including an intervention where there is inadequate evidence to support its inclusion. This does not equate to the statement that the intervention will not work or is harmful – only that to date, evidence is lacking to support its use. It may be that studies have not yet been done – or cannot be done – to determine the efficacy of a specific intervention.

Some typical interventions that are not yet incorporated into national guidelines include double sequence defibrillation, the use of lipid infusion therapy for toxicologic cardiovascular collapse codes, the use of albuterol and/or insulin for hypercalcemia – and the list goes on. These are all utilized in the practical real-world scenario and within the Emergency Medicine specialty. Similarly, interventions such as transcutaneous pacing or the use of atropine are still being utilized by Emergency Medicine practitioners – even though they are no longer reflected within

the AHA/ECC National Guideline. The reasons for this are varied – but are often anecdotal. In an "in extremis" life-threatening situation where previous interventions have not resulted in a positive outcome we feel that it is not unreasonable to try such interventions. These are situations where there is truly nothing to lose and a small chance of monumental life-restoring results.

Currently the medical literature tends to grade the strength of evidence for an intervention based upon the perceived or documented Benefit : Risk ratio. A Class 1 recommendation generally means that the benefits of the intervention far outweigh the risks of the intervention – with that ratio reversing for a Class 3 recommendation (i.e. the risks of the intervention outweigh the benefits). The Level of Certainty of the recommendation varies from Level A where large populations have been studied in randomized clinic trials to Level C where there is very limited populations which have been studied. Level C also includes "consensus opinion of experts or standard of care". A copy of the Standard Level of Evidence Nomogram is attached to help you understand the medical literature as you review it.

In conclusion, these protocols are a consensus document. These protocols will be frequently revised and updated. There is no "single way" to provide good medicine.

Edgar G. DesChamps, III, M. D.
State Medical Director
Bureau of EMS – SC DHEC
For:
Medical Control Committee

Levels and Certainty of Evidence

ESTIMATE OF CERTAINTY (PRECISION) OF TREATMENT EFFECT	SIZE OF TREATMENT EFFECT →			
	CLASS I *Benefit >>> Risk* Procedure/Treatment **SHOULD** be performed/administered	**CLASS IIa** *Benefit >> Risk* *Additional studies with focused objectives needed* **IT IS REASONABLE** to perform procedure/administer treatment	**CLASS IIb** *Benefit ≥ Risk* *Additional studies with broad objectives needed; additional registry data would be helpful* Procedure/Treatment **MAY BE CONSIDERED**	**CLASS III** *Risk ≥ Benefit* Procedure/Treatment should **NOT** be performed/administered **SINCE IT IS NOT HELPFUL AND MAY BE HARMFUL**
LEVEL A Multiple populations evaluated* Data derived from multiple randomized clinical trials or meta-analyses	▪ Recommendation that procedure or treatment is useful/effective ▪ Sufficient evidence from multiple randomized trials or meta-analyses	▪ Recommendation in favor of treatment or procedure being useful/effective ▪ Some conflicting evidence from multiple randomized trials or meta-analyses	▪ Recommendation's usefulness/efficacy less well established ▪ Greater conflicting evidence from multiple randomized trials or meta-analyses	▪ Recommendation that procedure or treatment is not useful/effective and may be harmful ▪ Sufficient evidence from multiple randomized trials or meta-analyses
LEVEL B Limited populations evaluated* Data derived from a single randomized trial or nonrandomized studies	▪ Recommendation that procedure or treatment is useful/effective ▪ Evidence from single randomized trial or nonrandomized studies	▪ Recommendation in favor of treatment or procedure being useful/effective ▪ Some conflicting evidence from single randomized trial or nonrandomized studies	▪ Recommendation's usefulness/efficacy less well established ▪ Greater conflicting evidence from single randomized trial or nonrandomized studies	▪ Recommendation that procedure or treatment is not useful/effective and may be harmful ▪ Evidence from single randomized trial or nonrandomized studies
LEVEL C Very limited populations evaluated* Only consensus opinion of experts, case studies, or standard of care	▪ Recommendation that procedure or treatment is useful/effective ▪ Only expert opinion, case studies, or standard of care	▪ Recommendation in favor of treatment or procedure being useful/effective ▪ Only diverging expert opinion, case studies, or standard of care	▪ Recommendation's usefulness/efficacy less well established ▪ Only diverging expert opinion, case studies, or standard of care	▪ Recommendation that procedure or treatment is not useful/effective and may be harmful ▪ Only expert opinion, case studies, or standard of care

INTRODUCTION

DEFINITION:
A **medical protocol** (or algorithm or guideline) is a document with the aim of guiding decisions and criteria regarding diagnosis, management, and treatment in specific areas of healthcare.

While medical and treatment protocols have existed for years, in contrast to previous approaches, which were often based on tradition or authority, modern medical protocols are based on an examination of current evidence within the paradigm of evidence-based medicine.

STATEMENT:
Clinical protocols (algorithms, guidelines) identify, summarize and evaluate the highest quality evidence and most current data about diagnosis, therapy (including dosage of medications), risk/benefit and cost-effectiveness. Then they define the most important questions related to clinical practice and identify possible decision options and their outcomes. Some guidelines contain decision or computation algorithms to be followed. Thus, they integrate the identified decision points and respective courses of action with the clinical judgment and experience of practitioners.

Additional objectives of clinical guidelines and protocols are to standardize medical care, to raise quality of care, to reduce several kinds of risk (to the patient or to the healthcare provider) and to achieve the best balance between cost and parameters such as effectiveness, specificity, sensitivity, etc.

Guidelines may lose their clinical relevance as they age and newer research emerges. 20% or more of strong recommendations, especially when based on opinion rather than trials, from practice guidelines may ultimately be retracted or revised. ***Guidelines may make recommendations that are stronger than the supporting evidence.***

Medical algorithms based on best practice can assist everyone involved in delivery of standardized treatment via a wide range of clinical care providers. Many are presented as protocols and it is a key task in training to ensure providers step outside the protocol when necessary.

In the USA, the National Guideline Clearinghouse [**https://www.guideline.gov/browse/clinical-specialty**] maintains a catalog of high-quality guidelines published by various organizations (mostly professional physician organizations). Another organization that frequently publishes treatment and care guidelines is the American Heart Association / Emergency Cardiovascular Care Committee.

SC PREHOSPITAL EMS PROTOCOLS

The following medical treatment protocols are developed for South Carolina EMS agencies. The process has evolved since 2007 and continues with input from Medical Directors, EMS Administration, EMS field personnel and members of specialty organizations.

The 2017 update expands on the 2010 version and continues to incorporate evidence-based guidelines, expert opinion and historically proven practices meant to ensure that citizens and visitors of South Carolina will continue to be provided the highest quality pre-hospital patient care available.

The South Carolina Department of Health and Environmental Control Bureau of EMS Medical Control Committee develops and provides final approval. The purpose of the protocol section is to provide treatment protocols outlining permissible and appropriate assessment, delivery of care, reassessment and procedures which may be rendered by pre-hospital providers. The protocols also outline which medical situations require direct voice communication with medical control. In general treatment protocols are specific orders which may and should be initiated prior to contact with Medical Control.

Whereas a **Protocol** (guideline or algorithm) guides decisions and criteria for diagnosis, management, and treatment of specific cases, a **Standing Order** is a specific written policy that prescribes a definitive action to be taken for a particular condition or situation. Standing Orders include medication dosages, routes of administration, therapeutic procedures, etc. to be implemented. Standing Orders are often included within Protocols.

Note the medical protocols are divided into three (3) to four (4) sections. The upper section includes three (3) boxes (History, Signs and Symptoms and Differential) which serve as a guide to assist in obtaining pertinent patient information and exam findings as well as considering multiple potential causes of the patient's complaint. It is not expected that every historical element or sign / symptom be recorded for every patient. It is expected that those elements pertinent to your patient encounter will be included in the patient evaluation. The algorithm section describes the essentials of patient care. Virtually every patient should receive the care outlined in this section, usually in the order described. However, **each medical emergency must be dealt with individually and appropriate care determined accordingly**. Professional judgment is mandatory in determining treatment modalities within the parameters of these protocols. Circumstances will arise where treatment may move ahead in the algorithm, move outside to another protocol and then re-enter later.

INTRODUCTION

While protocols are written based on body systems and primary complaints the patient should be treated as a whole and therefore the protocols should be considered as a whole in providing care. Professional judgment hierarchy: The pre-hospital provider may determine that no specific treatment is needed; *Or* The pre-hospital provider may follow the appropriate treatment protocols and then consult Medical Control; *Or* The pre-hospital provider may consult Medical Control before initiating any specific treatment.

Within these protocols, there are two Protocols that are **MANDATED** by the Bureau of EMS: **Protocol 37 – Field Triage and Bypass**. **ALL EMS Services MUST adopt this protocol.** It is contingent upon the Service Medical Control Physician – in consultation with the Service Director – to specify which facilities within their area meet the criteria for Trauma Centers and to determine to which of these facilities the EMS Service WILL transport patients who meet the appropriate criteria as outlined. In addition, **Protocol 20b – SC R.A.C.E. Tool** (**R**apid **A**rterial o**C**clusion **E**valuation Scale) is mandated per statute **[**"The Department *shall adopt and distribute a nationally recognized, standardized stroke-triage assessment tool. The department must post the stroke-triage assessment tool on its website and provide a copy, which may be an electronic copy, of the stroke-triage assessment tool to each licensed emergency medical services provider before January 31, 2012.* ***Each licensed emergency medical services provider must establish a stroke assessment and triage system that incorporates the department approved stroke-triage assessment tool.****"*]

All other protocols are "optional" to be chosen and utilized by the EMS Service in consultation with and approval from their Local Medical Control Physician. However, within the remaining protocols there are three protocols – which if adopted by the service - **MUST be followed as written**. These Protocols are:

1. **Protocol 9 – Rapid Sequence Intubation**
2. **Protocol 16 – Adult: Pain Management**
3. **Protocol 45 – Pediatric: Pain Control**

Specific Process Improvement / Quality Control measurements for certain protocols are – or will be – established by the Bureau. For example, the use of Sedation prior to contact with Online Medical Control requires 100% review by the Local Medical Control Physician and/or the designated surrogate. Similarly, review of administration of Schedule II Narcotics (Morphine or Fentanyl) prior to establishing Online Medical Control is required as well as documentation of timely signature for this administration (i.e within 1 week) by the Medical Control Physician.

INTRODUCTION

These protocols will encompass at least two (2) pages. The PEARLS section will generally be located at the bottom of page 2. The PEARLS section provides points regarding the main protocol based on evidence to date, common medical knowledge and expert medical opinion.

Information boxes are found highlighted in purple. These areas are editable at the local level. They will mainly involve specific medications and dosages utilized by the local EMS agency. Protocol Page 2 will have a large section highlighted in purple where the local Medical Director may edit as they see fit to provide expanded points and treatment not otherwise specified in the algorithm.

Finally these medical treatment protocols are established to ensure safe, efficient and effective interventions to relieve pain and suffering and improve patient outcomes without inflicting harm. They also serve to ensure a structure of accountability for Medical Directors, EMS agencies, pre-hospital providers and facilities to provide continual performance improvement. A recent report of the Institute of Medicine calls for the development of standardized, evidence-based pre-hospital care protocols for the triage, treatment and transport of patients. These protocols establish current recommendations of pre-hospital care in South Carolina.

While these protocols have been extensively reviewed - the Bureau of EMS acknowledges that errors (usually typographical) may evade the reviewers. The Bureau has established a dedicated e-mail address to allow the professionals who utilize these protocols to identify errata and suggest corrections.
That e-mail is: **Protocols@dhec.sc.gov**.

As protocols are revised or updated the most recent approved protocol may be identified by the “Revision Identifier” located along the lower left ribbon and of the format:
Rev: 20170401.

Legend

Top Left Logo

Indicates a statement and/or Protocol page by South Carolina that has been unaltered

Indicates a statement made by the City of Beaufort/Town of Port Royal Fire Department. Or Protocol created by South Carolina, then altered by the City of Beaufort/ Town of Port Royal Fire Department.

Indicates a Protocol

Indicates a Medication

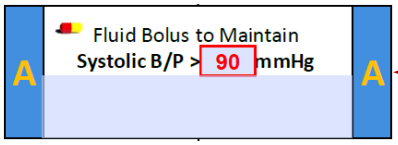
Indicates an Intervention or an Action

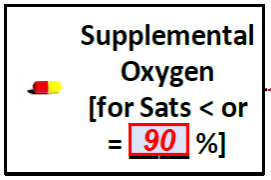
LEGEND

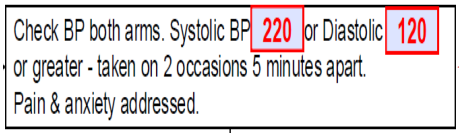
Legend

Indicates a MANDATORY Protocol. All EMS Services MUST adopt this Protocol

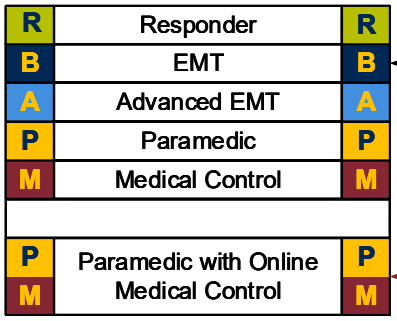
Indicates a REQUIRED Protocol. IF an EMS Service adopts this Protocol it MUST be utilized EXACTLY as published





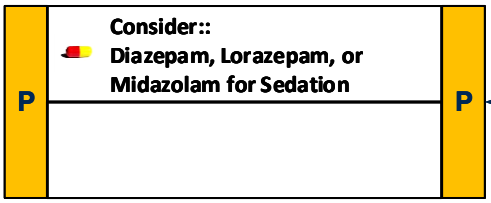


RED Box indicates a Mandatory field that must be completed



Indicates the Minimum Level of Provider authorized to perform this task

The P/M indicator allows the Paramedic to perform the intervention or medication administration only with OnLine Medical Control (OLMC)



Indicates an intentionally blank space left for Local Medical Control to assign dosage, route, etc.

LEGEND

EMS Drug Formulary – Introduction

The EMS Drug Formulary was developed by the Bureau of EMS in conjunction with the Medical Control and EMS Advisory Committees.

This listing should be considered a menu of available pharmacologic agents for use in the prehospital setting. EMS Services are not required to carry or utilize the entire list – but **an EMS Service may NOT carry or utilize a drug that is not listed within the Formulary.** Drugs not encompassed within this list may be utilized in the circumstance of an interfacility transfer – provided the agent is initiated at the sending facility and the appropriate Interfacility Drug Transfer Form is completed as described later.

There are specific drugs contained in this document which require on-line medical control, these drugs are denoted by ***"OLMC"***. **There can be no standing order for Controlled Substances in Schedule II other than per the approved South Carolina State Protocol(s).** In addition, due to the potential for abuse, the Medical Control Committee added Geodon and Nubain to the "Controlled Substances List" for EMS. This change requires that these substances be inventoried, stored, and protected as would any other Schedule narcotic. On-Line orders to Paramedics should be rendered by the physician - either in person, by telephone, or over the radio. If a physician is unable to speak directly to the Paramedic, medical control should not be abandoned. It is then permissible for a physician's designee to relay his/her (the physician's) direct orders by telephone or radio. It is, however, never acceptable for orders to originate from a nurse, nurse practitioner, physician's assistant, or anyone other than the on-line Medical Control Physician.

Medication pumps used by home-bound patients are considered patient administered medication and all EMTs may transport such patients so long as the EMT does not have to do anything to the pump and the route of administration is a venous line. Patients who have certain intravenous access devices such as Percutaneously Placed Central Venous Catheters (e.g. CVP line; Triple Lumen Catheter; PICC; Subclavian, Internal Jugular, or Femoral Line - but NOT including Swan Ganz catheters) or Implantable Central Venous Catheters (e.g. Hickman or Broviac Catheter) may have medications administered through these catheters - by Paramedics **ONLY** when no other option is available for intravenous access. Such medication administration may be guided either by Standing Order or direct On-Line Medical Control order. AEMT, Intermediate and Basic EMTs may transport patients with these catheters provided the catheter is either not in use or has plain (non-medicated) IV Fluids in place.

These privileges are delineated in the SCDHEC: EMS and Trauma Certification Skills List. Patients who have certain implanted access devices such as the Completely Implantable Venous Access Port (i.e. Porta-Cath; PowerPort) may be transported by Paramedics with previously placed medication infusions. Since these devices require special needles for access, a Paramedic may administer medications through this device ONLY by way of previously placed lines when NO OTHER OPTION is available. This action may be authorized either by Standing Order or direct On-Line Medical Control Order - PROVIDED the device has already been accessed with the appropriate needle set PRIOR to transport. These privileges are delineated in the current publication of the SCDHEC: EMS and Trauma Certification Skills List.

Other devices - e.g. Epidural Catheters - are approved for TRANSPORT ONLY. The Paramedic MAY NOT utilize this catheter to administer ANY medication during transport and the device MAY NOT BE MANIPULATED by EMS personnel.

Effective in 1997, Paramedics may utilize the Per Rectal route of drug administration in certain patients - provided the Paramedic has received In-Service Training on the method and technique of rectal administration, and provided the route is approved by the local Medical Control Physician for that service. The utilization of the Per Rectal route of administration for Diazepam in adult patients was approved in 1999.

During 2000, the Bureau approved the transport of patients on various "Interfacility Drugs" and in so doing has eliminated the previous "Interfacility Drug List." These drugs were approved because the Bureau agreed that they may be necessary for continued patient care during transport - rather than for the sake of convenience. The interfacility transport drugs must be initiated at the sending facility and the patient must be stabilized on the medication prior to transport. The Paramedic in charge of the call is responsible for accepting the patient and for ensuring that the appropriate documentation, including the Interfacility Drug Transport Form(s): Part A and Part B (D-3485), has been completed. The Paramedic in charge of the call must also ensure that he/she has received adequate education and information on the Interfacility Drugs to be infused during transportation of the patient (i.e. side effects, adverse reactions, etc.) prior to accepting the patient for transfer. This information is to be documented on the Interfacility Drug Transport Form(s). Interfacility drugs must be supplied and initiated by the sending facility.

EMS Drug Formulary – Introduction

An Interfacility Transport Form(s) must accompany the patient during transport between facilities to continue administration of the drug(s) not listed on the SCDHEC: EMS Formulary. It is necessary that all the information requested on the form(s) be completed if the Paramedic is to accept the patient and act within the required protocols for appropriate interfacility transport and treatment. A copy of the Interfacility Transport Form(s) must be attached to the ePCR.

Effective November 2013, The Medical Control Committee was requested to address the issue of Basic EMT administration of sublingual Nitroglycerin (NTG) for patients experiencing chest pain. It has been universally accepted that EMTs may assist the administration of NTG to patients who already have NTG prescribed. It is further approved and authorized for EMTs to initiate NTG to the patient utilizing the EMS stock supply and acting under their local Medical Control's signed and dated standing orders.

Initiation of the Rapid Sequence Intubation Protocol no longer requires Direct On-Line Medical Control authorization. However, Direct On-Line Medical Control should be established as soon as feasible without interfering with the care of the patient.

In addition to changes in the Rapid Sequence Intubation protocol, the Medical Control Committee, in conjunction with the DHEC: Bureau of Drug Control, has relaxed the requirement for Direct On-Line Medical Control authorization prior to the administration of several Schedule Drugs -e.g. Ketamine (**C III**) or Lorazepam, Diazepam, and Midazolam (**C IV**). These may be initiated under Standing Order or Protocol - but still must be approved by the Local Medical Control Physician for the Service. The Paramedic should make every reasonable effort to contact Medical Control prior to utilizing these agents - or immediately after utilizing these agents - provided this does not interfere with the appropriate delivery of care to the patient. The paramedic must still obtain a signature for administration of Class IIIs and IVs by the receiving physician or Medical Control Physician.

Effective in 2016 the Medical Control Committee, in conjunction with DHEC: Bureau of Drug Control developed protocols to allow the Paramedic to initiate pain management prior to contact with On-Line Medical Control. There are protocols for pain management prior to On-Line Medical Control for both Adult and Pediatric patients. If the EMS Service elects to adopt this therapy – that EMS Service **MUST exactly follow the protocols** developed by the Bureau. Further, it is incumbent upon the Service Medical Director to review the utilization of all **C II** agents and to provide a signature for administration of **C II** narcotics in a timely fashion (i.e. within 1 week).

EMS Drug Formulary – Introduction

All EMS Services utilizing Schedule drugs MUST complete a Service-wide comprehensive inventory on 01 May of each calendar year. This inventory and reconciliation must be performed and attested to by the Service Medical Director.

Paramedics are NOT authorized to accept any Schedule (**C II, C III, C IV**) drug from a transferring facility for use during the transport. If the EMS Service does not stock the Schedule drug then another drug (that is stocked by the EMS Service) or another transport service must be utilized. The caveat to this statement is that the Service MAY accept a patient on an IV Infusion of a Schedule drug for transport (e.g. a PCA pump).

Paramedics are not authorized to mix interfacility drugs. If it is anticipated intravenous therapy will run out during transport, an additional bag of fluid should be supplied, pre-mixed and piggybacked into the existing IV infusion before transport begins. Paramedics are not authorized to initiate any additional units of Packed Red Blood Cells (PRBCs) or other Blood Products (i.e. Fresh Frozen Plasma (FFP)), during transport. When Sodium Nitroprusside, Magnesium Sulfate, and/or Nitroglycerin are being administered by a volumetric infusion pump, a noninvasive electronic blood pressure monitor and cardiac monitor are required during transport. Patients being transported on Mannitol require an indwelling urinary catheter to be in place prior to transport. Drugs will be monitored in transit by the Paramedic based upon signed, written orders of the sending physician. ONLY Paramedics are authorized to maintain these drugs.

In November 2013, the Medical Control Committee made the decision in conjunction with approval of the SC EMS Advisory Council for Interfacility Medications to be administered by existing IV infusion(s). These medications are necessary, among other things, for continuity of care, for patient safety, or for patient comfort in the case of pain management. During transfer of the patient on an Interfacility Transport Drug, the Paramedic may titrate the medication(s) downward or up to the original dose prescribed, as needed. The medication(s) cannot be titrated past the original dose prescribed unless direction of on-line medical control or written order is obtained by a physician.

EMS Drug Formulary – Introduction

In May 2015, after a successful pilot program, the Medical Control Committee made the decision in conjunction with approval of the SC Training Committee to allow use of Broad Spectrum Antibiotic(s) to treat suspected sepsis patients. The Local Medical Control Physician may allow the use of Broad Spectrum Antibiotic(s) for treatment of sepsis so long as the following are met:

- Prior to implementing, the EMS Agency must complete the required training as established by the Bureau.
- The patient must have a suspected infection source.
- The patient meets at least two signs/symptoms of systemic inflammatory response syndrome (SIRS).
- The receiving hospital(s) has 'sponsored' the sepsis protocol and agree to accept Blood Culture(s) and lab work drawn in the field.
- In addition, the hospital(s) agree to share the lab results to the EMS agency for QA/QI.

It is the responsibility of the Local Medical Control Physician to ensure that the appropriate State and Federal Registrations are in place for each EMS Service he/she oversees. In the past, the EMS Formulary contained only Schedule II (**C II**) and Schedule IV (**C IV**)drugs; however, with the addition of Ketamine (**C III**) this has been expanded. The EMS Service – and the Local Medical Control Physician must ensure that both State and Federal DEA licensure reflect all Schedules utilized by that service. The Local Medical Control Physician must have separate and individual State and Federal Controlled Substance Registrations for each and every Service that he/she oversees and authorizes to utilize each class of controlled substances (State Law 44-53-290 § e).

It is the responsibility of the EMS Service to ascertain that it (the Service) is in compliance with the State Board of Pharmacy Licensing requirements and has the appropriate Pharmaceutical Dispensing Permit(s) for the Service. Applications for these permits may be obtained at:

SC LLR-Board of Pharmacy
110 Centerview Drive - Suite 306 (29210)
Post Office Box 11927 Columbia, SC 29211
Telephone: (803) 896-4700

Questions regarding State and Federal Controlled Substances and permitting may be directed to:

SC DHEC: Bureau of Drug Control
2600 Bull Street
Columbia, SC 29201
(803) 896-0636

Questions regarding this Formulary or Bureau Policy concerning these agents may be directed to:

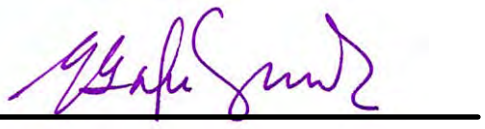
SCDHEC: Bureau of EMS
EMS Director
2600 Bull Street
Columbia, SC 29201
(803) 545-4204

All Drugs are to be administration under On Line Medical Control direction or Standing Orders submitted and reviewed by the Bureau within the Food and Drug Administration (FDA) standards. Any drug(s) not listed on the EMS Drug Formulary must have prior, written approval to be administered by EMS personnel in the Prehospital setting by the Bureau.

Edgar G. DesChamps, III, M. D.
State Medical Director
Bureau of EMS

EMS Drug Formulary

Acetaminophen (Tylenol ®)
Activated Charcoal
Aspirin
Albuterol Sulfate
Adenosine (ADENOCARD ®)
Amiodarone (CORDARONE ®)
Atropine Sulfate
Amyl Nitrite
Atropine and Pralidoxime Chloride Injection
Broadspectrum Antibiotic(s)
Calcium Chloride
Calcium Gluconate
Dextrose 5% in Water (D5W)
Dextrose 10% (D10)
Dextrose 25% (D25)
Dextrose 50% (D50)
Diazepam (VALIUM ®) **Class IV**
Diltiazem (CARDIAZEM ®)
Diphenhydramine (BENADRYL ®)
Dobutamine (DOBUTREX ®)
Dopamine (INROPIN ®)
Epinephrine Auto Injector
Epinephrine 1:1000
Epinephrine 1:10,000
Etomidate (AMIDATE ®)
Famotidine (PEPCID ®)
Fentanyl Citrate (SUBLIMAZE ®) **Class II**
Flumazenil (ROMAZICON ®)
Furosemide (LASIX ®)
Glucagon USP (GlucaGen®)
Heparin – High Dose
Hydroxocobalamin Inj (CYANOKIT ®)
Ibuprofen (MOTRIN ®)
Ipratropium Bromide (ATROVENT ®)
Ketamine (KETALAR ®) **Class III**
Ketorolac (TORADOL ®)
Labetalol
Lactated Ringers
Levalbuterol (XOPENEX ®)
Lidocaine (XYLOCAINE ®)
Lorazepam (ATIVAN ®) **Class IV**
Magnesium Sulfate
Methylprednisolone (SOLU-MEDROL ®)
Metoprolol (LOPRESSOR ®)
Methylene Blue
Midazolam (VERSED ®) **Class IV**
Morphine Sulfate **Class II**
Nalbuphine (NUBAIN ®) - ***OLMC**
Naloxone (NARCAN ®)
Nitroglycerin Paste
Nitroglycerin Tablets / Spray (NITROSTAT ®)
Nitrous Oxide (N_2
Norepinephrine (LEVOPHED ®)
0.9% Saline (Normal Saline)
Oral Glucose (Glucose 15 ™)
Oxygen (O_2)
Ondansetron (ZOFRAN ®)
Oxymetazoloine HCL Nasal Spray (Afrin ®)
Oxytocin (PITOCIN ®)
Phenobarbital **Class IV**
Pralidoxime (2-PAM ®)
Procainamide (PROCAN ®)
Prochlorperazine (COMPAZINE ®)
Promethazine (PHENERGAN ®)
Proparacaine (ALCAINE ®)
Propranolol (INDERAL ®)
Pyridoxine HCL (Vitamin B6)
Racemic Epinephrine (MicroNEFRIN ®)
Rocuronium Bromide (ZEMURON ®)
Sodium Bicarbonate ($NaHCO_3$
Sodium Nitrite
Sodium Thiosulfate
Succinylcholine (ANECTINE ®)
Terbutaline Sulfate (BRETHINE ®)
Thiamine (BIAMINE ®) (Vitamin B1)
Vasopressin (PITRESSIN ®)
Vecuronium Bromide (NORCURON ®)
Ziprasidone (GEODON ®)



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South Carolina State Medical Director
Bureau of EMS

EMS Drug Formulary

Acetaminophen:
INDICATIONS: Pain control, Fever
ADMINISTRATION: Oral Liquid, Rectal Suppository, PO (For adult only)
DOSAGE:
ADULT: Up to 1000 mg PO
PEDIATRIC: 10 – 15 mg/kg PO / PR
THERAPEUTIC EFFECTS: Relief of mild to moderate pain and fever reduction
RELATIVE CONTRAINDICATIONS: Known allergy, Should be used with caution in patients with liver and renal disease
SIDE EFFECTS: None when administered in the therapeutic dosage range

Aspirin: (Children's chewable aspirin)
INDICATIONS: Myocardial Infarction; Chest pain suspicious of cardiac origin
ADMINISTRATION: Chew P.O.
DOSAGE:
ADULT: 162mg to 324mg
Give two (2) to four (4) "children's" chewable Aspirin (81mg x 4 = 324mg)
PEDIATRIC: NOT APPROVED
THERAPEUTIC EFFECTS: Given as an early potent anticoagulant. Blocks formation of Thromboxane A2. Thromboxane A2 causes platelets to aggregate and arteries to constrict. Reduce overall mortality of acute MI. Reduce nonfatal re-infarction. RELATIVE CONTRAINDICATIONS: Active ulcer; Hypersensitivity to aspirin
SIDE EFFECTS: Allergic reaction; Nausea/Vomiting; Indigestion; Heartburn; Tinnitus

Adenosine:
INDICATIONS: SVT- Narrow Complex (Regular)
ADMINSTRAION: IV, IO (preferably an IV in the Left AC or IO in the Left Humeral Head.)
DOSAGE:
ADULT: Initial 6mg rapid IVP. May Repeat after 2 minutes at 12mg rapid IVP.
PEDIATRIC: 0.1 mg/kg (max 6mg) rapid IVP. Repeat in two minutes at 0.2 mg/kg (max 12 mg) rapid IVP.
THERAPEUTIC EFFECTS: Control of Narrow Complex Tachycardia
RELATIVE CONTRADICATIONS: Second or Third Degree AV block and sick sinus syndrome. Ventricular Tachycardia - wide QRS Complex
SIDE EFFECTS: Transient AV Block Aystole, Dizziness, Flushing, Nausea, Shortness of breath.

Albuterol:
INDICATIONS: Acute bronchospasm, Cardiac arrest associated with asthma
ADMINISTRATION: Handheld nebulizer OR Nebulizer Mask
DOSAGE: Initial dose 5-10 mg nebulized.
THERAPEUTIC EFFECTS: Decreases bronchospasm; Improves pulmonary function
RELATIVE CONTRAINDICATIONS: Hypersensitivity to any of the contents of the inhalation solution SIDE EFFECTS: Tremor; Dizziness; Nervousness; Headache; Nausea; Tachycardia; Bronchospasm

Amiodarone:
INDICATIONS: Ventricular Fibrillation, Ventricular Tachycardia, Atrial Fibrillation with Rapid Ventricular Response, Atrial Flutter with Rapid Ventricular Ventricular Response, SVT
ADMINISTRATION: IV/IO
DOSAGE:
Adult: VF and pulseless VT 300 mg IV/IO push, Repeat of 150 mg. Stable VT/SVT 150mg in a NS Solution over 10 mins.
Pediatric: VF and pulseless VT 5mg/kg push (max 300mg). VT with a pulse and SVT 5mg/kg in NS over 20 mins.
THERAPEUTIC EFFECTS: Slows Rhythm down to a level of good perfusion
RELATIVE CONTRAINDICATIONS:Known hypersensitivity, cardiogenic shock, 2nd or 3rd degree AV block or sick sinus syndrome or other sinus node disease unless a functioning artificial pacemaker is present.
SIDE EFFECTS: Dizziness, fatigue, malaise, tremor, ataxia, lack of coordination, ARDS, pulmonary edema, cough, progressive dyspnea, heart failure, bradycardia, hypotension, worsening of dysrhythmias, prolonged QT interval, nausea, vomiting, burning at IV site,

Atropine:

INDICATIONS: Adult Symptomatic Bradycardia, Pediatric Bradycardia due to vagal response, Orthophosphate posioning.
ADMINISTRATION: IV/IO
DOSAGE:
Adult: 0.5mg-1mg IV/IO may repeat every 3-5 minutes until 3mg
Pediatric 0.02 mg/kg IV/IO (max dose 0.5mg)
THERAPEUTIC EFFECTS:
RELATIVE CONTRAINDICATIONS: None in emergency situations
SIDE EFFECTS: Drowsiness, confusion, headache, tachycardia, palpitations, dysrhythmias, nausea, vomiting, pupil dilation, dry mouth/nose/skin, blurred vision, urinary retention, constipation, flushed, hot, dry skin; paradoxical bradycardia when pushed too slowly or when given at low doses.

Calcium Chloride:

INDICATIONS: Symptomatic hyperkalemia with cardiac conduction defects, Crush Syndrome, Calcium Channel Blocker Overdose.
ADMINISTRATION: IV/IO
DOSAGE:
Adult: 1 gram IV/IO over 10 minutes.
Pediatric: 0.2mL/kg over 10 minutes.
THERAPEUTIC EFFECTS: Increased myocardial contraction
RELATIVE CONTRAINDICATIONS: Hypercalcemia, VF (relative), digitalis toxicity
SIDE EFFECTS: Syncope, cardiac arrest, dysrhythmia, bradycardia, hypotension, asystole, peripheral vasodilation, nausea, vomiting, metallic taste, tissue necrosis at injection site, coronary and cerebral artery spasm.

DO NOT USE IN THE SAME IV AS SODUIM BICARBONATE

Dextrose 10%:

INDICATIONS: Suspected hypoglycemia, Altered LOC, Coma/
Seizure of unknown etiology ADMINISTRATION: IO, IV through a free flowing line
DOSAGE:
ADULT: 100mL IV/IO, repeat as needed - initial dose
May repeat doses based upon Medical Control Order or
Protocols/Standing Orders for persistent hypoglycemia.
PEDIATRIC:
0.5grams/kg (5mL) IV/IO, up to 100mL repeat as needed
Dilute D50W 1:1 with sterile water, or Saline (2-4 ml/kg of D25 mixture) THERAPEUTIC EFFECTS: Immediate source of glucose and water
RELATIVE CONTRAINDICATIONS: Intracranial hemorrhage, Known CVA
SIDE EFFECTS: Local irritation, May precipitate severe neurologic symptoms in alcoholics

Diltiazem:

INDICATIONS: Atrial Fibrillation or Atrial Flutter with Rapid Ventricular Response. Supraventicular Tachycardia
ADMINISTRATION: IV/IO
DOSAGE: ADULT ONLY: 0.25mg/kg IV/IO (15-20mg) slowly.
THERAPEUTIC EFFECTS: Slows AV nodal conduction time.
RELATIVE CONTRAINDICATIONS:Hypersensitivity, hypotension, cardiogenic shock, wide-complex tachycardia (may lead to hemodynamic deterioration and VF), 2nd or 3rd degree heart block or sick sinus syndrome or other sinus node disease unless a functioning artificial pacemaker is present
SIDE EFFECTS: Dizziness, weakness, headache, dyspnea, cough, dysrhythmias, heart failure, peripheral edema, bradycardia, hypotension, AV blocks, syncope, VF, VT, cardiac arrest, chest pain, nausea, vomiting, dry mouth.

Diphenhydramine:
INDICATIONS: Anaphylaxis, Allergic reactions, Urticaria, Extrapyramidal reaction
ADMINISTRATION: IV, deep IM, IO
DOSAGE:
ADULT:
Up to 50 mg slow administration - initial dose
Up to 100 mg total dose ONLY WITH DIRECT MEDICAL ORDER
PEDIATRIC:
Up to 1 mg/kg slow administration - initial dose
Up to 2 mg/kg total dose ONLY WITH DIRECT MEDICAL ORDER
THERAPEUTIC EFFECTS: Inhibits histamine release and effects, Mild sedative, Inhibits motion sickness RELATIVE CONTRAINDICATIONS: Asthma, COPD, Pregnancy, Nursing mothers, Acute glaucoma SIDE EFFECTS: Sedation, Dries bronchial secretions, Blurred vision, Headache, Palpitations

Epinephrine 1:1,000
INDICATIONS: Anaphylaxis
ADMINISTRATION: IM
DOSAGE:
ADULT: 0.5mg IM
PEDIATRIC: 0.3mg IM
THERAPEUTIC EFFECTS: Increased systemic vascular resistance, Increased arterial B/P, Increased heart rate, Increased coronary and cerebral blood flow, Increased myocardial contraction, Increased myocardial O2 demand, Increased automaticity
RELATIVE CONTRAINDICATIONS: There are no contraindications to the use of epinephrine in the situation of cardiac arrest
SIDE EFFECTS: Palpitations, Hypertension, Dysrhythmias, Anxiety, Tremors

Epinephrine 1:10,000
INDICATIONS: Cardiac Arrest
ADMINISTRATION: IV/IO/ET
DOSAGE:
ADULT:1 mg IV/IO/ET every 3-5 mins
PEDIATRIC: 0.01 mg IIV/IO/ET every 3-5 mins
THERAPEUTIC EFFECTS: Increased systemic vascular resistance, Increased arterial B/P, Increased heart rate, Increased coronary and cerebral blood flow, Increased myocardial contraction, Increased myocardial O2 demand, Increased automaticity
RELATIVE CONTRAINDICATIONS: There are no contraindications to the use of epinephrine in the situation of cardiac arrest
SIDE EFFECTS: None in Cardiac Arrest

Etomidate:
INDICATIONS: Premeditation for medication-facilitated intubation.
ADMINISTRATION: IV/IO
DOSAGE: Adult: 0.3mg/kg IV over 30 to 60 secs (typical adult dose is 20mg).
THERAPEUTIC EFFECTS: Short-acting hypnotic that acts at the level of the reticular activating system.
RELATIVE CONTRAINDICATIONS: Hypersensitivity, labor/delivery, or septic shock.
SIDE EFFECTS: Apnea of short duration, resp depression, hypoventilation, hyperventilation, dysrhythmias, hypotension, hypertension, nausea, vomiting, involuntary muscle movement, pain at injection site.

Fentanyl Citrate:
INDICATIONS: Pain management, anesthesia adjunct.
ADMINISTRATION:
DOSAGE:
Adult: 50 to 100mcg (1mcg/kg) IM and IV slow push to a max of 200mcg. IN is rapid push.
Peds: 1 mcg/kg IM, IV, or IN slow push (over 1 to 2 mins) to a max dose of 100mcg. Do not use for pediatric under 2 years.
THERAPEUTIC EFFECTS: Pain relief, decreased agitation in sedation.
RELATIVE CONTRAINDICATIONS: Known hypersensitivity. Use with caution in TBI
SIDE EFFECTS: Respiratory Depression, Bradycarida and Nausa/Vomiting.

Glucagon:
INDICATIONS: Hypoglycemia, Beta blocker overdose, Calcium channel overdose
ADMINISTRATION: SQ, IM, IV, IO
DOSAGE:
ADULT: 0.5 - 1.0 mg
PEDIATRIC: 0.1 mg/kg
Maximum dosage = 1.0 mg
THERAPEUTIC EFFECTS: Causes breakdown of glycogen to glucose; inhibits glycogen synthesis; elevates blood glucose level
RELATIVE CONTRAINDICATIONS: Hypersensitivity, Insulinoma, Pheochromocytoma
SIDE EFFECTS: Relatively free of adverse reactions except for occasional nausea and vomiting, Urticaria, respiratory distress and hypotension have been reported

Ibuprofen:
INDICATIONS: Pain, Fever, Inflammation
ADMINISTRATION: P.O.
DOSAGE:
ADULT: 200-600 mg P.O.
PEDIATRIC: 10 mg/kg
THERAPEUTIC EFFECTS: Analgesia, Antipyretic, Anti-inflammatory
RELATIVE CONTRAINDICATIONS: Active ulcer; < 2 months of age; Dose Within Previous 6 hours; Known Bleeding Disorders
SIDE EFFECTS: Allergic reaction; Nausea/Vomiting; Indigestion; Heartburn

Ipratropium Bromide:
INDICATIONS: Persistent bronchospasm, COPD exacerbation
ADMINISTRATION: Nebulized
DOSAGE:
Adult: 0.5 mg Nebulized
Pediatric: 0.25 mg Nebulized
THERAPEUTIC EFFECTS: Inhibits cholinergic receptos in bronchial smooth muscle producing bronchodilation.
RELATIVE CONTRAINDICATIONS: Hypersensitivity to ipratropium, atropine, alkaloids.
SIDE EFFECTS: Headache, dizziness, nervousness, fatigue, tremor, blurred vision, cough, dyspnea, worsening COPD symptoms, tachycardia, palpitations, flushing, MI, dry mouth, nausea, vomiting, GI distress.

Ketamine:
INDICATIONS: Excited delirium, pain management, procedural sedation
ADMINISTRATION: IV/IO/IM
DOSAGE:
Adult: 1.5-2mg/kg IV/IO for RSI, 4 mg/kg Excited Delirium, 0.2mg/kg for pain control.
Pediatric: None
THERAPEUTIC EFFECTS: Produces a dissociative state via direct action on the cerebral cortex and limbic system
RELATIVE CONTRAINDICATIONS: Hypersensitivity,
SIDE EFFECTS: Laryngospam and apnea (especially with IV dosing), bronchodilation hypersalivation myoclonus, hypertonus spontaneous movement and emergence psychosis

Ketorolac:
INDICATIONS: Headache with similar to previous migraines, Abdominal/Flank/Pelvic/ Back Pain (non-traumatic)
ADMINISTRATION: IV/IO/IM
DOSAGE:
Adult: 15 mg IV/IO/IM
Peds: 0.5mg/kg IV/IO/IM (max dose of 15mg)
THERAPEUTIC EFFECTS: Short-term management of moderate to severe pain.
RELATIVE CONTRAINDICATIONS: Allergy to salicylates or other NSAIDs. Pts with history of asthma, bleeding disorders (especially GI related, such as peptic ulcer disease), renal failure
SIDE EFFECTS: Drowsiness, dizziness, headache, sedation, bronchospasm, dyspnea, edema, vasodilation, hypotension, hypertension, GI bleeding, diarrhea, dyspepsia, nausea.

Lidocaine Hydrochloride:
INDICATIONS: Recurrent VF-VT and Wide Complex Tachycardia, IO Local Anesthetic
ADMINISTRATION: IV/IO
DOSAGE:
Adult: 1.5 mg/kg IV/IO may repeat 0.75mg/kg every 5-10 minutes to max dose of 3mg/kg. IO Local Anesthetic: 20-40mg IO push.
Pediatric: 1 mg/kg IV/IO may repeat 1 mg/kg every 15 minutes to max dose of 3mg/kg. IO Local Anesthetic: 0.5 mg/kg IO push.
THERAPEUTIC EFFECTS: Depresses ventricular diastolic depolarization and automaticity. Topically Lidocaine blocks the generation and conduction of nerve impulses.
RELATIVE CONTRAINDICATIONS: Allergy to Caine related anesthetics, Idioventricular rhythm. Second and Third Degree AV Block.
SIDE EFFECTS: Anxiety, drowsiness, confusion, seizures, slurred speech, resp arrest, hypotension, bradycardia, dysrhythmias, cardiac arrest, AV block, nausea, vomiting.

Magnesium Sulfate:
INDICATIONS: Eclampsia, Torsades de Pointes, Refractory Bronchospasm
ADMINISTRATION: IV/IO
DOSAGE:
Adult: Eclamptic seizure: 4-6 grams in 10% solution, IV/IO over 15-30 minutes.
Torsades de Pointes: 2 mg IV/IO over 1-2 min q5-15 mins.
Bronchospasm: Only to be used with ONLINE MEDCIAL CONTROL: 2 gm infusion.
THERAPEUTIC EFFECTS: Produces vasodilation and prevents or controls convulsions
RELATIVE CONTRAINDICATIONS: Heart block, myocardial damage
SIDE EFFECTS: Drowsiness, CNS depression, resp depression, resp tract paralysis, abnormal ECG, AV block, hypotension, vasodilation, hyporeflexia.

Methylprednisolone Sodium:
INDICATIONS: Allergic Reaction, Bronchospasm- Asthma/COPD
ADMINISTRATION: IV/IO
DOSAGE:
Adult: 125 mg IV/IO
Pediatric: 2mg/kg IV/IO
THERAPEUTIC EFFECTS: Multiple mechanisms of action including anti-inflammatory and immunosuppressive suppersion.
RELATIVE CONTRAINDICATIONS: Known hypersensitivity to Methlpresnisolone
SIDE EFFECTS: Sodium and Water Retention Hypertension, Seizures, Hypokalemia

Midazolam Hydrochloride:

INDICATIONS: Seizures, Procedural Sedation, Agitated/Combative Behavior, Vetrigo
ADMINISTRATION: IV/IO/IM/IN
DOSAGE:
Adult: Seizure and Sedation: 0.05mg/kg IV/IO/IN, 5 mg IM may repeat every 5 minutes until a max dose of 0.1 mg/kg
Pediatric: Seizures: 0.1 mg/kg IV/IO/IN, 0.15 mg/kg IM, may repeat every 5 minutes until a max dose of 0.2 mg/kg IV. Sedation: 0.05mg/kg IV/IO.
THERAPEUTIC EFFECTS: Binds to the GABA receptors in the CNS depressing the RAS and neuronal excitability.
RELATIVE CONTRAINDICATIONS: Know hypersensitivity to Midazolam. Acute/Untreated Glaucoma
SIDE EFFECTS: Res[iratory depression, laryngospasm, bronchospasm, Hypotension, dysrhythmias, retrograde amnesia, dizziness, nausea, vomiting.

Naloxone Hydrochloride:

NDICATIONS: Narcotic overdoses; i.e.:
- Morphine - Demerol - Heroin - Dilaudid - Paregoric - Percodan
- Fentanyl - Methadone - Codeine

Synthetic analgesic overdose; i.e.:
- Nubain - Talwin - Stadol - Darvon/Darvocet

ADMINISTRATION: IV, IO, IM, SC, IN
DOSAGE:
ADULT: 0.4 – 2mg IV/IO/IM/IN Q2-3 min PRN
PEDIATRIC:
0.1 mg/kg for children up to 5 years old or <20 kg
2.0 mg for children over 5 years or > 20 kg
may repeat every 2 – 3 minutes as needed
THERAPEUTIC EFFECTS: Reverses most effects of nearly all narcotic and/or synthetic narcotic agents RELATIVE CONTRAINDICATIONS: Hypersensitivity to the drug
SIDE EFFECTS: Vomiting with rapid administration, Ventricular dysrhythmias, Precipitate acute narcotic withdrawal syndrome, Seizures, Hypertension

Nitroglycerin/Nitroglycerin Paste:

INDICATIONS: Chest pain consistent with acute coronary symptoms. Pulmonary edema ADMINISTRATION: Sublingual Tablet or Spreadable Paste

DOSAGE:

Adult: 1 tablet 0.3 - 0.4 mg sublingual or 1 Inch Paste
No more than 3 tablets should be administrated within a 15 minute period. A 4th, and subsequent tablets, may be administered with online orders if chest pain persists and as long as systolic BP remains at 100 or greater.
PEDIATRIC: NOT APPROVED
THERAPEUTIC EFFECTS: Dilates coronary and systemic arteries
RELATIVE CONTRAINDICATIONS: Increased Intracranial Pressure (ICP), Hypotension/ Shock, Glaucoma Use of VIAGRA/CIALIS/LEVITRA within previous 24 Hours
SIDE EFFECTS: Headache, Dizziness, Hypotension

Sodium Chloride 0.9%:

INDICATIONS: Heat exhaustion and related heat problems, Diabetic disorders, Freshwater Drowning, Head injury (depending upon Medical Control Physician), Hypovolemia
ADMINISTRATION: IV infusion, IO
DOSAGE:
ADULT: Dependent upon patient condition and situation being treated
PEDIATRIC: Dependent upon patient size and condition
THERAPEUTIC EFFECTS: Provides fluid and sodium replacement
RELATIVE CONTRAINDICATIONS: Congestive Heart Failure
SIDE EFFECTS: Volume Overload, Congestive Heart Failure, Diuresis, Thirst

Oral Glucose:

INDICATIONS: Conscious patients with suspected hypoglycemia.
ADMINISTRATION: PO
DOSAGE:
Adult: 25g PO in pts with intact gag reflex and ability to manage their own secretions.
THERAPEUTIC EFFECTS: After absorption in the GI tract, glucose is distributed to the tissues providing an increase in circulating blood glucose levels.
RELATIVE CONTRAINDICATIONS:Decreased LOC, nausea, vomiting.
SIDE EFFECTS: Nausea, vomiting

Ondansetron Hydrochloride:
INDICATIONS: Nausea and Vomiting
ADMINISTRATION: IV/IO/PO
DOSAGE:
Adult: 4-8 mg IV/IM/IO
Pediatric: 0.1 mg/kg IV/IO in patients less than 40kg. 4 mg IV/IO/IM in patients over 40kg.
THERAPEUTIC EFFECTS: Selective serotonin antagonist that centrally inhibits the vomiting center in the brain.
RELATIVE CONTRAINDICATIONS: Known allergy to ondansetron
SIDE EFFECTS: Headache, malaise, wheezing, bronchospasm, AF, abnormal ECG, prolonged QT interval, ST segment depression, 2nd degree AV block, constipation, diarrhea, hives, skin rash.

Sodium Bicarbonate:
INDICATIONS: Crush Syndrome, Severe Metabloc acidosis, Salicylate(Aspirin overdose, Hyperkalemia, Cyanide poisoning.
ADMINISTRATION: IV/IO
DOSAGE:
Adults:1-2 mEq/kg IV/IO Bolus q10 mins
Pediatrics: Not recommended
THERAPEUTIC EFFECTS: An alkalizing agent uded to buffer acids.
RELATIVE CONTRAINDICATIONS: None
SIDE EFFECTS: Hypernatremia, metabolic alkalosis, tissue sloughing, cellulitis, necrosis at injection site, seizures, fluid retention, hypokalemia, electrolyte imbalance, tetany, sodium retention, peripheral edema.

