

Dane County EMS System



Policies

Adult Medical

Adult Trauma

Procedures

Pharmaceuticals

Peds Medical

Peds Trauma

Resources

Protocols, Policies & Procedures 2022-2024

EMR / EMT / A-EMT / Paramedic

Madison and Dane County Community Resources

Call 2-1-1 any time for information about almost anything related to health and human services.

You can also visit <http://www.211wisconsin.org> or <https://www.danecountyhumanservices.org>

Aging and Disability Resource Center (<http://www.daneadrc.org/>)..... 608-240-7400
Free information and assistance for adults aged 60+ and people with disabilities

Drug Abuse and Addiction Resources

Parent Addiction Network of Dane County (<http://www.safercommunity.net/parent-addiction-network-home/>)..... 608-441-3060
Resources for family and friends of people battling drug addiction
Dane County Behavioral Resource Specialist..... 608-242-6461

Clothing/Winter Jackets (Free)

Community Action Coalition (<http://www.cacscw.org/winterglow/>)..... 608-246-4730, ext. 216

Dane County Human Services (<https://www.dcdhs.com/>)..... 608-242-6200

Provides protection of children and adults at risk mental health and substance abuse services; services and transportation for older adults and people with disabilities; and financial assistance

Domestic Abuse Intervention Services (<http://abuseintervention.org/>)..... 608-251-4445

Assistance for individuals in abusive relationships

Economic Assistance

Dane County Job Center (<https://www.scwijobs.com/>)..... 608-405-4400

Food Pantries and Meal Locations..... 2-1-1

Health Care Coverage

Dane County Job Center-Income Maintenance Agency (<https://access.wisconsin.gov/access/>)..... 800-362-3002

Application assistance for BadgerCare / Medicaid and food stamps

Covering Wisconsin (<https://coveringwi.org/>)..... 608-262-2618

Application assistance for Affordable Care Act ("Obamacare") health care plans

Home Health, Hospice Care, Medical Equipment and Supplies..... 2-1-1

If you have insurance, contact your provider and/or insurance company

Aging and Disability Resource Center (<http://www.daneadrc.org/>)..... 608-240-7400

Homeless Services and Shelters

Housing Crisis Hotline (Community Action Coalition)..... 608-237-1255

Porchlight, Inc. (<http://porchlightinc.org>)..... 608-257-2534

YWCA (<https://ywcamadison.org>)..... 608-257-1436

Salvation Army (<http://www.salvationarmydanecounty.org/>)..... 608-250-2203

The Road Home (family support) (<http://trhome.org/>)..... 608-294-7998

Dental Care

Public Health Madison and Dane County Dental Line..... 608-243-0354

Housing (Public and Subsidized)

Madison Housing Authority (<https://www.cityofmadison.com/dpced/housing/>)..... 608-266-4675

Dane County Housing Authority (<http://www.dcha.net/>)..... 608-224-3636

Mental Health Services If you have health insurance, contact your provider and/or insurance company

Recovery Dane..... 608-237-1661

Journey Mental Health Center (<http://www.journeymhc.org/>)..... 608-280-2700

Mental Health Crisis Line (24 hours per day)..... 608-280-2600

Parental Stress Line (8am – 10pm daily)..... 608-241-2221

RISE Wisconsin Emergency and Crisis Child Care (24 hours per day)..... 608-244-5700

Transportation

Dane County Transportation Services (<https://danecountyhumanservices.org/Disability-and-Aging/Transportation/Community-Access-Transportation>)..... 608-242-6489

Madison Metro Transit and Paratransit (<https://cityofmadison.com/metro/> ; <https://www.cityofmadison.com/metro/paratransit/>)

BadgerCare / Medicaid (<https://www.dhs.wisconsin.gov/nemt/index.htm>)..... 800-362-3002

Medical Emergency : Call 9-1-1

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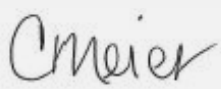
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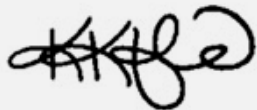
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Authorization:

In accordance with Wisconsin Statute 256 and Chapter 110 of the Wisconsin Administrative Code, effective April 15, 2022, the following medical protocols are authorized by the Dane County EMS Medical Director for use in the County. Changes to these protocols can be made only with the authorization of the Medical Director.



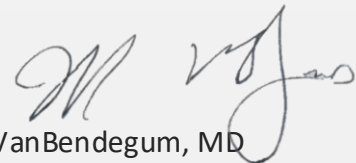
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Introduction:

The Dane County EMS Protocols contained within this document are intended to provide and ensure uniform treatment for all patients who receive care from EMS Agencies and Providers participating in the Dane County EMS System. These protocols apply exclusively to agencies responding via the 9-1-1 System within the County. Any other use must receive prior approval from the Medical Director of Dane County EMS.

These protocols are the direct result of countless hours reviewing evidence-based guidelines, historically proven treatments and the best practices of EMS Systems recognized as leaders in the nation. We sincerely hope that this document will be viewed as an invaluable tool for learning, teaching and reference so that the Dane County EMS System may continue to provide the highest quality of out-of-hospital care. Although we have attempted to address all patient care scenarios, it is possible that unforeseen circumstances and patient care needs will arise. In these situations, the EMS Provider should rely on their education, experience and clinical judgment combined with the principle of patient centered care to achieve optimal results. As always, On-Line Medical Control is available for consultation and assistance with patients, scenarios or presentations that do not fall within the scope of this document.

Acknowledgements:

The protocols contained within this document have been extensively reviewed not only by the Dane County EMS Office, but by the Dane County Medical Advisory Subcommittee and representatives from all aspects of the local medical community. They are intended to create a seamless and consistent treatment plan across provider levels, and have been evaluated for applicability as well as internal consistency. While they may not be perfect, it is our sincere hope that this document is viewed as the most complete and robust protocol set possible, and that they meet or exceed the standard set by the top EMS Services in the nation. The Office would like to specifically acknowledge the following individuals and groups for their contributions to this document.

- Dane County EMS Commission
- Dane County Medical Advisory Subcommittee
- UW ALS Consortium
- Meriter Hospital
- St. Mary’s Hospital
- William S. Middleton Memorial Veterans Hospital
- Stoughton Hospital
- University of Wisconsin Hospitals and Clinics
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- Dr. J. Brent Myers
- Tom Ellison
- Dr. Luke Bradbury
- Dr. Katherine Darr
- Chris Carbon

The Dane County Protocol Workgroup (ALL Of You!!)


“Don’t judge each day by the harvest you reap, but by the seeds that you plant.”

-Robert Louis Stevenson


Guidelines for Use of Protocols:


In general, the protocols are divided into Adult and Pediatric sections, with subheadings for Medical and Trauma. For pediatric patients, the appropriate pediatric-specific protocol should be used if one exists. If there is no pediatric-specific protocol for a condition, use the adult protocol but use weight-based dosing for medications. The adult dose of a medication should never be exceeded for a pediatric patient.

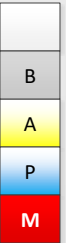
There have been a great many changes from previous versions of the Dane County EMS Protocols. While the core of the protocols remains the same – to provide the highest level of patient centered care possible – this protocol book may almost be viewed as a completely new document. A summary of the major formatting changes appears below this paragraph, but it is not a replacement for careful study of the protocol book itself. Please take the time to orient yourself and become familiar with the look and flow of the content.

 In order to make the flowcharts easier to read, a standardized presentation has been adopted. For circumstances where an EMS Provider needs to make a decision, the question appears in a diamond-shaped box with the answers coming off in separate, usually opposite directions. For simplicity, every attempt was made to make these “yes/no” or dichotomous decisions whenever possible.

 When an EMS Provider is referenced to another **PROTOCOL** within the book, the name of the Protocol appears in a rectangular box, with a lime-green shadow.

 If there is a bi-directional arrow referencing another **PROTOCOL**, the intention is that the EMS Provider returns to the current Protocol after a critical assessment or treatment is completed in the referenced Protocol. For example, a bi-directional arrow referencing the Airway Management, Adult Protocol would imply that after the airway has been addressed that the Provider return to the current Protocol for further evaluation and patient management.

 When an EMS Provider is referenced to a **PROCEDURE** within the book, the name of the Procedure appears in a rectangular box, with a purple shadow.

 When medications are referenced in the Protocol, they are coded to the level of the EMS Provider with a key attached to the left side of the medication box. Procedures and medications that are in the scope of EMR providers have a **CLEAR** box attached to the left side, EMTs have a **GRAY** box with the letter B, Advanced EMTs have a **YELLOW** box with the letter A and Paramedics have a **BLUE** box with the letter P. Any time Medical Control must be contacted for approval or authorization, the key is **RED** with the letter M. The Legend appears in the top left corner of all Protocols for reference. Rather than have multiple boxes attached to each medication, the supposition is that all providers credentialed at a level *higher than the key are authorized* to administer the medication. For example, albuterol has a clear box in the key and is authorized for the EMR, EMT, Advanced EMT *and* Paramedic.

Under the heading for each Protocol, there are two sections immediately below entitled, “Pertinent Positives and Negatives” and “Differential”. These boxes are meant to be a guide to assist with the pertinent historical information as well as a reminder of the multiple potential causes for a patient presentation that should be considered by the EMS Provider. It is expected that these elements be considered in the patient evaluation and appear in the documentation for the call.

Finally, the “Pearls” section at the bottom of the page provides further guidance as well as some tips to keep in mind when assessing patients and scenes. It is impossible to condense all of Emergency Medicine into a single page flow chart, but the pearls section allows for expanded medical advice, dosages and descriptions of special situations. Please study these sections along with the rest of the flowcharts – there is likely something to learn on every page!

These protocols are the basis of the care we provide. Combined with your experience and education, this document should help you provide patient care that rivals the best in the world.

Dedication:

These protocols are dedicated to **you**, the EMS Providers of Dane County. It is your tireless dedication, commitment to continuous improvement and solemn promise to care for the sick and injured that makes Dane County, Wisconsin the special community that it is. While missed time with family and friends comes too often and the 'thank you's' come far too infrequently, please know that your time and efforts are sincerely appreciated.

Some people spend a lifetime wondering if they made a difference in the world; you don't have that problem.

EMS, Fire and Law Enforcement Honor Guards:

Lastly, we would like to acknowledge all of the EMS, Fire and Law Enforcement Honor Guards within Dane County, who ensure that fallen members of the EMS profession are given the honor, respect and dignity they deserve for the vital service in public safety they so willingly provided to their communities. Thank you for honoring those who have dedicated their lives to others.

"Use your skills, your knowledge, your instincts to serve – to go change the world in the way that only you can."

-Robert F. Smith



	EMR
B	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Medical Transport Destination

Purpose:

To provide guidelines for the transport of patients with Time Critical Diagnoses (TCDs) to the most appropriate facility that can provide definitive level care.

Policy:

When feasible, patients AND/OR their healthcare power of attorney should be permitted to make autonomous decisions regarding their destination hospital, and given the opportunity to choose. Occasionally, patients may need to be directed away from their preferred institution in favor of a specialty resource center, which can provide advanced levels of care not available at every hospital. In those instances, the EMS Provider’s decision should be calmly and respectfully communicated to the patient and their family. By keeping a patient-centered focus and always working to do what is right for the patient, transport to the most appropriate level of care will hopefully be an obvious decision. At the time of publication, the following centers have achieved the appropriate level of credentialing for each of the Time Critical Diagnoses (TCDs) and Specialty Resource Center listed:

<p>Comprehensive Stroke Center: UW Hospital – Main Campus</p>	<p>Primary Stroke Center: Mercy Hospital – Janesville Meriter Hospital St. Mary’s – Madison VA Hospital</p>	<p>Acute Stroke Ready (CT and tPA Only): Fort Memorial Hospital – Ft. Atkinson The Richland Hospital – Richland Center Stoughton Hospital St. Clare Hospital – Baraboo St. Mary’s – Sun Prairie St. Mary’s – Janesville Upland Hills Health – Dodgeville UW – East Madison Hospital Columbus Hospital</p>
<p>ED ECMO Center: UW Hospital – Main Campus</p>	<p>ST-Segment Elevation MI: St. Mary’s – Madison UW Hospital – Main Campus VA Hospital</p>	<p>Level I Pediatric Trauma: < 18 years old UW Hospital – Main Campus</p>
<p>Level I Trauma: UW Hospital – Main Campus</p> <p>Level II Trauma: St. Mary’s – Madison Mercy Hospital – Janesville</p>	<p>Burn Center: Peds and Adult UW Hospital – Main Campus</p>	<p>Level III Trauma: Sauk Prairie Hospital St. Clare Hospital – Baraboo St. Mary’s – Janesville</p>
<p>Level IV Trauma: Meriter Hospital Monroe Clinic Stoughton Hospital St. Mary’s – Sun Prairie Upland Hills Health – Dodgeville Columbus Hospital Edgerton Hospital</p>	<p>Pediatric Intensive Care Unit: UW Hospital – Main Campus</p>	<p>Neonatal Intensive Care Unit: Meriter Hospital St. Mary’s – Madison UW Hospital – Main Campus</p>
<p>OB, Labor and Delivery Receiving: Fort Memorial Hospital – Ft. Atkinson Mercy Hospital – Janesville Meriter Hospital Monroe Clinic The Richland Hospital – Richland Center</p>	<p>OB, Labor and Delivery Receiving (cont): Sauk Prairie Hospital St. Clare Hospital - Baraboo St. Mary’s – Madison St. Mary’s – Janesville Upland Hills Health – Dodgeville Columbus Hospital</p>	<p>Forensic Nurse Examiner (Also Known As SANE Nurse): Meriter Hospital</p>

Any patient who is judged to be too unstable for transfer to definitive care may be transported to the closest Emergency Department for immediate stabilization



	EMR
B	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Request for Helicopter EMS (HEMS)

Purpose:
To provide general guidelines for the appropriate utilization of Helicopter EMS (HEMS) Response during routine daily operations.

Policy:
EMS Providers are trained and equipped to manage emergency situations. Occasionally, a situation occurs that may benefit from care beyond the scope or resources of an EMS provider, such as utilization of HEMS.

Helicopter EMS activation should be considered in Time Critical Diagnoses (TCDs) when transport via helicopter is anticipated to provide a significant time advantage over ground transport in the delivery of the patient to definitive care. Examples of when HEMS may be beneficial to consider:

- Patient has a TCD (e.g. major trauma, STEMI, stroke) and HEMS will meaningfully shorten the time of delivery of the patient to definitive care. Consideration for situations where scene time may be prolonged (such as extrication) HEMS may offer additional time savings.
- Patient is located in a geographically isolated area, which would make ground transport difficult or delayed.
- Patient is likely to require high-level life support available from HEMS, which isn't readily available by ground transport.
- Local EMS resources are exceeded (e.g. mass casualty incident with multiple critically ill or injured patients), when activation would not put responding HEMS unit at increased risk (e.g. active shooter without neutralized threat).

- Procedure:**
- The highest credentialed EMS Provider on scene will determine if HEMS response is appropriate for the patient.
 - When considering air transport, the following terminology should be referenced when speaking with HEMS Dispatch:
 - **“Status Inquiry” or “Inquiry”** - contact asking whether HEMS is available to fly or not based on current weather conditions, aircraft availability and crew status. An aircraft will NOT be reserved.
 - **“Stand-by”** - aircraft will be pulled out and prepared for flight with blades turning and ready to lift. If the aircraft has not been “Requested” or stood down by that point, HEMS will “launch and stage” in the air approximately 5 nautical miles from the scene.
 - **“Request”** - final decision has been made by the EMS Provider(s) on scene to transport the patient by air, and the helicopter will launch (or proceed if already airborne) to the scene or rendezvous point as soon as possible.
 - A safe landing zone (LZ) must be established per protocol prior to HEMS arrival. **If using a landing zone (LZ) in Dane County such as a grass airstrip at night, it should be marked by flares, strobes, vehicle lights or other suitable ground based lighting.**
 - Patients coming from a Hazardous Materials (HazMat) scene need to be fully decontaminated prior to HEMS transport. This includes contamination with various fuels as well as ingestions of volatile substances which may cause off-gassing.
 - Under NO circumstances should patient transport be delayed to use a helicopter.**

There are multiple Helicopter Landing Zones (LZs) in and around Dane County that do NOT require Fire or Law Enforcement establishment. If appropriate for the situation, weather and patient condition, these locations may be considered for rendezvous with the HEMS unit and transfer of patient care.

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	EMR
B	EMT
A	A-EMT
P	Paramedic
M	Medical Control

EMS Physician Response

Purpose:
To provide general guidelines for the appropriate utilization of EMS Physician Response during routine daily operations.

Policy:
EMS Providers are trained and equipped to manage emergency situations. Occasionally, a situation occurs that may benefit from care beyond the scope or resources of an EMS provider, such as utilization of EMS Physician Response.

EMS Physicians who are knowledgeable about local EMS and healthcare resources, may be beneficial to support EMS providers in the rare situation when advanced skills, authority, or access to hospital resources may be warranted. EMS Physician response DOES NOT replace ALS resources. Examples of when EMS Physician Response may be beneficial to consider:

- Patient requires specialized medical attention in the field that is beyond the scope of the EMS Providers present on scene or available at the time of the emergency (i.e. field amputation).
- Mass Casualty Incident with multiple critically ill or injured patients. Physicians can provide on scene medical support or provision of treat/release and/or alternative destination recommendations.
- Expanding events with unclear patient involvement or community threats.

Procedure:

- The highest credentialed EMS Provider on scene will determine if EMS Physician response is appropriate for the patient.
- That EMS Provider will request the Dane County 9-1-1 Center to “Request” dispatch of the closest, most appropriate EMS Physician Response.

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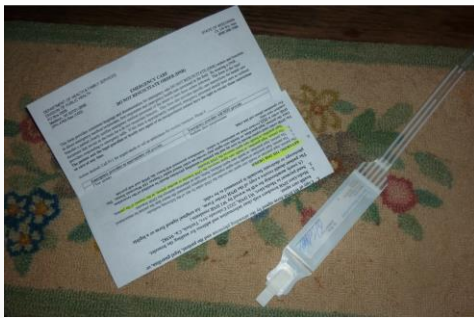
	EMR
B	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Do Not Resuscitate (DNR)

Purpose:
To clarify the State of Wisconsin Do Not Resuscitate (DNR) laws, and to provide guidance for several exceptions to the rule.

Policy:
As defined in Wisconsin Statute 154.17(2), a valid Do Not Resuscitate (DNR) order directs EMS Providers not to attempt cardiopulmonary resuscitation on the person for whom the order is issued if that person suffers cardiac or respiratory arrest. As further defined in 154.17(5), "Resuscitation" means cardiopulmonary resuscitation or any component of cardiopulmonary resuscitation, including cardiac compression, endotracheal intubation and other advanced airway management, artificial ventilation, defibrillation, administration of cardiac resuscitation medications and related procedures. "Resuscitation" does not include the Heimlich maneuver or similar procedure used to expel an obstruction from the throat or upper airway.

There are two types of DNR bracelets available to identify a person with a valid DNR order. One is a plastic ID bracelet, which looks like a hospital ID band. The other is a metal bracelet, which is currently available from StickyJ® Medical ID. Per Wisconsin Statute 154, StickyJ® is the *current* State of Wisconsin authorized vendor of the metal bracelets; however, the previous MedicAlert® bracelets *will continue to be recognized*.



DNR patients should still receive appropriate treatment from EMS Personnel under the Dane County Protocols, to include but not limited to: clearing the airway, administering supplemental O₂, positioning for comfort, splinting extremities, hemorrhage control, providing pain medications, providing emotional support and transporting to an Emergency Department for evaluation.

- DNR orders shall be followed by EMS Providers, except in the following situations:
- The Do-Not-Resuscitate bracelet appears to have been tampered with or removed
 - The emergency medical technician, first responder or member of the emergency health care facility knows that the patient is pregnant
 - The Do-Not-Resuscitate order is revoked. Methods for revocation may occur at any time by the following (154.21):
 - The patient expresses to an emergency medical technician, first responder or to a person who serves as a member of an emergency health care facility's personnel the desire to be resuscitated. The emergency medical technician, first responder or the member of the emergency health care facility shall promptly remove the do-not-resuscitate bracelet.
 - The patient defaces, burns, cuts or otherwise destroys the do-not-resuscitate bracelet.
 - The patient removed the do-not-resuscitate bracelet or another person, at the patient's request, removed the do-not-resuscitate bracelet.
 - The Guardian or Health Care Agent of an incapacitated qualified patient may direct an emergency medical technician, first responder or a person who serves as a member of an emergency health care facility's personnel to resuscitate the patient. The emergency medical technician, first responder or the member of the emergency health care facility shall promptly remove the do-not-resuscitate bracelet. (154.225)

- Under Wisconsin Statute 154.23, no physician, emergency medical technician, first responder, health care professional or emergency health care facility may be held criminally or civilly liable, or charged with unprofessional conduct, for any of the following:
- Under the directive of a do-not-resuscitate order, withholding or withdrawing, or causing to be withheld or withdrawn, resuscitation from a patient.
 - Failing to act upon the revocation of a do-not-resuscitate order unless the person or facility had actual knowledge of the revocation.
 - Failing to comply with a do-not-resuscitate order if the person or facility did not have actual knowledge of the do-not-resuscitate order or if the person or facility in good faith believed that the order had been revoked.



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Criteria for Death / Withholding Resuscitation / Termination of Resuscitation

Criteria for Death / Withholding Resuscitation:

To provide guidelines for situations when initiation of resuscitative efforts by EMS Personnel is not appropriate. For patients with a valid Do-Not-Resuscitate (DNR) order, please refer to the Do Not Resuscitate Policy.

Policy:

Resuscitative efforts should not be undertaken for an adult patient ≥ 18 years of age who is pulseless and apneic IF one or more of the following criteria are met:

- Decapitation
- Incineration
- Decomposition of Body Tissue
- Rigor Mortis and/or Dependent Lividity
- Massively Deforming Head or Chest Injury
- Freezing to the point of Rigor Mortis or inability to provide chest compressions
- Traumatic arrest that meets criteria according to Traumatic Arrest Protocol page 70

Do not initiate resuscitative measures for patients meeting the above criteria. Confirmation of asystole with a 4-lead cardiac monitor is acceptable if appropriate for the situation. If resuscitative efforts are in progress, consider discontinuation of efforts (EMT-P only), or contact Medical Control for consultation. If the patient is believed to have severe hypothermia (core temperature $< 82^{\circ}\text{F}$ or $< 28^{\circ}\text{C}$), go to the **Environmental, Hypothermia – Adult, Trauma Protocol**.

If the circumstances are unknown or unclear, or if there is question about the validity of a DNR order, initiate resuscitation while simultaneously contacting On-Line Medical Control for further advice.

Termination of Resuscitation:

To provide guidelines for discontinuation of resuscitative efforts in the out-of-hospital environment, when attempts have not resulted in Return Of Spontaneous Circulation (ROSC).

Policy:

The successful resuscitation of an out-of-hospital cardiac arrest requires a very well coordinated team effort, aggressive management of malignant dysrhythmias and thoughtful consideration of the reversible causes of cardiac arrest (the proverbial H's and T's). Unfortunately, there are a significant number of patients that – despite appropriate and aggressive medical management – are not able to achieve ROSC in the field. This policy is evidence driven and based on best practice, and it is intended to provide guidance for arrests when it is more prudent to stop resuscitation efforts than to risk provider and public safety with a patient transport.

This policy may **ONLY** be considered by **EMT-Paramedics** without Medical Control contact if **ALL** of the criteria below are met:

- The patient is an **ADULT** (≥ 18 years of age) and the arrest is presumed to be of a primary cardiac origin
- The initial rhythm on patient contact is asystole
- The American Heart Association ACLS algorithm for cardiac arrest has been followed for a minimum of 20 minutes
- The airway has been secured with either an Endotracheal Tube (ETT) OR Blindly Inserted Airway Device (BIAD), and confirmed by digital capnography
- The quantitative End-tidal CO₂ (EtCO₂) is $< 20\text{mmHg}$ despite effective compressions and after 20 minutes of ACLS
- The final rhythm is asystole and is again confirmed in at least two leads on a printed strip

If ALL criteria above are NOT met, the ACLS algorithm must be followed for a minimum of 20 minutes and then Medical Control contacted for approval of field termination of resuscitation if the patient does not achieve ROSC.

The EMS Provider always has the discretion to continue resuscitative efforts if provider safety, scene safety, location of arrest or bystander input compels the decision.

- All pediatric cardiac arrest cases should follow the PALS and Dane County Pediatric Cardiac Arrest algorithms.
- Notify Law Enforcement of the patient's death and involve the Dane County Medical Examiner. If the patient is in a medical facility (nursing home, physician's office, rehab facility) and under the supervision of medically trained personnel (physician or RN), you may contact the patient's primary physician directly and involve the Dane County Medical Examiner. Once the determination has been made that resuscitative efforts will not be initiated or will be discontinued, respect for the patient and family with protection of the dignity of the deceased is critically important. As with every EMS call, situational awareness should be a high priority. Maintain vigilance and be aware that these patient calls may be investigated as a crime scene; do your best to avoid disturbing the scene or any potential evidence.



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Child/Elder Abuse Recognition and Reporting

Purpose:

To provide guidelines for the EMS Provider who encounters suspected and/or confirmed cases of child or elder abuse while on duty.

Policy:

Child Abuse is the physical and mental injury, sexual abuse, negligent treatment and/or maltreatment of a child under the age of 18 by a person who is responsible for the child’s welfare. The recognition of abuse and the proper reporting is a critical step to improving the safety of children and preventing child abuse.

An elderly person is defined in the State of Wisconsin as a person >60 years of age. Elder abuse is the physical and/or mental injury, sexual abuse, negligent treatment or maltreatment of a senior citizen by another person. Abuse may be at the hand of a caregiver, spouse, neighbor or adult child of the patient. The recognition of abuse and the proper reporting is a critical step to improve the health and well-being of senior citizens.

Effective management of a case of suspected abuse or neglect is based upon the following :

- Protect the patient from harm
- Suspect that the patient may be a victim of abuse, especially if the illness/injury is not consistent with the reported history
- Respect the privacy of the patient and the family
- Collect as much information as possible, and preserve any physical evidence

Any findings of abuse or neglect OR suspicion of abuse or neglect must be reported immediately to Law Enforcement or Protective Services upon arrival to the receiving hospital. In cases of suspected abuse or neglect where a patient contact does not result in transport, Law Enforcement or Protective Services must be notified prior to clearing the scene. Cases happening outside of Dane County should be reported to the authorities for the County in which the incident occurred.

There are many subtle signs of abuse that may be missed without a high index of suspicion. ALL patients evaluated by EMS should be screened for these cues. Some include:

Psychological cues – excessively passive behavior, fearful behavior, excessive aggression, violent tendencies, excessive or inappropriate crying, substance abuse, medical noncompliance or repeat EMS requests for seemingly minor problems.

Physical cues – injuries inconsistent with the reported mechanism, defensive injuries (i.e. forearms), injuries during pregnancy are suggestive of abuse. Multiple bruises and injuries in various stages of healing may also suggest repeated violence against the victim.

Signs of neglect – inappropriate level of clothing for weather, poor hygiene, absence of and/or inattentive caregivers, poor living conditions and physical signs of malnutrition.

EMS Providers in the State of Wisconsin are required by law to report suspected cases of child abuse and neglect as well as those situations in which they have reason to believe that a child / elder has been treated with abuse or neglect or that abuse or neglect will occur.

For Suspected Elder Abuse or Neglect -

- Cases in Dane County NOT in a State-licensed facility, contact the Dane County Department of Human Services Elder Abuse/Neglect Helpline at **(608) 261-9933**.
- Cases in Dane County that ARE in a State-licensed nursing home, contact the State Division of Quality Assurance at **(608) 266-7474**.
- Cases in Dane County that ARE in a State-licensed program such as assisted living, community based residential facility (CBRF), adult family home (AFH), contact the Wisconsin State Bureau of Assisted Living at **(608) 264-9888**.
- Cases outside of Dane County, call the Elder Care Locator at **(800) 677-1116**.

See the Wisconsin Department of Health Services internet listing of County elder abuse agencies as necessary.

<http://www.dhs.wisconsin.gov/aps/Contacts/eaaragencies.htm>

For Suspected Child Abuse or Neglect -

- Contact the Dane County Department of Human Services Protective services:
 Mon-Fri, 7:45AM-4:30PM – **(608) 261-KIDS (5437)**
 After hours and on weekends – **(608) 255-6067**
- If caregivers are refusing the evaluation or treatment of a child that you suspect may be the victim of abuse or neglect, do not hesitate to contact Medical Control for advice. If necessary, Law Enforcement may be consulted to help settle disagreements on scene, while maintaining the effective management principles above.
- In the instance that a child has a life or limb threatening illness or injury **AND** the caregivers are refusing evaluation, the child should be transported to the closest appropriate facility, with simultaneous contact of Law Enforcement and On-Line Medical Control. If your Service Medical Director is unavailable, the Dane County Medical Director should be contacted to assist as needed.
- When abuse or suspected abuse is reported to Law Enforcement, it is required that name and badge number of the officer receiving the report be captured in your documentation.

See the Dane County Department of Human Services Protective Services website for additional information as necessary:

<http://www.danecountyhumanservices.org/ProtectiveServices/Child/>



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Abandoned Infant

Purpose:

To provide a guideline to EMS personnel that is following *WI Statute 48.195*. This statute relates to the right a parent has in relinquishing a child that is less than 72 hours old and has not been abused.

BACKGROUND:

Taking a child into custody

- WI Statute 48.195* allows a parent to anonymously relinquish custody of a child that is 72 hours old or younger to a law enforcement officer, emergency medical technician (EMT), or hospital staff member and does not express any intent to return for the child.
- This can be accomplished by:
 - Bringing the child to any place where these personnel are located or
 - Calling "911" and relinquishing custody on arrival of a law enforcement officer or EMT.
- Upon receipt of a child, any action necessary to protect the health and safety of the child shall be taken. The child then needs to be delivered to an intake worker within 24 hours.

Anonymity and Confidentiality

- A parent who relinquishes custody and any person who assists the parent has the right to remain anonymous.
- This shall not affect the way the recipient performs his or her duties.
- No person may induce or coerce a parent or person assisting a parent into revealing his or her identity, unless the person has reasonable cause to suspect that the child has been the victim of abuse or neglect.
- No person shall pursue a parent or person assisting a parent unless the person has reasonable cause to suspect that the child has been the victim of abuse or neglect.
- No officer, employee, or agent of this state or of a political subdivision of this state may attempt to locate or ascertain the identity of a parent who relinquishes custody of a child.
- Any information obtained related to the relinquishment of the child shall be kept confidential. Information may be provided to specific agencies or persons as listed in Act 2.

Information for Parents

- The recipient of the child shall make available to the parent the maternal and child health toll-free telephone number (1-800-722-2295). The parent may refuse this number.

Immunity from Liability

- The parent or person assisting the parent is:
 - Immune from any civil or criminal liability
 - Has the right to leave at any time
 - The right not to accept any information and
 - Immunity from prosecution.
- Any law officer, EMT or hospital staff who take a child into custody are immune from any civil or criminal liability for any good faith actions or omission occurring solely in connection with the act of receiving custody of the child. This person is not immune for any act or omission occurring in subsequently providing care for the child.

Medical Assistance Eligibility: *A child taken into custody is presumed to be eligible for medical assistance.*

Procedure:

- Accept the child.
- Initiate treatment of any life-threatening conditions.
- Attempt to verify that custody of the child is being relinquished.
- Provide the parent or person assisting the parent with the maternal and child health toll-free telephone number. This person has the right to refuse acceptance of this.
- Do not attempt to induce or coerce an identity from this person unless abuse is suspected.
- Do no attempt to pursue this person unless abuse is suspected.
- Provide medical care to child as appropriate.
- Transport child to the Emergency Department.
- Document appropriately on a Patient Care Record.



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Documentation of Patient Care & Vital Signs

Purpose:

To provide guidelines and to set best practice for documentation of patient encounters in the electronic Patient Care Report (ePCR).

Policy:

As EMS Providers and out-of-hospital care becomes increasingly more important to the healthcare community, it has brought a focus on the need to have a more robust set of standards for the Patient Care Reports generated. What you document is almost as important as what you see and the interventions you make to help your sick and injured patients. To that end, these criteria should help set the standards for documentation and maximize your productivity as members of the healthcare delivery team. At a minimum, every ePCR should include:

- A clear history of the present illness with chief complaint, onset time, associated complaints, pertinent positives and negatives, mechanism of injury, etc. This should be included in the subjective portion of the PCR. The section should be sufficient to refresh the clinical situation after it has faded from memory.
- Consider the **P-SOAP-delta** format for the narrative. Only approved medical abbreviations may be used – see Appendix.
 - **P** – prearrival information, including delays to scene or factors inhibiting patient access or treatment
 - **S** – subjective information (what the patient tells the EMS Provider)
 - **O** – objective information (VS, physical exam findings, etc.)
 - **A** – assessment (EMS Provider Impression of patient illness as well as differential diagnosis)
 - **P** – plan of treatment (EMS Provider interventions planned to administer)
 - **Delta** – change in patient condition due to EMS Provider interventions
- An appropriate physical assessment that includes all relevant portions of a head-to-toe physical exam. When appropriate, this information should be included in the procedures section of the PCR.
- Vital Signs (VS) play a critical role in patient assessment and evaluations, and must be documented in the ePCR for any patient. At least two complete sets of vital signs. A complete set of vitals includes:
 - Pulse Rate, Systolic AND Diastolic Blood Pressure, Respiratory Rate, SpO2, Pain and GCS for trauma patients. Temperature, EtCO2, Level of Awareness are also encouraged.
- These vital signs should be repeated and documented after drug administration, prior to patient transfer, and as needed during transport. Any abnormal VS should be followed closely, and repeated as indicated by change in patient subjective status or clinical condition. Vital signs should be included in the ePCR either via manual entry or a monitor to ePCR integration. Incorrect vitals imported from the monitor integration should be updated as needed.
- The CAD to PCR interface embedded within the PCR system should be used to populate all PCR data fields it supplies. When 9-1-1 center times are improperly recorded, these may be edited as necessary.
- Medications administered, dosages, route, administration time, treatments delivered and patient response.
- Extremity neurovascular status after splinting affected limb, or all limbs after spinal immobilization.
- For IV administration, the catheter size, site, number of attempts, type of fluid, and flow rate.
- Requested Medical Control orders and whether approved or denied.
- Any waste of controlled medications should include the quantity wasted, where wasted, and name of the person who witnessed the waste. Hospital personnel should be utilized (if available) to witness.
- ALL crew members are responsible for, and should review, the content of the ePCR for accuracy.
- After the ePCR is closed, patient care information may not be modified for any reason. Corrections or additions should be in the form of an addendum to the ePCR, with note for the reason of the addendum.
- When possible, all ePCRs should be completed and the report closed within 24 hours of the incident.
- Paper copies of the ECG, DNR paperwork, Skilled Nursing Facility documentation and - when applicable - documentation of refusal to accept an appropriate assessment, treatment, or hospital destination shall be provided to the receiving hospital.
- If the patient refuses EMS evaluation, an assessment of capacity must be completed AND documented in the ePCR. Detailed documentation should be captured regarding the patient's clinical presentation, reason for refusing (if known) and the refusal process in the ePCR narrative. Be sure to *capture the names of family members, Law Enforcement personnel or other EMS personnel who are present* for this conversation and evaluation.
- If patient transported from the scene with red lights and siren, be sure to document the reason for doing so.

Remember – if you didn't document it, it never happened!



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Domestic Violence (Spousal and/or Partner Abuse) Recognition and Reporting

Purpose:

To provide guidelines and resources for the EMS Provider who encounters suspected and/or confirmed cases of domestic violence while on duty.

Policy:

Domestic Violence is physical, sexual or psychological abuse and/or intimidation which attempts to control another person in a current or former family, dating or household relationship. The recognition, appropriate reporting and referral of abuse is an essential step to improving patient safety, providing quality care and preventing further abuse.

Effective management of a case of suspected abuse or neglect is based upon the following:

- Protect the patient from harm
- Suspect that the patient may be a victim of abuse, especially if the illness/injury is not consistent with the reported history
- Respect the privacy of the patient and the family
- Collect as much information as possible, and preserve physical evidence

Any findings of abuse or neglect OR suspicion of abuse or neglect must be handled with sensitivity and delicacy by the EMS Provider.

Provision of emotional support is key, without passing judgment on the victim or alleged perpetrator of domestic violence. Discretion should be a high priority, and when possible questions regarding abuse and safety should be done in private. Offering the resources below to the patient may feel awkward at the time, but are excellent resources and may be used at any time in the future. Have a low threshold to transport patients of suspected or confirmed domestic violence, as they may not have other means of escaping their assailant and accessing resources that may be available at the hospital.

There are many subtle signs of abuse that may be missed without a high index of suspicion. Some include:

Psychological cues – excessively passive in nature, fearful behavior, excessive aggression, violent tendencies, excessive or inappropriate crying, substance abuse, medical noncompliance or repeat EMS requests for seemingly minor problems.

Physical cues – injuries inconsistent with the reported mechanism, defensive injuries (i.e. forearms), injuries during pregnancy are suggestive of abuse. Multiple bruises and injuries in various stages of healing may also suggest repeated violence against the victim.

Signs of neglect – inappropriate level of clothing for weather, poor hygiene, absence of and/or inattentive caregivers, poor living conditions and physical signs of malnutrition.

For Suspected Domestic Violence –

- EMS Providers should attempt in private to provide the victim with the Dane County Domestic Abuse Intervention Services (DAIS) helpline, (608) 251-4445 or (800) 747-4045. Both numbers are available 24 hours per day.
- EMS Providers may also provide the National Hotline (800) 799-SAFE (7233).
- Depending on the situation, transport should be considered regardless of the illness or injury, so that the victim may receive the expert consultation and additional services that are available in the Emergency Department.

See the Dane County Domestic Abuse Intervention Services (DAIS) website for additional information as necessary:

<http://www.abuseintervention.org>

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Emergency Interhospital Transfers

Purpose:

To provide guidelines for EMS Provider expectations and medical care of patients during emergent transfer between Hospitals . This Policy does not supersede or replace existing EMTALA regulations.

This Policy **IS NOT** intended to authorize services or care that are not part of an EMS Services’ operational plan with the State of Wisconsin. Rather, it is intended to provide guidance for the rare but foreseeable circumstances when a critically ill or injured patient may need to be rapidly moved to a higher level of care, and time is of the essence.

Policy:

In general, Dane County EMS Providers should only perform Emergent Interhospital Transfers for Time Critical Diagnoses (TCDs), usually involving patients requiring management at a specialty care facility (Trauma, STEMI, Stroke, Pediatrics, OB) when an authorized service is not available within a reasonable amount of time. Dane County EMS Providers may also be called upon to assist with Emergent Interhospital Movement of patients during large-scale or Mass Casualty Incidents (MCIs), or during a situation necessitating the implementation of Crisis Standards of Care – in these cases, there is likely to be heavy involvement of the Dane County Medical Director as well as each of the EMS Service Medical Directors (or their designees) to help provide real-time guidance on how to proceed.

If a Dane County EMS Provider is contacted for the Emergent Interhospital Transfer of a non-TCD patient, contact your Service EMS Supervisor for consultation prior to responding and transporting the patient.

Emergent Interhospital Transport decisions should be made based on the needs of the patient(s), any expected changes in their clinical condition and the familiarity / comfort level of the responding EMS Providers with the clinical situation as well as any medications or devices being used .

If a patient has unstable vital signs prior to departure from the sending facility, the EMS Provider responding is not knowledgeable of the medications being administered and/or the medications infusing are not in the Wisconsin Scope **OR** on an IV pump with inadequate reserve to last the anticipated duration of the transfer, it is the responsibility of the referring hospital to supply an additional provider. The additional provider shall be appropriately credentialed, familiar with the medications and devices to accompany the patient AND present for the entire transfer to the receiving facility. If there is any difficulty with this provision, the Service EMS Supervisor should be contacted immediately for guidance on how to proceed.

Communication and coordination between hospitals and EMS Providers is essential before an Emergent Interhospital Transfer is initiated to ensure patient safety and the appropriate medical management en route between the hospitals . A clear plan for responsibility of patient care while moving between facilities should be in place prior to departing the transferring hospital. In general, if the patient unexpectedly deteriorates while en route, the transferring facility should be notified, but the *receiving facility* should be contacted for additional Medical Control orders. The standing Dane County Protocols in this book may be followed as situation appropriate until Medical Control can provide further direction.

Unless there are extenuating circumstances (i.e. Mass Casualty Incident, Crisis Standards of Care), any Dane County EMS Service performing an Emergent Interhospital Transfer should only deliver patients to the Emergency Department of the receiving facility, where additional interventions and coordination of care may take place.

As with any Protocol, contact On-Line Medical Control with any questions or concerns.

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Lights and Sirens During Patient Transport

Purpose:

To provide guidelines for the appropriate use of red lights and siren when transporting a patient from the scene of an emergency to the hospital. This Policy intends to help identify patients for whom safe use of red lights and siren can potentially reduce morbidity and mortality, and eliminate the unnecessary use of emergency lights and siren during transport to improve patient comfort, reduce anxiety and enhance safety for the patient, the EMS team, and the Dane County community. It is impossible to clearly identify each scenario where a patient could benefit from the use of lights and sirens by EMS, so provider discretion must be used to weigh the potential benefit of time saved against the ability for prehospital interventions to stabilize patients.

Policy:

- Use of lights and siren during response to the incident location should be dictated by local department policy.
- At the discretion of the ambulance crew, driving with lights and siren may be considered if the following clinical conditions or circumstances exist:
 - Difficulty in sustaining the ABCs (airway, breathing, circulation) including (but not limited to):
 - Inability to establish an adequate airway or ventilation.
 - Severe respiratory distress or respiratory injury not responsive to available field treatment.
 - Inability to correct hemodynamic instability.
 - Severe uncontrolled hemorrhage.
 - Shock, unresponsive to available treatment.
 - Severe trauma resulting in hemodynamic compromise, airway instability, or neurovascular compromise of an extremity that cannot be managed or corrected in the field.
 - Status epilepticus that is not responsive to prehospital interventions.
 - Substantial or rapidly deteriorating level of consciousness.
 - Obstetrical emergencies such as prolapsed cord, breech presentation, arrested delivery, or suspected ruptured ectopic pregnancy.
- For any transport where reducing time to definitive care is clinically indicated, consider options other than emergent driving. In these cases, an alternative mode of transportation or higher level of care (such as ALS intercept, physician response vehicles, or air-medical) should be considered if it is available and appropriate.
- For any lights and siren transport, specifically document in the narrative the patient's condition, case circumstances and the rationale for choosing emergent transport.

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Non-Paramedic Transport of Patients

Purpose:

To provide guidelines for interactions of EMS Providers while on scene, and to help guide determination of the most appropriate level of service to transport patients to the Emergency Department.

This policy is intended to clarify expectations of providers on scene during situations when multiple levels of provider with transport capability arrive concurrently. It is **NOT** intended to be used as justification for refusal of transfer to a Paramedic level of service when a lower level is requesting it.

Policy:

For the purposes of this Policy, “Paramedic” refers to a Dane County EMS System credentialed Paramedic with no current restrictions on their clinical practice.

The provider with the highest level of Dane County EMS System credentialing on scene will conduct a detailed interview and physical assessment of the patient to determine the chief complaint and level of distress. If the provider determines that the patient is stable and ALL patient care needs can be managed by an EMS Provider at a lower level than Paramedic, then patient care may be transferred and transport initiated AND/OR completed by the lower level provider. All personnel are encouraged to participate in patient care while on-scene, regardless of who “attends” with the patient while en route to the hospital.

The determination of who attends should be based on the patient’s immediate treatment needs and any reasonably anticipated treatment needs while en route to the hospital. The highest credentialed provider on scene retains the right to make the decision to personally attend to any patient transported based on his or her impression of the patient’s clinical conditions, current needs or anticipated needs based on the EMS Provider’s evaluation and experience.

The highest credentialed EMS Provider who performs the assessment and determines the appropriate level of care for transport must document the findings of their assessment. Additional documentation shall be completed by the transporting provider. As with all documentation, both providers are responsible for the content of the report.

Patients who meet the criteria below shall be attended by Paramedics (per their operational plan) in the patient care compartment, unless mass casualty incident, natural disaster or previously approved by policy or the On-Line Medical Control. The care of the following patients cannot be transferred to a lower level of credentialing:

- Any patient who requires or might reasonably require additional or ongoing medications, procedures AND/OR monitoring beyond the scope of practice of the lower credentialed provider. This includes any critically ill or unstable patient as advanced airway management may be required in any decompensating patient. EMT-Basic and EMT-Advanced providers may be credentialed to perform some but not all airway management, and medications associated with airway management are limited to the Paramedic scope of practice by the Wisconsin State Medical Board.
- Any patient for whom ALL EMS providers on scene do not agree can be safely transported without a Paramedic in attendance in the patient care compartment. As a general rule, if providers are questioning who should attend the patient, the highest credentialed level of care should attend.
- Post-ictal patients with high probability of recurrent seizure.
- Patients who have been medicated on the scene cannot be transferred to a provider of a lower credentialing level **UNLESS** the provided medication is included in the receiving EMS Provider’s scope.

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Paramedic Intercept Guidelines

Purpose:

To outline circumstances in which an Advanced Life Support (ALS) Service should be requested for intercept with a non-ALS level Service.

Policy:

The situations listed below are not all-inclusive, but are intended to serve as examples of when a higher level of care would be appropriate for advanced interventions and patient safety. In addition to advanced skills and additional medication options, Paramedics also bring an experience with critically ill and injured patients, and can assist with the safe evaluation and destination determination process.

While the care of the patient should be the top priority of all providers in the Dane County System, many factors go into the decision to request an ALS intercept. Time of day, traffic conditions, weather and proximity to appropriate medical care all may be considered when making the decision. When possible, arrangements may be made to rendezvous with an ALS service while en route to the hospital, so that the delay to advanced skills and medications may be minimized.

Some examples of patients that may benefit from ALS level evaluation and management include but are not limited to;

- Sepsis
- Cardiopulmonary Arrest
- Altered Mental Status not explained by simple hypoglycemia or opiate overdose
- Severe Respiratory Distress AND/OR Impending Airway Compromise
- Multi-System Trauma
- Unstable or Deteriorating Vital Signs
- Chest Pain with Hemodynamically Compromising Dysrhythmia
- ST-Segment Elevation MI with Hypotension, Altered Mental Status or Impending Cardiac Arrest
- Complex Seizures (First Seizure without History, Seizure After Head Injury, Recurrent Seizure without Return to Baseline)
- Allergic Reaction assessed to be 'Severe' or 'Impending Cardiac Arrest'
- Asthma Exacerbation not improving after Albuterol OR Requiring Multiple Nebs
- Complications of Childbirth
- Mass Casualty Incident
- Any Situation that the Dane County EMS Provider OR Medical Control feels warrants ALS Evaluation and Management

We are all working together to get the right patient to the right level of care at the right time!

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	EMR
B	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Patient Care During Transport

Purpose:

To provide general guidelines and to set best practice when caring for patients both on the scene of an emergency as well as in the ambulance during transport to the receiving facility.

Policy:

All sick or injured persons requesting transport shall be transported without delay to the most appropriate Emergency Department, with high consideration given to patient preference. Exceptions to this policy are as follows:

- An “appropriate local Emergency Department” includes all Dane County Emergency Departments as well as hospitals in contiguous counties as designated in this Procedures and Protocols Handbook. The ability of a patient to pay or the insurance status (if known) should not play a part in this decision. If EMS Unit availability will be a concern due to requested destination, contact your Service EMS Supervisor prior to initiating transport.
- All sick or injured persons requesting transport who *do not express a preference* or who rely on the knowledge of the EMS Provider should be transported to the closest, most appropriate local Emergency Department.
- Patients who are suffering from a Time Critical Diagnosis (TCD) or a condition covered under the Destination Determination Protocols should be transported in accordance with the specialty resource required by the treatment flowchart. All other patients should be transported per the policy statement above.
- Transport destination decisions should take into consideration the preexisting healthcare relationships that a patient may have. In general, a patient should be taken to the hospital at which they typically receive care and/or where their primary care physician has affiliation, *unless the patient expressly requests otherwise*. Providers should discuss risks and benefits of transport to a facility that has not previously cared for the patient, and document the discussion clearing in the electronic Patient Care Report (ePCR).

The following situations shall require more than one EMS Provider in the passenger compartment of the transporting vehicle, to provide adequate medical care. The additional provider(s) is/are present not only to serve as additional “hands”, but to expand the critical thinking of the team and to help optimize patient outcomes. **For these circumstances, students with the current training permit may assist with patient care, but may NOT count as one of the additional EMS Providers.**

- Cardiac Arrest of Medical OR Traumatic etiology
- Post Resuscitation Return of Spontaneous Circulation (ROSC) patients, *even if Vital Signs are stable*
- Active Airway Management, *regardless of modality chosen* (Endotracheal Tube, Blindly Inserted Airway Device (BIAD) or Bag-Valve Mask (BVM))
- Impending Arrest or “Peri-Code” Situation
- Imminent Delivery
- Newly Born Patients (Mother and Newborn count as two patients, and require an attendant for each)
- At the Attending EMS Provider’s Judgement, for cases not covered above

If a second EMS Provider is not available and transport would be delayed, initiation may be started under these two circumstances:

- An Advanced Care Intercept (Ground ALS or HEMS) has been contacted and arrangements made for rendezvous en route

OR

- The case has been reviewed with On-Line Medical Control (OLMC) AND approval granted

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Medical Provider Bystander On Scene

Purpose:

To define the responsibilities of EMS Providers responding to an emergency scene, to identify the chain of command and to prevent potential conflicts regarding patient care that may arise during EMS evaluation and management when a trained medical provider is on scene. No other healthcare professionals are permitted to provide medical direction under this policy.

This policy is not intended to apply to Service Medical Directors.