DUTY TO ACT PROTOCOL

Policy:
Bluffton Township Fire District personnel shall report all incidents encountered during routine operations and ensure all potentially injured persons receive patient care.

Purpose:
- To provide guidance to all field personnel on required “duty to act” incidents, in the event that additional or separate patient(s) are encountered, other than the original assigned patient(s) seeking medical treatment.

Procedure:
Unit enroute to a call and come upon another incident
- Notify the Communications Center that you are stopping at the scene to assess the patient(s).
- Crew must evaluate all information and make a decision to attend the patient at the greatest risk based on:
  - The Communication Center's assessment of the condition of the patient at the scene of the original incident.
  - The condition of the patient at the scene of the found incident.
  - Consider the response time that a second ambulance would have to travel to either incident.
  - Are there first responders or medically trained personnel on the scene and available.
- Once you determine which call has the greatest risk for the patient, alert the Communications Center of the incident you plan to attend.

Ambulance transporting a non-critical patient and come upon another incident
- Advise the Communications Center that you are stopping at the scene to access the patient(s).
- If the patient of the found incident does not require ALS and the first responders are on the scene, you may elect to continue transport of the original patient.
- If you elect to continue transport, advise the found patient(s) that you will have a second ambulance respond.
- If the found patient is critical and requires ALS, your partner will remain with your original patient while you attend to the found patient(s).

Ambulance has an emergency patient on board and comes upon a second incident
- Slow down or stop only long enough to inform the citizens at the scene that you have a critical patient on-board and another ambulance is enroute. Continue immediate transport of the first patient.
  - Ensure Communications Center awareness of incident location and that additional resources are responding.
- Notify the Communications Center that you have staff requesting another ambulance for a different patient.
- Crew must evaluate all information and make a decision to attend the patient at the greatest risk based on:
  - The condition of the patient at the scene for the original incident.
  - The condition of the second patient at the scene.

Responding Agency is advised that there are now more than one patient in a nursing or other healthcare facility requiring EMS.
- Crew may have to split up to provide care to both patients until additional resources arrive.
- If contact is already made with original patient and crew is unable to split up, advise staff of situation and that there is another ambulance on the way.

FOUNDATION

Universal Patient Care Protocol

Scene Safety
Bring all necessary equipment to patient's side
Demonstrate Professionalism and Courtesy

PPE (Consider Airborne or Droplet if indicated)

Initial Assessment
Age Appropriate Assessment Procedure
Consider Spinal Motion Restriction [as indicated]
(PEDIATRIC: < 12 years old AND [a] < 55 Kg -or- [b] Fits on Standardized Pediatric Length Based Tape)

→ Cardiac Arrest Protocol

R	Consider F.A.S.T / R. A. C. E. Assessment	R

Airway Protocol
Age Appropriate

R	Vital Signs (Temperature if appropriate)	R
R	Pulse Oximetry	R
B	Assess Blood Glucose	B
R	Consider Supplemental **Oxygen**	R
B	Consider Cardiac Monitor / ECG **Acquisition** If available	B

↔ Go To Glucose Management Protocol

Exit To
Appropriate Protocol

M	**Patient Does Not Fit a Protocol: Contact Medical Control**	M

A patient is defined as any person who meets ANY of the following criteria:

- Receives basic or advanced medical or trauma treatment or;
- Is physically examined or;
- Has visible signs of injury or illness or has a medical complaint or;
- Requires EMS **specific** assistance to change locations and/or position or;
- Identified by any party as a possible patient because of some known, or reasonably suspected illness or injury or;
- Has a personal medical device evaluated or manipulated by EMS or;
- Requests EMS assistance with the administration of personal medications or treatments.

FOUNDATION

Universal Patient Care Protocol

A patient is defined as any person who meets ANY of the following criteria:

- Receives basic or advanced medical or trauma treatment or;
- Is physically examined or;
- Has visible signs of injury or illness or has a medical complaint or;
- Requires EMS **specific** assistance to change locations and/or position or;
- Identified by any party as a possible patient because of some known, or reasonably suspected illness or injury or;
- Has a personal medical device evaluated or manipulated by EMS or;
- Requests EMS assistance with the administration of personal medications or treatments.

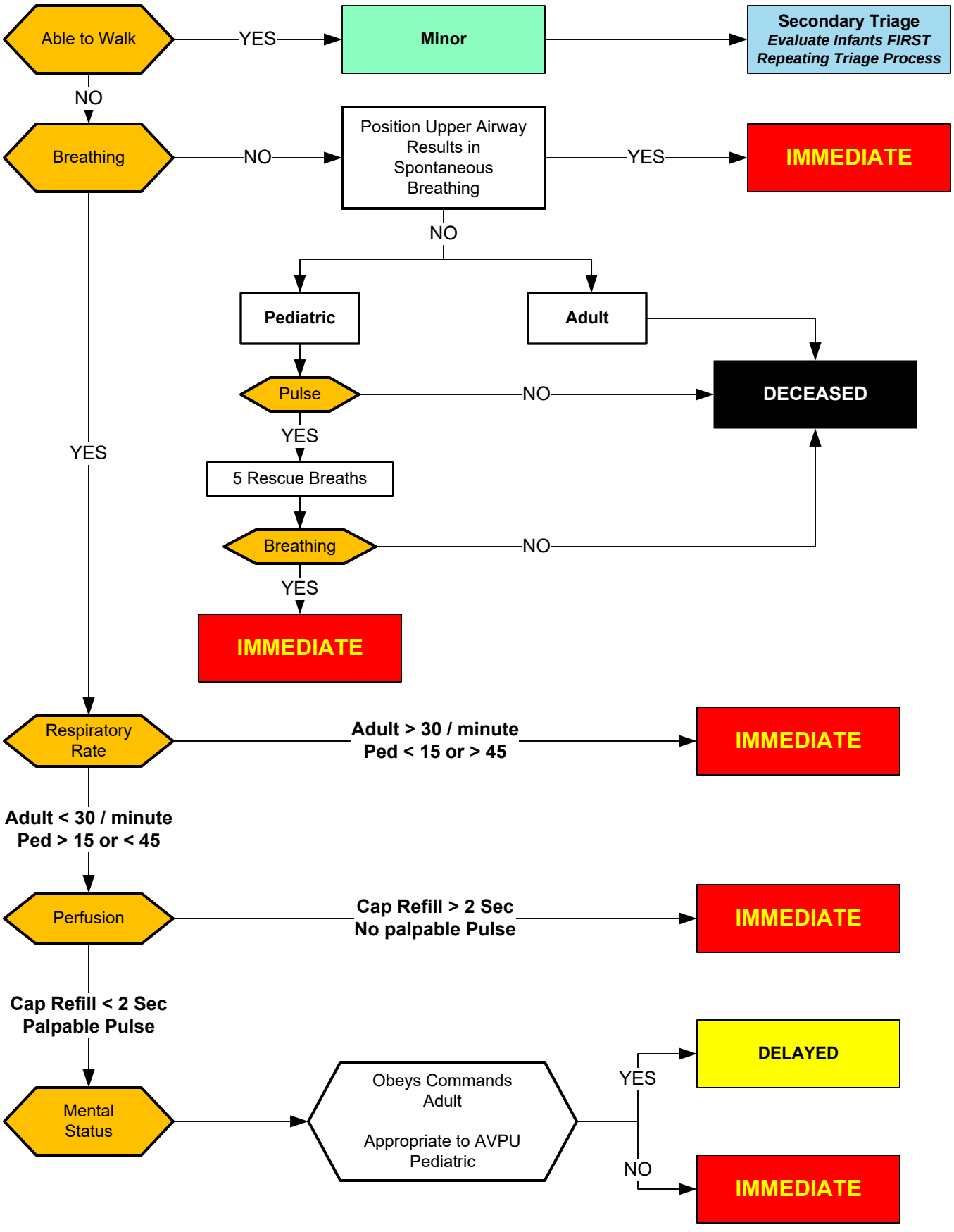
Completion of a PCR (ePCR) is required for any and all patient encounters.

FOUNDATION

Pearls

- **Recommended Exam: Minimal exam if not noted on the specific protocol is vital signs, mental status with GCS, and location of injury or complaint.**
- **Any patient contact which does not result in an EMS transport must have a completed disposition form.**
- **Required vital signs on every patient include blood pressure, pulse, respirations, pain / severity.**
- **Pulse oximetry and temperature documentation is dependent on the specific complaint.**
- **Capnography is:**
  - **Required for ALL Intubated Patients and Cricothyroidotomy Patients***
  - **Recommended / Encouraged for all unstable patients**
  - **Recommended / Encouraged for utilization of any Airway Device (e.g. BIAD)**
  - **[* Attachment of the Capnograph may be delayed until the scene is safe / non-threatening]**
- **A pediatric patient is defined as < 12 years old AND either [a] < 55 Kg -or- [b] Fits on Standardized Pediatric Length Based Tape**
- Timing of transport should be based on patient's clinical condition and the transport policy.
- Never hesitate to contact medical control for patient who refuses transport.

Mass CasualtyTriage



FOUNDATION

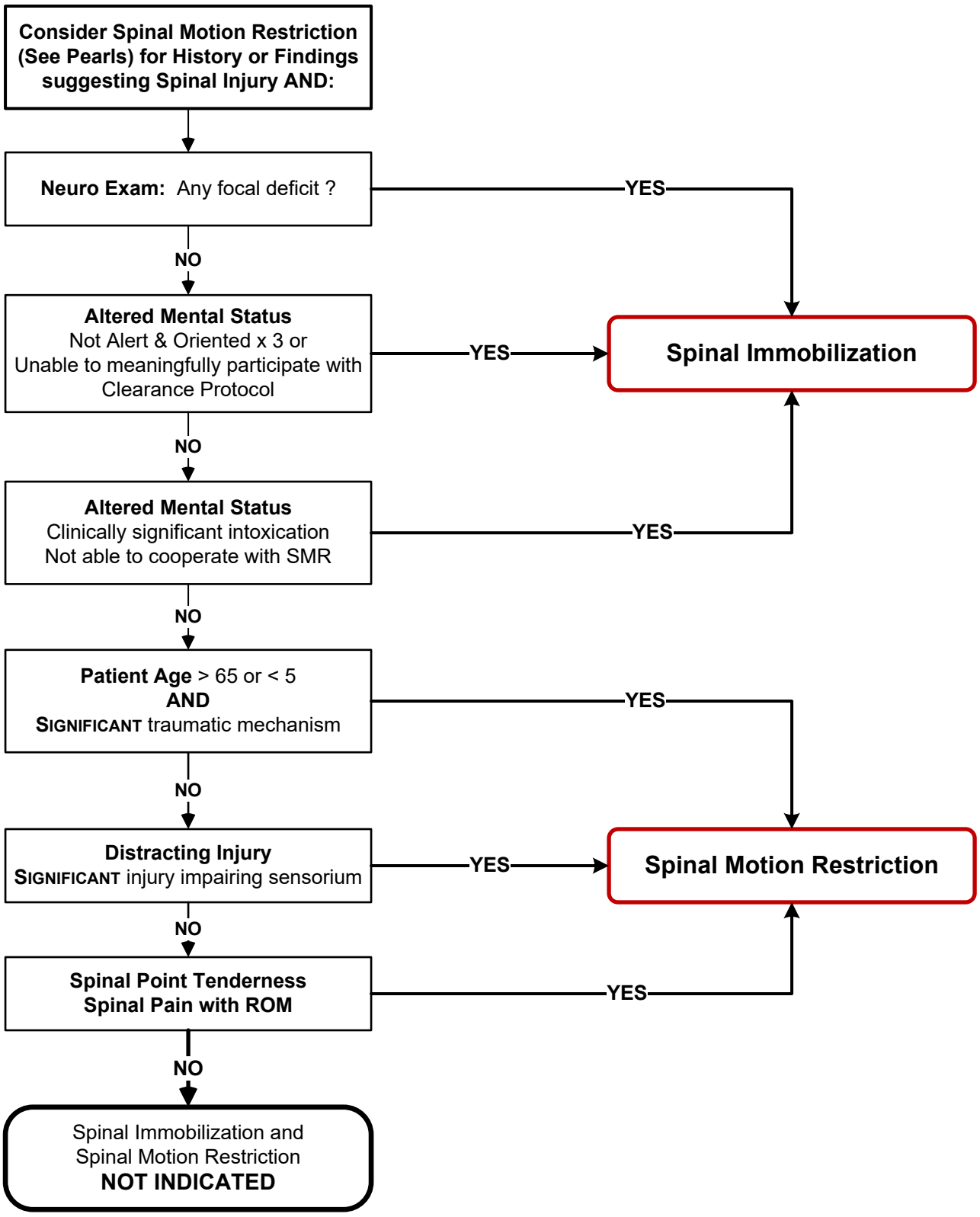
Mass Casualty Triage

FOUNDATION

Pearls

- First evaluate all children who did not walk under their on power where possible and safety allows.
- Capillary refill can be altered by many factors including skin temperature. Age-appropriate heart rate may also be used in triage decisions.

Spinal Motion Restriction



Spinal Immobilization = C-Collar + Long Spine Board / Scoop Stretcher + HID
Spinal Motion Restriction (SMR) = Cervical Collar + Patient remains in position of comfort, assisted movement to prevent extremes of spinal motion.

FOUNDATION

Spinal Motion Restriction

FOUNDATION

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Consider Spinal Motion Restriction [SMR] in any patient with arthritis, cancer, or other underlying spinal or bone disease.**
- Significant mechanism includes high-energy events such as ejection, high falls, and abrupt deceleration crashes and may indicate the need for spinal motion restriction in the absence of symptoms.
- Range of motion should NOT be assessed if patient has midline spinal tenderness. Patient's range of motion should not be assisted. The patient should touch their chin to their chest, extend their neck (look up), and turn their head from side to side (shoulder to shoulder) without spinal process pain.
- The acronym "NSAIDS" should be used to remember the steps in this protocol.
- "**N**" = Neurologic exam. Look for focal deficits such as tingling, reduced strength, on numbness in an extremity.
- "**S**" = Significant mechanism or extremes of age.
- "**A**" = Alertness. Is patient oriented to person, place, time, and situation? Any change to alertness with this incident?
- "**I**" = Intoxication. Is there any indication that the person is intoxicated (impaired decision making ability)?
- "**D**" = Distracting injury. Is there any other injury which is capable of producing significant pain in this patient?
- "**S**" = Spinal exam. Look for point tenderness in any spinal process or spinal process tenderness with range of motion.

Vascular Access

Universal Patient Care Protocol

Assess need for Vascular Access. Emergent or Potentially emergent medical or trauma condition

A

- Peripheral IV
- External Jugular IV
  - Not for use in Pediatric Patients EXCEPT in Life Threatening Event
- Intraosseous IV (Pediatric or Adult device) for Life Threatening Event

A

P May access Percutaneous Central Catheter if Available **P**

A May utilize an already accessed Central Line Catheter **A**

Successful

B Monitor Med-Lock **B**

B Monitor Non-Medicated Infusion **B**

P **Monitor Medicated Infusion** **P**

Unsuccessful x 3 [total] Attempts with any methods

M **Notify Destination or Contact Medical Control** **M**

P If IO is successful and the patient is an adult and is conscious, may administer 20 mg of Lidocaine IVP over 2-5 mins for a local anesthetic, may repeat once for a total dose of 40mg

or

May administer 0.5mg/kg of Lidocaine over 2-5 mins for a local anesthetic, may repeat once for a total dose of 20mg for Pediatric. **P**

FOUNDATION

Vascular Access

FOUNDATION

Pearls

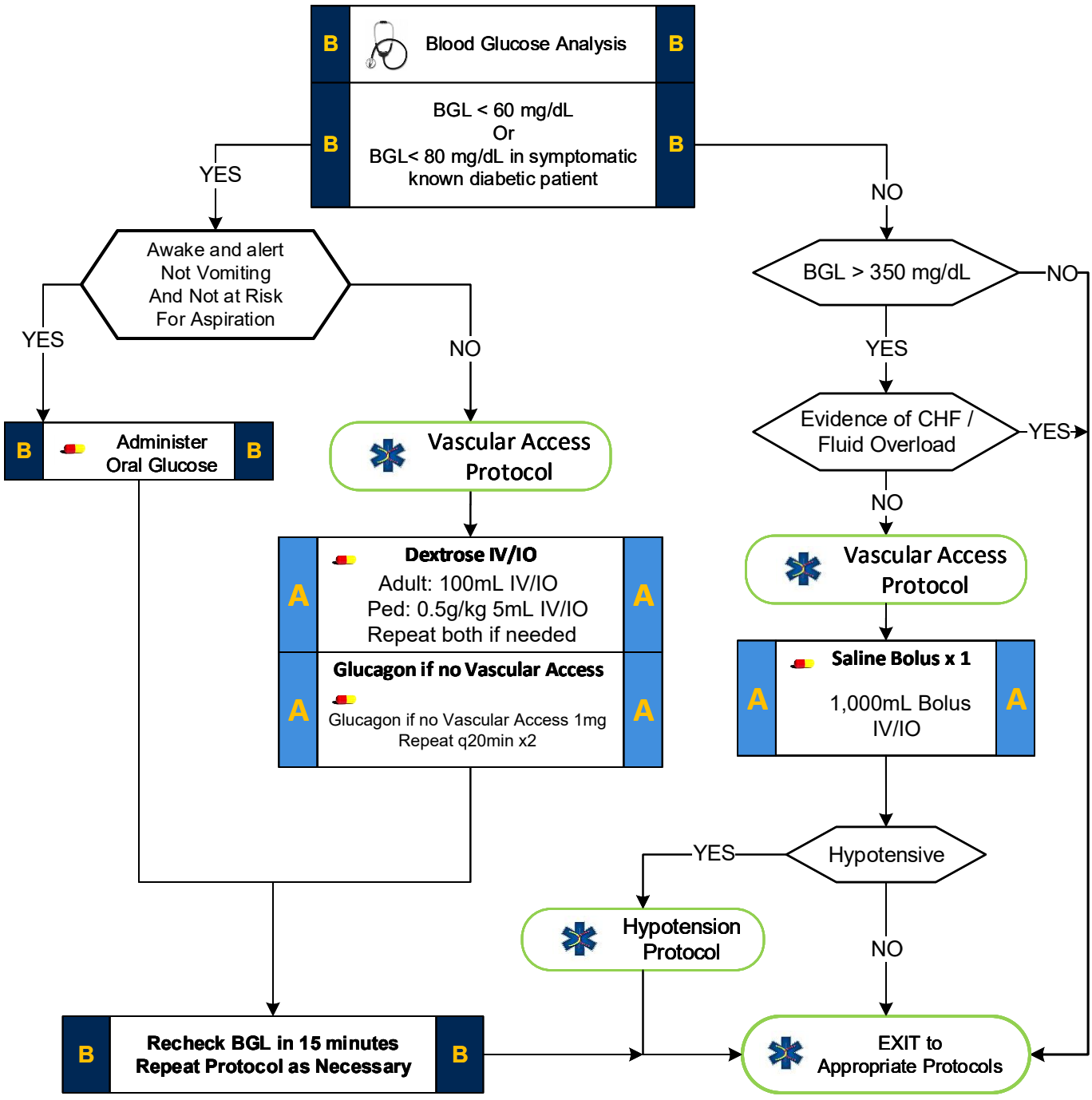
- In patients who are **NOT** hemodynamically unstable or in extremis, contact medical control prior to accessing dialysis shunts or external central venous catheters.
- In the setting of cardiac arrest, any preexisting dialysis shunt or external central venous catheter may be used.
- Intraosseous with the appropriate adult or pediatric device.
- Any prehospital fluids or medications approved for IV use, may be given through an intraosseous line.
- All IV rates should be at KVO (minimal rate to keep vein open) unless administering fluid bolus.
- External jugular lines can be attempted initially in life-threatening events where no obvious peripheral site is noted.
- Any venous catheter which has already been accessed prior to EMS arrival may be used.
- Upper extremity IV sites are preferable to lower extremity sites.
- Lower extremity IV sites are discouraged in patients with vascular disease or diabetes.
- In post-mastectomy patients, avoid (if possible) IV, blood draw, injection, or blood pressure in arm on affected side.

Glucose Management

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.



FOUNDATION

Glucose Management

- 50 mL of D50 = 25 GM Dextrose
- 100 mL of D25 = 25 GM Dextrose
- 250 mL of D10 = 25 GM Dextrose
- 500mL of D5 = 25 GM Dextrose

- Age < 31 days: Dextrose **NO MORE THAN D10**
- Age 31 d – 2 Y: Dextrose **NO MORE THAN D25**
- Age > 2 Y - Adult: Dextrose Concentration **UP TO D25**
- Age: Adult: Dextrose **D50**

FOUNDATION

Pearls

- **Recommended exam: Mental Status, Skin, Respirations and effort, 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.
- In extreme circumstances with no IV and no response to glucagon, Dextrose 50 % can be administered rectally. Contact medical control for advice.
- Infiltration of D50 may causes significant pain, swelling, and necrosis of tissues.
- **Make D10 by removing 10 mL of D50 and dilute with 40 mL of NS. Make D25 by removing 25 mL of D50 and dilute with 25 mL of NS.**
- **Patient's refusing transport to medical facility after treatment of hypoglycemia:**
- **Oral Agents:**

  Patient's 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. Patient's who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal.
- **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. Not all insulins have prolonged action so Contact Medical Control for advice. Patient's who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal.

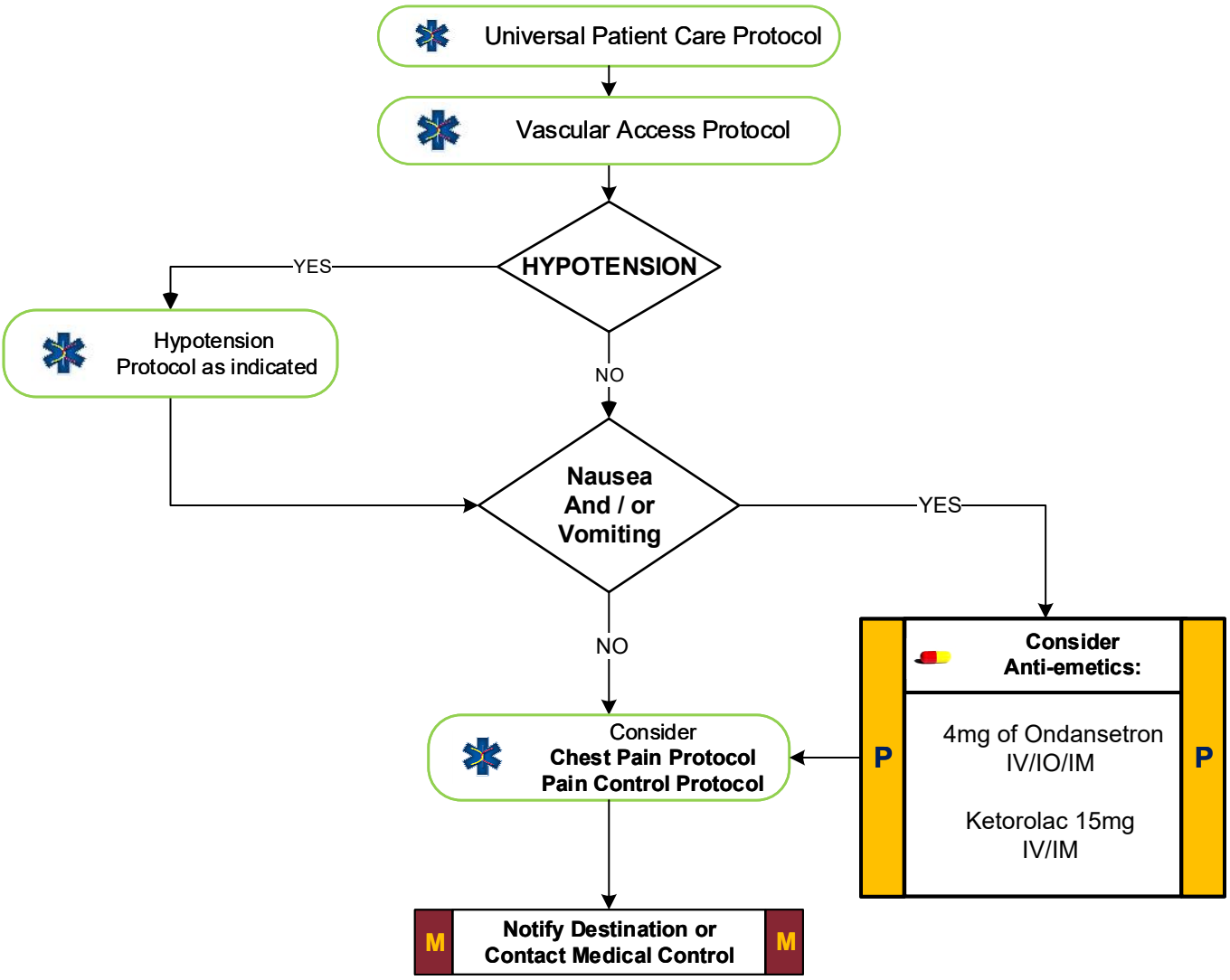
Abdominal Pain

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)**



ADULT MEDICAL

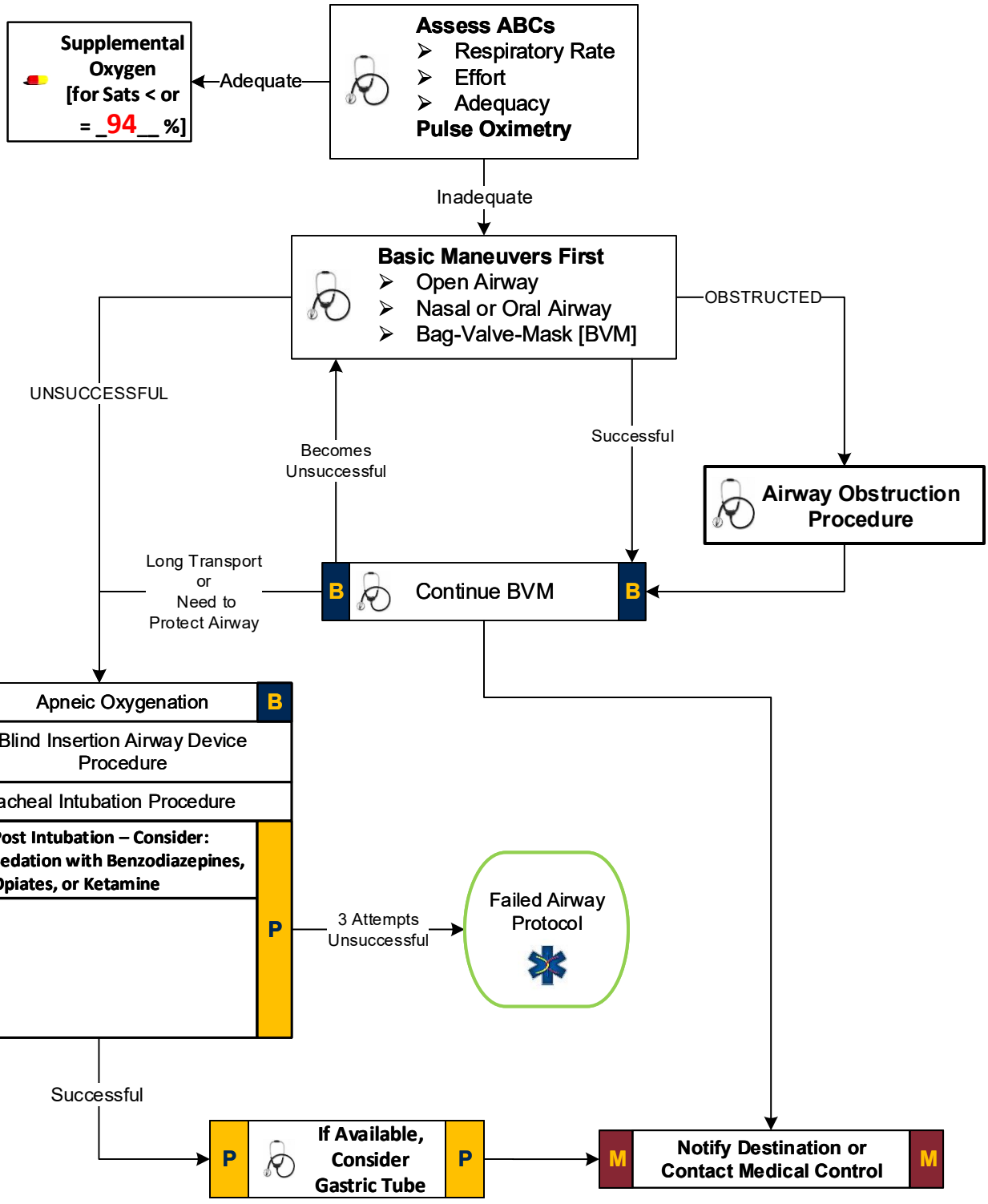
Abdominal Pain

ADULT MEDICAL

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 an ectopic pregnancy until proven otherwise.
- Antacids should be avoided in patients with renal disease.
- The diagnosis of abdominal aneurysm dissection should be considered with abdominal pain in patients over 50.
- Repeat vital signs after each bolus.
- Appendicitis may present with vague, peri-umbilical pain which migrates to the RLQ over time.

Airway, Adult



ADULT MEDICAL

Airway, Adult

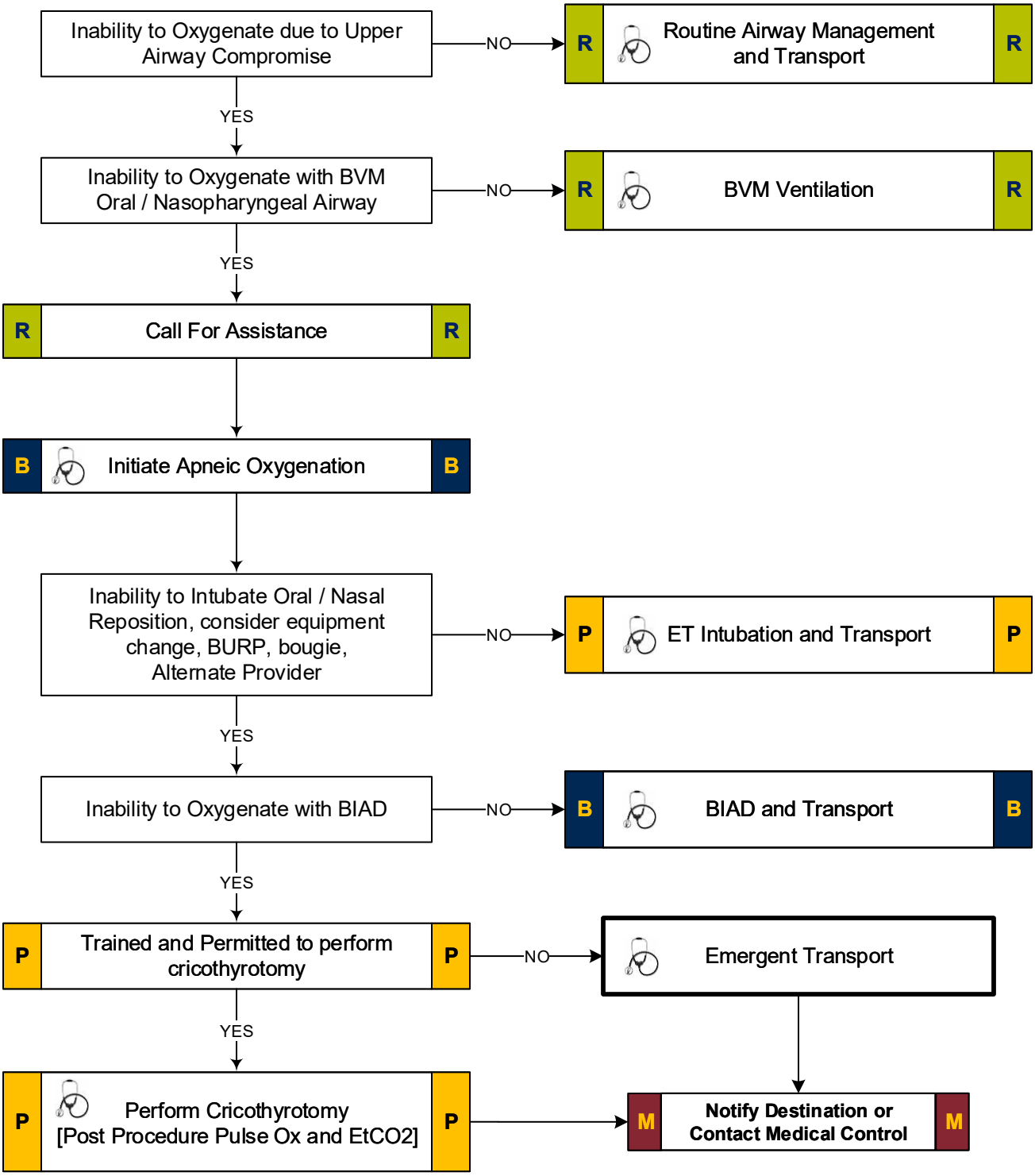
ADULT MEDICAL

Pearls

- **This protocol is only for use in ADULT patients.**
- **Capnometry (Color) or capnography is mandatory with all methods of intubation. Document results.**
- **Capnography is:**
  - **Required for ALL Intubated Patients and Cricothyroidotomy Patients***
  - **Recommended / Encouraged for all unstable patients**
  - **Recommended / Encouraged for utilization of any Airway Device (e.g. BIAD)**
  - **[* Attachment of the Capnograph may be delayed until the scene is safe / non-threatening]**
- **If an effective airway is being maintained by BVM with continuous pulse oximetry values of > 92% , it is acceptable to continue with basic airway measures instead of using a BIAD or Intubation.**
- **For the purposes of this protocol an adequate airway is when the patient is receiving appropriate oxygenation and ventilation – and not at an undue risk of aspiration or deterioration**
- **An Intubation Attempt is defined as passing the laryngoscope blade or endotracheal tube past the teeth or inserted into the nasal passage.**
- **Ventilatory rate should be sufficient to maintain a EtCO2 of 35-45. Avoid hyperventilation.**
- **It is strongly encouraged to complete an Airway Evaluation Form with any BIAD or Intubation procedure.**
- Paramedics should consider using a BIAD if oral-tracheal intubation is unsuccessful.
- Maintain C-spine motion restriction for patients with suspected spinal injury.
- Do not assume hyperventilation is psychogenic - use oxygen, not a paper bag.
- BURP maneuver may be used to assist with difficult intubations.
- Hyperventilation in deteriorating head trauma should only be done to maintain a EtCO2 of 30-35. Procedure may worsen view in some cases.
- Gastric tube placement should be considered in all intubated patients if available.
- It is important to secure the endotracheal tube well and consider c-collar to better maintain ETT placement.

Airway, Adult - Failed

Two (2) failed intubation attempts by most proficient technician on scene or anatomy inconsistent with intubation attempts. NO MORE THAN THREE (3) ATTEMPTS TOTAL



Airway, Adult - Failed

Pearls

- If first intubation attempt fails, make an adjustment and then consider:
  - Different laryngoscope blade
  - Gum Elastic Bougie
  - Different ETT size
  - Change cricoid pressure
  - 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.
- **Capnography is:**
  - **Required for ALL Intubated Patients and Cricothyroidotomy Patients***
  - **Recommended / Encouraged for all unstable patients**
  - **Recommended / Encouraged for utilization of any Airway Device (e.g. BIAD)**
  - **[* Attachment of the Capnograph may be delayed until the scene is safe / non-threatening]**
- Notify **Medical Control** **AS EARLY AS POSSIBLE** about the patient's difficult / failed airway.

Airway, Rapid Sequence Intubation

Indications for MFI / RSI
Failure to protect the airway
Unable to oxygenate
Unable to ventilate
Impending airway compromise

Protocols 1, 7, and 8 should be utilized together (even if agency is not using RSI) as they contain very useful information for airway management.

B — Preoxygenate 100% O2 — B

Vascular Access Protocol

P — **Assemble:** Airway Equipment, Suction Equipment, Alternative Airway Device — P

Dangerously Combative ?

NO

B — Apneic Oxygenation — B

P — **Etomidate 0.3 mg/kg IV / IO** or **Ketamine 1.5 - 2 mg/kg IV / IO** May repeat x 1 — P

MFI

P — **Verify Endotracheal Tube Placement** — P

P — **Long Acting Sedation: Benzodiazepine/Opiate/ Ketamine** — P

Consider Restraints [Physical] Procedure

P — Consider Gastric Tube Insertion Procedure — P

Awakening or Moving After Intubation ?

YES

P — Consider Increased Sedation — P

P — Consider Long Acting Paralytic — P

NO

M — **Notify Destination or Contact Medical Control** — M

YES

P — **Ketamine 4 mg/kg IM** — P

RSI

P — **Succinylcholine 1.5 mg / kg IV/ IO** or **Rocuronium 0.6 mg / kg IV/ IO** May repeat x 1 — P

If Unsuccessful in 3 attempts

Exit to Adult Failed Airway Protocol as indicated

At any point in this protocol where the patient is able to be intubated – intubation may proceed. If paralytics omitted continue to follow MFI protocol.

Procedure will remove patient's protective airway reflexes and ability to ventilate.

You must be sure of your ability to intubate before beginning this procedure.

Red Text are the key performance indicators used to evaluate protocol compliance.

An Airway Evaluation Form must be completed on every patient who receives MFI / RSI

ADULT MEDICAL

Airway, Rapid Sequence Intubation

ADULT MEDICAL

Pearls

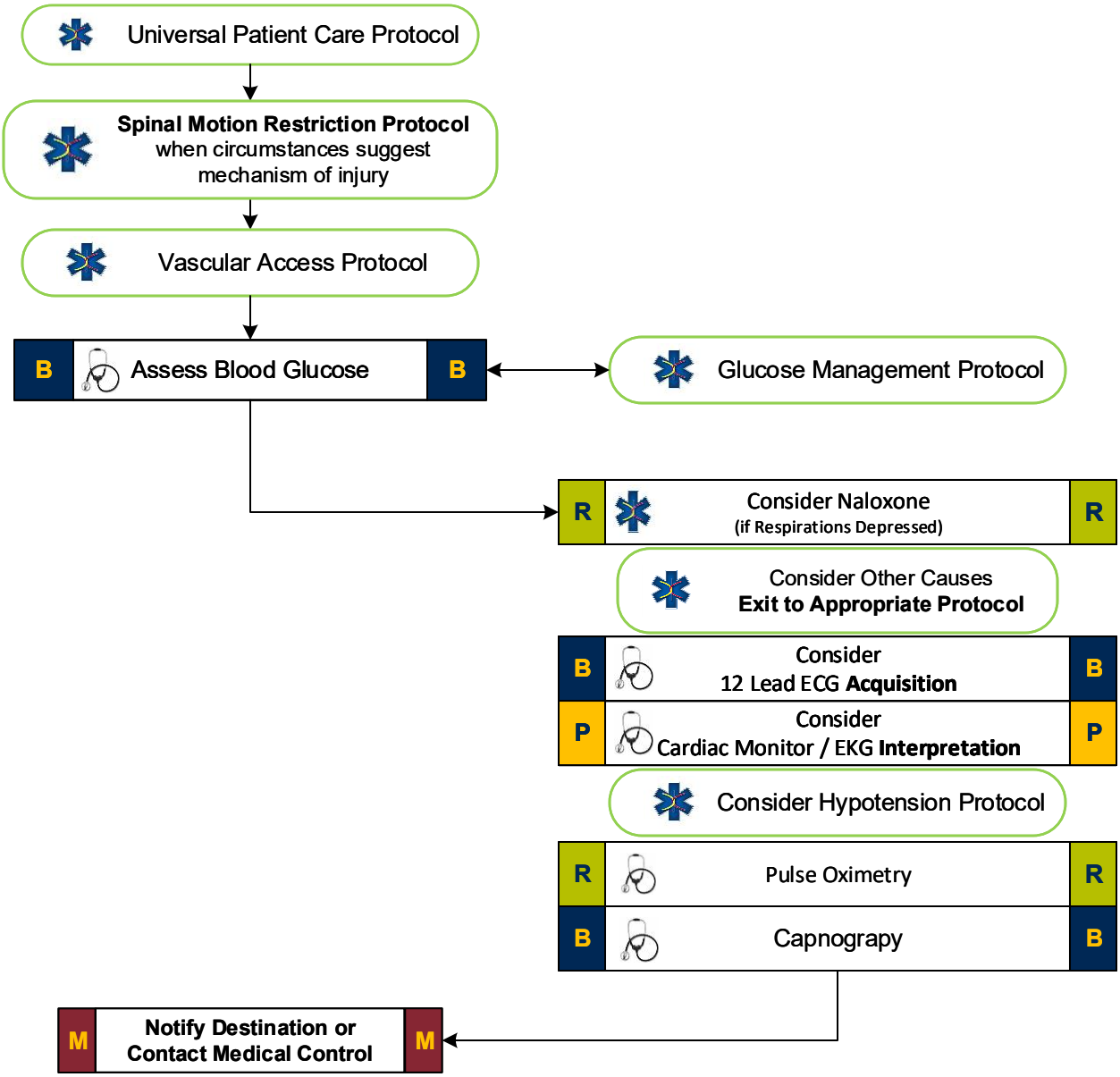
- **Agencies must maintain a separate Performance Improvement Program specific to Rapid Sequence Intubation.**
- **This procedure requires at least 1 EMT-Paramedic and a second credentialed/licensed medical provider. Divide the workload – ventilate, suction, cricoid pressure, drugs, intubation.**
- **Patients with hypoxia and/or hypotension are at risk of cardiac arrest when a sedative and paralytic medication are administered. Hypoxia and hypotension require resuscitation and correction prior to use of these combined agents.**
- **<u>This protocol is only for use in ADULT (non-pediatric) patients.</u>**
- **Before administering any paralytic drug, screen for contraindications with a thorough neurologic exam.**
- **Capnography is:**
  - **Required for ALL Intubated Patients and Cricothyroidotomy Patients***
  - **Recommended / Encouraged for all unstable patients**
  - **Recommended / Encouraged for utilization of any Airway Device (e.g. BIAD)**
  - **[* Attachment of the Capnograph may be delayed until the scene is safe / non-threatening]**
- **If First intubation attempt fails, make an adjustment and try again:**
  - **Different laryngoscope blade**
  - **Change cricoid pressure; No longer routinely recommended and may worsen your view.**
  - **Different ETT size**
  - **Align external auditory canal with sternal notch / proper positioning.**
  - **Change head positioning**
  - **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.
- RSI not recommended in urban setting (short transport) when able to maintain oxygen saturation ≥ 92 %.
- Consider Naso or orogastric tube placement in all intubated patients to limit aspiration and decompress stomach if needed.

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

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



ADULT MEDICAL

Altered Mental Status

Pearls

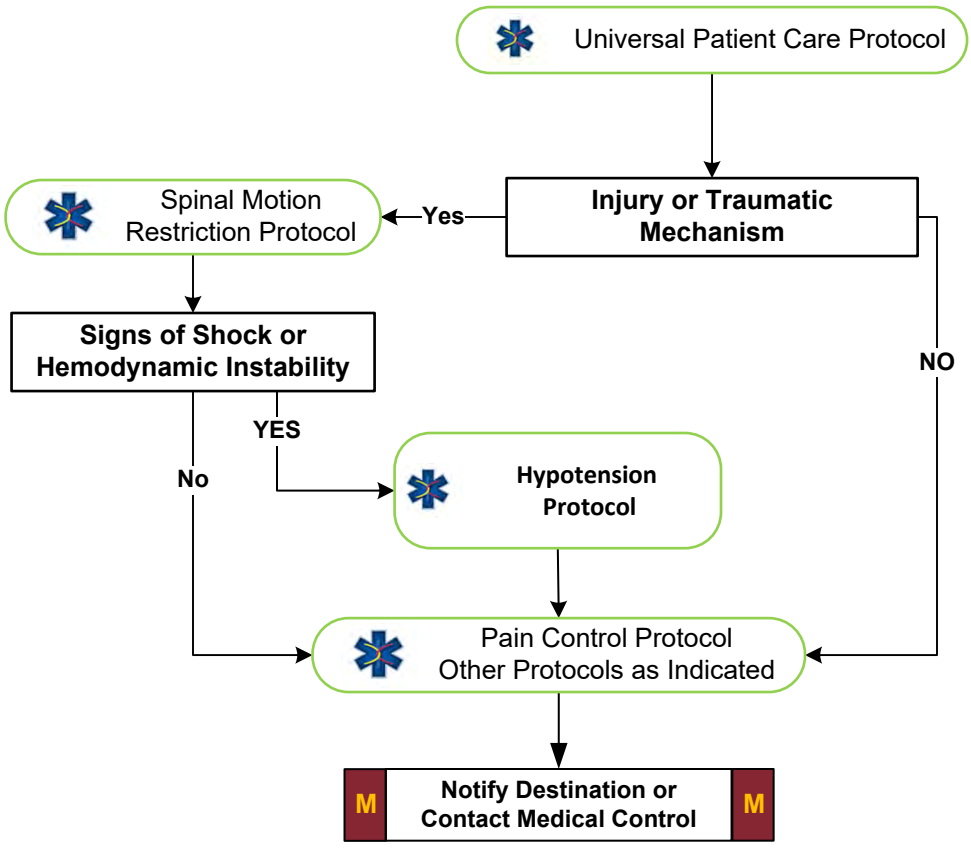
- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro. Pay careful attention to the head exam for signs of bruising or other injury.**
- Naloxone may be given by EMRs, EMTs, or AEMTs by either auto-injector or nasal spray only per local medical control option.
- 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.
- 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.

Back Pain

History
- Age
- Past medical history
- Past surgical history
- Medications
- Onset of pain / injury
- Previous back injury
- Traumatic mechanism
- Location of pain
- Fever
- Improvement or worsening with activity

Signs and Symptoms
- Pain (paraspinous, spinous
- process)
- Swelling
- Pain with range of motion
- Extremity weakness
- Extremity numbness
- Shooting pain into an extremity
- Bowel / bladder dysfunction

Differential
- **Muscle spasm / strain**
- **Herniated disc with nerve**
- **Compression**
- **Sciatica**
- **Spine fracture**
- **Kidney stone**
- **Pyelonephritis**
- **Aneurysm**
- **Pneumonia**
- **Spinal Epidural Abscess**
- **Metastatic Cancer**



Back Pain

Pearls

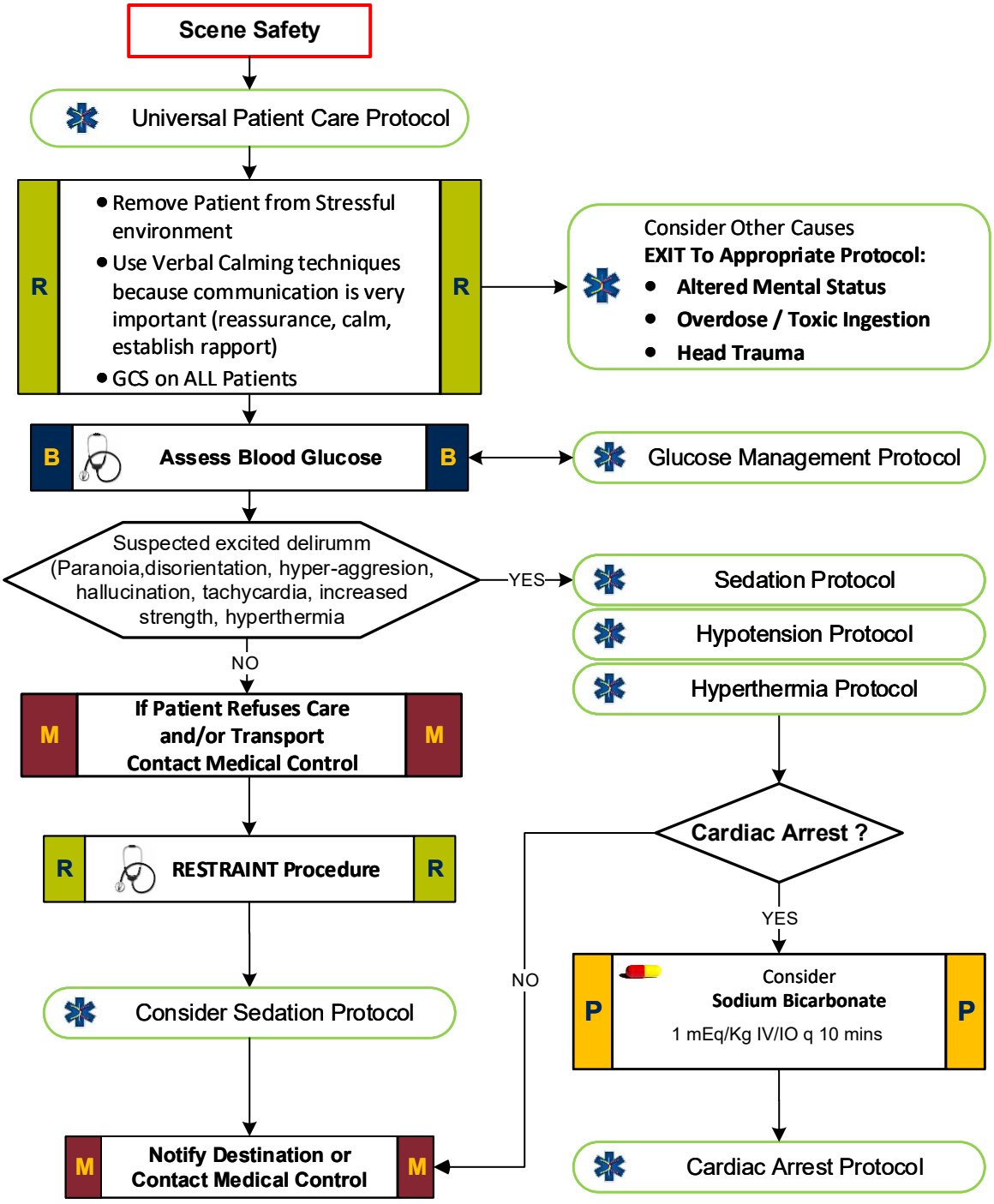
- **Recommended Exam: Mental Status, HEENT, Neck, Chest, Lungs, Abdomen, Back, Extremities, Neuro**
- Abdominal aneurysm dissections are a concern in patients over the age of 50.
- Kidney stones typically present with an acute onset of flank pain which radiates around to the groin area.
- Any bowel or bladder incontinence is a significant finding which requires immediate medical evaluation.
- In patient with history of IV drug abuse a spinal epidural abscess should be considered.