Policy:

The medical evaluation and management of patients at the scene of an emergency is the responsibility of the person most appropriately trained in emergency medical care. As an agent of the EMS Service Medical Director and operating under the Dane County EMS Protocols, the EMS Provider routinely fills this role. Occasions may arise when a physician or medical provider on scene may wish to deliver care to a sick or injured patient, or to direct EMS personnel in medical management. In order for a physician to assume care of a patient, they **MUST**:

- Provide photo identification verifying his/her current credentialing as a physician (MD/DO) AND a current copy of his/her license to practice medicine in the State of Wisconsin **AND**
- Assume care of the patient AND allow documentation of his/her assumption of care on the electronic Patient Care Report (ePCR), as verified by his/her signature, **AND**
- Agree to accompany the patient during transport to the receiving hospital **AND**
- Not appear to be impaired or under the influence of drugs, alcohol or medical conditions **AND**
- Explicitly express willingness to accept liability for the care provided to the patient under their personal medical license

Contact with Medical Control must be established as soon as possible, and the Medical Control Physician must agree to relinquish responsibility for patient care to the Physician On Scene.

Once care has been transferred from the On-Line Medical Control to the Physician On Scene, the EMS Provider may provide care under the license and authority of the Physician On Scene. Direction provided by the Physician On Scene assuming care of the patient should be followed by the EMS Provider, granted that the interventions are not believed by the EMS Provider to endanger the well-being of the patient.

Orders received from an authorized (as determined by this Policy) Physician On Scene may be followed, even if they conflict with existing local protocols, provided the orders encompass skills AND/OR medications approved by both the Dane County Medical Advisory Subcommittee and the Wisconsin State Medical Board for a provider's level of credentialing. **Under no circumstances** shall EMS Providers perform procedures or give medications that are outside of their scope of practice AND/OR credentialing.

Conflict with Physician or Medical Provider On Scene :

If the Physician or Medical Provider On Scene is judged by the EMS Provider on scene to be potentially harmful or dangerous to the patient, the EMS Provider should politely voice their objection, and immediately contact On-Line Medical Control for further assistance. On-Line Medical Control should be briefed by the EMS Provider, and the Physician or Medical Provider On Scene allowed to communicate directly with the On-Line Medical Control. When at all possible, these conversations should be held on a recorded line.

If the Physician or Medical Provider Bystander On Scene and On-Line Medical Control are in conflict, it is the responsibility of the EMS Provider to:

- Follow the directions of On-Line Medical Control
- Enlist the aid of Law Enforcement as necessary to regain control of the emergency scene and resume authority of the scene

Documentation:

All interactions with Physicians and Medical Providers On Scene must be thoroughly documented in the electronic Patient Care Report (ePCR), including the full name and medical license number, as well as the interventions performed at their direction.



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Poison Control

Purpose:

To provide guidelines for involving Poison Control with out-of-hospital management of patients with potential or actual poisonings.

Policy:

Patients who have sustained significant poisonings, envenomations, and environmental/biochemical terrorism exposures in the out-of-hospital setting require timely and appropriate level of care, including the decisions regarding scene treatment and transport destination. By integrating the State Poison Center into the out-of-hospital response plan for HazMat and biochemical terrorism incidents, this policy aims to empower the out-of-hospital care provider and enhance the ability to deliver the most appropriate care to the patient possible.

If the patient is assessed by the EMS Provider and no immediate life threat or indication for immediate transport is identified, the EMS Provider may conference call with the Poison Center at the Wisconsin State Poison Center at **1 (800) 222-1222**.

The Poison Center will help evaluate the exposure and make recommendations regarding the need for on-site treatment and hospital transport in a timely manner. If EMS transport to the hospital is determined to be necessary, the Poison Center will contact the receiving hospital and provide information regarding the poisoning, including treatment recommendations. EMS may also contact On-Line Medical Control for further instructions or for treatment options.

If EMS transport is determined to *not be* necessary, the contact phone number for the patient will be provided to the Poison Center. The Poison Center will make a minimum of one follow-up phone call to determine the status of the patient. Additionally, the EMS Provider must contact On-Line Medical Control to review the case and discuss the recommendations of the Poison Center and what is believed to be in the best interest of the patient.

As detailed elsewhere in this document, exposures and/or poisonings that are the result of suicide attempts or gestures, or children who sustain an exposure and/or poisoning due to child abuse or neglect *SHOULD NOT be allowed to refuse transport*. These are both vulnerable populations who are at an increased risk of death or permanent disability if not cared for appropriately. As always, good Provider judgment and patient advocacy will be the cornerstones of making sound, defensible patient treatment decisions.

In any cases of poisoning, whether accidental, intentional or the consequence of a bioterrorism event, the safety of the First Responders should be of the highest priority. At a minimum, the following information should be gathered so that the Poison Center can make the best recommendations for the current situation:

- Age of the patient
- Substance(s) involved with the exposure (if known)
- Time and Duration of exposure (if known)
- Signs and Symptoms
- Any Treatments provided and the response to the intervention

As with many of the EMS Protocols, a significant amount of information is collected by the EMS Providers on scene and can be extremely valuable for downstream providers. Be sure to notice and document HazMat placards in cases of transportation incidents, any MSDS sheets available in the industrial / manufacturing setting, or the contents and volumes of products / substances present in the cases of household ingestion.

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Patients in Police Custody

Purpose:

To provide guidelines for the evaluation and management of patients requiring EMS assessment while in the custody of Law Enforcement. As with every patient interaction, it is important that the EMS Provider serve as a patient advocate and use their best medical judgment to assist Law Enforcement in making safe, appropriate decisions regarding medical aid and disposition decisions.

Policy:

As a general rule, when evaluating a patient who is in the custody of Law Enforcement, the EMS Provider should approach the patient with the same respect and consideration as patients who are not being detained. While EMS is not equipped or authorized to provide "Medical Clearance" before transport to jail, it is the responsibility of the EMS Provider to provide an unbiased assessment and to make recommendations based on Dane County Protocols as well as EMS Provider experience and judgment.

These patient encounters have a higher than average incidence of scrutiny on review; as such, take steps to ensure that your documentation is clear, descriptive and complete. Law Enforcement Agent names and badge numbers are essential in the EMS Provider documentation.

- If a patient in custody of Law Enforcement is evaluated by EMS and felt to need transport to the Emergency Department and *the patient is refusing transport*:
 - Evaluate the capacity of the patient to make informed decisions as outlined in the Dane County Protocols.
 - Advise the Law Enforcement Agent of the decision of the patient, and consider potential risks or hazards to Law Enforcement if the patient were to refuse (i.e. lacerations that may pose a biohazard to officers or other detainees).
 - If Law Enforcement requests transport, document their request and coordinate safe transport to the closest, most appropriate Emergency Department. In these instances, the Law Enforcement Agent must take the patient into Protective Custody and effectively making decisions as the healthcare power of attorney for the patient.
 - Document that Law Enforcement has taken Protective Custody of the patient.
 - In this instance, the Law Enforcement Agent must accompany the patient to the Emergency Department.
 - If the patient is evaluated to have capacity and does not pose an undue risk to Law Enforcement, execute a Patient Refusal as outlined in the Dane County Protocols.

- If a patient in custody of Law Enforcement is evaluated by EMS and felt to need transport to the Emergency Department and the *Law Enforcement Agent is refusing transport*:
 - Advise the Law Enforcement Agent that transport is indicated by Dane County Protocols, and that medical clearance is not authorized by EMS Personnel in the field.
 - Contact On-Line Medical Control for consultation and assistance as needed.
 - If Law Enforcement continues to decline transport for medical evaluation and management, allow the patient to remain in the custody of the Law Enforcement Agent, and advise them that EMS may be re-contacted at any time to provide medical assistance as needed.
 - The Law Enforcement Agent in these situations is taking the patient into Protective Custody and effectively making decisions as the healthcare power of attorney for the patient.
 - Document that Law Enforcement has taken Protective Custody of the patient.
 - Document the Law Enforcement Agency as well as the name and badge number of the responsible officer along with specifics of the discussion in your electronic Patient Care Report (ePCR).

- If a patient in custody of Law Enforcement requires transport to the Emergency Department and is *requiring physical restraint* by the Law Enforcement Agent for behavior modification:
 - Advise the Law Enforcement Agent that Dane County EMS Policy requires their accompaniment in the patient compartment of the ambulance during transport to the Emergency Department.
 - With active restraints in place, it is an issue of patient safety as well as provider safety.
 - Consider the Behavioral Emergencies Protocol in the Dane County Protocol book, OR contact On-Line Medical Control for advice regarding medication management as appropriate to assist with safe and expeditious transport.



	EMR
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Radio Report Format

Purpose:
To provide guidelines for clear communication between EMS Providers and receiving facilities prior to delivery of the patient.

Policy:
For all patients being transported to the hospital by EMS, every effort should be made to contact the receiving facility *as early as possible* once the destination facility has been chosen and transport initiated.

Procedure:
Begin each transmission with the agency name and unit number, and **wait for acknowledgement** from the receiving facility. After the receiving facility acknowledges contact with your unit, give a clear, concise report which includes the following:

- Agency Unit
- ETA
- If applicable; Alerts – Medical, Trauma, STEMI, Stroke, Sepsis (repeat this twice)
- Age
- Chief Complaint / Observations
- Vital Signs – Brief and Concise
- Pertinent Interventions
- Special Resources/Needs – interpreter, respiratory therapy, security, bariatric, cath lab, labor/delivery, etc.

CATEGORY	DEFINITION
Medical ALERT	High acuity of illness, with unstable VS or requiring immediate support from ED staff
Trauma ALERT	Severe mechanism of injury, life or limb threatening injury
SEPSIS ALERT	SEPSIS Screening Positive
STEMI ALERT	STEMI Interpretation of Field ECG (EMS or Monitor)
STROKE ALERT	Focal Neurologic Deficit with Last Known Normal \leq 24 Hours

- Contacting Medical Control
- Medical Control may be contacted for any additional orders, to consult as needed for patients refusing transport and for any questions regarding patient management on scene or en route to the receiving facility. Any orders given should be repeated back for clarification and patient safety.
 - Make sure your request of Medical Control is clearly communicated, and be prepared to answer follow up questions regarding the protocol you are following as well as your assessment of the situation.

Remember: you are the one who has the patient in front of you – your assessment and impression matter!

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Transfer of Care at Hospital

Purpose:

To provide guidelines for in-person communication with receiving facilities, and to clarify expectations of EMS Provider documentation.

Policy:

When delivering a patient to the receiving facility, it is imperative that a clear, concise communication happen between the EMS Provider and the emergency medical staff assuming care. In order to prevent miscommunication, a full verbal report should be communicated in a face-to-face fashion, preferably with the entire medical team assembled at the patient bedside. On the occasion that the complete team is not available, verbal report should be given to a receiving caregiver credentialed at the RN level or higher.

All treatments and interventions initiated under the Dane County Protocols may be continued after arrival in the receiving facility up until the appropriate personnel and equipment are assembled to assume care of the patient. At that time, responsibility for all medical care and continued treatment is transferred to the facility, and the Dane County EMS Protocols are no longer authorized for patient management. On-Line Medical Control should not be contacted for additional orders once this handoff has occurred. In the rare circumstance that the EMS Provider is requested/invited to participate, direction will be at the authorization and the discretion of the supervising on-scene physician. It is important that the involvement, orders received and name of the responsible physician be captured in the electronic Patient Care Report (ePCR) as part of the medical care provided by EMS.

Verbal Report

Verbal report at the time of handoff shall include all pertinent known information about the patient, the history of present illness or mechanism of injury, treatments administered by EMS Providers as well as the patient’s responses to treatment. In addition, all prehospital ECGs and provided paper medical records should be turned over to the treatment team assuming care.

Written Report

Wisconsin DHS Administrative Rule 110.34(7) specifically addresses EMS responsibility for written patient report at the time of handoff at the receiving facility. The rule states:

An emergency medical service provider shall, “...submit a written report to the receiving hospital upon delivering a patient, and a complete patient care report within 24 hours of patient delivery. A written report may be a complete patient care report or other documentation approved by the department and accepted by the receiving hospital.”

The expectation is that there will be written documentation left at the receiving facility, and conveyed either in printed or electronic format *prior to your departure* and returning available to service. It is not required that the documentation left at the facility be the completed, finalized electronic Patient Care Report (ePCR). **HOWEVER, all EMS Providers in Dane County are integral members of the healthcare team**, and may hold key pieces of information not available to any of the downstream providers and which are at significant risk of being lost, overlooked or miscommunicated if not documented in a prompt manner.

Given the nature of EMS and out-of-hospital care, it should be the goal of every Dane County EMS Service at minimum to have a draft narrative, list of the EMS interventions, medications given and vital signs documented *prior to leaving the facility* and returning to duty.

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Persons with EMS Care Plans

Purpose:

To establish a uniform approach for the evaluation and management of persons having an established Care Plan , developed by the EMS Service and approved by the Medical Director.

Policy:

All sick or injured persons requesting transport shall be transported without delay to an appropriate local Emergency Department of the patient’s preference. The only exceptions to this rule are found below:

- Patients who are suffering from a Time Critical Diagnosis (TCD) or whose condition is covered under the Destination Determination Protocols shall be transported in accordance with those specialty algorithms to the appropriate receiving facility . The presence of a Care Plan **DOES NOT** supersede the Destination Determination Protocol.
- Patients known to have been discharged from an Emergency Department within the last 48 hours should generally be transported back to the same ED, **unless** they meet specialty center destination criteria, as outlined in the Destination Determination Protocol.
- Patients who have been identified as frequent users of the EMS System may have a designated Care Plan , which has been developed with the patient and/or their healthcare providers, the EMS Service and one or more of the Dane County hospitals. If a patient has a formal Care Plan approved by the EMS Service Medical Director, the patient should be evaluated, treated and transported in accordance with the Plan, **unless** the patient meets criteria for transport to a specialty receiving center, as outlined above. Regardless of the existence of a Care Plan, all patients should be treated with respect and dignity, and fully evaluated as per the standards set forth in this Protocol Book.

There may be exceptions to this guideline, and if there are questions while evaluating a patient with a Care Plan, do not hesitate to contact the Officer In Charge (OIC) or the Medical Director or Medical Director’s designee for clarification.

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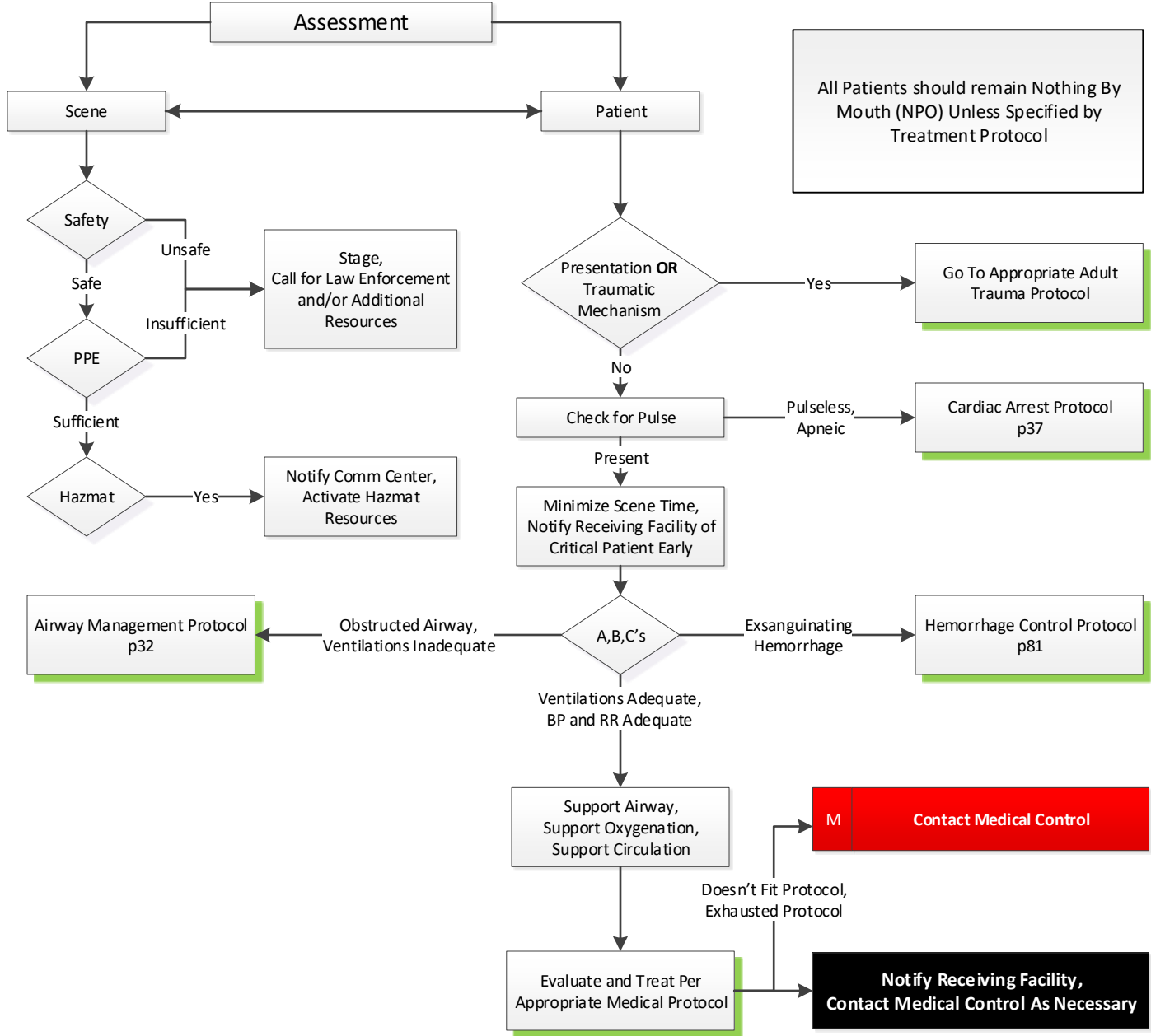
General Approach – Adult, Medical

Pertinent Positives and Negatives

- Age, VS, BP, RR, SpO2
- SAMPLE history
- OPQRST history
- Source of blood loss, if any (GI, vaginal, AAA, ectopic)
- Source of fluid loss, if any (vomiting, diarrhea, fever)
- Pregnancy history
- Mental Status
- Pale, Cool Skin
- Delayed Cap Refill
- Coffee Ground Emesis
- Tarry Stools
- Allergen Exposure

Differential

- Cardiac Dysrhythmia
- Hypoglycemia
- Ectopic Pregnancy
- AAA
- Sepsis
- Occult Trauma
- Adrenal Insufficiency



Pearls

REQUIRED EXAM: VS, GCS, Nature of Complaint

- 12-Lead ECG should be done early for *any* non-traumatic pain complaint between the ear lobes and the umbilicus (belly button).
- Include Blood Glucose reading for *any* patient with complaints of **weakness, altered mental status, seizure, loss of consciousness, known history of diabetes OR Cardiac Arrest.**
- Measure and document SpO2, EtCO2 for ANY patient with complaint of weakness, altered mental status, respiratory distress, respiratory failure or EMS managed airway.
- If hypotensive (Systolic BP<100mmHg) and/or clinical evidence of dehydration, consider IV Access Protocol and Shock (Non-Trauma) Adult Medical Protocol .
- Any patient contact which does not result in an EMS transport must have a completed refusal form.
- Never hesitate to consult medical control for assistance with patient refusals that can't meet all required fields, clarification of protocols or for patients that make you uncomfortable.



EMR
B EMT
A A-EMT
P Paramedic
M Medical Control

Airway Management - Adult

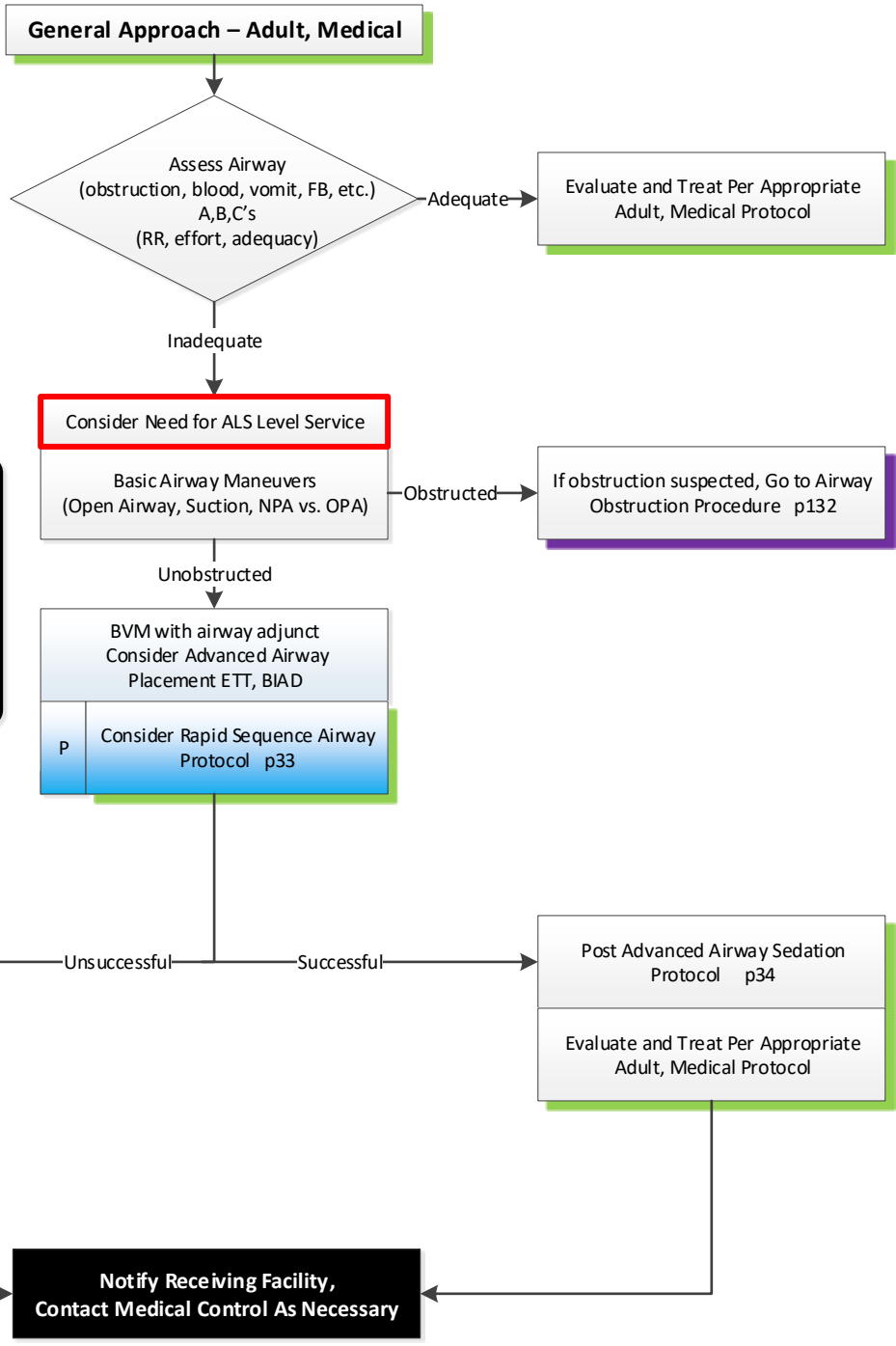
General Approach – Adult, Medical

Anticipate and Prepare for the Difficult Airway

LEMON Rule

- Look Externally
- Evaluate with 3:3:2 Rule
- Mallampati Classification
- Obstruction
- Neck Mobility (or lack thereof)

B	Consider CPAP Procedure p146 For respiratory distress with intact airway protection
P	Consider Midazolam 2mg IV/IN or Ketamine 0.25mg/kg IV/IM/IO (max 25mg) If needed for CPAP compliance



Pearls

REQUIRED EXAM: VS, GCS, Head, Neck, Blood Glucose

- If BIAD in place and adequately ventilating/oxygenating - Do Not Remove.
- Digital capnography is the standard of care and is to be used with all methods of advanced airway management and endotracheal intubation. If a service uses color change capnometry only and an Invasive Airway Device is placed, an intercept with a digital capnography capable service **MUST** be completed.
- Goal EtCO₂ = 35-45mmHg.
- If Airway Management is adequately maintained with a Bag-Valve Mask and waveform SpO₂ >93%, it is acceptable to defer advanced airway placement in favor of basic maneuvers and rapid transport to the hospital.
- *Always* assume that patient reports of dyspnea and shortness of breath are physiologic, not psychogenic.
- Gastric decompression with Oral Gastric Tube should be considered on all patients with advanced airways, if time and situation allow.
- Once secured, every effort should be made to keep the endotracheal tube in the airway; commercially available tube holders and C-collars are good adjuncts.
- For all protocols, an **Advanced Airway Attempt** is defined as: passing the tip of the laryngoscope blade or Blindly Inserted Airway Device (BIAD) tube past the teeth.



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Rapid Sequence Airway - Adult

Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- History of CHF, COPD, Asthma
- Lung Sounds before *AND after* intervention
- Allergen Exposure
- Toxic / Environmental Exposure

Differential

- Head Injury
- Electrolyte Abnormality
- COPD Exacerbation
- CHF Exacerbation
- DM, CVA, Seizure, Tox
- Sepsis
- Asthma Exacerbation
- Drug Ingestion / Overdose

Airway Management – Adult, Medical

P Rapid Sequence Airway

Preparation

IV, O2, Continuous Cardiac Monitor, SpO2, EtCO2, BP
 Check Laryngoscope Bulb, Check video laryngoscope function, ETT Balloon, Stylet, Syringes, Optimize Positioning
 Prepare Rescue Airway Device
 Medications Drawn Up and Labeled
 Optimize hemodynamics and consider preparing a push dose Epinephrine (p190)

Preoxygenate

100% O2 x 5 Minutes
 8 Vital Capacity Breaths via BVM or NRB
 Continue Until Airway Secured
 Continue apneic oxygenation via Nasal Cannula throughout procedure

Pretreatment

Consider Cricoid Pressure (Sellick's Maneuver)
 Coordinate with crew re: order of meds, anticipated course and contingency plans

Paralysis and Induction

Etomidate 0.3mg/kg IV/IO (max 30mg) **OR**
 Ketamine 2mg/kg IV/IO (max 200mg)
THEN
 Succinylcholine 2mg/kg IV/IO (max 200mg) **OR**
 Rocuronium 1.0mg/kg (max 100mg)

Placement with Proof

Continuous EtCO2 Monitoring
 Auscultation, Chest Rise, Fogging in Tube
 Secure Device

Post Placement Management

Post-Advanced Airway Sedation Adult p34

Indications for Adult Rapid Sequence Airway Management

Determining whether RSA is indicated for a patient is multifactorial, requires experienced clinical judgement, and a robust training/QA support system. These indications to consider RSA are meant to serve as guidelines and RSA should not be considered if unable to ventilate with BVM unless all other options have been exhausted.

- Failure to oxygenate
- Failure to ventilate
- Failure of airway protection

Each Attempt should include change in approach, operator and/or equipment

If endotracheal tube placement is attempted, after two (2) unsuccessful attempts move towards alternative airway device

Notify Receiving Facility,
 Contact Medical Control As Necessary

Pearls

REQUIRED EXAM: VS, GCS, Head, Neck, Blood Glucose, Lung Exam, Posterior Pharynx

- Resuscitate first, hemodynamically unstable patients are at high risk for cardiac arrest.
- Digital capnography is the standard of care and is to be used with all methods of advanced airway management and endotracheal intubation. If a service uses color change capnometry only and an Invasive Airway Device is placed, an intercept with a digital capnography capable service **MUST** be completed.
- If Airway Management is adequately maintained with a Bag-Valve Mask and waveform SpO2 ≥93%, it is acceptable to defer advanced airway placement in favor of basic maneuvers and rapid transport to the hospital.
- Gastric decompression with Oral Gastric Tube should be considered on all patients with advanced airways, if time and situation allows.
- Once secured, every effort should be made to keep the endotracheal tube in the airway; commercially available tube holders and C-collars are good adjuncts.
- For all protocols, an **Advanced Airway Attempt** is defined as passing the tip of the laryngoscope blade or Blindly Inserted Airway Device (BIAD) tube past the teeth.
- Recent history of Upper Respiratory Infection, Missing / Loose Teeth or Dentures all will increase complexity of airway management.



	EMR
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Post Advanced Airway Sedation - Adult

Pertinent Positives and Negatives

- Age, VS, BP, RR, SpO2
- SAMPLE history
- OPQRST history

- Mental Status
- Pale, Cool Skin
- Delayed Cap Refill

Differential

- Cardiac Dysrhythmia
- Hypoglycemia
- Overdose
- Toxidrome
- Sepsis
- Occult Trauma
- Adrenal Insufficiency

Airway Management – Adult, Medical

Assess and Document
BP, HR, SpO2, Continuous Cardiac Monitoring, EtCO2

Signs of Discomfort

No

Monitor VS Closely
Notify Receiving Facility,
Contact Medical Control As Necessary

REMEMBER
It is critical that we do not administer
paralytics without adequate sedation

Yes

Rising BP, Increasing HR, Tearing, Pulling at Lines and Tubes,
Coughing or Gagging on Invasive Airway Device,
Clinical Signs of Agitation

P	Fentanyl 1mcg/kg IV/IO (max 100mcg) AND / OR
P	Midazolam 0.1mg/kg IV/IO (max 5mg) OR Midazolam 0.2 mg/kg IM/IN (max 10mg) OR Lorazepam 0.1mg/kg IV/IO/IM (max 2mg)
P	OR Consider Ketamine 2mg/kg IV/IO (max 200mg)
P	May Repeat Sedation (max 3 doses)
A	Consider Ondansetron 0.15mg/kg (max 4mg) IV/IO/IM

Improved Comfort

Yes

Monitor VS Closely
Notify Receiving Facility,
Contact Medical Control As Necessary

No

M

Contact Medical Control
Consider Rocuronium 1.0mg/kg
(max 100mg)

Pearls

REQUIRED EXAM: VS, GCS, Nature of Complaint

- Paralytics block movement of skeletal muscle but do **NOT** change awareness. Remember that without sedation, patients may be **awake** but **paralyzed**.
- Monitor Vital Signs closely when managing airways and sedation. Changes that indicate pain, anxiety **as well as tube dislodgment** may be subtle (at first)!
- Document Vital Signs before and after administration of every medication to prove effectiveness.
- **ANY** change in patient condition, reassess from the beginning. Use the mnemonic **DOPE** (Dislodgment, Obstruction, Pneumothorax, Equipment) to troubleshoot problems with the ET Tube.
- **Continuous End Tidal CO₂** is mandatory for all intubated patients – color change is **NOT** sufficient proof of ET Tube in the trachea.



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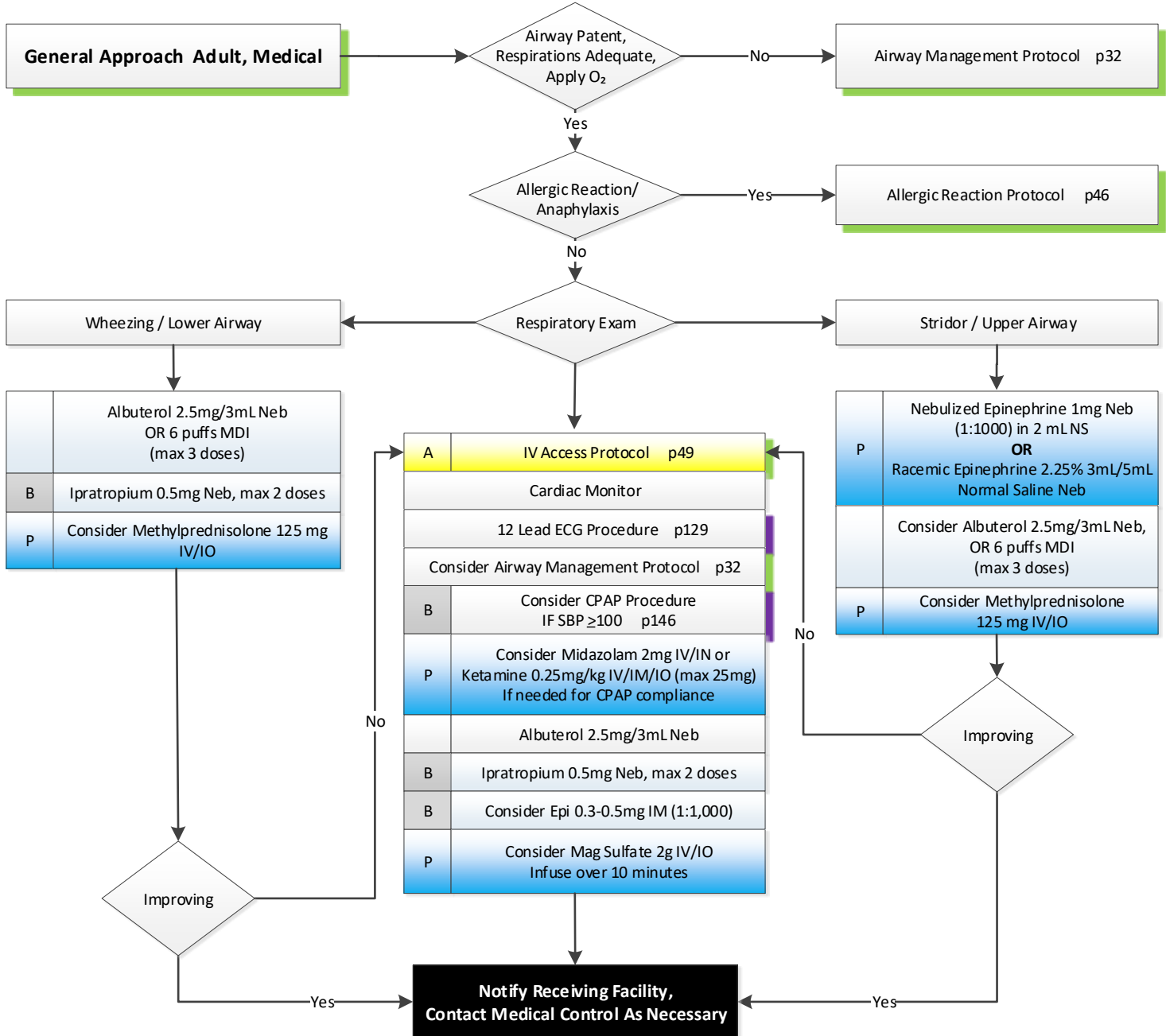
COPD / Asthma - Adult

Pertinent Positives/Negatives:

- Age, VS, SpO2, EtCO2
- SAMPLE history
- OPQRST history
- Asthma, COPD, CHF history
- Home meds used prior to call (Neb, Steroids, Theophylline)
- Wheezing, Rhonchi
- Accessory Muscle Use
- Decreased Ability to Speak
- History of CPAP/Intubation/ICU Admission from previous flares
- Smoke Exposure, Inhaled Toxins

Differential

- Simple Pneumothorax
- Tension Pneumothorax
- Pericardial Tamponade
- STEMI, CHF
- Inhaled Toxins (CO, CN, etc.)
- Anaphylaxis
- Asthma/COPD



Pearls

REQUIRED EXAM: VS, 12 Lead, GCS, RR, Lung Sounds, Accessory muscle use, nasal flaring

- Do not delay inhaled meds to get extended history.
- Supplemental O2 for all cases of hypoxia, tachypnea, subjective air hunger.
- Keep patient in position of comfort if partial obstruction.
- If COPD, monitor mental status.
- **Severe Asthma may restrict airway enough to not hear wheezing.**



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CHF / Pulmonary Edema - Adult

Pertinent Positives and Negatives

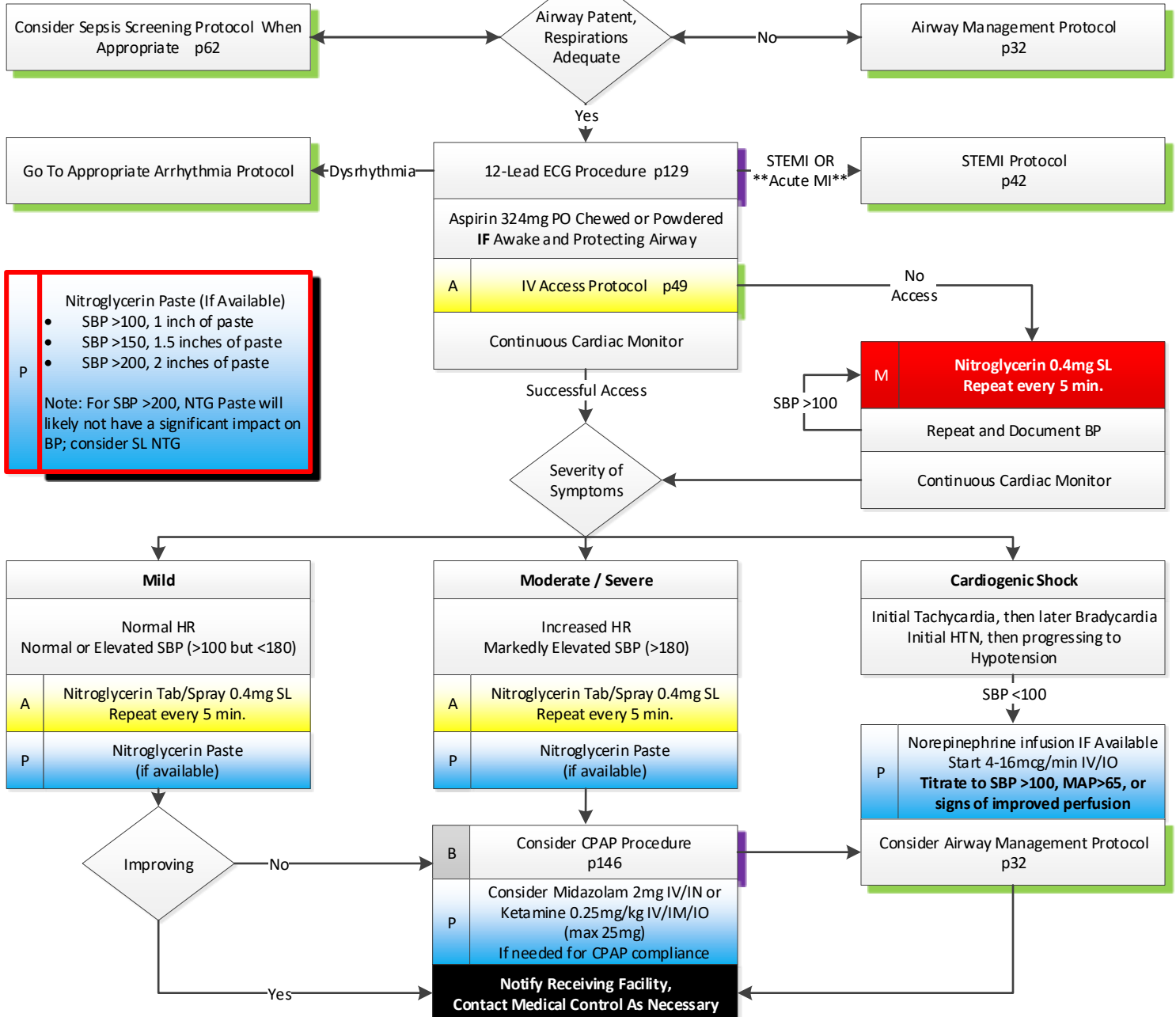
- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- CHF, CAD, Chest Pain History
- Peripheral Edema

- Home meds used prior to call (Digoxin, Lasix, Viagra, Cialis)
- Respiratory Distress, Rales
- Orthopnea, JVD
- Pink, Frothy Sputum

Differential

- Myocardial Infarction
- Pericardial Tamponade
- Pulmonary Embolism
- Congestive Heart Failure
- Toxic Exposure
- COPD Exacerbation
- Acute Renal Failure

General Approach – Adult, Medical



Nitroglycerin Paste (If Available)

- SBP >100, 1 inch of paste
- SBP >150, 1.5 inches of paste
- SBP >200, 2 inches of paste

Note: For SBP >200, NTG Paste will likely not have a significant impact on BP; consider SL NTG

Pearls

REQUIRED EXAM: VS, GCS, Head, Neck, Blood Glucose

- If CHF / Cardiogenic Shock is from inferior MI (II, III, aVF), consider RIGHT sided ECG
- If ST Elevation in V3, V4 OR Inferior Leads (II, III, aVF), Nitroglycerin may cause severe hypotension requiring IV Fluid boluses
- NTG goal is 20% reduction in SBP or symptom relief. If patient reports no relief with home Nitroglycerin, consider potency of medication (is the medicine expired? Would EMS supply be useful?)
- **BE CAUTIOUS** – Benzodiazepines may worsen respiratory depression, altered mental status, agitation especially if recent EtOH or illicit drug use. This med should be considered with EXTREME caution. All efforts should be made to verbally coach compliance PRIOR to BZD use in respiratory distress



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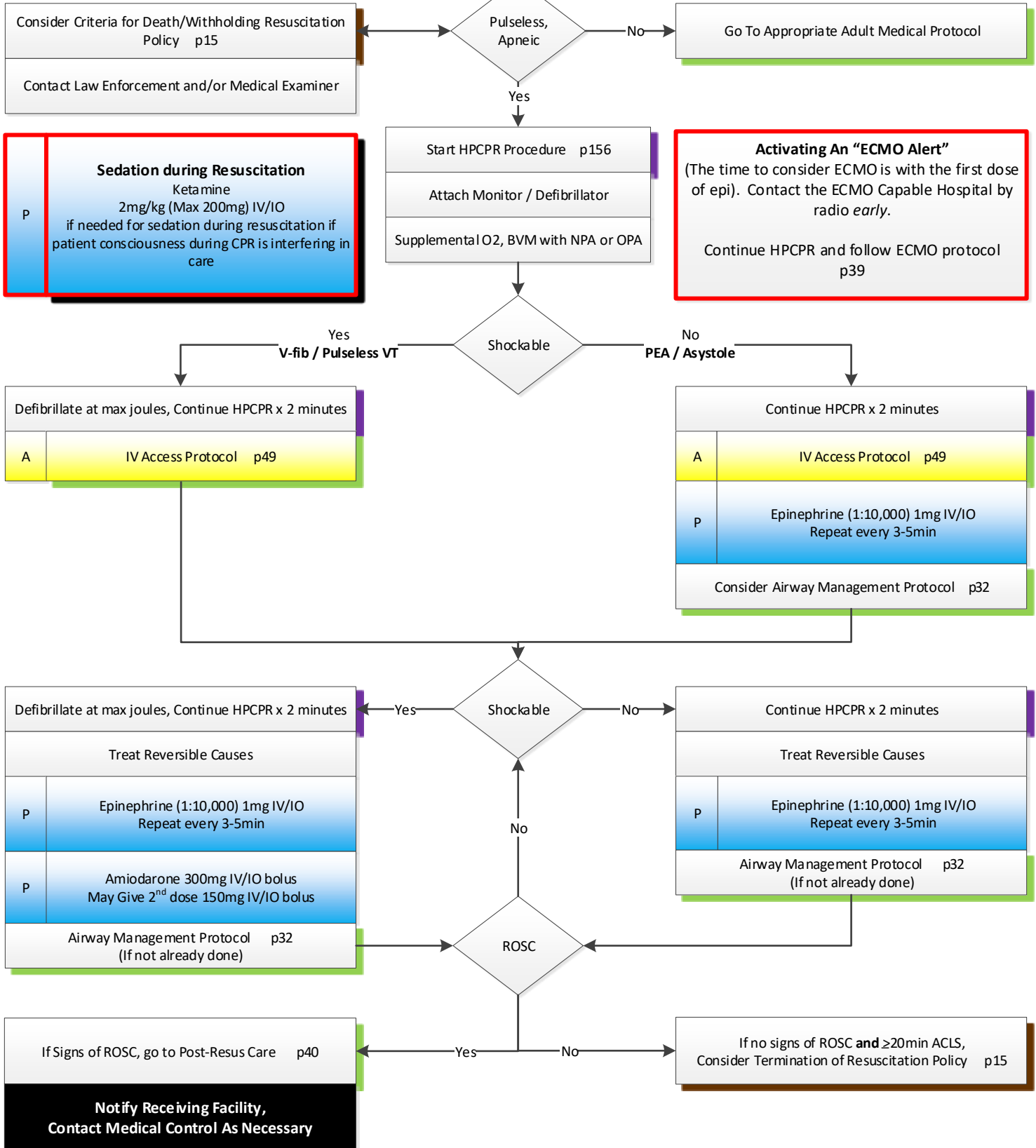


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Cardiac Arrest - Adult

General Approach – Adult, Medical



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Cardiac Arrest - Adult

CPR Quality

- Push Hard (at least 2 inches) and fast (100-120/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilation
- Rotate compressors every 2 minutes, sooner if fatigued
- If no advanced airway, 30:2 compression: ventilation ratio
- Quantitative waveform capnography
- If EtCO₂ <10mmHg, attempt to improve CPR quality
- Consider Mechanical CPR device by 6 minutes of resuscitation; may consider sooner if resources allow
- Consider advanced airway placement by 6 minutes of resuscitation; may consider sooner if resources allow

CONSIDER ALS EARLY if not auto dispatched

If at any time Patient has Return of Spontaneous Circulation (ROSC) Go to Post Resuscitation Protocol p40

Drug Therapy

Epinephrine IV/IO dose: 1mg every 3-5 minutes

Consider Max 5 doses epi IF not responding to resuscitation efforts

Amiodarone IV/IO dose: First dose 300mg bolus. Second dose 150mg bolus.

*Ketamine sedation during resuscitation consider 2mg/kg IV/IO

CONSIDER CORRECTABLE CAUSES OF ARRHYTHMIA:

Hypoxia – Secure airway and ventilate

Hypothermia – Active Rewarming

Hydrogen Ion (acidosis) – secure airway and ventilate

Toxins:

Narcotic OD – Naloxone 2mg IV/IO/IN/IM

A

Hypoglycemia – D10W 100ml IV/IO

Hypovolemia – NS Bolus IV/IO

P

Hyperkalemia – Sodium Bicarbonate 50mEq IV/IO AND

- Calcium Chloride 1g IV/IO

Hypomagnesemia / Torsades – Magnesium 2g IV/IO over 2 min

Tension Pneumothorax – Chest Decompression Procedure

Tamponade, Cardiac

Toxins:

Calcium Channel and B-Blocker OD – Glucagon 2mg IV/IO infusion

Calcium Channel Blocker OD – Calcium Chloride 1g IV/IO infusion
(contraindicated if pt. also on Digoxin/Lanoxin)

Tricyclic Antidepressant OD – Sodium Bicarb 1mEq/kg IV/IO

Thrombosis, Pulmonary

Thrombosis, Coronary

High Performance CPR (HPCPR)

HPCPR is an emphasis on communication, efficient movement of resuscitators, and an increased emphasis on the BASICS that improves outcomes

Refractory/Recurrent Vfib (Shockable Rhythm)

- Consider changing position of pads, reduce impedance, double sequential (see below), ECMO, transport

Double Sequential Defibrillation

- Consider for cases of shock refractory V-fib or Pulseless V-tach that have not converted after 3 defibrillation attempts AND ≥1 dose of ACLS medication
- There is the potential to cause damage to equipment when performing this procedure. Therefore, it is recommended to be attempted using an AED and a monitor to minimize risk.
- Because of the potential for adverse equipment results, **it is important that your Service Director and Medical Director approve this procedure BEFORE attempting**

Advanced Airway

- Endotracheal Intubation or supraglottic airway
- Waveform capnography to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Abrupt sustained increase in ETCO₂ (typically >40mmHg)

Pearls

RECOMMENDED EXAM: Mental Status, Pulse, Initial and Final Rhythm

- Immediately after defibrillation, resume chest compressions with a different operator compressing. Do not pause for post-shock rhythm analysis. Stop compressions only for signs of life (patient movement) or rhythm visible through compressions on monitor or pre-defibrillation rhythm analysis every 2 minutes and proceed to appropriate protocol.
- **Based on current literature, Ventricular Fibrillation and Pulseless Ventricular Tachycardia patients who are successfully resuscitated should be transported to a 24/7 STEMI capable facility if reasonable to do so.**
- **In the event a patient suffers cardiac arrest in the presence of EMS, the absolute highest priority is to apply the AED/Defibrillator and deliver a shock immediately if indicated.**
- Reassess airway frequently and with every patient move. Cycle compressors frequently – compression quality deteriorates before fatigue is perceived.
- Designate a “Code Leader” to coordinate transitions, defibrillation and pharmacological interventions. “Code Leader” ideally should have no procedural tasks.
- External Compression Devices may be considered if available and will not impede patient care.
- **Consider sodium bicarb early in cases of sudden cardiac arrest in Excited Delirium.**
- Consider Ketamine if needed for sedation during resuscitation if patient consciousness during CPR is interfering in care.