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



ADULT MEDICAL

Behavioral

Physical Restraint as needed without causing undue harm.

ADULT MEDICAL

Pearls

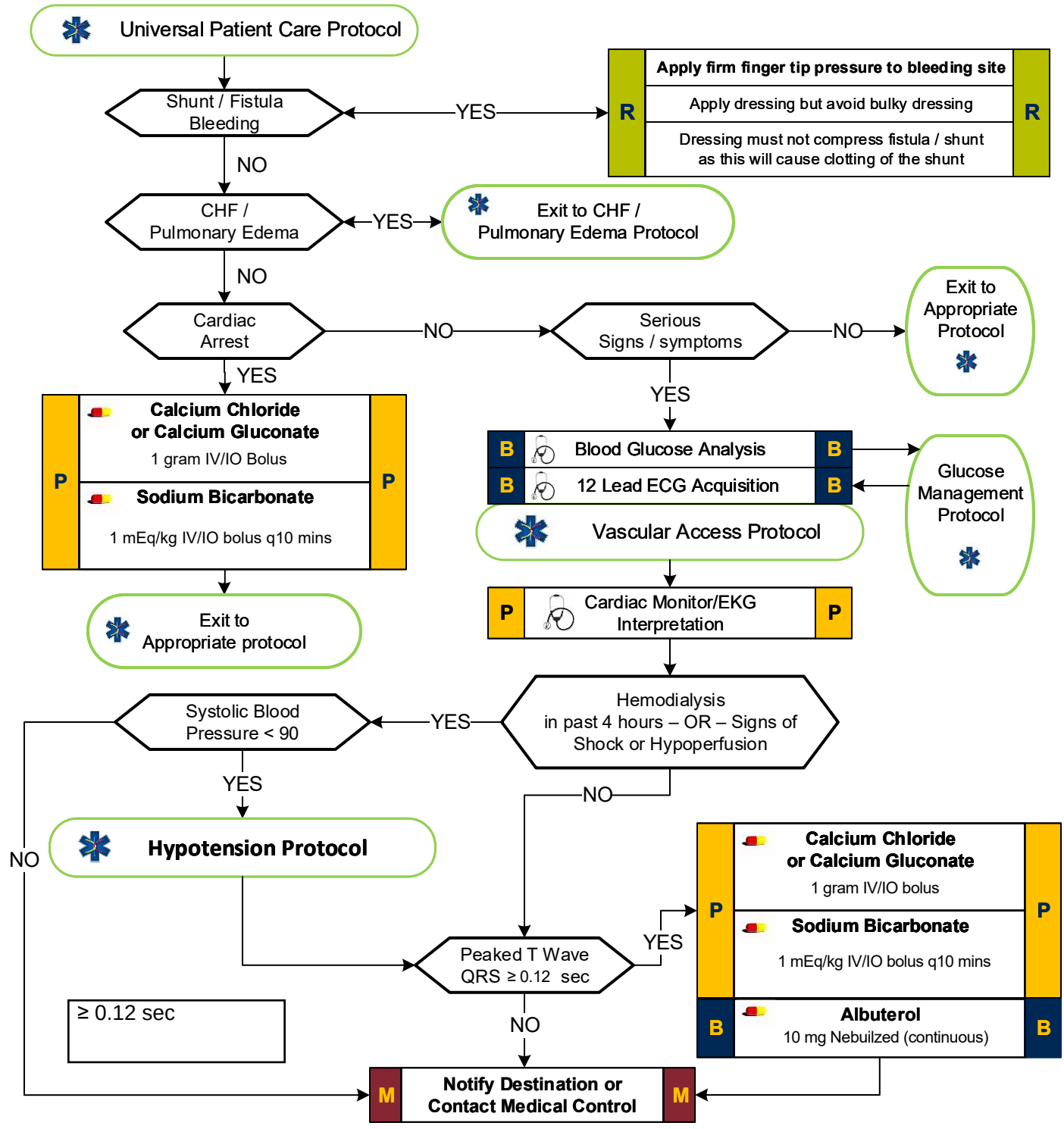
- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Neuro**
- Your safety first!!
- **Consider Geodon for patients with history of psychosis or a benzodiazepine for patients with presumed substance abuse.**
- Be sure to consider all possible medical/trauma causes for behavior (hypoglycemia, overdose, substance abuse, hypoxia, head injury, etc.)
- Hyperthermic patients may require aggressive cooling measures.
- 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.
- **All patients who receive either physical or chemical restraint should be continuously observed by ALS personnel on scene or immediately upon their arrival.**
- Any patient who is handcuffed or restrained by Law Enforcement and transported by EMS must be accompanied by law enforcement in the ambulance.
- Do not position or transport any restrained patient is such a way that could impact the patients respiratory or circulatory status.

Dialysis / Renal Failure

History
- Peritoneal or Hemodialysis
- Anemia
- Catheter access noted
- Shunt access noted
- Hyperkalemia

Signs and Symptoms
- Hypotension
- Bleeding
- Fever
- Electrolyte imbalance
- Nausea and / or vomiting
- Altered Mental Status
- Seizure
- Arrhythmia

Differential
- Congestive heart failure
- Pericarditis
- Diabetic emergency
- Sepsis
- Cardiac tamponade



ADULT MEDICAL

Dialysis / Renal Failure

Pearls

- **Recommended exam: Mental status. Neurological. Lungs. Heart.**
- **Do not take Blood Pressure or start IV in extremity which has a shunt / fistula in place.**
- **Access of shunt indicated in the dead or near-dead patient only with no other available access. IO if available.**
- Always consider Hyperkalemia in all dialysis or renal failure patients.
- **Sodium Bicarbonate** and **Calcium Chloride / Gluconate** should not be mixed. Ideally give in separate lines.
- Renal dialysis patients have numerous medical problems typically. Hypertension and cardiac disease are prevalent.

Hypertensive Emergency / Urgency

History
- Documented hypertension
- Related diseases: diabetes, CVA
- renal failure, cardiac
- Medications (compliance ?)
- Erectile dysfunction medication (Levitra/Cialis/Viagra)
- Pregnancy

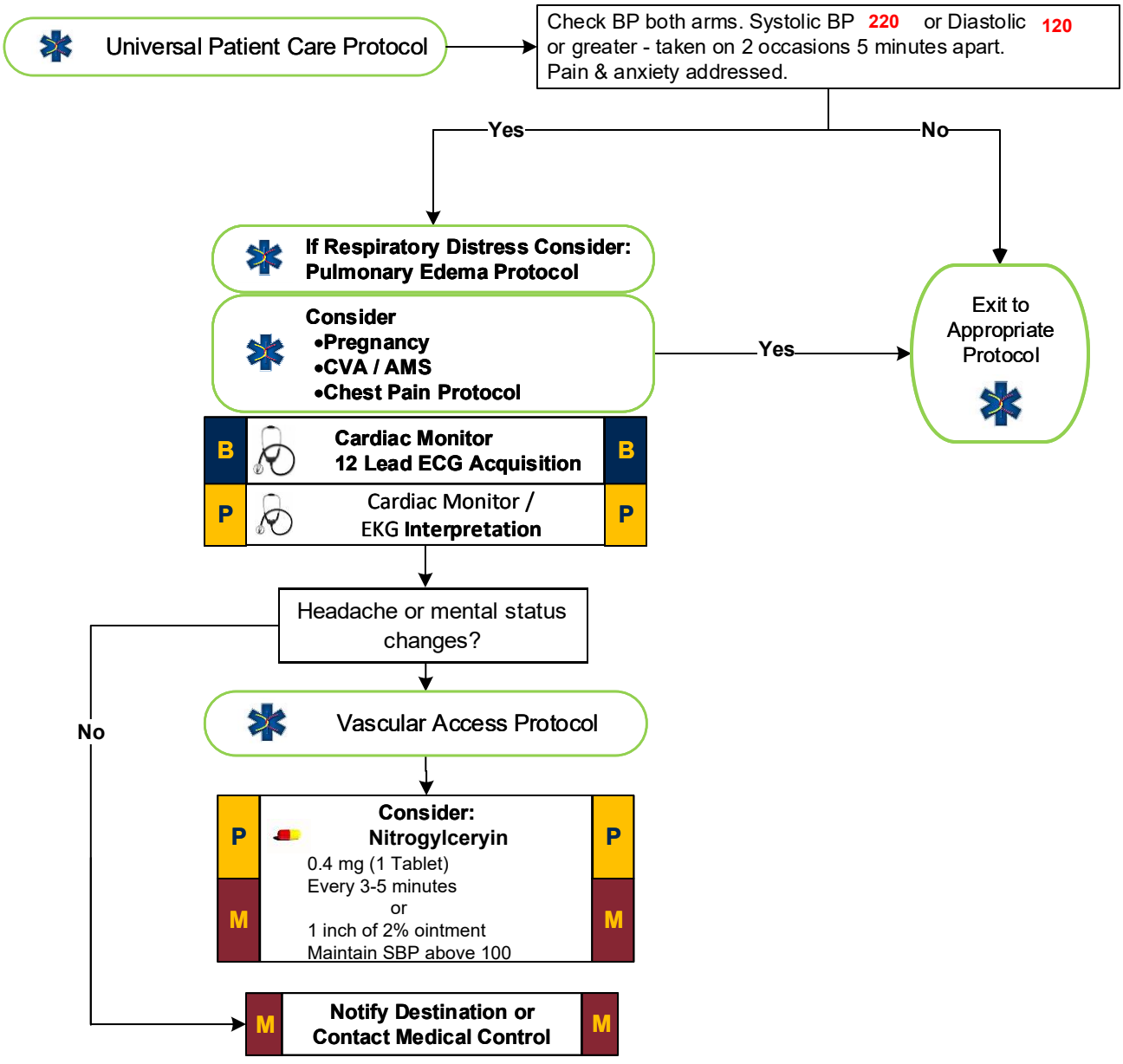
Signs and Symptoms

One of these
- Systolic BP 220 or greater
- Diastolic BP 120 or greater

AND at least one of these
- Headache
- Nosebleed
- Blurred vision
- Dizziness
- Chest Pain
- SOB
- AMS
- Hematuria

Differential
- **Hypertensive encephalopathy**
- **Primary CNS Injury (Cushing's response = bradycardia with 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 specific protocols and consultation with Medical Control.



ADULT MEDICAL

Hypertensive Emergency / Urgency

Pearls

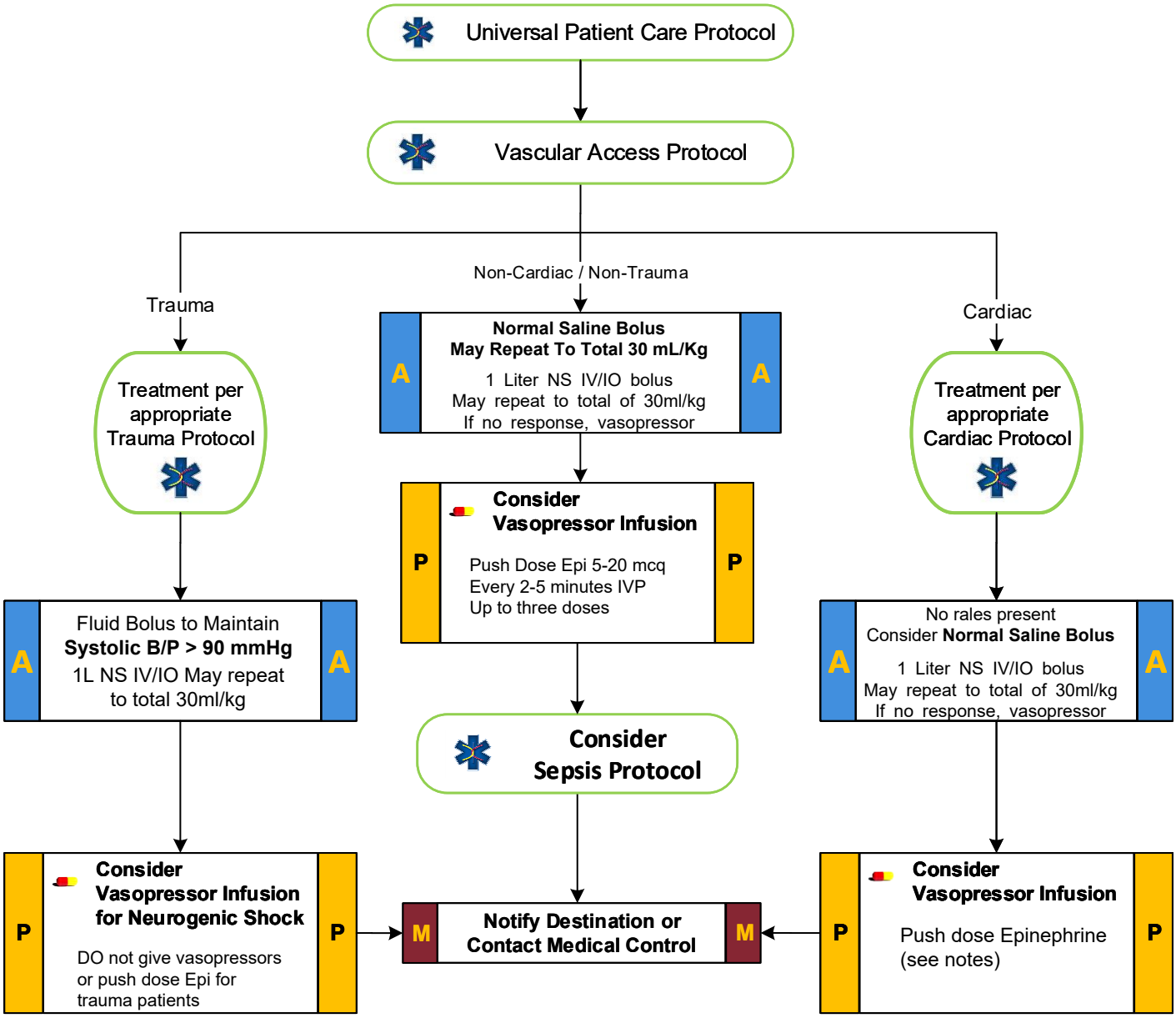
- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Never treat elevated blood pressure based on one set of vital signs or on vital signs alone.**
- Symptomatic hypertension is typically revealed through end organ damage to the cardiac, CNS or renal systems.
- All symptomatic patients with hypertension should be transported with their head elevated.

Hypotension (Symptomatic)

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
- Cardiomyopathy
- Trauma

Signs and Symptoms
- Restlessness, confusion
- Weakness, dizziness
- Weak, rapid pulse
- Pale, cool, clammy skin
- Delayed capillary refill
- 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)**



ADULT MEDICAL

Hypotension (Symptomatic)

-Hypovolemic shock (trauma) should be treated with volume replacement ONLY, never vasopressors
-Shock in a trauma patient is almost always related to significant bleeding, and should be treated with IV fluids until blood products are available.
-If isolated head/neck trauma is present, and neurogenic shock is CERTAIN, you may administer push-dose epinephrine or dopamine infusion.
-If cardiogenic shock is suspected and a tachyarrhythmia is present, DO NOT administer Dopamine, as this may result in worsening arrhythmia. Proceed to electrical cardioversion.

Epinephrine is a vasopressor with both alpha and beta1/2-adrenergic effects. It is a potent inotropic and vasoconstricting agent
Push-Dose Epinephrine is a way to transiently increase cardiac output and blood pressure in patients with transient hypotension or to allow adequate tissue perfusion for a short period to allow time to correct the underlying condition.
To prepare Push-Dose Epinephrine:
Take a 10ml syringe with 9ml's of normal saline
Draw up 1ml of Epinephrine 1-10,000 (ACLS / cardiac epinephrine)
The concentration is now 10mcg/ml
Administer 1-2 ml's (10-20mcg) q2-5min as needed to maintain systolic blood pressure > 90 mmHg
Time-to-onset is 1 minute
Duration of action is 2-5 minutes

Epinephrine infusion
Initial starting dose is 1-4mcg/min IV/IO
Titrate by 2mcg/min q5-10 min to maintain SBP > 90

ADULT MEDICAL

Pearls:

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro.**
- Hypotension can be 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.
- Repeat Vital Signs AFTER each Bolus or Change in Pharmacologic Therapy (Change in Dose or Agent).
- 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 protocol:
- **Hypovolemic Shock:**
- Hemorrhage, trauma, GI bleeding, ruptured aortic aneurysm or pregnancy related bleeding.
- **Cardiogenic Shock:**
- Heart failure, MI, Cardiomyopathy, Myocardial contusion, Ruptured ventrical/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.
- **Acute Adrenal Insufficiency:**
- State where body cannot produce enough steroids (glucocorticoids/mineralocorticoids). May have primary adrenal disease or more commonly have stopped a steroid like prednisone. Usually hypotensive with nausea, vomiting, dehydration and/or abdominal pain. If suspected Paramedic should give **Methylprednisolone** 125 mg IV / IO. May use steroid agent specific to your drug list.

Pain Control: Adult

History
- Age
- Location
- Duration
- Severity (1 - 10)
- 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)**

Universal Patient Care Protocol

Patient care according to **Protocol** based on **Specific Complaint**

Pain Severity > 6 out of 10
Or
Indication for IV / IM Medication

NO → B: Consider If Available: **Ibuprofen or Acetaminophen** B

YES

R: **Pulse Oximetry** R

Vascular Access Protocol

P: Consider Ketorolac P

P: Morphine or Fentanyl *
* **ONLY** these doses may be administered **PRIOR to OLMC contact** P

P: **Fentanyl* 2 mcg/kg up to 100 mcg. May repeat x 1 Q 5 minutes. Max Dose = 200 mcg** P

P: Consider anti-nausea medication as needed P

P: Consider subdissociative Ketamine for Refractory Pain P

B: Must reasssess patient at least **every 15 minutes** after sedative medication B

M: **Notify Destination or Contact Medical Control** M

Morphine and Fentanyl Doses listed in this protocol may be used PRIOR to contact with OnLine Medical Control

Relative Contraindications For IV Pain Control:
- Severe Head Injury
- End-Stage Lung Disease
- Untreated Hypotension

Relative Contraindications For Non-Steroidal Agents :
- Active Bleeding
- Possible Surgery
- Renal Disease

Pain Control: Adult

FOR FUTURE USE

ADULT MEDICAL

Pearls

- **Recommended Exam: Mental Status, Area of Pain, Neuro**
- **Pain severity (0-10) is a vital sign to be recorded pre and post IV or IM medication delivery and at disposition.**
- **Vital signs should be obtained pre, 15 minutes post, and at disposition with all pain medications.**
- Relative Contraindications to the use of a **narcotic** include hypotension, head injury, respiratory distress or severe Lung Disease.
- **Ibuprofen should not be used in patients with known renal disease or renal transplant, in patients who have known drug allergies to NSAID's (non-steroidal anti-inflammatory medications), with active bleeding, or in patients who may need surgical intervention such as open fractures or fracture deformities.**
- All patients should have drug allergies documented prior to administering pain medications.
- All patients who receive IM or IV medications must be observed 15 minutes for drug reaction.
- **Ibuprofen** should not be given for headaches or abdominal pain, history of gastritis, stomach ulcers, fracture, or if patient will require sedation.
- Do not administer any PO medications for patients who may need surgical intervention such as open fractures or fracture deformities, headaches, or abdominal pain.
- Do not administer **Acetaminophen** to patients with a history of liver disease.
- See drug list for other contraindications for Narcotics, Acetaminophen, Nitrous Oxide, and Ibuprofen.

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.)**

Universal Patient Care Protocol

Respiratory / Ventilatory Insufficiency?
If available measure EtCO2
Consider Airway Compromise or Foreign Body

YES → Go To Airway Protocol

NO

Rales or Signs of CHF ?

YES → Pulmonary Edema Protocol

NO

Position Patient for Comfort

Vascular Access Protocol

Wheezing

B	**Albuterol** or other **Beta-Agonist** 5-10 mg nebulized	B
A	Repeat **Albuterol** or other **Beta-Agonist** 5-10 mg nebulized	A
P	Repeat **Albuterol** or other **Beta-Agonist** with **Ipratropium** if Available Albuterol 5-10mg nebulized Ipratropium 0.5 mg nebulized	P
P	If Available: **Methylprednisolone** 125 mgIV/IO/IM	P
B	Consider **BiPAP / CPAP**	B
P	Consider **IM Epinephrine** Epinephrine 1:1000 0.3mg IM	P

Stridor

B	**Normal Saline Nebulized**	B
P	If No Improvement or Severe **Racemic Epinephrine Nebulized**	P
P	If Available: **Methylprednisolone** 125 mg IV/IO/IM	P

M	**If No Improvement Contact Medical Control**	M

OLMC

Consider Anaphylaxis Protocol

P	Consider **Magnesium Sulfate**	P

ADULT MEDICAL

Respiratory Distress

ADULT MEDICAL

Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Neck, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care**
- **EMT administration of Beta-Agonists (e.g., Albuterol) is restricted to patients who are under doctor's orders with a prescription for the drug.**
- **Pulse oximetry** should be monitored continuously if initial saturation is < or = 94%, or there is a decline in patients status despite normal pulse oximetry readings.
- **Contact Medical Control** prior to administering epinephrine in patients who are > 50 years of age, have a history of cardiac disease, or if the patient's heart rate is >150. Epinephrine may precipitate cardiac ischemia. A 12-lead ECG should be performed on these patients.
- A silent chest in respiratory distress is a pre-respiratory arrest sign.
- **Capnography is:**
  - **Required for ALL Intubated Patients and Cricothyroidotomy Patients***
  - **Recommended / Encouraged for all unstable patients**
  - **Recommended / Encouraged for utilization of any Airway Device (e.g. BIAD)**
  - **[* Attachment of the Capnograph may be delayed until the scene is safe / non-threatening]**

Seizure

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**

Universal Patient Care Protocol → Spinal Motion Restriction Protocol

* For Actively seizing Patients on EMS arrival (i.e. without IV) consider **IM VERSED** for known seizure disorder

5mg IM

R — Pulse Ox / EtCO2 — R

B — **Cardiac Monitor 12 Lead ECG Acquisition** — B

P — Cardiac Monitor / EKG **Interpretation** — P

Vascular Access Protocol

Airway Protocol

Glucose Management Protocol ↔ B — **Assess Blood Glucose** — B

Seizing *
- NO → Monitor and Transport
- YES → P — **Benzodiazepines** Versed: 0.05 mg/kg IV/IO, Versed1-5 mg IV/IO/IM — P
  May Repeat x 1 in 5 mins PRN

Seizure Recurs ?
- YES → P — **Benzodiazepines** Versed: 0.05 mg/kg IV/IO, Versed1-5 mg IV/IO/IM — P
  May Repeat x 1 in 5 mins PRN
- NO → Monitor and Transport

Still Seizing ?
- NO → Monitor and Transport
- YES → Active Seizure in Known or Suspected Pregnancy > 20 weeks [? Ecclampsia or recent post-partum]
  P — Consider **Magnesium Sulfate** 4-6 grams in 10% solution, IV/IO over 15-30 min — P

M — **Notify Destination or Contact Medical Control** — M

ADULT MEDICAL

Seizure

For geriatric patients, consider a lower dose.

Pearls

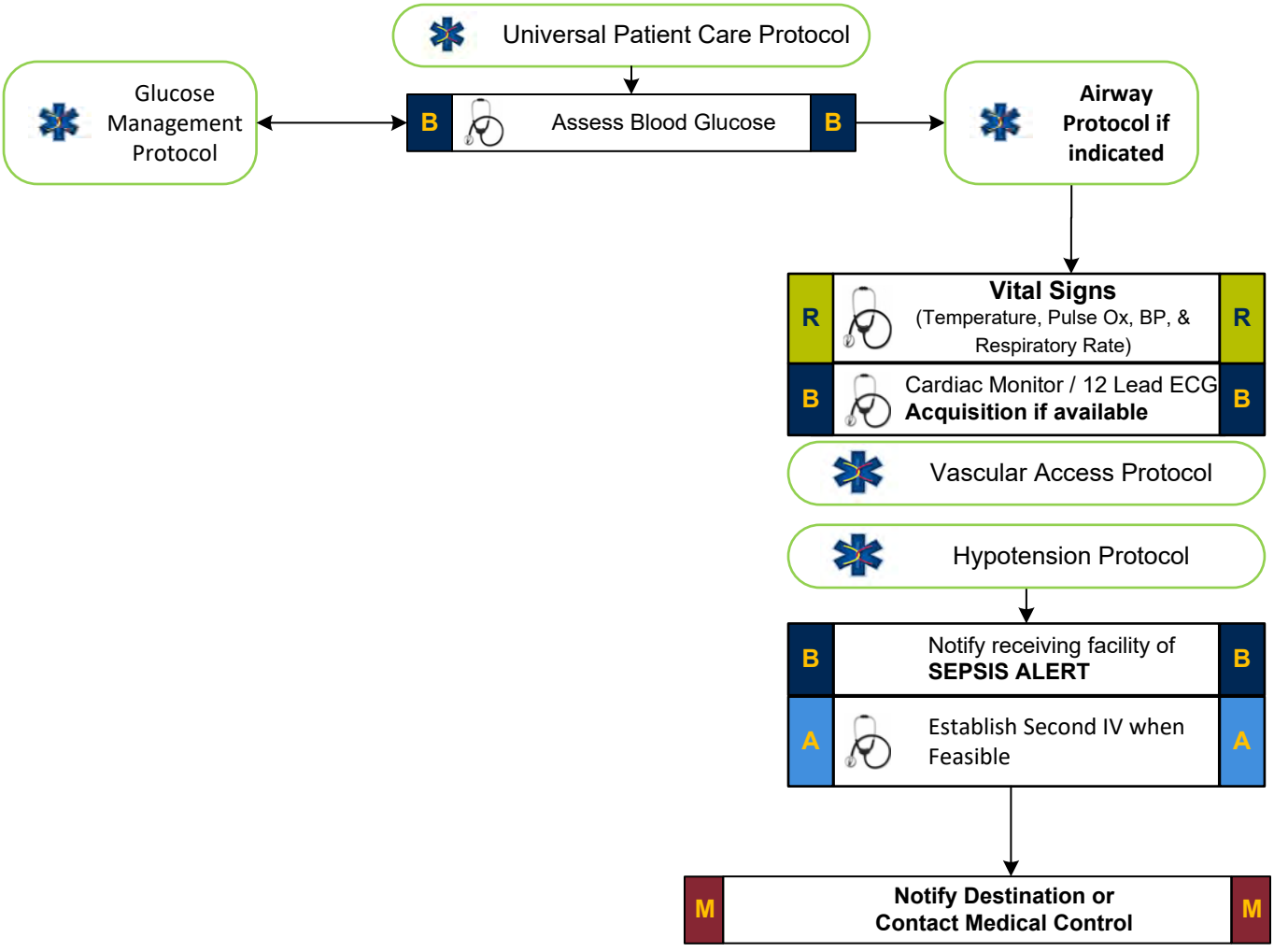
- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care**
- ***Status epilepticus*** is defined as two or more successive seizures without a period of consciousness or recovery. This is a true emergency requiring rapid airway control, treatment, and transport.
- **Grand mal seizures (generalized)** are associated with loss of consciousness, incontinence, and tongue trauma.
- **Focal seizures (petit mal)** effect only a part of the body and are not usually associated with a loss of consciousness
- **Jacksonian seizures** are seizures which start as a focal seizure and become generalized.
- Be prepared for airway problems and continued seizures.
- Assess possibility of occult trauma and substance abuse.
- Be prepared to assist ventilations especially if diazepam or midazolam is used.
- For any seizure in a pregnant or recently delivered patient, follow the OB Emergencies Protocol.
- **For actively seizing patients on EMS arrival, (i.e. no IV) consider IM VERSED prior to establishing IV access.**
- **Diazepam** (Valium) is not effective when administered IM. It should be given IV or Rectally. **Midazolam** is well absorbed when administered IM

Sepsis

History
- Age > 18 years old
- Duration of fever
- Severity of Fever
- Altered Mental Status
- Past Medical History
- Medications
- Immunocompromise
  - Transplant
  - HIV
  - Diabetes
  - Cancer
- Environmental Exposure
- Last Acetaminophen

Signs and Symptoms/ Significant Findings
- Hyperthermia (>100.4^{O} F / 38^{O} C)
- Hypothermia (< 95^{O} F / 35^{O} C)
- Tachypnea
- Tachycardia
- Acute mental status change
- Urinary Tract Infection
- Pneumonia
- Skin / soft tissue infection
- Abdominal Infection
- Wound Infection
- Suspected meningitis, endocarditis, or osteomyelitis

Collecting Cultures
- Maintain aseptic technique at all times
- Put on a new set of clean gloves
- Prepare site with Chloraprep
  - Clean 2 inch site
  - Allow site to dry
  - Do not touch once cleaned
- Remove cap from culture bottles
- Clean bottle diaphragm with alcohol and allow to dry
- Venipuncture and draw blood
- Add 5 – 10 mL of blood in each bottle
  - Aerobic (Blue/Gray) first
  - Anaerobic (Purple) Second



ADULT MEDICAL

Sepsis

Pearls:

- **If unable to obtain cultures, do NOT administer antibiotics.**
- Determine the hospital destination prior to drawing cultures. Use appropriate kit for **that** destination hospital (kits differ based on the hospital facility).
- Utilize **Sepsis Checklist**
- **Septic Shock:**
  - Hypotension (SBP <90 mmHg) refractory to fluid bolus.
  - **Consider Pressor Agents [Norepinephrine is preferred agent in septic shock.]**
- Be alert for signs and symptoms of anaphylaxis during antibiotic administration
- Bolus Fluids up to 30 mL / Kg for Hypotension in Sepsis.
- Extended scene times to provide antibiotic therapy are acceptable
- Withhold antibiotics if suspect meningitis, endocarditis, or osteomyelitis.
- If possible meningitis, utilize precautions and notify receiving ED facility of possible meningitis.
- **Specific Broad Spectrum Antibiotics are determined by the Local MCP. State Approved Formulary notes these as "Broad Spectrum Antibiotics".**

Sepsis Checklist

EMS EVALUATION AND TREATMENT OF SEPSIS – TOOL

Date:	EMS Arrival Time:	Unit #:
Lead Medic:	Culture Drawn by:	

Evaluation for Sepsis:

1. Are any two of the following symptoms present AND new to the patient?
   - ❑ Hyperthermia (> 101 ^{o} F or 38 ^{o} C) or Hypothermia (< 96.8 ^{o} F or 36 ^{o} C)
   - ❑ Heart Rate > 90 beats per minute
   - ❑ Respiratory Rate > 20 breaths per minute OR Mechanical Ventilation
   - ❑ Signs of poor perfusion (such as SBP < 90 mmHg)
2. Is the patient's presentation suggestive of any of the following infections?
   - ❑ Pneumonia (cough/thick sputum)
   - ❑ Urinary Tract Infection
   - ❑ Acutely AMS / change
   - ❑ Blood stream / Catheter related
   - ❑ Abdominal pain and/or diarrhea
   - ❑ Wound Infection
   - ❑ Skin / Soft Tissue Infection

Glucose
Result: mg/dL
Normal Range 80 – 120 mg/dL
Temperature
Result:

If positive for sepsis, call a **SEPSIS ALERT** and follow the directions on the below:

TREATMENT FOR SEPSIS

Confirm NO PENICILLIN ALLERGY. If PENICILLIN ALLERGY DO NOT ADMINISTER ANTIBIOTICS

Draw Blood Culture (8cc – 10cc of blood in each vial) Time Drawn: _____

- ➢ Prepare a 2 inch site area with ChloraPrep and allow to dry
- ➢ Disinfect the top of each culture bottle with alcohol and allow to dry
- ➢ Inoculate the aerobic (Blue Cap) bottle first and then the anaerobic (Purple Cap) bottle
- ➢ Minimum of 3 cc of blood in aerobic bottle is required to proceed with antibiotic therapy
- ➢ If unable to draw cultures **DO NOT ADMINISTER ANTIBIOTICS**

Draw point of care lactate (only good for 30 minutes)	Time Drawn:	
Begin fluid resuscitation:	Total Given:	
Presumed sepsis antibiotic selection:	Antibiotic:	
Antibiotic	Dose:	
Antibiotic Time Initiated	Time Hung	

ADULT MEDICAL

Suspected Stroke

History
- Prior Stroke / TIA
- 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**
- **Hypoglycemia**
- **Tumor**
- **Trauma**

Universal Patient Care Protocol

B **Assess Blood Glucose** B

B **Cardiac Monitor 12 Lead ECG Acquisition if available** B

Go To Glucose Management Protocol

R **Prehospital Stroke Screen Use RACE Stroke Tool** R

Use the South Carolina RACE (**R**apid **A**rterial o**C**clusion **E**valuation) tool on Suspected Stroke Patients

If Positive and Symptoms < 7 hours, Transport to the Destination as per the **EMS System Stroke Plan.**
Limit Scene Time to 10 minutes.
Provide Early Notification

Transport ALL Patients with a RACE Score > 0 and Last Known Time Well < 7 Hours EMERGENTLY

Vascular Access Protocol

Consider Other Protocols as Indicated:
Altered Mental Status
Hypertension / Hypotension
Seizure
Overdose / Toxic Ingestion

M **Notify Destination or Contact Medical Control** M

South Carolina **RACE Score ≥ 4** suggestive of Large Vessel Occlusion [LVO]

ADULT MEDICAL

Suspected Stroke

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**
- **RACE is based on Acute Non-Traumatic Symptoms ONLY.**
- **ALL RACE SCORES > 0 are indicative of Stroke.**
- **RACE SCORE ≥ 4 is INDICATIVE of Large Vessel Occlusion (LVO) Stroke that may benefit from interventional procedures.**
- **The Reperfusion Checklist should be completed for any suspected stroke patient. With a duration of symptoms of less than 7 hours, scene times should be limited to 10 minutes, early destination notification/activation should be provided and transport times should be minimized based on the EMS System Stroke Plan.**
- **Onset of symptoms** is defined as the last witnessed time the patient was symptom free (i.e. awakening with stroke symptoms would be defined as an onset time of the previous night when patient was symptom free)
- The differential listed on the Altered Mental Status Protocol should also be considered.
- Elevated blood pressure is commonly present with stroke. Consider treatment per Hypertensive Protocol.
- Be alert for airway problems (swallowing difficulty, vomiting/aspiration).
- Hypoglycemia can present as a localized neurologic deficit.
- Document the Stroke Screen results in the PCR.
- Document the 12 Lead ECG as a procedure in the PCR.

Suspected Stroke

SC EMS R. A. C. E. Stroke Scale

Rapid Arterial oCclusion Evaluation Scale

ITEM	Instruction	RESULT	SCORE
Facial Palsy	Ask Patient to show their teeth (Smile)	**Absent** (symmetrical movement)	**0**
		Mild (slightly asymmetrical)	**1**
		Moderate to **Severe** (completely asymmetrical)	**2**
Arm Motor Function	Extending the arm of the patient 90 ^{o} (if sitting) or 45 ^{o} (if supine) palms up	**Normal** to **Mild** (limb upheld more than **10** seconds)	**0**
		Moderate (limb upheld less than **10** seconds)	**1**
		Severe (patient unable to raise arm against gravity)	**2**
Leg Motor Function	Extending the leg of the patient 30 ^{o} (in supine) One Leg at a time	**Normal** to **Mild** (limb upheld more than **5** seconds)	**0**
		Moderate (limb upheld less than **5** seconds)	**1**
		Severe (patient unable to raise leg against gravity)	**2**
*Head & Gaze Deviation	Observe range of motion of eyes and look for head turning to one side	**Absent** (normal eye movements to both sides and no head deviation was observed)	**0**
		Present (eyes and/or head deviation to one side was observed)	**1**
*Aphasia [IF patient has RIGHT sided weakness]	Ask patient to follow two simple commands: ***1. Close your eyes. 2. Make a fist***	**Normal** (performs both tasks requested correctly)	**0**
		Moderate (performs only 1 of 2 tasks requested correctly)	**1**
		Severe (Cannot perform either task requested	**2**
Agnosia [IF patient has LEFT sided weakness]	Inability to recognize familiar objects. Ask patient: ***1. "Whose arm is this?"*** (while showing the affected arm). ***2. "Can you move your arm?"***	**Normal:** Appropriate or correct answer	**0**
		Moderate (does not recognize limb or states that they can move it - but cannot)	**1**
		Severe (does not recognize arm and is unaware of arm)	**2**
* Head/Eye Gaze Deviation or if patient is mute and does not follow commands = HIGH likelihood of Large Vessel Occlusion (LVO)		**RACE SCALE TOTAL =**	

- ❑ **Emergency Contact**
- ❑ **Last Known Normal (Well) Time**
- ❑ **Medication List**

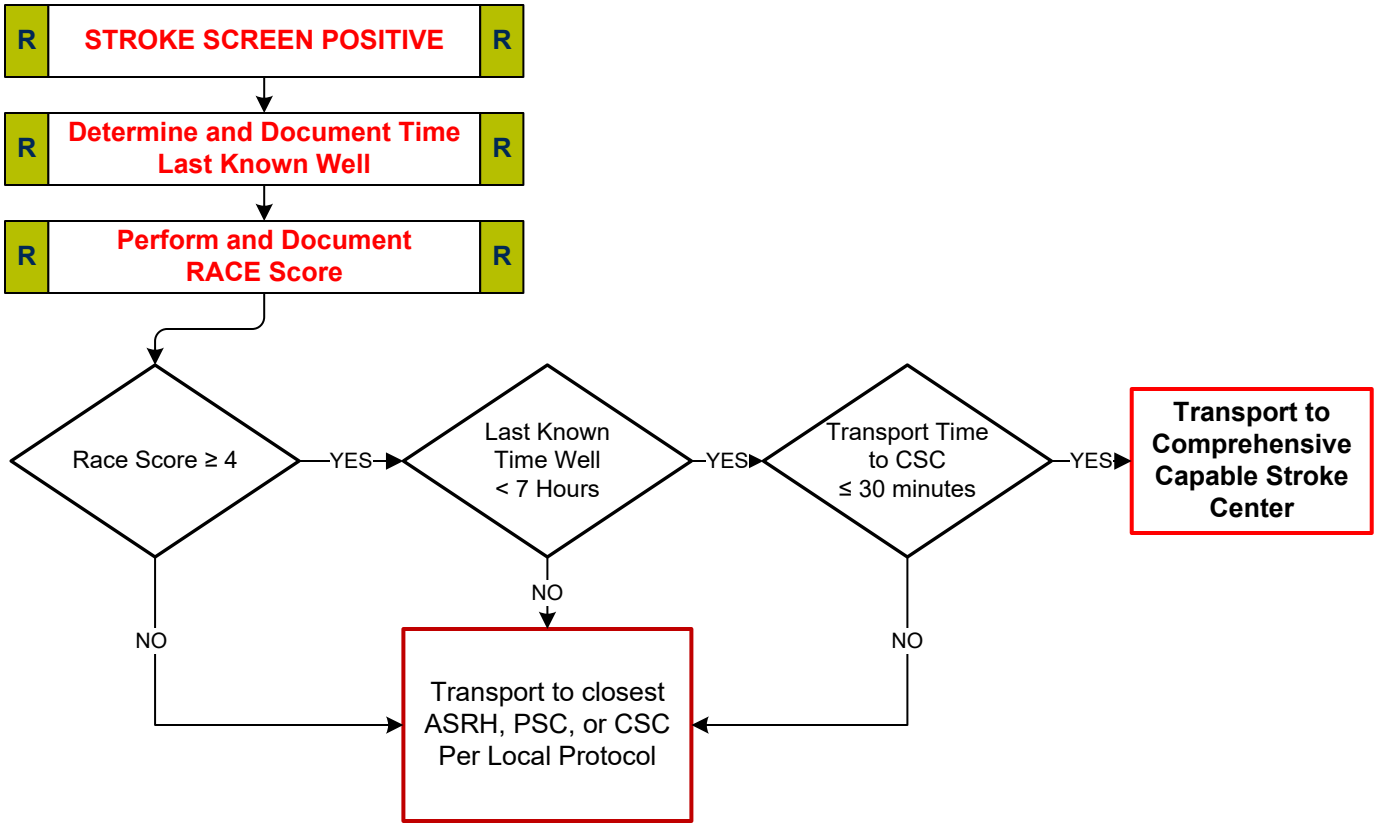
Maximum RACE Score = 9

Any score > 0 is a "Stroke Alert"

Any score ≥ 4 is likely an LVO

ADULT MEDICAL

Adult Stroke Patient Destination Determination by Stroke Center Capability



Comprehensive Stroke Center

- Physician / Nursing Staff trained in neurologic care on-site 24 hours a day
- Organized Emergency Department with written pathway for rapid identification and management of acute stroke patient
- CT of the head with technician on-site 24 hours a day
- Clinical Laboratory Services
- 24 / 7 Stroke Call and capabilities for IV tPA therapy for eligible patients
- 24 / 7 Endovascular Call and capabilities for endovascular therapy for eligible patients
- 24 / 7 Neurosurgery Call
- Neuro-Intensive Care Unit and neurointensivists
- Stroke Registry and Quality Improvement Process
- Accredited Comprehensive Stroke Center (CSC)

Primary Stroke Center

- Physician / Nursing Staff trained in neurologic care on-site 24 hours a day
- Organized Emergency Department with written pathway for rapid identification and management of acute stroke patient
- CT of the head with technician on-site 24 hours a day
- Clinical Laboratory Services
- 24 / 7 Stroke Call and capabilities for IV tPA therapy for eligible patients
- Stroke Registry and Quality Improvement Process
- Accredited Primary Stroke Center (PSC)

Non-Stroke Hospitals

No organized treatment for acute stroke

Acute Stroke Ready Hospital

- Emergency Department 24 hours a day with Physician or physician extender and nursing staff trained in neurological care on-site 24 hours a day.
- CT of the head with technician on-site 24 hours a day
- Clinical Laboratory Services
- Telestroke Video – Conferencing Capabilities
- 24 / 7 Capabilities for IV tPA therapy for eligible patients
- Transfer agreement established in advance to ensure orderly transition from Level II Stroke Hospital to specialized stroke care facility
- Stroke Registry and Quality Improvement Process
- Accredited Acute Stroke Ready Hospital (ASRH)

Adult Stroke Patient Destination Determination by Stroke Center Capability

*** Local Medical Control**

Acite Stroke Ready Hospital (ASRH), Primary Stroke Center (PSC), Thrombectomy-Capable Stroke Center (TSC) * Comprehensive Stroke Center (CSC) are universal terms used to designate a facility's capabilities in caring for an acute stroke patient.

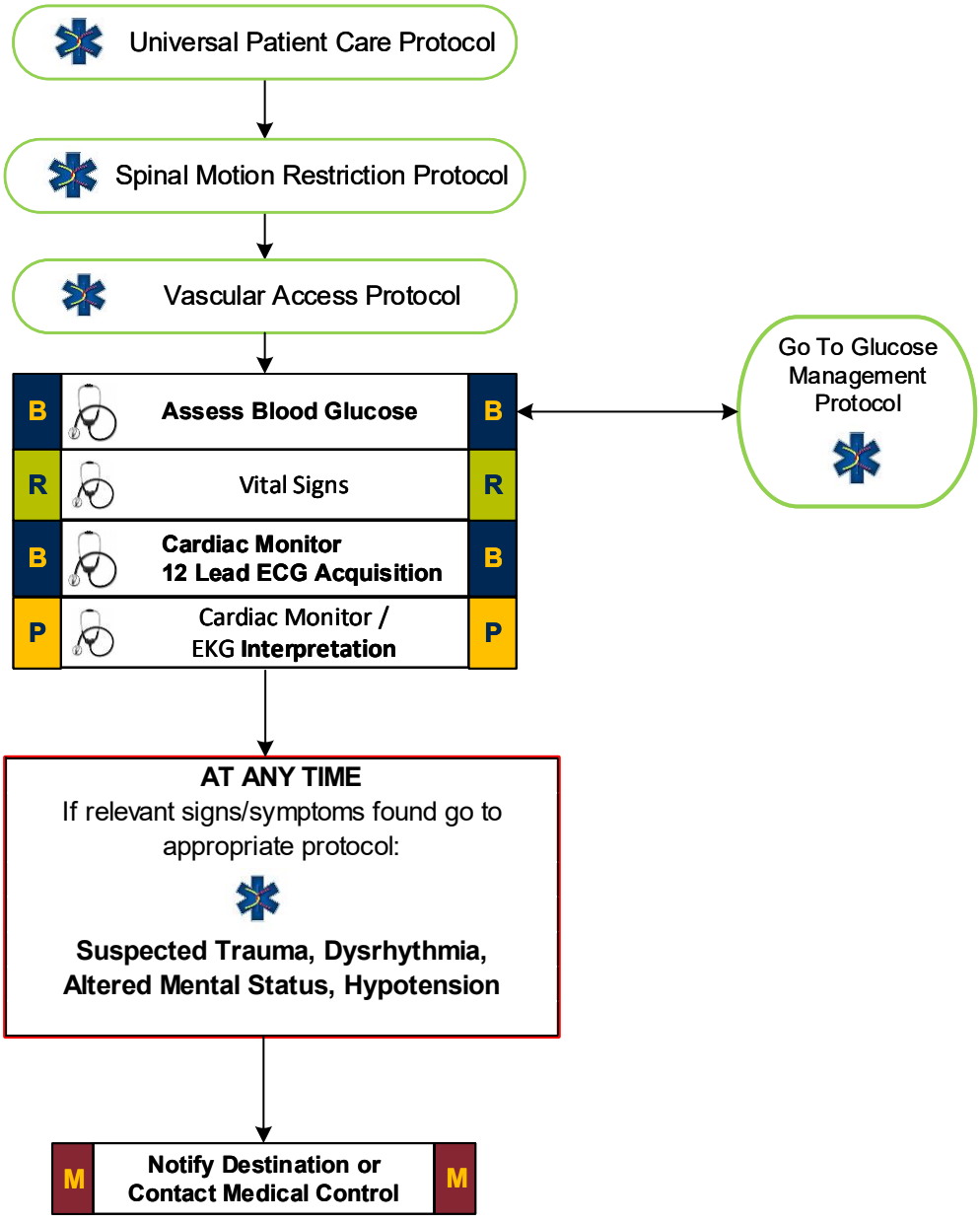
It is dependent on local Medical Control Physicians to identify all facilities within their service area and to incorporate them within their own stroke patient destination guidelines.

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
- Micturation / Defecation syncope
- Psychiatric
- Stroke
- Hypoglycemia
- Seizure
- Shock (see Shock Protocol)
- Toxicologic (Alcohol)
- Medication effect (hypotension)
- AAA
- PE



ADULT MEDICAL

Syncope

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- Assess for signs and symptoms of trauma if associated or questionable fall with syncope.
- Consider dysrhythmias, GI bleed, ectopic pregnancy, and seizure as possible causes of syncope.
- These patients should be transported.
- More than 25% of geriatric syncope is related to cardiac dysrhythmia.

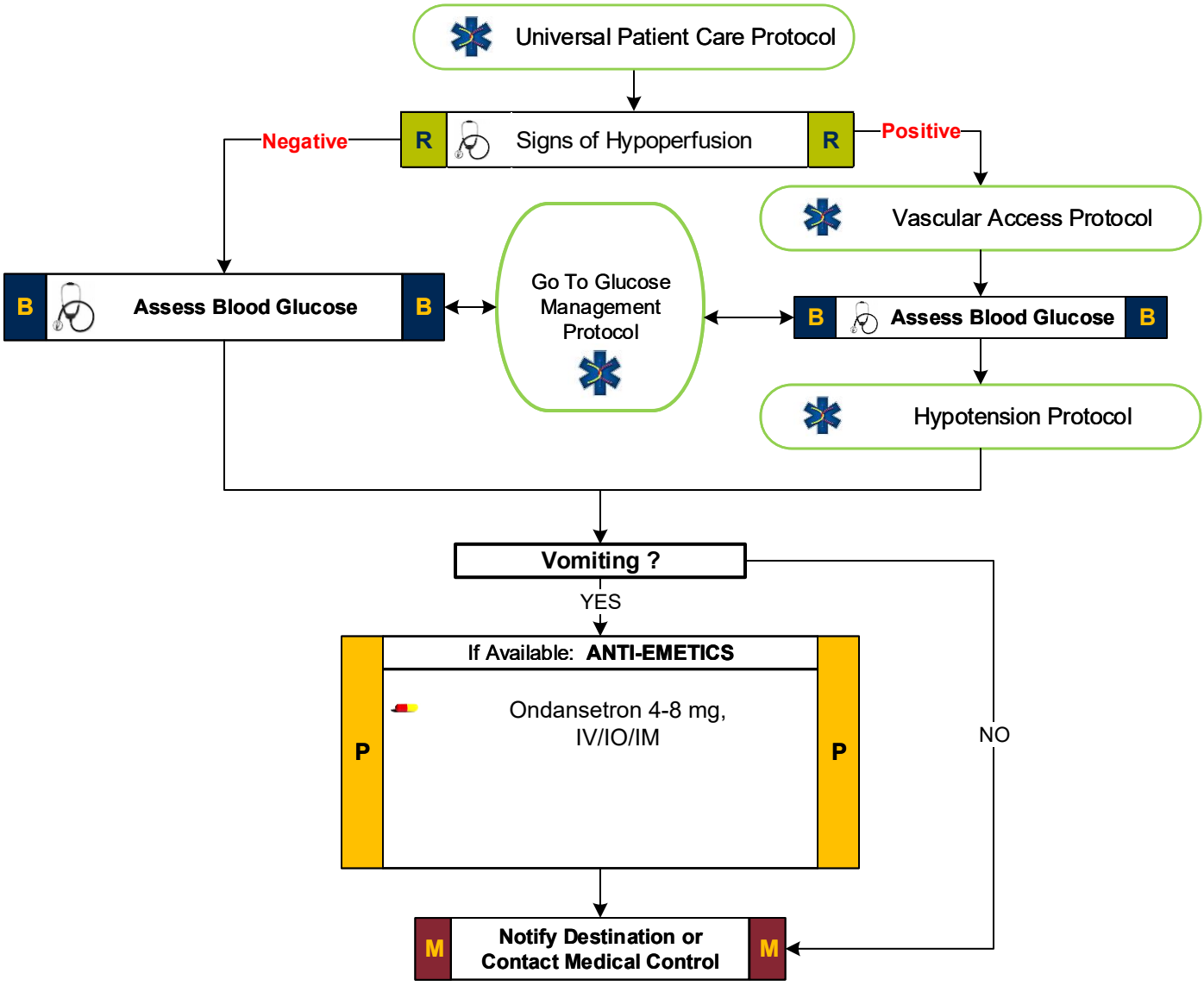
Vomiting and Diarrhea

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
- 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**



ADULT MEDICAL

Vomiting and Diarrhea

- **Pearls**
- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- Document the mental status and vital signs prior to administration of antiemetic medications.
- Beware of vomiting only in children. Pyloric stenosis, bowel obstruction, and CNS processes (bleeding, tumors, or increased CSF pressures) all often present with vomiting.
- Heart Rate: One of the first clinical signs of dehydration 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.