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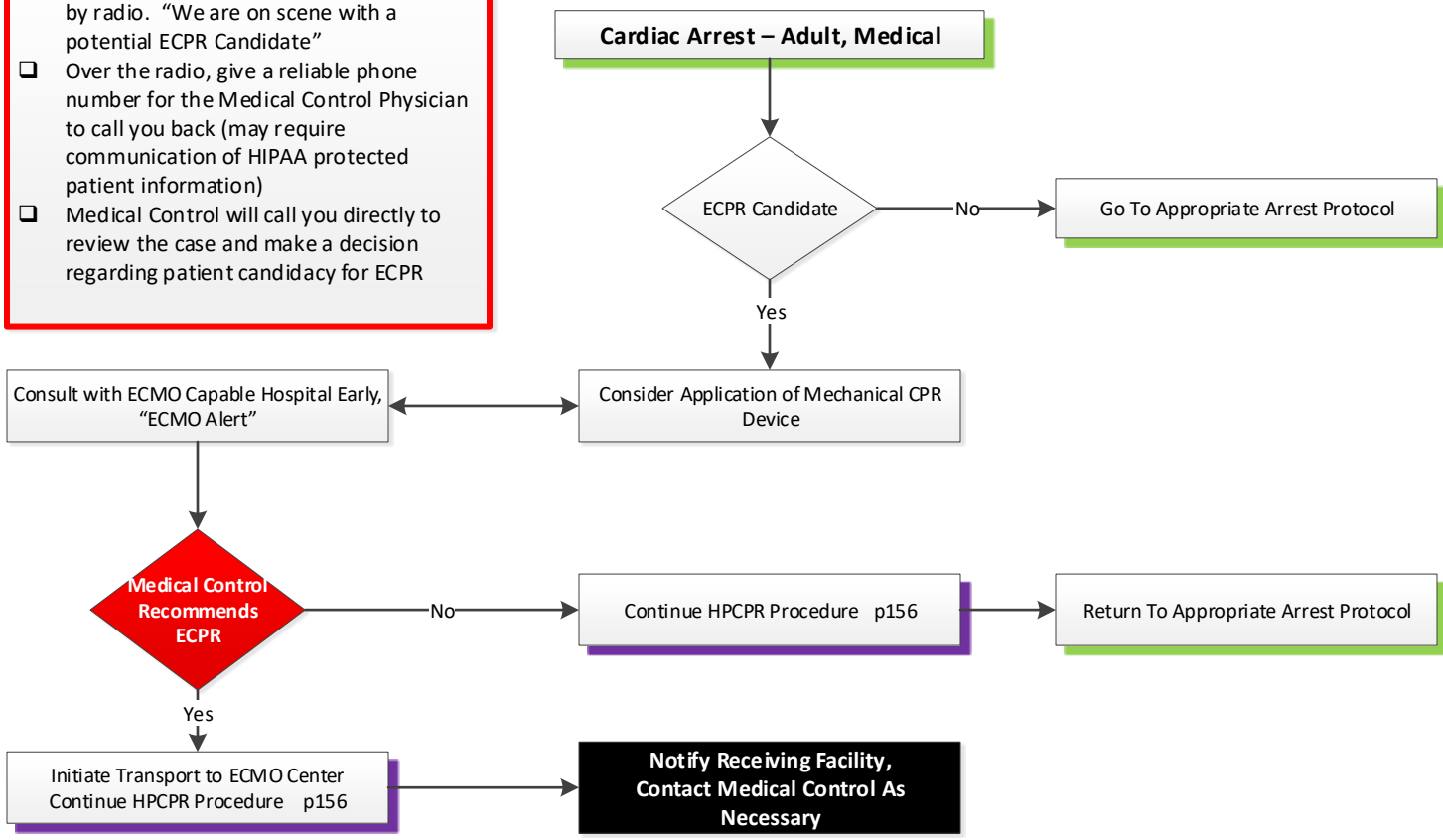
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Extracorporeal Cardiopulmonary Resuscitation (ECPR or "ECMO") - Adult

- Inclusion Criteria for ECPR:**
- Age 13 -70 years; weight \geq 40kg
 - Arrest is EITHER:
 - Witnessed **OR**
 - Initial Shockable Rhythm **OR**
 - Intermittent ROSC
 - ECPR can be initiated within ~60 minutes of estimated initial arrest
 - Suspect reversible cause of arrest – STEMI, massive PE, cardiac toxin overdose, primary arrhythmia, accidental hypothermia, etc.
 - ECPR and full ICU care are consistent with patient wishes (if known by family at bedside)

- Exclusions to ECPR:**
- Estimated BMI >40 due to morbid obesity
 - (i.e. >300lbs at 6' tall; >250lbs at 5'6" tall; cannot fit into LUCAS device)
 - Cannot safely anticoagulate
 - (i.e. Trauma, Aortic Dissection, ICH, Uncontrolled Hemorrhage)
 - Cannot perform ADLs at baseline, including (if known or reported by family)
 - Resident of Nursing Home, SNF, LTAC
 - Not oriented to self and place and/or not conversational
 - Advanced comorbidities (if known or reported by family)
 - Oxygen-dependent lung disease
 - Previously evaluated and deemed not a candidate for LVAD
 - ESRD requiring dialysis
 - ESLD, including jaundice, ascites, varices and/or transplant list
 - Metastatic cancer and/or receiving chemo or radiation
 - DNR/DNI (if known or reported by family)
 - Attending physician perception of futility, including
 - EtCO₂ <10mmHg for >20minutes

- Activating An "ECMO Alert"**
- Contact the ECMO Capable Hospital Early by radio. "We are on scene with a potential ECPR Candidate"
 - Over the radio, give a reliable phone number for the Medical Control Physician to call you back (may require communication of HIPAA protected patient information)
 - Medical Control will call you directly to review the case and make a decision regarding patient candidacy for ECPR



- Pearls**
- REQUIRED EXAM: VS, GCS, RR, Lung Sounds, Cardiac Exam, JVD**
- Goal is estimated time of arrest to on ECMO Circuit <60 minutes
 - It is important to *balance* High Performance CPR on scene with ECPR potential; Strongly consider candidate patient if not responding to quality CPR.
 - Ideally, decision to move patient should be made and transport from scene should happen in <16 minutes
 - Contact ECPR-capable receiving hospital with "ECMO Alert" early; consider contact after 2nd shock for refractory V-fib, rearrest after ROSC, EMS Discretion, etc.
 - ECPR is a *highly* time-critical intervention; it is important to consider the patient circumstances and whether pt. could be a candidate. Consultation with ECMO center early is a priority
 - There are many variables that go into the decision to start a patient in ECPR circuit; not every candidate patient will be able to be cannulated on arrival to the ED



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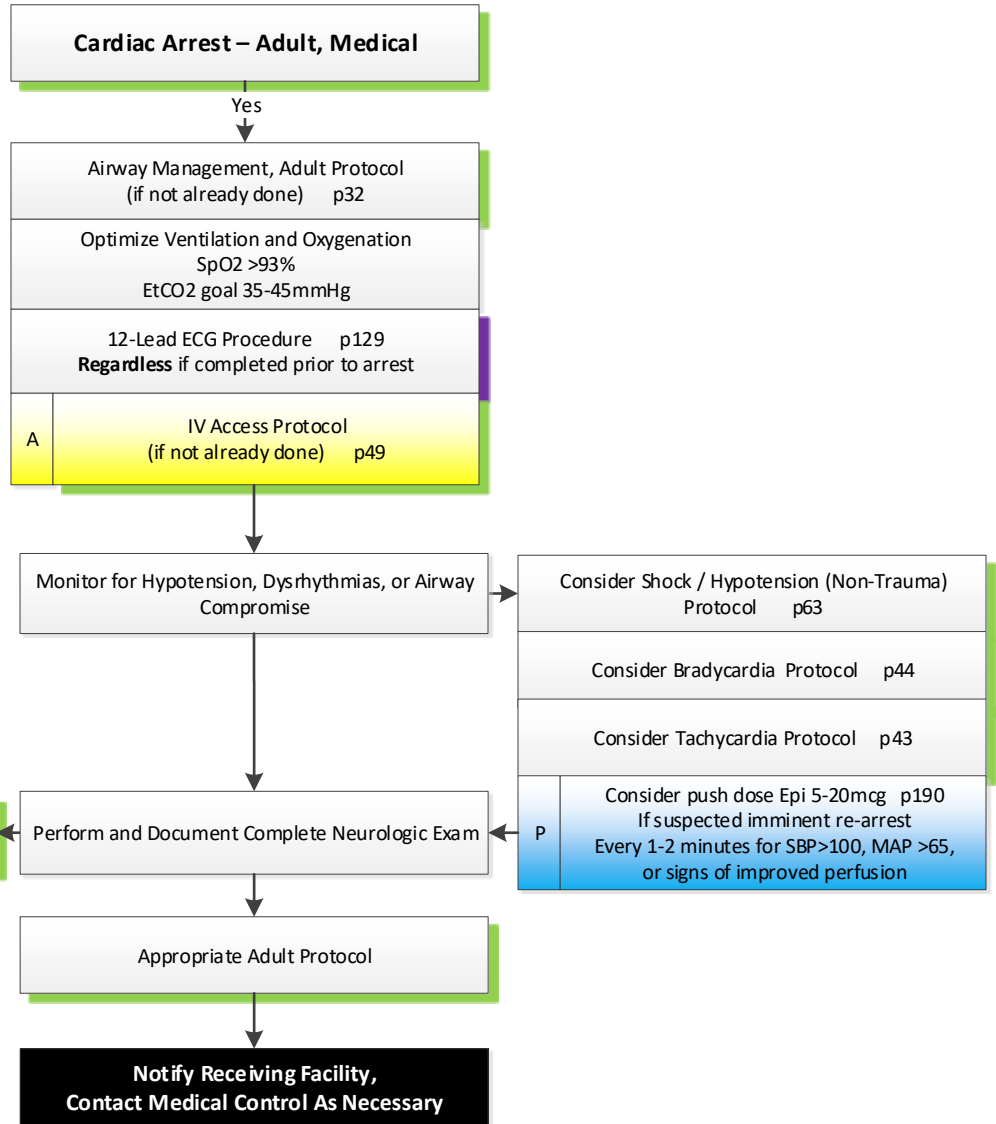
Post Resuscitation - Adult

Pertinent Positives and Negatives

- Events leading to arrest
- Estimated downtime
- Past Medical History
- Medications
- Existence of terminal illness
- Signs of lividity, rigor mortis
- Code Status (DNR)

Differential

- Medical or Trauma
- Vfib vs Pulseless Vtach
- Asystole
- Pulseless electrical activity (PEA)



Pearls

RECOMMENDED EXAM: Mental Status, Pulse, Initial and Final Rhythm

- The American Heart Association no longer supports routine prehospital hypothermia induction for all out of hospital cardiac arrests based on the most current literature.
- Acute myocardial infarction, cardiomyopathy, and primary arrhythmia are the most common causes for cardiac arrest.
- **Based on current literature, Ventricular Fibrillation and Pulseless Ventricular Tachycardia patients who are successfully resuscitated should be transported to a 24/7 STEMI capable facility if reasonable to do so.**
- In observational studies, PaCO₂ in a normal range (35 to 45 mmHg) when measured at 37°C is associated with better outcomes than higher or lower PaCO₂.
- Antiarrhythmic drugs should be reserved for patients with recurrent or ongoing unstable arrhythmias.
- No data support the routine or prophylactic use of antiarrhythmic drugs after the return of spontaneous circulation following cardiac arrest, even if such medications were employed during the resuscitation.
- Determining and correcting the underlying cause of the arrhythmia (eg, electrolyte disturbance, acute myocardial ischemia, toxin ingestion) is the best intervention.



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Chest Pain / Suspected Acute Coronary Syndrome - Adult

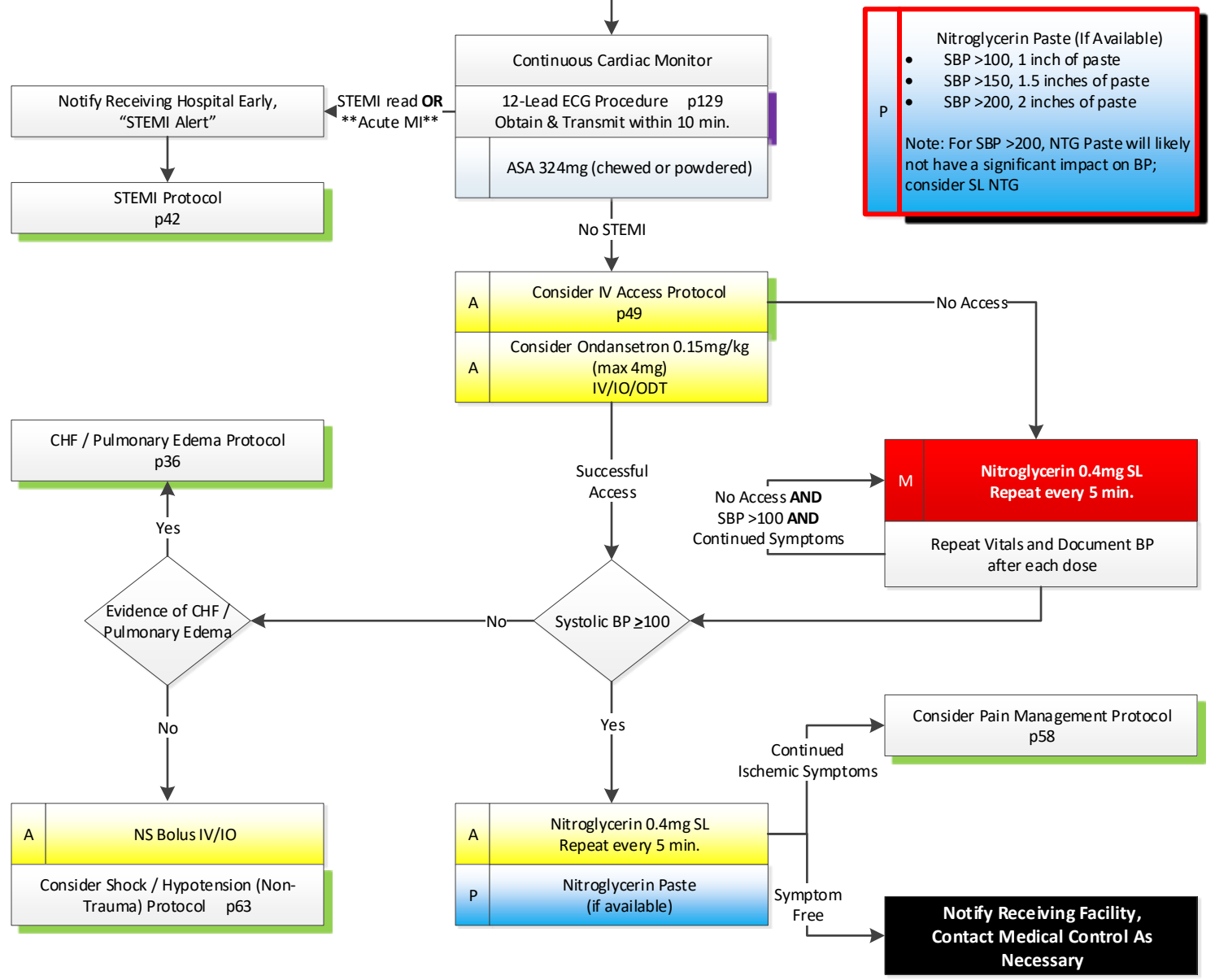
Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE History
- OPQRST History
- CHF, CAD, Chest Pain History
- Home meds prior to EMS Arrival (Digoxin, Lasix, ASA, Viagra, Cialis)
- Respiratory Distress
- Orthopnea, JVD

Differential

- Pericardial Tamponade
- Pericarditis
- Asthma / COPD
- Aortic Dissection
- Sympathomimetic Overdose
- Pulmonary Embolism
- Esophageal Spasm
- Gastroesophageal Reflux (GERD)

General Approach – Adult, Medical



Pearls

REQUIRED EXAM: VS, GCS, RR, Lung Sounds, Cardiac Exam, JVD

- Avoid Nitroglycerin in any patient who has used Viagra (Sildenafil) or Levitra (Vardenafil) in the last 24 hours or Cialis (Tadalafil) in the last 36 hours
- If no IV Access, ECG MUST be obtained and reviewed by Medical Control prior to administration of Nitroglycerin (even patient supplied)
- If patient takes Aspirin immediately prior to EMS arrival, confirm the medication and expiration date. If uncertain, administer full dose aspirin
- NTG goal is 20% reduction in SBP or symptom relief. If patient reports no relief with home Nitroglycerin, consider potency of medication (is the medicine expired? Would EMS supply be useful?)
- Use Nitroglycerin with caution if Inferior, Right Ventricle or Posterior MI is suspected
- Elderly patients, diabetics and women are more likely to have atypical chest pain– SOB, fatigue, weakness, back pain, jaw pain
- Have a low threshold to get a 12-Lead ECG. They are minimally invasive, painless and can evolve with time
- If ST Elevation in V3, V4 or Inferior Leads (II, III, aVF), Nitroglycerin may cause hypotension requiring IV Fluid Boluses



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ST Elevation Myocardial Infarction - Adult

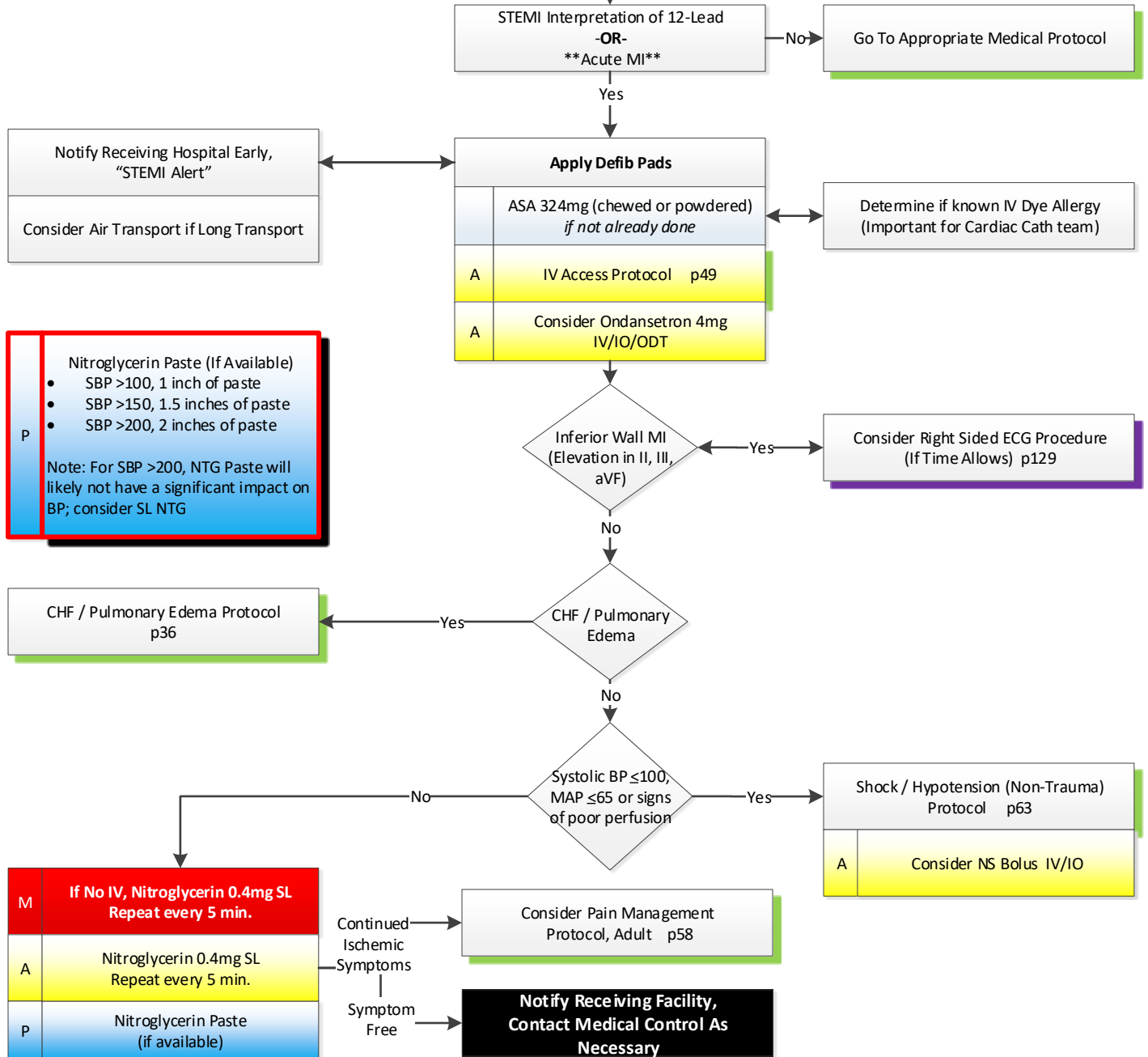
Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE History
- OPQRST History
- CHF, CAD, Chest Pain History
- Home meds prior to EMS Arrival (Warfarin, Anticoagulation, ASA, Viagra, Cialis)
- Respiratory Distress
- Orthopnea, JVD

Differential

- Pericardial Tamponade
- Pericarditis
- Asthma / COPD
- Aortic Dissection
- Sympathomimetic Overdose
- Pulmonary Embolism

General Approach – Adult, Medical



Pearls

REQUIRED EXAM: VS, GCS, RR, Lung Sounds, Cardiac Exam, JVD

- Goal is First Medical Contact (YOU!!) to arrival at the 24/7 PCI capable STEMI facility should be <60 minutes.
- Goal is to limit on-scene time with a STEMI patient to <10 minutes.
- NTG goal is 20% reduction in SBP or symptom relief. If patient reports no relief with home Nitroglycerin, consider potency of medication (is the medicine expired? Would EMS supply be useful?).
- If long transport time expected due to geography, traffic, etc. consider activation of Air EMS for delivery directly to cath lab.
- Transmit STEMI or **Acute MI** 12-Leads early and call STEMI receiving hospital with "STEMI Alert" early; inform them of full report to follow.



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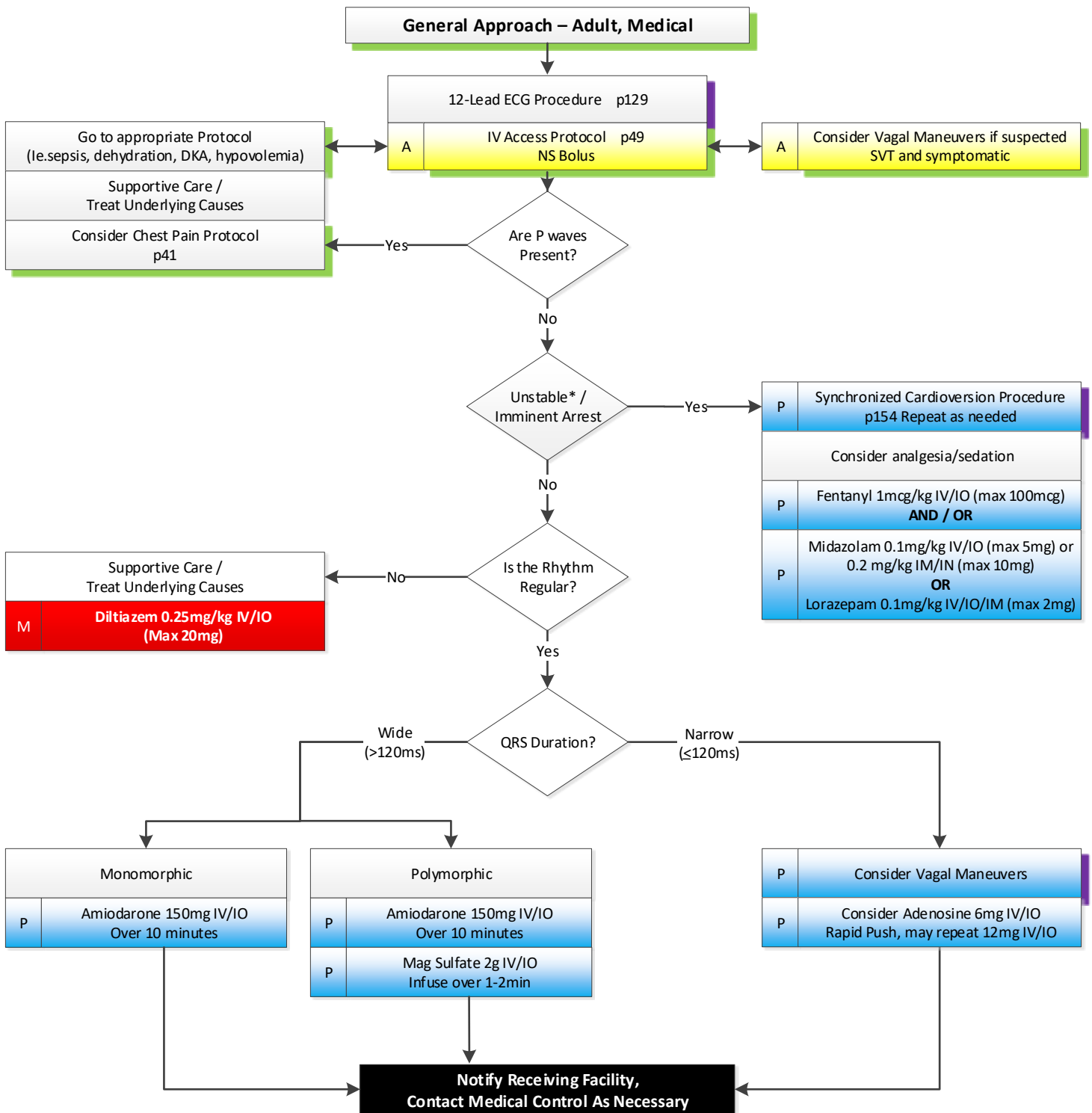
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Tachycardia With A Pulse - Adult



Pearls
REQUIRED EXAM: VS, GCS, RR, Lung Sounds, Cardiac Exam, JVD

- *Unstable – Severe Hypotension, Signs of Shock, AMS Secondary to Arrhythmia.
- Not all cases of tachycardia need to be rate controlled; sepsis, hypovolemia, and acute hemorrhage will do worse if their ability to compensate is taken away
- Adenosine has a very short half life (5sec or less) so it must be infused rapidly in a patent IV site, preferably the AC fossa or more proximal



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Bradycardia With A Pulse - Adult

Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE History
- OPQRST History
- CHF, CAD, Chest Pain History
- QRS <0.12 sec (≤3 small squares)

- Home meds prior to EMS Arrival (Digoxin, Lasix, ASA, Viagra, Cialis)
- Respiratory Distress
- Orthopnea, JVD

Differential

- Pericardial Tamponade
- Pericarditis
- Pacemaker Failure
- Hypothermia
- Sinus Bradycardia
- Head Injury
- Spinal Cord Injury
- Sick Sinus Syndrome
- Acute MI
- AV Block (1°, 2°, 3°)

General Approach – Adult, Medical

Continuous Cardiac Monitor
Supplemental O2 to maintain SpO2 ≥93%

A IV Access Protocol p49

HR <60bpm **AND**
Unstable / Imminent
Arrest

P External Cardiac Pacing Procedure p159

Consider analgesia/sedation

P Fentanyl 1mcg/kg IV/IO (max 100mcg)
AND / OR

P Midazolam 0.1mg/kg IV/IO (max 5mg) or
0.2 mg/kg IM/IN (max 10mg)
OR
Lorazepam 0.1mg/kg IV/IO/IM (max 2mg)

12-Lead ECG Procedure p129

Go To STEMI Treatment Protocol p42

Symptomatic

A Consider IVF bolus IV/IO, repeat as indicated for patient condition

P Atropine 1.0mg IV/IO
May Repeat every 3-5min; Max 3mg

P Consider push dose Epi 5-20mcg p190 every 1-2 minutes SBP>100, MAP >65, or signs of improved perfusion

Look for and Treat Underlying Causes

Consider Specific Overdose and Poisoning Protocol p54

Consider SEPSIS Screening p62

Improving

P Consider External Cardiac Pacing Procedure p159

P Epinephrine (1:1,000) 2-10 mcg/min IV/IO
Titrate to SBP>100, MAP>65,
OR signs of improved perfusion

Consider Hypotension / Shock (Non-Trauma) Protocol p63

**Notify Receiving Facility,
Contact Medical Control As Necessary**

Pearls

REQUIRED EXAM: VS, GCS, RR, Lung Sounds, Cardiac Exam, JVD

- Not all cases of bradycardia need to be treated with medicine or pacing; use good clinical judgement and follow symptoms.
- Continually monitor for signs of decompensation and be prepared to move to external cardiac pacing if the patient condition changes. Place the pads while reaching for the meds.
- Atropine is unlikely to work in cases of complete heart block. Atropine is contraindicated in patients with narrow angle glaucoma.
- Elderly patients, diabetics and women are more likely to have atypical chest pain – SOB, fatigue, weakness, back pain, jaw pain.
- Have a low threshold to get a 12-Lead ECG. They are minimally invasive, painless and can evolve with time.



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Abdominal Pain / GI Bleeding - Adult

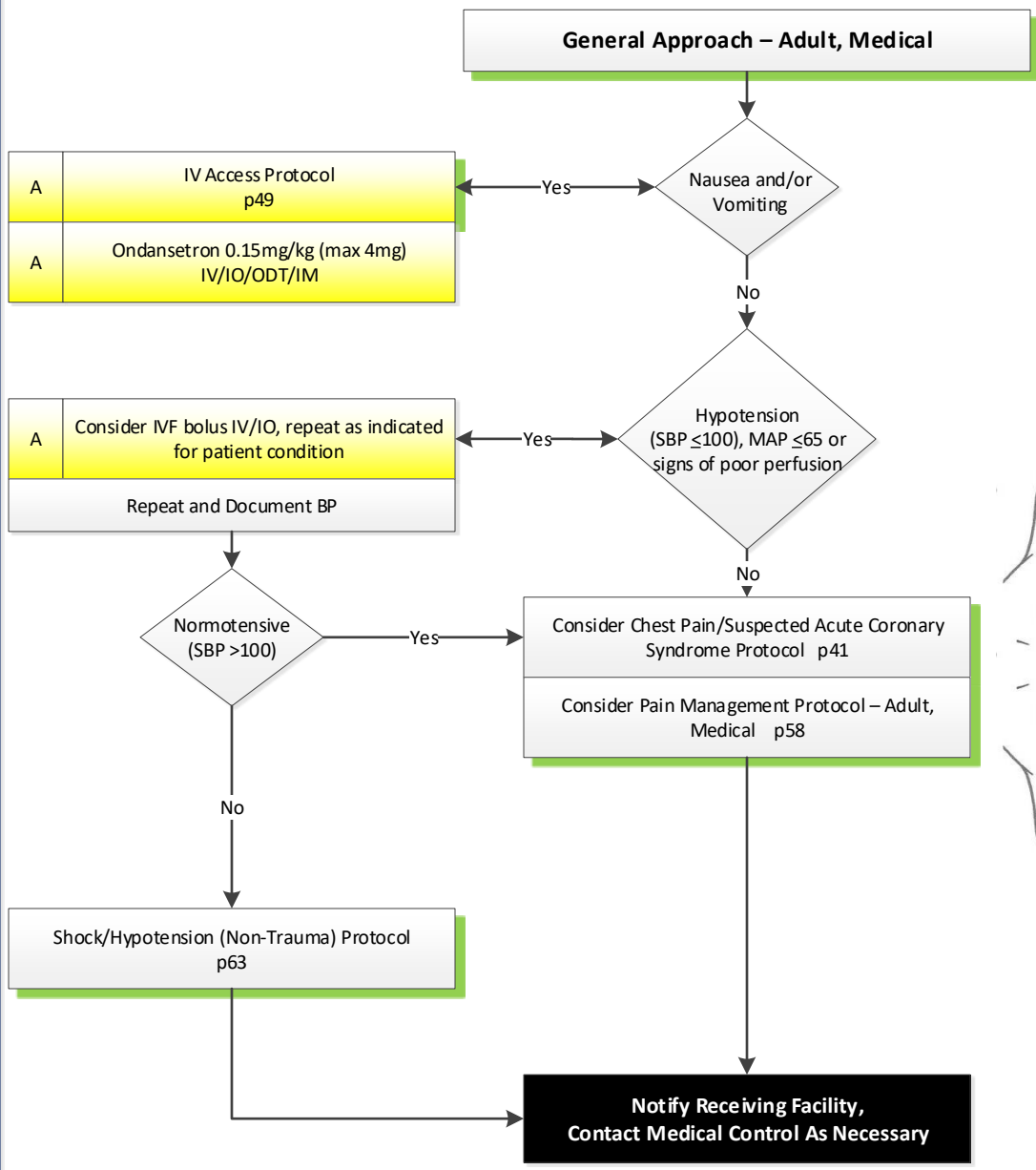
Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- Last Meal / Oral Fluids
- Menstrual / Pregnancy History
- Anticoagulant Use

- Nausea, Vomiting, Diarrhea
- Constipation
- Hematochezia (Bloody Stool)
- Recent Travel
- Recent Antibiotics

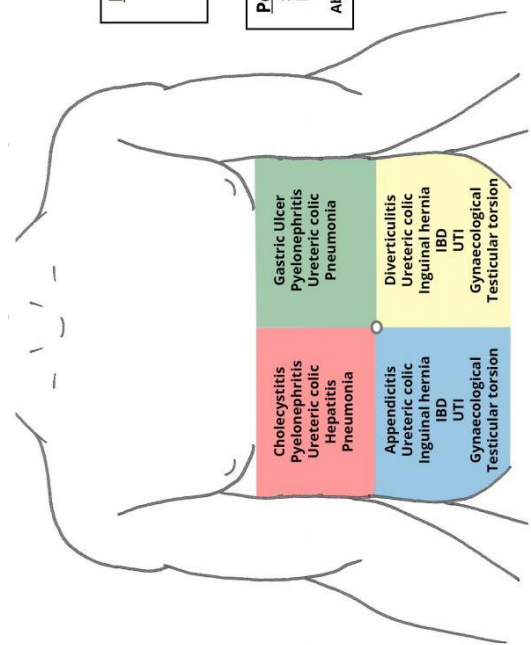
Differential

- AAA +/- Rupture
- Perforated Ulcer
- Appendicitis
- Ectopic Pregnancy +/- Rupture
- Diverticulitis
- Small Bowel Obstruction
- Splenic Enlargement / Rupture



Epigastric Region
 Peptic ulcer disease
 Cholecystitis
 Pancreatitis
 Myocardial infarction

Peri-umbilical Region
 Small bowel obstruction
 Large bowel obstruction
 Appendicitis
 Abdominal aortic aneurysm



Pearls

REQUIRED EXAM: VS, GCS, Focal Tenderness, Rebound Tenderness, Distal Pulses, Abdominal Masses

- Nothing by mouth (NPO) Status for all patients with abdominal pain
- If pain is above the umbilicus, perform a 12-Lead ECG. Go to Chest Pain Protocol as indicated
- Abdominal pain in women of child bearing age should be treated as an ectopic pregnancy until proven otherwise
- The diagnosis of AAA should be considered in patients >50 years old. Assess the abdomen for a midline pulsatile mass and feel for pulses in feet / legs
- Rebound tenderness is pain that is *increased* when releasing pressure from palpation
- Appendicitis may present with vague, peri-umbilical pain that slowly migrates to the Right Lower Quadrant (RLQ) over time
- Blood loss from the GI Tract has a very distinct smell; use all of your senses when evaluating your patients. GI Bleed patients have a high risk of serious hemorrhage
- **Abdominal Pain and known pregnancy, go to OB Protocol**



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B EMT
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P Paramedic
M Medical Control

Allergic Reaction - Adult

Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- Onset and Location of Symptoms
- Lung Sounds before *AND* after intervention
- Allergen Exposure
- Toxic / Environmental Exposure
- Subjective throat "tightness" OR "closing"

Differential

- Urticaria (Rash Only)
- Anaphylaxis (Systemic Effect)
- Shock (Vascular Effect)
- Angioedema
- Aspiration / Airway Obstruction
- Vasovagal Event
- Asthma / COPD
- CHF

General Approach – Adult, Medical

Allergic Reaction

Flushing, Hives, Itching, Erythema
Normal BP, No Respiratory Involvement

Anaphylaxis

Multi System involvement or Hypotension, respiratory distress, AMS
Dyspnea, Wheezing, Chest Tightness, Vomiting or Abdominal Pain

Epi 0.3-0.5mg IM (1:1000)

Consider Airway Management Protocol p32

A IV Access Protocol p49

A Consider IVF bolus IV/IO, repeat as indicated for patient condition

Consider Hypotension/Shock Protocol p63

Albuterol 2.5mg/3mL Neb
May repeat Q10min, Max 3

P Methylprednisolone, 125mg IV/IO

P Diphenhydramine 50mg IV/IM/IO/PO

P Famotidine 20mg IV/IO If available

12-Lead ECG Procedure p129

P Consider push dose Epi 5-20mcg p190
If suspected imminent arrest.
Every 1-2 minutes SBP>100, MAP >65, or signs of improved perfusion

Improving

No

Yes

Monitor and Reassess
Document Response to Medications

Improving

Yes

No

Consider ALS if not already done

Epi 0.3-0.5mg IM (1:1000)

P Epi Infusion 2-10mcg/min IV/IO

**Notify Receiving Facility,
Contact Medical Control As Necessary**

Pearls

REQUIRED EXAM: VS, GCS, Skin, Cardiovascular, Pulmonary

- Epinephrine Infusion: Mix 1mg (1:1,000) in 250mL NS. If worsening/refractory anaphylaxis, contact Med Control as soon as practical. Start at 2mcg/min, titrate up.
- Famotidine **dilution no longer required**. Infuse over 2 minutes.
- In general, the shorter the time from allergen contact to start of symptoms, the more severe the reaction.
- Consider the Airway Management Protocol early in patients with Severe Allergic Reaction or subjective throat closing



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Behavioral Emergencies - Adult

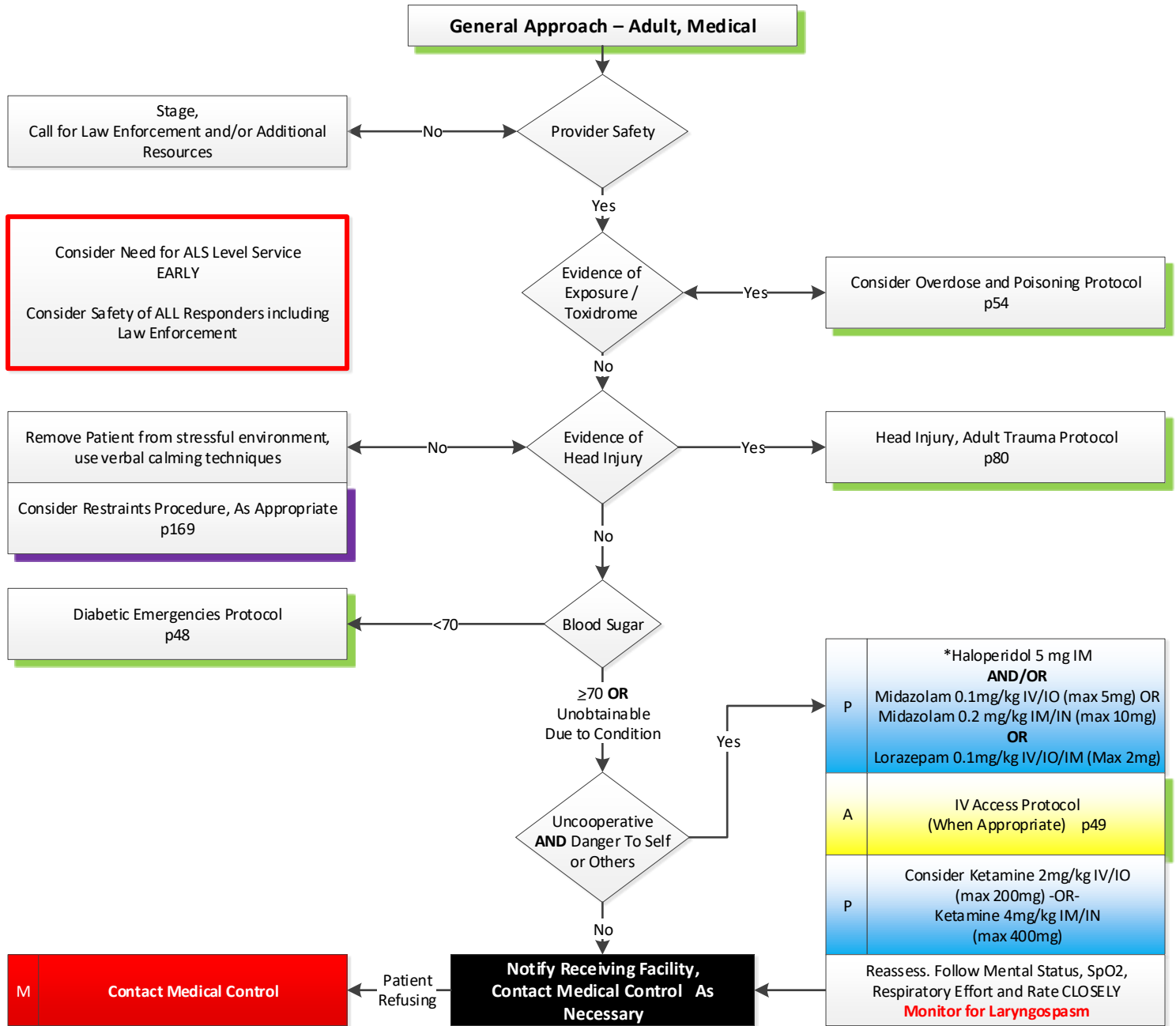
Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- Situational Crisis
- Psychiatric Illness / Medication History
- Medic Alert Bracelet, DM History
- Anxiety, Agitation or Confusion
- Suicidal / Homicidal Thoughts or History
- Evidence of Substance Use / Overdose

Differential

- EtOH Intoxication / Withdrawal
- Toxic Ingestion
- Substance Use / Abuse
- Schizophrenia
- Hypoglycemia
- Hypoxia
- Head Injury
- Occult Trauma
- Cerebral Hypoperfusion

General Approach – Adult, Medical



Pearls

REQUIRED EXAM: VS, GCS, Skin, Cardiovascular, Pulmonary

- Safety First – For Providers, Police and Patients! Never restrain any patients in the prone (face down) position.
- Physical and/or chemical restraints should ONLY be used if patient is deemed a danger to themselves or others and is uncooperative and less invasive measures to deescalate have failed or were deemed unsafe to attempt.
- All patients who require chemical restraint MUST be continuously monitored by ALS Personnel.
- Patients who are actively fighting physical restraints are at high risk for Behavioral Emergencies and In-Custody Death; Have a low threshold to activate ALS for chemical restraint.
- There are multiple possible causes of behavioral emergencies. Keep a broad differential when evaluating and treating these patients.
- Transport of patients requiring handcuffs or Law Enforcement (LE) restraint require LE to ride in the ambulance to the hospital – they have the keys!
- *Avoid Haloperidol in patients with known history of MAOI Antidepressant use (Phenelzine, Tranylcypromine) OR history of Parkinson's Disease.
- If a patient with severe agitation suddenly becomes cooperative/quiet, reassess them quickly! Sudden Cardiac Death is common in this population.



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Diabetic Emergencies - Adult

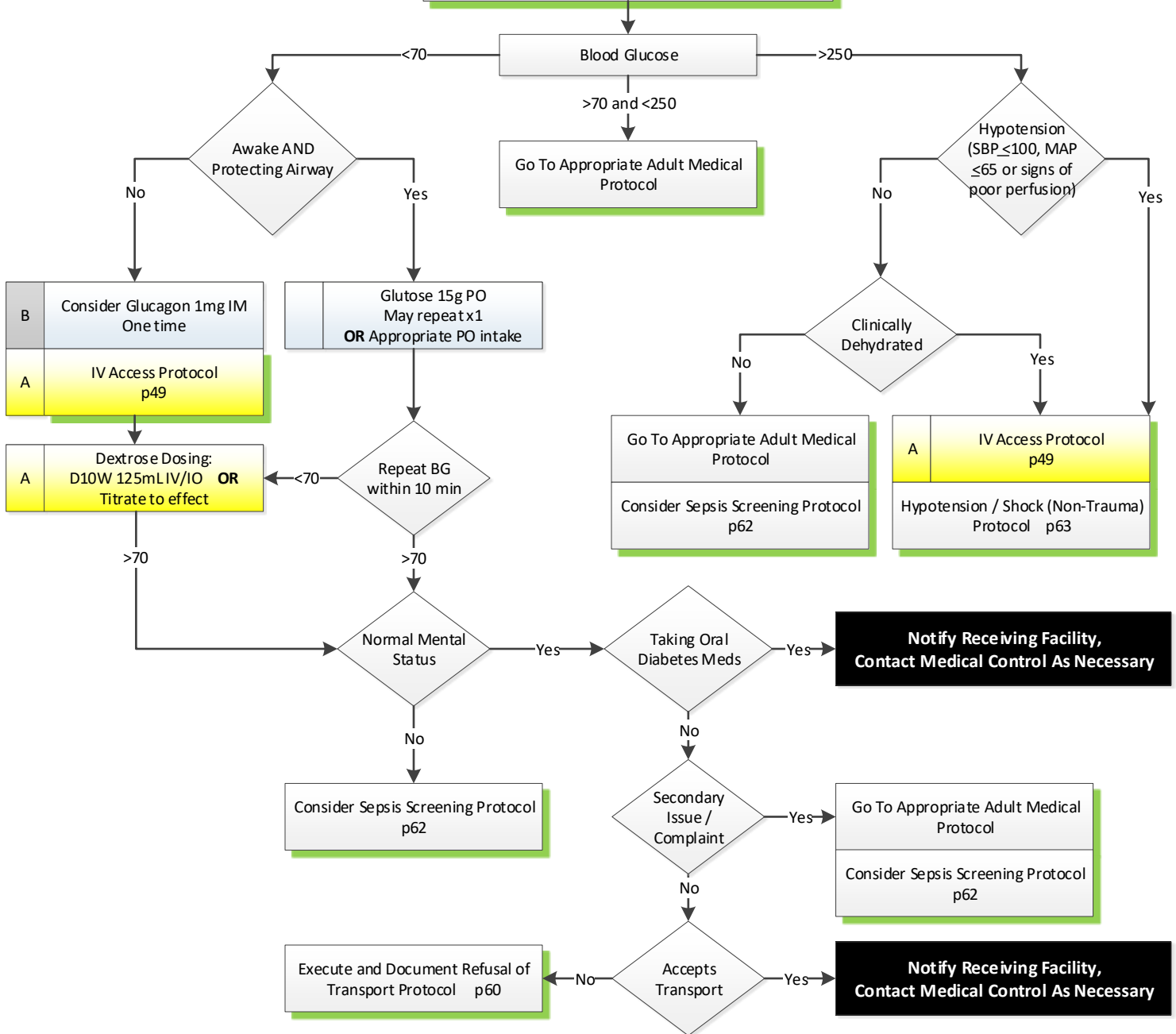
Pertinent Positives/Negatives:

- Age, VS, Blood Glucose Reading
- SAMPLE History
- OPQRST History
- Last Meal, History of Skipped Meal
- Diaphoresis
- Seizures
- Abnormal Respiratory Rate
- History of DKA

Differential

- Toxic Ingestion
- Head Injury
- Sepsis
- Stroke/TIA
- Seizure
- EtOH Abuse/Withdrawal
- Drug Abuse/Withdrawal

General Approach – Adult, Medical



Pearls

REQUIRED EXAM: VS, SpO2, Blood Glucose, Skin, Respiratory Rate and Effort, Neuro Exam

- Do NOT administer oral glucose to patients that can't swallow or adequately protect their airway.
- Simple Hypoglycemia for these protocols is defined as: hypoglycemia caused by insulin ONLY and not suspected to be due to occult infection or trauma
- Prolonged hypoglycemia may not respond to Glucagon; be prepared to start an IV and administer IV Dextrose.
- Alcoholics and patients with advanced liver disease may not respond to Glucagon due to poor liver glycogen stores.
- Patients on oral diabetes medications are at a very high risk of recurrent hypoglycemia and should be transported. Contact Medical Control for advice/patient counseling if patient is refusing. See Refusal after Hypoglycemia Treatment Protocol for additional information as necessary.
- Always consider intentional insulin overdose, and ask patients / family / friends / witnesses about suicidal ideation or gestures.



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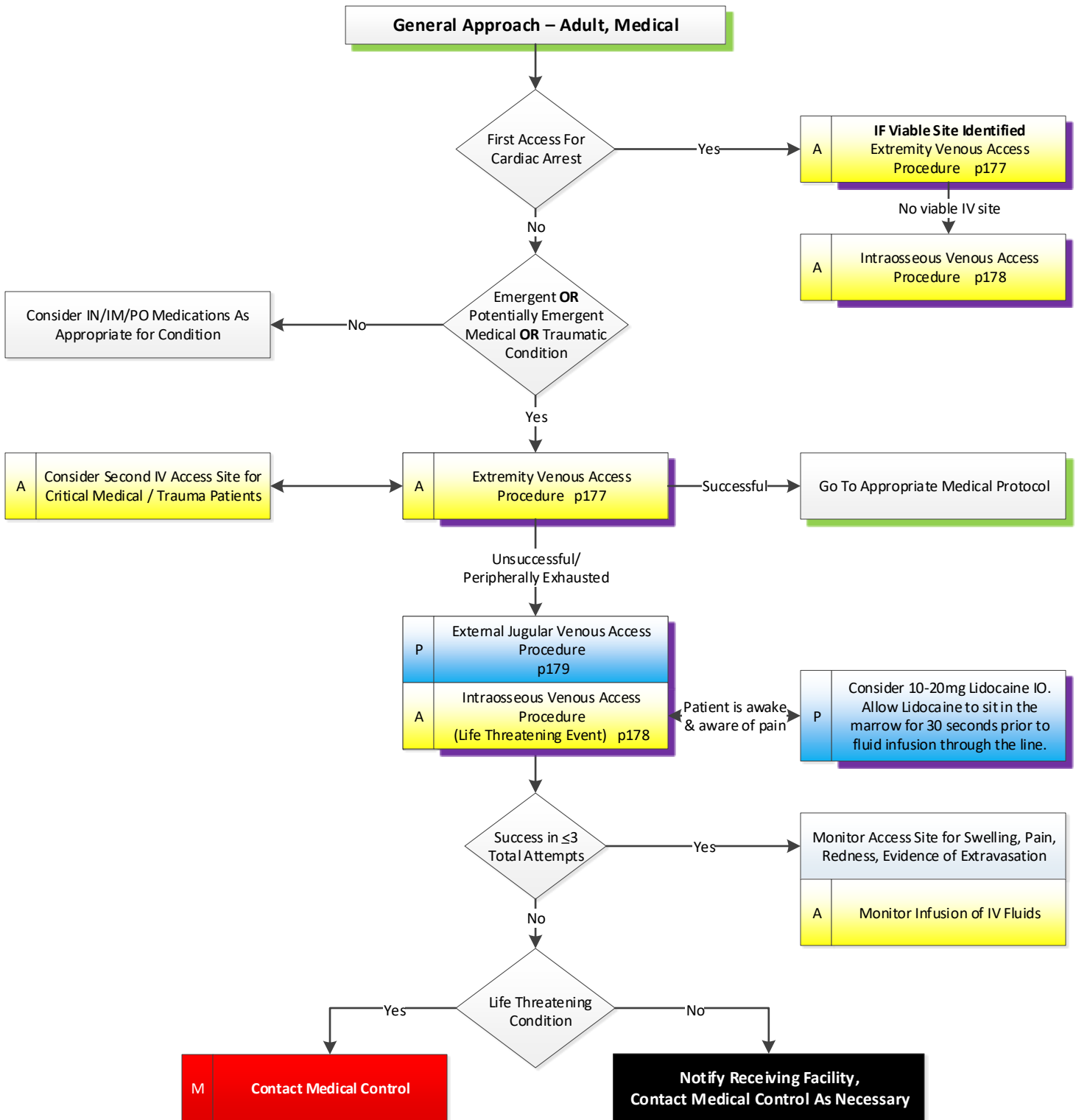
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IV Access - Adult



Pearls

- In the setting of **CARDIAC ARREST ONLY**, any preexisting dialysis shunt or central line may be used by Paramedics
- For patients who are hemodynamically unstable or in extremis, Medical Control **MUST** be contacted prior to accessing any preexisting catheters
- Upper Extremity sites are preferred over Lower Extremity sites. Lower Extremity IVs are discouraged in patients with peripheral vascular disease or diabetes
- In post-mastectomy patients and patients with forearm dialysis fistulas, avoid IV attempts, blood draws, injections or blood pressures in the upper extremity on the affected side
- Saline Locks are acceptable in cases where access may be necessary but the patient is not volume depleted; having an IV does not mandate IV Fluid infusion
- The *preferred order* of IV Access is: Peripheral IV, External Jugular IV, Intraosseous IV **UNLESS** medical acuity or situation dictate otherwise.



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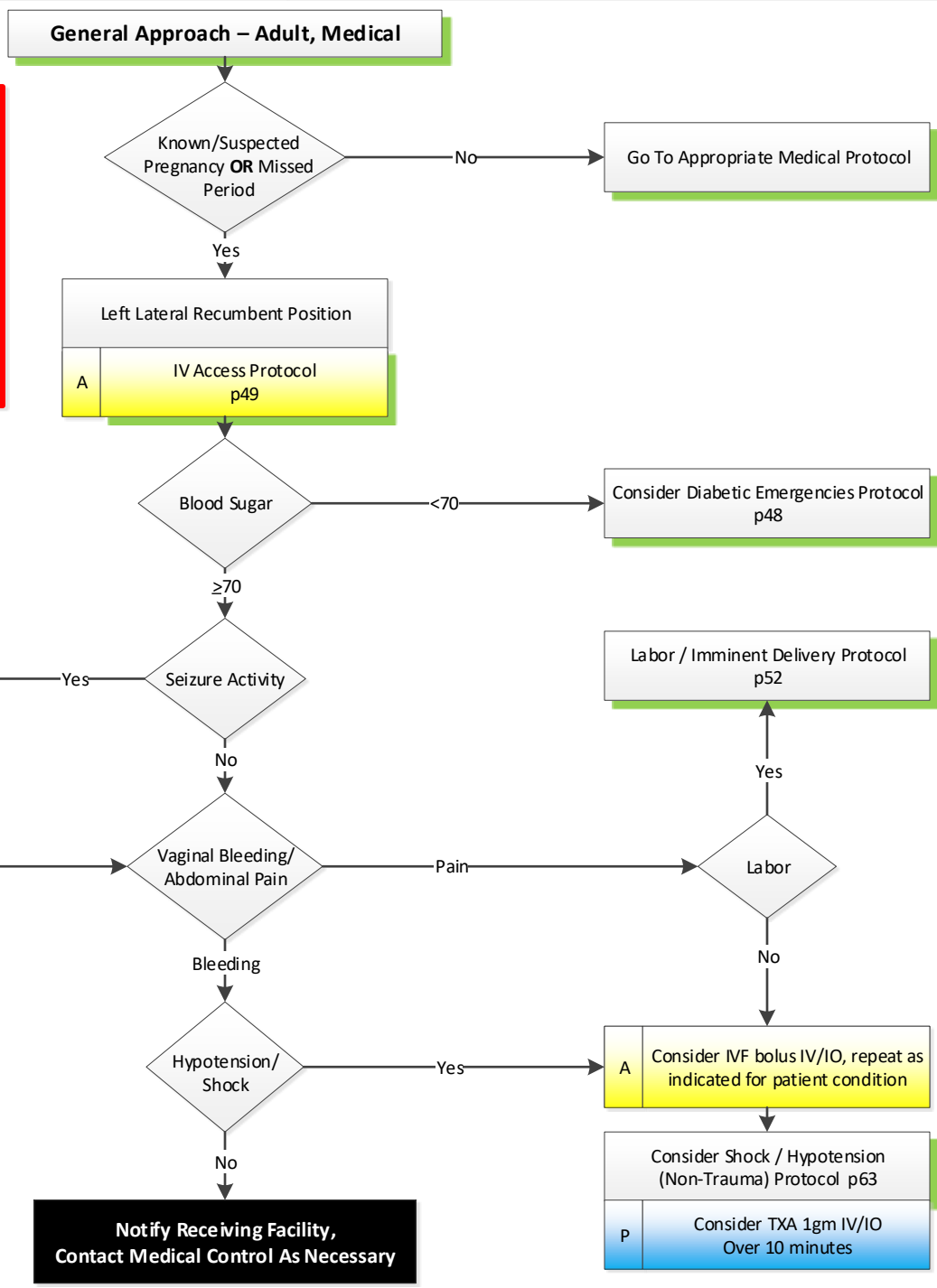
OB General - Adult

Pertinent Positives and Negatives	Differential
<ul style="list-style-type: none"> Age, VS, SpO2, EtCO2, RR SAMPLE history OPQRST history Pregnancy History (G's and P's) 	<ul style="list-style-type: none"> Headache Abdominal Pain +/- Contractions Blurred Vision Vaginal Bleeding Chest Pain, Dyspnea, Hypoxia
	<ul style="list-style-type: none"> Pre-Eclampsia / Eclampsia Ectopic Pregnancy Hypertensive Encephalopathy Uterine Rupture Pulmonary Embolism
	<ul style="list-style-type: none"> Threatened / Impending / Missed Spontaneous Abortion Head Injury / Cushing's Reflex (Bradycardia + HTN) Domestic Abuse

Remember you have TWO patients during pregnancy; evaluate, treat and protect **BOTH**

Left Lateral Recumbent Position takes pressure off of the Inferior Vena Cava and prevents supine hypotension

Preeclampsia and Eclampsia are typically encountered in 3rd trimester, but may be in late 2nd trimester and up to 6 weeks after delivery



Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Neuro, Abdominal Exam, Cardiovascular

- Magnesium is the priority for pregnant seizures (eclampsia), but if seizing on EMS arrival give IM/IN Midazolam until IV Access achieved.
- Continuous monitoring is required, as magnesium may cause hypotension and decreased respiratory drive.
- Hypertension, Severe headache, vision changes, RUQ pain, diffuse edema may indicate preeclampsia. This may progress to seizures (eclampsia).
- Any pregnant patient involved in an MVC or other trauma should be evaluated by MD for evaluation and fetal monitoring.



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OB / Vaginal Bleeding - Adult

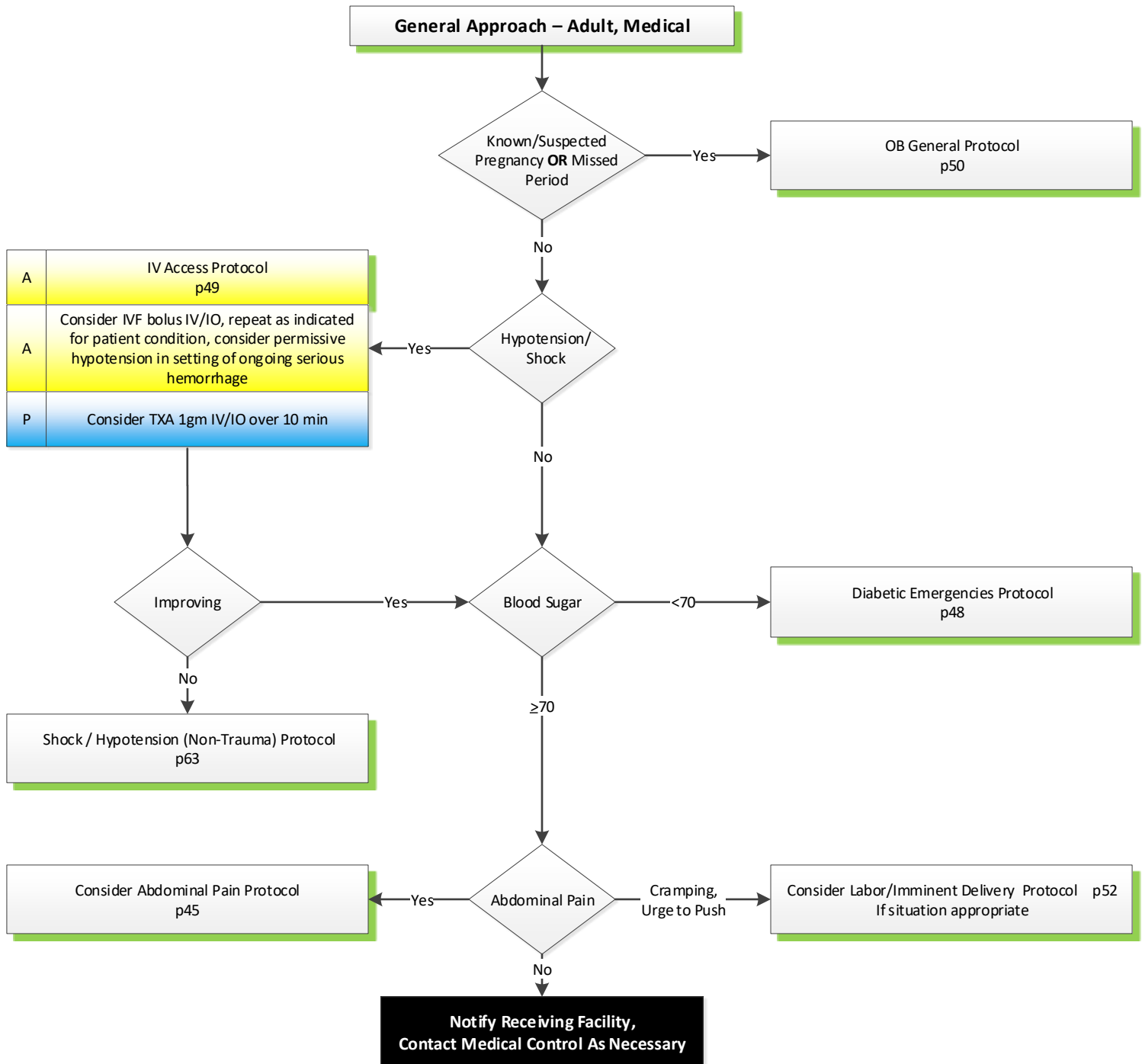
Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- Pregnancy History (G's and P's)

Differential

- Abdominal Pain +/- Contractions
- Blurred Vision
- Estimated Blood Loss (Pads / Tampons Per Hour)
- Chest Pain, Dyspnea, Hypoxia
- Ectopic Pregnancy
- Domestic Violence
- Sexual Assault
- Dysfunctional Uterine Bleeding
- Threatened / Impending / Missed Spontaneous Abortion
- Normal Menstrual Period

General Approach – Adult, Medical



Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Neuro, Abdominal Exam, Cardiovascular

- Always suspect pregnancy as a cause of vaginal bleeding in reproductive age women; patient report regarding menstrual history and sexual activity may not be accurate.
- Ectopic pregnancy is a surgical emergency! Patients with vaginal bleeding, unstable vital signs and suspected ectopic pregnancy should be transferred to an OB receiving facility for emergent evaluation and management when possible.
- Always have a high suspicion for domestic violence and/or sexual assault when evaluating a female with a reproductive or GU related complaint.



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Labor / Imminent Delivery - Adult

Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- Pregnancy History (G's and P's)
- Estimated Due Date

- Prenatal Care / High Risk Pregnancy
- Time of Contraction Onset, Frequency
- Rupture of Membranes and Time
- Sensation of Fetal Movement

Differential

- Endometritis
- Normal Active Labor
- Abnormal Presentation
- Prolapsed Cord
- Preterm Labor
- Threatened / Impending / Missed Spontaneous Abortion
- Premature Rupture of Membranes
- Placenta Previa / Placenta Abruption

General Approach – Adult, Medical

Unable To Deliver

Create air passage by supporting presenting part of infant

Place 2 fingers alongside the nose and push away from the infant's face

Transport in Knee-Chest or Left Lateral Recumbent Position

M Contact Medical Control

Abnormal Vaginal Bleeding/Hypertension

Yes

OB General Protocol p50

No

Left Lateral Recumbent Position

Cord

Once the cord stops pulsating, then double-clamp approximately 10-12cm from the infant's abdomen. Cord should be cut between the two clamps.

Inspect Perineum
NO Digital Vaginal Exam

No Crowning

Crowning, ≥36 Weeks Gestation

Crowning, <36 Weeks Gestation
Abnormal Presentation
Severe Vaginal Bleeding
Multiple Gestation

Monitor and Document VS
Reassess Frequently

Crowning, ≥36 Weeks Gestation

Yes

A IV Access Protocol p49

Activate ALS

Expedite Transport to Nearest OB Receiving Facility

No

Prolapsed Cord / Shoulder Dystocia

Breech / Footling / Abnormal Presentation

Crowning, Delivery Imminent

Hips Elevated, Knees to Chest

Insert Gloved Fingers Into Vagina
Relieve Pressure on Umbilical Cord

Moist Saline Dressing Over Cord
Eval Fetal Heart Rate / Cord Pulsation

Transport knees to chest
Unless Delivery Imminent

Encourage Mother to Refrain from Pushing

Support Presenting Parts, Do NOT Pull

Control delivery with gentle support of head to prevent injury to Mother/Baby

Check for nuchal cord; if present slip over head gently

Gently apply downward pressure to deliver anterior shoulder, then upward to deliver posterior shoulder

**Notify Receiving Facility,
Contact Medical Control As Necessary**

Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Neuro, Abdominal Exam, Cardiovascular

- If Delivery is Completed, go to **Newly Born Protocol** for evaluation and management of the infant p.53
- Remember that you have TWO patients during Pregnancy, Labor and Delivery; be sure to monitor and protect both throughout your management
- After Delivery, massage the uterus through the anterior abdomen and wait for the placenta; **NEVER** pull on the umbilical cord to expedite the afterbirth
- Record the APGAR Scores for the infant at 1minute and 5minutes after delivery; if either in the Moderately Depressed range, continue to record and document every 5 minutes while supporting the infant per the Newly Born Protocol



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Newly Born - Peds

Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- Pregnancy History (G's and P's)
- Estimated Due Date
- Prenatal Care / High Risk Pregnancy
- Time of Contraction Onset, Frequency
- Rupture of Membranes and Time
- Sensation of Fetal Movement

Differential

- Maternal Medication Effect
- Hypovolemia
- Pneumothorax
- Hypoglycemia
- Congenital Heart Defect
- Maternal / Newborn Infection / Sepsis
- Airway Obstruction – Secretions
- Choanal Atresia (imperforate nares)

Airway Suctioning

Routine Suctioning of the Newborn is NO LONGER Recommended

Clear Amniotic Fluid

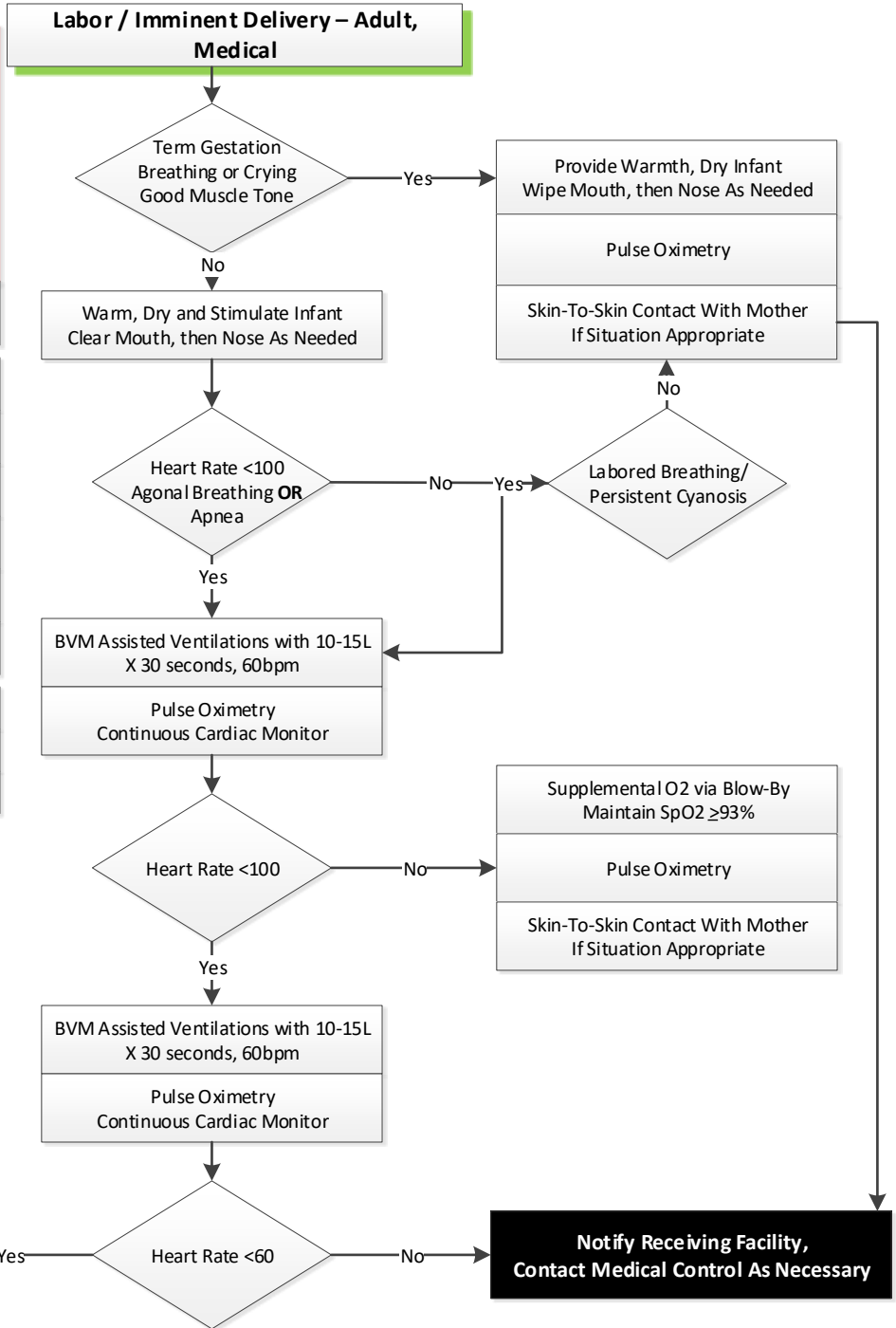
Suction ONLY when obstruction is present and/or BVM is required

Meconium Present

Non-Vigorous Newborns may undergo suctioning under direct laryngoscopy

M Contact Medical Control If Any Questions

	0 Points	1 Point	2 Points	Points Totaled
Activity (Muscle Tone)	Absent	Arms and Legs Flexed	Active Movement	↓
Pulse	Absent	<100 bpm	≥100 bpm	
Grimace (Reflexes, Irritability)	Flaccid	Some Flexion of Extremities	Motion (Sneeze, Cough, Pull)	
Appearance (Skin Color)	Blue, Pale	Body Pink, Extremities Blue	Completely Pink	
Respirations	Absent	Slow, Irregular	Vigorous Cry	
		Severely Depressed	0-3	
		Moderately Depressed	4-6	
		Excellent Condition	7-10	



Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Neuro, Abdominal Exam, Cardiovascular

- Most Newborns requiring resuscitation will respond to supplemental O2, BVMs, airway clearing maneuvers. If not, go to Neonatal Resuscitation Protocol
- Consider birth trauma during evaluation of non-vigorous Newborn; pneumothorax, hypovolemia, hypoglycemia
- Term gestation, strong cry / adequate respirations with good tone will generally need no resuscitation
- Expected Pulse Ox Readings: Birth – 1min = 60-65%, 1-2min = 65-70%, 3-4min = 70-75%, 4-5min = 75-80%, 5-10min = 80-85%, >10min = >90%
- APGAR scores at 1min and 5 min. Appearance, Pulse, Grimace, Activity, Respirations. Each score gets 0, 1 or 2 points (Total 10). If either in the moderately depressed range, continue to record and document every 5 minutes.



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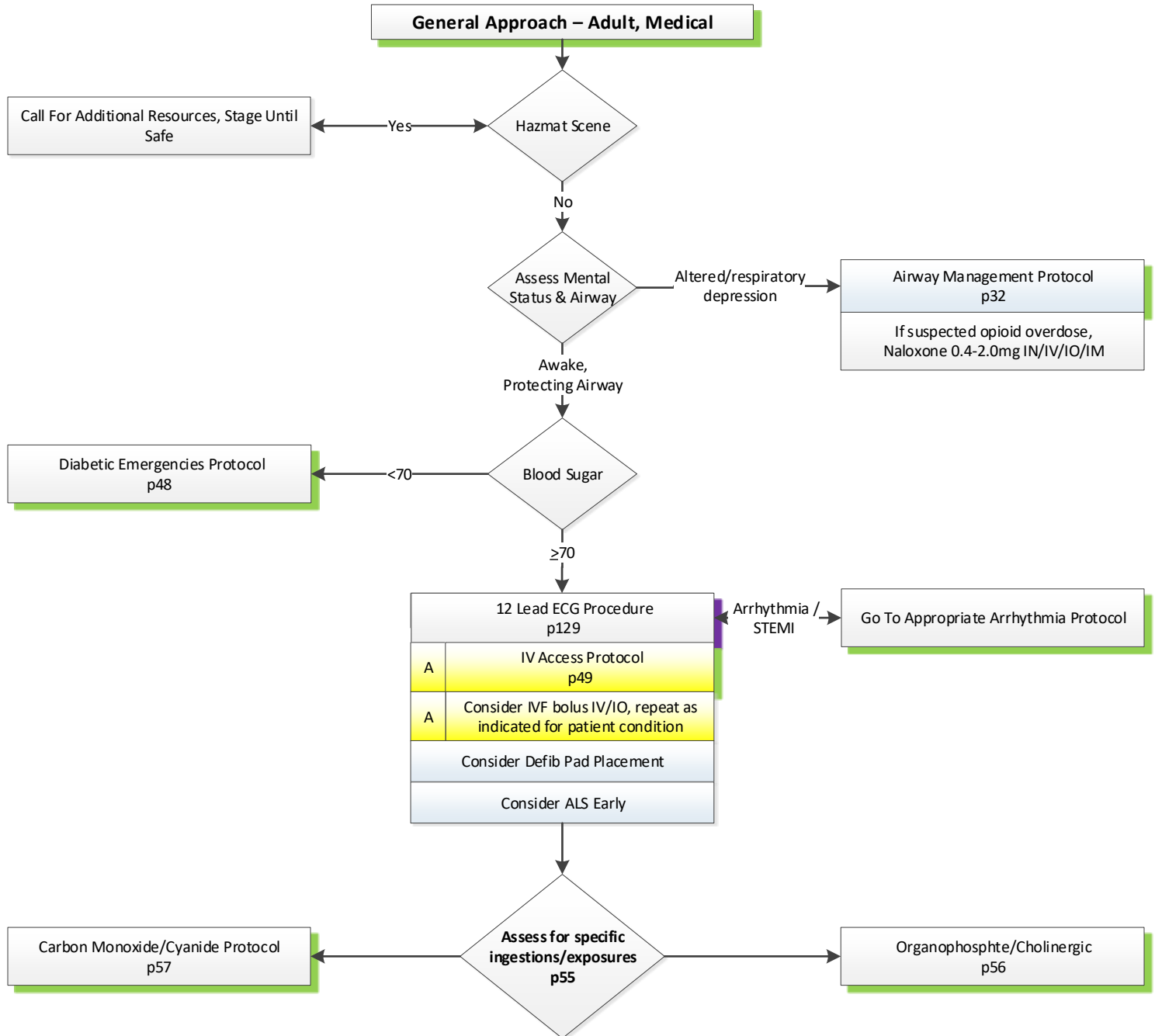
PHARMACEUTICALS



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Overdose and Poisoning, Adult



Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Skin, Blood Glucose

- Resuscitate first, hemodynamically unstable patients are high risk for cardiac arrest.
- Be suspicious of scenes where multiple people and/or animals appear to be affected.
- In opioid overdose – poor respiratory efforts is what kills patients, emphasis should be on ventilation support FIRST and naloxone administration second.
- Patients are unreliable historians in overdose situations, particularly in suicide attempts. Trust what they tell you, but verify (pill bottles, circumstances, etc.).
- Critical Scene Information: Time of Ingestion, Number and Type of meds ingested, Seizure or mental status changes; Please consider bringing pill bottles, contents, emesis and reliable contact info to the ED; this will be important in patient evaluation and assessment.
- Be careful of off-gassing in cases of inhalation of volatile agents.
- Many intentional overdoses involve multiple substances, some with cardiac toxicity; a 12-Lead ECG should be obtained on all overdoses situation permitting.
- If smoke exposure consider carbon monoxide/Cyanide protocol p63.
- Consider Cyanide when exposed to any products of combustion, mining incidents or industrial organic chemistry exposure.
- Poison Control : **1-800-222-1222**



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Overdose - Adult

Beta Blocker Overdose

Clinical Features:

Cardiovascular – hypotension, bradycardia, AV block
Pulmonary – bronchospasm, wheezing
Metabolic – Hypoglycemia, Hyperkalemia
Neuro – Stupor

Common Beta Blockers -

Metoprolol (Lopressor, Toprol-XL) Propranolol (Inderal LA, InnoPran XL)
Atenolol (Tenomin) Sotalol
Labetalol Carvedilol (Coreg)

Many beta blocker ingestions do not cause symptoms; exceptions are the elderly, poor cardiac/respiratory reserve, and coingestions with other cardiac medications

P	Consider Glucagon 2mg IV/IO may repeat if available Manage symptoms of Bradycardia per Protocol p44
---	--------------------------------------------------------------------------------------------------------

Calcium Channel Blocker Overdose

Clinical Features:

Cardiovascular – hypotension, bradycardia, shock
Pulmonary – pulmonary edema, rales, crackles
Metabolic – Hyperglycemia (can be a marker of severity)
Neuro – Seizures, myoclonus, dizziness, syncope
GI – Nausea and vomiting

Common Calcium Channel Blockers -

Amlodipine (Norvasc)
Diltiazem (Cardizem, Tiazac)
Nifedipine (Procardia)
Verapamil (Calan, Verelan)

Sustained release preparations may have delayed onset of toxic symptoms (up to 12 hours)

Overdoses with Calcium Channel Blockers have a high mortality!! Electrical conduction abnormalities, vasodilation, myocardial depression are severe

P	Consider Calcium Chloride 1gm IV/IO Consider Glucagon 2mg IV/IO, if available for hypotension, may repeat if available Manage symptoms of Bradycardia per Protocol p44
---	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Antipsychotic/Acute Dystonic Reaction

Clinical Features:

Dystonia refers to sustained muscle contractions, frequently causing twisting, repetitive movements or postures, and may affect any part of the body

Common -

Antipsychotics – i.e. Haldol, Prolixin, Thorazine
Antiemetics – i.e. prochlorperazine, metopropamide
Antidepressants – i.e. buspirone, sumatriptan
Antibiotics – i.e. erythromycin
Anticonvulsants – i.e. carbamazepine, vigabatrin
H2 Receptor Blockers – i.e. ranitidine, cimetidine
Recreational Drugs – i.e. cocaine

Acute dystonic reactions are extrapyramidal side effects of antipsychotic and certain other medications. 90% occur within 5 days of starting a new med

P	Diphenhydramine 50mg IV/IO/IM/PO If not improving, consider Midazolam 0.1mg/kg IV/IO (max 5mg) or 0.2mg/kg IM/IN (max 10mg)
---	--------------------------------------------------------------------------------------------------------------------------------

Cocaine or Sympathomimetic Overdose

Clinical Features:

Hypertension, Tachycardia, Agitation, Seizure, Dilated Pupils

Common Sympathomimetics -

Cocaine Pseudoephedrine
Ephedrine Methamphetamine
Phenylephrine Amphetamines
Terbutaline

Patients on MAOIs for depression may have symptoms of a Sympathomimetic Overdose after eating certain foods such as aged cheese, beer, mushrooms

Patients with Cocaine or Sympathomimetic Overdose are at high risk of Arrhythmias, Myocardial Infarction and Stroke

Sympathomimetics are drugs that mimic the effects of the sympathetic nervous system

P	Midazolam 0.1mg/kg IV/IO (max 5mg) or 0.2mg/kg IM/IN (max 10mg) OR Lorazepam 0.1mg/kg IV/IO/IM (max 2mg)
---	-------------------------------------------------------------------------------------------------------------

TCA Overdose

Clinical Features:

Neuro – AMS, seizures
Cardiovascular – Hypotension, arrhythmias, wide QRS interval

Common Tricyclic Antidepressants:

Amitriptyline
Clomipramine
Doxepin
Imipramine
Nortriptyline
Protriptyline

P	If QRS >0.12 Sodium Bicarb 1mEq/kg IV/IO slow push, may repeat every 5 minutes until narrowing of QRS
---	----------------------------------------------------------------------------------------------------------

Opioid Overdose

Clinical Features:

Cardiovascular – hypotension
Pulmonary – respiratory depression
Neuro – AMS, pin point pupils

Common Opioid Medications:

Oxycodone (Percocet, Oxycontin, MS Contin)
Hydrocodone (Vicodin, Norco, Vicoprofen)
Morphine
Heroin
Dilaudid
Fentanyl
Codeine (T3)
Methadone

	Naloxone 0.4-2.0mg IN/IV/IO/IM
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Cholinergic / Organophosphate Overdose - Adult

Pertinent Positives/Negatives:

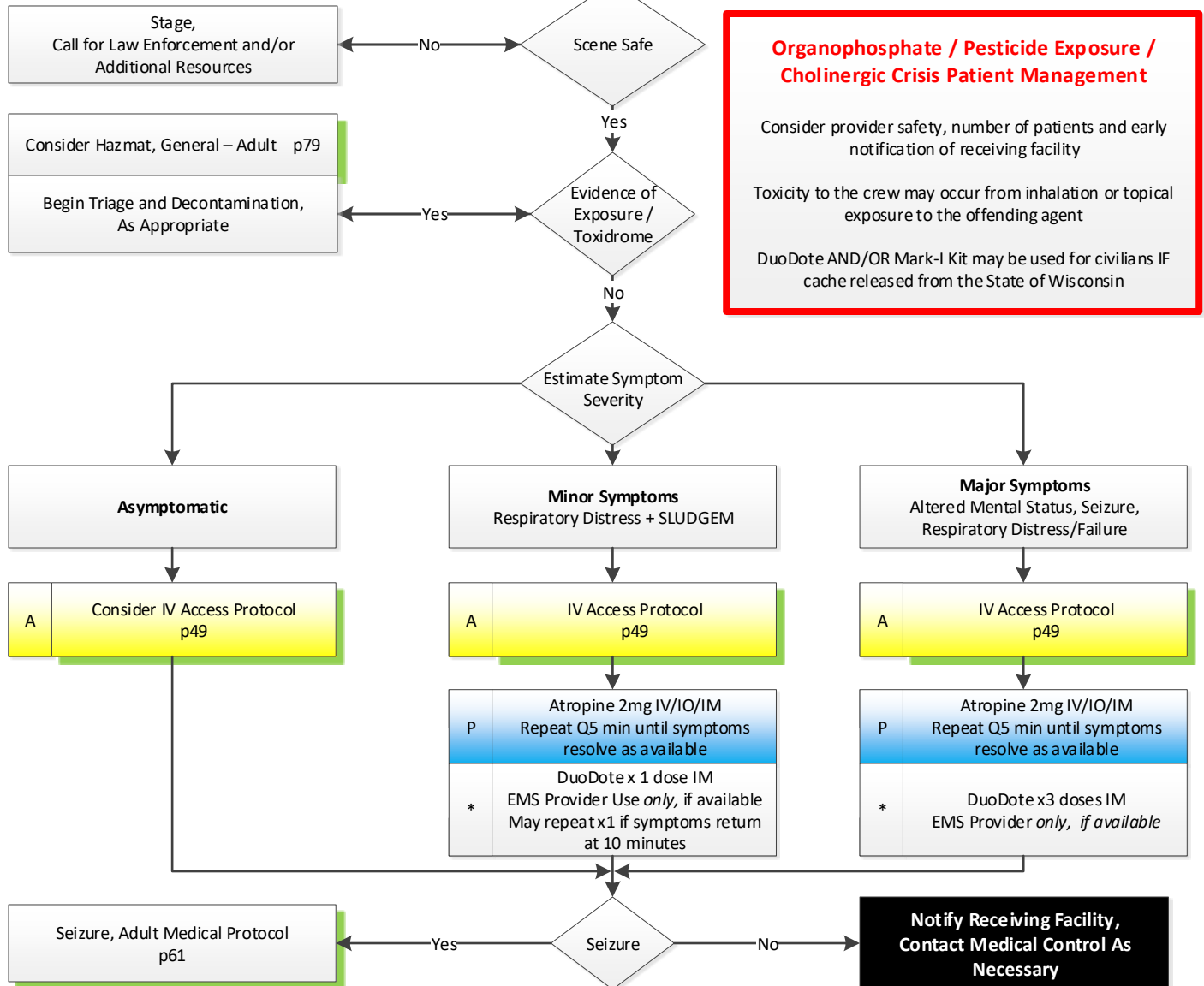
- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- History of Ingestion or Suspected Ingestion
- Dysrhythmias
- SLUDGEM
- DUMBELLS

- Time of Ingestion
- Type, Number and Dose of Pills Taken (if known)
- Seizures
- Mental Status Change
- Vomiting

Differential

- Head Injury
- Hazmat Exposure
- Electrolyte Imbalance
- DM, CVA, Seizure
- Sepsis

General Approach, Adult Medical



Organophosphate / Pesticide Exposure / Cholinergic Crisis Patient Management

Consider provider safety, number of patients and early notification of receiving facility

Toxicity to the crew may occur from inhalation or topical exposure to the offending agent

DuoDote AND/OR Mark-I Kit may be used for civilians IF cache released from the State of Wisconsin

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- *Each DuoDote Kit contains 600mg 2-PAM and 2.1mg of Atropine. The kits in the ambulance are intended for responder use only. If/When the emergency cache has been released by the State of Wisconsin, those kits may be used for the general public.
- **SLUDGEM** – Salivation, Lacrimation, Urination (Incontinence), Defecation (Incontinence), GI Upset, Emesis, Miosis.
- For patients with major symptoms, there is no max dosing for Atropine; continue administering until salivation/secretions improved.
- Follow all Hazmat procedures, strictly adhere to personal protective equipment for exposure prevention and begin decontamination early.
- Patients who have been exposed to organophosphates are highly likely to off-gas; be sure to use all responder PPE and to avoid exposure to clothing or exhalations of victims. Helicopter EMS is generally NOT appropriate for these patients.
- A **cholinergic crisis** is an over-stimulation at a neuromuscular junction due to an excess of acetylcholine (ACh), as a result of the inactivity or inhibition of the AChE enzyme, which normally breaks down acetylcholine.



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Carbon Monoxide Poisoning - Adult

Pertinent Positives/Negatives:

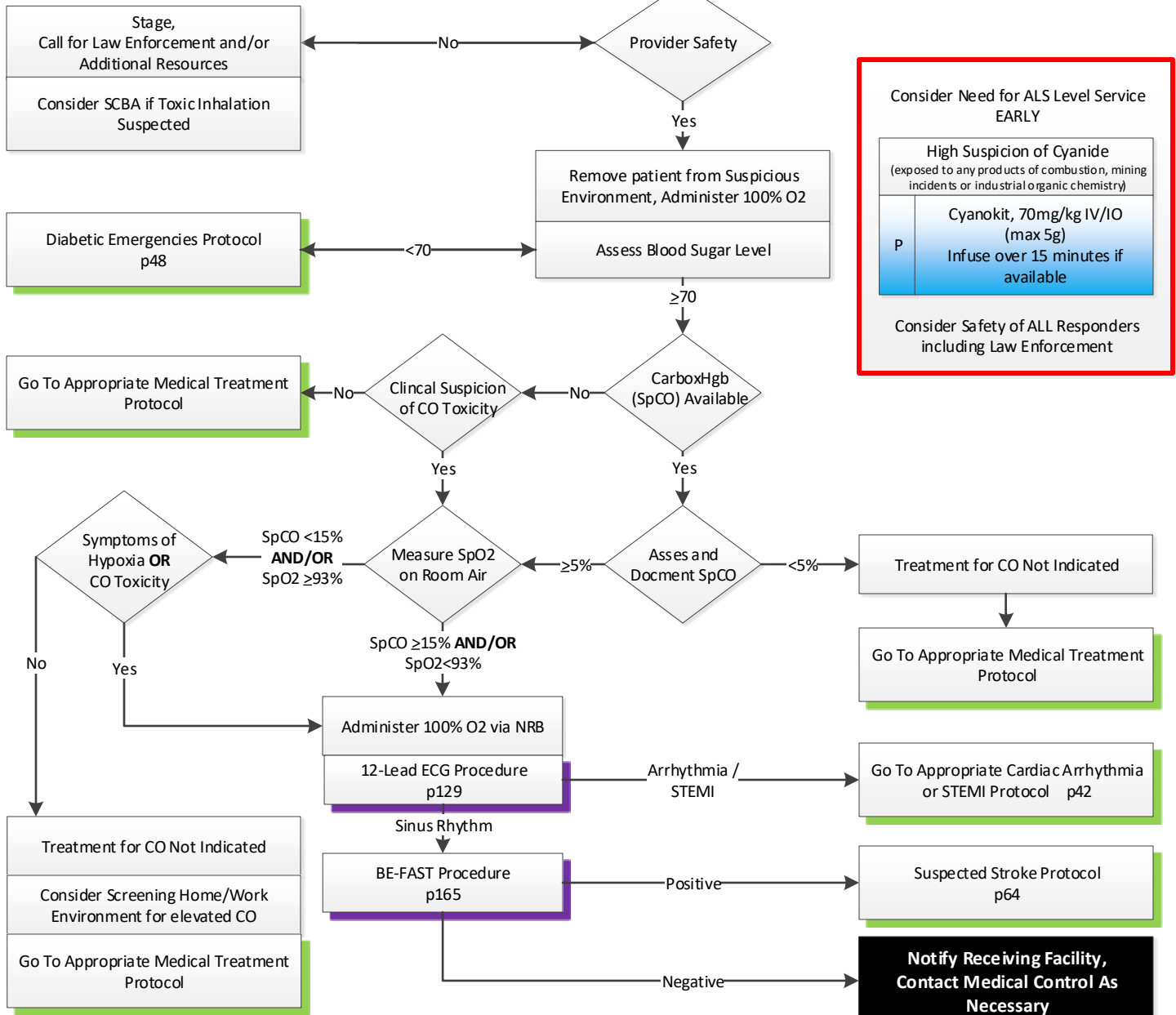
- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- Known or suspected CO Exposure
- Source and Duration of Exposure
- Dysrhythmias

- Headache, Nausea/Vomiting
- Chest Pain, Arrhythmias
- Respiratory Distress
- Seizures
- Mental Status Change
- Vomiting

Differential

- Acute Myocardial Infarction
- Hypoglycemia
- Diabetic Ketoacidosis
- Subarachnoid Hemorrhage
- Acute Stroke
- Influenza
- Other toxic inhalation
- Tension Headache

General Approach, Adult Medical



Consider Need for ALS Level Service EARLY

High Suspicion of Cyanide
(exposed to any products of combustion, mining incidents or industrial organic chemistry)

P Cyanokit, 70mg/kg IV/IO (max 5g)
Infuse over 15 minutes if available

Consider Safety of ALL Responders including Law Enforcement

Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Neuro, Abdominal Exam, Cardiovascular

- Fetal hemoglobin has a stronger affinity for CO than adult, and will preferentially take the CO from the Mother, giving her a FALSE LOW SpCO level.
- Hospital evaluation should be strongly encouraged for any pregnant or suspected to be pregnant females; all hospitals should have access to Rad-57 device.
- The absence or low levels of SpCO is not a reliable predictor of firefighter/victim exposures to other toxic byproducts of combustion. Consider the Cyanide Poisoning Protocol.
- Multiple patients presenting with vague, influenza-like symptoms simultaneously should raise your suspicion of CO exposure. Ask about home heating methods, generator use, exposure to combustible fuels.



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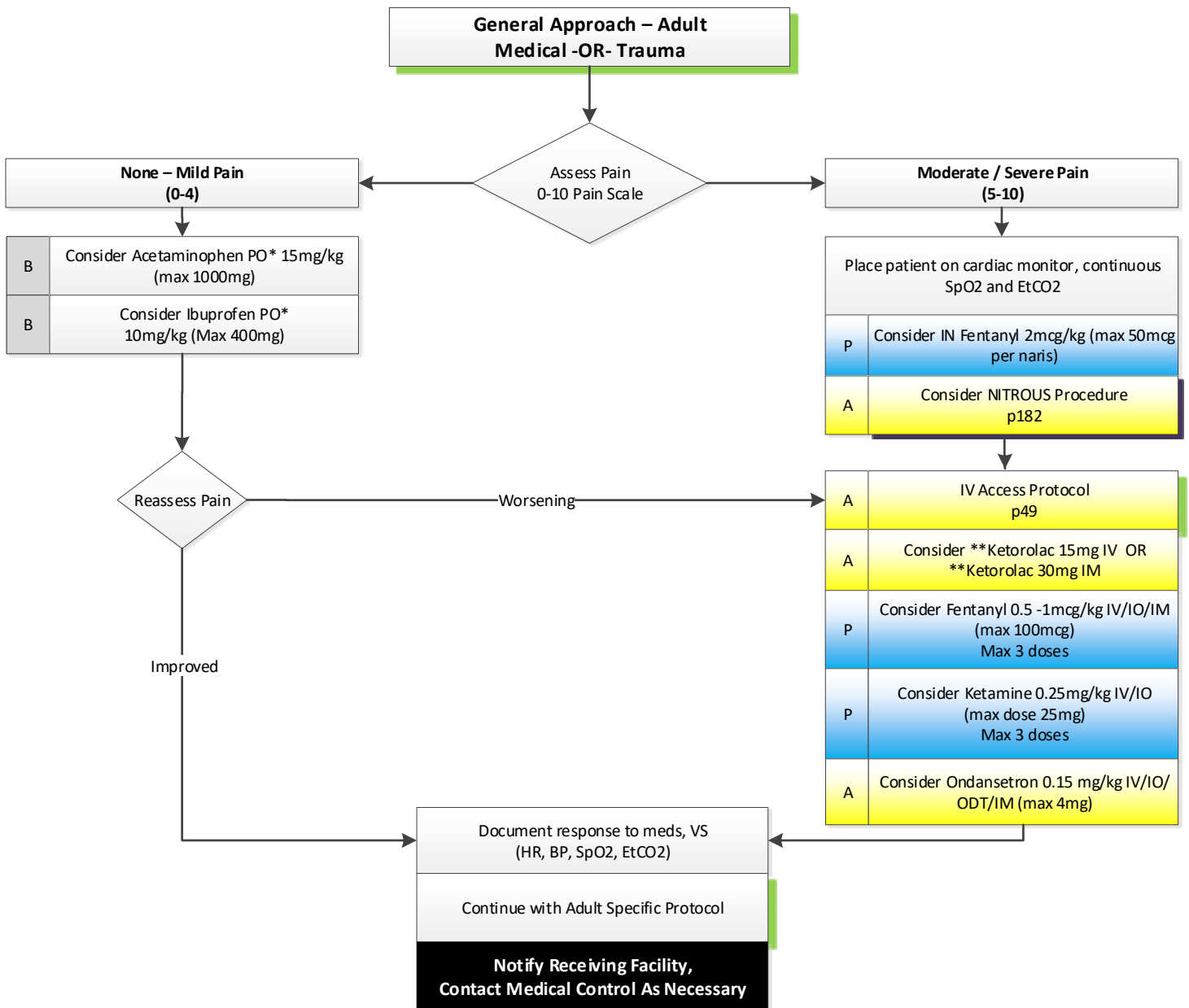
Pain Management - Adult

Pertinent Positives and Negatives

- Age, VS, GCS
- SAMPLE History
- OPQRST History
- History of chronic pain

Differential

- Head injury
- Spine Injury
- Compartment Syndrome
- Fracture, Sprain, Strain
- Pneumo/hemo-thorax
- Pericardial effusion
- Aortic Dissection
- Internal organ injury



Pearls

REQUIRED EXAM: Vital Signs, GCS, Neuro Exam, Lung Sounds, Abdominal Exam, Musculoskeletal Exam, Area of Pain

- Provider discretion to be used for patients suffering from chronic pain related issues. However, please note that history of chronic pain does not preclude the patient from treatment of acute pain related etiologies.
- Pain severity (0-10) is a vital sign to be recorded pre- and post-medication delivery and at disposition.
- As with all medical interventions, assess and document change in patient condition pre- and post-treatment.
- Opiate naive patients and the elderly can have a dramatic response to analgesic medications; start low and titrate up as appropriate.
- Allow for position of maximum comfort as situation allows.
- Acetaminophen or Ibuprofen if no contraindications may be considered for analgesic benefit in the setting of fever.
- ****Ketorolac is contraindicated in: Pregnancy, anticoagulation or bleeding diatheses, anticipated surgery, NSAID use (including EMS administered ibuprofen), GI bleeding, possible intracranial hemorrhage, renal disease. Extreme caution in females of reproductive age (hospitals will not give to patients without a negative pregnancy test), elderly patients, and potential renal insufficiency.**
- *Oral medications are contraindicated in anyone who may need an emergent surgery or procedure; "if in doubt, don't give PO".



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Refusal Protocol - Adult

Pertinent Positives and Negatives

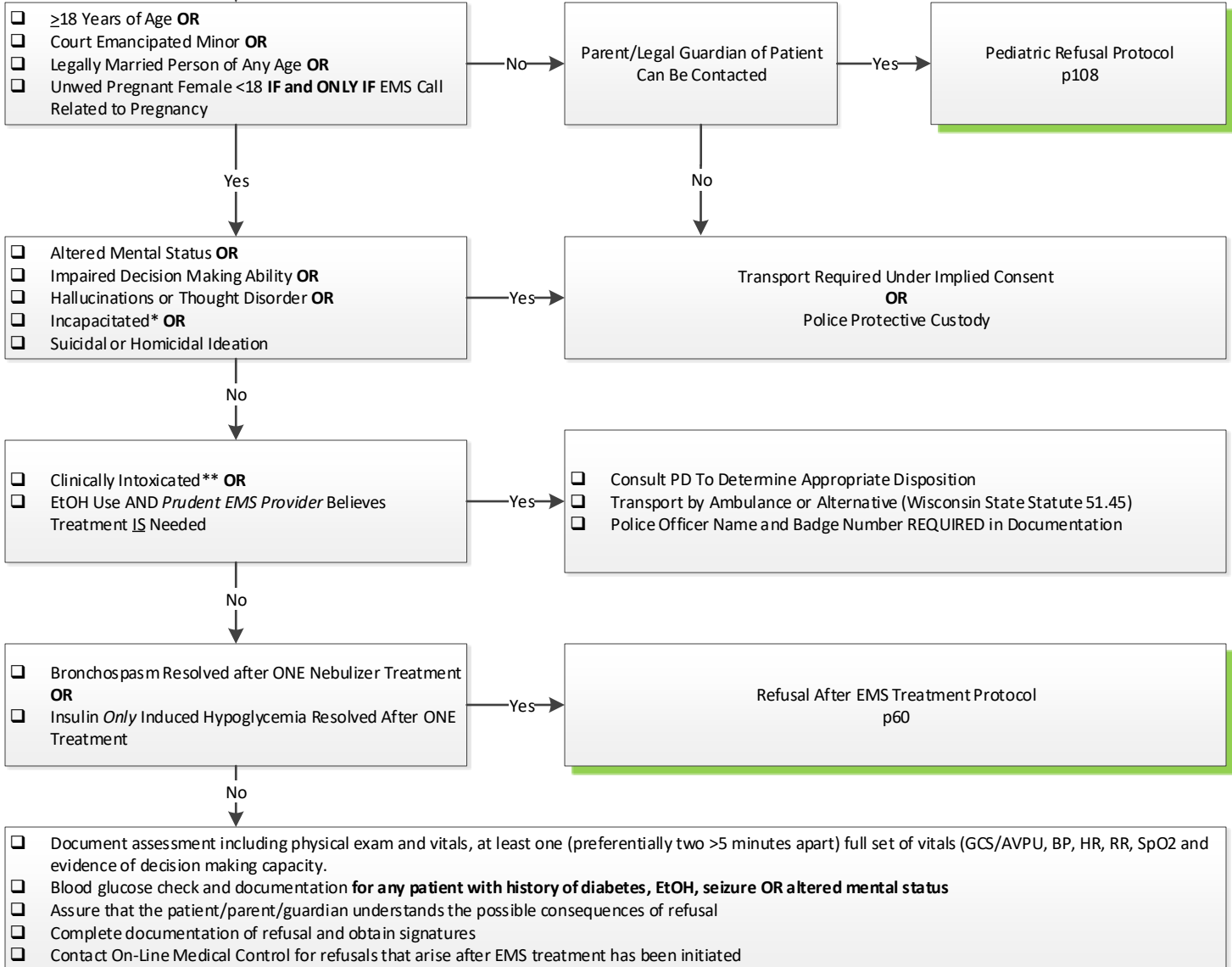
- Age, VS, BP, RR, SpO2
- SAMPLE history
- OPQRST history

- Mental Status
- Pale, Cool Skin
- Delayed Cap Refill

Differential

- Cardiac Dysrhythmia
- Hypoglycemia
- Overdose
- Toxicodrome
- Sepsis
- Occult Trauma
- Adrenal Insufficiency

General Approach – Adult, Medical



Pearls

REQUIRED EXAM: VS, GCS, Nature of Complaint

- *Incapacitated definition: A person who, because of alcohol consumption or withdrawal, is unconscious or whose judgment is impaired such that they are incapable of making rational decisions as evidenced by extreme physical debilitation, physical harm or threats of harm to themselves, others or property. Evidence of incapacitation: inability to stand on ones own, staggering, falling, wobbling, vomit/urination/defecation on clothing, inability to understand and respond to questions, DTs, unconsciousness, walking or sleeping where subject to danger, hostile toward others.
- **Intoxicated definition: A person whose mental or physical functioning is substantially impaired as a result of the use of alcohol.
- If there is ANY question, do not hesitate to involve Law Enforcement to ensure the best decisions are being made on behalf of the patient.