Asystole
Pulseless Electrical Activity (PEA)

HISTORY
- Past medical history
- Medications
- Events leading to arrest
- End stage renal disease
- Estimated downtime
- Suspected hypothermia
- Suspected overdose
  - Tricyclics
  - Digitalis
  - Beta blockers
  - Calcium channel blockers
- DNR form

Signs and Symptoms
- Pulseless
- Apneic
- Electrical activity on ECG
- No heart tones on auscultation

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

Cardiac Arrest Protocol

R | **CPR** | R

Airway Protocol

Vascular Access Protocol

Glucose Management Protocol

P	**Epinephrine** every 3 – 5 mins 1 mg 1:10,000 IV/IO q 3-5 min	P
A	**Normal Saline Bolus** 1 L NS Bolus IV/IO	A
B	**Assess Blood Glucose**	B
P	Consider **Naloxone**[1] 0.4 -2mg IV/IO/IM q 2-3min	P
P	Consider **Glucagon**[2] 0.5 - 1 mg IV/IO	P
P	Consider **Calcium Chloride / Calcium Gluconate**[3] 1 gram IV/IO q 10 mins	P
P	Consider **Bicarbonate**[4] 1-2 mEq/kg IV/IO bolus	P
P		P
P	Consider **Chest Decompression**[5]	P
P	Consider **Atropine** (Rate < 60) 0.5 - 1 mg IV/IO q 3-5 mins PRN	P
P	**Consider External Pacing**	P
P	Consider Epinephrine Infusion See notes below	P

1. Consider Naloxone for suspected opioid overdose.
2. Glucagon for suspected Beta Blocker or Calcium Channel Blocker Overdose.
3. Calcium for suspected Calcium Channel Blocker etiology or Hyperkalemia
4. Bicarbonate for Tricyclic Overdose, Hyperkalemia, Renal Failure
5. Consider Chest Decompression for Tension Pneumothorax

AT ANY TIME

Return of Spontaneous Circulation

↓

Go to Post Resuscitation Protocol

Criteria for Discontinuation

YES → **STOP RESUSCITATION**

NO → M **Notify Destination or Contact Medical Control** M

ADULT CARDIAC

Asystole
Pulseless Electrical Activity (PEA)

Reversible Causes Medication Dosages

Suspected Narcotic (Opiate)
Consider Naloxone titrated to patients needs.

Suspected Organophosphate Poisoning
Consider Atropine 2mg IV Starting Dose

Suspected Tricyclic overdose
Consider Soduim Bicarbonate at 1 mEq/kg not to exceed 100 mEq.

Suspected Beta Blocker or Calcium Channel Blocker
Administer Atropine 1 mg.

Suspected Hypomagnesic State
Administer Magnesium Sulfate 1-2 grams

Epinephrine infusion
Initial starting dose is 1-4mcg/min IV/IO
Titrate by 2mcg/min q5-10 min to maintain SBP > 90

ADULT CARDIAC

Pearls
- **Recommended Exam: Mental Status**
- Consider each possible cause listed in the differential: Survival is based on identifying and correcting the cause!
- Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.

Supraventricular Tachycardia
Atrial Fibrillation

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

Signs and Symptoms
- HR > 150/Min
- **QRS < .12 Sec (if QRS >.12 sec, go to V-Tach Protocol**
- **If history of WPW, go to V-tach Protocol**
- Dizziness, CP, SOB
- Potential presenting rhythm
  Atrial/Sinus tachycardia
  Atrial fibrillation / flutter
  Multifocal atrial 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**

Universal Patient Care Protocol

Vascular Access Protocol

B | Cardiac Monitor / 12 Lead EKG **Acquisition** | B

P | Cardiac Monitor / EKG **Interpretation** | P

*** If patient is unstable and /or vascular access is problematic – initial therapy with synchronized electrical cardioversion is warranted**

STABLE

Rhythm Regular

YES

P | May attempt **Valsalva or other Vagal Maneuver** initially and after each drug administration if indicated | P

P | **Adenosine** f regular, administer 6mg IV/IO rapid push, may repeat once with 12mg IV/IO | P

NO

PERSISTENT Tachydysrhythmia

Unstable/Altered Mental Status *

P | **Adenosine** If regular, administer 6mg IV/IO rapid push, may repeat once with 12mg IV/IO | P

P | Consider **Benzodiazepines** 2 mg Midolazam IV/IO | P

P | **Synchronized Cardioversion** May Repeat as Needed | P

If Rhythm Changes Exit to Appropriate Protocol

P | **Consider Diltiazem** | P

P | Consider **Beta-Blocker** | P

B | Repeat 12 Lead EKG **Acquisition** | B

M | **Notify Destination or Contact Medical Control** | M

ADULT CARDIAC

Supraventricular Tachycardia
Atrial Fibrillation

Pearls

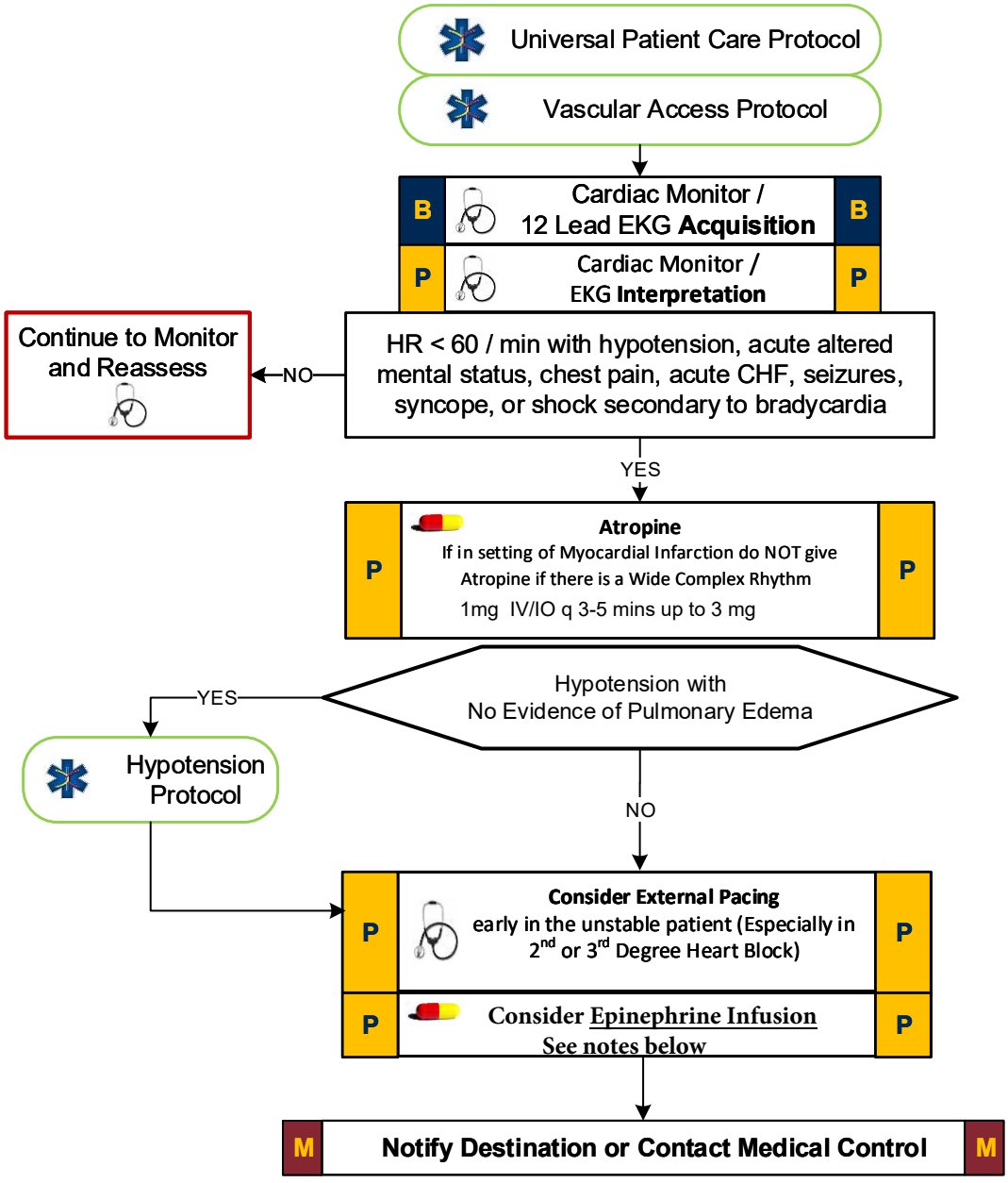
- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- If patient has history or 12 Lead ECG reveals Wolfe Parkinson White (WPW), DO NOT administer a Calcium Channel Blocker (e.g., Diltiazem) or Beta Blockers.
- Calcium Channel Blocker administered ONLY with Narrow Complex Tachydysrhythmia.
- Adenosine may not be effective in identifiable atrial flutter/fibrillation, yet is not harmful.
- Monitor for hypotension after administration of Calcium Channel Blocker or Beta Blockers.
- 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.

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 CARDIAC

Bradycardia

Transcutaneous Pacing Directions:

1. Apply 4 Leads to Patient
2. Apply Pacing/Defib Pads to the patients chest.
3. Turn on the Pacer on the Monitor
4. Set minimum heart rate to 80 BPM
5. Set millivolts to 80. Increasing by 10 until you get electrical capture. You will see a pacer spike for every QRS complex.
6. Verify mechanical capture by verifying a palpated pulse rate that corresponds to the heart rate on the monitor.
7. Adjust Pacer Rate up to treat persistent hypotension.

Epinephrine infusion

Initial starting dose is 1-4mcg/min IV/IO
Titrate by 2mcg/min q5-10 min to maintain SBP > 90

ADULT CARDIAC

Pearls

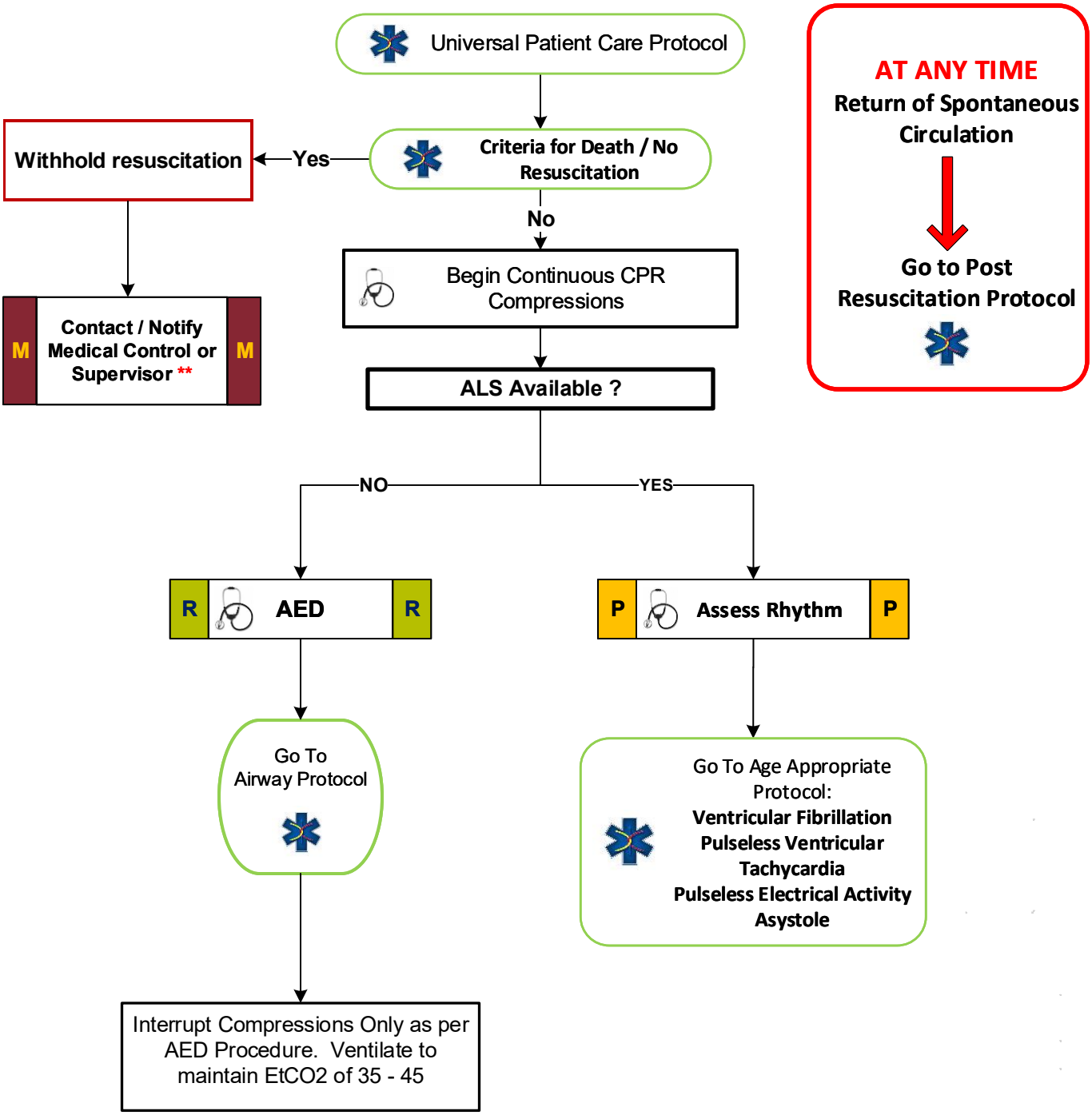
- **Recommended Exam: Mental Status, Neck, Heart, Lungs, Neuro**
- The use of Lidocaine, Beta Blockers, and Calcium Channel Blockers in heart block can worsen Bradycardia and lead to asystole and death.
- Pharmacological treatment of Bradycardia is based upon the presence or absence of symptoms. **If symptomatic treat, if asymptomatic, monitor only.**
- In wide complex slow rhythm consider hyperkalemia.
- Remember: The use of Atropine for PVCs in the presence of a MI may worsen heart damage.
- If vascular access is problematic and the patient is symptomatic, initial therapy with external pacing may be warranted.
- Consider treatable causes for Bradycardia (Beta Blocker OD, Calcium Channel Blocker OD, etc.)

Cardiac Arrest

History:
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness
- Signs of lividity, rigor mortis
- DNR form

Signs and Symptoms:
- Unresponsive
- Apneic
- Pulseless

Differential:
- **Medical vs Trauma**
- **V. fib vs Pulseless V. tach**
- **Asystole**
- **Pulseless electrical activity (PEA)**



ADULT CARDIAC

Cardiac Arrest

Reversible Causes Medication Dosages

Suspected Narcotic (Opiate)
Consider Naloxone titrated to patients needs.

Suspected Organophosphate Poisoning
Consider Atropine 2mg IV Starting Dose

Suspected Tricyclic overdose
Consider Soduim Bicarbonate at 1 mEq/kg not to exceed 100 mEq.

Suspected Beta Blocker or Calcium Channel Blocker
Administer Atropine 1 mg.

Suspected Hypomagnesic State
Administer Magnesium Sulfate 1-2 grams

Pearls

- **Recommended Exam: Mental Status**
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.
- Reassess airway frequently and with every patient move.
- **Maternal Arrest** - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport.
- **Adequate compressions with timely defibrillation are the keys to success.**
- **Consider use of Impedance Threshold Device once Advanced Airway placed. REMOVE Impedance Threshold Device once ROSC obtained.**

****Contact Supervisor Based on Local Policy and Written Protocol to Withhold Resuscitation.**

CHF/Pulmonary Edema

History
- Congestive heart failure
- Past medical history
- Medications (Digoxin, Lasix)
- **Erectile Dysfunction Medication**
- Cardiac history –past myocardial infarction

Signs/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**

Universal Patient Care Protocol

R | **Obtain and Record Pulse Ox** | R

B | **Obtain and Record EtCO2 if available** | B

R | Supplemental Oxygen to Maintain Sat ≥ 94 % | R

B | Consider **CPAP / BiPAP** if Available | B

P | Consider **Nitroglycerin** [if B/P ≥ 100 mmHg **SYSTOLIC**] 0.4 mg Tablet PO q 5 mins x3 | P

P | May use **Nitroglycerin Paste** if available 1 inch long layer | P

Vascular Access Protocol

B | Cardiac Monitor / 12 Lead ECG **Acquisition** | B

P | Cardiac Monitor / 12 Lead ECG **Interpretation** | P

M | **Notify Destination or Contact Medical Control** | M

P | Consider **Benzodiazepines** if needed to better tolerate CPAP/BiPAP 2 mg IV/IO Midazolam | P

If Cardiogenic Shock suspected Consider

ADULT CARDIAC

CHF/Pulmonary Edema

ADULT CARDIAC

Pearls

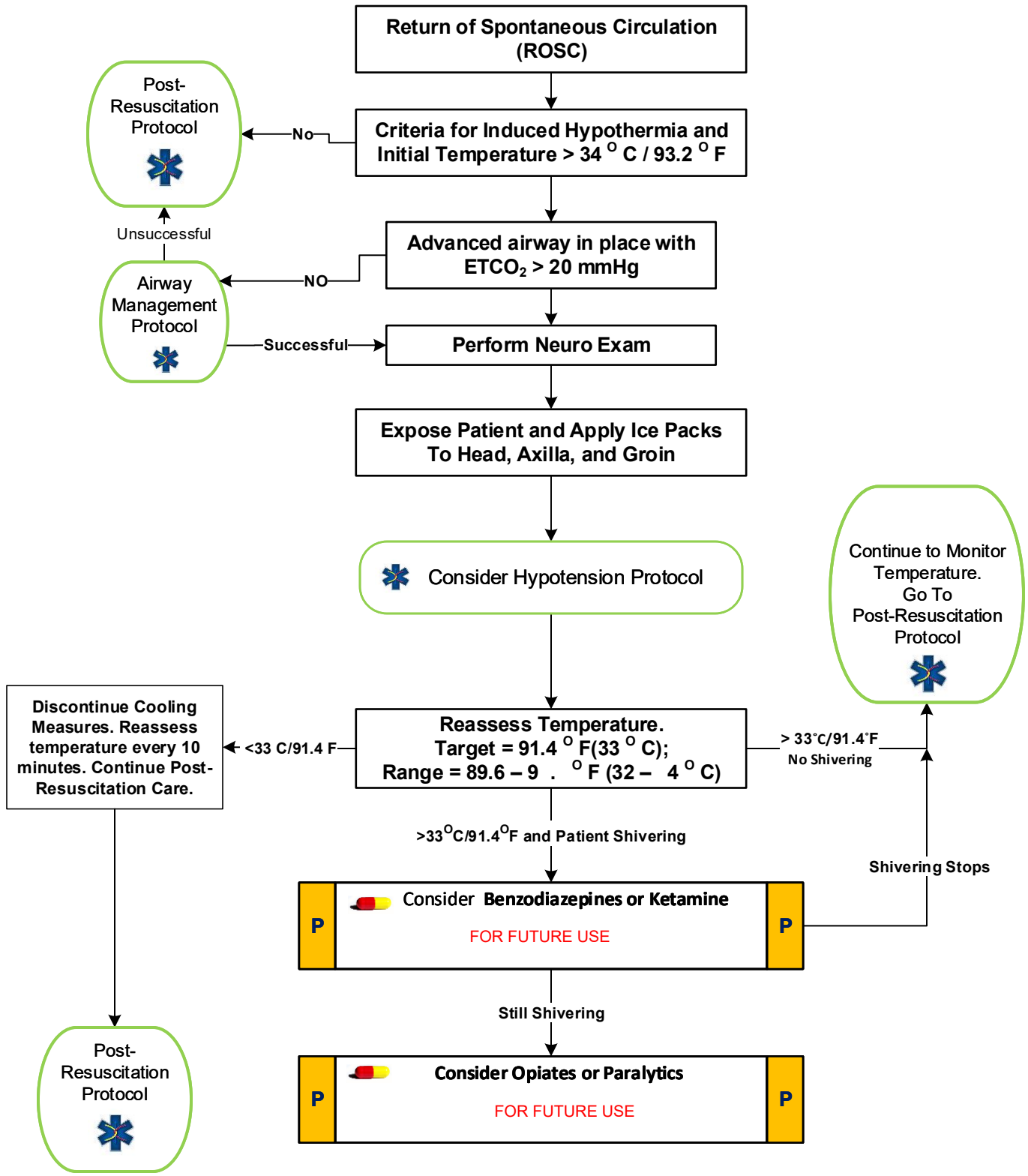
- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care**
- **Avoid Nitroglycerin in any patient who has used erectile dysfunction medication (Viagra or Levitra <24 hours; or Cialis <36 hours) due to potential severe hypotension.**
- **Furosemide and Narcotics have NOT been shown to improve the outcomes of EMS patients with pulmonary edema. This historically has been a mainstay of EMS treatment.**
- If patient has taken nitroglycerin without relief, consider potency of the medication.
- Consider myocardial infarction in all these patients. Diabetics and geriatric patients often have atypical pain, or only generalized complaints.
- **Carefully monitor the level of consciousness, BP, and respiratory status with the above interventions.**
- If Nitropaste is used, do not continue to use Nitroglycerin SL
- Allow the patient to be in their 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.

Hypothermia-Induced

History:
- Non-traumatic cardiac arrest (drowning and hanging are permissible in this protocol)

Signs and Symptoms:
- Return of pulse

Differential:
- **Continue to address specific differentials associated with the original dysrhythmia**



Hypothermia-Induced

ADULT CARDIAC

Pearls

- If BIAD is already in place – DO NOT REMOVE to intubate
- If no advanced airway can be obtained, cooling may only be initiated on order from online medical control
- Take care to protect patient modesty. Undergarments may remain in place during cooling
- Do not delay transport to cool
- Frequently monitor airway, especially after each patient move
- Patients may develop metabolic alkalosis with cooling. Do not hyperventilate.
- Induction of hypothermia REQUIRES transport of patient to a facility capable of continuing/maintaining hypothermia protocol.

Inclusion Criteria for Induced Hypothermia

- ✓ ROSC not related to blunt/penetrating trauma or hemorrhage
- ✓ ADULT Patients ONLY. NOT FOR USE IN PEDIATRICS
- ✓ Temperature after ROSC greater than 34°C/93.2°F degrees
- ✓ Advanced airway in place with no purposeful response to pain
- ✓ Comatose after ROSC; GCS < 8 AND No purposeful movement

EXCLUSION Criteria for Induced Hypothermia

- X Uncontrolled GI Bleeding
- X Conflict with Do Not Resuscitate (DNR) order.
- X Major intracranial, intra-thoracic, or intra-abdominal surgery within last 14 days.
- X Sepsis as suspected cause of cardiac arrest.
- X Cardiovascular instability as evidenced by: uncontrollable arrythmias, refractory hypotension.

Post Resuscitation

History
- Respiratory arrest
- Cardiac arrest

Signs/Symptoms
- Return of pulse

Differential
- **Continue to address specific differentials associated with the original dysrhythmia**

Repeat Primary Assessment

Consider Induced Hypothermia Protocol

B **Continue ventilatory support**
- O2 Sats ≥ 94%
- EtCO2 ideally 35 – 45

DO NOT HYPERVENTILATE
Remove Impedance Threshold Device **B**

Vascular Access Protocol

Airway Protocol

B	Cardiac Monitor / 12 Lead ECG **Acquisition**	B
R	**Vital Signs**	R
P	Cardiac Monitor / 12 Lead ECG **Interpretaion**	P
P	**Continue Anti-Arrhythmic if Return of Spontaneous Circulation (ROSC) was associated with its use.**	P

STEMI Protocol

Hypotension

Significant Ectopy

Bradycardia

Hypotension Protocol

Ventricular Tachycardia Protocol

Bradycardia Protocol

If arrest reoccurs, revert to appropriate protocol and/or initial successful treatment

M **Notify Destination or Contact Medical Control** M

ADULT CARDIAC

Post Resuscitation

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.
- 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 best be planned in consultation with medical control.
- Common causes of post-resuscitation hypotension include hyperventilation, hypovolemia, pneumothorax, and medication reaction to ALS drugs.
- Titrate Pressor Agent to maintain a systolic blood pressure > 100 mmHg. Ensure adequate fluid resuscitation is ongoing.
- Induction of hypothermia **REQUIRES** transport of patient to a facility capable of continuing/maintaining hypothermia protocol.

Chest Pain: Cardiac and STEMI

History
- Age
- Medications
- **Erectile Dysfunction Medication**
- Past medical history (MI, Angina, Diabetes, post menopausal)
- Allergies (Aspirin, Morphine, Lidocaine)
- Recent physical exertion
- **P**alliation / **P**rovocation
- **Q**uality (crampy, constant, sharp, dull, etc.)
- **R**egion / **R**adiation / **R**eferred
- **S**everity (1-10)
- **T**ime (onset /duration / repetition)

Signs and Symptoms
- CP (pain, pressure, aching, vicelike 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**

Universal Patient Care Protocol

B Cardiac Monitor / 12 Lead EKG **Acquisition** B

P Cardiac Monitor / EKG **Interpretation** P

Positive Acute MI (STEMI = 1 mm ST Segment Elevation in 2 Contiguous Leads

Vascular Access Protocol

B **Aspirin** (Unless Allergy) 324 mg PO B

B **Nitroglycerin SL** 0.4 mg PO Tablet q 5 mins x3 B

P Consider **Nitroglycerin Paste** 1 inch long layer P

Transport based on EMS System STEMI Plan With Early Notification Keep Scene Time to < 15 minutes

B If Transporting to Non-PCI Center: **Reperfusion Checklist** B

A Consider NS Bolus for Inferior MI / Hypotension A

A Consider 2nd IV A

Continued Pain: **Pain Control Protocol** (per Local Medical Control)

P Consider **Anti-Emetics** for Nausea/Vomiting P

Ondansetron 4mg IV/IO/IM

Go To Appropriate Protocol:
Hypotension Protocol
Dysrhythmia Protocols

M **Notify Destination or Contact Medical Control** M

ADULT CARDIAC

Chest Pain: Cardiac and STEMI

EMT- B are able to assist patient with Patients Nitroglycerin medication.

DO NOT administer Nitroglycerin medication to anyone with a systolic blood pressure of less the 100.

Paramedic: 12-Lead EKG should be obtained before administering Nitroglycerin

ADULT CARDIAC

Pearls

- Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro
- Items in Red Text are the key performance indicators for the EMS Acute Cardiac (STEMI) Care Toolkit
- **Positive Acute MI (STEMI = cardiac symptoms > 15 minutes and < 12 hours AND ST segment elevation of ≥ 1 mm in 2 or more Anatomically Contiguous Leads OR Left Bundle Branch Block NOT KNOWN to be present in past)**
- ****_High Risk: Cardiogenic shock_** – inadequate tissue perfusion due to low cardiac output. Systolic Blood Pressure ≤ 90 mm Hg in setting of acute myocardial infarction. (Killip class ≥ III)
- Patients with STEMI (ST-Elevation Myocardial Infarction) or positive Reperfusion Checklist should be transported to the appropriate destination based on the EMS System STEMI Plan
- **Avoid Nitroglycerin (NTG) in patients who use erectile dysfunction medication (Viagra or Levitra < 24 hours; or Cialis < 36 hours) due to possible severe hypotension.**
- *_Travel Time_ defined with understanding that PCI can be completed within 90 minutes or less including transport time.
- Document the time of the 12-Lead ECG in the PCR as a Procedure along with the interpretation (EMT-P)
- Nitroglycerin and Narcotics may be repeated per dosing guidelines
- If patient has taken NTG without relief, consider potency of medication.
- Monitor for hypotension after administration of NTG and/or Narcotics / Opiates
- Perform a patient interview, examination and treatment as simultaneously and expediently as possible, do not excessively delay treatment or transportation of this patient.
- Diabetics and geriatric patients often have atypical pain, or only generalized complaints.
- Additional Information is appended in POLICY: STEMI.

For Future Use

Chest Pain: STEMI Transport

Ventricular Fibrillation
Pulseless Ventricular Tachycardia

History
- Estimated down time
- Past medical history
- Medications
- Events leading to arrest
- Renal failure / dialysis
- DNR or living will

Signs and Symptoms
- Unresponsive, apneic, pulseless
- Ventricular fibrillation or ventricular tachycardia on ECG

Differential
- **Asystole**
- **Artifact / Device failure**
- **Cardiac**
- **Endocrine / Metabolic**
- **Drugs**
- **Pulmonary**

Cardiac Arrest Protocol

P — **Defibrillate x 1** — 360 Joules — P

Airway Protocol

R — **5 cycles of CPR** — R

Vascular Access Protocol

Check Rhythm and Pulse

P — **Defibrillate x 1** — 360 Joules — P

P — **Epinephrine** **(May repeat Q 3 – 5minutes)** 1 mg 1:10,000 IV/IO/IM/ET q 3-5 mins — P

After 5 Cycles of CPR Check Rhythm and Pulse

P — **Defibrillate x 1** — 360 Joules — P

P — **Consider Anti-Arrhythmic:**
Amiodarone: 300mg IV/IO first dose; second dose 150 mg
Lidocaine: 1.5 mg/kg IV/IO max dose: 3mg/kg
If **Torsades de Pointes:** 2 mg Magnesium IV/IO over 1-2 min q5-15 min — P

R — **Continue CPR x 5 cycles** — R

Criteria For Discontinuation?

YES → **STOP RESUSCITATION**

NO → M — **Notify Destination Or Contact Medical Control** — M

AT ANY TIME
Return of Spontaneous Circulation
↓
Go to Post Resuscitation Protocol

AT ANY TIME
Rhythm Changes to Nonshockable Rhythm
↓
Go to appropriate protocol

ADULT CARDIAC

Ventricular Fibrillation
Pulseless Ventricular Tachycardia

Reversible Causes Medication Dosages

Suspected Narcotic (Opiate)
Consider Naloxone titrated to patients needs.

Suspected Organophosphate Poisoning
Consider Atropine 2mg IV Starting Dose

Suspected Tricyclic overdose
Consider Soduim Bicarbonate at 1 mEq/kg not to exceed 100 mEq.

Suspected Beta Blocker or Calcium Channel Blocker
Administer Atropine 1 mg.

Suspected Hypomagnesic State
Administer Magnesium Sulfate 1-2 grams

ADULT CARDIAC

Pearls

- **Recommended Exam: Mental Status**
- Reassess and document endotracheal tube placement and EtCO2 frequently, after every move, and at transfer of care.
- Calcium and sodium bicarbonate if hyperkalemia is suspected (renal failure, dialysis).
- **Treatment priorities are: uninterrupted chest compressions, defibrillation, then IV access and airway control.**
- Polymorphic V-Tach (Torsades de Pointes) may benefit from administration of magnesium sulfate if available.
- Do not stop CPR to check for placement of ET tube or to give medicines.
- If arrest not witnessed by EMS then 5 cycles of CPR prior to 1st defibrillation.
- Effective CPR and prompt defibrillation are the keys to successful resuscitation.
- If BVM is ventilating the patient successfully, intubation should be deferred until rhythm has changed or 4 or 5 defibrillation sequences have been completed.

Ventricular Tachycardia
(With A Pulse)

History
- Past medical history / medications, diet, drugs.
- Syncope / near syncope
- CHF
- Palpitations
- Pacemaker
- Allergies: lidocaine / novacaine

Signs and Symptoms
- Ventricular tachycardia on ECG (Runs or sustained)
- Conscious, rapid pulse
- Chest pain, shortness of breath
- Dizziness
- Rate usually 150 - 180 bpm for sustained V-Tach
- **QRS > .12 Sec**

Differential
- **Artifact / Device failure**
- **Cardiac**
- **Endocrine / Metabolic**
- **Drugs**
- **Pulmonary**

Universal Patient Care Protocol

B — Cardiac Monitor / 12 Lead EKG **Acquisition** — B

P — Cardiac Monitor / EKG **Interpretation** — P

YES

- **Palpable Pulse**
- **Wide, Regular Rhythm**
- **QRS > 0.12 s**

No → Exit to Appropriate Protocol

If Rhythm Changes Or Becomes Pulseless Exit to Appropriate Protocol

Vascular Access Protocol

Stable

P — Consider **Adenosine** * **[Regular Monomorphic Rhythm Only]** (Narrow Complex Rhythm only) — P

P — **AntiArrhythmic Therapy** Amiodarone: 150 mg IV/IO, over 10 mins; Lidocaine: 1.5 mg/kg IV/IO; Magnesuim: 2 g IV/IO if Torsades de Pointes — P

If Unsuccessful – Rapid Transport with Early Destination Notification

Becomes Unstable ?

YES → **Unstable**

NO →

Unstable

P — Consider **Benzodiazepines** 1-5 mg IV/IO (0.05 mg/kg) Midazolam — P

P — **Synchronized Cardioversion** 100 Joules, May repeat at 200, 300 initially, 360 joules — P

P — **Antiarrhythmic Therapy** Amiodarone: 150 mg IV/IO, over 10 mins; Lidocaine: 1.5 mg/kg IV/IO; Magnesuim: 2 g IV/IO if Torsades de Pointes — P

B — Repeat 12 Lead EKG **Acquisition** — B

M — **Notify Destination or Contact Medical Control** — M

ADULT CARDIAC

Ventricular Tachycardia
(With A Pulse)

ADULT CARDIAC

Pearls

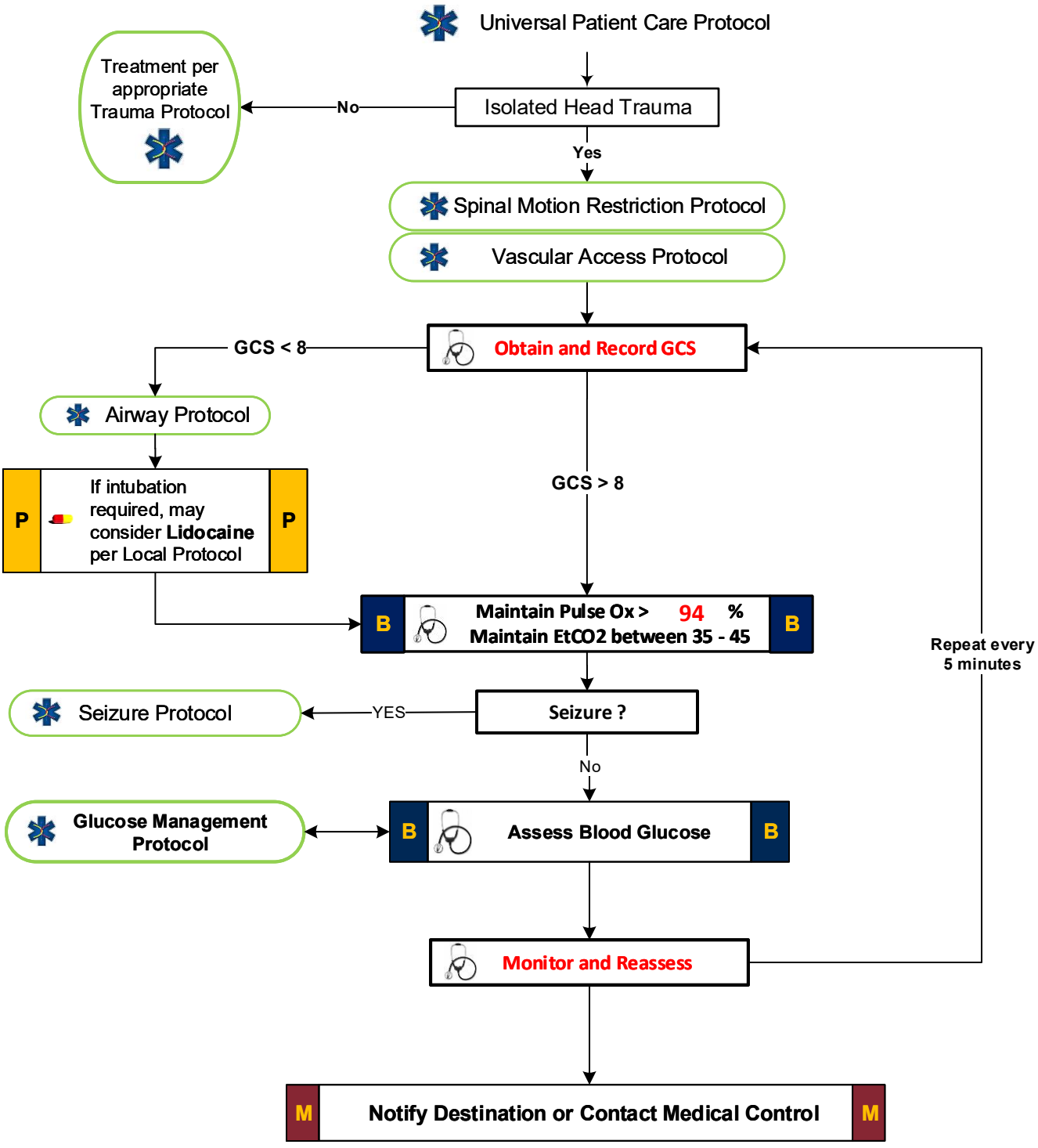
- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- For witnessed / monitored ventricular tachycardia, try having patient cough.
- Polymorphic V-Tach (Torsades de Pointes) may benefit from the administration of **Magnesium Sulfate** if available.
- If presumed hyperkalemia (end-state renal disease, dialysis, etc.), administer **Sodium Bicarbonate**.
- * Adenosine should NOT be given for unstable or for irregular or for polymorphic wide-complex tachycardias as it may cause degeneration of the arrhythmia to Ventricular Fibrillation.

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**



ADULT TRAUMA

Head Trauma

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neuro**
- If GCS < 12 consider air / rapid transport
- In the absence of Capnography, hyperventilate the patient (adult: 20 breaths/min, child: 30, infant: 35) only if ongoing evidence of brain herniation (blown pupil, decorticate or decerebrate posturing, or bradycardia)
- 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.
- The most important item to monitor and document is a change in the level of consciousness.
- Consider Restraints/Sedation if necessary for patient's and/or personnel's protection per the Restraint Procedure.
- Limit IV fluids unless patient is hypotensive.
- Concussions are periods of confusion or LOC associated with trauma which may have resolved by the time EMS arrives. 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.
- In areas with short transport times, RSI/Drug-Assisted Intubation is not recommended for patients who are spontaneously breathing and who have oxygen saturations of greater than 90% with supplemental oxygen.

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**

Universal Patient Care Protocol

Spinal Motion Restriction Protocol

Assessment of Serious Signs / Symptoms
ABC and LOC

Airway Protocol
If indicated

Vascular Access Protocol

R — VS / Perfusion / GCS — R

ABNORMAL

Rapid Transport to appropriate destination using
EMS System Trauma Plan
Limit Scene Time to 10 minutes
Provide Early Notification

B — Cardiac Monitor / 12 Lead EKG **Acquisition** — B

P — Cardiac Monitor / EKG **Interpretation** — P

Hypotension Protocol

R — Splint Suspected Fractures
Consider Pelvic Binding
Hemorrhage Control Procedure — R

P — Consider **Chest Decompression**
Needle Procedure if indicated — P

Head Injury Protocol if indicated

R — **Monitor and Reassess** — R

NORMAL

Repeat Assessment

R — Splint Suspected Fractures
Consider Pelvic Binding
Hemorrhage Control Procedure — R

Transport to appropriate destination using
EMS System Trauma Plan

R — **Monitor and Reassess** — R

Pain Protocol

M — **Notify Destination or Contact Medical Control** — M

ADULT TRAUMA

Multiple Trauma

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro**
- **Items in Red Text are key performance measures used in the EMS Acute Trauma Care Toolkit**
- **Transport Destination is chosen based on the EMS System Trauma Plan with EMS pre-arrival notification.**
- 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.
- In prolonged extrications or serious trauma, consider air transportation for transport times and the ability to give blood.
- Do not overlook the possibility of associated domestic violence or abuse.
- Scene times should not be delayed for procedures. These should be performed en route when possible. Rapid transport of the unstable trauma patient is the goal.
- Bag valve mask is an acceptable method of managing the airway if pulse oximetry can be maintained above 90%

Field Triage and Bypass

Assessment of Serious Signs / Symptoms
ABC and LOC

Measure Vital Signs and Level of Consciousness

- Glasgow Coma Scale < 13
- Systolic Blood Pressure < 90 mmHg
- Respiratory Rate < 10 or > 29 Breaths / min
- Need for Ventilatory Support
- Rate < 20 in infant age < 1 Year

YES → Transport to closest designated trauma center available. Air transport or bypass of Level 3 Trauma Center to Level 1 or Level 2 Trauma Center should be considered if distance and circumstances are appropriate and/or no Level 3 Trauma Center is available

NO →

Assess anatomy of injury:

- Penetrating injuries to head, neck, torso or extremity to elbow and knee
- Chest wall instability/deformity (e.g.Flail Chest)
- Crush, de-gloved, mangled or pulseless extremity
- Amputation proximal to wrist or ankle
- Pelvic fracture
- Paralysis
- Open or depressed skull fracture
- Two or more proximal long bone fractures

YES → Transport to closest designated trauma center available. Air transport or bypass of Level 3 Trauma Center to Level 1 or Level 2 Trauma Center should be considered if distance and circumstances are appropriate and/or no Level 3 Trauma Center is available

NO →

Assess mechanism of injury and evidence of high energy impact:

Falls:
- >20 ft. in adult (one story = 10 feet)
- > 10 ft. or two to three times the height of a child

High Risk Auto Crash:
- Intrusion including roof: > 12 inches occupant side or > 18 inches any site
- Ejection (partial or complete) from automobile
- Death in same passenger compartment
- Vehicle telemetry data consistent with a high risk of injury
- **Pedestrian or bicyclist struck by vehicle, thrown, run over, or with impact > 20 MPH**
- **Motorcycle crash > 20 MPH**

YES → Transport to closest designated trauma center available. **A lower level Trauma Center should not be bypassed to transport to a higher level Trauma Center.** If no Trauma Center is available, transport to the closest appropriate hospital Emergency Department for evaluation and transfer as necessary.
Air Transport from incident scene is rarely appropriate

NO →

Assess special patient or system considerations:

Older Adults:
- Risk of injury/death increases > age 55
- SBP < may represent shock after age 65
- Low impact mechanisms (e.g. ground level falls) may result in severe injury

Children:
- Should be triaged preferntially to pediatric capable trauma centres
- **Pregnancy > 20 weeks**

Anticoagulants / bleeding disorders:
- Patients with head injury are at high risk for rapid deterioration

Burns:
- Without other trauma mechanism: triage to burn facility
- With trauma mechanism: triage to trauma center
- **EMS provider judgment**

YES → Transport to closest designated trauma center available. **A lower level Trauma Center should not be bypassed to transport to a higher level Trauma Center.** If no Trauma Center is available, transport to the closest appropriate hospital Emergency Department for evaluation and transfer as necessary.
Air Transport from incident scene is rarely appropriate

NO →

Transport according to usual Transport Protocol

ADULT TRAUMA

Field Triage and Bypass

Pearls

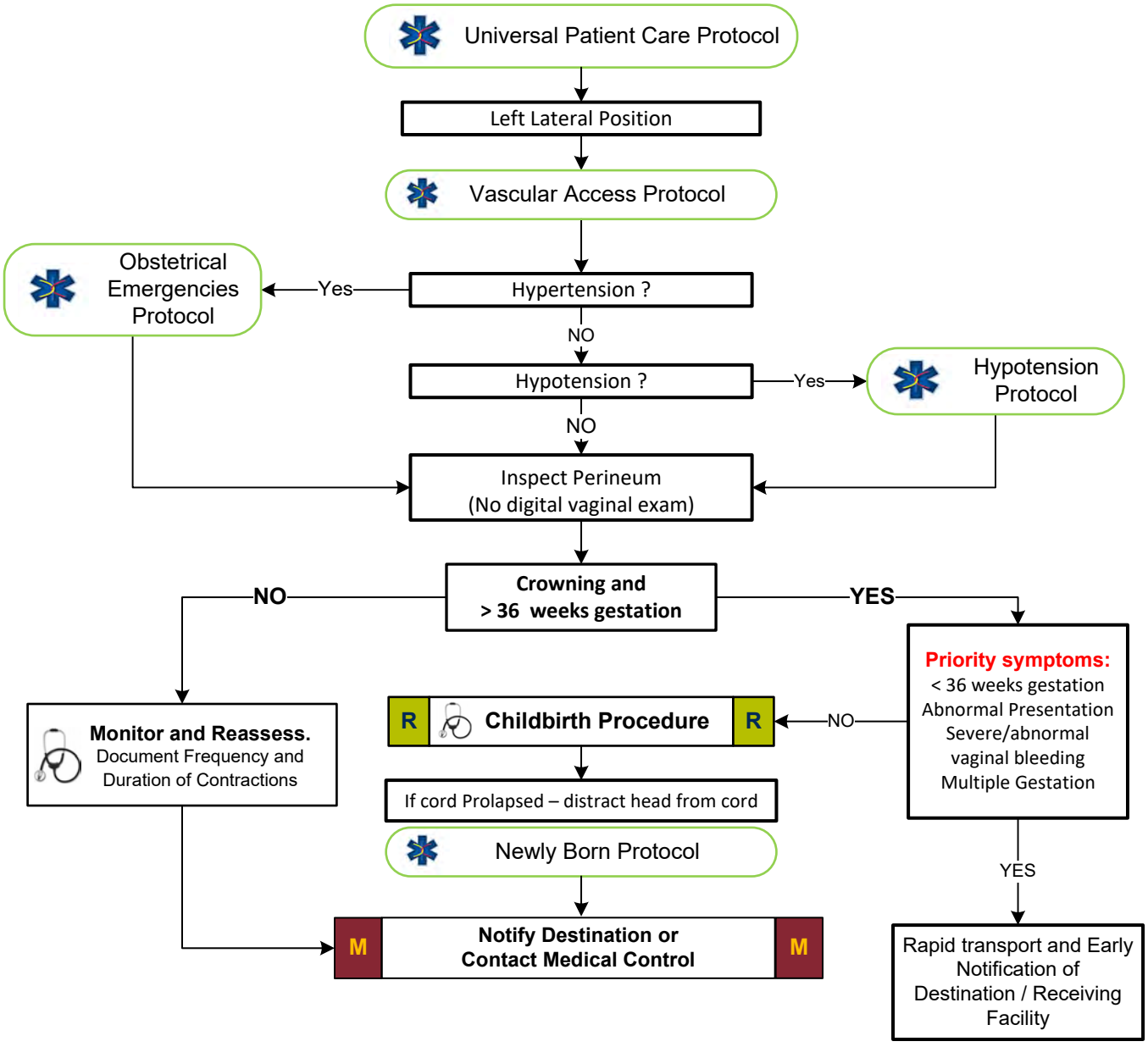
- **EMS Service *must identify* - in their local protocols - appropriate hospitals when no trauma center is available.**
- **Transport Destination is chosen based on the EMS System Trauma Plan with EMS pre-arrival notification.**
- Geriatric patients should be evaluated with a high index of suspicion. 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.
- In prolonged extrications or serious trauma, consider air transportation for transport times and the ability to give blood.
- Scene times should not be delayed for procedures. These should be performed en route when possible. Rapid transport of the unstable trauma patient is the goal.