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Refusal After EMS Treatment - Adult

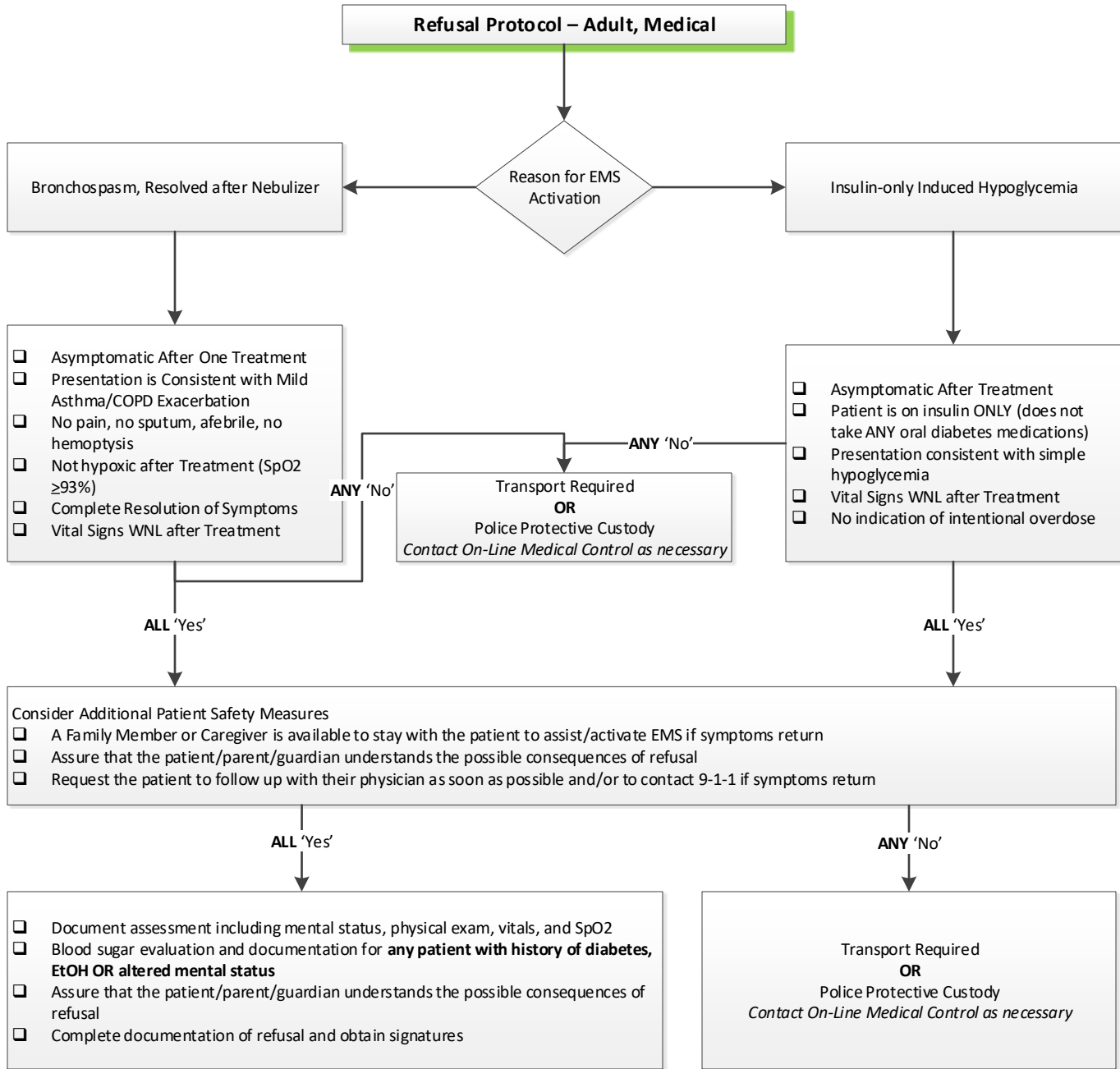
Pertinent Positives and Negatives

- Age, VS, BP, RR, SpO2
- SAMPLE history
- OPQRST history

- Mental Status
- Pale, Cool Skin
- Delayed Cap Refill

Differential

- Cardiac Dysrhythmia
- Hypoglycemia
- Overdose
- Toxicity
- Sepsis
- Occult Trauma
- Adrenal Insufficiency



Pearls

REQUIRED EXAM: VS, GCS, Nature of Complaint

- *Incapacitated definition: A person who, because of alcohol consumption or withdrawal, is unconscious or whose judgment is impaired such that they are incapable of making rational decisions as evidenced by extreme physical debilitation, physical harm or threats of harm to themselves, others or property. Evidence of incapacitation: inability to stand on ones own, staggering, falling, wobbling, vomit/urination/defecation on clothing, inability to understand and respond to questions, DTs, unconsciousness, walking or sleeping where subject to danger, hostile toward others.
- Simple Hypoglycemia for these protocols is defined as: hypoglycemia caused by insulin ONLY and not suspected to be due to occult infection or trauma
- **Intoxicated definition: A person whose mental or physical functioning is substantially impaired as a result of the use of alcohol.
- If there is ANY question, do not hesitate to involve Law Enforcement to ensure the best decisions are being made on behalf of the patient.



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Seizure - Adult

Pertinent Positives and Negatives

- Age, VS, GCS, SpO2, Blood Sugar
- SAMPLE History
- OPQRST History
- Seizure History, Med Compliance

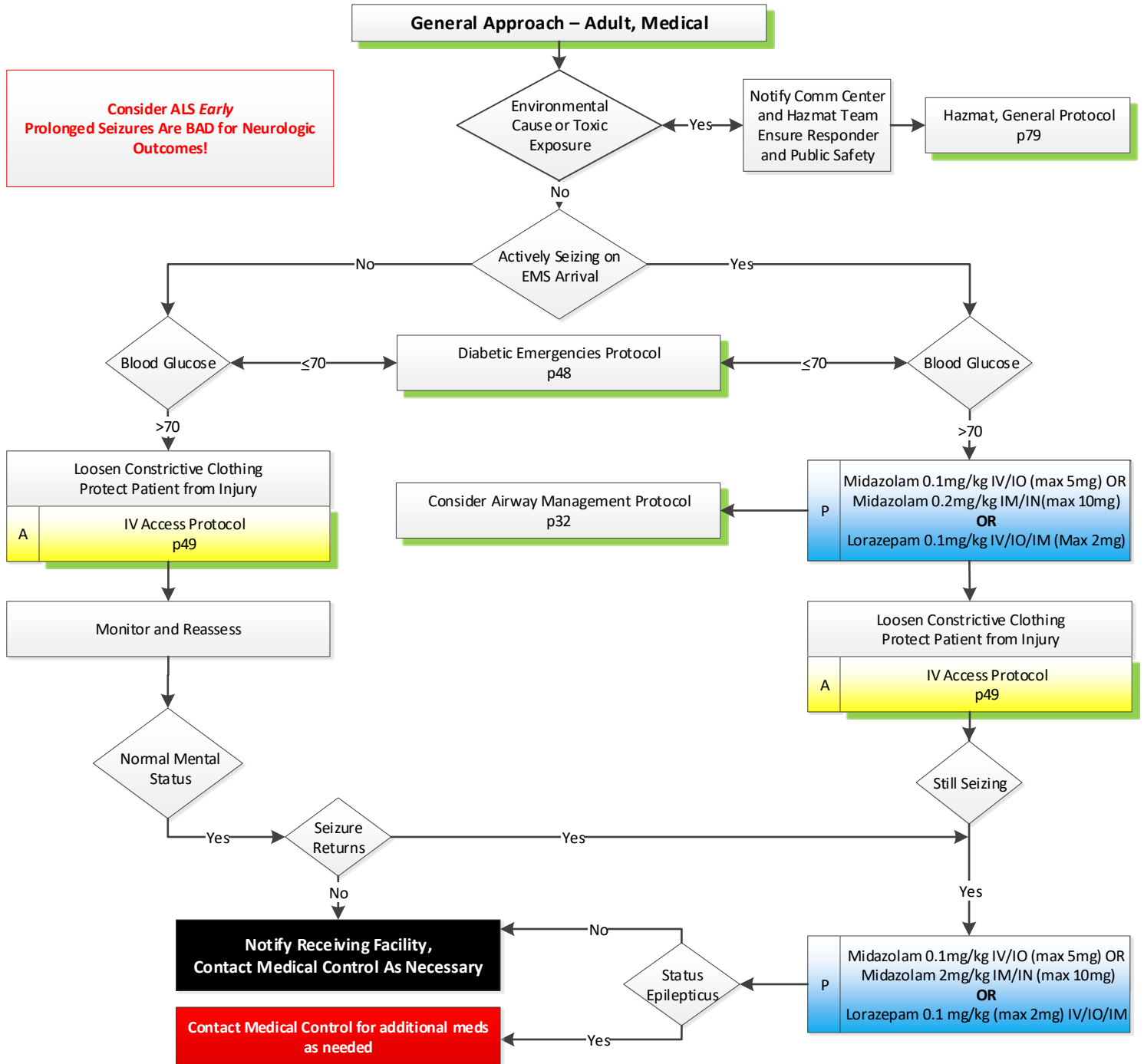
- Bowel or Bladder Incontinence
- Tongue Biting
- Pregnancy History
- Evidence of Trauma
- Number of Seizures and Duration

Differential

- Hypoxia
- Hypoglycemia
- Electrolyte Imbalance
- Eclampsia
- Stroke
- Hyperthermia
- Drugs, EtOH Abuse
- Drugs, EtOH Withdrawal
- Occult Head Injury
- Tumor
- Liver / Kidney Failure
- Infection / Sepsis

General Approach – Adult, Medical

Consider ALS Early
Prolonged Seizures Are BAD for Neurologic Outcomes!



Pearls

REQUIRED EXAM: Blood Sugar, SpO2, GCS, Neuro Exam

- Midazolam is effective in terminating seizures. Do not delay IM/IN administration to obtain IV access in an actively seizing patient.
- Do not hesitate to treat recurrent, prolonged (>1 minute) seizure activity.
- Status epilepticus is ≥2 successive seizures without recovery or consciousness in between. These patients require airway management and rapid transport.
- Assess for possibility of occult trauma, substance abuse.
- Active seizure in known or suspected pregnancy >20 weeks, give Magnesium 4gm IV/IO over 10 minutes.



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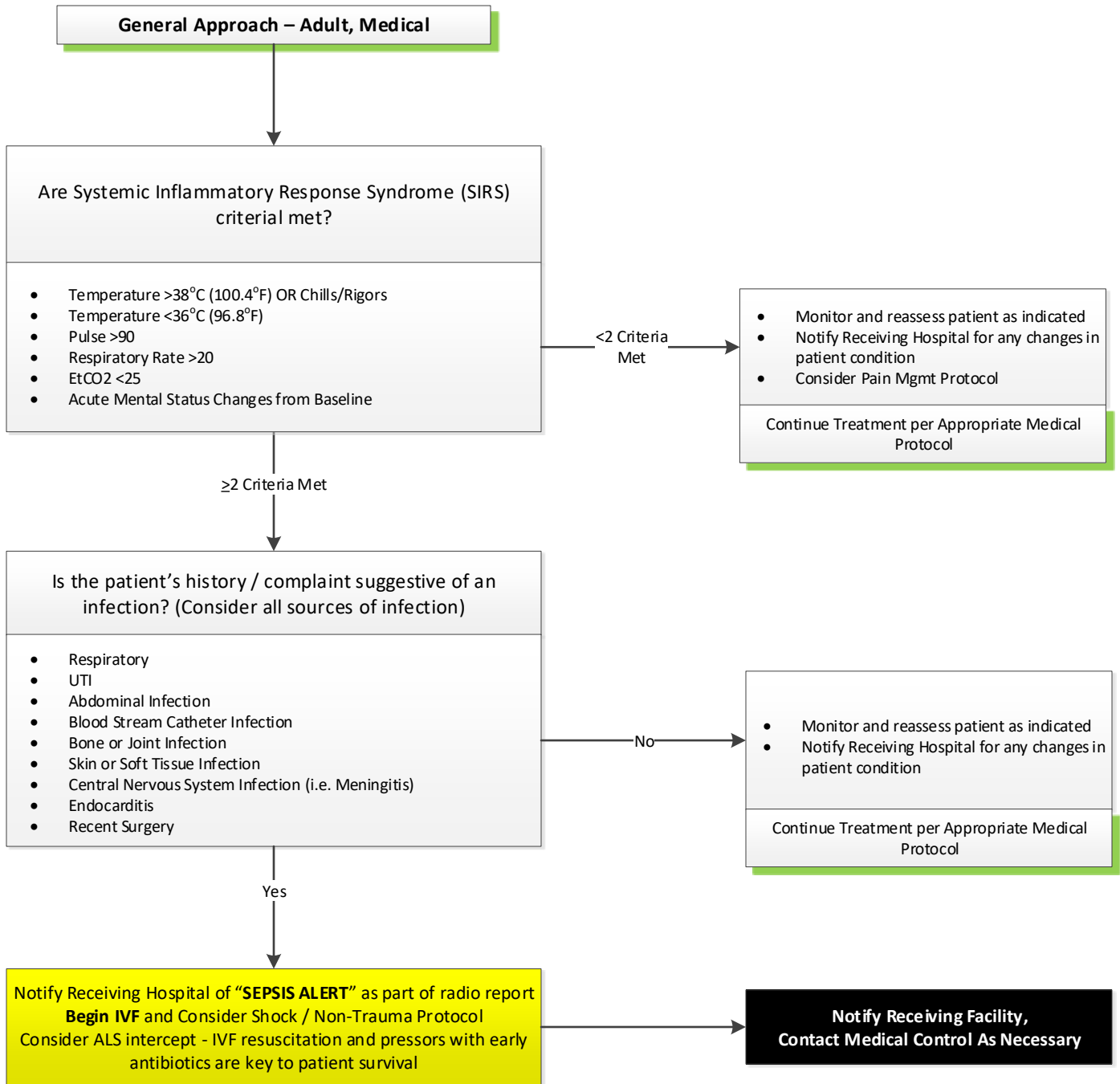
PHARMACEUTICALS



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Sepsis - Adult



Pearls

REQUIRED EXAM: VS, SpO2, Blood Glucose, Neuro Exam, Cincinnati Stroke Scale

- **SIRS:** The body's inflammatory response to an insult that results in the activation of the immune response
- **Sepsis:** SIRS + documented or highly suspected infection
- **Severe Sepsis:** Sepsis + sepsis induced organ dysfunction
- **Septic Shock:** Sepsis-induced hypotension persisting despite adequate fluid resuscitation resulting in tissue hypoperfusion
- **Surviving Sepsis Campaign (SSC):** An international initiative to reduce mortality in patients with sepsis. Mortality with severe sepsis is 30-50%, and increases to 60% when shock is present. There are 750,000 new cases and 210,000 US fatalities are attributed to sepsis annually.
- The importance of early identification of sepsis and prompt appropriate treatment cannot be understated; EMS is the critical first link!
- Fluid resuscitation, pressors and EARLY antibiotics are the things that save lives in sepsis.



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Hypotension / Shock (Non-Trauma) - Adult

Pertinent Positives and Negatives

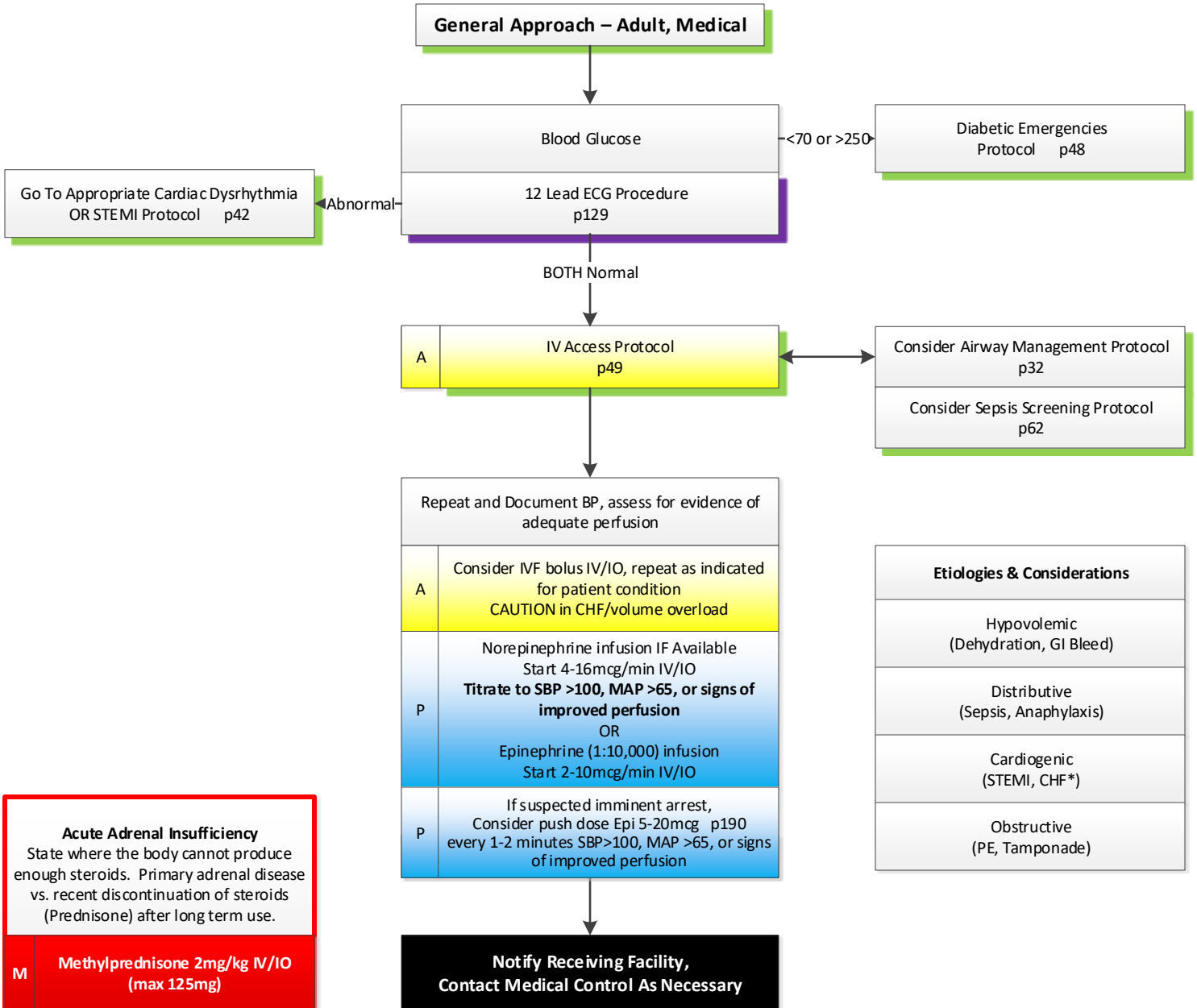
- Age, VS, BP, RR, SpO2
- SAMPLE history
- OPQRST history
- Source of blood loss, if any (GI, vaginal, AAA, ectopic)
- Source of fluid loss, if any (vomiting, diarrhea, fever)
- Pregnancy history

- Mental Status
- Pale, Cool Skin
- Delayed Cap Refill
- Coffee Ground Emesis
- Tarry Stools
- Allergen Exposure

Differential

- Cardiac Dysrhythmia
- Hypoglycemia
- Ectopic Pregnancy
- AAA
- Sepsis
- Occult Trauma
- Adrenal Insufficiency

General Approach – Adult, Medical



Acute Adrenal Insufficiency
State where the body cannot produce enough steroids. Primary adrenal disease vs. recent discontinuation of steroids (Prednisone) after long term use.

M Methylprednisone 2mg/kg IV/IO (max 125mg)

Etiologies & Considerations
Hypovolemic (Dehydration, GI Bleed)
Distributive (Sepsis, Anaphylaxis)
Cardiogenic (STEMI, CHF*)
Obstructive (PE, Tamponade)

Pearls

REQUIRED EXAM: VS, GCS, RR, Lung sounds, JVD

- Shock may present with normal VS and progress insidiously; Tachycardia may be the *first and only* sign of shock.
- *Patients receiving a fluid bolus should be continuously re-evaluated for signs of fluid overload. This is especially true for patients with suspected obstructive or cardiogenic etiologies of shock.
- If evidence or suspicion of trauma, move to Hemorrhage Protocol early.
- Document respiratory rate, SpO2 and breath sounds with IV Fluids, and consider Pulmonary Edema Protocol as appropriate.



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Suspected Stroke - Adult

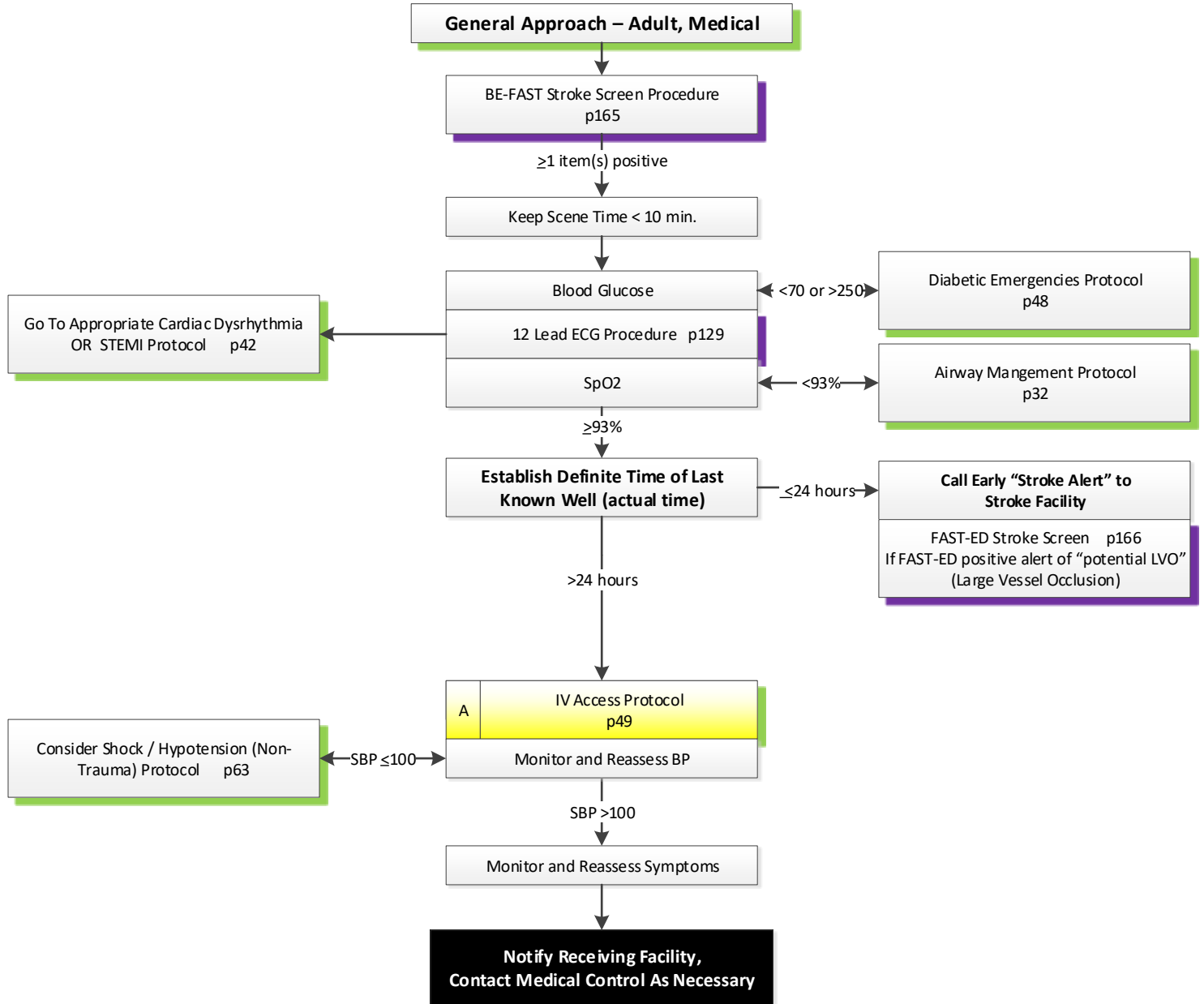
Pertinent Positive/Negative:

- SAMPLE History
- OPQRST History
- History of CVA, TIA
- Previous Cardiac, Vascular Surgery
- Anticoagulant Use

- Weakness / Paralysis
- Aphasia / Dysarthria
- Headache
- Vertigo
- Seizure

Differential

- TIA
- Seizure
- Hypoglycemia
- Tumor
- Occult Trauma
- Stroke
 - Ischemic (~85%)
 - Hemorrhagic (~15%)



Pearls

REQUIRED EXAM: VS, SpO2, Blood Glucose, Neuro Exam, BE-FAST Stroke Scale

- In Stroke, **BE-FAST** – Sudden onset of Balance loss or incoordination, Eyes/vision changes, Facial Asymmetry, Arm Strength, Speech difficulty or Terrible headache.
- Be very diligent observing for airway compromise in suspected acute stroke (swallowing, vomiting, aspirating).
- Consider Elevate Head of Stretcher 15-30 degrees.
- Hypoglycemia, Infection and Hypoxia can present with Neurologic deficit, *especially in the elderly*.
- IV Access is important, but establishment of a line should not significantly delay initiation of transport. Time lost is brain lost!
- Pre-notification to the receiving hospital is critical to ensure timely brain imaging, administration of thrombolytics and thrombectomy procedures.
- When calling in last known well time, identify actual time vs. duration of symptoms.



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Syncope or Near-Syncope

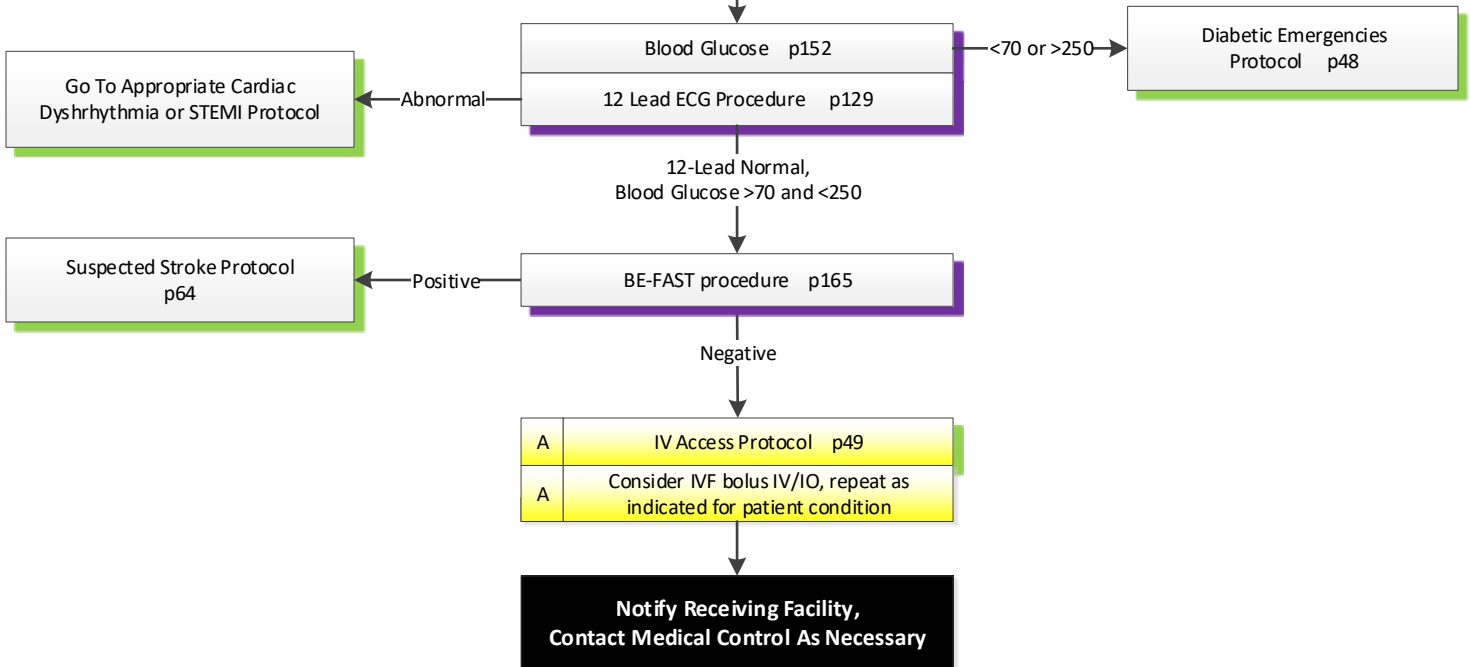
Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- History of DM, medic alert bracelet

Differential

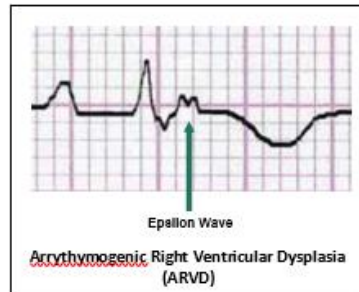
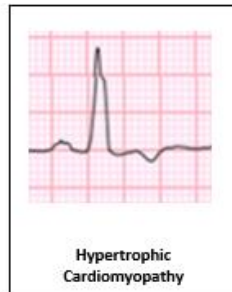
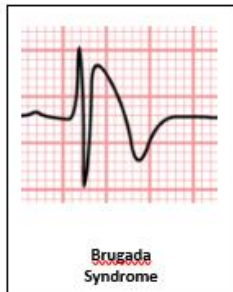
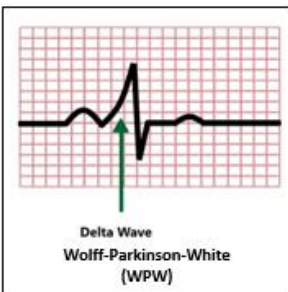
- Head Injury
- Electrolyte Abnormality
- Psychiatric Disorder
- Cardiac Dysrhythmia
- DM, CVA, Seizure, Tox
- Sepsis
- Hypothermia
- Hypothyroidism
- Pulmonary

General Approach – Adult, Medical



Consider causes of presyncope/impending arrest syndrome:

- Acute coronary syndrome (ACS) : look for evidence of ischemia
- Tachydysrhythmias
- Bradydysrhythmias and heart blocks
- Wolff-Parkinson-White (WPW): look for short PR, prolonged QRS and a delta wave
- Brugada Syndrome: look for rugada sin with coved ST segment elevation >2mm in >1 V1-V3 followed by a negative T Wave
- Hypertrophic Cardiomyopathy (HCM): look for evidence of left ventricular hypertrophy with deep narrow "dagger like" Q waves in lateral and inferior leads, may also have left atrial enlargement
- Long or short QT-intervals: look for a QTc <300 or >450
- Arrhythmogenic Right Ventricular Dysplasia (ARVD): look for epsilon waves +/- T wave inversions in V1-V3
- Miscellaneous: PE, right sided heart strain, electrolyte abnormalities, ICH, etc.



Pearls

REQUIRED EXAM: VS, GCS, Head, Neck, Blood Glucose

- Pay special attention to head and neck exam for bruising or signs of injury.
- Syncope/Altered Mental Status may be the presenting sign of environmental hazards / toxins. Protect yourself and other providers / community if concern. Involve Hazmat early.
- Safer to assume hypoglycemia if doubt exists. Recheck blood sugar after dextrose/glucose administration and reassess.
- **Do not let EtOH fool you!** Alcoholics frequently develop hypoglycemia, Alcoholic ketoacidosis (AKA) and often hide traumatic injuries!



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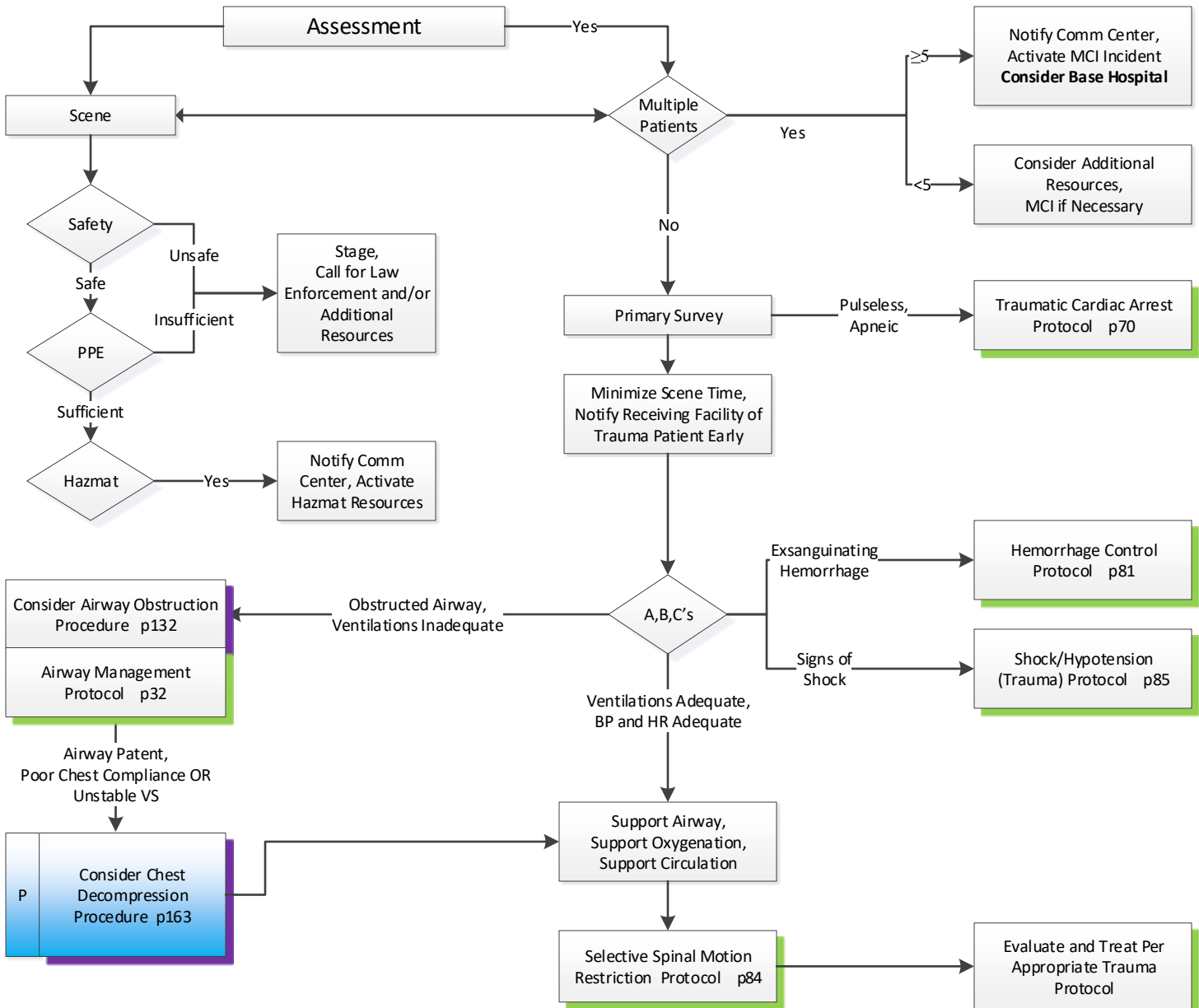
General Approach – Adult, Trauma

Pertinent Positives and Negatives

- Age, VS, GCS
- Time of Injury, Mechanism of Injury
- DCAP-BTLS
- SAMPLE History
- OPQRST History
- Pain / Swelling
- Mental Status
- Hypotension / Shock

Differential

- Stroke
- STEMI
- Overdose
- Elder Abuse
- Domestic Violence
- Non-Accidental Trauma



Pearls

REQUIRED EXAM: Vital Signs, GCS, Loss of Consciousness, Location of Pain (then targeted per Appropriate Trauma Protocol)

- If presentation is not consistent with traumatic mechanism consider potential medical etiologies.
- Trauma Destination for patients <18 - Pediatric Destination Determination Protocol p113
- Assess for major trauma criteria immediately upon patient contact
 - RR <10 or >29; SBP <90; Pulse <50 or >140; GCS <13; SpO2 <93%
 - Transport to Trauma Center, minimize scene time to goal of <10 minutes
- Disability – assess for neuro deficits including paralysis, weakness, abnormal sensation
- Suspect Tension Pneumothorax when:
 - Mechanism consistent with Chest Trauma; Resp Distress; Decreased Breath Sounds; JVD; Low BP; Tachycardia; Tracheal Deviation
 - Signs and Symptoms of Tension Pneumothorax may be present *with or without* positive pressure ventilations
 - Needle Decompression should be performed with a 3" 14ga needle at the 2nd intercostal space, *midclavicular line*
 - If repeat decompression necessary, continue to move laterally along the superior aspect of the 3rd rib



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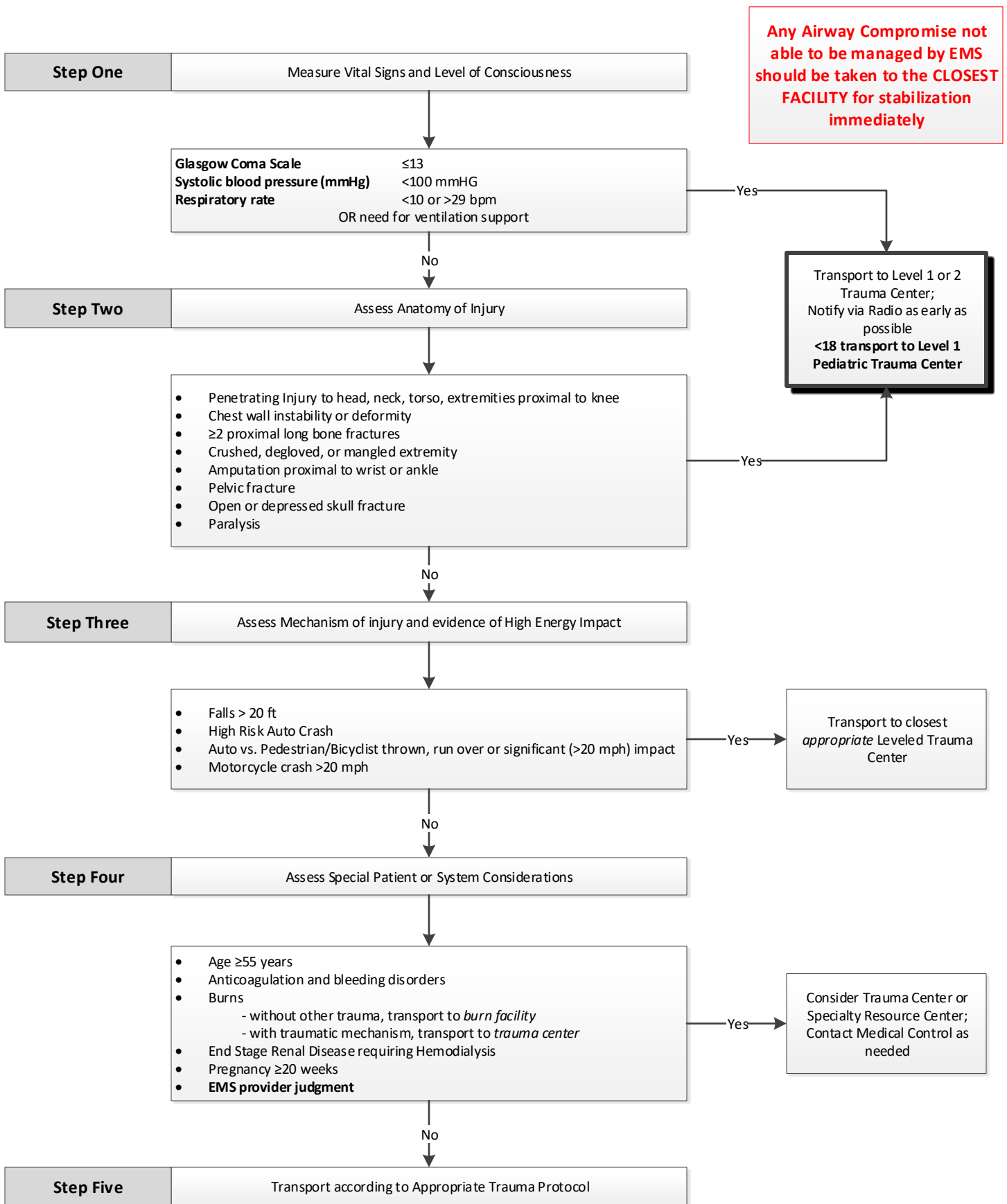
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Destination Determination – Adult, Trauma



Any Airway Compromise not able to be managed by EMS should be taken to the CLOSEST FACILITY for stabilization immediately

<https://www.dhs.wisconsin.gov/publications/p0/p00730.pdf>



Trauma Protocols - Adult



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Bites and Envenomations – Adult, Trauma

Pertinent Positives and Negatives

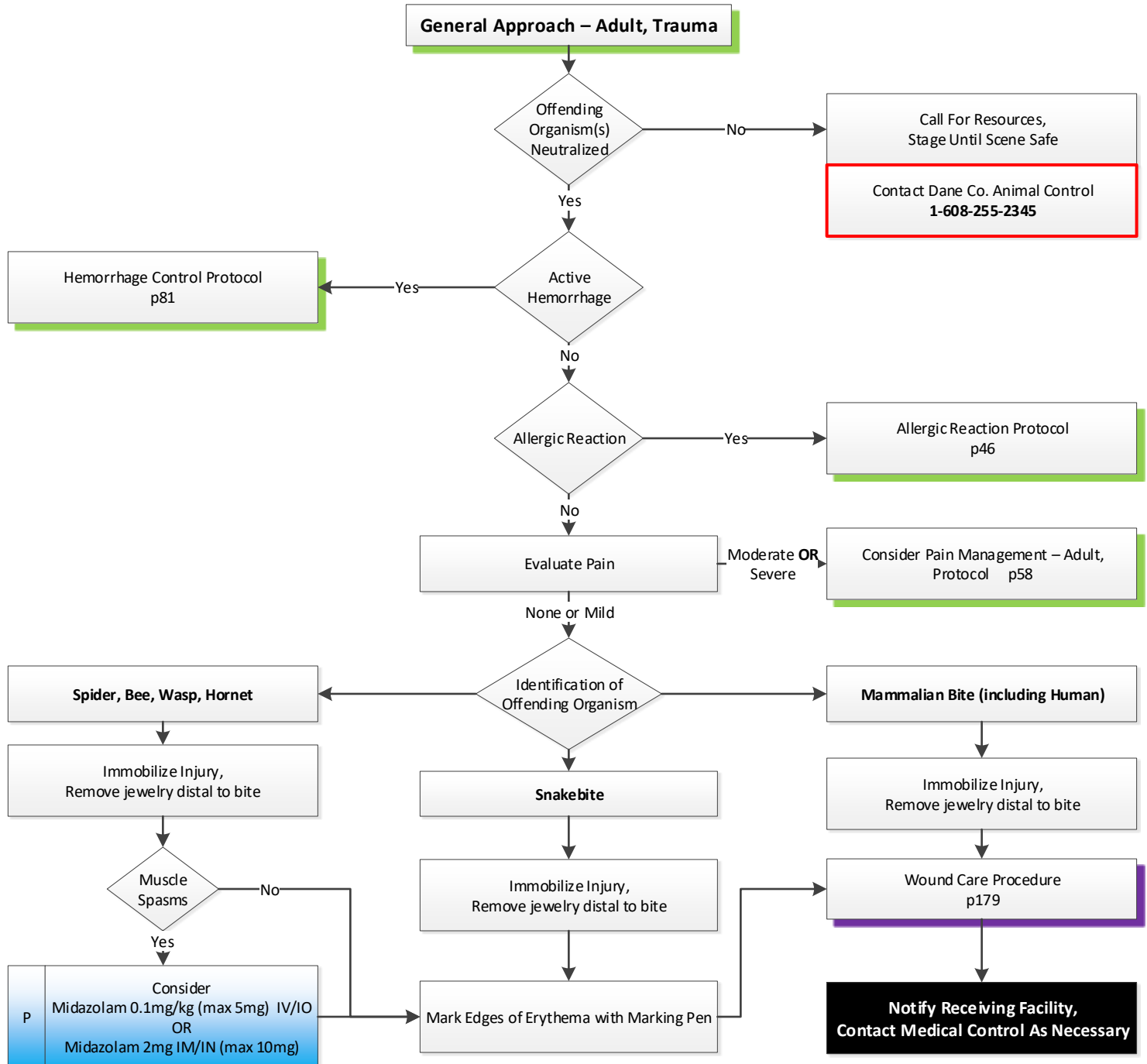
- Age, VS, Pulses distal to wound
- SAMPLE History
- OPQRST History
- Description or photo of offending creature
- Tetanus status

- Immunization History of Creature (if known)
- Domestic vs. Wild Animal
- Allergic Reaction
- Hypotension, Shock, Fever

Differential

- Penetrating Trauma
- Dry Bite (Snake)
- Abscess/Cellulitis
- Non-Accidental Trauma
- Projectile Injury

General Approach – Adult, Trauma



Pearls

REQUIRED EXAM: VS, GCS, Evidence of Intoxication, Affected Extremity Neurovascular Exam

- Cat bites may not initially appear serious, but can progress rapidly to severe infection
- Human bites have higher rates of infection than animal bites and necessitate evaluation in the Emergency Department for antibiotics
- It is not necessary to bring the offending insects, animals or reptiles to the ED for identification; this may result in added danger to others
- Bites on the hands and lacerations over knuckles should be assumed to be “Fight Bites” until proven otherwise, and need evaluation
- Brown recluse spider bites are usually painless at the time of bite. Pain and tissue necrosis develops over hours to days
- Immunocompromised patients have higher risk of infection – Think: Diabetes, Chemotherapy, Organ Transplant



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Burns – Adult, Trauma

Pertinent Positives and Negatives

- Age, VS
- SAMPLE History
- OPQRST History
- Mechanism of Burn (heat, gas, chemical)
- Time of Injury

- Singed Facial Hair
- Wheezing, Hoarseness
- Subjective Throat Swelling
- Loss of Consciousness

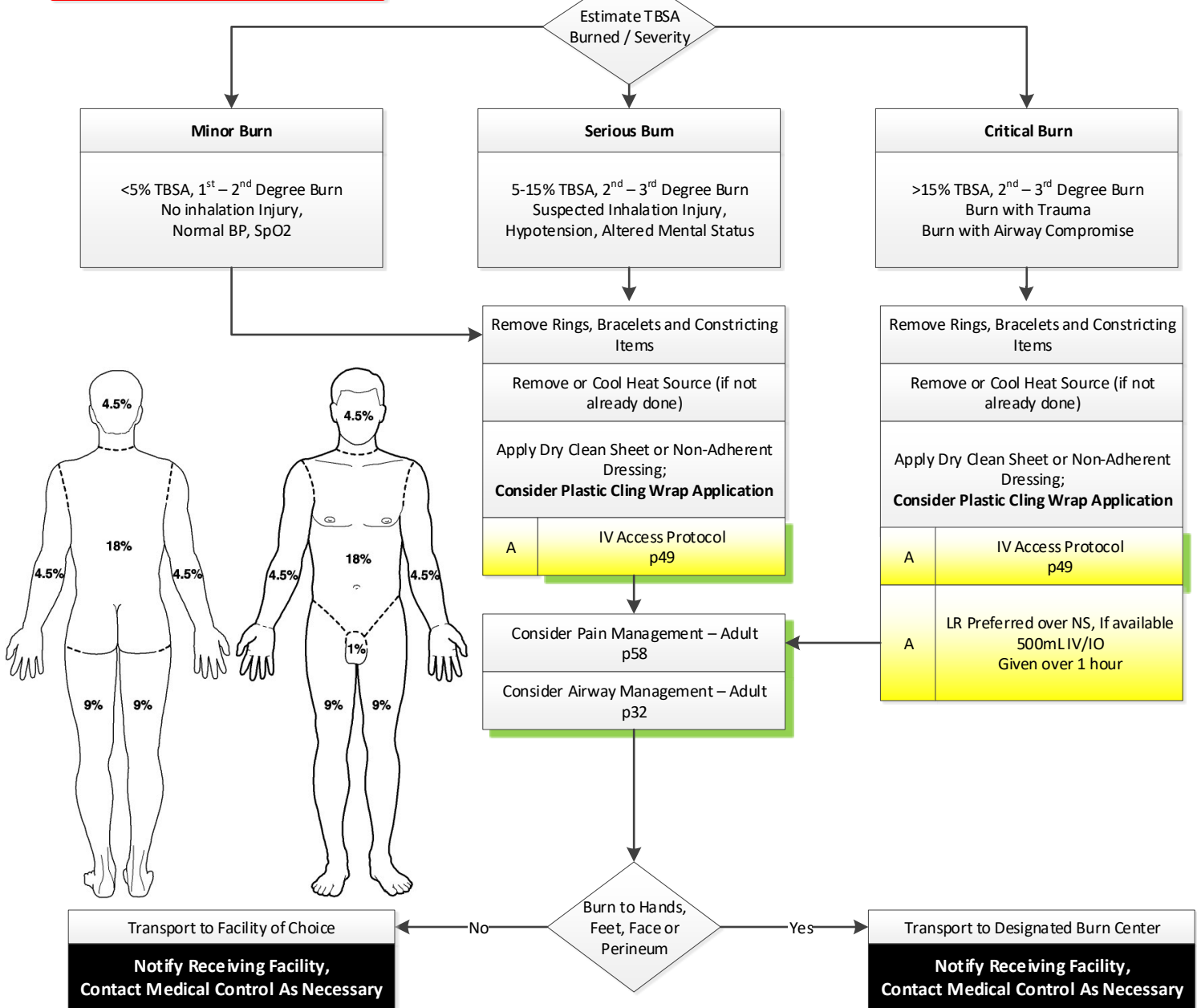
Differential

- Blast Injury
- Radiation Injury
- Electrical Injury
- Cyanokit Need?
- Cellulitis
- Dermatitis
- Drug Reaction (Stevens-Johnson Syndrome)

Consider Need for Airway Management EARLY, if concern request ALS

General Approach – Adult, Trauma

Consider CN Exposure for Enclosed Space Fire with Synthetic Materials



Pearls

REQUIRED EXAM: VS, GCS, Lung Sounds, HEENT, Posterior Pharynx

- Burns to face and eyes, remove contact lenses prior to irrigation.
- Chemical burns require removal of contaminated clothing, brush away dry powder before irrigation. Flush with copious warm water on scene and continue irrigation en route. Be sure to brush excess away and remove contaminated clothing BEFORE beginning irrigation. Early intubation is strongly recommended if suspicion of inhalation injury. Suspicion is high in patients involved in an enclosed space fire, who have facial burns or show signs of airway involvement; carbonaceous sputum, facial burns or edema, hoarseness, singed nasal hairs, agitation, hypoxia or cyanosis.
- **Indications of possible Cyanide Poisoning** - Exposure to fumes from burning Nitrile (polyurethane, vinyl) Seizures, coma, cardiac arrest, headache, vertigo and/or cherry red skin color from increased venous O2 concentration.