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
- Illicit Drug Use

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**



Childbirth / Labor

APGAR SCORE

	Score = 0	Score = 1	Score = 2	Totals
Appearance Skin Color	Blue or Pale all over	Blue at extremities Body pink (acrocyanosis)	Body and Extremities Pink	
Pulse Rate	Absent	< 100 BPM	100 BPM +	
Reflex irritability **G**rimace	No Response to Stimulation	Grimace on Suction or Aggressive Stimulation	Cry with Stimulation	
Activity	None	Some Flexion	Flexed Arms and Legs – resist extension	
Respiratory Effort	Absent	Weak, Irregular, Gasping	Strong, Robust Cry	

Pearls

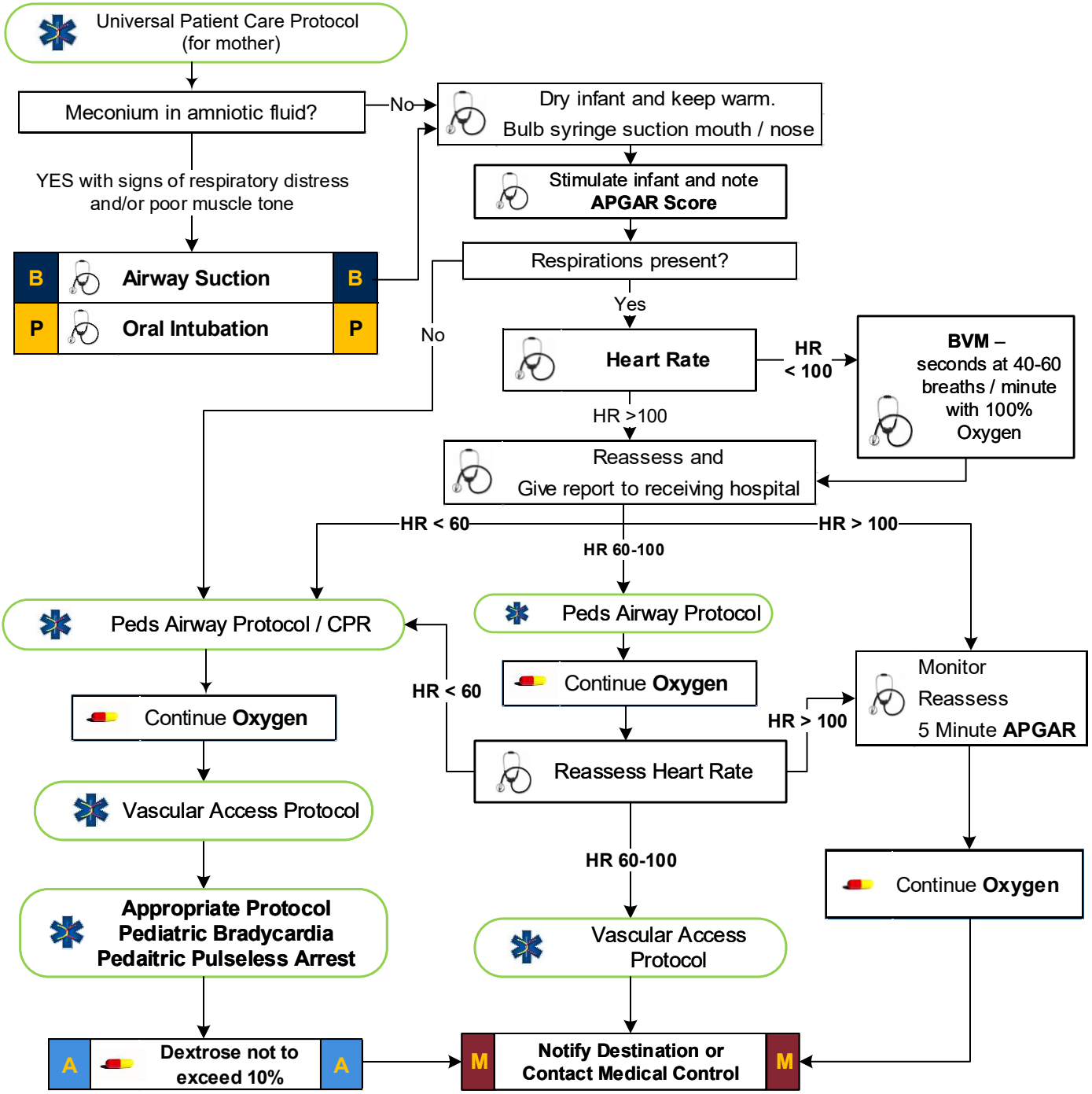
- **Recommended Exam (of Mother): Mental Status, Heart, Lungs, Abdomen, Neuro**
- Document all times (delivery, contraction frequency, and length).
- If maternal seizures occur, refer to the Obstetrical Emergencies Protocol.
- After delivery, massaging the uterus (lower abdomen) will promote uterine contraction and help to control postpartum 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. (APGAR = Appendix C)

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**



OB and NEWLY BORN

Newly Born

APGAR SCORE

	Score = 0	Score = 1	Score = 2	Totals
Appearance Skin Color	Blue or Pale all over	Blue at extremities Body pink (acrocyanosis)	Body and Extremities Pink	
Pulse Rate	Absent	< 100 BPM	100 BPM +	
Reflex irritability **G**rimace	No Response to Stimulation	Grimace on Suction or Aggressive Stimulation	Cry with Stimulation	
Activity	None	Some Flexion	Flexed Arms and Legs – resist extension	
Respiratory Effort	Absent	Weak, Irregular, Gasping	Strong, Robust Cry	

Pearls

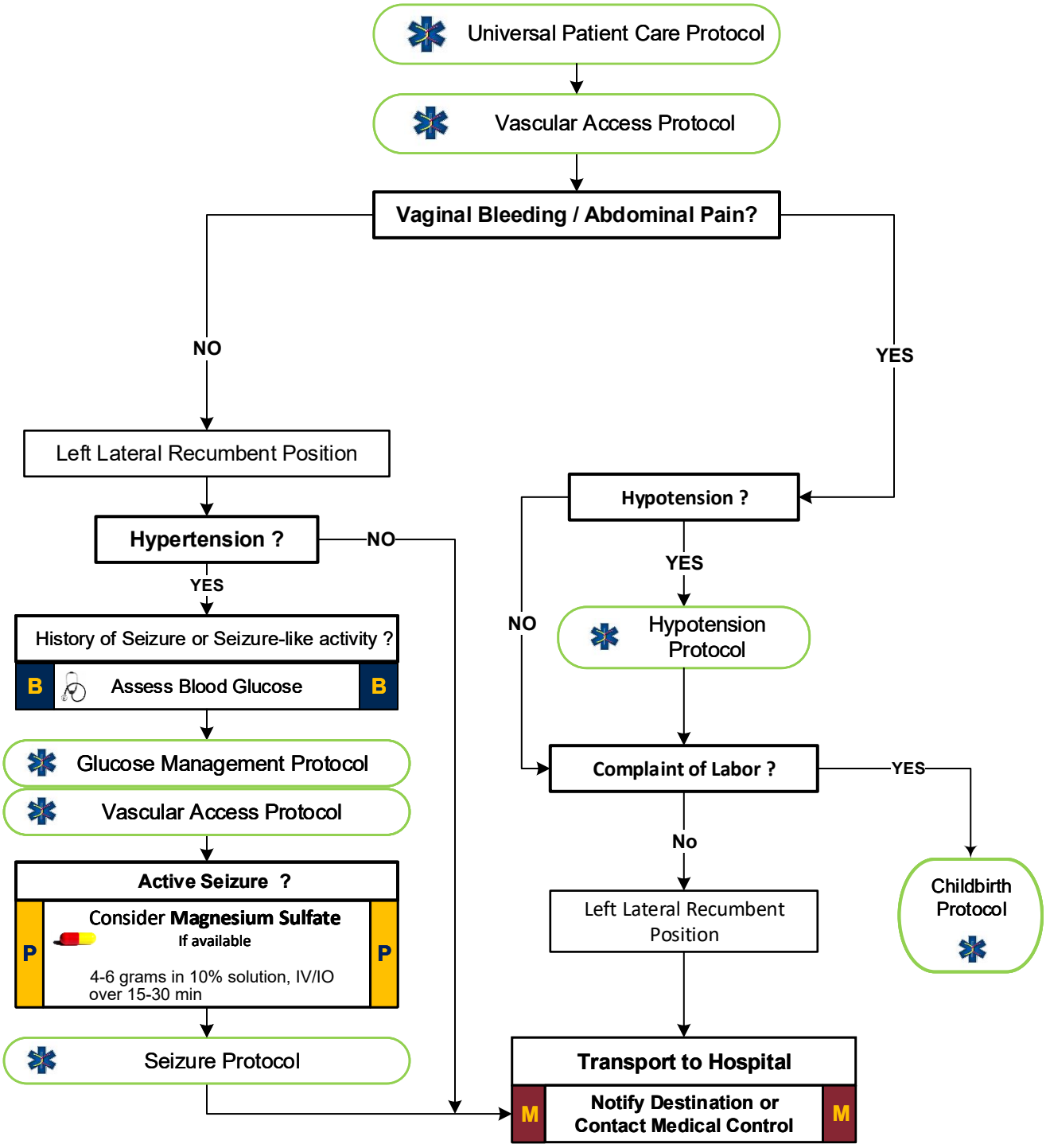
- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Chest, Heart, Abdomen, Extremities, Neuro**
- CPR in infants is 120 compressions/minute with a 3:1 compression to ventilation ratio
- It is extremely important to keep infant warm.
- Maternal sedation or narcotics will sedate infant.
- Consider hypoglycemia in infant.
- Document 1 and 5 minute APGAR in PCR (APGAR = Appendix C)
- D10 = D50 diluted (1 ml of D50 with 4 ml of Normal Saline)

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**
- **Ectopic Pregnancy**



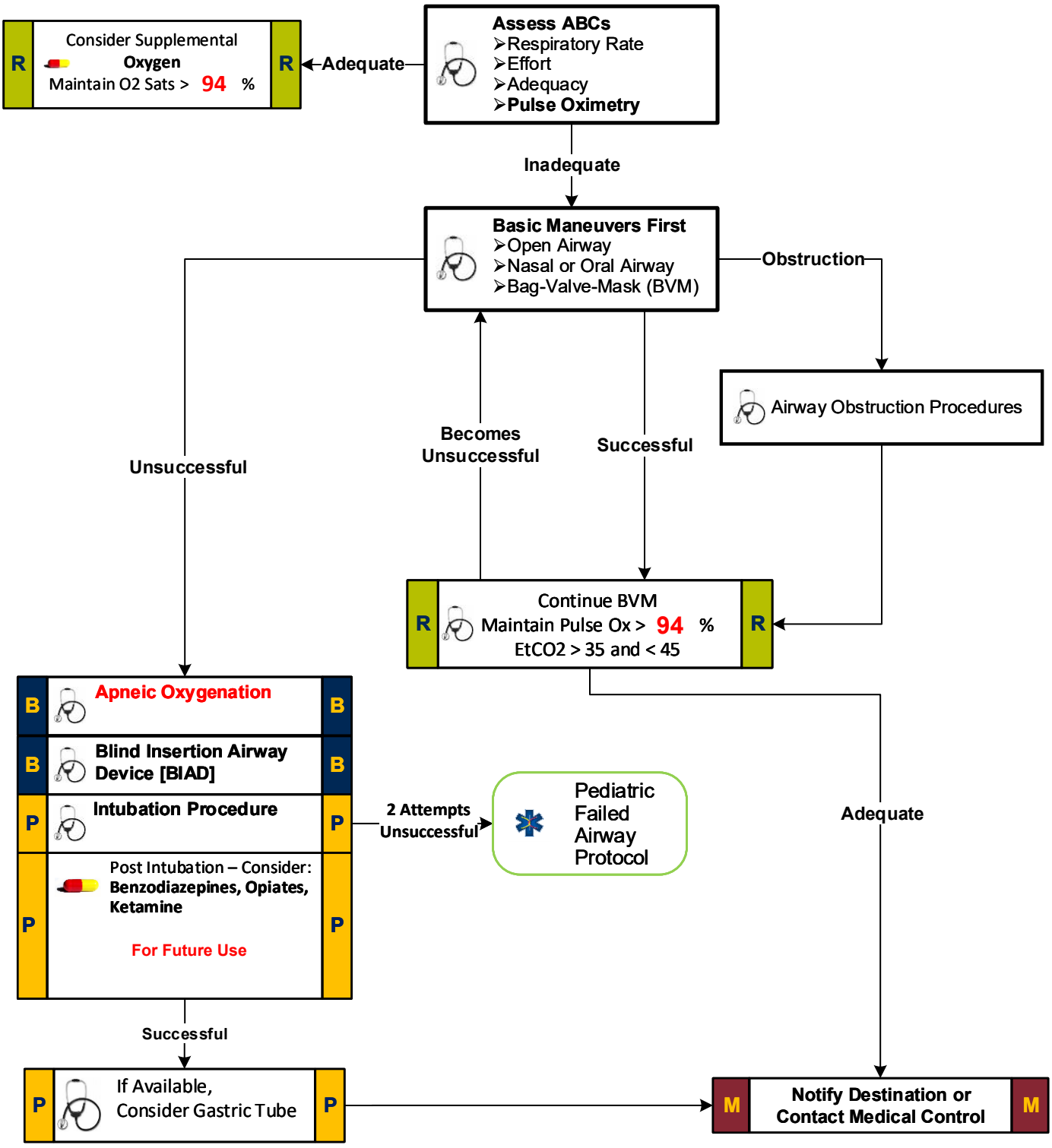
OB and NEWLY BORN

Obstetrical Emergency

Pearls

- **Recommended Exam: Mental Status, Abdomen, Heart, Lungs, Neuro**
- Severe headache, vision changes, hypertension 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.
- 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 .
- Magnesium may cause hypotension and decreased respiratory drive. Use with caution.

Airway, Pediatric



PEDIATRIC MEDICAL

Airway, Pediatric

Pearls

- **For this protocol, pediatric is defined as: < 12 years old AND [a] < 55 Kg -or- [b] Fits on Standardized Pediatric Length Based Tape**
- **Capnography is:**
  - **Required for ALL Intubated Patients and Cricothyroidotomy Patients***
  - **Recommended / Encouraged for all unstable patients**
  - **Recommended / Encouraged for utilization of any Airway Device (e.g. BIAD)**
  - **[* Attachment of the Capnograph may be delayed until the scene is safe / non-threatening]**
- **If an effective airway is being maintained by BVM with continuous pulse oximetry values of > 92% , it is acceptable to continue with basic airway measures instead of using a BIAD or Intubation.**
- **For the purposes of this protocol an adequate airway is when the patient is receiving appropriate oxygenation and ventilation without undue risk of aspiration or worsening airway pathology.**
- **An Intubation Attempt is defined as passing the laryngoscope blade or endotracheal tube past the teeth or inserted into the nasal passage.**
- **Ventilatory rate are typically about 30 for Neonates, 25 for Toddlers, 20 for School Age, and for Adolescents the normal Adult rate of 12 per minute. Maintain a EtCO2 between 35 and 45 and avoid hyperventilation.**
- **It is strongly encouraged to complete an Airway Evaluation Form with any BIAD or Intubation procedure.**
- Paramedics should consider using a BIAD if oral-tracheal intubation is unsuccessful.
- Maintain C-spine immobilization for patients with suspected spinal injury.
- Do not assume hyperventilation is psychogenic - use oxygen, not a paper bag.
- BURP maneuver should be used to assist with difficult intubations. [Sellick's maneuver no longer recommended by AHA.]
- Hyperventilation in deteriorating head trauma should only be done to maintain a EtCO2 (pCO2) of 30-35.
- Gastric tube placement should be considered in all intubated patients.
- It is important to secure the endotracheal tube well. Manual stabilization of the endotracheal tube should be used during all patient moves/transfers.

Airway, Pediatric - Failed

Two (2) failed intubation attempts by most proficient technician on scene or anatomy inconsistent with intubation attempts. NO MORE THAN THREE (3) ATTEMPTS TOTAL

Inability to Oxygenate due to Upper Airway Compromise

NO → R Routine Airway Management and Transport R

YES

Inability to Oxygenate with BVM Oral / Nasopharyngeal Airway

NO → R BVM Ventilation R

YES

R Call For Assistance R

B Initiate Apneic Oxygenation B

Inability to Intubate Oral / Nasal Reposition, consider equipment change, BURP, bougie, Alternate Provider

NO → P ET Intubation and Transport P

YES

Inability to Oxygenate with BIAD

NO → B BIAD and Transport B

Emergent Transport

YES

M Notify Destination or Contact Medical Control M

PEDIATRIC MEDICAL

Airway, Pediatric - Failed

Pearls

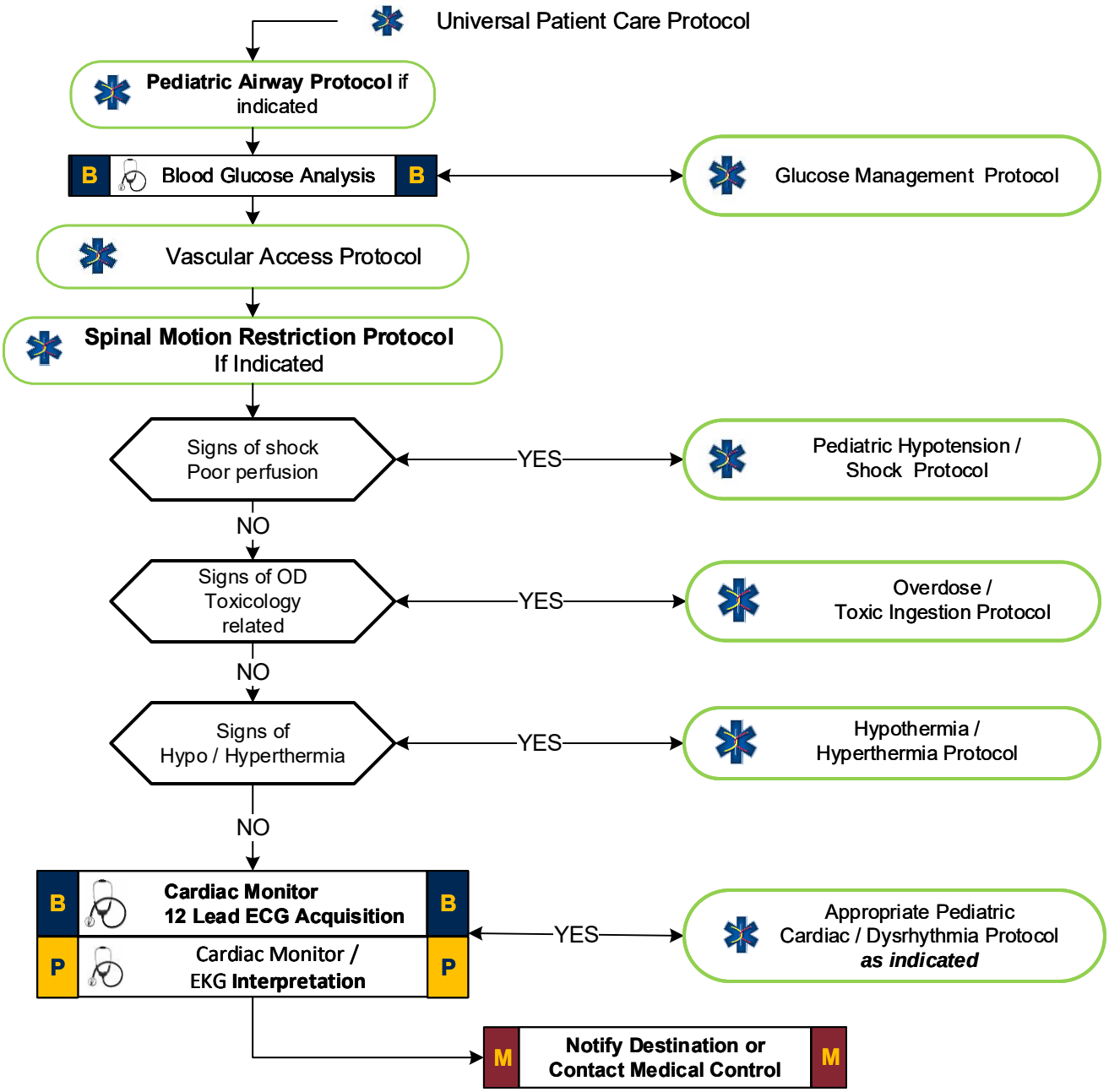
- If first intubation attempt fails, make an adjustment and then consider:
  - Different laryngoscope blade
  - Gum Elastic Bougie
  - Different ETT size
  - Change cricoid pressure
  - Apply BURP maneuver (Push trachea Back [posterior], Up, and to patient's Right)
  - Change head positioning
- Continuous pulse oximetry should be utilized in all patients with an inadequate respiratory function.
- **Ventilatory rate are typically about 30 for Neonates, 25 for Toddlers, 20 for School Age, and for Adolescents the normal Adult rate of 12 per minute. Maintain a EtCO2 between 35 and 45 and avoid hyperventilation.**
- **Capnography is:**
  - **Required for ALL Intubated Patients and Cricothyroidotomy Patients***
  - **Recommended / Encouraged for all unstable patients**
  - **Recommended / Encouraged for utilization of any Airway Device (e.g. BIAD)**
  - **[* Attachment of the Capnograph may be delayed until the scene is safe / non-threatening]**
- Notify **Medical Control** **AS EARLY AS POSSIBLE** about the patient's difficult / failed airway.

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
- Fever

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



PEDIATRIC MEDICAL

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 Hypotension

History
- Blood loss
- Fluid loss
  - Vomiting
  - Diarrhea
  - Fever
- Infection
- Congenital Defects
- Birth Complications

Signs and Symptoms
- Restlessness, confusion, weakness
- Dizziness
- Increased HR, rapid pulse
- Decreased BP
- Pale, cool, clammy skin
- Delayed capillary refill

Differential
- Trauma
- Infection
- Dehydration
  - Vomiting
  - Diarrhea
  - Fever
- Congenital heart disease
- Medication or Toxin
- Allergic reaction

Universal Patient Care Protocol
Use Age Appropriate B/P Levels

Vascular Access Protocol

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Yes → Pediatric Multiple Trauma Protocol

No

B — Assess Blood Glucose — B ↔ Glucose Management Protocol

A — b2ŊYI-f {I-ťIyŜ .2ŧdž ó I MÚ HЛ Y [ĸY∃ — A

A — / 2yǡŘŜŊ wŜǈŜI-űIyƎY b2ŊYI-f {I-ťIyŜ .2ŧdž ó I HÚ HЛ Y [ĸY∃ — A

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P — **Consider: Pressor Infusion**
Notify Medical Control for guidance using pressors in pediatric patients — P

Consider OD / Toxic Protocol

M — **Notify Destination or Contact Medical Control** — M

Age Appropriate Vital Signs:

	SBP	HR
Premature	55-75	120-170
0-3 m	65-85	100-150
3-6m	70-90	90-120
6-12m	80-100	80-120
1-3Y	90-105	70-110
3-6Y	95-110	65-110
6-12Y	100-120	60-95

Pediatric Hypotension

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro**
- Consider all possible causes of shock and treat per appropriate protocol.
- Decreasing heart rate and hypotension occur late in children and are signs of imminent cardiac arrest.
- Most maternal medications pass through breast milk to the infant. Examples: Narcotics, Benzodiazepines.
- Consider possible allergic reaction or early anaphylaxis.
- Consider sepsis as possible etiology and measure a body temperature as part of vital signs.
- If patient has a history of cardiac disease, (prematurity) chronic lung disease, or renal disease limit Normal Saline bolus to 10 ml/kg unless otherwise directed by Medical Control Physician

Pain Control: Pediatric

History
- Age
- Location
- Duration
- Severity (1 - 10)
- 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)**

Universal Patient Care Protocol

Patient care according to **Protocol** based on **Specific Complaint**

Pain Severity 6 out of 10
OR
Indication for IV IM Medication

NO → B: Consider If Available: Ibuprofen (Age mos) or Acetaminophen

R: Obtain and Record Pulse Ox

B: Obtain and Record ETCO2 if available

Vascular Access Protocol

A: Consider: **Nitrous Oxide** → Consider If Available: **Nitrous Oxide (Age > 5 Yrs)**

P: Consider **Ketorolac** (Age > 6 months)

P: **Fentanyl ***
*** ONLY these doses may be administered PRIOR to OLMC contact [AGE > 5 Yrs]**

P: **Fentanyl* 1 mcg/kg up to 50 mcg. May repeat x 1 Q 5 minutes. Max Dose = 100 mcg**

P: Consider **anti-emetics** as needed

P: Consider subdissociative **Ketamine** for Refractory Pain

M

B: Must reasssess patient at least **every 5 minutes** after sedative medication

M: **Notify Destination or Contact Medical Control**

Morphine and Fentanyl Doses listed in this protocol may be used PRIOR to contact with OnLine Medical Control Age > 5 Years

Relative Contraindications For IV Pain Control:
- Severe Head Injury
- End-Stage Lung Disease
- Untreated Hypotension

Relative Contraindications For Non-Steroidal Agents :
- Active Bleeding
- Possible Surgery
- Renal Disease

PEDIATRIC MEDICAL

Pain Control: Pediatrics

FOR FUTURE USE

PEDIATRIC MEDICAL

Pearls

- **Recommended Exam: Mental Status, Area of Pain, Neuro**
- **Pain severity (0-10) is a vital sign to be recorded pre and post IV or IM medication delivery and at disposition.**
- **Vital signs should be obtained pre, 15 minutes post, and at disposition with all pain medications.**
- Relative Contraindications to the use of a **narcotic** include hypotension, head injury, respiratory distress or severe Lung Disease.
- **Ibuprofen should not be used in patients with known renal disease or renal transplant, in patients who have known drug allergies to NSAID's (non-steroidal anti-inflammatory medications), with active bleeding, or in patients who may need surgical intervention such as open fractures or fracture deformities.**
- All patients should have drug allergies documented prior to administering pain medications.
- All patients who receive IM or IV medications must be observed 15 minutes for drug reaction.
- **Ibuprofen** should not be given for headaches or abdominal pain, history of gastritis, stomach ulcers, fracture, or if patient will require sedation.
- Do not administer any PO medications for patients who may need surgical intervention such as open fractures or fracture deformities, headaches, or abdominal pain.
- Do not administer **Acetaminophen** to patients with a history of liver disease.

Pediatric Respiratory Distress

History
- Time of onset
- Possibility of foreign body
- Medical history
- Medications
- Fever or respiratory infection
- Other sick siblings / contacts
- History of trauma

Signs and Symptoms
- Wheezing or stridor
- Respiratory retractions
- Increased heart rate
- Altered level of consciousness
- Nasal flaring / tripoding
- Anxious appearance

Differential
- **Allergic Reaction**
- **Asthma**
- **Aspiration**
- **Foreign body**
- **Infection**
  - **Pneumonia**
  - **Croup**
  - **Epiglotitis**
- **Congenital heart disease**
- **Medication or Toxin**
- **Trauma**

Universal Patient Care Protocol

Respiratory / Ventilatory Insufficiency

YES → Airway Management Protocol

NO

Position Patient for Comfort

R — Pulse Oximetry — R

B — Capnography if Available — B

Consider Pediatric CHF Protocol

Wheezing

B — **Albuterol** or Other **Beta Agonist** — B

Vascular Access Protocol
If SpO2 < 94 % after 1st Treatment

B — If No Improvement – Repeat **Albuterol** (or other **Beta Agonist**) x 3 — B

P — Consider Addition of **Ipratropium** to Nebulizer (if Available) — P

P — If Available: **Methylprednisolone** 2 mg/kg IV/IO/IM — P

B — **Consider CPAP / BiPAP** — B

Stridor

B — **Normal Saline *Nebulized*** — B

P — If NO Improvement or Severe **Racemic Epinephrine *Nebulized*** — P

Vascular Access Protocol
If SpO2 < 94 % after 1st Treatment

P — If Available: **Methylprednisolone** 2 mg/kg IV/IO/IM — P

M — **Notify Destination or Contact Medical Control** — M

OLMC*

B — Consider Repeat **Albuterol** or Other **Beta Agonist** — B

P — Consider **Magnesium Sulfate** 25-50 mg/kg over 10-20 min, Only with OLMC — P

Consider Anaphylaxis Protocol

OLMC*

P — If NO Improvement Repeat **Racemic Epinephrine *Nebulized*** — P

Consider Anaphylaxis Protocol

OLMC* = Online Medical Control

PEDIATRIC MEDICAL

Pediatric Respiratory Distress

Albuterol Dose: 5 mg above the age of 1 years
Ipratropium Dose: 0.5 mg, mixed with Albuterol on the Initial Dose.

Racemic Epinephrine dose: 5 mL of 1:1,000 via nebulizer

Pearls

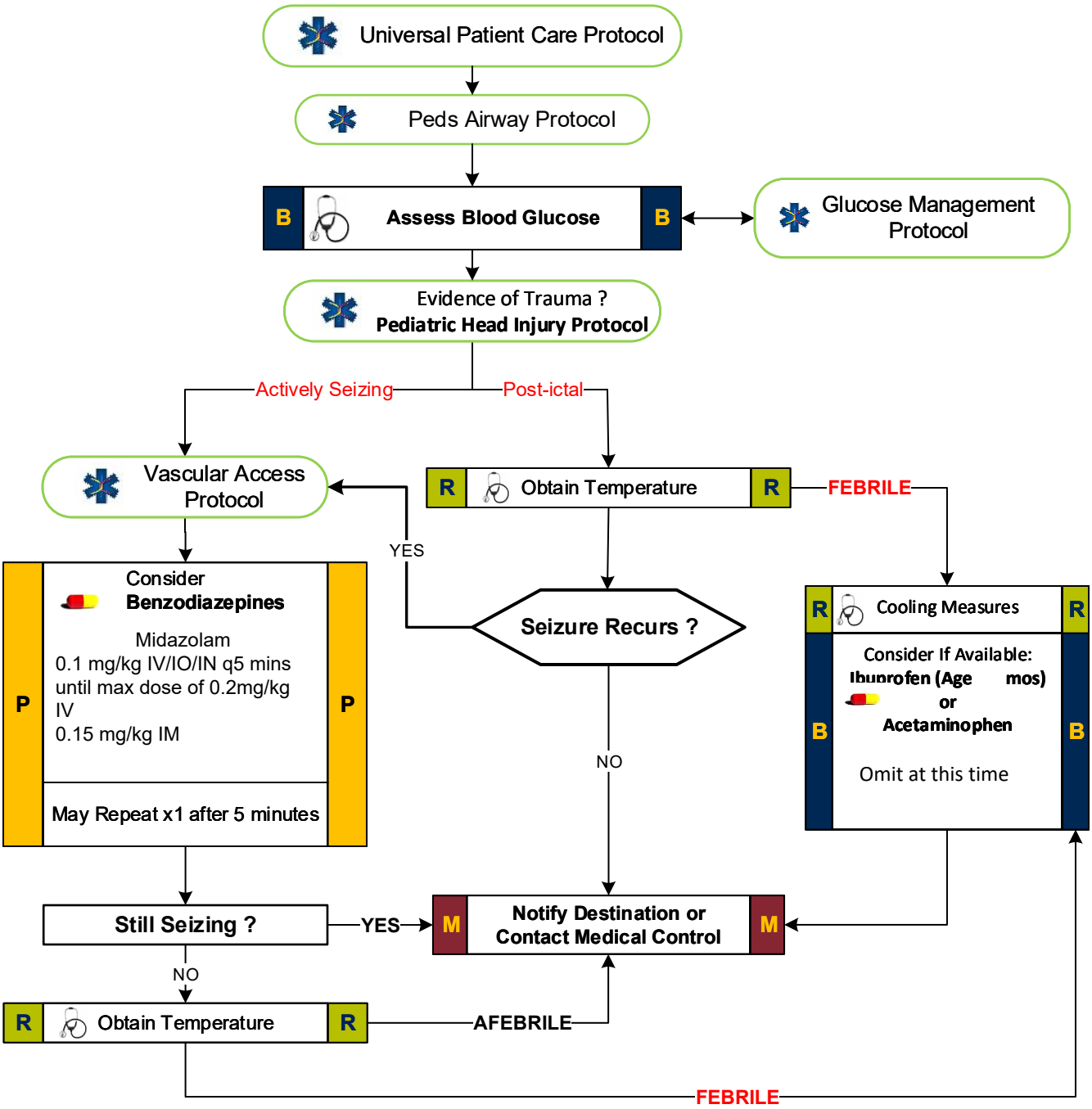
- **Recommended Exam: Mental Status, HEENT, Skin, Neck, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care.**
- Do not force a child into a position. They will protect their airway by their body position.
- The 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 viral, possible fever, gradual onset, no drooling is noted.
- Epiglottitis typically affects children > 2 years of age. It is bacterial, with fever, rapid onset, possible stridor, patient wants to sit up to keep airway open, drooling is common. Airway manipulation may worsen the condition.
- Avoid direct laryngoscopy unless intubation is imminent.

Pediatric Seizure

History
- Fever
- Prior history of seizures
- Seizure medications
- Reported seizure activity
- History of recent head trauma
- Congenital abnormality
- Consider pregnancy in teenage female

Signs and Symptoms
- Observed seizure activity
- Altered mental status
- Hot, dry skin or elevated body temperature

Differential
- Fever
- Infection
- Head trauma
- Medication or Toxin
- Hypoxia or Respiratory failure
- Hypoglycemia
- Metabolic abnormality / acidosis
- Tumor



PEDIATRIC MEDICAL

Pediatric Seizure

Pearls

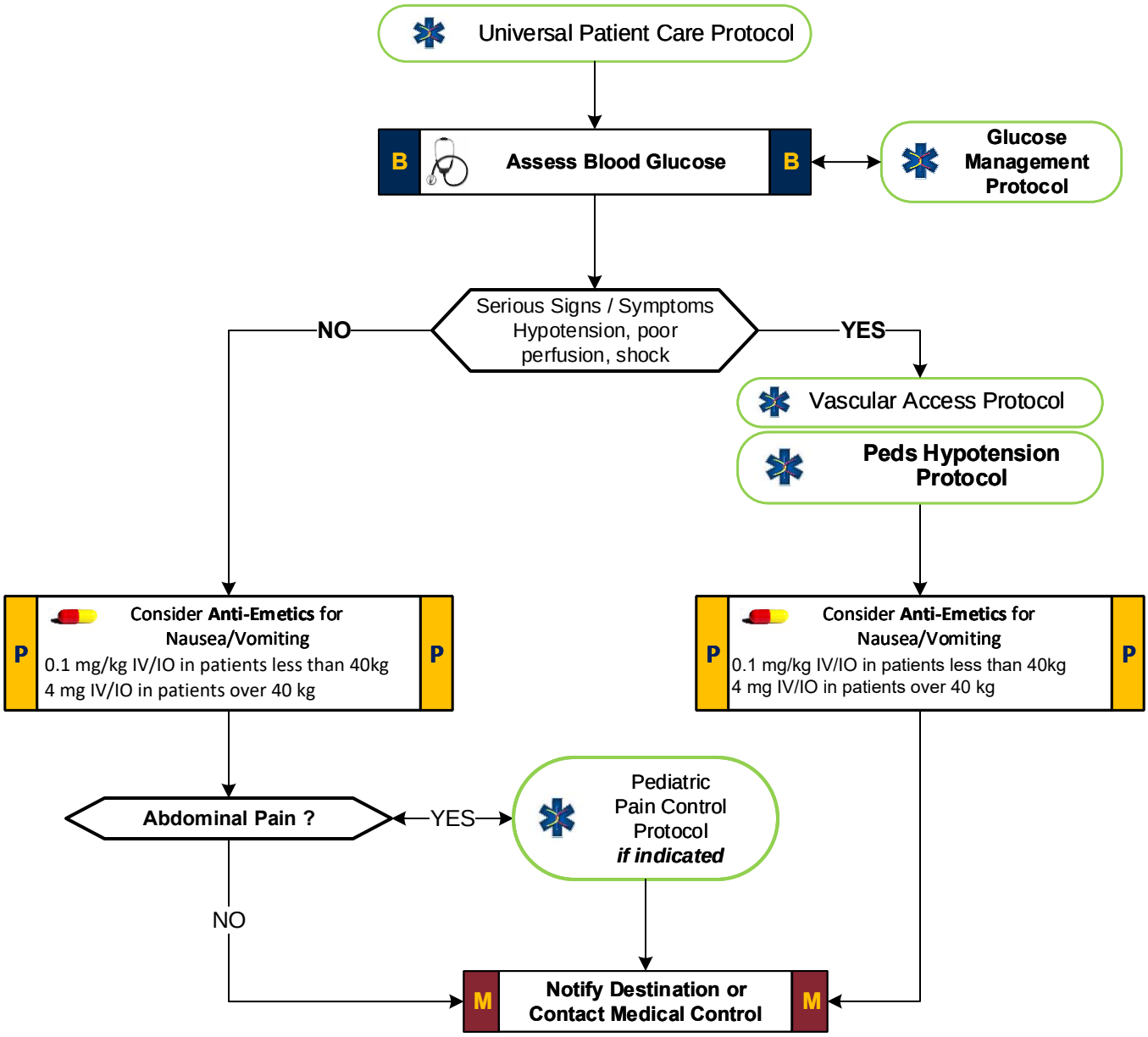
- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care**
- **Addressing the ABCs and verifying blood glucose is more important than stopping the seizure**
- **Avoiding hypoxemia is extremely important**
- **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.
- **Grand mal seizures (generalized)** are associated with loss of consciousness, incontinence, and tongue trauma.
- **Focal seizures (petit mal)** effect only a part of the body and do not usually result in a loss of consciousness.
- **Jacksonian seizures** are seizures which start as a focal seizure and become generalized.
- Be prepared to assist ventilations especially if a benzodiazepine is used.
- If evidence or suspicion of trauma, spine should be immobilized.
- In an infant, a seizure may be the only evidence of a closed head injury.
- **Rectal Diazepam/Lorazepam:** Draw drug dose up in a 3 ml syringe. Remove needle from syringe and attached syringe to an IV extension tube. Cut off the distal end of the extension tube leaving about 3 or 4 inches of length. Insert tube in rectum and inject drug. Flush extension tube with 3 ml of air and remove.
- * D10 used in Newborn/Infant and D25 used in Pediatric

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 MEDICAL

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, 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 vomiting only in children. Pyloric stenosis, bowel obstruction, and CNS processes (bleeding, tumors, or increased CSF pressures) all often present with vomiting.

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, epiglotitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxin or medication
- Hypoglycemia
- Acidosis

Pediatric Pulseless Arrest Protocol

Criteria for Death / No Resuscitation Review DNR / POST Form

YES → Do not begin Resuscitation

Follow Deceased Subjects Policy

NO

R Begin Continuous CPR Compressions **R**
Push Hard / Push Fast
Change Compressors every 2 minutes
(*Limit changes / pulses checks ≤ 10 seconds*)

Airway Protocol

Hypotension Protocol

Search for Reversible Causes
Utilize Appropriate Protocol

AT ANY TIME
Return of Spontaneous Circulation
Go to Post Resuscitation Protocol

AT ANY TIME
If rhythm changes:
Go to Appropriate Protocol

Glucose Management Protocol ↔ **B** Blood Glucose Analysis **B**

P **Epinephrine1:10,000** **P**
0.01 mg/kg IV/IO (max 1mg)
Repeat every 3 – 5 minutes

P Consider Chest Needle DecompressionProcedure **P**

P **Consider External Pacing** **P**

M **Notify Destination or Contact Medical Control** **M**

REVERSIBLE CAUSES:

Hypovolemia
Hypotension Protocol – Fluid Bolus

Hypoxia
Airway Protocol – Obstruction? Increase ventilation, Supplemental Oxygen

Hydrogen ion (acidosis)
Increase ventilation, Bicarbonate

Hypothermia
Hypothermia Protocol, Rewarming

Hyperkalemia
Dialysis / Renal Failure Protocol – Calcium, Bicarbonate, Albuterol

Hypoglycemia
Hypoglycemia Protocol – Dextrose, Glucagon

Tension pneumothorax
Chest Decompression

Tamponade; cardiac
Rapid Transport – Early Notification

Toxins
OD / Toxic Ingestion Protocol;
Specific Antidote

Thrombosis; pulmonary (PE)
Fluid Bolus.
Rapid Transport – Early Notification

Thrombosis; coronary (MI)
Rapid Transport – Early Notification

PEDIATRIC CARDIAC

Pediatric Asystole / PEA

Pearls

- 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.

Pediatric Bradycardia

History
- Past medical history
- Foreign body exposure/swallowed
- 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, epiglotitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxin or medication
- Hypoglycemia
- Acidosis

AT ANY TIME
Pulseless
Go To Pediatric Cardiac Arrest Protocol

Universal Patient Care Protocol

Pediatric Airway Protocol

B — Cardiac Monitor / 12 Lead ECG Acquisition — B

P — Cardiac Monitor / 12 Lead ECG **Interpretation** — P

Poor Perfusion / Decreased Blood Pressure
Respiratory Insufficiency

NO → **Monitor & Reassess**

YES

Vascular Access Protocol

Hypotension Protocol

R — Heart Rate < 60 in Infant **CPR** — R

P — **Epinephrine 1:10,000** 0.01mg/kg IV/IO (equals 0.1 ml/kg) — P

P — **Atropine** 0.02 mg/kg IV/IO, may repeat x 1 after 5 min Minimum dose is 0.1mg — P

Consider Reversible Causes

REVERSIBLE CAUSES:

Hypovolemia
Hypotension Protocol – Fluid Bolus

Hypoxia
Airway Protocol – Obstruction? Increase ventilation, Supplemental Oxygen

Hydrogen ion (acidosis)
Increase ventilation, Bicarbonate

Hypothermia
Hypothermia Protocol, Rewarming

Hyperkalemia
Dialysis / Renal Failure Protocol – Calcium, Bicarbonate, Albuterol

Hypoglycemia
Hypoglycemia Protocol – Dextrose, Glucagon

Tension pneumothorax
Chest Decompression

Tamponade; cardiac
Rapid Transport – Early Notification

Toxins
OD / Toxic Ingestion Protocol;
Specific Antidote

Thrombosis; pulmonary (PE)
Fluid Bolus.
Rapid Transport – Early Notification

Thrombosis; coronary (MI)
Rapid Transport – Early Notification

P — **Consider Pressor Agents** Contact Medical Control — P

P — **Consider External Pacing** — P

Monitor & Reassess

M — **Notify Destination or Contact Medical Control** — M

PEDIATRIC CARDIAC

Pediatric Bradycardia

Pearls

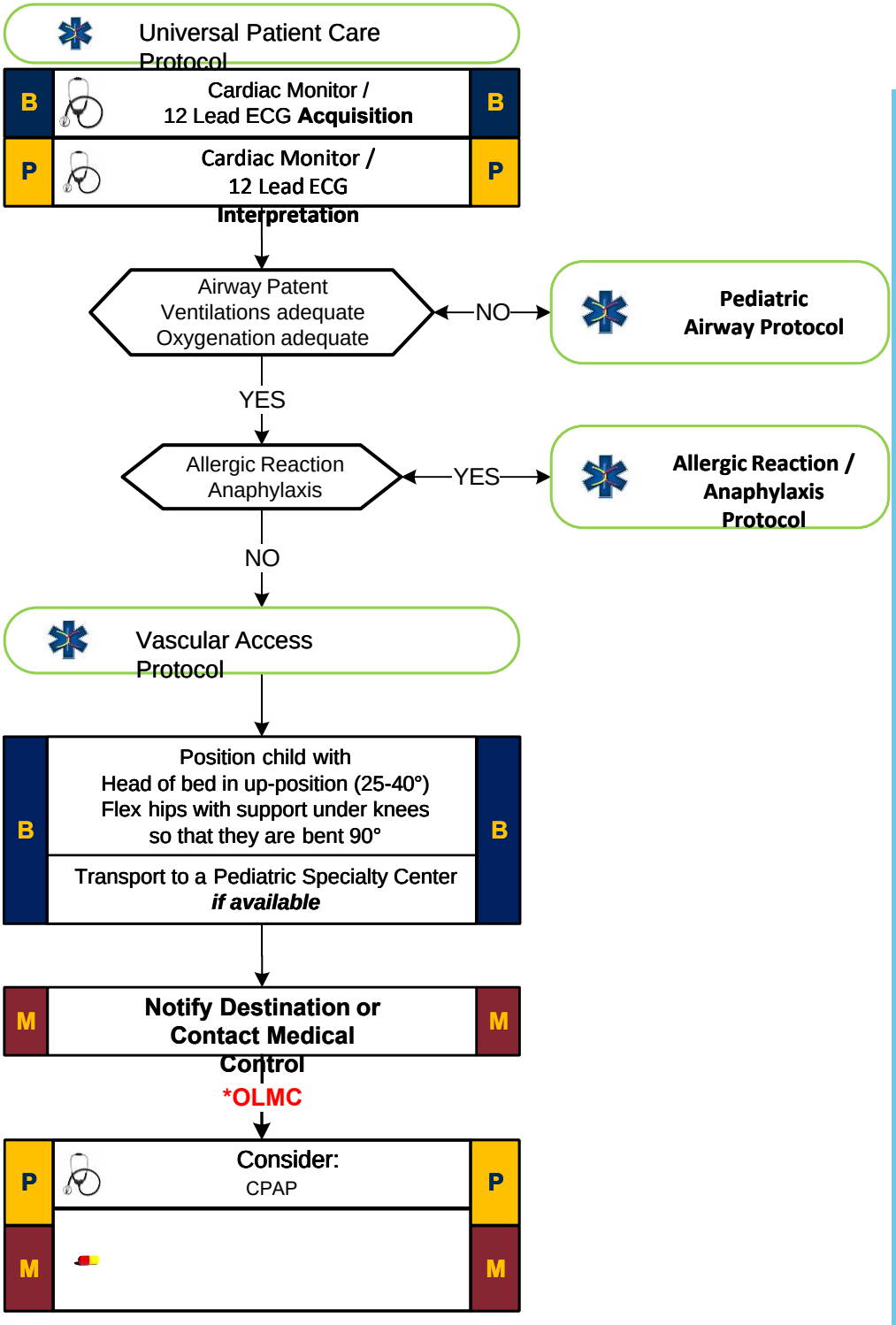
- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Age/Weight/Length based system to accurately calculate drug dosages and equipment**
- Infant = < 1 year of age
- The majority of pediatric arrests are due to airway problems.
- Most maternal medications pass through breast milk to the infant.
- Hypoglycemia, severe dehydration and narcotic effects may produce bradycardia.
- Pediatric patients requiring external transcutaneous pacing require the use of pads appropriate for pediatric patients per the manufacturers guidelines.
- Minimum Atropine dose is 0.1 mg IV.

Pediatric Pulmonary Edema / CHF

History
- Congenital Heart Disease
- Chronic Lung Disease
- Congestive heart failure
- Past medical history

Signs/Symptoms
- Infant: Respiratory distress, poor feeding, lethargy, weight gain, +/- cyanosis
- Child/Adolescent: Respiratory distress, bilateral rales, apprehension, orthopnea, jugular vein distention (rare), pink, frothy sputum, peripheral edema, diaphoresis, chest pain
- Hypotension, shock

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



PEDIATRIC CARDIAC

Pediatric Pulmonary Edema / CHF

Pearls

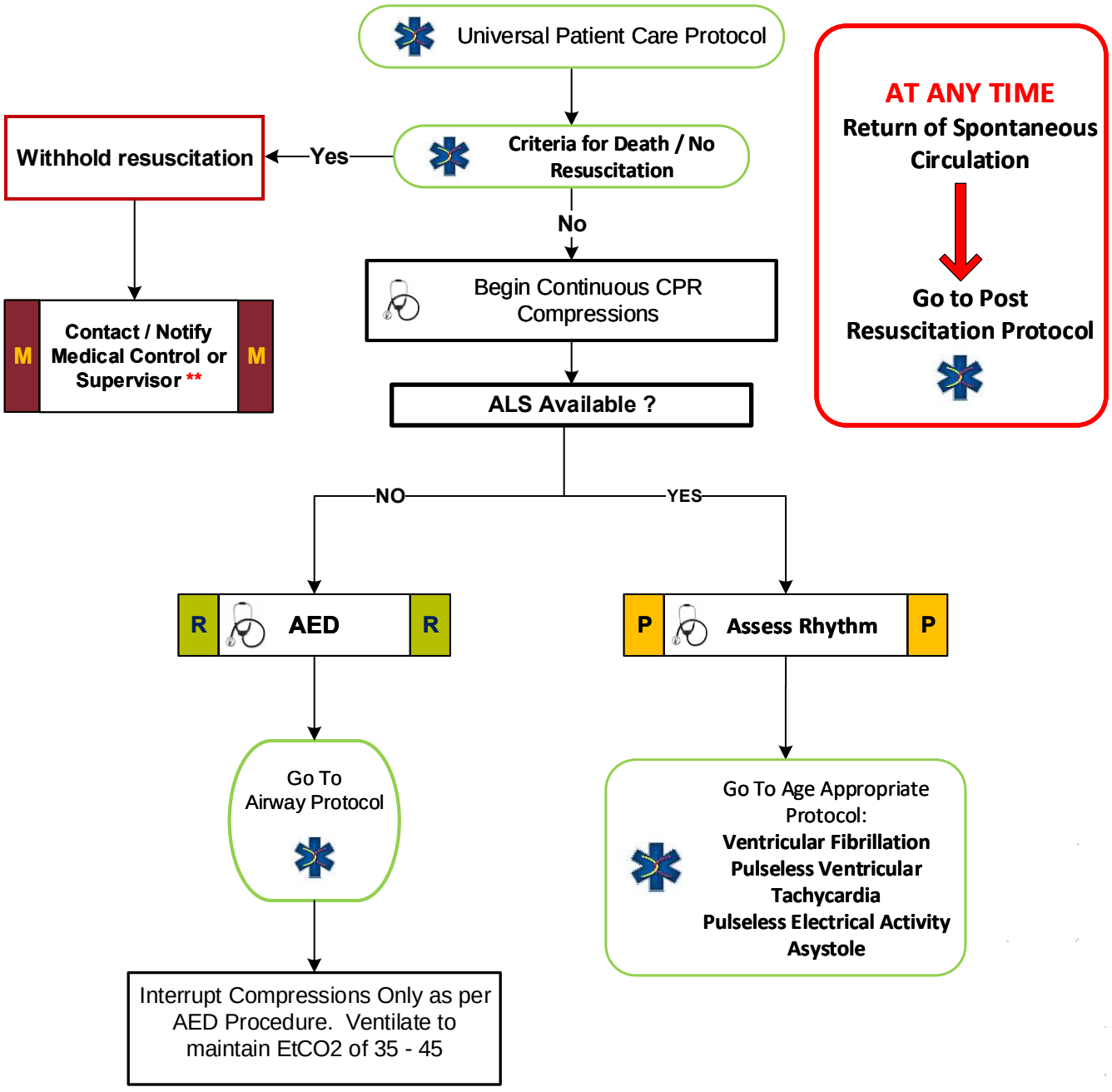
- **Recommended exam: Mental status, Respiratory, Cardiac, Skin, Neuro**
- **Contact Medical Control early in the care of the pediatric cardiac patient.**
- **Most children with CHF have a congenital heart defect, obtain a precise past medical history.**
- **Congenital heart disease varies by age:**
  - < 1 month: Tetralogy of Fallot, Transposition of the great arteries, Coarctation of the aorta.
  - 2 – 6 months: Ventricular septal defects (VSD), Atrioseptal defects (ASD).
  - Any age: Myocarditis, Pericarditis, SVT, heart blocks.
- **Treatment of Congestive Heart Failure / Pulmonary edema may vary depending on the underlying cause and should include consultation with Control:**
- Do not assume all wheezing is pulmonary, especially in a cardiac child: avoid albuterol unless strong history of recurrent wheezing secondary to pulmonary etiology (discuss with Medical Control)

Pediatric Cardiac 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, epiglotitis)
- **Hypovolemia (dehydration)**
- **Congenital heart disease**
- **Trauma**
- **Tension pneumothorax, cardiac tamponade, pulmonary embolism**
- **Hypothermia**
- **Toxin or medication**
- **Electrolyte abnormalities (Glucose, K)**
- **Acidosis**



Pediatric Cardiac Arrest

Pearls

- **Recommended Exam: Mental Status, Heart, Lungs**
- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- Airway is the most important intervention. This should be accomplished immediately. Patient survival is often dependent on airway management success.
- ****Contact Supervisor Based on Local Policy and Written Protocol to Withhold Resuscitation.**

Pediatric Tachycardias
(With A Pulse)

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

Universal Patient Care Protocol

B Cardiac Monitor / 12 Lead ECG **Acquisition** B

P Cardiac Monitor / 12 Lead ECG **Interpretation** P

Vascular Access Protocol

Unstable / Serious Signs & Symptoms

YES → P Cardioversion Procedure P

P Consider **Pre-Shock Benzodiazepines** P

NO

QRS > 0.08 secs ?