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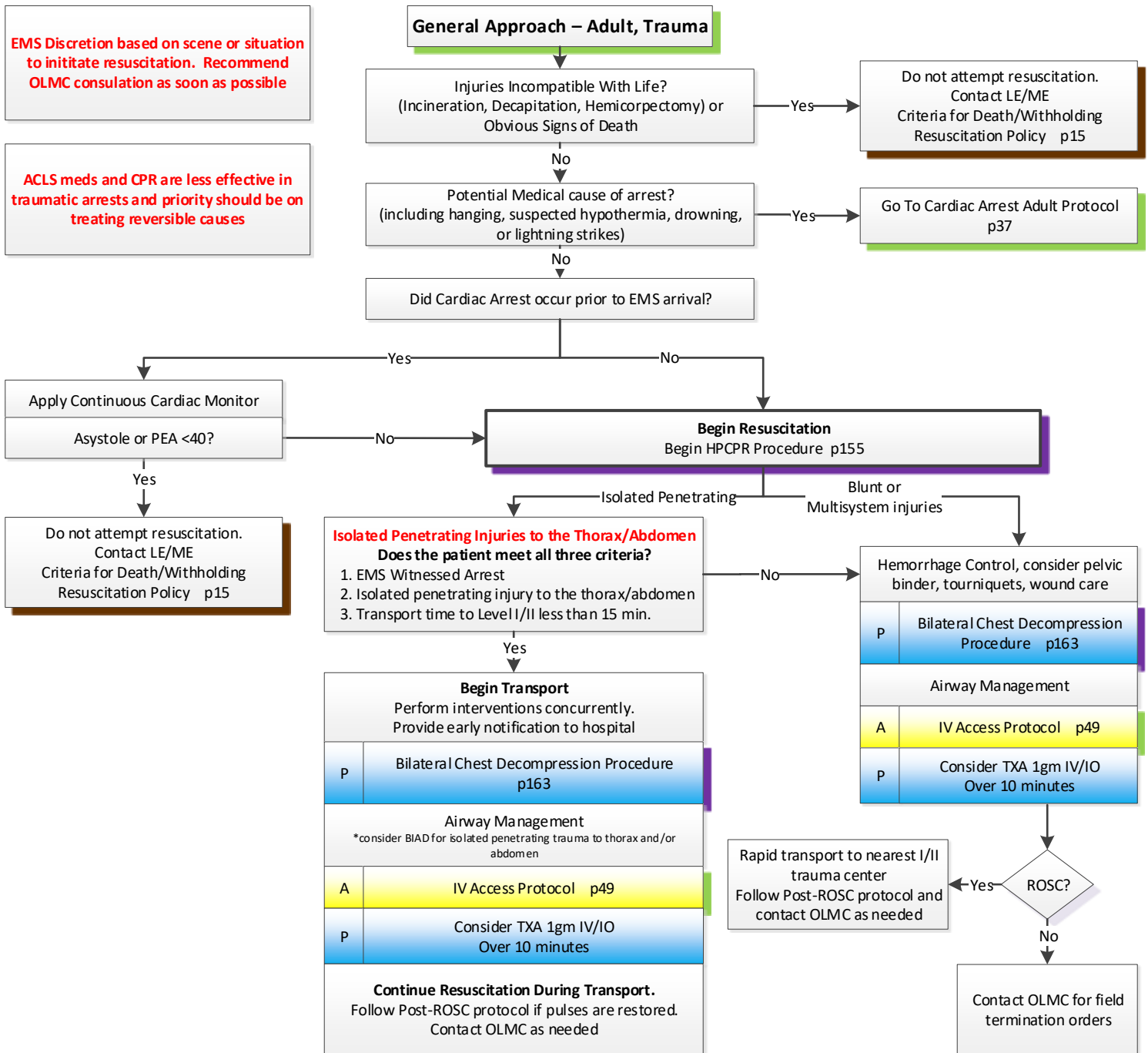
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Traumatic Cardiac Arrest – Adult, Trauma



Pearls

REQUIRED EXAM: Pupillary Light Reflex, Palpation of Pulses, Heart and Lung Auscultation

- Special consideration for patients – hanging, suspected hypothermia, drowning, or lightning strikes follow medical cardiac arrest protocol and consider early OLMC consultation.
- Injuries incompatible with life include; decapitation, incineration, massively deforming head or chest injury, or obvious signs of death (p15)
- Consider using medical cardiac arrest protocols if uncertainty exists regarding etiology of arrest
- Use of a long spine board will make chest compressions more effective; however, if spinal immobilization interferes with CPR use reasonable effort to limit patient and spine movement
- Be aware that these may be crime scenes: do your best to avoid disturbing forensic evidence
- If provider safety becomes a concern, transport of deceased patients to the hospital is *acceptable*
- Pregnancy EDC can be estimated by palpating the gravid uterus; above the level of the umbilicus is generally ≥ 22 weeks



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Chemical / Electrical Burn – Adult, Trauma

Pertinent Positives and Negatives

- Type of exposure (heat, gas, chemical)
- Central and Peripheral Pulses
- Nausea, Vomiting, Diarrhea
- Chemical Name (if known)

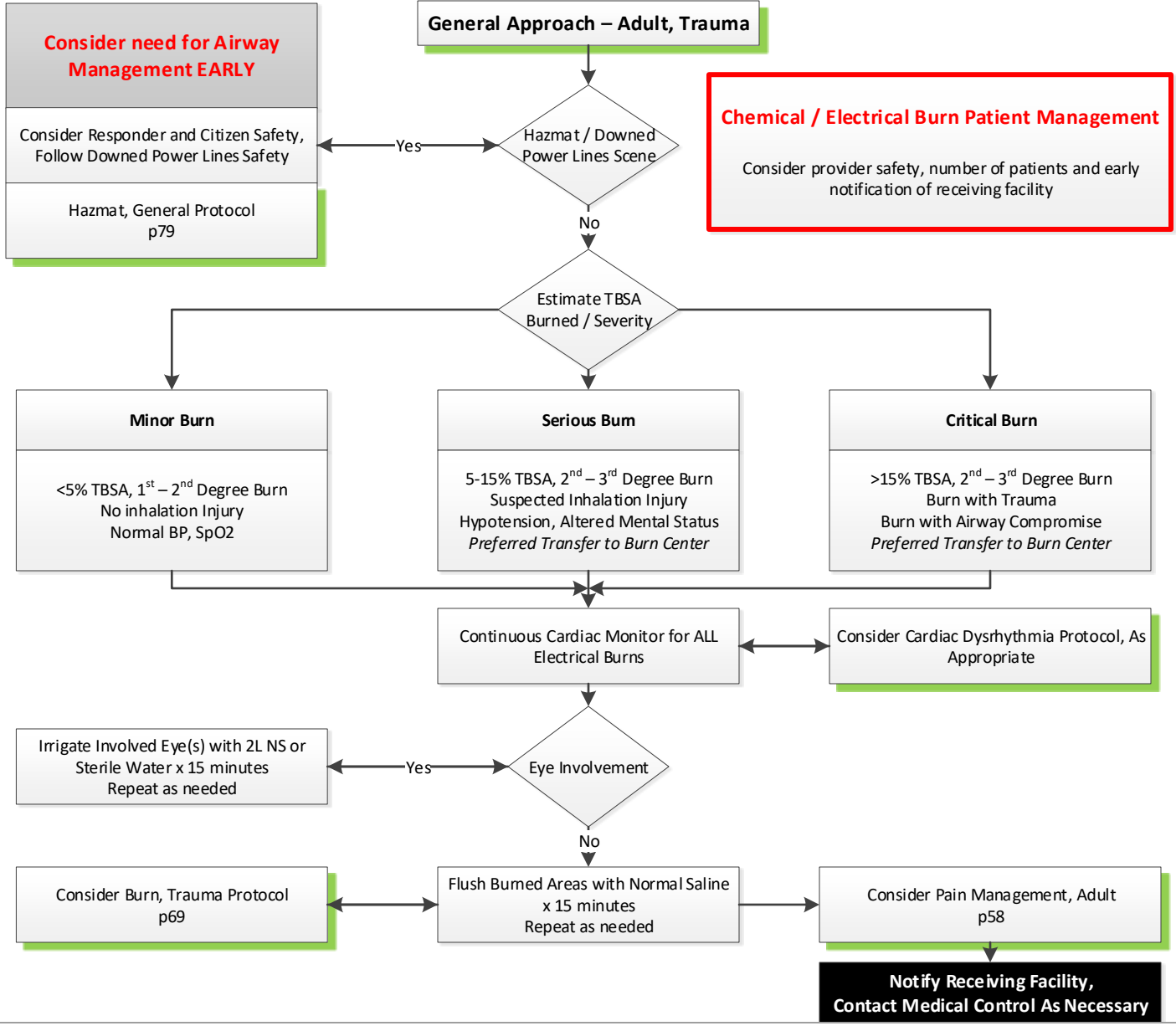
Differential

- Time of Exposure (duration)
- Mechanism of secondary injury (blunt vs. penetrating)
- Voltage of Electrical Current (if known)

Differential

- Thermal Injury
- Chemical Burn
- Electrical Injury
- Blast Injury

- Abrasion
- Contusion
- Laceration
- Compartment Syndrome



Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- Provider Safety is paramount! Ensure Chemical Source is not a hazard to responders and Electrical Sources are not contacting patient prior to assessment. Don't allow yourself or your crew to become victims.
- Safety First! Assure a Chemical source of burn is NOT a hazard to responders. Assure an Electrical source of burn is OFF or no longer contacting pt.
- High Voltage Electrical Burns (>600 volts) require spinal immobilization, continuous cardiac monitor and IV access regardless of external appearance of injury
- Chemical burns require removal of contaminated clothing, brush away dry powder before irrigation. Flush with copious warm water on scene and continue irrigation en route. Be sure to brush excess away and remove contaminated clothing BEFORE beginning irrigation
- Superficial appearance of Electrical Burns does NOT indicate severity of underlying tissue damage
- Attempt to locate contact points in Electrical Burns, generally contact point with source and where patient is grounded. Do not refer to them as entry or exit wounds. Surface appearance may belie the damage below
- Electrical Burns cause ventricular and atrial irritability and dysrhythmias; anticipate cardiac problems and treat accordingly



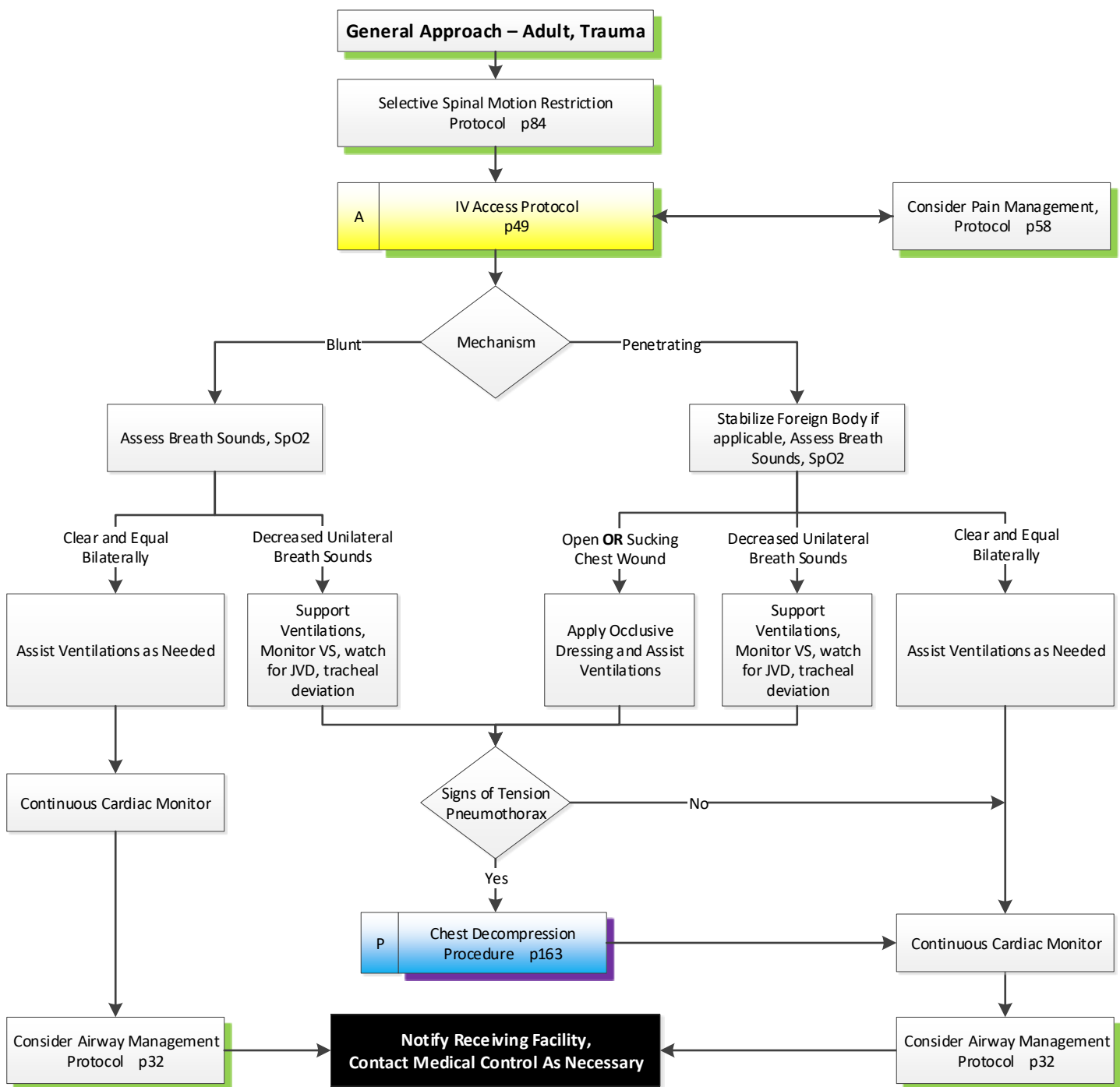
Trauma Protocols - Adult



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Chest Injury – Adult, Trauma

- | | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pertinent Positives and Negatives <ul style="list-style-type: none"> Type of injury Mechanism (blunt vs. penetrating) Respiratory Effort, Adequacy Abnormal Breath Sounds (unilateral vs. bilateral) | <ul style="list-style-type: none"> SAMPLE History OPQRST History Evidence of Intoxication Evidence of Multi-System Trauma | Differential <ul style="list-style-type: none"> Simple Pneumothorax Tension Pneumothorax Pericardial Tamponade Aortic Root Disruption | <ul style="list-style-type: none"> Bronchial Tree Injury Tracheal Disruption Great Vessel Laceration Cardiac Contusion Cardiac Laceration |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- Consider tension pneumothorax in any patient with penetrating chest trauma, OR blunt chest trauma with decreased unilateral breath sounds, hypotension, tachycardia, hypoxia, tracheal deviation (late) or JVD (late)
- Aortic root injuries, bronchial disruption and tracheal disruptions are common with major deceleration injuries (i.e. MVC)
- Cardiac contusions are common with blunt chest trauma, and may present with ectopy, PVCs or even STEMI appearance on cardiac monitor
- Pericardial Tamponade is a surgical emergency and needs rapid transport. Look for muffled heart tones, hypotension, tachycardia



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A A-EMT
P Paramedic
M Medical Control

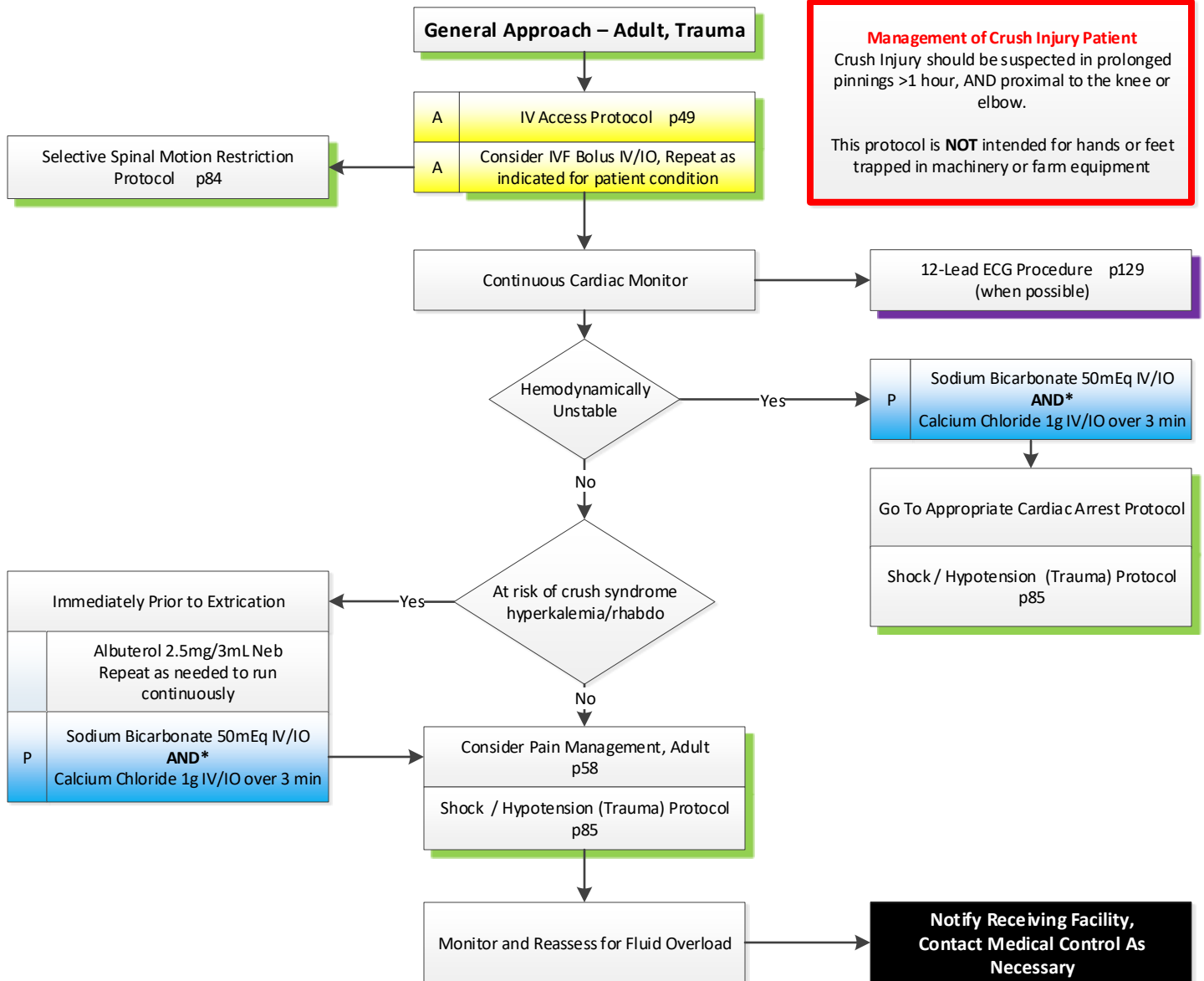
Prolonged Crush Injury – Adult, Trauma

Pertinent Positives and Negatives

- Age, VS, GCS
- SAMPLE History
- OPQRST History
- Crushed under heavy load ≥30 min
- Building collapse, trench collapse, industrial accident, heavy equipment pinning

Differential

- Compartment Syndrome
- Entrapment without Crush
- Fracture, Sprain, Strain



Pearls

REQUIRED EXAM: Vital Signs, GCS, Lung Sounds, Neuro Exam, Musculoskeletal Exam

- Structural Collapse, Crush Scenes are often full of hazards, provider safety is the most important consideration
- Patients may become hypothermic, even in warm environments
 - Hypothermia can lead to coagulopathy, which will increase bleeding times and have worse outcomes for the patient
- Crush injuries can result in hyperkalemia from shift of Potassium out of injured cells. Cardiac monitoring is required and 12-lead ECG preferred whenever possible (as dictated by the situation)
- Monitor extremities for signs of compartment syndrome after crush injury; **Pain, Pallor, Paresthesias, Paralysis, Pulselessness** and **Poikilothermia** (inability to regulate core body temperature)
- *Utilize different IV lines or flush between bicarb and calcium to prevent precipitation in the line



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Near Drowning / Submersion Injury – Adult, Trauma

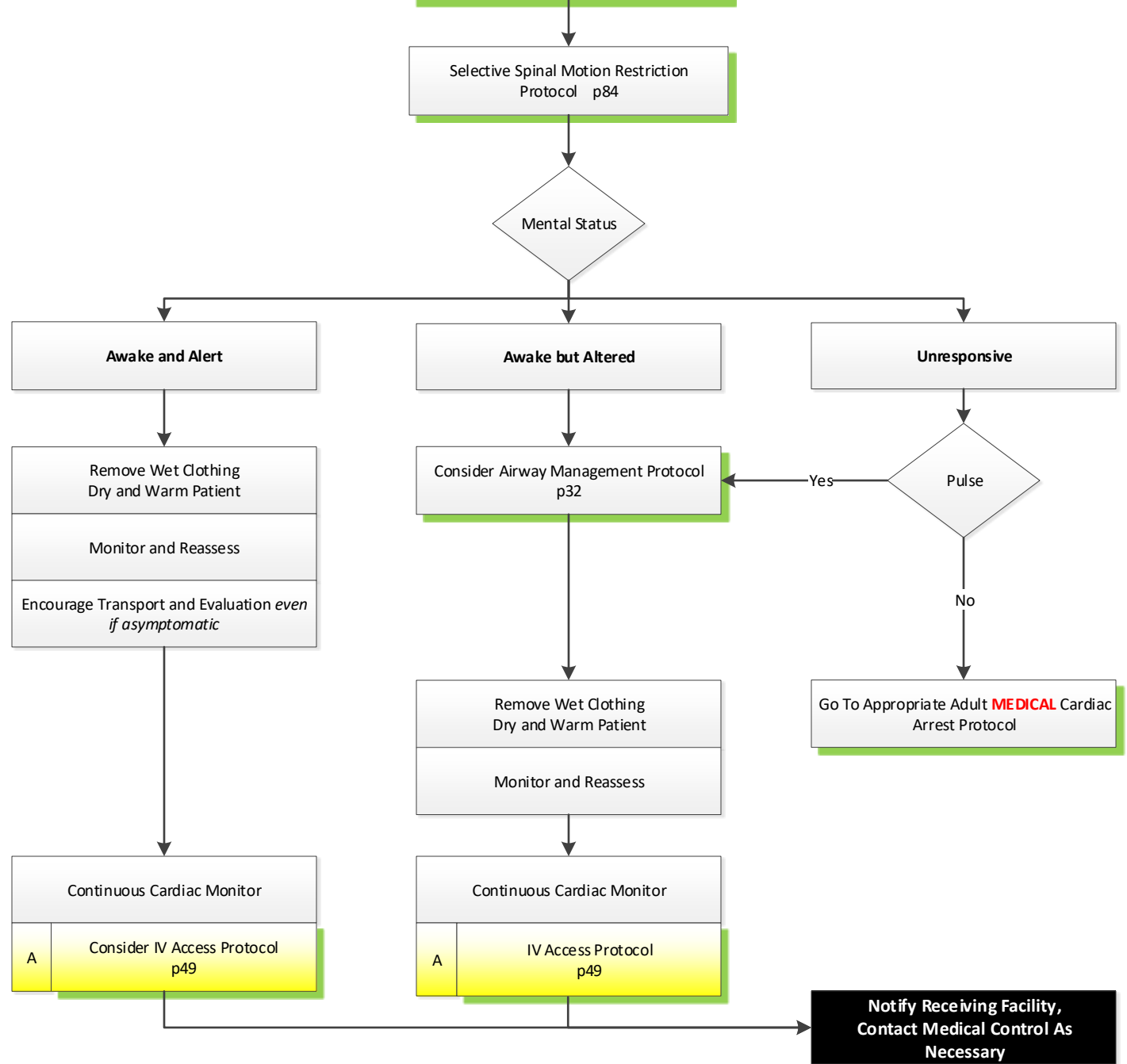
Pertinent Positives and Negatives

- Submersion in water regardless of depth
- SAMPLE History
- OPQRST History
- Temperature of water
- Mental Status Changes
- Degree of Water Contamination
- Vomiting
- Coughing, Wheezing, Rales, Rhonchi, Stridor

Differential

- Spinal Trauma
- Pre-Existing Medical Condition
- Hypothermia
- Aspiration
- The Bends
- Pressure Injury
 - Barotrauma
 - Decompression Sickness
- Post-Immersion Syndrome

General Approach – Adult, Trauma



Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- Have a HIGH index of suspicion for possible spinal injuries. Any diving injury or submersion with unclear details should be fully immobilized.
- Hypothermia is often associated with near-drowning and submersion injuries. Consider the Hypothermia Protocol as appropriate.
- All patients with Near-Drowning / Submersion Injury should be transported for evaluation due to delayed presentation of respiratory failure.
- With diving injuries (decompression / barotrauma) consider availability of a hyperbaric chamber; contact Medical Control early.
- Near-drowning patients who are awake and cooperative but with respiratory distress may benefit from CPAP / Positive Pressure Ventilation.



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Environmental, Hyperthermia – Adult, Trauma

Pertinent Positives and Negatives

- Age, VS, Mental Status
- SAMPLE History
- OPQRST History
- Time and length of exposure to hot environment

Differential

- Hot, dry or sweaty skin
- Seizures
- Nausea
- Hypotension, Shock, Fever

Differential

- Alcohol Withdrawal (DTs)
- Hyperthyroidism (Thyroid Storm)
- Dehydration
- Cocaine or Sympathomimetic OD
- Sepsis

- CNS Lesion or Head Injury
- Abuse or Neglect (Elderly or disabled)
- Medication (Serotonin Syndrome, Malignant Hyperthermia)

General Approach – Adult, Trauma

If Evidence of Sympathomimetic OD
Consider Overdose, Sympathomimetic Protocol p65

Remove Patient from Hot Environment (if applicable)

Estimate Severity of Symptoms

Heat Cramps

Painful Spasms of Extremities and/or Abdominal Muscles
Normal Mental Status
Normal Vital Signs

Oral Fluids
Sponge with Cool Water and Fan

Heat Exhaustion

Dizziness, Lightheadedness, Headache, Irritability, Nausea
Normal or Mildly Depressed Mental Status
Mild Tachycardia (<150)
Normal or Mildly Elevated Temp

Keep Patient Supine
Apply 100% Oxygen
Sponge with Cool Water and Fan

Heat Stroke

Marked Alteration in Level of Consciousness
May Be Sweating OR Hot, Dry, Red Skin
Extremely High Temp, >104°F

Semi-Reclining Position with Head Elevated
Apply 100% Oxygen
Rapid Cooling with Cold Packs, Sponge with Cool Water and Fan

A IV Access Protocol p49

Consider Shock / Hypotension (Trauma) p85

A Ondansetron 0.15mg/kg IV/IO (max 4mg)

P If Shivering, Consider Midazolam 0.1 mg/kg IV/IO (max 5mg)

Notify Receiving Facility, Contact Medical Control As Necessary

Tolerating Oral Fluids

Yes

No

Reassess and Document Mental Status, VS and ability to take PO

Normal

Any Abnormal

A IV Access Protocol p49

Consider Shock / Hypotension (Trauma) p85

A Consider Ondansetron 0.15 mg/kg (max 4mg) IV/IO/ODT

Requires Transport

No

Yes

Execute and Document Patient Refusal Protocol p59

Pearls

REQUIRED EXAM: VS, GCS, Skin, HEENT, Neuro, Evidence of Intoxication, Mental Status

- Extremes of age are more prone to heat emergencies due to inability to easily self-extricate from hot environments
- Patients on Tricyclic Antidepressants, Anticholinergics, Diuretics (i.e. Lasix) are more susceptible to heat emergencies due to medication effects
- Cocaine, amphetamines and salicylates all may elevate body temperature or interfere with the ability to auto-regulate
- Sweating generally disappears as body temperature rises above 104°F
- If Heat Cramps resolved without IV Access or Medications, patients may refuse transport, IF tolerating oral fluids and VS normal



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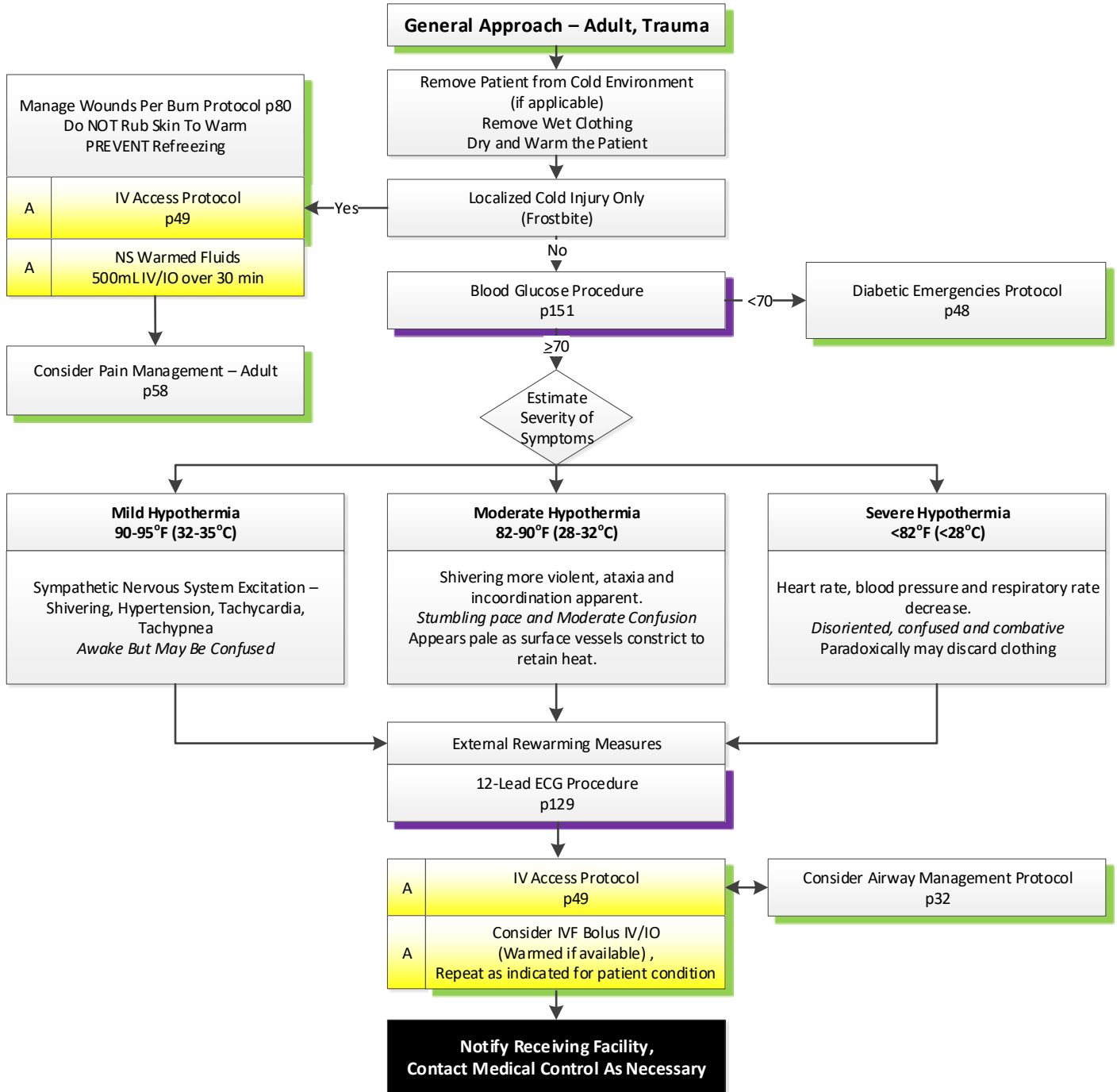


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Environmental, Hypothermia – Adult, Trauma

Pertinent Positives and Negatives <ul style="list-style-type: none"> Age, VS, Mental Status SAMPLE History OPQRST History Time and length of exposure to cold environment 	<ul style="list-style-type: none"> Cold or clammy skin Confusion Arrhythmias, J-waves on ECG Hypotension, Shock 	Differential <ul style="list-style-type: none"> Alcohol Intoxication Hypothyroidism (Myxedema Coma) Dehydration Sepsis 	<ul style="list-style-type: none"> CNS Lesion or Head Injury Abuse or Neglect (Elderly or disabled) Medication (beta blocker overdose, opiate overdose)
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------



Pearls

REQUIRED EXAM: VS, GCS, Skin, HEENT, Neuro, Evidence of Intoxication, Mental Status

- Hypoglycemia is found in many hypothermic patients, because hypothermia may be a result of hypoglycemia
- Severe hypothermia may cause myocardial irritability and rough handling can theoretically cause V-fib. Please handle carefully.
-Do not withhold intubation or CPR for this concern, but only the most experienced provider available should *gently* attempt intubation
- Below 86°F (30°C), antiarrhythmics may not be effective. If given, they should be given at reduced intervals. Do NOT attempt to pace below 86°F. If antiarrhythmics necessary for severely hypothermic patient, Contact Medical Control
- Extremes of age, malnutrition, EtOH and drug abuse and outdoor hobbies / employment all predispose to hypothermia



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Extremity Injury – Adult, Trauma

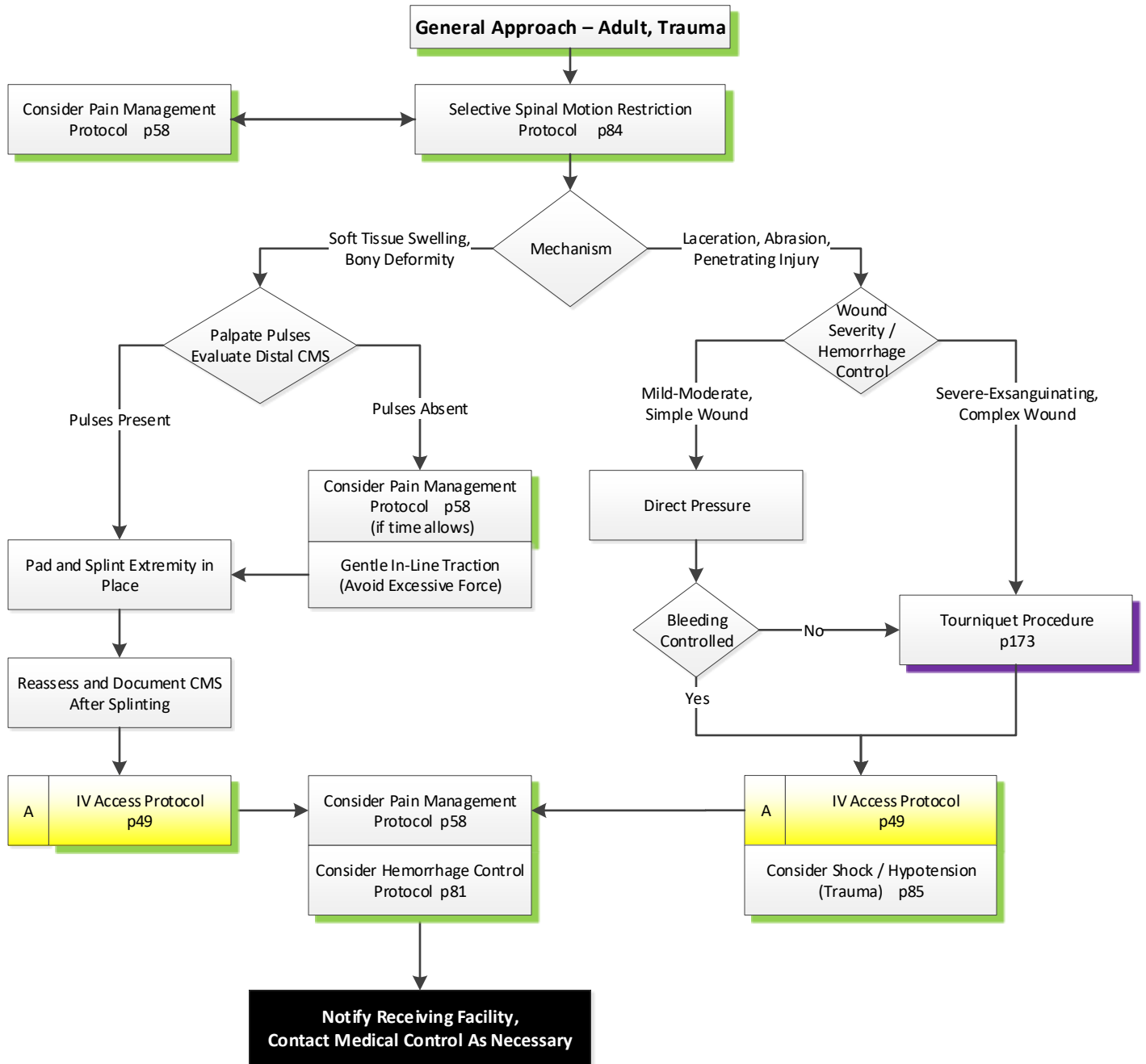
Pertinent Positives and Negatives

- Type of injury
- Mechanism (blunt vs. penetrating)
- Central and Peripheral Pulses
- Neuro Function Distal to Injury

- SAMPLE History
- OPQRST History
- Evidence of Intoxication
- Evidence of Multi-System Trauma

Differential

- Vascular Disruption
- Amputation
- Fracture, Dislocation
- Sprain, Strain
- Abrasion
- Contusion
- Laceration
- Compartment Syndrome



Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- Immobilization of bony injuries should include the joint above and below. Joint injuries require immobilization of bone above and below
- Palpate and document Circulation, Movement and Sensation both before and after splint application
- Tourniquets should remain in place once hemorrhage control is adequate. The tourniquet is tight enough when the bleeding stops!
- If active hemorrhage and bony/soft tissue deformity, priority should be put on hemorrhage control *first*, then splinting – remember A,B,C's
- If amputated extremities available, seal in a plastic bag and place in cool water and bring to the hospital with the patient



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Eye Pain – Adult, Trauma

Pertinent Positives and Negatives

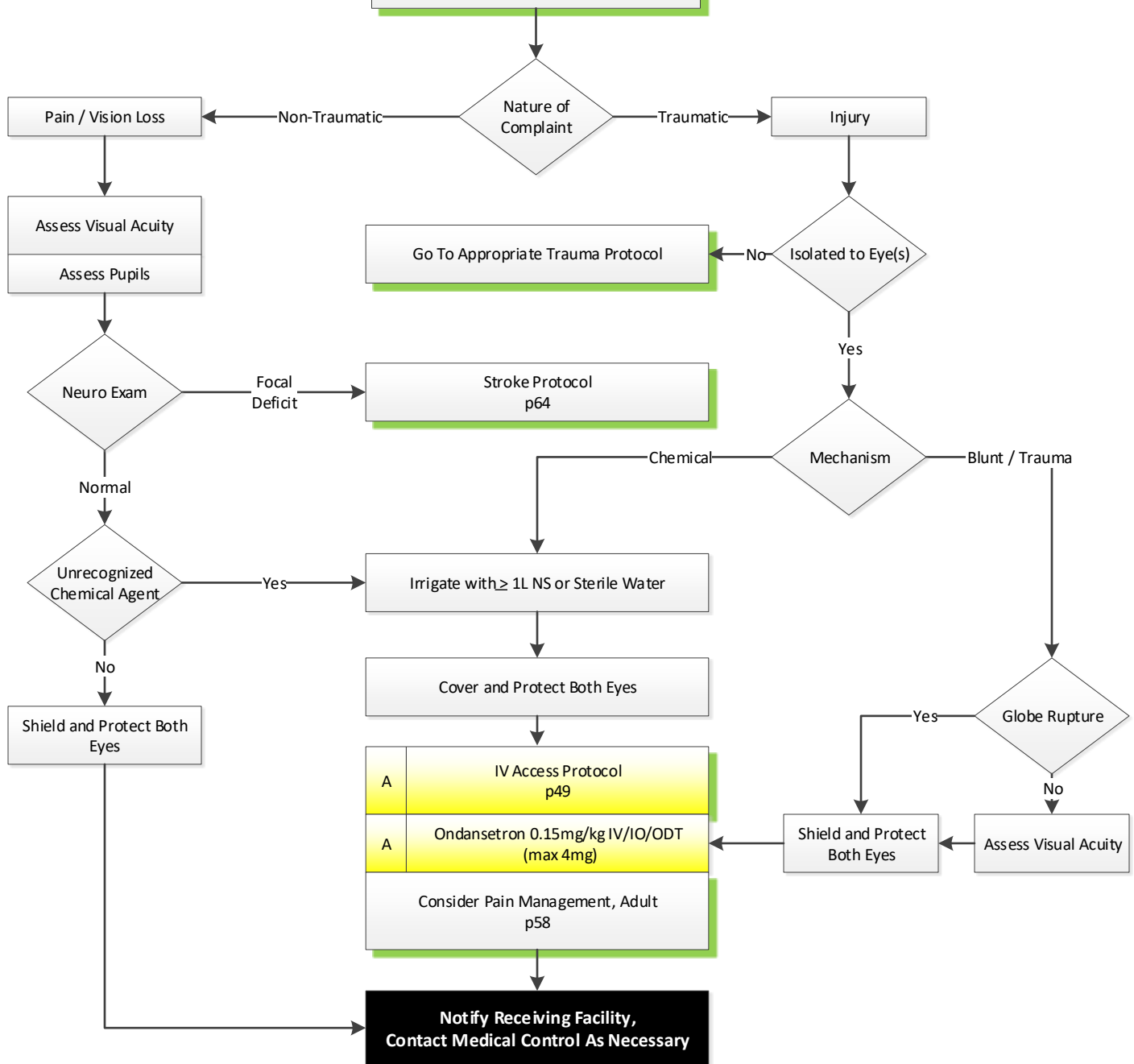
- Age, VS, Visual Acuity
- SAMPLE History
- OPQRST History
- Time of Injury

- Involved Chemical MSDS
- Contact/Corrective Lens Use
- “Shooting” or “Streaking” Lights
- Rust Ring
- “Lowering Shade” in Vision

Differential

- Globe Rupture
- Acute Closed Angle Glaucoma
- Stroke
- Retinal Artery Occlusion
- Chemical Burn
- Retinal Venous Thrombus

General Approach – Adult, Trauma



Pearls

REQUIRED EXAM: VS, GCS, Visual Acuity, Neuro Exam, Extraocular Movements

- Stabilize any penetrating objects. DO NOT remove any embedded / impaled objects
- If Long Spine Board not indicated, transport with head of stretcher elevated to 60 degrees to help reduce intraocular pressure
- Remove contact lenses when possible
- Always cover both eyes to prevent further injury
- Orbital fractures increase concern for globe or optic nerve injury; follow visual acuity and extraocular movements for changes
- Normal visual acuity can be present, even with severe injury



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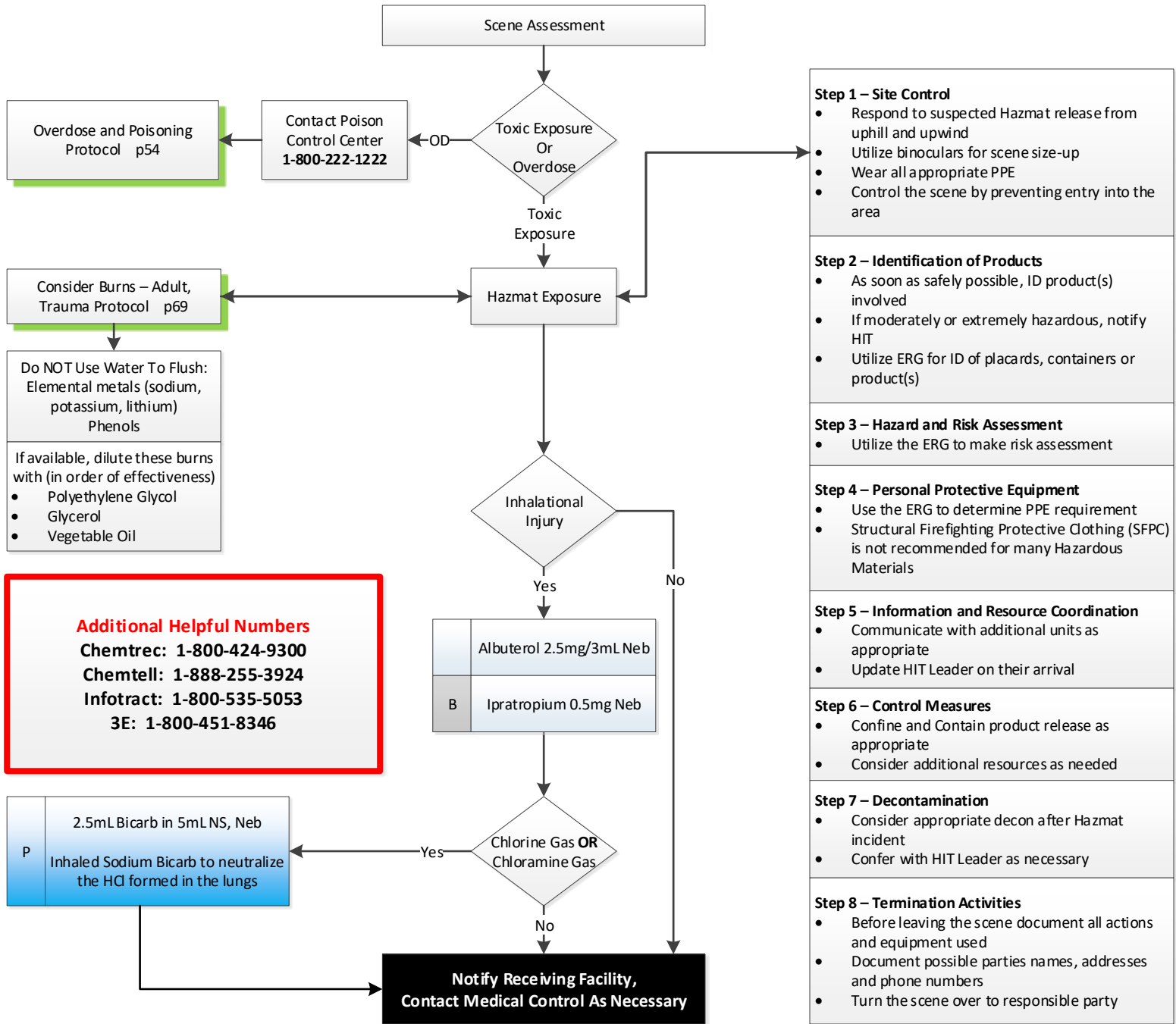
Hazmat, General – Adult, Trauma

Pertinent Positives and Negatives

- Age, VS, Mental Status
- SAMPLE History
- OPQRST History
- Time and length of exposure to toxic environment
- MSDS Sheet Info
- Mode of Release
- Number of Victims

Differential

- Alcohol Intoxication
- Hyperthyroidism
- Drug Abuse, Intoxication
- Sepsis
- CNS Lesion or Head Injury
- Abuse or Neglect (Elderly or disabled)
- Medication (beta blocker overdose, opiate overdose)



- Step 1 – Site Control**
 - Respond to suspected Hazmat release from uphill and upwind
 - Utilize binoculars for scene size-up
 - Wear all appropriate PPE
 - Control the scene by preventing entry into the area
- Step 2 – Identification of Products**
 - As soon as safely possible, ID product(s) involved
 - If moderately or extremely hazardous, notify HIT
 - Utilize ERG for ID of placards, containers or product(s)
- Step 3 – Hazard and Risk Assessment**
 - Utilize the ERG to make risk assessment
- Step 4 – Personal Protective Equipment**
 - Use the ERG to determine PPE requirement
 - Structural Firefighting Protective Clothing (SFPC) is not recommended for many Hazardous Materials
- Step 5 – Information and Resource Coordination**
 - Communicate with additional units as appropriate
 - Update HIT Leader on their arrival
- Step 6 – Control Measures**
 - Confine and Contain product release as appropriate
 - Consider additional resources as needed
- Step 7 – Decontamination**
 - Consider appropriate decon after Hazmat incident
 - Confer with HIT Leader as necessary
- Step 8 – Termination Activities**
 - Before leaving the scene document all actions and equipment used
 - Document possible parties names, addresses and phone numbers
 - Turn the scene over to responsible party

Additional Helpful Numbers
Chemtec: 1-800-424-9300
Chemtell: 1-888-255-3924
Infotract: 1-800-535-5053
3E: 1-800-451-8346

P 2.5mL Bicarb in 5mL NS, Neb
 Inhaled Sodium Bicarb to neutralize the HCl formed in the lungs

Notify Receiving Facility, Contact Medical Control As Necessary

Pearls

- REQUIRED EXAM: VS, GCS, Skin, HEENT, Neuro, Evidence of Intoxication, Mental Status**
- The most important factor in Hazmat response is provider safety – you can't help anyone else if you're a victim as well
 - In any Hazmat situation, consider that the exposure may not be accidental; consider intentional releases, secondary devices and terrorism
 - Always park upwind and uphill of any potential exposures, and be conscious of any symptoms you may begin to develop
 - Communication is key; contact the appropriate Hazmat authority early and notify the Hazmat leader as well as the Comm Center of findings
 - In a large-scale event, have the Comm Center activate Dane County Mass Casualty Plan and notify the Base Hospital to get prepared
 - Inhaled bicarb is controversial but seems to help. Aslan S, Kandis H, Akgun M, Cakir Z, Inandi T, Görgüner M. The effect of nebulized NaHCO3 treatment on "RADS" due to chlorine gas inhalation. *Inhal Toxicol*. 2006 Oct. 18(11):895-900.



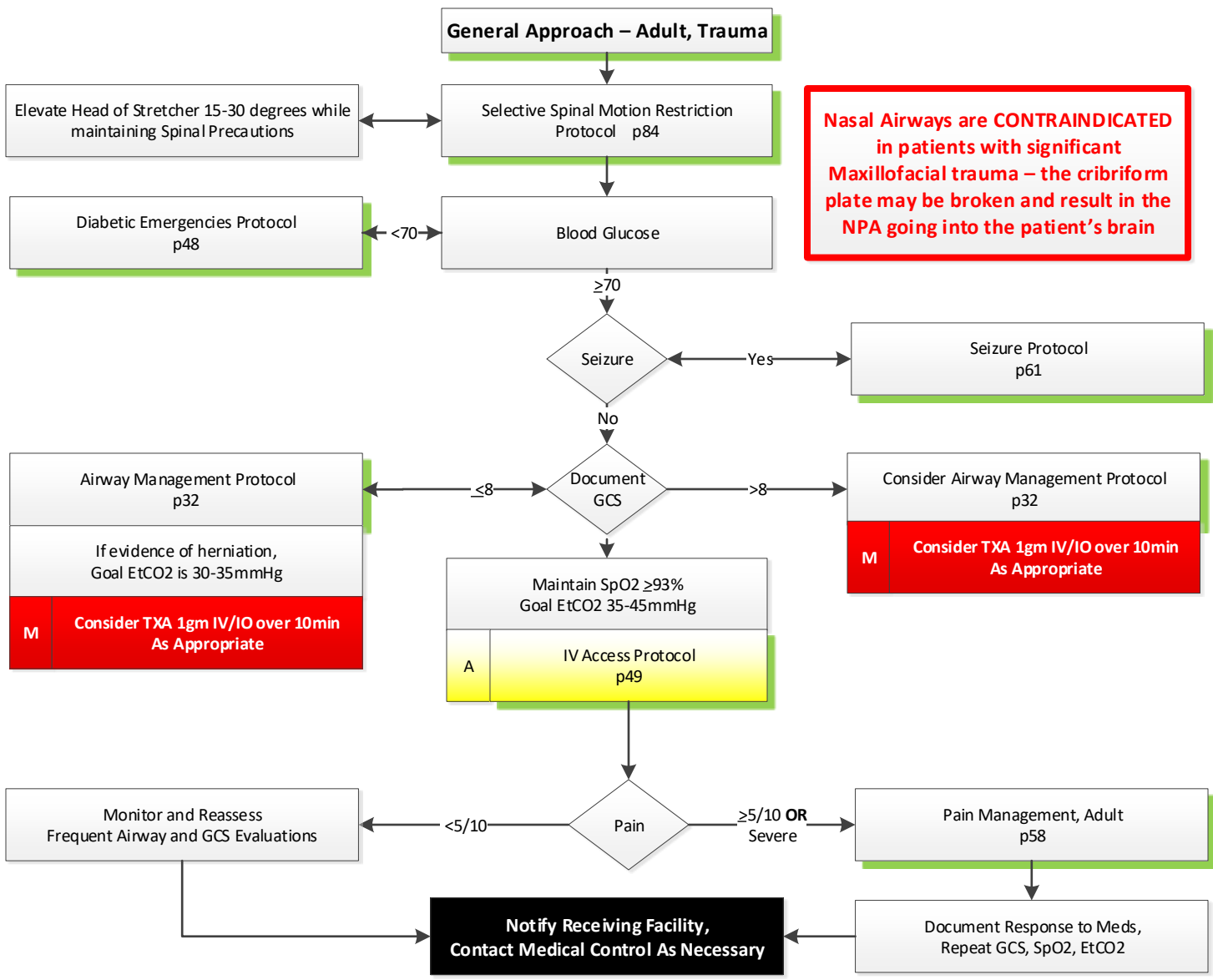
Trauma Protocols - Adult



EMR	
B	EMT
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M	Medical Control

Head Injury – Adult, Trauma

- | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Pertinent Positives and Negatives</p> <ul style="list-style-type: none"> Type of injury Mechanism (blunt vs. penetrating) Loss Of Consciousness Vomiting, Altered Mental Status | <ul style="list-style-type: none"> SAMPLE History OPQRST History Evidence of Intoxication Evidence of Multi-System Trauma | <p>Differential</p> <ul style="list-style-type: none"> Skull fracture Epidural hematoma Concussion, Contusion, Laceration, Hematoma Non-Accidental Trauma Spinal Cord Injury Subdural Hematoma Subarachnoid Hemorrhage |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



Nasal Airways are CONTRAINDICATED in patients with significant Maxillofacial trauma – the cribriform plate may be broken and result in the NPA going into the patient's brain

M Consider TXA 1gm IV/IO over 10min As Appropriate

M Consider TXA 1gm IV/IO over 10min As Appropriate

A IV Access Protocol p49

Pearls

- REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro**
- If GCS ≤ 13 consider Air transport or Rapid Transport
 - Airway interventions can be detrimental to patients with head injury by raising intracranial pressure, worsening hypoxia (and secondary brain injury) and increasing risk of aspiration. Whenever possible these patients should be managed in the least invasive manner to safely maintain O2 saturation >90% (ie. NRB, BVM with 100% O2)**
 - Acute herniation should be suspected when the following signs are present: acute unilateral dilated and non-reactive pupil, abrupt deterioration in mental status, abrupt onset of motor posturing, abrupt increase in blood pressure, abrupt decrease in heart rate.
 - Only in suspected acute herniation – increase ventilatory rate (rate 20/minute) and target EtCO2 30-35mmHg
 - Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushings response)
 - Hypotension usually indicates injury or shock unrelated to the head injury and should be treated aggressively
 - Most important vital sign to monitor and document is level of consciousness (GCS)
 - Concussions are periods of confusion or loss of consciousness (LOC) associated with trauma which may have resolved by the time EMS arrives. Any confusion or mental status abnormality which does not return to normal within 15 minutes or any documented loss of consciousness should be transported to an Emergency Department. Any questions or clarifications, contact Medical Control.



Trauma Protocols - Adult



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M Medical Control

Hemorrhage Control – Adult, Trauma

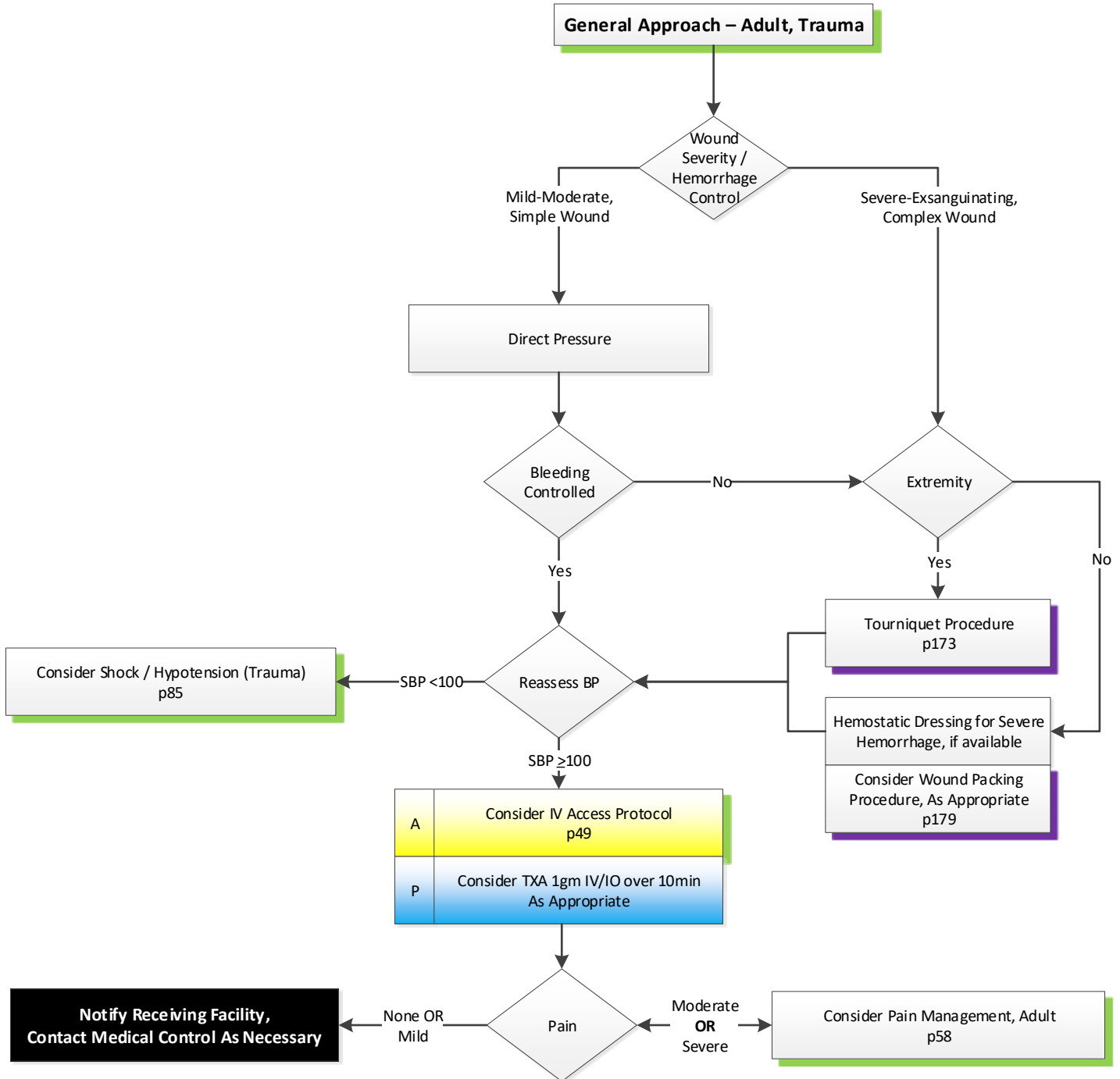
Pertinent Positives and Negatives

- Type of injury
- Mechanism (blunt vs. penetrating)
- Central and Peripheral Pulses
- Neuro Function Distal to Injury

- Time of Injury
- Deformity
- Diminished pulse / capillary refill

Differential

- Vascular Disruption
- Amputation
- Fracture, Dislocation
- Sprain, Strain
- Abrasion
- Contusion
- Laceration
- Compartment Syndrome



Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- Hypotension in trauma needs blood products early, so minimize scene time. Goal for scene time in major trauma cases should be <10 min.
- Multiple casualty incident or obvious life threatening hemorrhage, consider Tourniquet Procedure and/or Hemostatic Dressing FIRST.
- Hemostatic Dressings are appropriate for hemorrhage that can't be controlled with a tourniquet, such as junctional wounds in the groin or axilla.
- Remember - hemostatic agents are contraindicated in wounds that violate the thoracic or abdominal cavity; if unsure, use sterile roll gauze.
- Signs/Symptoms of Shock include: altered mental status, pallor, hypotension (SBP <100), cap refill >3 sec, faint/absent peripheral pulses.



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Lightning Strike – Adult, Trauma

Pertinent Positives and Negatives

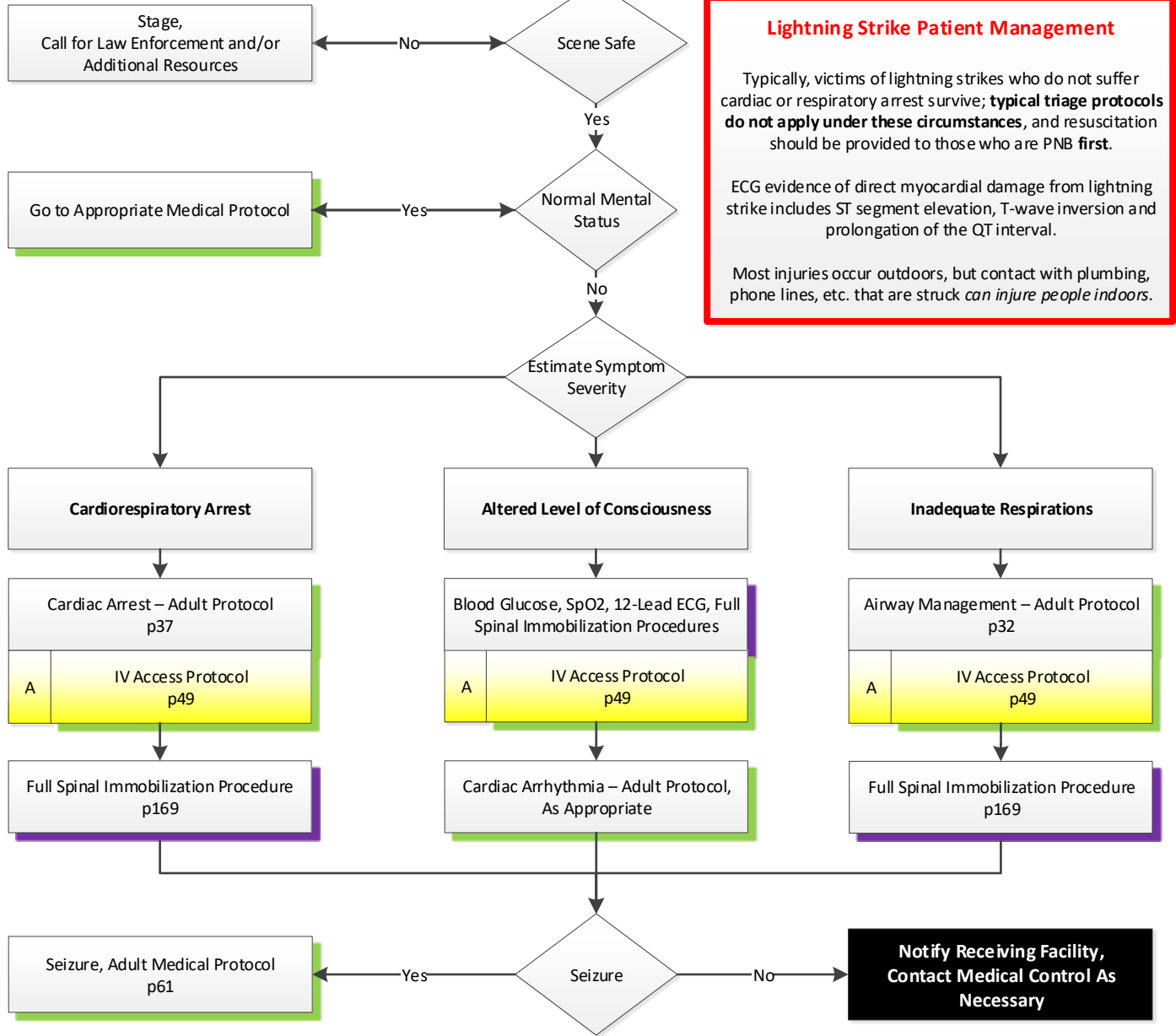
- Type of Strike (Direct, Splash, Contact)
- Central and Peripheral Pulses
- Nausea, Vomiting, Diarrhea
- Amnesia, Confusion, Neuro Deficits

- Duration of Unresponsiveness (if applicable)
- Time of Strike
- Wounds to Hands, Feet or Areas of Contact

Differential

- Thermal Injury
- Electrical Injury
- Blast Injury
- Acute Myocardial Infarction

General Approach – Adult, Trauma



Lightning Strike Patient Management

Typically, victims of lightning strikes who do not suffer cardiac or respiratory arrest survive; **typical triage protocols do not apply under these circumstances**, and resuscitation should be provided to those who are PNB first.

ECG evidence of direct myocardial damage from lightning strike includes ST segment elevation, T-wave inversion and prolongation of the QT interval.

Most injuries occur outdoors, but contact with plumbing, phone lines, etc. that are struck *can injure people indoors*.

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- National lightning safety guidelines state that risk continues for 30 minutes after the last lightning is seen or thunder heard.
- Lightning not striking twice is a **myth**; if there is continued risk to EMS providers, remove the patient to a safe place before treatment.
- *Full spinal immobilization should be performed* in any patient with altered level of consciousness, as spinal injuries are common from the concussive force of the strike and/or involuntary muscle spasms.
- There are reports of patients surviving prolonged periods of arrest after lightning strike. Treatment for cardiopulmonary arrest is per ACLS protocols, but *decision to terminate resuscitation should be made in coordination with Medical Control*.



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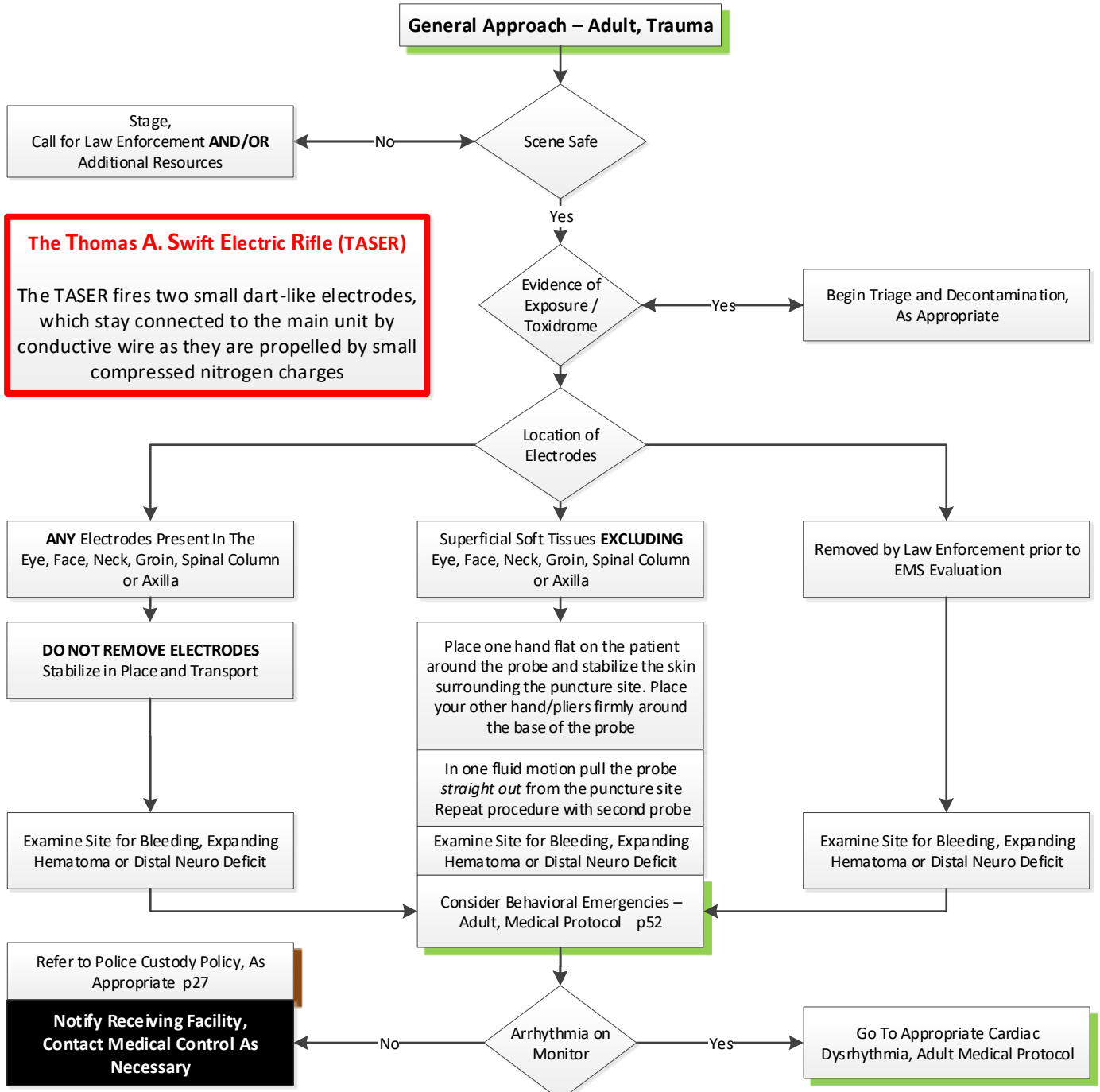


BACK

B	EMR
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Electronic Control Device (a.k.a. TASER) – Adult, Trauma

Pertinent Positives and Negatives <ul style="list-style-type: none"> Age, VS, SpO2, EtCO2, RR SAMPLE History OPQRST History Situational Crisis 	<ul style="list-style-type: none"> Psychiatric Illness / Medication History Medic Alert Bracelet, DM History Anxiety, Agitation or Confusion Suicidal / Homicidal Thoughts or History Evidence of Substance Use / Overdose 	Differential <ul style="list-style-type: none"> Illicit Drug Intoxication Drug/EtOH Withdrawal Primary Psychosis Hypoglycemia 	<ul style="list-style-type: none"> Hypoxia Head Injury Occult Trauma Cerebral Hypoperfusion Toxic Ingestion
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Pearls

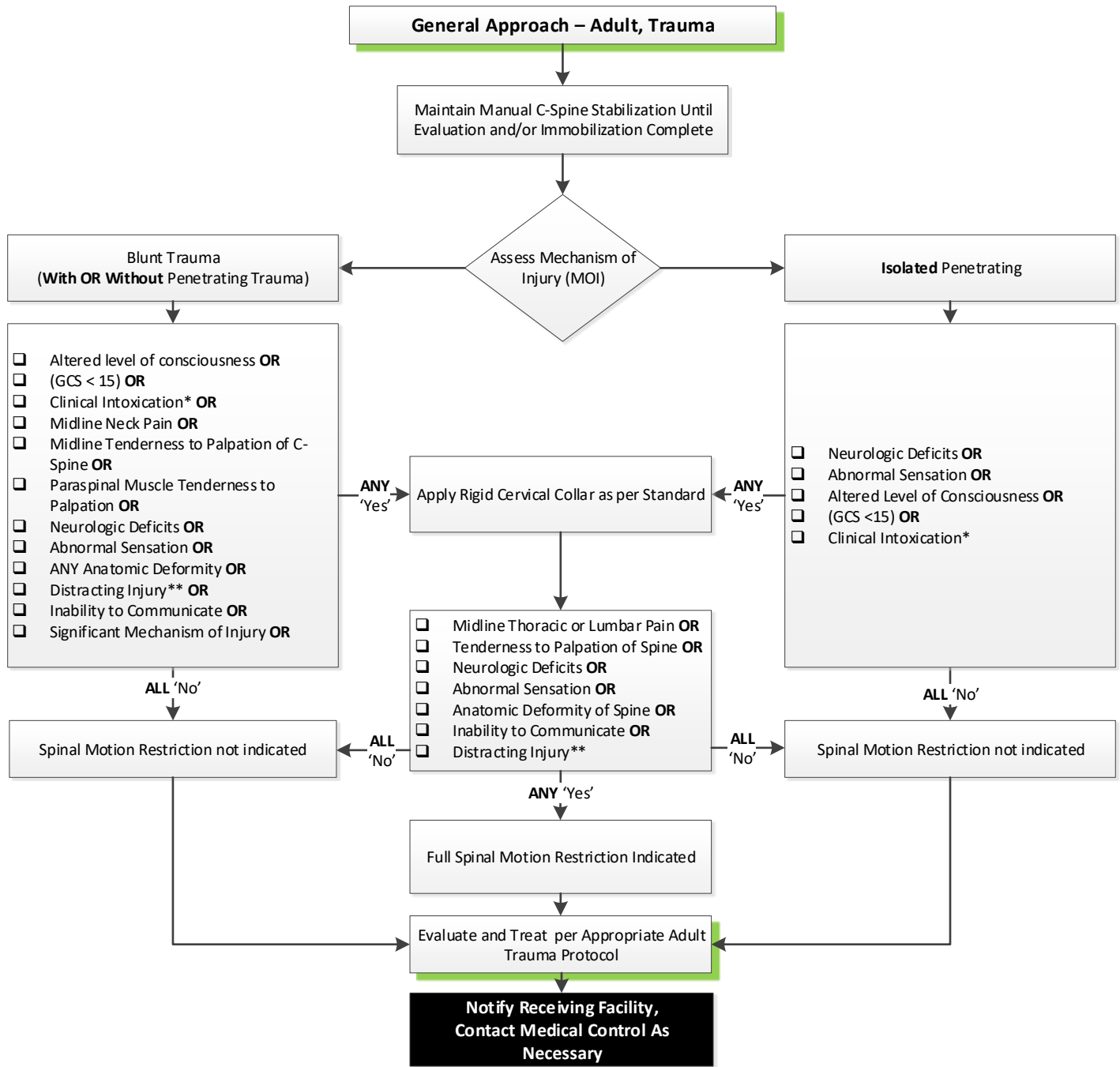
REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- Safety first – for Providers, Police and Patients. Never restrain any patients in the prone (face down) position.
- Document the site of electrode penetration as well as whether the barb was completely intact or broken on removal.
- Patients who require repeated deployments of the Electronic Control Device are at a significantly higher risk of cardiac dysrhythmias as well as in-custody death. Have a high index of suspicion and a low threshold to treat per the Behavioral Emergencies Protocol.
- Patients who are actively restrained by Law Enforcement require an officer be present in the ambulance patient compartment during transport. It is a patient safety issue as well as a medicolegal liability for the EMS Provider.



EMR	
B	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Selective Spinal Motion Restriction – Adult, Trauma



Pearls

REQUIRED EXAM: Motor Function both upper and lower extremities, Sensation of upper and lower extremities, subjective abnormal sensation, Tenderness to palpation of bony prominences OR paraspinal muscles

- ***Clinical Intoxication** – A transient condition resulting in disturbances in level of consciousness, cognition, perception, affect or behavior, or other psychophysiological functions and responses. Common examples include; ataxia, emotional instability, flight of ideas, tangential thought or motor incoordination.
- ****Distracting Injury** – Examples include, but are not limited to; long bone fracture, dislocations, large lacerations, deforming injuries, burns **OR any condition preventing patient cooperation with history.**
- **ALL** shallow water near drownings, diving injuries and high-voltage electrical injuries (lightning, $\geq 1000V$ AC or $\geq 1500V$ DC) **MUST** be fully immobilized
- If immobilization *indicated but refused*; advise the patient of risk of death, permanent disability or long term impairment. Clearly document the refusal and the conversation (re: risk); Apply a cervical collar, if allowed and transport in neutral alignment.
- Long spine boards have risks and benefits for patients. Spinal immobilization should always be applied when any doubt exists about the possibility of spinal trauma.
- It is always safer and better patient care to assume that a Cervical Spine injury has occurred and provide protection, and should be the standard of care in trauma patient management
- Long spine boards can be very useful for extricating patients, transferring locations, and providing a firm surface for chest compressions.
- Very thoughtful consideration should go into any decision to NOT use the rigid cervical collar OR long spine board.



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Hypotension / Shock (Trauma) – Adult, Trauma

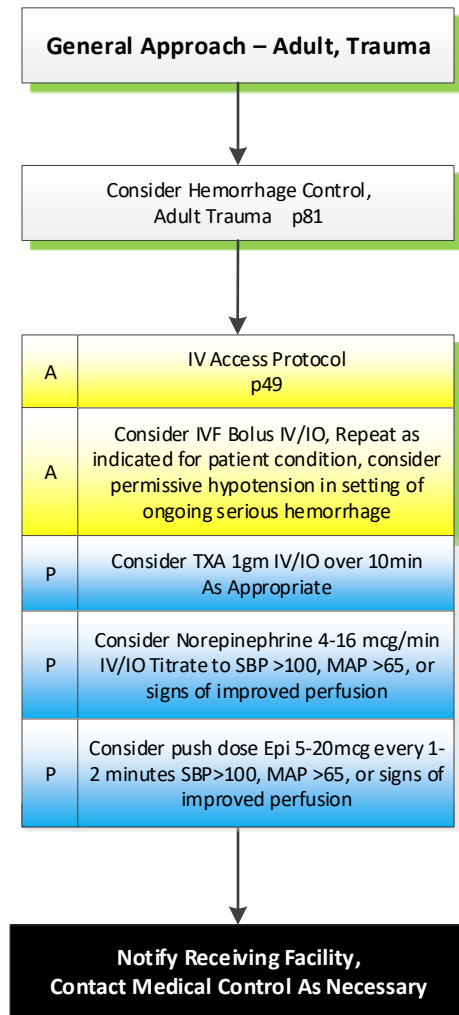
Pertinent Positives and Negatives

- Type of injury
- Mechanism (blunt vs. penetrating)
- Central and Peripheral Pulses
- Neuro Function Distal to Injury

- Time of Injury
- Deformity
- Diminished pulse / capillary refill

Differential

- Vascular Disruption
- Amputation
- Fracture, Dislocation
- Sprain, Strain
- Abrasion
- Contusion
- Laceration
- Compartment Syndrome



Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- **Hypotension in trauma needs blood products early**, so minimize scene time. Goal for scene time in major trauma cases should be <10 min.
- Remember the Triad of Death in Trauma – Hypotension, Hypothermia and Coagulopathy; IVF are important during resuscitation, but it is important to remember how fluids impact these three elements.
- Multiple casualty incident or obvious life threatening hemorrhage, consider Tourniquet Procedure and/or Hemostatic Dressing FIRST.
- Hemostatic Dressings are appropriate for hemorrhage that can't be controlled with a tourniquet, such as abdominal and pelvic wounds.
- Signs/Symptoms of Shock include: altered mental status, pallor, hypotension (SBP <100), cap refill >3 sec, faint/absent peripheral pulses.



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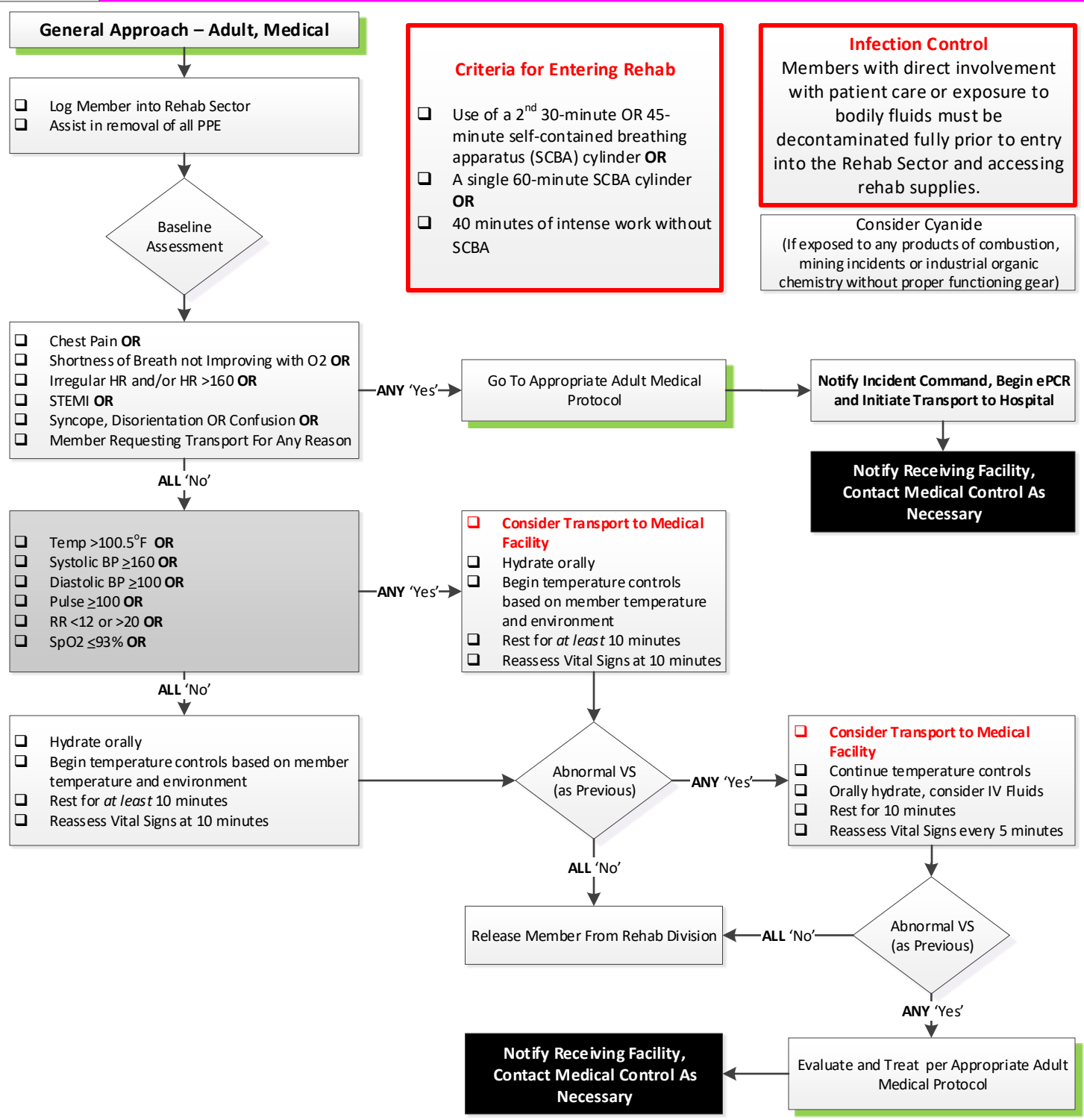
PHARMACEUTICALS



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M Medical Control

Public Safety Personnel Rehab – Special Operations



Pearls

REQUIRED EXAM: Mental Status, Skin Condition, Temperature, Heart Rate, Respiratory Rate, Blood Pressure, SpO2, SpCO

- This Protocol was named "Public Safety Rehab", and should be applied to any situation during which Firefighters, Law Enforcement Officers, Emergency Medical Services or ANY Emergency Response Personnel are exerting themselves for > 40 minutes.
 - This INCLUDES training operations, special events and non-emergency operations lasting longer than 40 minutes.
- Per NFPA 1584 Requirements, the Rehab Site should be set up in a location that provides shelter for the members, is far enough away from the active scene that the turnout gear, SCBA and protective equipment may be safely doffed, and provide protection from the environmental conditions.
 - Ideally, members should be shielded from view of the active scene, to reduce anxiety and to prevent members from trying to exit rehab inappropriately.
- The purpose of this Protocol is to protect the physical and mental condition of members operating at the scene of an emergency or a training exercise and to prevent decompensation of the individual. By keeping the individuals safe, it improves the safety and integrity of the team as well as the operation.
- At a minimum, turnout coat and nomex hood should be removed and turnout pants pushed down to the knees while seated in Rehab.



Trauma Protocols - Adult



EMR	
B	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Quick Reference – Peds (<12 y/o)

Normal Vital Signs In Children

Age	Heart Rate (Beats Per Minute)		Respiratory Rate (Breaths Per Minute)	Systolic Blood Pressure	Weight (kg)
	Awake Rate	Sleeping Rate			
Newborn	100-180	80-160	30-60	60-90	2-3
Infant (1-12mos)	100-170	75-160	30-60	87-105	4-10
Toddler (1-2yrs)	80-150	60-90	24-40	85-102	10-14
Preschool (3-5yrs)	70-130	60-90	20-34	89-108	14-18
School Age (6-12yrs)	65-120	60-90	15-30	94-120	20-42
Adolescent (13-17yrs)	55-90	50-90	12-20	107-132	>50

Modified Glasgow Coma Scale for Infants and Children

	Child	Score	Infant
Eye Opening	Spontaneous	4	Spontaneous
	To Speech	3	To Speech
	To Pain	2	To Pain
	None	1	None
Best Verbal Response	Oriented, Appropriate	5	Coos and Babbles
	Confused	4	Irritable, Cries
	Inappropriate Words	3	Cries in Response to Pain
	Incomprehensible Sounds	2	Moans in Response to Pain
	None	1	None
Best Motor Response	Obeys Commands	6	Moves Spontaneously and Purposely
	Localizes Painful Stimulus	5	Withdraws in Response to Touch
	Withdraws in Response to Pain	4	Withdraws in Response to Pain
	Flexion in Response to Pain	3	Abnormal Flexion Posture to Pain
	Extension in Response to Pain	2	Abnormal Extension Posture to Pain
	None	1	None

Wisconsin EMS Recommended Weight Conversion (2.2lbs = 1kg -OR- 1lb = 0.45kg)

Lbs.	Kgs.	Lbs.	Kgs.	Lbs.	Kgs.
5 lbs	2 kgs	20 lbs	9 kgs	35 lbs	16 kgs
6	3	21	10	36	16
7	3	22	10	37	17
8	4	23	10	38	17
9	4	24	11	39	18
10 lbs	5 kgs	25 lbs	11 kgs	40 lbs	18 kgs
11	5	26	12	41	19
12	5	27	12	42	19
13	6	28	13	43	20
14	6	29	13	44	20
15 lbs	7 kgs	30 lbs	14 kgs	45 lbs	20 kgs
16	7	31	14	46	21
17	8	32	15	47	21
18	8	33	15	48	22
19	9	34	15	49	22
www.chawisconsin.org				50 lbs	23 kgs

Equipment	GRAY 3-5kg	PINK Small Infant 6-7kg	RED Infant 6-9kg	PURPLE Toddler 10-11kg	YELLOW Small Child 12-14kg	WHITE Child 15-18kg	BLUE Child 19-23kg	ORANGE Large Child 24-29kg	GREEN Adult 30-36kg
Resuscitation Bag		Infant/Child	Infant/Child	Child	Child	Child	Child	Child	Adult
Oxygen Mask (NRB)		Pediatric	Pediatric	Pediatric	Pediatric	Pediatric	Pediatric	Pediatric	Pediatric/Adult
Oral Airway (mm)		50	50	60	60	60	70	80	80
Laryngoscope Blade (Size)		1 Straight	1 Straight	1 Straight	2 Straight	2 Straight	2 Straight OR Curved	2 Straight OR Curved	3 Straight OR Curved
Endotracheal Tube (mm)		3.5 Uncuffed 3.0 Cuffed	3.5 Uncuffed 3.0 Cuffed	4.0 Uncuffed 3.5 Cuffed	4.5 Uncuffed 4.0 Cuffed	5.0 Uncuffed 4.5 Cuffed	5.5 Uncuffed 5.0 Cuffed	6.0 Cuffed	6.5 Cuffed
King Airway	Size 0 (Clear)	Size 1 (White)	Size 1 (White)	Size 1 (White)	Size 2 (Green)	Size 2 (Green)	Size 2.5 (Orange)	Size 3 (Yellow)	Size 3 (Yellow)
LMA	NA	#1	#1	#1.5	#2	#2.5	#3	#3.5	#4
Suction Catheter (French)		8	8	10	10	10	10	10	10-12
BP Cuff	Neonatal #5/ Infant	Infant/Child	Infant/Child	Child	Child	Child	Child	Child	Small Adult
IV Catheter (ga)		22-24	22-24	20-24	18-22	18-22	18-20	18-20	16-20
IO (ga)		18/15	18/15	15	15	15	15	15	15
NG Tube (French)		5-8	5-8	8-10	10	10	12-14	14-18	16-18



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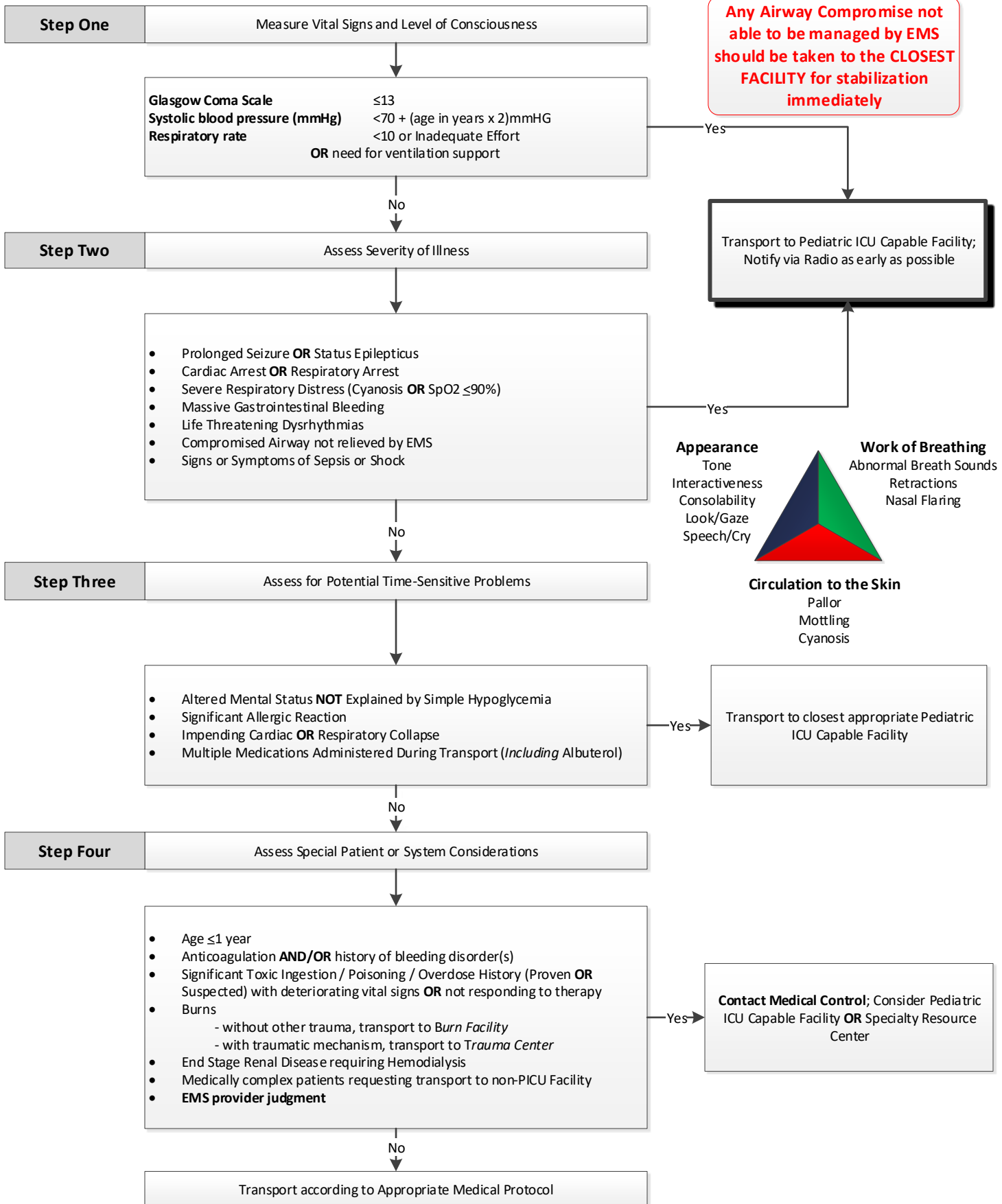
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Destination Determination



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M	Medical Control

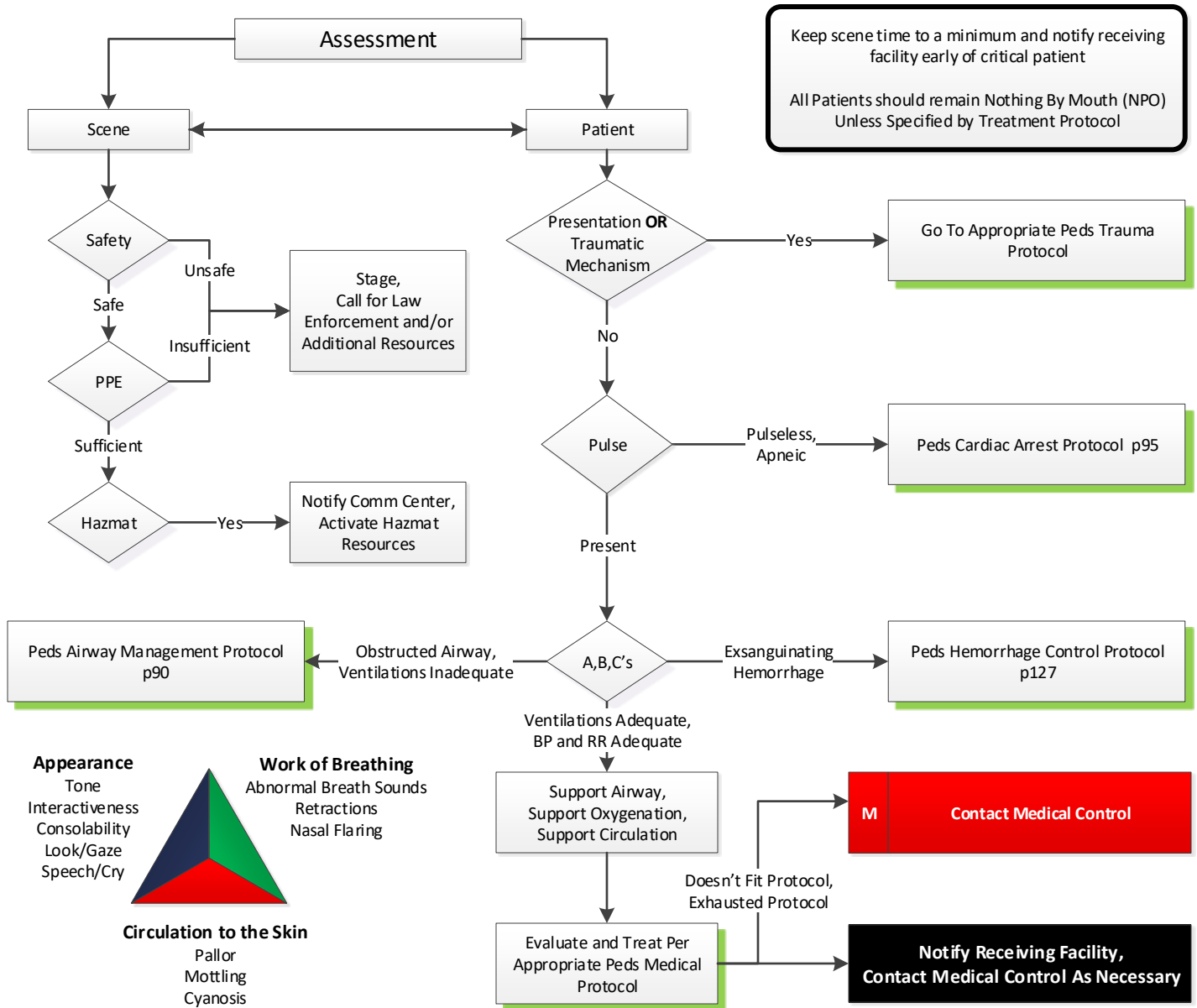
General Approach – Peds, Medical

Pertinent Positives and Negatives

- Age, VS, BP, RR, SpO2
- SAMPLE history
- OPQRST history
- Source of blood loss, if any (GI, vaginal, AAA, ectopic)
- Source of fluid loss, if any (vomiting, diarrhea, fever)
- Pregnancy history
- Mental Status
- Pale, Cool Skin
- Delayed Cap Refill
- Coffee Ground Emesis
- Tarry Stools
- Allergen Exposure

Differential

- Cardiac Dysrhythmia
- Hypoglycemia
- Ectopic Pregnancy
- AAA
- Sepsis
- Occult Trauma
- Adrenal Insufficiency



Pearls

REQUIRED EXAM: VS, GCS, Nature of Complaint

- Continuous Cardiac Monitor should be applied early for *any* non-traumatic pain complaint between the ear lobes and the umbilicus (belly button). Consider 12-Lead if concerning findings on Cardiac Monitor.
- Include Blood Glucose reading for *any* patient with **weakness, altered mental status, seizure, loss of consciousness or known history of diabetes**.
- Measure and document SpO2, EtCO2 for ANY patient with complaint of weakness, altered mental status, respiratory distress, respiratory failure or EMS managed airway.
- If hypotensive (Systolic BP < Reference Page Value) and/or clinical evidence of dehydration, consider Peds IV Access Protocol and Shock (Non-Trauma) Peds Medical Protocol.
- Any patient contact which does not result in an EMS transport must have an appropriately executed and completed refusal form.
- Never hesitate to consult Medical Control for assistance with patient refusals that can't meet all required fields, clarification of protocols or for patients that make you uncomfortable.