YES

NO

HR < 220 Infant
HR < 180 Child
P wave Present
HR Variable

YES → **Probable Sinus Tachycardia** → Identify & Treat Underlying Cause → Exit to Appropriate Protocol

NO → **Probable SVT**

P Vagal Maneuvers P

P Consider **Adenosine** 0.1 mg/kg up to 6 mg. May be repeated at 0.2 mg/kg up to 12 mg. P

P Consider **Antiarrhythmics** Amiodarone 5mg/kg IV/IO over 20 mins. max 300mg Lidocaine 1 mg/kg IV/IO P

P Consider **Adenosine*** **[Regular Monomorphic Rhythm Only]** P

Do NOT give Adenosine for wide complex tacycardias

P Consider **Antiarrhythmics** Amiodarone 5mg/kg IV/IO over 20 mins. max 300 mg Lidocaine 1 mg/kg IV/IO P

B **Rhythm Converts** 12 Lead ECG Acquisition B

M **Notify Destination or Contact Medical Control** M

AT ANY TIME
Pulseless
Go To Pediatric Cardiac Arrest Protocol

Single lead ECG able to diagnose and treat arrhythmia
12 Lead ECG not necessary to diagnose and treat, but preferred when patient stable

PEDIATRIC CARDIAC

Pediatric Tachycardias
(With A Pulse)

Pearls

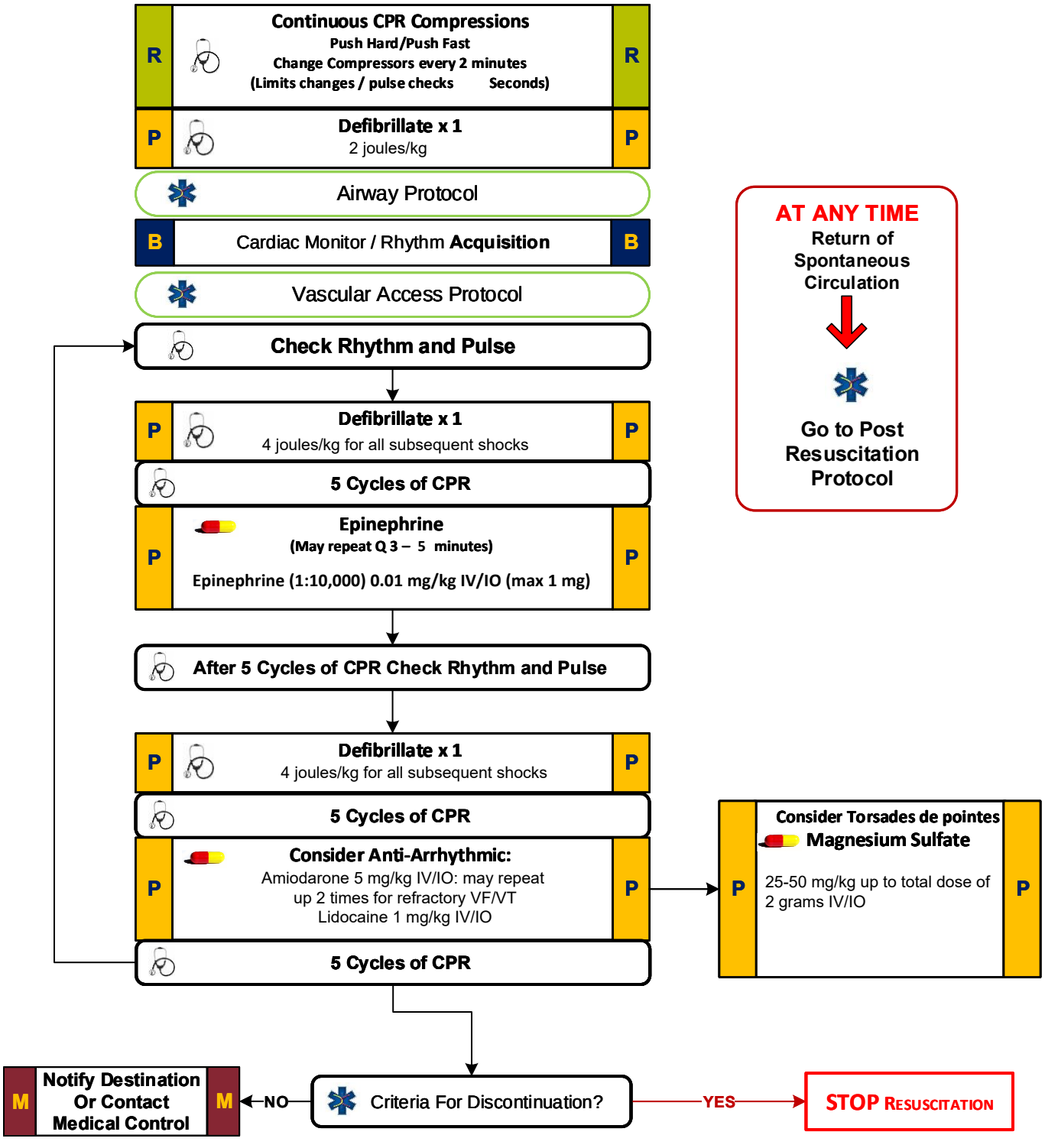
- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Serious Signs and Symptoms:**
  - **Respiratory distress / failure.**
  - **Signs of shock / poor perfusion with or without hypotension.**
  - **AMS**
  - **Sudden collapse with rapid, weak pulse**
- **Narrow Complex Tachycardia (≤ 0.08 seconds):**
  - 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 (≤0.08 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 (> 0.08 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 paddles should be used in children < 10 kg or Broselow-Luten color Purple if available.
- Monitor for respiratory depression and hypotension associated if Benzodiazepines are used.
- 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.
- * Adenosine should NOT be given for unstable or for irregular or for polymorphic wide-complex tachycardias as it may cause degeneration of the arrhythmia to Ventricular Fibrillation.

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 CARDIAC

Pediatric Ventricular Fibrillation
Pulseless Ventricular Tachycardia

Pearls

- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Compress ≥ 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: If no advanced airway (BIAD, 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 BIAD first to limit interruptions.**
- 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.
- Reassess and document endotracheal tube 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 Rhythm Appropriate Protocol

Hypotension Age Based

0–30 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

B Cardiac Monitor / 12 Lead ECG Acquisition B

P Cardiac Monitor / 12 Lead ECG **Interpretation** P

R Repeat Primary Assessment R

B Optimize Ventilation and Oxygenation Maintain SpO2 94 B

Pediatric Airway Protocol

B Remove Impedence Threshold Device
EtCO2: 35 – mmHg
DO NOT HYPERVENTILATE
Monitor Vital Signs / Reassess B

Vascular Access Protocol

Hypotension Age based ? — YES → **Hypotension Protocol**

B Blood Glucose Assessment B ↔ **Pediatric Glucose Management Protocol**

Symptomatic Bradycardia ? — YES → **Pediatric Bradycardia Protocol**

NO

Symptomatic Tachycardia ? — YES → **Pediatric Tachycardia Protocol**

NO

Antiarrhythmic utilized for ROSC

YES → P Continue **Antiarrhythmic** Utilized P

P **Consider Sedation / Paralysis** P

NO

M **Notify Destination or Contact Medical Control** M

PEDIATRIC CARDIAC

Pediatric Post Resuscitation

If ROSC is achieved, do not sedate or paralyze.

Pearls

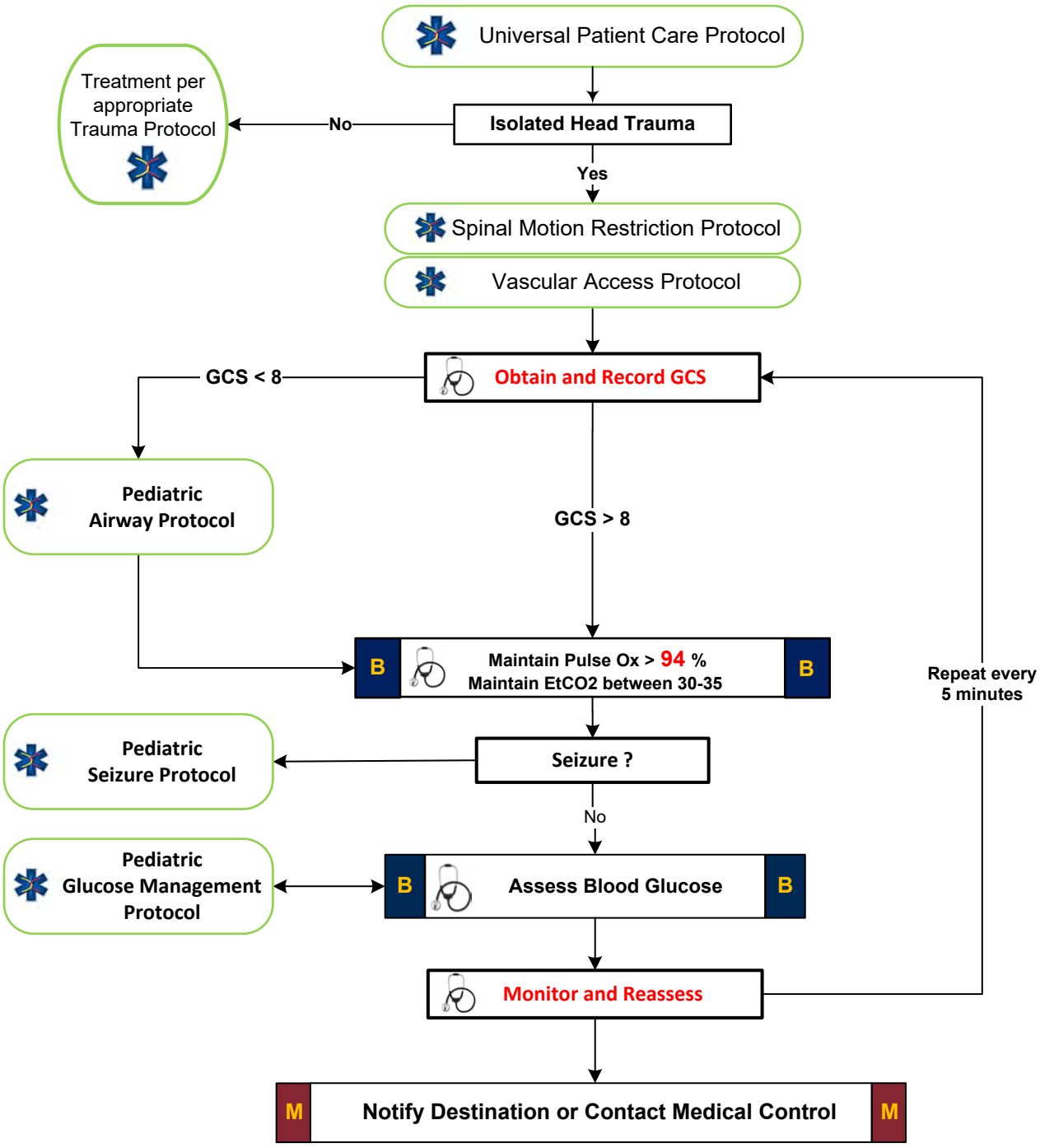
- **Recommended Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro**
- Hyperventilation is a significant cause of hypotension / recurrence of cardiac arrest in post resuscitation phase and must be avoided.
- **Consider use of Impedance Threshold Device once Advanced Airway is Placed.**
- **REMOVE Impedance Threshold Device once ROSC obtained**
- Appropriate post-resuscitation management may best be planned in consultation with medical control.

Pediatric Head Trauma

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

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

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



Pediatric Head Trauma

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.
- The most important item to monitor and document is a change in the level of consciousness.
- Concussions are periods of confusion or LOC associated with trauma which may have resolved by the time EMS arrives. 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.

Pediatric Multiple Trauma

History
- Time and mechanism of injury
- Height of any fall
- Damage to structure or vehicle
- Location in structure or vehicle
- Others injured or dead
- Speed and details of MVC
- Restraints / Protective equipment
  Car Seat / Helmet / PadsEjection
- Past medical history
- Medications

Signs and Symptoms
- Pain, swelling
- Deformity, lesions, bleeding
- Altered mental status
- Unconscious
- Hypotension or shock
- Cardiac/Respiratory 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

Universal Patient Care Protocol

Assessment of Serious Signs / Symptoms
ABC and LOC

Spinal Motion Restriction Protocol

Pediatric Airway Protocol

Vascular Access Protocol

R — VS / Perfusion / GCS — R

ABNORMAL

Rapid Transport to appropriate destination using
EMS System Trauma Plan
Limit Scene Time to 10 minutes
Provide Early Notification

B — Cardiac Monitor / 12 Lead EKG **Acquisition** — B

P — Cardiac Monitor / EKG **Interpretation** — P

Hypotension Protocol

R — Splint Suspected Fractures
Consider Pelvic Binding
Hemorrhage Control Procedure — R

P — Consider **Chest Decompression**
Needle Procedure if indicated — P

Pediatric Head Injury Protocol if indicated

R — **Monitor and Reassess** — R

NORMAL

Repeat Assessment

R — Splint Suspected Fractures
Consider Pelvic Binding
Hemorrhage Control Procedure — R

Transport to appropriate destination using
EMS System Trauma Plan

R — **Monitor and Reassess** — R

Pediatric Pain Protocol

M — **Notify Destination or Contact Medical Control** — M

PEDIATRIC TRAUMA

Pediatric Multiple Trauma

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro**
- **Items in Red Text are key performance measures used in the EMS Acute Trauma Care Toolkit**
- **Transport Destination is chosen based on the EMS System Trauma Plan with EMS pre-arrival notification.**
- Mechanism is the most reliable indicator of serious injury. Examine all restraints / protective equipment for damage.
- In prolonged extrications or serious trauma consider air transportation for extended transport times.
- Do not overlook the possibility for child abuse.
- Scene times should not be delayed for procedures. These should be performed en route when possible.
- Bag valve mask is an acceptable method of managing the airway if pulse oximetry can be maintained above 90%.

Pediatric Trauma Triage & Transport

Assessment for Serious Signs / Symptoms / Mechanism

This protocol applies to patients a prudent provider should consider as having a mechanism/event consistent with significant/major trauma and is not meant to be inclusive of all minor injuries

Patient < 16 years old

- YES → 1
- NO → Follow Adult Trauma Triage and Transport Guidelines !

1

- Inability to manage or secure airway/oxygenation/ventilation
- Unmanageable signs/symptoms of shock
- Uncontrolled bleeding

YES → **Transport to the closest Trauma Center or closest Emergency Department as identified by Service Medical Director**

NO → **2**

- Pediatric Glasgow Coma Scale PGCS ≤ 13
- Decreased Level of Responsiveness (See AVPU Scale)
- Penetrating trauma to head, neck, torso, or extremities proximal to knee or elbow
- Proximal Long bone fractures - crushed, mangled, or degloved extremity - Amputation proximal to the wrist or ankle - Pelvic fractures
- Open or depressed skull fractures
- Indications of significant closed head injury
- Paralysis
- Ejection of patient
- Indications of significant Chest or Abdominal Trauma
- Auto vs. Pedestrian >20 mph

YES → Designated Pediatric Trauma Center * if within **60** minutes by ground

- YES → **Transport to DESIGNATED PEDIATRIC TRAUMA CENTER ***
- NO → Transport to Closest Trauma Center

NO → **3**

- Fall > 10 feet or 2-3 times the height of a child
- MVA with Intrusion >12 inches roof; > 18 inches passenger compartment (as outlined in 2011 CDC guideline)
- Ejection from the vehicle (other occupant)
- Death in same vehicle
- Mechanism consistent with high risk of injury
- Inadequately restrained
- Another occupant of the same vehicle is transported to a high level trauma center
- Auto vs. Pedestrian <20 mph
- Motorcycle or motorized recreational vehicle

YES → Designated Pediatric Trauma Center * if within **30** minutes by ground

- YES → **Transport to DESIGNATED PEDIATRIC TRAUMA CENTER ***
- NO → Transport to Closest Trauma Center

NO → **4**

SPECIAL CIRCUMSTANCES
Burns
Pregnancy > 20 Weeks

- Without other trauma mechanism: triage to appropriate facility
- With trauma mechanism: triage to trauma center

NO → ***Any Injury not mentioned above shall be triaged and transported based on the EMS provider judgement – preferably with online medical direction – and according to local Protocols***

* Designated Pediatric Trauma Center is defined as those with ACS Designated Pediatric Trauma Center Status – or as identified by DHEC as Adult Trauma Center that includes Pediatrics

PEDIATRIC TRAUMA

PEDIATRIC GLASGOW COMA SCALE (PGCS)				
	>1 year		< 1 year	SCORE
EYE OPENING	Spontaneously		Spontaneously	4
	To Verbal Command		To Shout	3
	To Pain		To Pain	2
	No Response		No Response	1
MOTOR RESPONSE	Obeys		Spontaneous	6
	Localizes Pain		Localizes Pain	5
	Flexion-Withdrawal		Flexion-Withdrawal	4
	Flexion-Abnormal (Decorticate rigidity)		Flexion-Abnormal (Decorticate rigidity)	3
	Extension (Decerebrate rigidity)		Extension (Decerebrate rigidity)	2
	No Response		No Response	1
	>5 Years	2 – 5 Years	0 – 23 months	
VERBAL RESPONSE	Oriented	Appropriate words/phrases	Smiles/coos appropriately	5
	Disoriented/confused	Inappropriate words	Cries and is consolable	4
	Inappropriate words	Persistent cries and screams	Persistent inappropriate crying and/or screaming	3
	Incomprehensible sounds	Grunts	Grunts, agitated, and restless	2
	No Response	No Response	No response	1
			TOTAL PEDIATRIC GLASGOW COMA SCORE (3-15):	

Age	Heart Rate	Respiratory Rate	Systolic BP mm/Hg
Infant – 1 year	<100 or > 180	<30 or > 60	< 70
Toddler (1-2 yrs)	<80 or >150	<20 or > 40	<75
Preschooler (3-5 yrs)	<75 or >110	<20 or >34	<80
School Age (6-9 yrs)	<70 or >100	<16 or >25	<85
Adolescent (10-17 yrs)	<60 or >100	<12 or >20	<90

AVPU Scale	
A	Patient **A**lert
V	Patient responds to **V**oice
P	Patient responds to **P**ain
U	Patient **U**nresponsive

Pediatric Trauma Triage & Transport

PEDIATRIC TRAUMA

***** WHEN IN DOUBT – TRANSPORT TO PEDIATRIC TRAUMA CENTER.**
*** * * DO NOT HESITATE TO CONTACT MEDICAL CONTROL FOR QUESTIONS OR ADVICE !**

*** DESIGNATED PEDIATRIC TRAUMA CENTERS (SC)**

- Grand Strand Medical Center [F00004780]
- PRISMA Health Greenville Memorial [F00004703]
- McLeod Regional Medical Center – Florence [F00045381]
- MUSC Children's Health [F00004807]
- PRISMA Health Richland [F00004741]

*** DESIGNATED PEDIATRIC TRAUMA CENTERS (Out of State)**

- CMC Charlotte (NC)
- Augusta UMC / Children's Hospital of Georgia (GA)
- Savannah Children's (GA)

Pearls

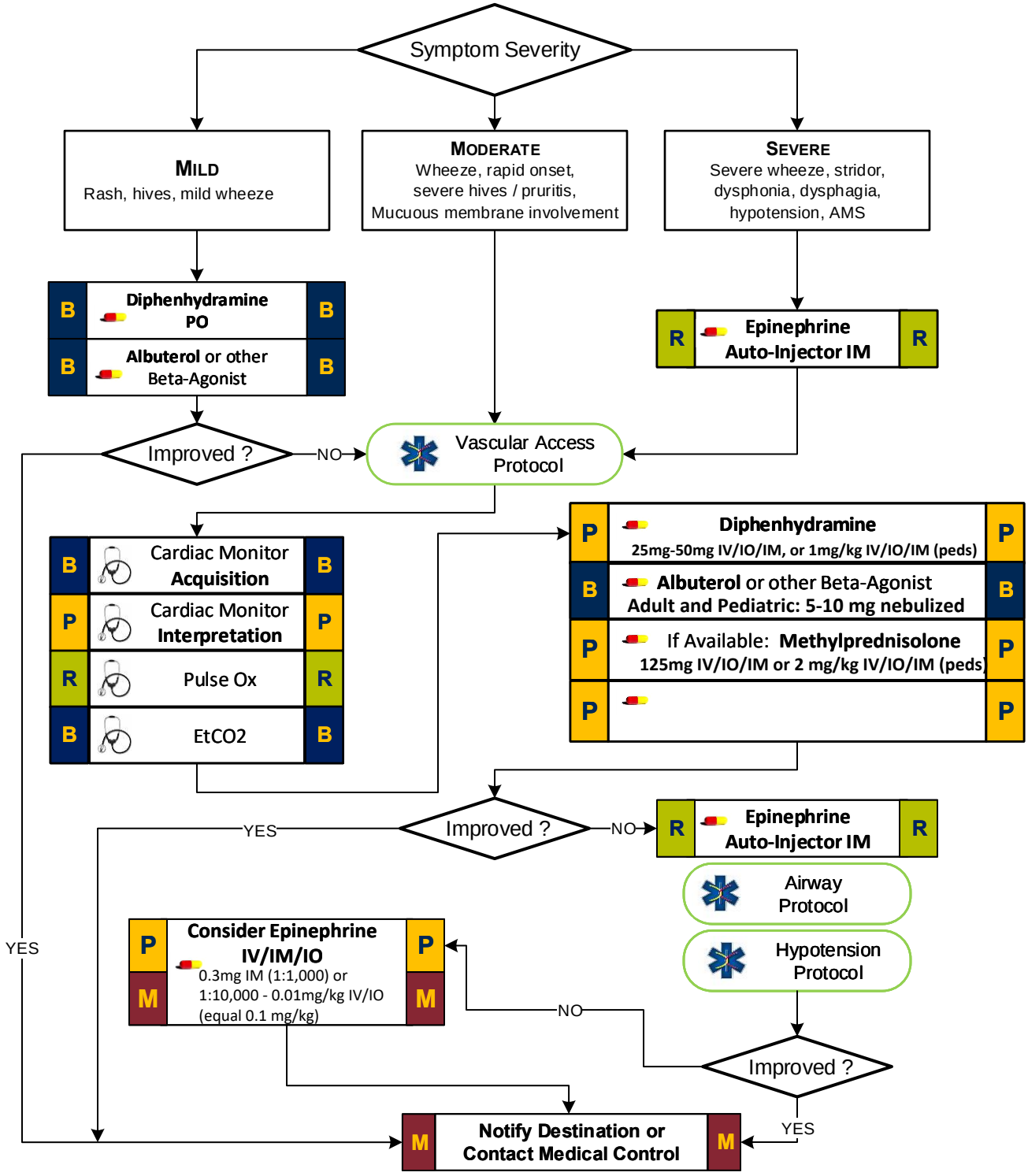
- **Items in Red Text (below) are key performance measures used in the EMS Acute Trauma Care Toolkit**
- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro**
- **Transport Destination is chosen based on the EMS System Trauma Plan with EMS pre-arrival notification.**
- Examine all restraints / protective equipment for damage.
- In prolonged extrications or serious trauma consider air transportation for extended transport times.
- Do not overlook the possibility for child abuse.
- Scene times should not be delayed for procedures. These should be performed en route when possible.
- Bag valve mask is an acceptable method of managing the airway if pulse oximetry can be maintained above 90%.

Anaphylaxis / Allergic Reaction

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

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



OVERLAP

Anaphylaxis / Allergic Reaction

*** Anaphylaxis Epinephrine Kit should include the following recommended items:**

1 – Tuberculin Syringe – 1 mL
2 – 20-22 gauge 1" – 1 ½" needles
2 – Alcohol Prep Pads
1 - Epinephrine Ampule or Vial 1:1,000 = 1 mg/1 mL

***The Pediatric dosage should match the dose of a Pediatric Epinephrine Auto-Injector (0.15 mg).**

***The Adult dosage should match the dose of an Adult Epinephrine Auto-Injector (0.3 mg).**

*** If Patient has respiratory involvement, consider Albuterol per local Medical Control Option**

*** See Anaphylaxis Emergency Kit Procedures for further details for EMTs and AEMTs**

OVERLAP

AEMTs and Paramedics can use above to administer the following dose:

Adult: 0.3 mg IM, may repeat once as indicated.
Pediatric: 0.15 mg IM, may repeat once as indicated.

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 (Severe Symptoms.) IM Epinephrine should be administered in priority before or during attempts at IV or IO access.**
- **Anaphylaxis unresponsive to repeat doses of IM epinephrine may require IV epinephrine administration by IV push or epinephrine infusion. Contact Medical Control for appropriate dosing.**
- **Symptom Severity Classification:**
  - **Mild symptoms:**
    Flushing, hives, itching, erythema with normal blood pressure and perfusion.
  - **Moderate symptoms:**
    Flushing, hives, itching, erythema plus symptomatic respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with normal blood pressure and perfusion.
  - **Severe symptoms:**
    Flushing, hives, itching, erythema plus symptomatic 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 blood pressure medications like Prinivil / Zestril (lisinopril)-typically end in -il.**
- **Fluids and Medication titrated to maintain a SBP >70 + (age in years x 2) mmHg.**
- **MR / EMT-B may administer Epinephrine IM and may administer from EMS supply.** Agency Medical Director may require contact of medical control prior to MR / EMT-B administering any medication.
- **EMT-B may administer diphenhydramine by oral route only and may administer from EMS supply**. Agency Medical Director may require contact of medical control prior to EMT-B / MR administering any medication.
- **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 symptoms to contact, the more severe the reaction.
- Contact Medical Control prior to administering epinephrine in patients who are >50 years of age, have a history of cardiac disease, or if the patient's heart rate is >150. Epinephrine may precipitate cardiac ischemia. These patients should receive a 12 lead ECG.

Chemical and Electrical Burns

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

Assure Chemical Source is NOT Hazardous to Responders.
Assure Electrical Source is NO longer in contact with patient before touching patient.

Initial Actions AFTER determining SCENE SAFE is to STOP THE BURN !

Universal Patient Care Protocol

Assess Burn Type
Concomitant Injury Severity

CHEMICAL BURN

R Brush off any DRY Chemical R

R Irrigate copiously for **AT LEAST** 15 minutes R

Consider Airway Protocol

ELECTRICAL BURN

R Remove metal objects R

Consider Spinal Motion Restriction Protocol

Consider Trauma Protocol

B Cardiac Monitor / 12 Lead ECG Acquisition B

P Cardiac Monitor / 12 Lead ECG **Interpretation** P

R Identify Contact Points R

Consider Vascular Access Protocol

Consider Pain Control Protocol

R Cover burns with Dry Sterile Dressings R

M **Notify Destination or Contact Medical Control** M

When Trauma coexists in the Burn Patient – initial transport to a verified Trauma Center based on the Trauma Triage and Bypass Protocol is warranted.

Age Appropriate **Cardiac Arrest / Pulseless Arrest / Arrhythmia Protocol(s)** *as indicated*

OVERLAP

Chemical and Electrical Burns

Critical (Red)

>15% TBSA 2nd/3rd Degree Burn
Burns with Multiple Trauma
Burns with definite airway compromise
(When reasonable or reasonably accessible, transport to a Burn Center or Trauma Center)

Serious (Yellow)

5-15% TBSA 2nd/3rd Degree Burn
Suspected Inhalation injury or requiring intubation for airway stabilization
Hypotension or GCS < 14
(When reasonable or reasonably accessible, transport to a Burn Center or Trauma Center)

Minor (Green)

< 5% TBSA 2nd/3rd Degree Burn
No inhalation injury, Not Intubated,
Normotensive
GCS>14
(Transport to the Local Hospital)

OVERLAP

Pearls

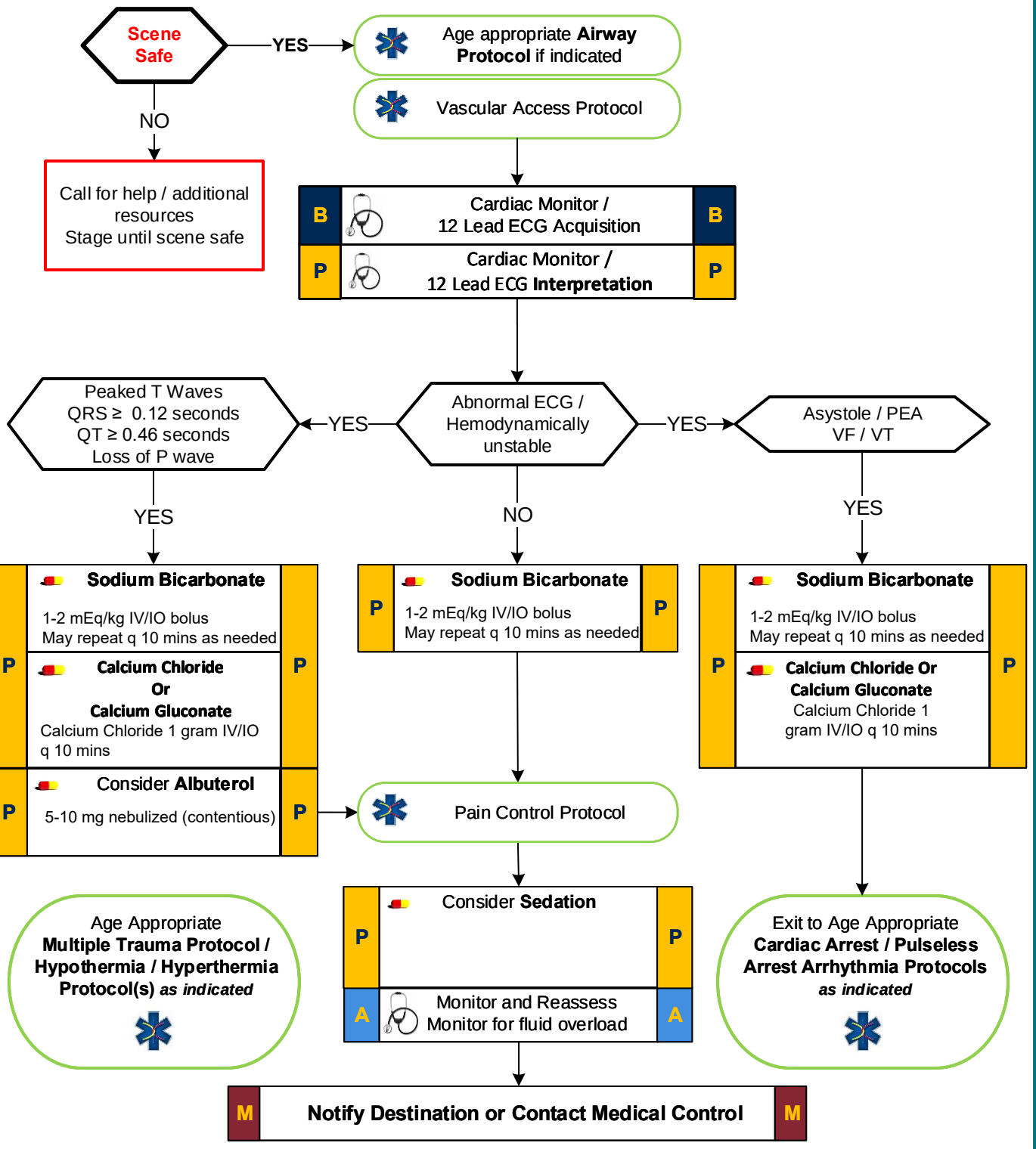
- **Recommended Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, and Neuro**
- **Green, Yellow and Red In burn severity do not apply to the Start / JumpStart Triage System.**
- **Refer to Rule of Nines: Remember the extent of the obvious external burn from an electrical source, does not always reflect more extensive internal damage not seen.**
- **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.
- **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 then 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.

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

Do not administer Sodium Bicarb and Calcium simultaneously. You should flush the line with at least 50 mL (cc) of saline between doses or use two separate IV sites.

OVERLAP

Pearls

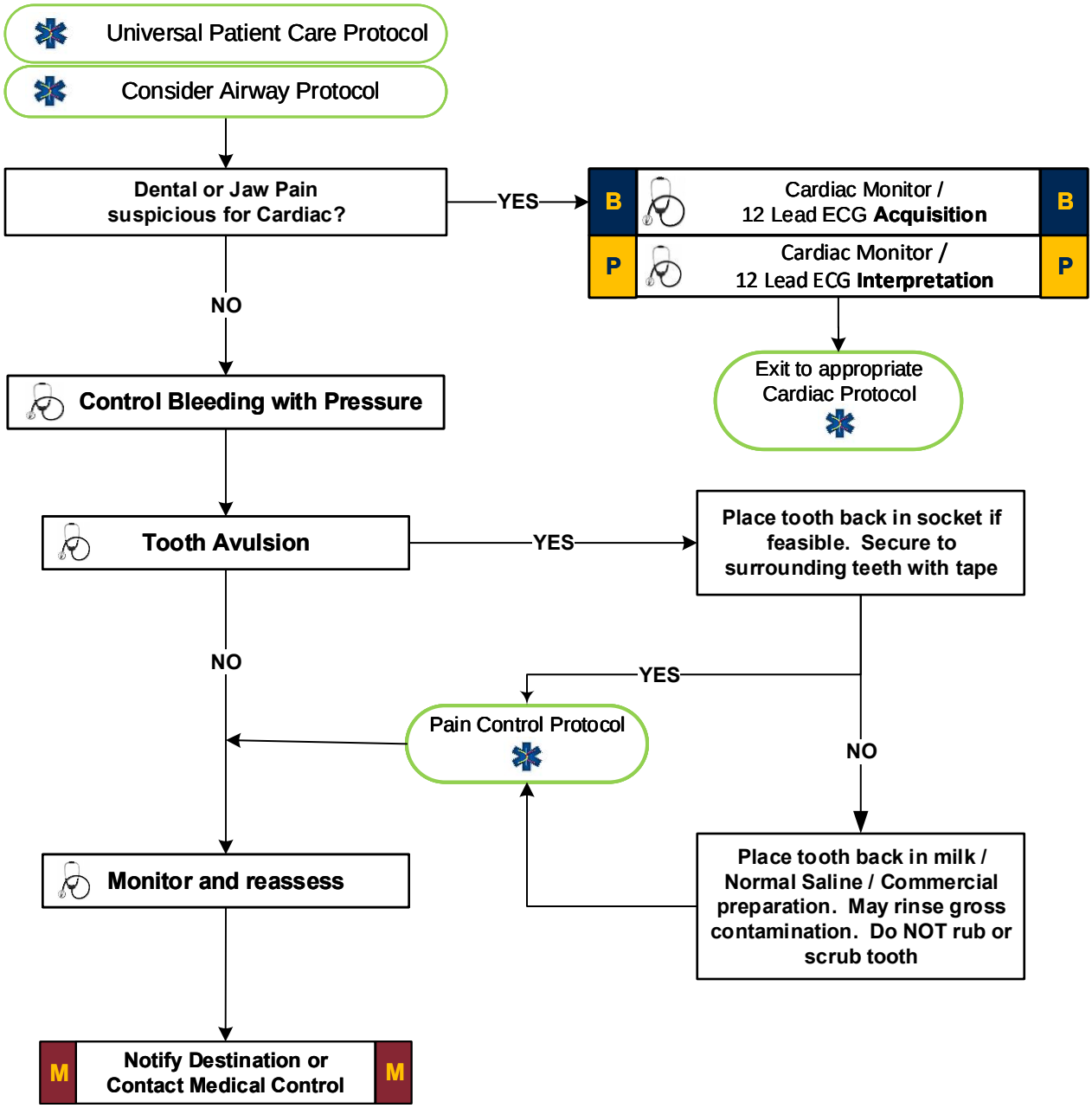
- **Recommended exam: Mental Status, Musculoskeletal, Neuro**
- **Scene safety is of paramount importance as typical scenes pose hazards to rescuers. Call for appropriate resources.**
- Avoid Ringers Lactate IV Solution due to potassium and potential worsening hyperkalemia
- Hyperkalemia from crush syndrome can produce ECG changes described in protocol, but may also be a bizarre, wide complex rhythm. Wide complex rhythms should also be treated using the Ventricular Tachycardia with a Pulse 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.
- If the Crush Injury is isolated to an extremity/extremities – application of a proximal tourniquet prior to release of the compression may be considered based upon Local Protocol

Dental Problems

History
- Age
- Past medical history
- Medications
- Onset of pain / injury
- Trauma with "knocked out" tooth
- Location of tooth
- Whole vs. partial tooth injury

Signs and Symptoms
- Bleeding
- Pain
- Fever
- Swelling
- Tooth missing or fractured

Differential
- **Decay**
- **Infection**
- **Fracture**
- **Avulsion**
- **Abscess**
- **Facial cellulitis**
- **Impacted tooth (wisdom)**
- **TMJ syndrome**
- **Myocardial infarction**



OVERLAP

Dental Problems

OVERLAP

Pearls

- **Recommended Exam: Mental Status, HEENT, Neck, Chest, Lungs, Neuro**
- Significant soft tissue swelling to the face or oral cavity can represent a cellulitis or abscess.
- Scene and transport times should be minimized in complete tooth avulsions. Reimplantation is possible within 4 hours if the tooth is properly cared for.
- All tooth disorders typically need antibiotic coverage in addition to pain control.
- Occasionally cardiac chest pain can radiate to the jaw.
- All pain associated with teeth should be associated with a tooth which is tender to tapping or touch (or sensitivity to cold or hot).
- DO NOT replace tooth if:
  - Obtunded patient
  - At risk for Aspiration
  - Spinal Immobilization
  - AMS
  - Multiple Teeth missing

Emergencies Involving Indwelling Central Lines

History

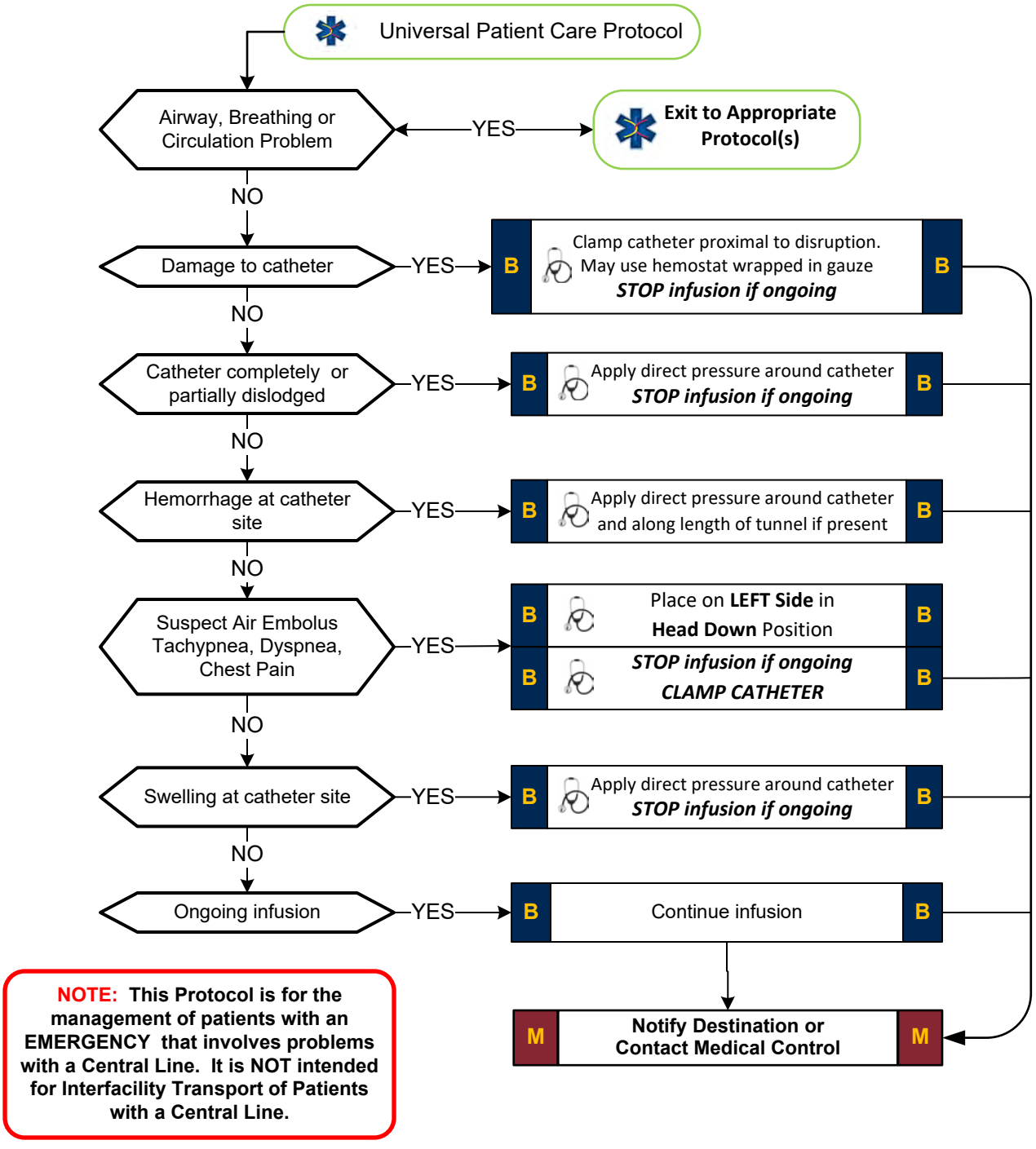
- Central Venous Catheter Type
  - Tunneled Catheter (Broviac / Hickman)
  - PICC (peripherally inserted central catheter
  - Implanted catheter (Mediport / Hickman)
- Occlusion of line
- Complete or partial dislodge
- Complete or partial disruption

Signs and Symptoms

- External catheter dislodgement
- Complete catheter dislodgement
- Damaged catheter
- Bleeding at catheter site
- Internal bleeding
- Blood clot
- Air embolus
- Erythema, warmth or drainage about catheter site indicating infection

Differential

- Fever
- Hemorrhage
- Reactions from home nutrient or medication
- Respiratory distress
- Shock



NOTE: This Protocol is for the management of patients with an EMERGENCY that involves problems with a Central Line. It is NOT intended for Interfacility Transport of Patients with a Central Line.

OVERLAP

Emergencies Involving Indwelling Central Lines

OVERLAP

Pearls

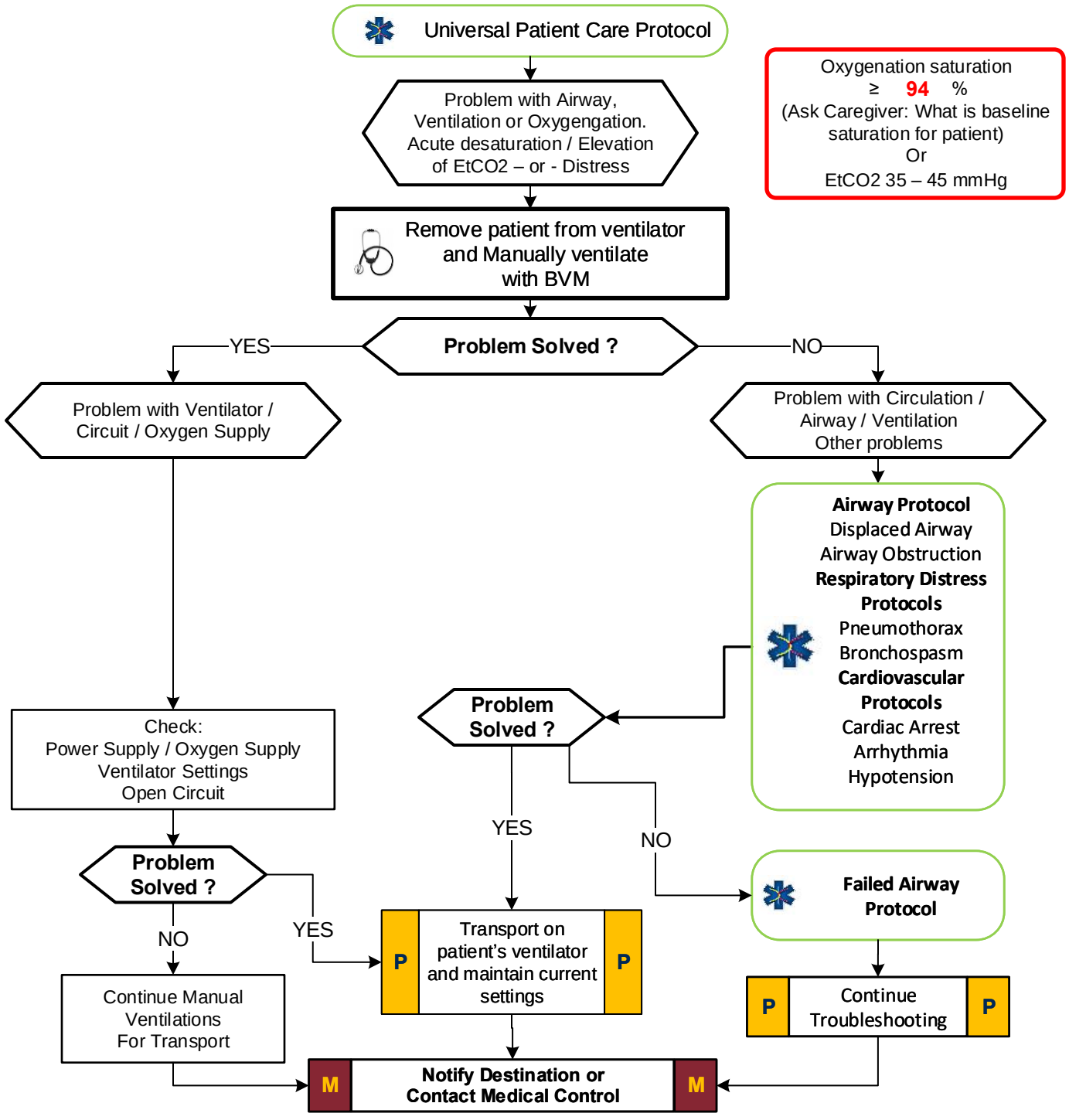
- **Always talk to family / caregivers as they have specific knowledge and skills.**
- Use strict sterile technique when manipulating an indwelling catheter.
- Do not place a tourniquet or BP cuff on the same side where a PICC line is located.
- Do not attempt to force catheter open if occlusion evident.
- Some infusions may be detrimental to stop. Ask family or caregiver if it is appropriate to stop or change infusion.
- Hyperalimentation infusions (IV nutrition): If stopped for any reason monitor for hypoglycemia.

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



OVERLAP

Emergencies Involving Ventilators

OVERLAP

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: D**isplaced tracheostomy tube / ETT, **O**bstructed 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.

Epistaxis

History
- Age
- Past medical history
- Medications (HTN, anticoagulants, Aspirin, NSAIDS)
- Previous episodes of epistaxis
- Trauma
- Duration of bleeding
- Quantity of bleeding

Signs and Symptoms
- Bleeding from nasal passage
- Pain
- Nausea
- Vomiting

Differential
- **Trauma**
- **Infection (viral URI or Sinusitis)**
- **Allergic rhinitis**
- **Lesions (polyps, ulcers)**
- **Hypertension**

Universal Patient Care Protocol

CONSIDER

B	Cardiac Monitor / 12 Lead ECG **Acquisition**	B
P	Cardiac Monitor / 12 Lead ECG **Interpretation**	P

R	**Compress Nostrils** **Ice Packs (if Available)** **Tilt Head Forward**	R
B	Consider Afrin Nasal Spray	B

Transport UPRIGHT Leaning Forward
Unless unstable – then
Transport in LATERAL DECUBITUS Position

Use Protocols as Needed
Airway Protocol
Vascular Access Protocol
Hypertension Protocol
Hypotension Protocol
Dysrhythmia Protocols

P	Consider Anti-Emetics Ondansetron 4 mg IV/IO/IM	P

M	**Notify Destination or Contact Medical Control**	M

OVERLAP

Epistaxis

OVERLAP

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Neuro**
- It is very difficult to quantify the amount of blood loss with epistaxis.
- Bleeding may also be occurring posteriorly. Evaluate for posterior blood loss by examining the posterior pharnyx.
- Anticoagulants include Aspirin, Coumadin, non-steroidal anti-inflammatory medications (Ibuprofen), and many over the counter headache relief powders.

Extremity Trauma

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

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**

Universal Patient Care Protocol

R

Wound Care
Hemorrhage Control
Procedure
Splinting as required

If Amputation:
- **Clean Amputated part**
- **Wrap part in sterile dressing soaked in Normal Saline.**
- **Place wrapped part in air tight container.**
- **Place container on ice if available.**

R

Consider
Vascular Access Protocol

Consider
Pain Control Protocol

M **Notify Destination or Contact Medical Control** M

OVERLAP

Extremity Trauma

OVERLAP

Pearls

- **Recommended Exam: Mental Status, Extremity, Neuro**
- Peripheral neurovascular status is important.
- In amputations, time is critical. Transport and notify medical control immediately, so that the appropriate destination can be determined.
- Hip dislocations and knee and elbow fracture / dislocations have a high incidence of vascular compromise.
- Urgently transport any injury with vascular compromise.
- Blood loss may be concealed or not apparent with extremity injuries.
- Lacerations must be evaluated for repair within 6 hours from the time of injury.
- Hemostatic Device approved by Bureau of EMS.
- Multiple Casualty Incident: Tourniquet Procedure may be considered 1st instead of direct pressure.

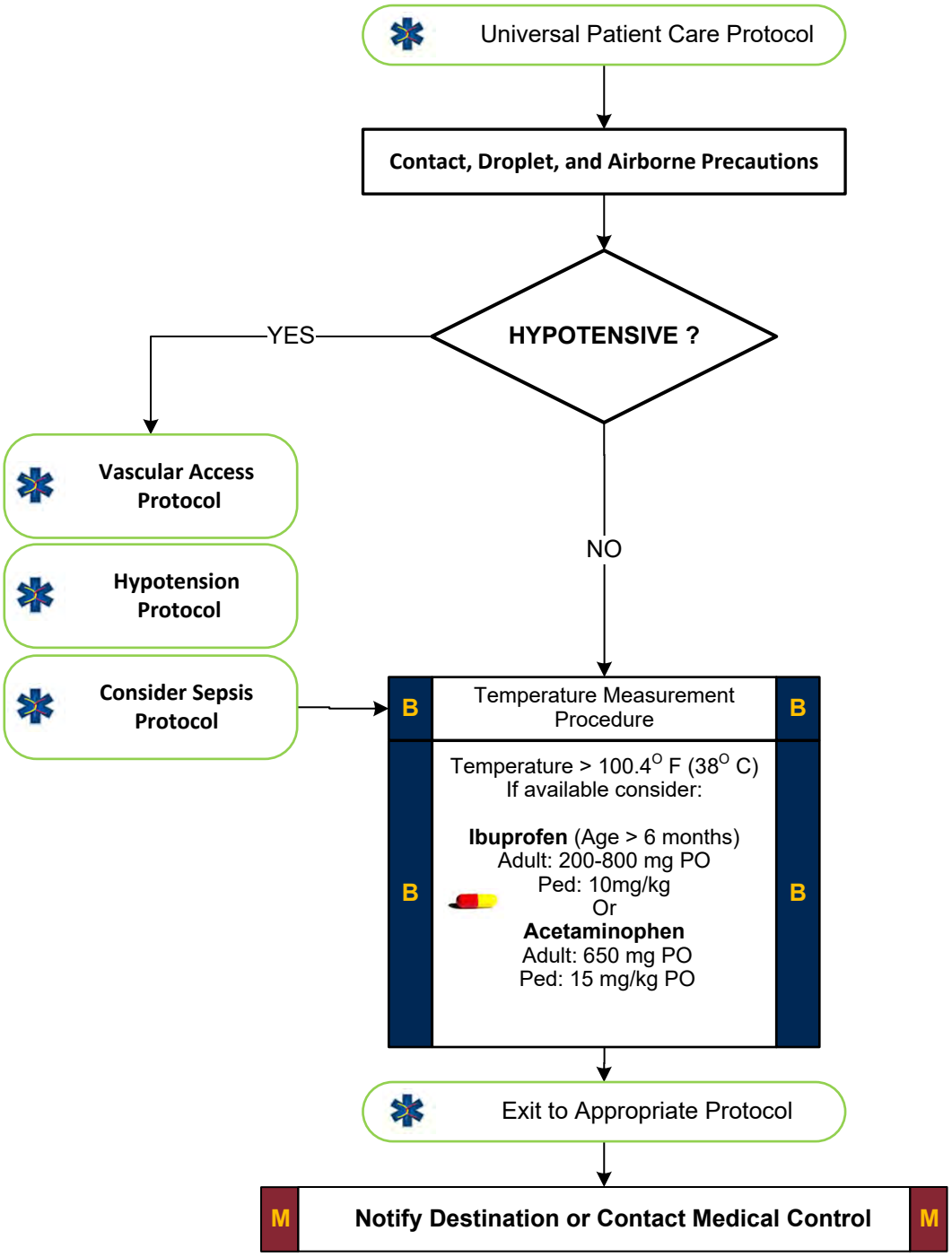
Fever / Infection Control

History
- Age
- Duration of fever
- Severity of fever
- Past medical history
- Medications
- Immunocompromised (transplant, HIV, diabetes, cancer)
- Environmental exposure
- Last acetaminophen or ibuprofen

Signs and Symptoms
- Warm
- Flushed
- Sweaty
- Chills/Rigors

Associated Symptoms (Helpful to localize source)
- myalgias, cough, chest pain, headache, dysuria, abdominal pain, mental status changes, rash

Differential
- **Infections / Sepsis**
- **Cancer / Tumors / Lymphomas**
- **Medication or drug reaction**
- **Connective tissue disease**
  - **Arthritis**
  - **Vasculitis**
- **Hyperthyroidism**
- **Heat Stroke**
- **Meningitis**



OVERLAP

Fever / Infection Control

OVERLAP

Pearls

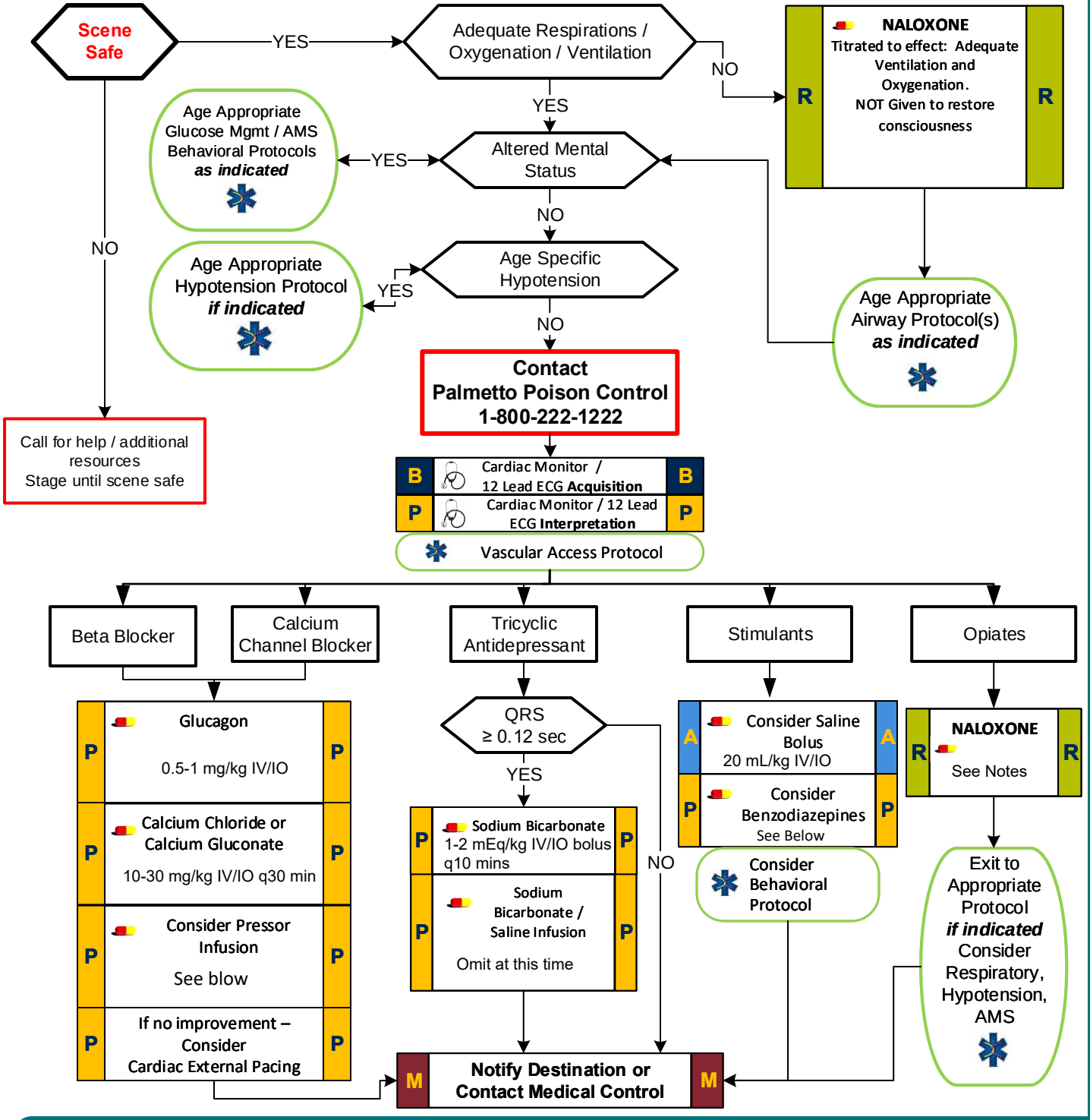
- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- Febrile seizures are more likely in children with a history of febrile seizures and with a rapid elevation in temperature.
- Patients with a history of Liver failure should not receive acetaminophen.
- **Droplet precautions** include standard PPE plus a standard surgical mask for providers who accompany patients in the back of the ambulance and a surgical mask or NRB O2 mask for the patient. This level of precaution should be utilized when influenza, meningitis, mumps, streptococcal pharyngitis, and other illnesses spread via large particle droplets are suspected. A patient with a potentially infectious rash should be treated with droplet precautions.
- **Contact precautions** include standard PPE plus utilization of a gown, change of gloves after every patient contact, and strict hand washing precautions. This level of precaution is utilized when multi-drug resistant organisms (e.g. MRSA), scabies, or zoster (shingles), or other illnesses spread by contact are suspected.
- **All-hazards precautions** include standard PPE plus airborne precautions plus contact precautions. This level of precaution is utilized during the initial phases of an outbreak when the etiology of the infection is unknown or when the causative agent is found to be highly contagious (e.g. SARS).
- Rehydration with fluids increased the patients ability to sweat and improves heat loss.
- All patients should have drug allergies documented prior to administering pain medications.
- Allergies to NSAID's (non-steroidal anti-inflammatory medications) are a contraindication to Ibuprofen.
- NSAID's should not be used in the setting of environmental heat emergencies.
- **Do not** give aspirin to a child.

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

Adult:

Suspected Narcotic (Opiate)

Consider Nalonxe titrated to Patients needs. 0.4 mg IV/IO/IM initial dose. 1.6 mg IV/IO/IM after 5 mins. Up to 4 mg. Intra-nasally 1 mg, per nostril.

Suspected Organophosphate Poisoning

Consider Atropine 2 mg IV starting dose.

Suspected Tricyclic overdose

Consider Sodium Bicarbonate at 1 mEq/kg not to exceed 100 mEq.

Suspected Beta Blocker or Calcium Channel Blocker

Administer 1 mg of Atropine

Pediatric:

Suspected Narcotic (Opiate)

Consider Nalonxe 0.1 mg/kg for children up to 5 years old (or <20kg) or 2 mg for children over 5 years old (or 20kg) and titrate to needs. Intra-nasally 0.5mg, up 1 mg.

Suspected Organophosphate Poisoning

Consider Atropine 0.1 mg/kg IV starting dose in children and 2mg in adolescents.

Suspected Tricyclic overdose

Consider Sodium Bicarbonate at 1 mEq/kg not to exceed 100 mEq. (If under <2 years old, dilute with NS with a 1:1 ratio.)

Suspected Beta Blocker or Calcium Channel Blocker

Administer Atropine 0.02 mg/kg minimum of 0.1 mg. Max single dose in child is 0.5 mg/adolescent 1mg.

Push-Dose Epinephrine is a way to transiently increase cardiac output and blood pressure in patients with transient hypotension or to allow adequate tissue perfusion for a short period to allow time to correct the underlying condition.

To prepare Push-Dose Epinephrine:
Take a 10ml syringe with 9ml's of normal saline
Draw up 1ml of Epinephrine 1-10,000 (ACLS / cardiac epinephrine)
The concentration is now 10mcg/ml
Administer 1-2 ml's (10-20mcg) q2-5min as needed to maintain systolic blood pressure > 90 mmHg
Time-to-onset is 1 minute
Duration of action is 2-5 minutes

OVERLAP

Pearls

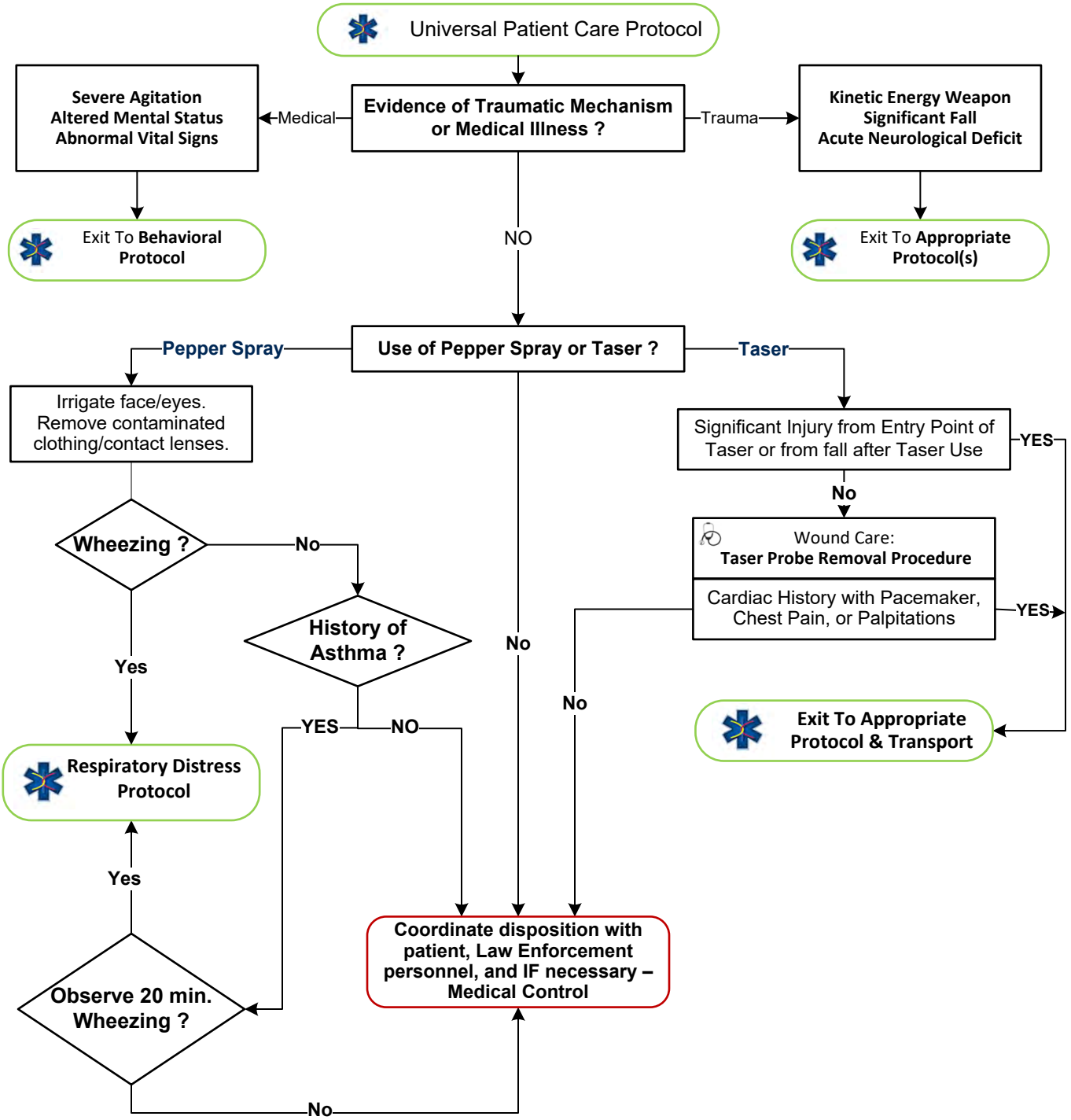
- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Do not rely on patient history of ingestion, especially in suicide attempts. Make sure patient is still not carrying other medications or has any weapons.**
- **Bring bottles, contents, emesis to ED.**
- **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: 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.
- **MR and EMT-B may administer naloxone by IN route only and may administer from EMS supply. Agency medical director may require Contact of Medical Control prior to administration and may restrict locally.**
- **When appropriate contact the Palmetto Poison Control Center for guidance.**

Police Custody

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



OVERLAP

Police Custody

OVERLAP

Pearls

- **For this protocol to be used, the patient does not have to be under police custody.**
- Agitated delirium is characterized by marked restlessness, irritability, and/or high fever. Patients exhibiting these signs are at high risk for sudden death and should be transported to hospital by ALS personnel.
- Patients restrained by law enforcement devices cannot be transported in the ambulance without a law enforcement officer in the patient compartment who is capable of removing the devices.
- If there is any doubt about the cause of a patient's alteration in mental status, transport the patient to the hospital for evaluation.
- If an asthmatic patient is exposed to pepper spray and released to law enforcement, all parties should be advised to immediately recontact EMS if wheezing/difficulty breathing occurs.
- All patients in police custody retain the right to request transport. This should be coordinated with law enforcement.
- If extremity/chemical/law enforcement restraints are applied, complete Restraint procedure in call reporting system.

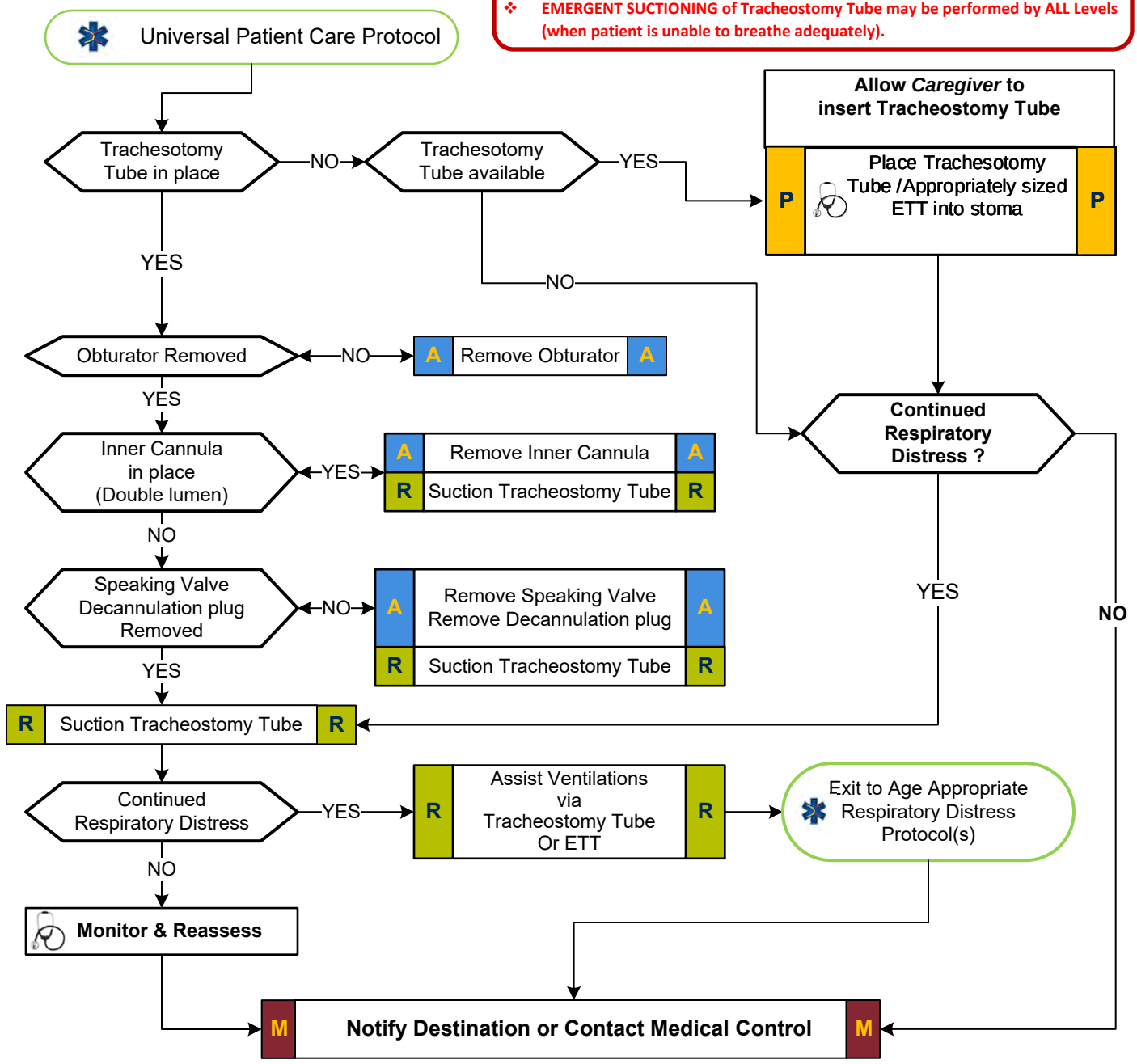
Respiratory Distress With a Tracheostomy Tube

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

- **If Tracheostomy Tube unable to be Cleared and Patient is in extremis – Remove Tracheostomy Tube.**
- **EMERGENT SUCTIONING of Tracheostomy Tube may be performed by ALL Levels (when patient is unable to breathe adequately).**



Overlap

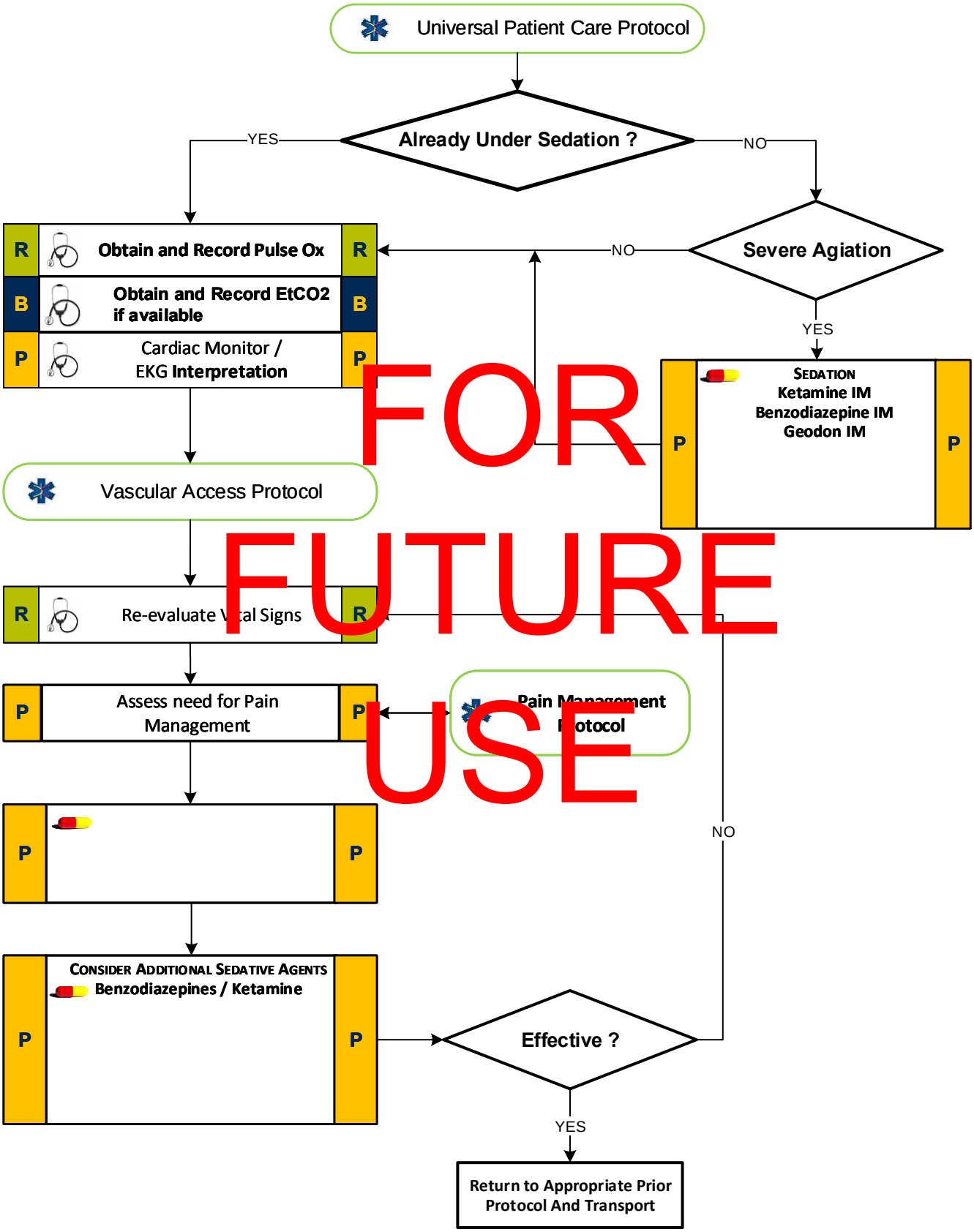
Respiratory Distress With a Tracheostomy Tube

OVERLAP

Pearls

- **Always talk to family / caregivers as they have specific knowledge and skills.**
- **If Tracheostomy Tube unable to be Cleared and Patient is in extremis – Remove Tracheostomy Tube.**
- **EMERGENT SUCTIONING of Tracheostomy Tube may be performed by ALL Levels (when patient is unable to breathe adequately).**
- Use patients 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: D**isplaced tracheostomy tube / ETT, **O**bstructed tracheostomy tube / ETT, **P**neumothorax and **E**quipment failure.

Sedation



OVERLAP

Sedation

FOR FUTURE USE

OVERLAP

Pearls

- **Sedation initiated prior to Online Medical Control Contact requires 100% QA review by the Medical Control Physician and/or an appropriately designated surrogate.**

Burns: Thermal

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
- singed facial or nasal hair
- Hoarseness / wheezing

Differential
- **Superficial (1st Degree)** red and painful
- **Partial Thickness (2nd Degree)** blistering
- **Full Thickness (3rd Degree)** painless/ charred or leathery skin
- **Thermal**
- **Chemical**
- **Electrical**
- **Radiation**

Initial Actions AFTER determining SCENE SAFE is to STOP THE BURN !

When Trauma coexists in the Burn Patient – initial transport to a verified Trauma Center based on the Trauma Triage and Bypass Protocol is warranted.

Universal Patient Care Protocol

Consider CO / Cyanide Poisoning — Yes → **Carbon Monoxide / Cyanide Poisoning Protocol**

Airway Protocol

Remove rings, bracelets, and other constricting items

Cover burn with dry sterile sheet or dressing

Vascular Access Protocol

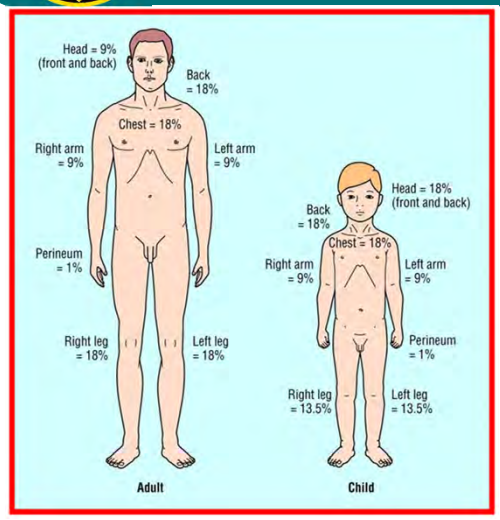
A — IV NS infuse total of 0.25 x Kg body Wgt x % TBSA /Hr for up to first 8 Hrs. (More info on next page). — A

Pain Control Protocol

M — **Notify Destination or Contact Medical Control** — M

OVERLAP

Burns: Thermal



1. The IV solution should be changed to Lactated Ringers if it is available. It is preferred over Normal Saline.
2. Formula example and a rule of thumb is; an 80 kg patient with 50% TBSA will need 1000 cc of fluid per hour.

- **Critical or Serious Burns**
- ***> 5-15% total body surface area (TBSA); 2nd or 3rd degree burns, or***
- ***3rd degree 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, or***
- ***any burn requiring hospitalization.***

(These burns will require direct transport to a burn center, or transfer once seen at a local facility where the patient can be stabilized with interventions such as airway management or pain relief if this is not available in the field or the distance to a Burn Center is significant.)

Critical (Red)

>15% TBSA 2nd/3rd Degree Burn
Burns with Multiple Trauma
Burns with definite airway compromise
(When reasonable or reasonably accessible, transport to a Burn Center or Trauma Center)

Serious (Yellow)

5-15% TBSA 2nd/3rd Degree Burn
Suspected Inhalation injury or requiring intubation for airway stabilization
Hypotension or GCS < 14
(When reasonable or reasonably accessible, transport to a Burn Center or Trauma Center)

Minor (Green)

< 5% TBSA 2nd/3rd Degree Burn
No inhalation injury, Not Intubated,
Normotensive
GCS>14
(Transport to the Local Hospital)

OVERLAP

Pearls

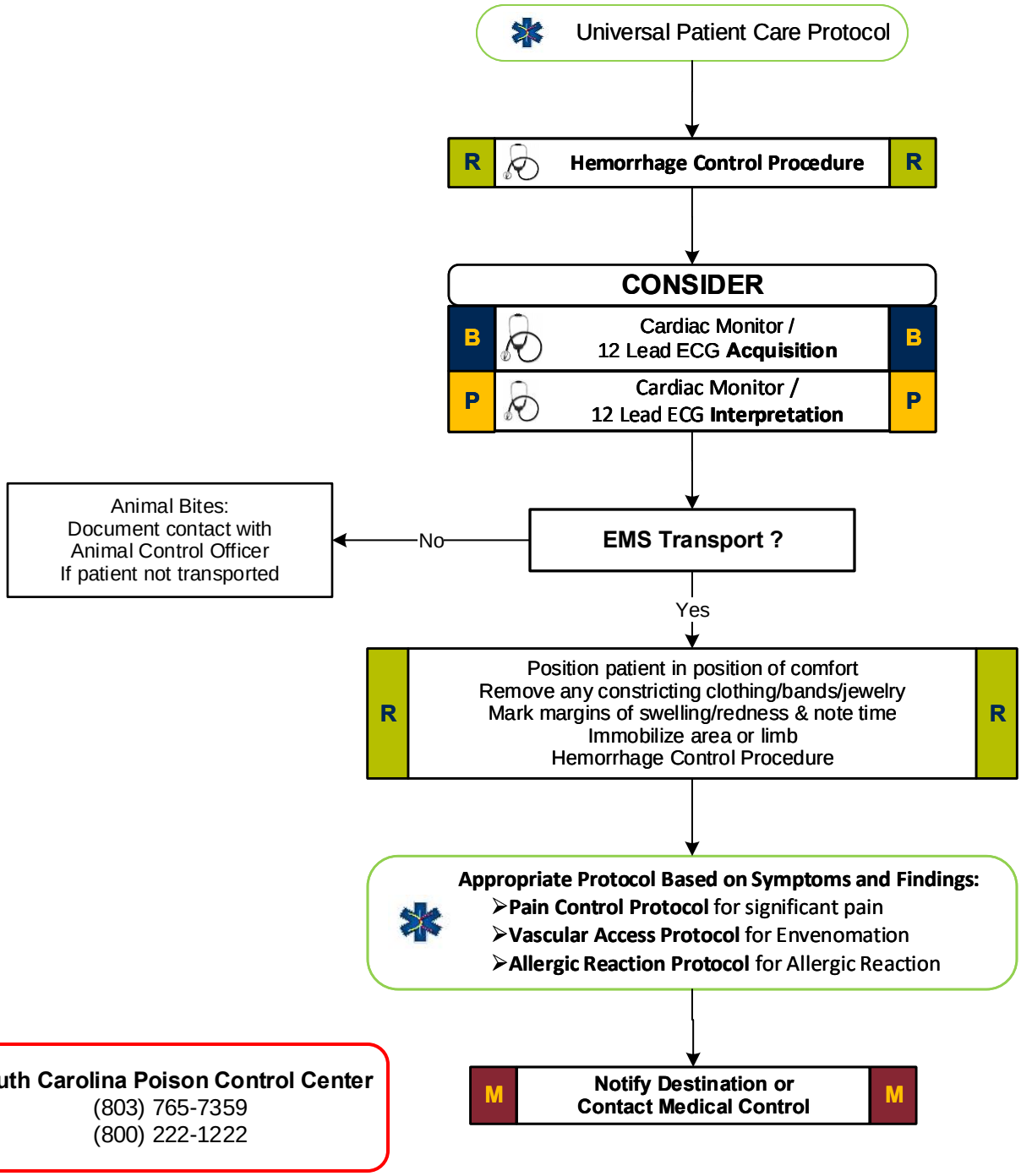
- Burn patients are Trauma Patients, evaluate for multisystem trauma.
- **When Trauma coexists in the Burn Patient – initial transport to a verified Trauma Center based on the Trauma Triage and Bypass Protocol is warranted.**
- Assure whatever has caused the burn, is no longer contacting the injury. (Stop the burning process!)
- Recommended Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, and Neuro
- Early intubation is required when the patient experiences significant inhalation injuries.
- Potential CO exposure should be treated with 100% oxygen. (For patients suffering from CO inhalation, transport to a hospital equipped with a hyperbaric chamber is indicated [when reasonably accessible].)
- 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 burns, must maintain normal body temperature.
- Evaluate the possibility of child abuse with children and burn injuries.

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**



South Carolina Poison Control Center
(803) 765-7359
(800) 222-1222

ENVIRONMENTAL / OTHER

Bites and Envenomations

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 multicoda).
- Poisonous snakes in this area are generally of the pit viper family: rattlesnake, copperhead, and water moccasin.
  - Coral snake bites are rare: Very little pain but very toxic. "Red on yellow - kill a fellow, red on black - venom lack."
  - Amount of envenomation is variable, generally worse with larger snakes and early in spring.
  - If no pain or swelling, envenomation is unlikely (except for Coral snakes).
- 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 South Carolina Poison Control Center for guidance (1-800-222-1222).
- Do NOT apply Tourniquet for envenomations

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

Accidental / Intentional Explosions (See Pearls)

Triage Protocol

Thermal / Chemical / Electrical Burn or Exposure — YES → Age Appropriate Thermal Burn / Chemical and Electrical Burn Protocol

Radiation Burn or Exposure — YES → Radiation Incident Protocol

Crush Injury — YES → Crush Syndrome Trauma Protocol

Age appropriate **Multiple Trauma Protocol** if indicated

Age appropriate **Airway Protocol** if indicated

Vascular Access Protocol

P — Cardiac Monitor / 12 Lead ECG **Interpretation** **If indicated** — P

Blast Lung Injury — YES → Maintain Oxygen Saturation ≥ 94 %

Age appropriate **Pain Control Protocol** if indicated

Age appropriate **Airway Protocol** if indicated

Rapid Transport to appropriate destination using
Trauma and Burn:
EMS Triage and Destination Plan

M — **Notify Destination or Contact Medical Control** — M

ENVIRONMENTAL / OTHER

Blast Injury / Incident

Pearls

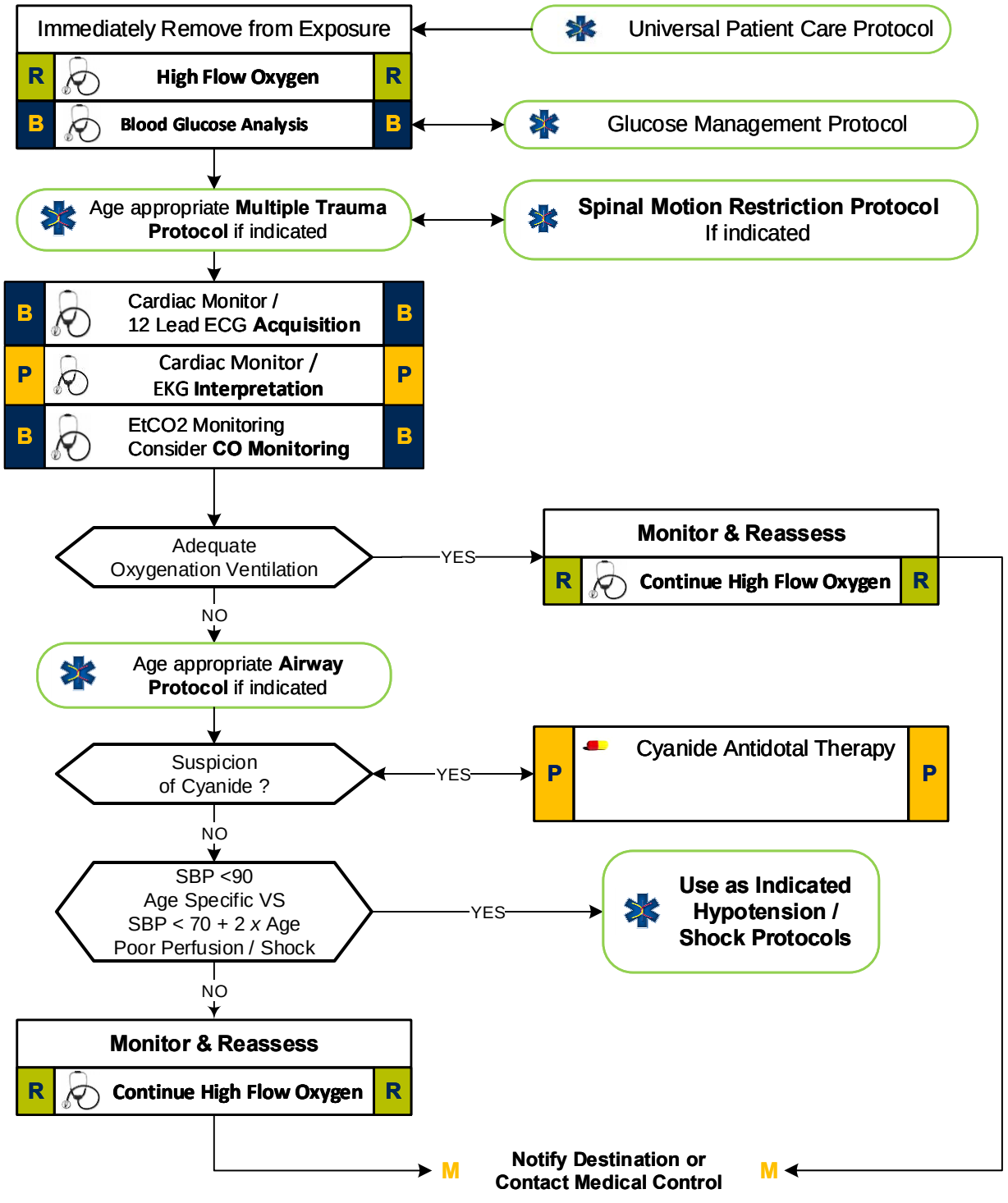
- **Types of Blast Injury:**
  Primary Blast Injury: From pressure wave.
  Secondary Blast Injury: Impaled objects. Debris which becomes missiles / shrapnel.
  Tertiary Blast Injury: Patient falling or being thrown / pinned by debris.
  Most Common Cause of Death: Secondary Blast Injuries.
- **Triage of Blast Injury patients:**
  Blast Injury Patients with Burn Injuries Must be Triaged using the Thermal / Chemical / Electrical Burn Destination Guidelines for Critical / Serious / Minor Trauma and Burns
- **Care of Blast Injury Patients:**
  Blast Injury Patients with Burn Injuries Must be cared for using the Thermal / Chemical / Electrical Burn Protocols.
  Use Lactated Ringers (if available) for all Critical or Serious 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.
  Air embolism should be considered and patient transported prone and in slight left-lateral decubitus position.
  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.
- **Accident Explosions:**
  Attempt to determine source of the blast to include any potential threat for particalization of hazardous materials.·
  Evaluate scene safety to include the source of the blast that may continue to spill explosive liquids or gases.
  Consider structural collapse / Environmental hazards / Fire.·
  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.
- **Intentional Explosions:**
  Attempt to determine source of the blast to include any potential threat for particalization of hazardous materials.
  Greatest concern is potential threat for a secondary device.
  Evaluate surroundings for suspicious items; unattended back packs or packages, or unattended vehicles.
  If patient is unconscious or there is(are) fatality(fatalities) and you are evaluating patient(s) for signs of life: Before moving note if there are wires coming from the patient(s), or it appears the patient(s) is(are) lying on a package/pack, or bulky item, do not move the patient(s), quickly back away and immediately notify a law enforcement officer. If no indications the patient is connected to a triggering mechanism for a secondary device, expeditiously remove the patient(s) from the scene and begin transport to the hospital.
  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.

Carbon Monoxide / Cyanide

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



ENVIRONMENTAL / OTHER

Carbon Monoxide / Cyanide

CONSIDER CYANIDE POISONING FOR:

- Patients on **NITROPRUSSIDE** infusions
- Smoke Exposure: Burning wools, silk, plastics, furniture
- Industrial / Laboratory Settings.
- Metal Processing, Jewelry Manufacturing, Photographic Processing, Dyeing, Plastics Manufacturing
- Agriculture / Mining

ENVIRONMENTAL / OTHER

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.
- Symptoms present with lower CO levels in pregnancy, children and the elderly.
- Continue high flow oxygen regardless of pulse ox readings.
- Pulse Oximetry Readings may read **FALSELY HIGH** with Carbon Monoxide Poisoning

Category A Isolation Protocol

History
- Positive 911 EMD / PSAP Screening
- **Travel history to – or residence in – a region with prevalent Category A disease within 21 days in conjunction with signs and symptoms listed within this protocol**

Signs and Symptoms
One of these
- Fever of > 100.4° F
- Severe headache
- Muscle pain
- Weakness
- Diarrhea
- Vomiting
- Abdominal Pain
- Unexplained hemorrhage

Differential
- Cold / Influenza
- Electrolyte imbalance
- Hyperglycemia
- Other Viral / Bacterial Infections

If you respond to an incident where an Emerging Disease (Category A) risk may be present, as determined by prescreening, **IMMEDIATELY** contact your DHEC Regional Public Health Epidemiology (EPI) as listed below. EPI will conduct a further risk assessment to determine what, if any, actions are necessary for disease containment or monitoring and assist in determining resources needed.

UPSTATE:	**MIDLANDS:**	**PEE DEE:**	**LOWCOUNTRY:**
Abbeville, Anderson, Cherokee, Greenville, Greenwood, Laurens, McCormick, Oconee, Pickens, Spartanburg, Union	Aiken, Barnwell, Chester, Edgefield, Fairfield, Kershaw, Lancaster, Lexingtron, Newberry, Richland, Saluda, York	Chesterfield, Clarendon, Darlington, Dillon, Florence, Georgetown, Horry, Lee, Marion, Marlboro, Sumter, Williamsburg	Allendale, Bamberg, Beaufort, Berkeley, Calhoun, Charleston, Colleton, Dorchester, Hampton, Jasper, Orangeburg
866.298.4442	**888.801.1046**	**843.915.8845**	**843.441.1091**

Appropriate **Personal Protective Equipment** in conjunction with current CDC recommendations **PRIOR** to entering scene

↓

Age Appropriate Airway Protocol *

↓

R	**Vital Signs** ➢(Does not include auscultation of Breath Sounds) ➢Recommend NIBP measurement and **Pulse Oximetry**	R
B	Consider **Supplemental Oxygen** by NRB if SpO2 < 92%, respiratory distress, altered LOC, or > 20 weeks pregnant	B
B	Consider **Cardiac Monitor if available** **ONLY** if patient is symptomatic for cardiac related complaint	B
R	Provide Supportive Care Continue to calm and reassure the patient(s)	R

↓

Is the Patient Stable ?

YES → **Provide for Transport to Appropriate Facility following orders from Incident Commander**

NO → **Exit to Appropriate Treatment Protocol. Transport Immediately**

If your agency is providing transport, alert the Receiving Medical Facility:
- ❖ As soon as feasible, confidentially notify the Receiving Facility that you are transporting a potential Ebola paitent.
- ❖ **DO NOT TAKE THE PATIENT INTO THE MEDICAL FACILITY UNTIL YOU ARE INSTRUCTED TO DO SO.**
- ❖ **MEDICAL FACILITY PERSONNEL WILL DIRECT YOU TO THE PROPER ROOM THROUGH A SAFE ENTRANCE.**

ENVIRONMENTAL / OTHER

Category A Isolation Protocol

* No routine aerosol generating procedures unless absolutely medically necessary. This includes CPAP / BiPAP. Advanced airway procedures should be performed under controlled conditions while not in motion.
** No routine IV lines unless absolutely medically necessary and then only under controlled conditions while not in motion.

ENVIRONMENTAL / OTHER

Pearls:

- **Incubation period 2 – 21 days.**
- A patient is only infectious when symptomatic.
- Once ill, a person can spread virus to others through direct contact with body fluids: blood, urine, sweat, semen, feces, and tears.
- **ONLY Personnel who have been well trained in use of PPE and know how to put it on and take it off safely and properly should enter contaminated zone.**
- There should be **NO** exposed skin once full PPE has been put on prior to entry.
- Per CDC Guidelines, withhold invasive procedures unless, absolutely necessary:
  - Limit the use of needles and other sharps as much as possible. All needles and sharps should be handled with extreme care and disposed of in puncture-proof, sealed containers. Safety devices must be employed immediately after use.
  - Do not attempt any invasive procedures while in motion to minimize exposure risk(s).
- Always have a monitor for the doffing procedure to insure there is no provider contamination during doffing.
- There should be a standardized procedure for donning and doffing that is monitored by a Safety Officerr.
- Remain cognizant that potential patients may experience heightened anxiety due to situation and EMS Responder in PPE.

Drowning

History
- Submersion in water regardless of depth
- Possible trauma to C-spine
- Possible history of trauma ie: diving board
- Duration of immersion
- Temperature of water or
- possibility of hypothermia

Signs and Symptoms
- Unresponsive
- Mental status changes
- Decreased or absent vital signs
- Vomiting
- Coughing
- Apnea
- Stridor / Wheezing / Rales

Differential
- Trauma
- Pre-existing medical problem (hypoglycemia, cardiac dysrhythmia)
- Pressure injury (diving)
- Barotrauma
- Decompression sickness
- Post-immersion syndrome
- Hypothermia

Universal Patient Care Protocol

Awake and Alert

R **Supplemental Oxygen As Tolerated** R

Spinal Motion Restriction Protocol (as indicated)

Remove wet clothing
Dry / Warm Patient

Monitor & Reassess

Encourage transport and evaluation even if asymptomatic or with minimal symptoms
Asymptomatic drowning patients (refusing transport) should be instructed to seek medical care/call 911 if they develop any symptoms within 6 hours

Vascular Access Protocol (as indicated)

B Cardiac Monitor / 12 Lead ECG **Acquisition** B

P Cardiac Monitor / 12 Lead ECG **Interpretation** P

Awake but with AMS

R **5 Breaths via BVM / Mouth-to-Mouth As Tolerated** R

R **Supplemental Oxygen As Tolerated** R

Age Appropriate Airway Protocol *(as indicated)*

Spinal Motion Restriction Protocol *(as indicated)*

Age Appropriate Altered Mental Status Protocol *(as indicated)*

Remove wet clothing
Dry / Warm Patient

B Cardiac Monitor / 12 Lead ECG **Acquisition** B

P Cardiac Monitor / 12 Lead ECG **Interpretation** P

Vascular Access Protocol

Age Appropriate Respiratory Distress Protocol *(as indicated)*

Unresponsive

Does patient have pulse?

YES → R **5 Breaths via BVM / Mouth-to-Mouth As Tolerated** R

NO → Exit to Age Appropriate:
Airway Protocol / Cardiac Arrest / Arrhythmia Protocol(s) / Respiratory Distress Protocol / Altered Mental Status and/or **Spinal Motion Restriction Protocol** as indicated

M **Notify Destination or Contact Medical Control** M

ENVIRONMENTAL / OTHER

Drowning

ENVIRONMENTAL / OTHER

Pearls

- **Recommended Exam: Respiratory, Mental status, Trauma Survey, Skin, Neuro**
- **Drowning is the process of experiencing respiratory impairment (any respiratory symptom) from submersion / immersion in a liquid.**
- **Begin with BVM ventilations, if patient does not tolerate then apply appropriate mode of supplemental oxygen.**
- **Ensure scene safety. Drowning is a leading cause of death among would-be rescuers.**
- **When feasible, only appropriately trained and certified rescuers should remove patients from areas of danger.**
- **Regardless of water temperature – resuscitate all patients with known submersion time of ≤ 25 minutes.**
- **Regardless of water temperature – If submersion time ≥ 1 hour consider moving to recovery phase instead of rescue.**
- **Foam is usually present in airway and may be copious, DO NOT waste time attempting to suction. Ventilate with BVM through foam (suction water and vomit only when present.)**
- **Cardiac arrest in drowning is caused by hypoxia, airway and ventilation are equally important to high-quality CPR.**
- **Encourage transport of all symptomatic patients (cough, foam, dyspnea, abnormal lung sounds, hypoxia) due to potential worsening over the next 6 hours.**
- Predicting prognosis in prehospital setting is difficult and does not correlate with mental status. Unless obvious death, transport.
- Hypothermia is often associated with drowning and submersion injuries even with warm ambient conditions.
- Drowning patient typically has <1 – 3 mL/kg of water in lungs (does not require suction.) Primary treatment is reversal of hypoxia.
- Spinal immobilization is usually unnecessary. When indicated it should not interrupt ventilation, oxygenation and / or CPR.

Hyperthermia

History
- Age
- Exposure to increased temperatures and / or humidity
- Past medical history / medications
- Extreme exertion
- Time and length of exposure
- Poor PO intake
- Fatigue and / or muscle cramping
- EtOH / Illicit Drug Use

Signs and Symptoms
- Altered mental status or unconsciousness
- Hot, dry or sweaty skin
- Hypotension or shock
- Seizures
- Nausea

Differential
- Fever (Infection)
- Dehydration
- Medications/Drugs
- Hyperthyroidism (Storm)
- Delirium trememes (DT's)
- Heat cramps
- Heat exhaustion
- Heat stroke
- CNS lesions or tumors

Universal Patient Care Protocol

Signs/Symptoms of Hyperthermia

B — Temperature Measurement Procedure if available — B

B — Remove from heat source to cool environment — B
- Passive cooling measures
- Remove tight clothing
- Blood Glucose Analysis

Seizure Protocol If indicated

If Indicated Glucose Management Protocol

Assess Symptom Severity

HEAT CRAMPS
Normal to elevated body temperature
Warm, moist skin
Weakness, Muscle cramping

HEAT EXHAUSTION
Elevated body temperature
Cool, moist skin
Weakness, Anxious, Tachypnea

HEAT STROKE
High body temperature, usually > 104
Hot, dry skin
Hypotension, AMS / Coma

PO Fluids as tolerated

Monitor and Reassess

R — Active Cooling Measures — R

B — Cardiac Monitor / 12 Lead ECG **Acquisition** — B

P — Cardiac Monitor / 12 Lead ECG **Interpretation** — P

Airway Protocol (as indicated)

Altered Mental Status Protocol (as indicated)

Vascular Access Protocol (as indicated)

Hypotension / Poor Perfusion?

Yes

No

Hypotension Protocol (as indicated)

Monitor and Reassess

M — **Notify Destination or Contact Medical Control** — M

ENVIRONMENTAL / OTHER

Hyperthermia

ENVIRONMENTAL / OTHER

Pearls

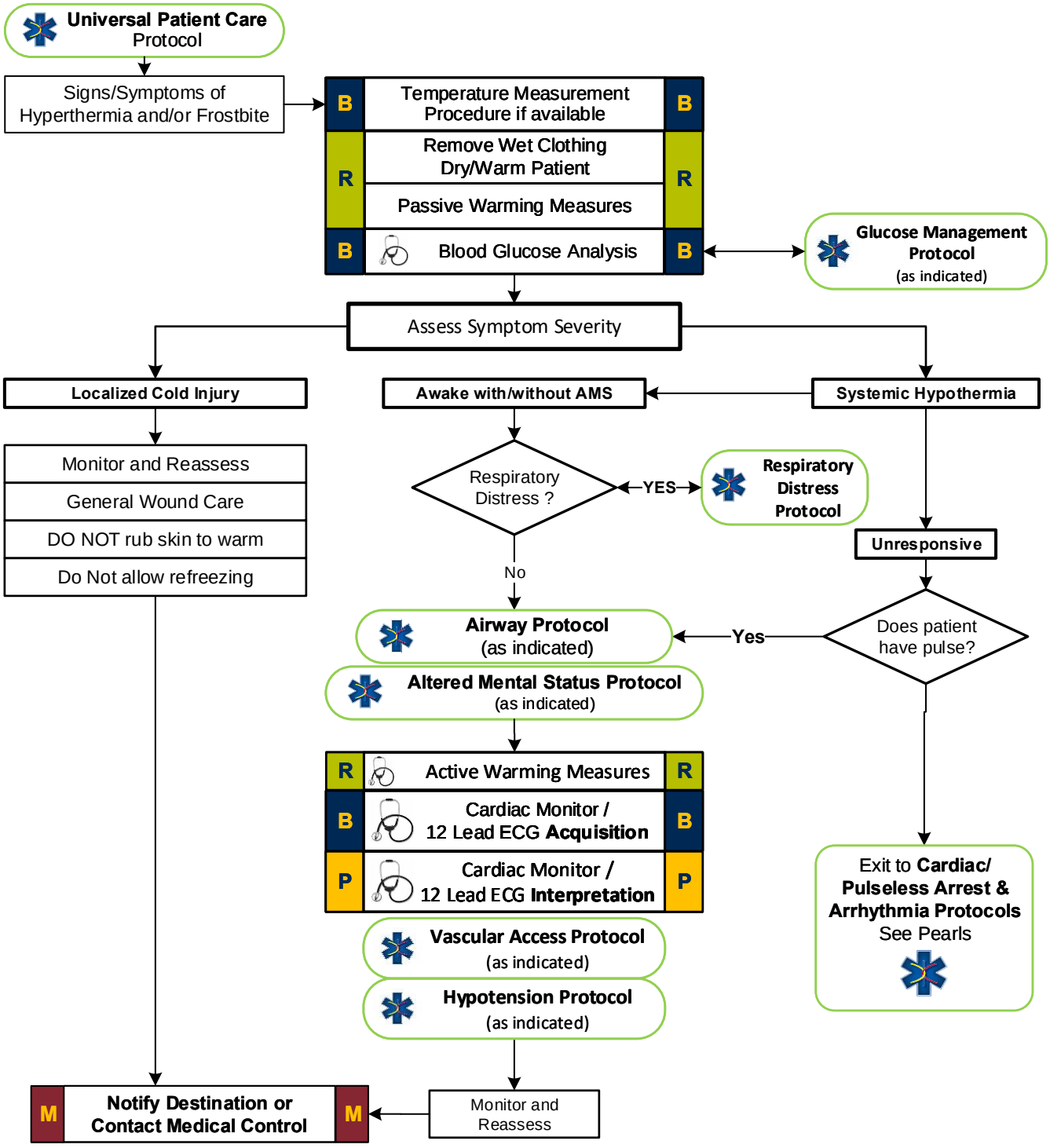
- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Neuro**
- Extremes of age are more prone to heat emergencies (i.e. young and old). Obtain and document patient temperature if able.
- Predisposed by use of: tricyclic antidepressants, phenothiazines, anticholinergic medications, antipsychotics, synthetic cannabinoids, 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.
- **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.
- **Rapid cooling takes precedence over transport as early cooling decreased morbidity and mortality. Goal temperature is about 102.5 degrees F.**
- **ACTIVE Cooling includes EVAPORATIVE Cooling as well as placement of Ice Packs in the groin, axillae, and on the head.**

Hypothermia

History
- Past medical history / medications
- Exposure to environment even in normal temperatures
- Exposure to extreme cold
- Extremes of age, very young & old
- Drug use: alcohol, barbituates
- Infections / Sepsis
- Length of exposure / wetness / wind chill

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

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



ENVIRONMENTAL / OTHER

Hypothermia

Pearls

- **Recommended Exam: Mental Status, Heart, Lungs, Abdomen, Extremities, Neuro**
- **NO PATIENT IS DEAD UNTIL WARM AND DEAD (Body temperature ≥ 93.2 degrees F, 32 degrees C.)**
- **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.
- ACTIVE WARMING Includes: Hot packs can be activated and placed in the axillae and groin area if available.
  - Care should be taken not to place the packs directly against the patient's skin
- **CPR:**

➢**Severe hypothermia may cause cardiac instability and rough handling of the patient theoretically can cause ventricular fibrillation. This has not been demonstrated or confirmed by current evidence. Intubation and CPR techniques should not be withheld due to this concern. Intubation can cause ventricular fibrillation so it should be done gently by most experienced person**

➢**Below 86 ^{O} F (30 ^{O} C) antiarrhythmics may not work and if given should be given at increased intervals. Contac Medical Control for direction. Epinephrine / Vasopressin can be administered. Below 86 ^{O} F (30 ^{O} C) pacing should not be done.**

➢**Consider withholding CPR if patient has organized rhythm or has other signs of life. Contact Medical Control.**

➢**If the patient is below 86 ^{O} F (30 ^{O} C) then defibrillate 1 time if defibrillation is required. Deferring further attempts until more warming occurs is controversial. Contact Medical Control for direction.**

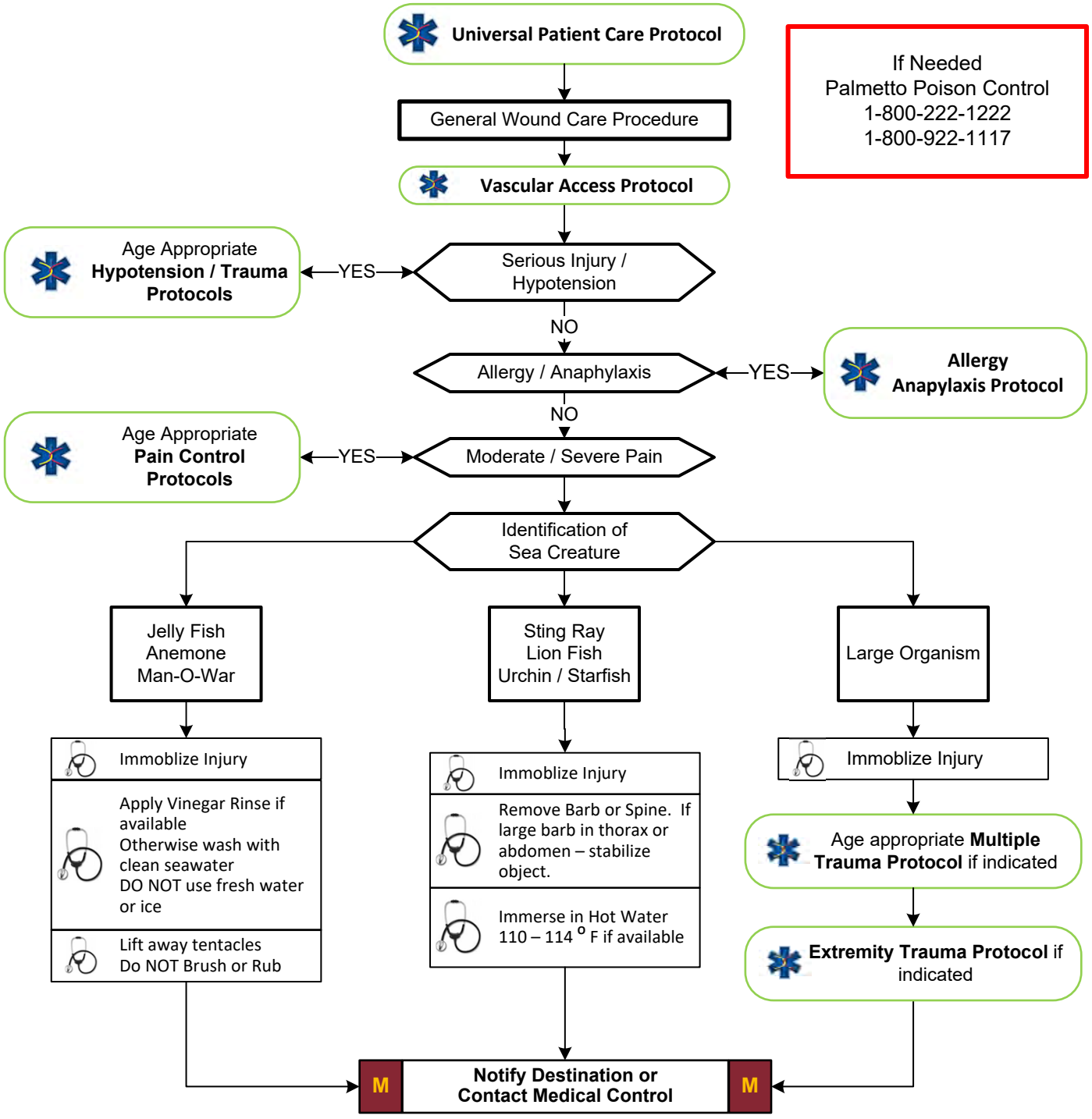
➢**Hypothermia may produce severe bradycardia so take at least 45 seconds to palpate a pulse.**

Marine Envenomations / Injury

History
- Type of bite / sting
- Identification of organism
- Previous reaction to marine organism
- Immunocompromised
- Household pet

Signs and Symptoms
- Intense localized pain
- Increased oral secretions
- Nausea / vomiting
- Abdominal cramping
- Allergic reaction / anaphylaxis

Differential
- Jellyfish sting
- Sea Urchin sting
- Sting ray barb
- Coral sting
- Swimmers itch
- Cone Shell sting
- Fish bite
- Lion Fish sting



ENVIRONMENTAL / OTHER

Marine Envenomations / Injury

Pearls

- Ensure your safety: Avoid the organism or fragments of the organism as they may impart further sting / injury.
- Patients can suffer cardiovascular collapse from both the venom and / or anaphylaxis even in seemingly minor envenomations.
- Arrest the envenomation by inactivation of the venom as appropriate.
- Ensure good wound care, immobilization and pain control.

Nerve Agent Protocol (Organophosphate)

History

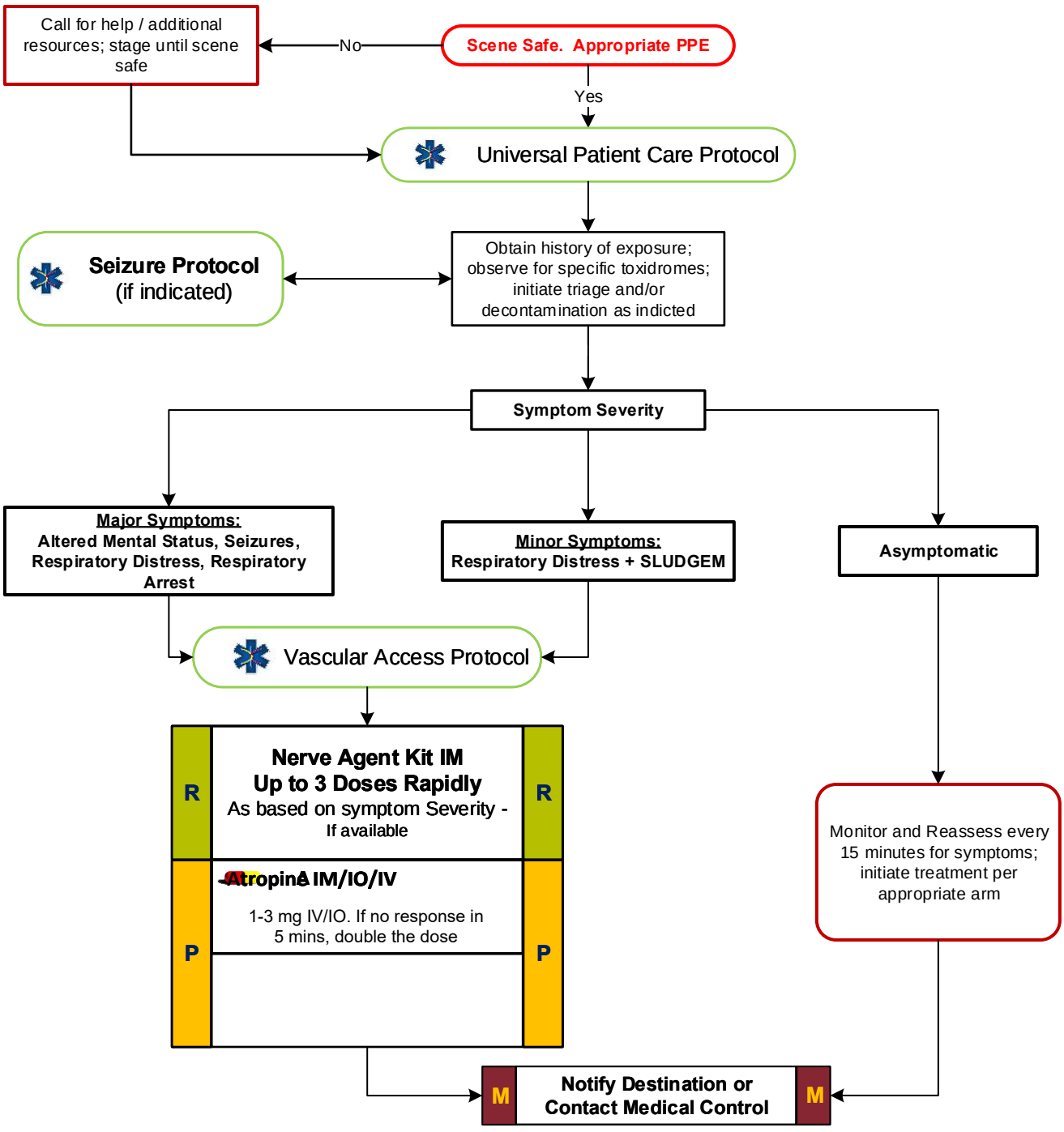
- Exposure to chemical, biologic, radiologic, or nuclear hazard
- Potential exposure to unknown substance/hazard

Signs and Symptoms

- **S**alivation
- **L**acrimation
- **U**rination; increased, loss of control
- **D**efecation / Diarrhea
- **GI** Upset/abdominal pain/cramping
- **E**mesis
- **M**uscle 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.)



ENVIRONMENTAL / OTHER

Nerve Agent Protocol (Organophosphate)

ENVIRONMENTAL / OTHER

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Gastrointestinal, Neuro**
- **Follow local HAZMAT protocols for decontamination and use of personal protective equipment.**
- **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.**
- **If Triage/MCI issues exhaust supply of Nerve Agent Kits, use pediatric atropines (if available). Use the 0.5 mg dose if patient is less than 40 pounds (18 kg), 1 mg dose if patient weighs between 40 to 90 pounds (18 to 40 kg), and 2 mg dose for patients greater than 90 pounds (>40 kg).**
- **Each Nerve Agent Kit contains 600 mg of Pralidoxime (2-PAM) and 2 mg of Atropine.**
- **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 to a patient atropine / pralidoxime by protocol. Agency medical director may require Contact of Medical Control prior to administration.

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

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

Universal Patient Care Protocol

Radiation Burn / Exposure

Assess Burn / Concomitant Injury Severity

R **Consider Decontamination of External Radiation Source if Patient is Stable** R

B **Cardiac Monitor 12 Lead ECG Acquisition** B

P Cardiac Monitor / EKG **Interpretation** P

→ Exit to Age Appropriate **Cardiac/ Pulseless Arrest & Arrhythmia Protocols** (as indicated)

R Irrigate any contaminated area copiously for **AT LEAST** 15 minutes R

Go To Age Appropriate **Thermal Burn Protocol**

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.*

ENVIRONMENTAL / OTHER

Radiation Incident

Critical (Red)

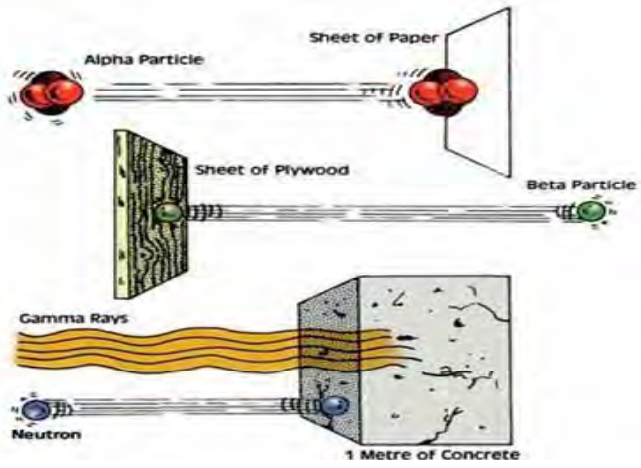
>15% TBSA 2nd/3rd Degree Burn
Burns with Multiple Trauma
Burns with definite airway compromise
(When reasonable or reasonably accessible, transport to a Burn Center or Trauma Center)

Serious (Yellow)

5-15% TBSA 2nd/3rd Degree Burn
Suspected Inhalation injury or requiring intubation for airway stabilization
Hypotension or GCS < 14
(When reasonable or reasonably accessible, transport to a Burn Center or Trauma Center)

Minor (Green)

< 5% TBSA 2nd/3rd Degree Burn
No inhalation injury, Not Intubated,
Normotensive
GCS>14
(Transport to the Local Hospital)



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.

ENVIRONMENTAL / OTHER

Pearls

- 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. Refer to the Decontamination Procedure for more information.
- 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 is 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 Decontamination Procedure / WMD / Nerve Agent Protocol 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.
- This event may require an activation of the National Radiation Injury Treatment Network.

Radiation Incident

EMS Non-Transport COVID-19 Guidance

PURPOSE:
To identify patients that are safe to assess and not transport to a hospital during widespread cases of confirmed COVID-19 patients.

Indication for COVID-19 Non-Transport

- **This guidance is only applicable if local EMS agency Medical Control Director has decided to enact non-transport guidelines based on local indications and in consultation with their hospital, community leaders, EMD, and DHEC**
- **Health care infrastructure is overwhelmed**
  - **Hospitals are exceeding maximum census**
  - **Hospitals and stand alone Emergency Departments are experiencing significant overcrowding**
  - **Hospitals have enacted surge plans – i.e. alternative care sites**
- **State or Federal Government Emergency Declaration**

INITIAL ASSESSMENT

- If call takers advise that the patient is suspected of having **COVID-19,** EMS clinicians should put on appropriate PPE before entering the scene.
- Initial assessment should begin from a distance of at least 6 feet from the patient and be limited to one EMS provider whenever possible.

R

PATIENT ASSESSMENT

- Has the patient had a fever that has been **> 100.4^{O} F**?
- Does the person currently have fever or symptoms of lower respiratory illness (such as cough and/or shortness of breath?
- Is the patient older than **60** years of age?
- Are Vital Signs outside the following normal limits?
  - Respiratory Rate **> 8 or < 20**
  - O2 Saturation **> 94%**
  - Heart Rate **< 100 bpm**
  - Systolic BP **at least 100**
  - GCS of **15**

NO to ALL ABOVE – BUT Patient IS Experiencing

- Chest pain, other than mild with coughing
- Shortness of Breath with activity
- Syncope
- Diaphoretic
- Cyanotic
- Respiratory Distress
- Other exclusions defined by the Medical Director

R

NO To ALL →

B

NO TRANSPORT DISPOSITION

- ❑ The patient has a support system
- ❑ The patient is competent.
- ❑ The patient consents to not being transported
- ❑ The EMS Provider should assit with use of TeleHealth Services (see Page 2)
- ❑ Patient should be provided with resources such as local public health authroities, EMS agency Community Paramedicine programs, or other mechanisms.
- ❑ If patient meets all dispositions noted above and is stable; have patient shelter in place

B

YES To ANY →

Exit to Appropriate Treatment Protocol. If YES to ANY question.

Sources: https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-for-ems.html

ENVIRONMENTAL / OTHER

EMS Non-Transport COVID-19 Guidance

If additional guidance is needed or questions arise you are free to contact the DHEC Care Line: 855.472.3432

The following hospital systems have available TeleHealth capabilities as additional resource:

PRISMA Health:	Roper St. Francis:	MUSC Health:	McLeod Health:
https://www.prismahealth.org/virtual-visit/	https://www/rsfh.com/virtualcare/	https://campaigns.muschealth.org/virtual-care/index.html	https://www.mcleodhealth.org/services/care/telehealth/

For use of these Telehealth services use the promo code: *COVID19*

ENVIRONMENTAL / OTHER

Pearls:

- First Responder Agencies should limit response to these COVID-19 calls to reduce the risk of exposure and usage of critical PPE.
- It is recommended that agencies that continue to First Respond stage prior to entering the scene and await the arrival of EMS personnel unless patient status is unknown or critical in nature. It is imperative to limit exposure and minimize the use of PPE.

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12 Lead ECG

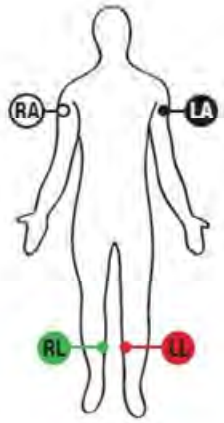
B	EMT	B
A	Advanced EMT	A

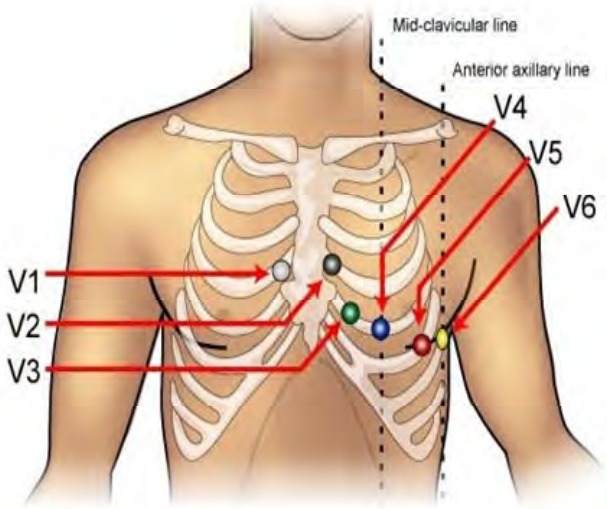
Clinical Indications:

- Suspected cardiac patient
- Electrical injuries
- Syncope

Procedure:

1. Assess patient and monitor cardiac status.
2. Administer oxygen as patient condition warrants.
3. If patient is unstable, definitive treatment is the priority. If patient is stable or stabilized after treatment, perform a 12 Lead ECG.
4. Prepare ECG monitor and connect patient cable with electrodes.
5. Enter the required patient information (patient name, etc.) into the 12 lead ECG device.
6. Expose chest and prep as necessary. Modesty of the patient should be respected.
7. Apply chest leads and extremity leads using the following landmarks:





- RA -Right arm
- LA -Left arm
- RL -Right leg
- LL -Left leg
- V1 -4th intercostal space at right sternal border
- V2 -4th intercostal space at left sternal border
- V3 -Directly between V2 and V4
- V4 -5th intercostal space at midclavicular line
- V5 -Level with V4 at left anterior axillary line
- V6 -Level with V5 at left midaxillary line

8. Instruct patient to remain still.
9. Press the appropriate button to acquire the 12 Lead ECG.
10. If the monitor detects signal noise (such as patient motion or a disconnected electrode), the lead acquisition will be interrupted until the noise is removed.
11. Once acquired, transmit the ECG data by fax to the appropriate hospital.
12. Contact the receiving hospital to notify them that a 12 Lead ECG has been sent.
13. Monitor the patient while continuing with the treatment protocol.
14. Download data as per guidelines and attach a copy of the 12 lead to the PCR.
15. Document the procedure, time, and results on/with the patient care report (PCR)

Airway: BIAD King

B	EMT	B
A	Advanced EMT	A

Clinical Indications:

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- Appropriate intubation is impossible due to patient access or difficult airway anatomy.
- Inability to secure an endotracheal tube in a patient who does not have a gag reflex where at least one failed intubation attempt has occurred.
- Patient must be unconscious.

Procedure:

1. Preoxygenate and hyperventilate the patient.
2. Select the appropriate tube size for the patient.
3. Lubricate the tube.
4. Grasp the patient's tongue and jaw with your gloved hand and pull forward.
5. Gently insert the tube rotated laterally 45-90 degrees so that the blue orientation line is touching the corner of the mouth. Once the tip is at the base of the tongue, rotate the tube back to midline. Insert the airway until the base of the connector is in line with the teeth and gums.
6. Inflate the pilot balloon with 45-90 ml of air depending on the size of the device used.
7. Ventilate the patient while gently withdrawing the airway until the patient is easily ventilated.
8. Auscultate for breath sounds and sounds over the epigastrium and look for the chest to rise and fall.
9. The large pharyngeal balloon secures the device.
10. Confirm tube placement using end-tidal CO2 detector.
11. It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.
12. It is strongly recommended that an Airway Evaluation Form be completed with any BIAD use.

Airway: CPAP

B	EMT	B
A	Advanced EMT	A

Clinical Indications:
CPAP is indicated in all patients whom inadequate ventilation is suspected that is not associated with Asthma. This could be as a result of pulmonary edema, pneumonia, COPD, etc.

Procedure:
1. Ensure adequate oxygen supply to ventilation device.
2. Explain the procedure to the patient.
3. Consider placement of a nasopharyngeal airway.
4. Place the delivery mask over the mouth and nose. Oxygen should be flowing through the device at this point.
5. Secure the mask with provided straps starting with the lower straps until minimal air leak occurs.
6. If the Positive End Expiratory Pressure (PEEP) is adjustable on the CPAP device adjust the PEEP beginning at 0 cmH20 of pressure and slowly titrate to achieve a positive pressure as follows:
   - o 5 – 10 cmH20 for Pulmonary Edema, Near Drowning, possible aspiration or pneumonia
   - o 3 – 5 cm H20 for COPD
7. Evaluate the response of the patient assessing breath sounds, oxygen saturation, and general appearance.
8. Titrate oxygen levels to the patient's response. Many patients respond to lower FIO2 (30-50%).
9. Encourage the patient to allow forced ventilation to occur. Observe closely for signs of complications. The patient must be breathing for optimal use of the CPAP device.
10. Document time and response on patient care report (PCR).

Airway: Foreign Body Obstruction

B	EMT	B
A	Advanced EMT	A

Clinical 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
   - Do not interfere with a mild obstruction allowing the patient to clear their airway by coughing.
   - In severe foreign-body obstructions, the patient may not be able to make a sound. The victim my 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.
   - First, subdiaphragmatic abdominal thrusts (Heimlich Maneuver) should be used in rapid sequence until the obstruction is relieved.
   - 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, If available EMT-Intermediate and EMT-Paramedic level professionals should visualize the posterior pharynx with a laryngoscope to potentially identify and remove the foreign-body using Magil forceps.
8. Document the methods used and result of these procedures in the patient care report (PCR).

Airway: End-Tidal CO_2 Detector

B	EMT	B
A	Advanced EMT	A

Clinical Indications:
The End-Tidal CO2 detector shall be used with any Endotracheal Tube or Blind Insertion Airway Device use.

It is strongly recommended that if available continuous Capnography be used in place of or in addition to the use of an End-Tidal CO2 detector.

Procedure:
1. Attach End-Tidal CO2 detector to the Blind Insertion Airway Device or the Endotracheal Tube.
2. Note color change. A color change or CO2 detection will be documented on each respiratory failure or cardiac arrest patient.
3. The CO2 detector shall remain in place with the airway and monitored throughout the prehospital care and transport unless/until continuous Capnography is used. Any loss of CO2 detection or color change is to be documented and monitored as procedures are done to verify or correct the airway problem.
4. Tube placement should be verified frequently and always with each patient move or loss of color change in the End-Tidal CO2 detector.
5. Document the procedure and the results on/with the Patient Care Report (PCR) as well as on the Airway Evaluation Form.

Airway: Nebulizer Inhalation Therapy

B	EMT	B
A	Advanced EMT	A

Clinical Indications:
Patients experiencing bronchospasm.

Procedure:
1. Gather the necessary equipment.
2. Assemble the nebulizer kit.
3. Instill the premixed drug (Albuterol) into the reservoir well of the nebulizer.
4. Connect the nebulizer device to oxygen at 4 - 6 liters per minute or adequate flow to produce a steady, visible mist.
5. Instruct the patient to inhale normally through the mouthpiece of the nebulizer. The patient needs to have a good lip seal around the mouthpiece.
6. The treatment should last until the solution is depleted. Tapping the reservoir well near the end of the treatment will assist in utilizing all of the solution.
7. Monitor the patient for medication effects. This should include the patient's assessment of his/her response to the treatment and reassessment of vital signs, and breath sounds.
8. Assess and document peak flows before and after nebulizer treatments.
9. Document the treatment, dose, and route on/with the patient care report (PCR).

Airway: Suctioning

B	EMT	B
A	Advanced EMT	A

Clinical Indications:
Obstruction of the airway (secondary to secretions, blood, or any other substance) in a patient who cannot maintain or keep the airway clear.

Procedure:
1. Ensure suction device is in proper working order with suction tip in place.
2. Preoxygenate the patient as is possible.
3. Explain the procedure to the patient if they are coherent.
4. Examine the oropharynx and remove any potential foreign bodies or material which mayocclude the airway if dislodged by the suction device.
5. If applicable, remove ventilation devices from the airway.
6. Use the suction device for no more than 30 seconds to remove any secretions, blood, or other substance.
7. The alert patient may assist with this procedure.
8. Reattach ventilation device (e.g., bag-valve mask) and ventilate or assist the patient
9. Record the time and result of the suctioning in the patient care report (PCR).

Assessment: Adult

B	EMT	B
A	Advanced EMT	A

Clinical Indications:
Any patient requesting a medical evaluation that is too large to be measured with a BroselowLuten Resuscitation Tape.

Procedure:
1. Scene size-up, including universal precautions, scene safety, environmental hazards assessment, need for additional resources, by-stander safety, and patient/caregiver interaction
2. Assess need for additional resources.
3. Initial assessment includes a general impression as well as the status of a patient's airway, breathing, and circulation.
4. Assess mental status (e.g., AVPU) and disability (e.g., GCS).
5. Control major hemorrhage and assess overall priority of patient.
6. Perform a focused history and physical based on patient's chief complaint.
7. Assess need for critical interventions.
8. Complete critical interventions and perform a complete secondary exam to include a baseline set of vital signs as directed by protocol.
9. Document all findings and information associated with the assessment, performed procedures, and any administration of medications on the PCR.

Assessment: Pediatric

B	EMT	B
A	Advanced EMT	A

Clinical Indications:
Any child that can be measured with the Broselow-Luten Resuscitation Tape.

Procedure:
1. Scene size-up, including universal precautions, scene safety, environmental hazards assessment, need for additional resources, by-stander safety, and patient/caregiver interaction
2. Assess patient using the pediatric triangle of ABCs:
- Airway and appearance: speech/cry, muscle tone, inter-activeness, look/gaze, movement of extremities
- Work of breathing: absent or abnormal airway sounds, use of accessory muscles, nasal flaring, body positioning
- Circulation to skin: pallor, mottling, cyanosis

3. Establish spinal immobilization if suspicion of spinal injury
4. Establish responsiveness appropriate for age (AVPU, GCS, etc.)
5. Color code using Broselow-Luten tape if available
6. Assess disability (pulse, motor function, sensory function, papillary reaction)
7. Perform a focused history and physical exam. Recall that pediatric patients easily experience hypothermia and thus should not be left uncovered any longer than necessary to perform an exam.
8. Record vital signs (BP > 3 years of age, cap refill < 3 years of age)
9. Include Immunizations, Allergies, Medications, Past Medical History, last meal, and events leading up to injury or illness where appropriate.
10. Treat chief complaint as per protocol

Blood Glucose Analysis

B	EMT	B
A	Advanced EMT	A

Clinical Indications:
Patients with suspected hypoglycemia
(diabetic emergencies, change in mental status,
bizarre behavior, etc.)

Procedure:
1. Gather and prepare equipment.
2. Blood samples for performing glucose analysis must be obtained through a finger-stick.
3. Place correct amount of blood on reagent strip or site on glucometer per the manufacturer's instructions.
4. Time the analysis as instructed by the manufacturer.
5. Document the glucometer reading and treat the patient as indicated by the analysis and protocol.
6. Repeat glucose analysis as indicated for reassessment after treatment and as per protocol.
7. 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.

Standard Procedure (skill)

Cardiopulmonary Resuscitation

B	EMT	B
A	Advanced EMT	A

Clinical Indications: Basic life support for the patient in cardiac arrest

Procedure:

1. Assess the patient's level of responsiveness (shake and shout)
2. If no response, open the patient's airway with the head-tilt, chin-lift and look, listen, and feel for respiratory effort. If the patient may have sustained C-spine trauma, use the modified jaw thrust while maintaining immobilization of the C-spine. For infants, positioning the head in the sniffing position is the most effective method for opening the airway
3. If patient is an adult, go to step 4. If no respiratory effort in a pediatric patient, give two ventilations. If air moves successfully, go to step 4. If air movement fails, proceed to the Airway Obstruction Procedure.
4. Check for pulse (carotid for adults and older children, brachial for infants) for at least 10 seconds. If no pulse, begin chest compressions based on chart below:

Age	Location	Depth	Rate
Infant	Over sternum, between nipples (inter-mammary line), 2-3 fingers	0.5 to 1 inch (1/3 the anterior-posterior chest dimension)	At least 100/minute
Child	Over sternum, just cephalad from xyphoid process, heel of one hand	1 to 1.5 inches (1/3 the anterior-posterior chest dimension)	80 to 100/minute (3 compressions every 2 seconds)
Adult	Over sternum, just cephalad from xyphoid process, hands with interlocked fingers	1.5 to 2 inches (1/3 the anterior-posterior chest dimension)	80 to 100/minute (3 compressions every 2 seconds)

5. Go to Cardiac Arrest Procedure. Begin ventilations in the adult as directed in the Cardiac Arrest Procedure
6. Provide no more than 12 breaths per minute with the BVM. Use EtCO2 to guide your ventilations as directed in the Cardiac Arrest Protocol.
7. Chest compressions should be provided in an uninterrupted manner. Only brief interruptions are allowed for rhythm analysis, defibrillation, and performance of procedures
8. Document the time and procedure in the Patient Care Report (PCR).

Childbirth

B	EMT	B
A	Advanced EMT	A

Clinical Indications: Imminent delivery with crowning

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 for 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. Suction the airway with a bulb syringe.
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 Protocol 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.

Decontamination

B	EMT	B
A	Advanced EMT	A

Clinical Indications: Any patient who may have been exposed to significant hazardous materials, including chemical, biological, or radiological weapons.

Procedure:

1. In coordination with HazMAT and other Emergency Management personnel, establish hot, warm and cold zones of operation.
2. Ensure that personnel assigned to operate within each zone have proper personal protective equipment.
3. In coordination with other public safety personnel, assure each patient from the hot zone undergoes appropriate initial decontamination. This is specific to each incident; such decontamination may include:
   - Removal of patients from Hot Zone
   - Simple removal of clothing Irrigation of eyes
   - Passage through high-volume water bath (e.g., between two fire apparatus) for patients contaminated with liquids or certain solids. Patients exposed to gases, vapors, and powders often will not require this step as it may unnecessarily delay treatment and/or increase dermal absorption of the agent(s).
4. Initial triage of patients should occur after step #3. Immediate life threats should be addressed prior to technical decontamination.
5. Assist patients with technical decontamination (unless contraindicated based on 3 above). This may include removal of all clothing and gentle cleansing with soap and water. All body areas should be thoroughly cleansed, although overly harsh scrubbing which could break the skin should be avoided.
6. Place triage identification on each patient. Match triage information with each patient's personal belongings which were removed during technical decontamination. Preserve these personnel affects for law enforcement.
7. Monitor all patients for environmental illness.
8. Transport patients per local protocol.

Automated Defibrillation

B	EMT	B
A	Advanced EMT	A

Clinical Indications: Patients in cardiac arrest (pulseless, non-breathing).Age < 8 years, use Pediatric Pads if available.

Contraindication:

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. Use alternate placement when implanted devices (pacemakers, AICDs) occupy preferred pad positions.
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 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. Adequate CPR is a key to successful resuscitation.
13. If pulse returns please use the Post Resuscitation Protocol

Spinal Immobilization

B	EMT	B
A	Advanced EMT	A

Clinical Indications: Need for spinal immobilization as determined by protocol

Procedure:

1. Gather a backboard, straps, C-collar appropriate for patient's size, tape, and head rolls or similar device to secure the head.
2. Explain the procedure to the patient
3. Place the patient in an appropriately sized C-collar while maintaining in-line stabilization of the C-spine. This stabilization, to be provided by a second rescuer, should not involve traction or tension but rather simply maintaining the head in a neutral, midline position while the first rescuer applies the collar.
4. Once the collar is secure, the second rescuer should maintain their position to ensure stabilization (the collar is helpful but will not do the job by itself.)
5. Place the patient on a long spine board with the log-roll technique if the patient is supine or prone. For the patient in a vehicle or otherwise unable to be placed prone or supine, place them on a backboard by the safest method available that allows maintenance of in-line spinal stability.
6. Stabilize the patient with straps and head rolls/tape or other similar device. Once the head is secured to the backboard, the second rescuer may release manual in-line stabilization.
7. NOTE: Some patients, due to size or age, will not be able to be immobilized through in-line stabilization with standard backboards and C-collars. Never force a patient into a non-neutral position to immobilize them. Such situations may require a second rescuer to maintain manual stabilization throughout the transport to the hospital.
8. Document the time of the procedure in the patient care report (PCR).

Splinting

B	EMT	B
A	Advanced EMT	A

Clinical Indications:
Immobilization of an extremity for transport, either due to Suspected fracture, sprain, or injury. Immobilization of an extremity for transport to secure medically necessary devices such as intravenous catheters

Procedure:

1. Assess and document pulses, sensation, and motor function prior to placement of the splint. If no pulses are present and a fracture is suspected, consider reduction of the fracture prior to placement of the splint.
2. Remove all clothing from the extremity.
3. Select a site to secure the splint both proximal and distal to the area of suspected injury, or the area where the medical device will be placed.
4. Do not secure the splint directly over the injury or device.
5. Place the splint and secure with Velcro, straps, or bandage material (e.g., kling, kerlex, cloth bandage, etc.) depending on the splint manufacturer and design.
6. Document pulses, sensation, and motor function after placement of the splint. If there has been a deterioration in any of these 3 parameters, remove the splint and reassess
7. If a femur fracture is suspected and there is no evidence of pelvic fracture or instability, the following procedure may be followed for placement of a femoral traction splint:
   - Assess neurovascular function as in #1 above.
   - Place the ankle device over the ankle.
   - Place the proximal end of the traction splint on the posterior side of the affected extremity, being careful to avoid placing too much pressure on genitalia or open wounds. Make certain the splint extends proximal to the suspected fracture. If the splint will not extend in such a manner, reassess possible involvement of the pelvis
   - Extend the distal end of the splint at least 6 inches beyond the foot.
   - Attach the ankle device to the traction crank.
   - Twist until moderate resistance is met.
   - Reassess alignment, pulses, sensation, and motor function. If there has been deterioration in any of these 3 parameters, release traction and reassess.
8. Document the time, type of splint, and the pre and post assessment of pulse, sensation, and motor function in the patient care report (PCR).

Stroke Screen

B	EMT	B
A	Advanced EMT	A

ITEM	Instruction	Result	Score	NIHSS Equivalent
Facial Palsy	Ask patient to show their teeth (smile)	**Absent** (symmetrical movement) **Mild** (slight asymmetrical) **Moderate to Severe** (completely asymmetrical)	**0** **1** **2**	0-3
Arm Motor Function	Extending the arm of the patient 90° (if sitting) or 45° (if supine)	**Normal** to **Mild** (limb upheld more than **10** seconds) **Moderate** (limb upheld less than **10** seconds) **Severe** (patient unable to raise arm against gravity)	**0** **1** **2**	0-4
Leg Motor Function	Extending the leg of the patient 30° (in supine)	**Normal** to **Mild** (limb upheld more than **5** seconds) **Moderate** (limb upheld less than **5** seconds) **Severe** (patient unable to raise leg against gravity)	**0** **1** **2**	0-4
Head & Gaze Deviation	Observe eyes and head deviation to one side	**Absent** (eye movements to both sides were possible and no head deviation was observed) **Present** (eyes and head deviation to one side was observed)	**0** **1**	0-2
Aphasia (R side)	Difficulty understanding spoken or written words. Ask patient to follow two simple commands: 1. Close your eyes. 2. Make a fist.	**Normal** (performs both tasks requested correctly) **Moderate** (performs only 1 of 2 tasks requested correctly) **Severe** (Cannot perform either task requested correctly)	**0** **1** **2**	0-2
Agnosia (L side)	Inability to recognize familiar objects. Ask patient: 1. "Whose arm is this?" (while showing the affected arm) 2. "Can you move your arm?"	**Normal** (recognizes arm, and attempts to move arm) **Moderate** (does not recognize arm **or** is unaware of arm) **Severe** (does not recognize arm **and** is unaware of arm)	**0** **1** **2**	0-2

Venous Access – External Jugular

B	EMT	B
A	Advanced EMT	A

Clinical Indications:

External jugular vein cannulation is indicated in a critically ill patient ≥ 8 years of age who requires intravenous access for fluid or medication administration and in whom an extremity vein is not obtainable.

External jugular cannulation can be attempted initially in life threatening events where no obvious peripheral site is noted.

Procedure:

1. Place the patient in a supine head down position. This helps distend the vein and prevents air embolism.
2. Turn the patient's head toward the opposite side if no risk of cervical injury exists.
3. Prep the site as per peripheral IV site.
4. Align the catheter with the vein and aim toward the same side shoulder.
5. "Tourniqueting" the vein lightly with one finger above the clavicle, puncture the vein midway between the angle of the jaw and the clavicle and cannulate the vein in the usual method.
6. Attach the IV and secure the catheter avoiding circumferential dressing or taping.
7. Document the procedure, time, and result (success) on/with the patient care report (PCR).

Venous Access – Extremity

B	EMT	B
A	Advanced EMT	A

Clinical Indications: Any patient where intravenous access is indicated (significant trauma or mechanism, Emergent or potentially emergent medical condition).

Procedure:

1. Saline locks may be used as an alternative to an IV tubing and IV fluid in every protocol at the discretion of the ALS professional.
2. Use intraosseous access where threat to life exists as provided for in the Venous AccessIntraosseous procedure.
3. Use the largest catheter bore necessary based upon the patient's condition and size of veins.
4. Fluid and setup choice is preferably:
Lactated Ringers with a macro drip (10 gtt/cc) for trauma or hypovolemia.
Normal Saline with a macro drip (10 gtt/cc) for medical conditions, and
Normal Saline with a micro drip (60 gtt/cc) for medication infusions.
5. Inspect the IV solution for expiration date, cloudiness, discoloration, leaks, or the presence of particles.
6. Connect IV tubing to the solution in a sterile manner. Fill the drip chamber half full and then flush the tubing bleeding all air bubbles from the line.
7. Place a tourniquet around the patient's extremity to restrict venous flow only.
8. Select a vein and an appropriate gauge catheter for the vein and the patient's condition.
9. Prep the skin with an antiseptic solution.
10. Insert the needle with the bevel up into the skin in a steady, deliberate motion until the bloody flashback is visualized in the catheter.
11. Advance the catheter into the vein. Never reinsert the needle through the catheter. Dispose of the needle into the proper container without recapping.
12. Remove the tourniquet and connect the IV tubing or saline lock.
13. Open the IV to assure free flow of the fluid and then adjust the flow rate as per protocol or as clinically indicated.
Rates are preferably:
Adult: KVO: 60 cc/hr (1 gtt/ 6 sec for a macro drip set)
Pediatric: KVO: 30 cc/hr (1 gtt/ 12 sec for a macro drip set)
If shock is present:
Adult: 500 cc fluid boluses repeated as long as lungs are dry and BP < 90.
Consider a second IV line.
Pediatric: 20 cc/kg blouses repeated PRN for poor perfusion.
14. Secure the IV and tubing.
15. Document the procedure, time and result (success) on/with the patient care report (PCR).

Venous Access – Intraosseous

B	EMT	B
A	Advanced EMT	A

Clinical Indications: Patients where rapid, regular IV access is unavailable with any of the following: Cardiac arrest. Multisystem trauma with severe hypovolemia. Severe dehydration with vascular collapse and/or loss of consciousness. Respiratory failure / Respiratory arrest.

Contraindications:

Fracture proximal to proposed intraosseous site.
History of Osteogenesis Imperfecta
Current or prior infection at proposed intraosseous site.
Previous intraosseous insertion or joint replacement at the selected site.

Procedure:

1. Don personal protective equipment (gloves, eye protection, etc.).
2. Identify anteromedial aspect of the proximal tibia (bony prominence below the knee cap). The insertion location will be 1-2 cm (2 finger widths) below this. If this site is not suitable, and patient >12 years of age, identify the anteriormedial aspect of the distal tibia (2 cm proximal to the medial malleolus).
3. Prep the site recommended by the device manufacturer with providone-iodine ointment or solution.
4. For manual pediatric devices, hold the intraosseous needle at a 60 to 90 degree angle, aimed away from the nearby joint and epiphyseal plate, twist the needle handle with a rotating grinding motion applying controlled downward force until a “pop” or “give” is felt indicating loss of resistance. Do not advance the needle any further.
5. For the EZ-IO intraosseous device, hold the intraosseous needle at a 60 to 90 degree angle, aimed away from the nearby joint and epiphyseal plate, power the driver until a “pop” or “give” is felt indicating loss of resistance. Do not advance the needle any further.
6. For the Bone Injection Gun (BIG), find and mark the manufacturers recommended site. Position the device and pull out the safety latch. Trigger the BIG at 90° to the surface and remove the injection device.
7. Remove the stylette and place in an approved sharps container.
8. Attach a syringe filled with at least 5 cc NS; aspirate bone marrow for manual devices only, to verify placement; then inject at least 5 cc of NS to clear the lumen of the needle.
9. Attach the IV line and adjust flow rate.
10. Stabilize and secure the needle with dressings and tape.
11. Following the administration of any IO medications, flush the IO line with 10 cc of IV fluid.
13. Document the procedure, time, and result (success) on/with the patient care report (PCR).

Venous Access – Intraosseous

B	EMT	B
A	Advanced EMT	A

Clinical Indications: When medication administration is necessary and the medication must be given via the SQ (not auto-injector) or IM route or as an alternative route in selected medications.

Procedure:

1. Receive and confirm medication order or perform according to standing orders.
2. Prepare equipment and medication expelling air from the syringe.
3. Explain the procedure to the patient and reconfirm patient allergies.
4. The most common site for subcutaneous injection is the arm.
Injection volume should not exceed 1 cc.
5. The possible injection sites for intramuscular injections include the arm, buttock and thigh.
Injection volume should not exceed 1 cc for the arm
Injection volume should not exceed 2 cc in the thigh or buttock.
6. The thigh should be used for injections in pediatric patients and injection volume should not exceed 1 cc.
7. Expose the selected area and cleanse the injection site with alcohol.
8. Insert the needle into the skin with a smooth, steady motion
SQ: 45-degree angle
IM: 90-degree angle skin pinched skin flattened
9. Aspirate for blood
10. Inject the medication.
11. Withdraw the needle quickly and dispose of properly without recapping.
12. Apply pressure to the site.
13. Monitor the patient for the desired therapeutic effects as well as any possible side effects.
14. Document the medication, dose, route, and time on/with the patient care report (PCR).

Wound Care – Tourniquet

B	EMT	B
A	Advanced EMT	A

Clinical Indications:
Life threatening extremity hemorrhage that can not be controlled by other means.
Serious or life threatening extremity hemorrhage and tactical considerations prevent the use of standard hemorrhage control techniques.

Contraindications:
Non-extremity hemorrhage
Proximal extremity location where tourniquet application is not practical

Procedure:
1. Place tourniquet proximal to wound
2. Tighten per manufacturer instructions until hemorrhage stops and/or distal pulses in affected extremity disappear.
3. Secure tourniquet per manufacturer instructions
4. Note time of tourniquet application and communicate this to receiving care providers
5. Dress wounds per standard wound care protocol
6. Apply a second tourniquet proximal to the first tourniquets placement.

Capnography

B	EMT	B
A	Advanced EMT	A

Clinical Indications: Capnography shall be used when available with the use of all invasive airway procedures Blind Insertion Airway Devices (BIAD).
Capnography should also be used when possible with CPAP.

Procedure:

1. Attach capnography sensor to the BIAD, endotracheal tube, or oxygen delivery device.
2. Note CO2 level and waveform changes. These will be documented on each respiratory failure, cardiac arrest, or respiratory distress patient.
3. The capnometer shall remain in place with the airway and be monitored throughout the prehospital care and transport.
4. Any loss of CO2 detection or waveform indicates an airway problem and should be documented.
5. The capnogram should be monitored as procedures are performed to verify or correct the airway problem.
6. Document the procedure and results on/with the Patient Care Report (PCR) and the Airway Evaluation Form.