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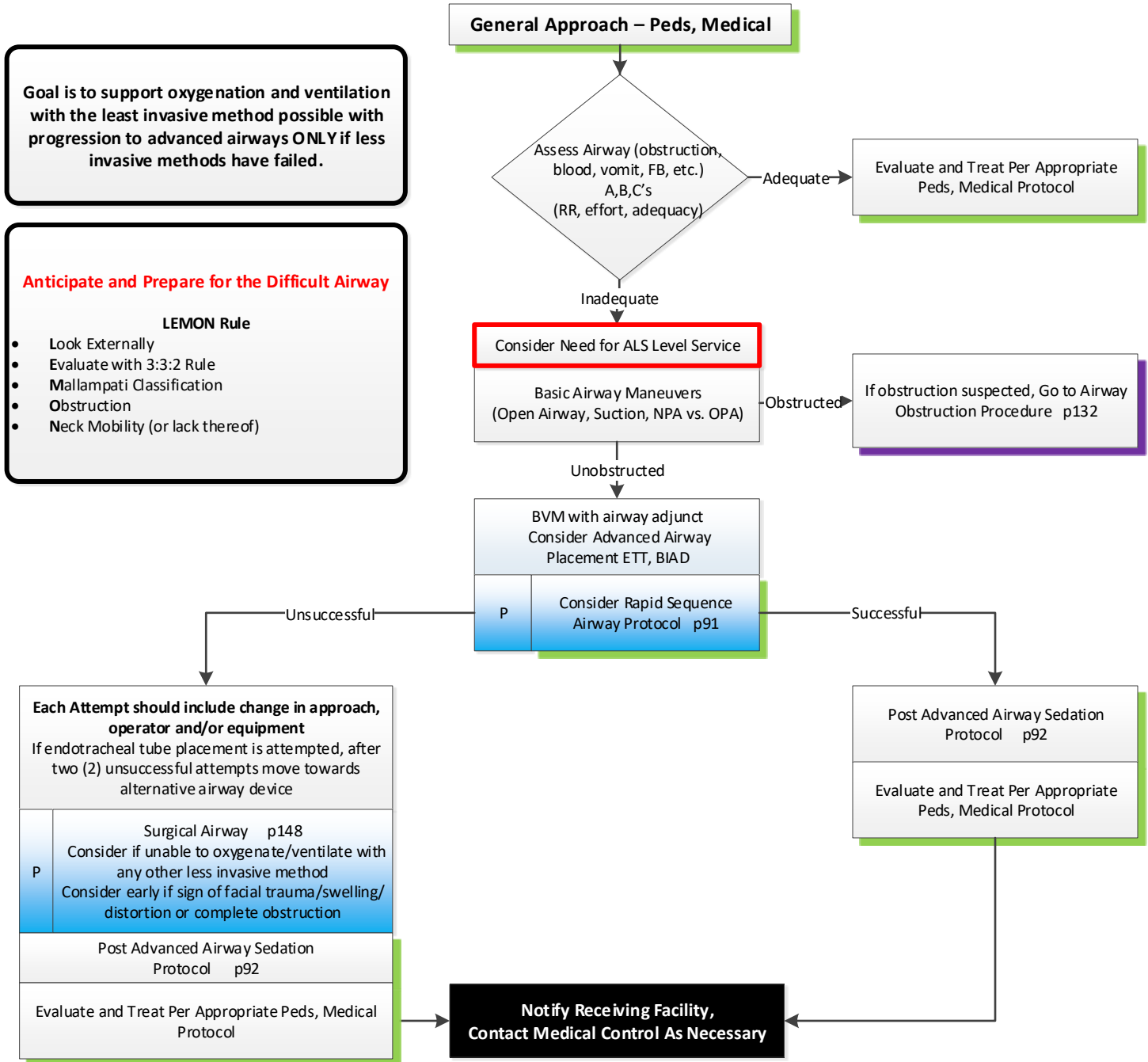
PHARMACEUTICALS



BACK

B	EMR
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Airway Management - Peds



Pearls

REQUIRED EXAM: VS, GCS, Head, Neck, Blood Glucose

- If BIAD in place and adequately ventilating/oxygenating - Do Not Remove.
- Digital capnography is the standard of care and is to be used with all methods of advanced airway management and endotracheal intubation. If a service uses color change capnometry only and an Invasive Airway Device is placed, an intercept with a digital capnography capable service **MUST** be completed.
- Goal EtCO₂ = 35-45mmHg.
- If Airway Management is adequately maintained with a Bag-Valve Mask and waveform SpO₂ >93%, it is acceptable to defer advanced airway placement in favor of basic maneuvers and rapid transport to the hospital.
- *Always* assume that patient reports of dyspnea and shortness of breath are physiologic, not psychogenic.
- Gastric decompression with Oral Gastric Tube should be considered on all patients with advanced airways, if time and situation allow.
- Once secured, every effort should be made to keep the endotracheal tube in the airway; commercially available tube holders and C-collars are good adjuncts.
- For all protocols, an **Advanced Airway Attempt** is defined as: passing the tip of the laryngoscope blade or Blindly Inserted Airway Device (BIAD) tube past the teeth.



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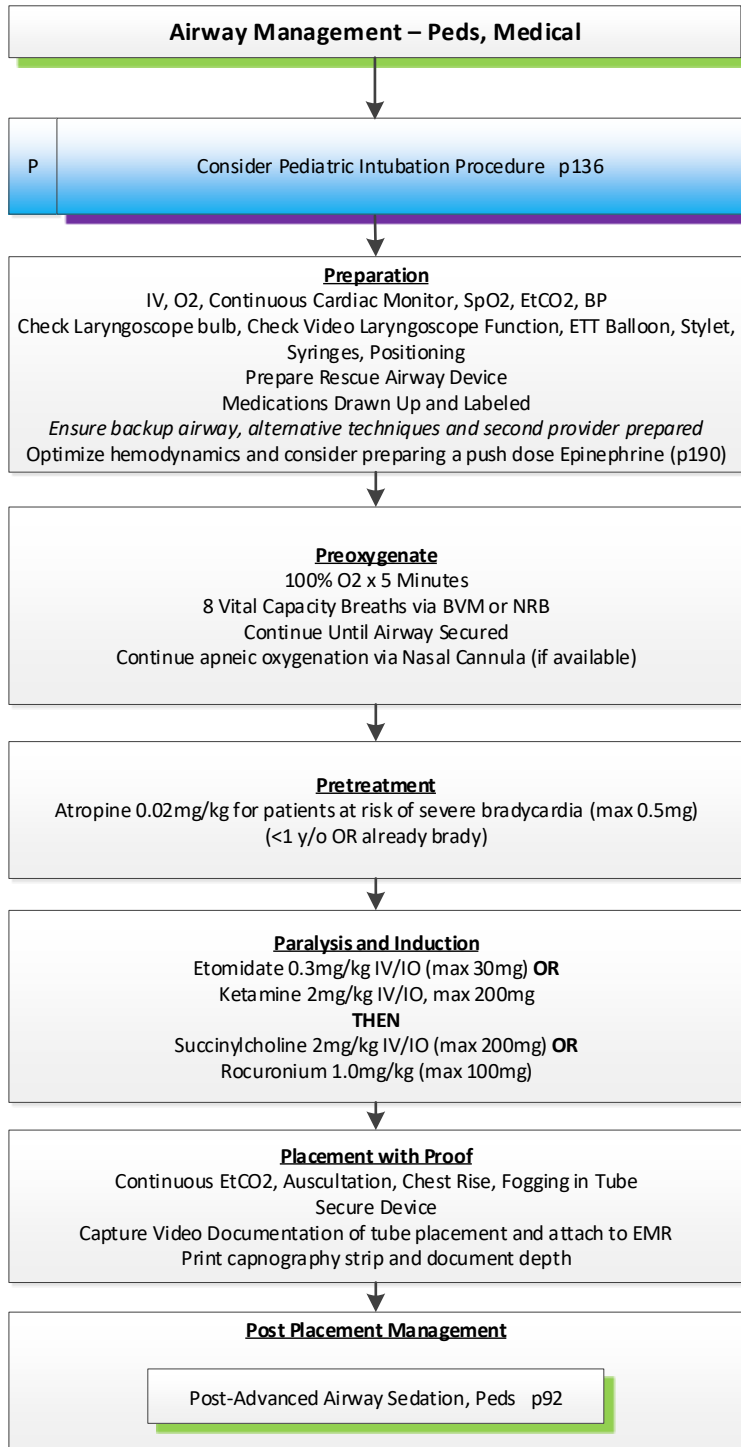
PHARMACEUTICALS



BACK

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P	Paramedic
M	Medical Control

Rapid Sequence Airway - Peds



Goal is to support oxygenation and ventilation with the least invasive method possible with progression to advanced airways ONLY if less invasive methods have failed.

Indications for Rapid Sequence Airway Management

Determining whether RSA is indicated for a patient is multifactorial, requires experienced clinical judgement, and a robust training/QA support system. These indications to consider RSA are meant to serve as guidelines and RSA should not be considered if unable to ventilate with BVM unless all other options have been exhausted.

- **Failure to oxygenate**
- **Failure to ventilate**
- **Failure of airway protection**

Each Attempt should include change in a approach, operator and/or equipment

If endotracheal tube placement is attempted, after two (2) unsuccessful attempts move towards alternative airway device

Pearls

REQUIRED EXAM: VS, GCS, Head, Neck, Blood Glucose, Lung Exam, Posterior Pharynx

- Digital capnography is the standard of care and is to be used with all methods of advanced airway management and endotracheal intubation. If a service uses color change capnometry only and an Invasive Airway Device is placed, an intercept with a digital capnography capable service **MUST** be completed.
- **If Airway Management is adequately maintained with a Bag-Valve Mask or supraglottic airway and waveform SpO2 >93%, it is acceptable to defer advanced airway placement in favor of basic maneuvers and rapid transport to the hospital;** Endotracheal Tube placement is a complicated skill that is not without potential consequence.
- Gastric decompression with Oral Gastric Tube should be considered on all patients with advanced airways, if time and situation allows.
- Once secured, every effort should be made to keep the endotracheal tube in the airway; commercially available tube holders and C-collars are good adjuncts.
- For all protocols, **an Advanced Airway Attempt is defined as:** passing the tip of the laryngoscope blade or Blindly Inserted Airway Device (BIAD) tube past the teeth.



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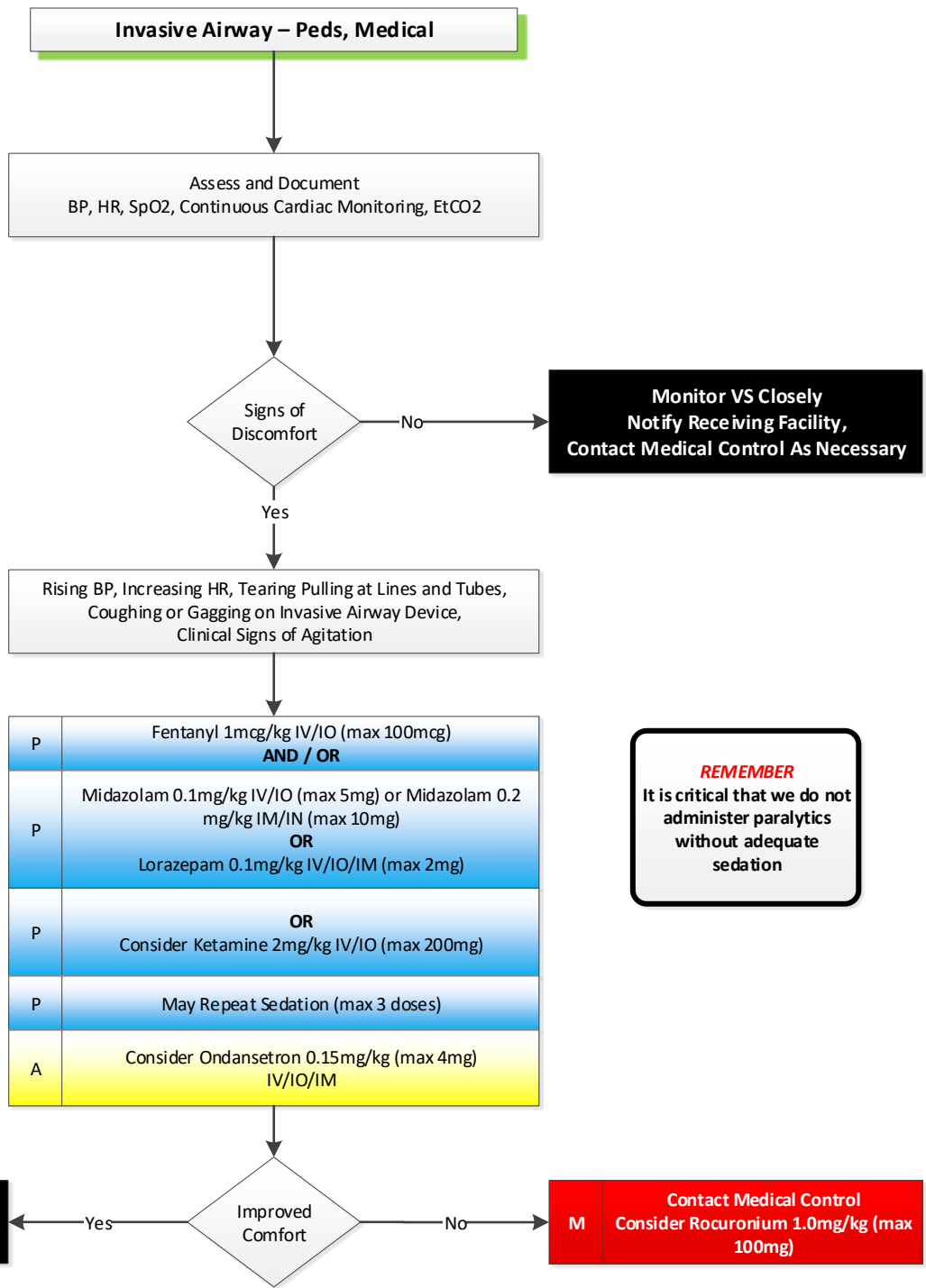
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Post Airway Sedation - Peds



Pearls

REQUIRED EXAM: VS, GCS, Nature of Complaint

- Paralytics block movement of skeletal muscle but do **NOT** change awareness. Remember that without sedation, patients may be **awake** but **paralyzed**.
- Monitor Vital Signs closely when managing airways and sedation. Changes that indicate pain, anxiety **as well as tube dislodgment** may be subtle (at first)!!
- Document Vital Signs before and after administration of every medication to prove effectiveness.
- **ANY** change in patient condition, reassess from the beginning. Use the mnemonic **DOPE** (Dislodgment, Obstruction, Pneumothorax, Equipment) to troubleshoot problems with the ET Tube.
- Ketamine may be considered for sedation AFTER standard regimen exhausted AND if Ketamine **NOT** used as induction agent for intubation.
- Continuous End Tidal CO₂ is mandatory for all intubated patients – color change is not sufficient proof of ET Tube in the trachea.



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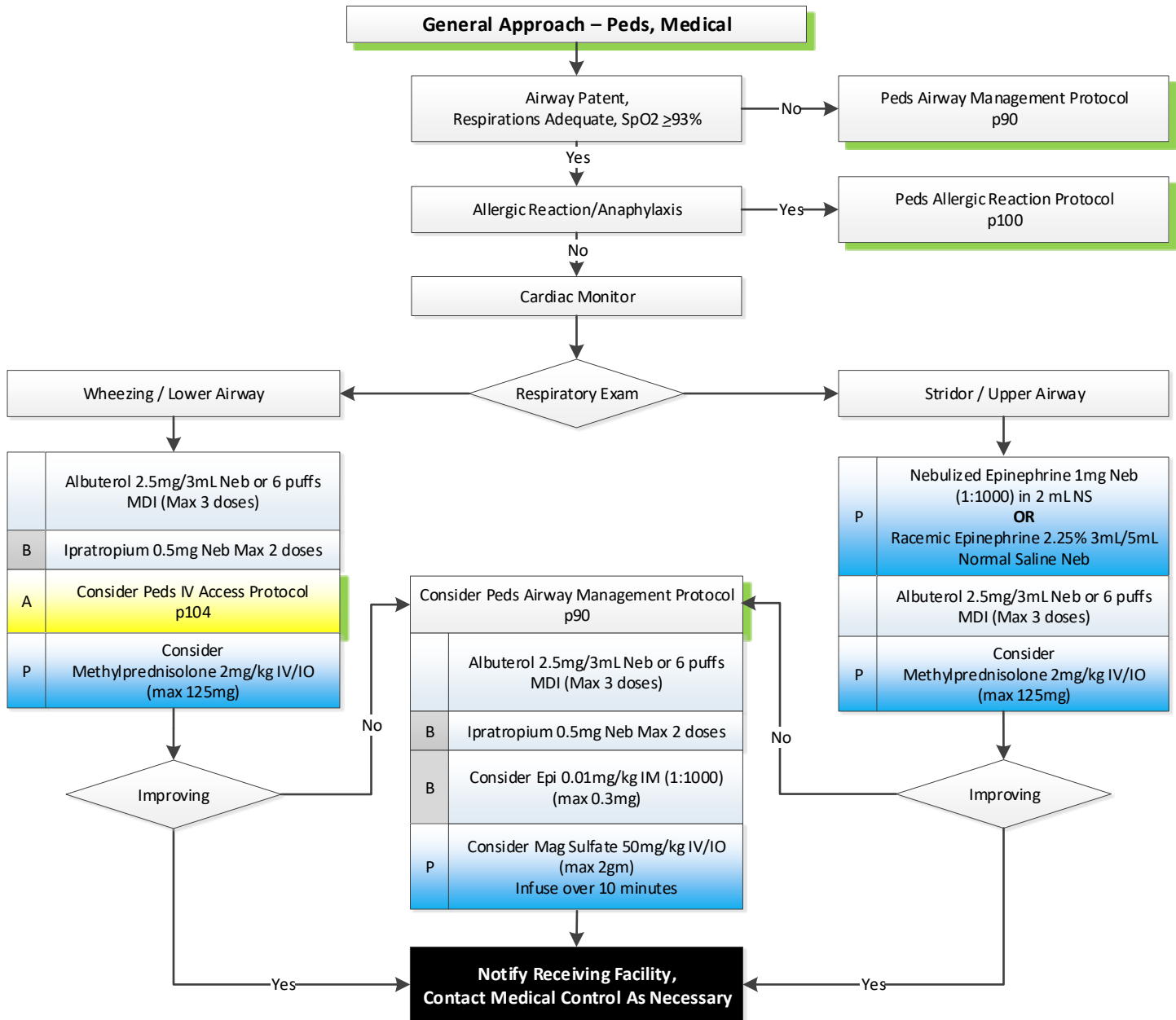
Wheezing / Asthma - Peds

Pertinent Positives/Negatives:

- Age, VS, SpO2, EtCO2
- SAMPLE history
- OPQRST history
- Asthma, COPD, CHF history
- Home meds used prior to call (Neb, Steroids, Theophylline)
- Wheezing, Rhonchi
- Accessory Muscle Use
- Decreased Ability to Speak
- History of CPAP/Intubation/ICU Admission from previous flares
- Smoke Exposure, Inhaled Toxins

Differential

- Simple Pneumothorax
- Tension Pneumothorax
- Pericardial Tamponade
- STEMI, CHF
- Inhaled Toxins (CO, CN, etc.)
- Anaphylaxis
- Asthma/COPD



Pearls

REQUIRED EXAM: VS, 12 Lead, GCS, RR, Lung Sounds, Accessory muscle use, nasal flaring

- Do not delay inhaled meds to get an extended history. Assessments and interviews may be carried out simultaneously with breathing treatments.
- Supplemental O2 should be administered for all cases of hypoxia, tachypnea, and subjective air hunger.
- Magnesium Sulfate is contraindicated if there is a history of renal failure.
- Keep patient in position of comfort if partial obstruction.
- EpiPen Jr. is 0.15mg and is indicated for patients <60lbs. The adult EpiPen is 0.30mg and is indicated for patients ≥60lbs.
- Severe Asthma attacks may have such severe obstruction that they do NOT wheeze. Cases of "Silent Chest" need aggressive management with inhaled and IV medications. This is an ominous sign of impending respiratory failure.
- * **Albuterol** max 3 doses total, **Ipratropium** max 2 doses total. If pt. requires repeat dosing of either medication, contact Med Control **AND/OR** Activate ALS.



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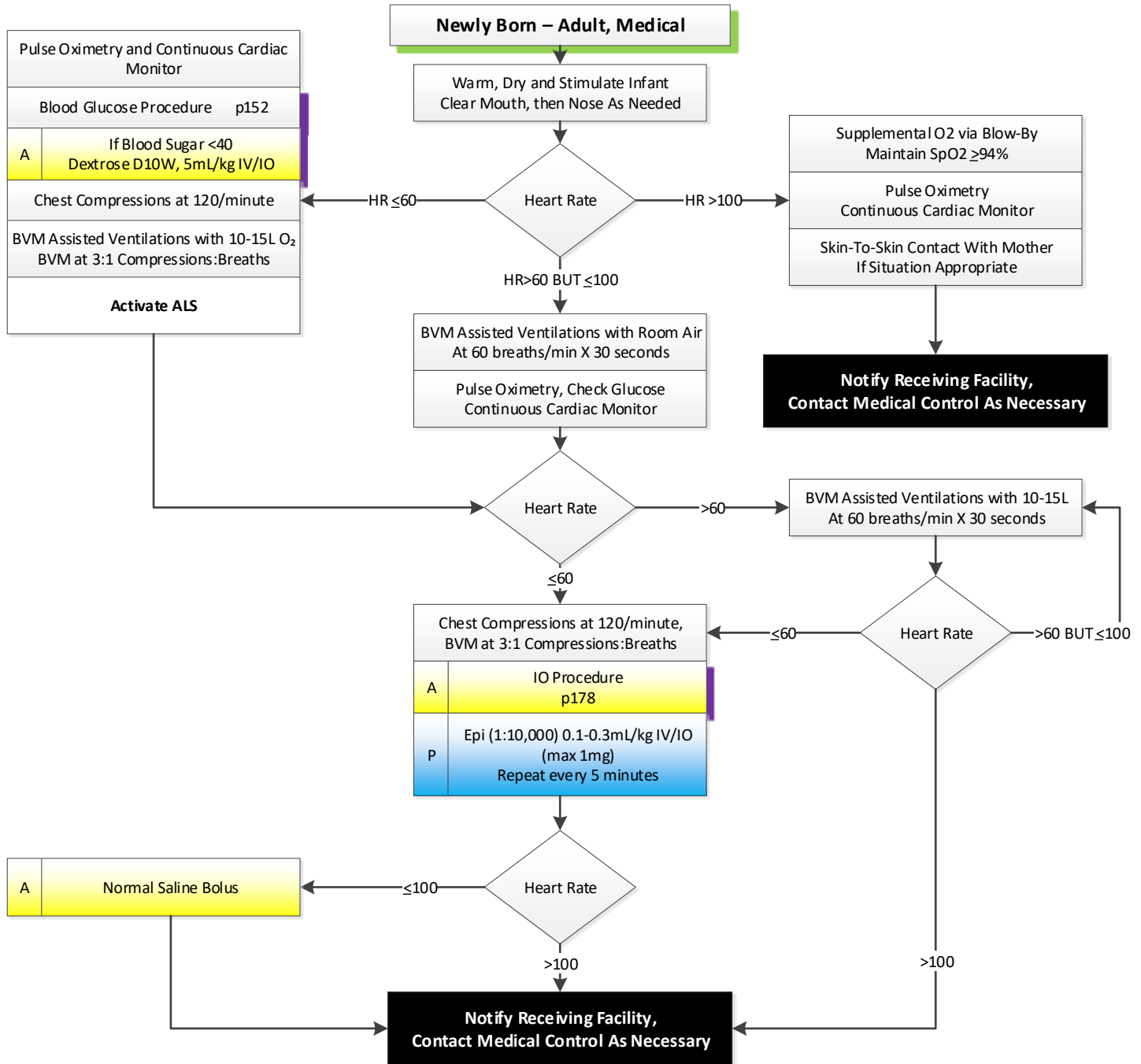
Newly Born Resuscitation - Peds

Pertinent Positives and Negatives

- Time of Delivery, Estimated Weight or Broselow
- Events Surrounding Arrest
- Estimated Time of Arrest
- Past Medical History (if known)
- Medications
- Concern for Foreign Body Aspiration
- Body Temperature
- History of Congenital Heart Defect

Differential

- Hypoxemia, Hypovolemia, Hypotension, Acidosis
- Toxins, Tension Pneumo, Pericardial Tamponade
- Hypoglycemia, Trauma
- Respiratory Failure
- Foreign Body, Infectious, Epiglottitis



Pearls

REQUIRED EXAM: VS, GCS, Skin, Cardiovascular, Pulmonary

- Call early for ALS Intercept on neonates who are critically ill, and involve Medical Control so arrangements can be made at the receiving facility.
- Transport rapidly to an OB Receiving Facility.
- Consider hypoglycemia as etiology of neonatal arrest/peri-arrest situation. If not able to evaluate blood sugar, treat presumptively x 1.
- The increased concentration of fetal hemoglobin (HbF) and its increased affinity for oxygen is a factor to consider in establishing target SpO2 values in the neonate. HbF will shift the oxygen dissociation curve to the left due to its high affinity for oxygen, which may result in high oxygen saturation (eg, 85 percent) at PaO2 levels below 40 mmHg.
- Per AHA Naloxone is not recommended in initial resuscitation of newborns.



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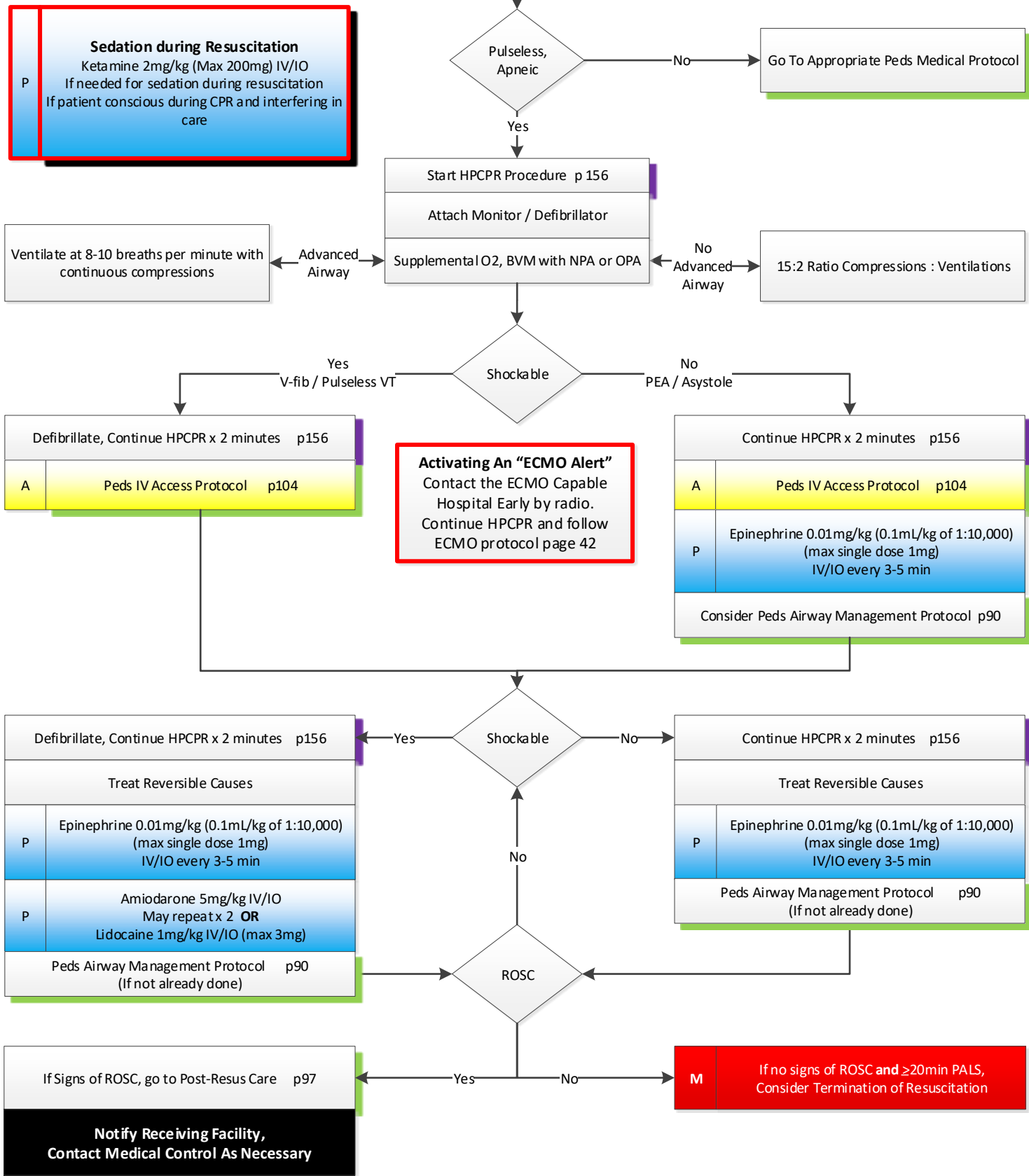


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Cardiac Arrest, General - Peds

General Approach – Peds, Medical



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Cardiac Arrest, General - Peds

Pertinent Positives and Negatives

- Age (if known), Estimated Weight or Broselow
- Events Surrounding Arrest
- Estimated Time of Arrest
- Past Medical History (if known)

- Medications
- Concern for Foreign Body Aspiration
- Body Temperature
- History of Congenital Heart Defect

Differential

- Hypoxemia, Hypovolemia, Hypotension, Acidosis
- Toxins, Tension Pneumo, Pericardial Tamponade
- Hypoglycemia, Trauma
- Respiratory Failure
- Foreign Body, Infectious, Epiglottitis

CPR Quality

- Push hard (>1/3 of anterior-posterior diameter of chest) and fast (at least 100/min) and allow for complete chest recoil
- Minimize interruptions in compressions
 - Count out loud or use metronome
- Avoid excessive ventilations
 - One breath every 6 seconds
- Rotate compressors every 2 minutes
- If no advanced airway, 15:2 compressions:ventilations ratio.
- If advanced airway, give 10 breaths per minute with continuous chest compression**

Shock Energy for Defibrillation

- First Shock 2 J/kg
- Second Shock 4 J/kg
- Subsequent Shocks >4 J/kg
- Maximum 10 J/kg or adult dose

Reversible Causes

- Hypovolemia
- Hypoxia
- Hydrogen Ion (acidosis)
- Hypoglycemia
- Hypo- / Hyperkalemia
- Hypothermia
- Tension Pneumothorax
- Tamponade, Cardiac
- Toxins
- Thrombosis, Pulmonary
- Thrombosis, Coronary
- Trauma

Refractory/Recurrent Vfib (Shockable Rhythm)

Consider changing position of pads, reduce impedance, double sequential (see below), ECMO (>13 years of age), transport

CONSIDER CORRECTABLE CAUSES:

- Hypoxia** – Secure airway and ventilate
- Hypothermia** – Active Rewarming
- Hydrogen Ion (acidosis)** – secure airway and ventilate
- Toxins:**

Narcotic OD – Naloxone 2mg IV/IO/IN/IM

A	Hypoglycemia – 0.5 – 1mg/kg (5-10mL/kg of D10W) Hypovolemia – NS Bolus IV/IO
P	Amiodarone IV/IO Dose 5mg/kg bolus in VF/pulseless V-Tach, max 300mg May repeat up to 2 times if refractory VF/Pulseless VT Atropine IM/IV/IO Dose 0.02 mg/kg IM/IV/IO, minimum dose 0.1mg; max 1mg Epinephrine IV/IO Dose: 0.01mg/kg (0.1mL/kg of 1:10,000 concentration), max 1mg. Repeat every 3-5 minutes. Lidocaine IV/IO Dose 1mg/kg, max 3mg/kg Hyperkalemia – Sodium Bicarbonate 1mEq/kg, max 50m IV/IO AND - Calcium Chloride 100mg/kg, max 1gm IV/IO Tension Pneumothorax – Chest Decompression Procedure

Advanced Airway

- If no advanced airway is in place, ventilate with 1 breath every 3-5 seconds (12-20 breaths per minute)*
- When bag-mask ventilation is unsuccessful... the LMA is acceptable when used by experienced providers to provide a patent airway and support ventilation.
- Waveform capnography to confirm and monitor airway placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths per minute)**

Return of Spontaneous Circulation (ROSC)

- Glucose, Pulse and Blood Pressure check and documentation
- Spontaneous arterial pressure waves in the intra-arterial monitoring

Pearls

RECOMMENDED EXAM: Mental Status

- IO is the preferred access for all Pediatric Cardiac Arrest patients.
- In order to successfully resuscitate a Pediatric patient, a cause of arrest must be identified and corrected.
- Airway is the most important intervention. This should be addressed immediately. Survival is often dependent on successful airway management.
- Airway management with BVM is often sufficient in the Pediatric patient.
- If evidence of tension pneumothorax - unilateral decreased or absent breath sounds, tracheal deviation, JVD, tachycardia, hypotension – consider needle thoracostomy. Chest decompression may be attempted at the 2nd intercostal space, mid clavicular line.
- For Neonatal Resuscitation, refer to Neonatal Resuscitation, p. 109.
- *<https://eccguidelines.heart.org/wp-content/themes/eccguidelines/pdf/master/pdffiles/part-11-pediatric-basic-life-support-and-cardiopulmonary-resuscitation-quality.pdf>.
- **<https://eccguidelines.heart.org/wp-content/uploads/2015/10/PALS-Cardiac-Arrest-Algorithm.png>.
- Consider Ketamine if needed for sedation during resuscitation if patient consciousness during CPR is interfering in care.



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Post Resuscitation Care - Peds

Pertinent Positives and Negatives

- Age (if known), Estimated Weight or Broselow
- Events Surrounding Arrest
- Estimated Time of Arrest
- Past Medical History (if known)

- Medications
- Concern for Foreign Body Aspiration
- Body Temperature
- History of Congenital Heart Defect

Differential

- Hypoxemia, Hypovolemia, Hypotension, Acidosis
- Toxins, Tension Pneumo, Pericardial Tamponade
- Hypoglycemia, Trauma
- Respiratory Failure
- Foreign Body, Infectious, Epiglottitis

Cardiac Arrest – Peds, Medical

Yes

Airway Management, Peds Protocol
(if not already done) p90

Optimize Ventilation and Oxygenation
SpO2 >93%
EtCO2 goal 35-45mmHg

12-Lead ECG Procedure p129
Regardless if completed prior to arrest

A Peds IV Access Protocol
(if not already done) p104

Monitor for Hypotension, Dysrhythmias, or Airway
Compromise

Consider Peds Shock / Hypotension
(Non-Trauma) Protocol p110

Consider Peds Bradycardia Protocol p99

Consider Peds Tachycardia Protocol p98

Consider Post Advanced Airway
Sedation, Peds Protocol p92

Perform and Document Complete Neurologic Exam

P If suspected imminent arrest,
Consider push dose Epi 1mcg/kg
(max 20mcg) p190*
every 1-2 minutes SBP>100, MAP >65,
or signs of improved perfusion

Appropriate Peds Protocol

Notify Receiving Facility,
Contact Medical Control As Necessary

Pearls

RECOMMENDED EXAM: Mental Status

- *if <40kg use saline bag procedure
- Monitor and treat for agitation and seizures.
- Monitor and treat hypoglycemia.
- If evidence of tension pneumothorax - unilateral decreased or absent breath sounds, tracheal deviation, JVD, tachycardia, hypotension – consider needle thoracostomy. Chest decompression may be attempted at the 2nd intercostal space, mid clavicular line.
- Hyperventilation is a significant cause of hypotension / recurrent cardiac arrest in post resuscitation phase; **avoid at all costs.**



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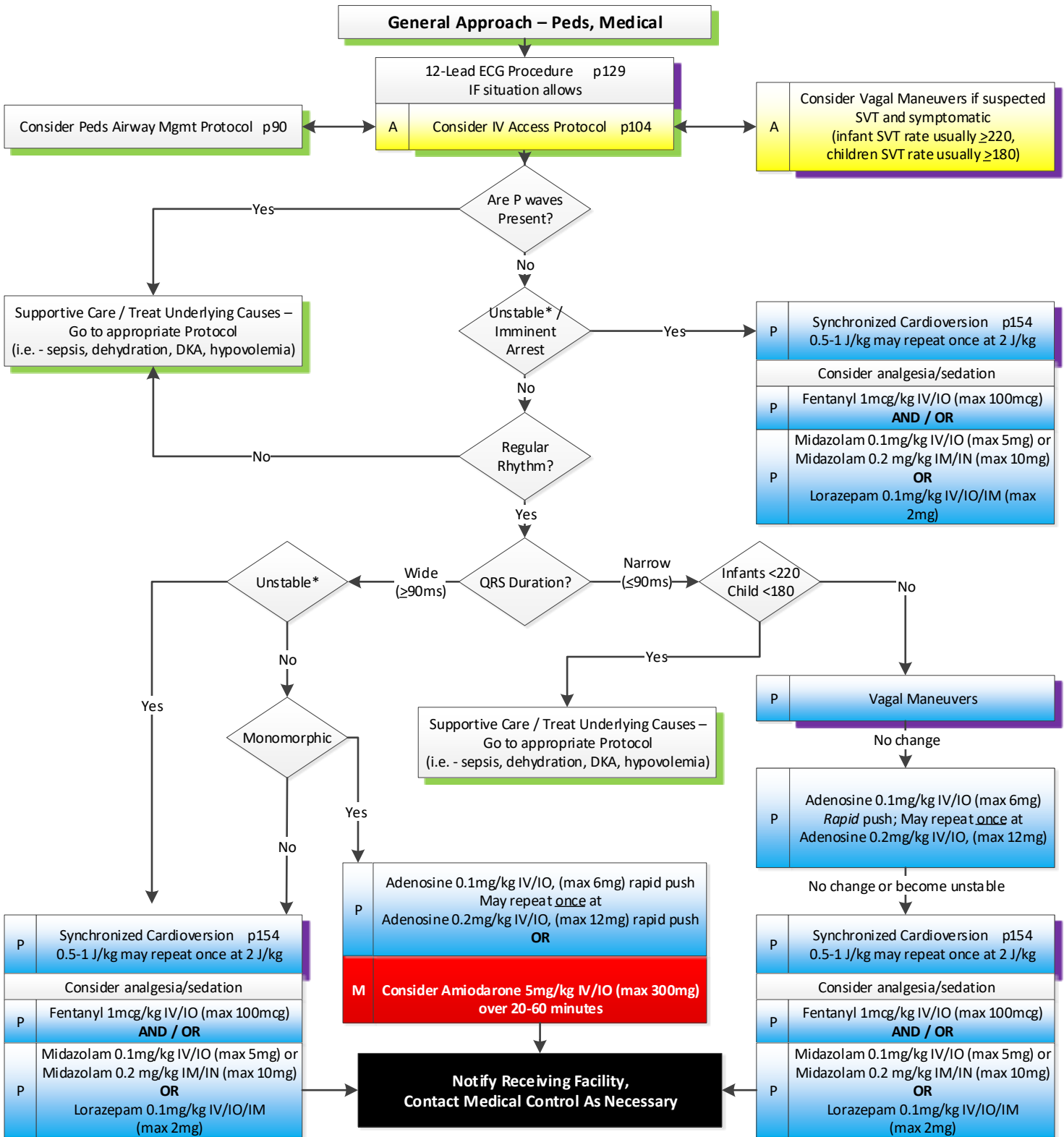
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Tachycardia With A Pulse - Peds



Pearls

RECOMMENDED EXAM: Mental Status

- Probable Sinus tachycardia – P-waves present before every QRS, constant P-R interval. Infants usually <220/min, Children usually <180/min.
- Probable SVT – history vague, nonspecific with abrupt rate change, P-waves absent / abnormal, HR *not* variable. Infants usually >220/min, Children >180/min.
- Don't delay treatment to get 12-lead ECG if patient is unstable.
- Alternative vagal maneuvers include carotid massage, hold breath in young children, bag valve mask ventilation, cold water or ice to face for 10-15 sec, bring knees to chest and hold, hold infant upside down



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Bradycardia With A Pulse - Peds

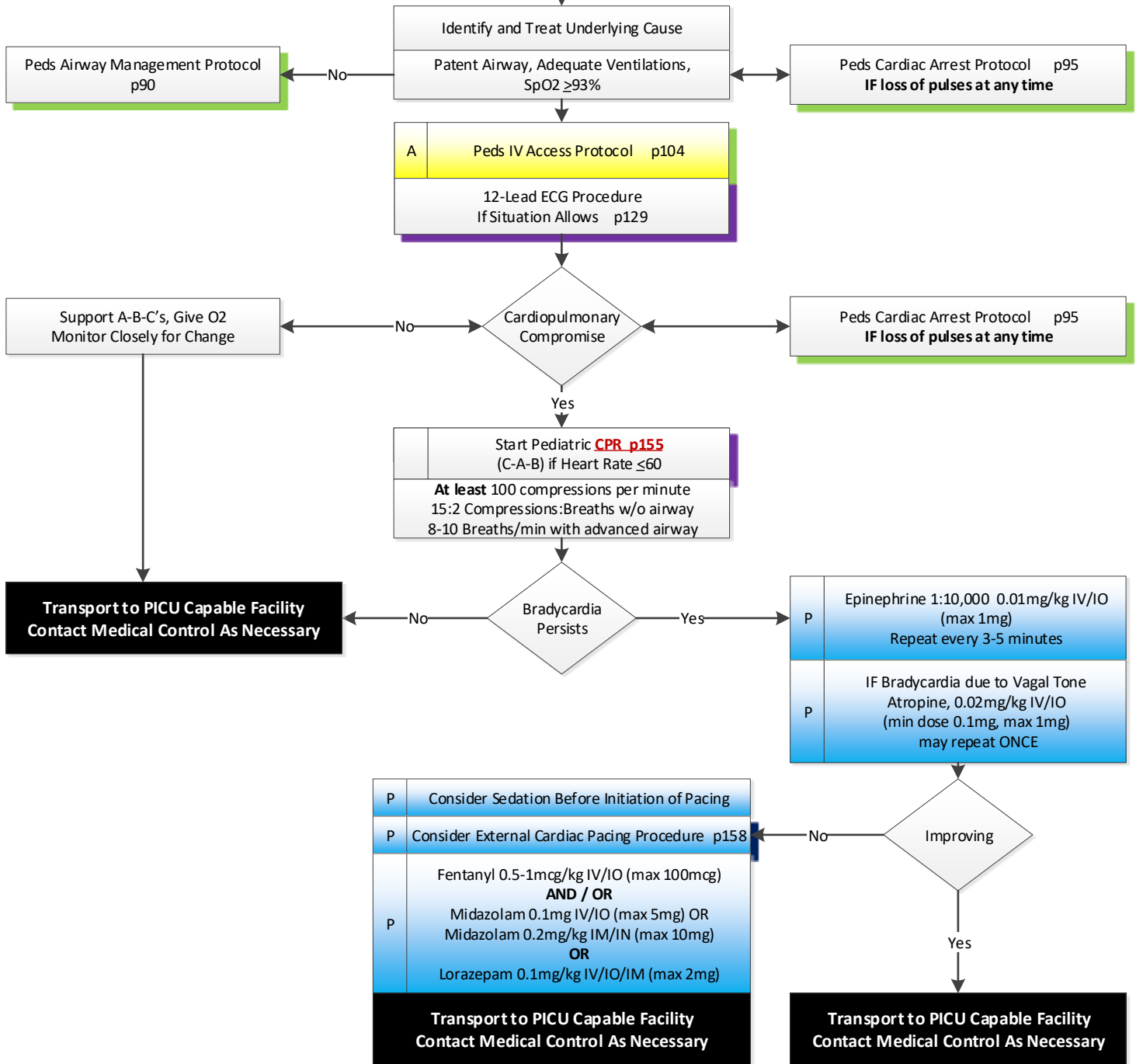
Pertinent Positives and Negatives

- Age (if known), Estimated Weight or Broselow
- Events Surrounding Rhythm Change
- Estimated Time of Events
- Past Medical History (if known)

Differential

- Hypoxemia, Hypovolemia, Hypotension, Acidosis
- Toxins, Tension Pneumo, Pericardial Tamponade
- Hypoglycemia, Sepsis
- Increased Intracranial Pressure (trauma, shunt, NAT)

General Approach – Pediatric, Medical



Pearls

RECOMMENDED EXAM: Mental Status

- **Cardiopulmonary Compromise** defined as hypotension, altered mental status, signs of inadequate perfusion.
- Maintain patent airway throughout evaluation and treatment; assist breathing as necessary.
- Don't delay treatment to get 12-lead ECG if patient is unstable.



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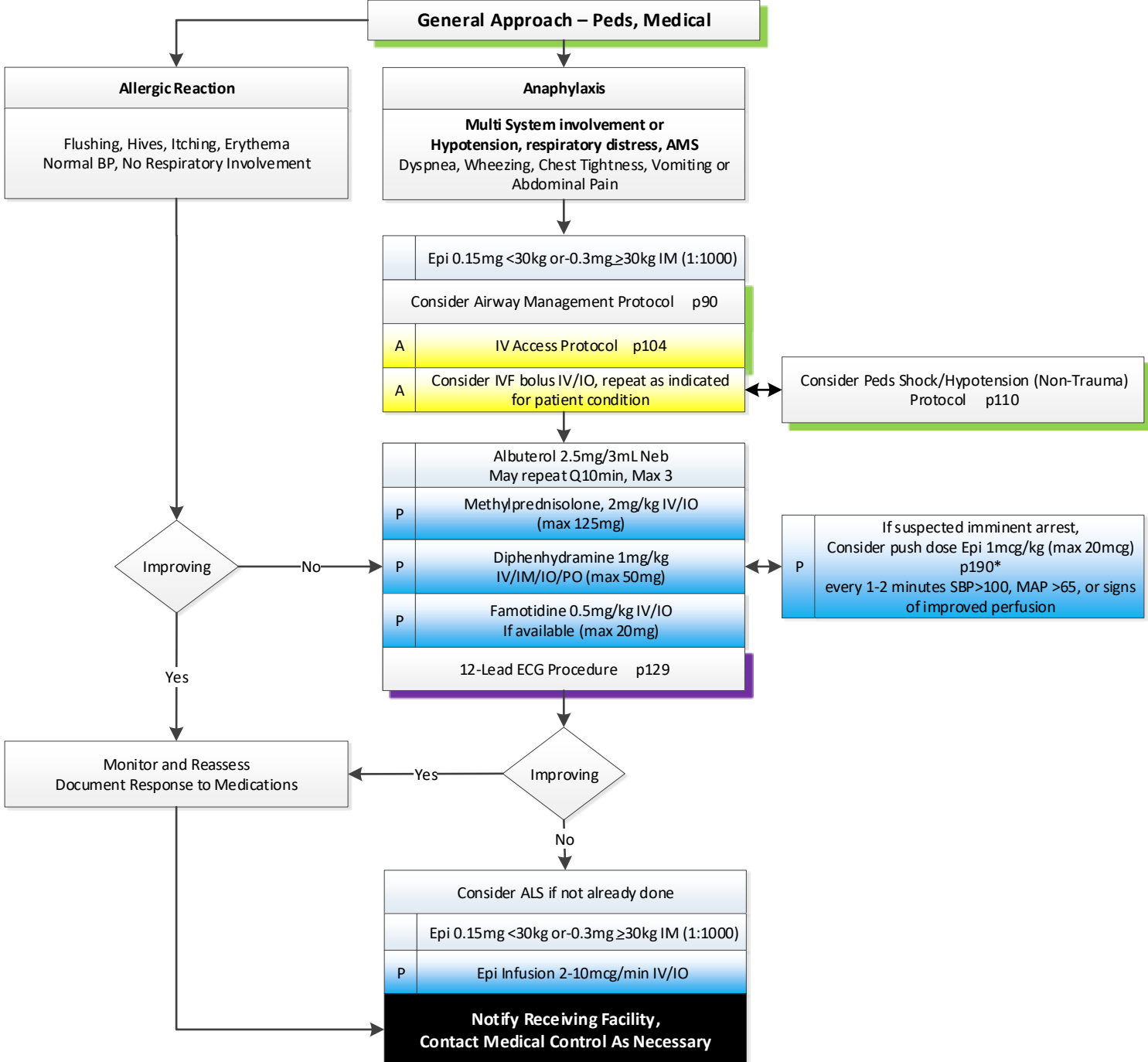


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Allergic Reaction - Peds

- | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pertinent Positives and Negatives <ul style="list-style-type: none"> • Age, VS, SpO2, EtCO2, RR • SAMPLE history • OPQRST history • Onset and Location of Symptoms | <ul style="list-style-type: none"> • Lung Sounds before <i>AND after</i> intervention • Allergen Exposure • Toxic / Environmental Exposure • Subjective throat "tightness" OR "closing" | Differential <ul style="list-style-type: none"> • Urticaria (Rash Only) • Anaphylaxis (Systemic Effect) • Shock (Vascular Effect) • Angioedema | <ul style="list-style-type: none"> • Aspiration / Airway Obstruction • Vasovagal Event • Asthma / COPD • CHF |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|



- Pearls**
- REQUIRED EXAM: VS, GCS, Skin, Cardiovascular, Pulmonary**
- Epinephrine Infusion: Mix 1mg (1:1,000) in 250mL NS. If worsening or refractory anaphylaxis, contact Med Control first. Start at 2mcg/min, titrate up.
 - *if <40kg use saline bag procedure
 - Famotidine **dilution no longer required**. Infuse over 2 minutes.
 - In general, the shorter the time from allergen contact to start of symptoms, the more severe the reaction.
 - Consider the Airway Management Protocol early in patients with Severe Allergic Reaction or subjective throat closing.
 - Imminent Cardiac Arrest should be considered in patients with severe bradycardia, unresponsiveness, no palpable radial or brachial pulse.
 - If parents have administered diphenhydramine (Benadryl) prior to EMS arrival, confirm medication given as well as dose.



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Behavioral Emergencies - Peds

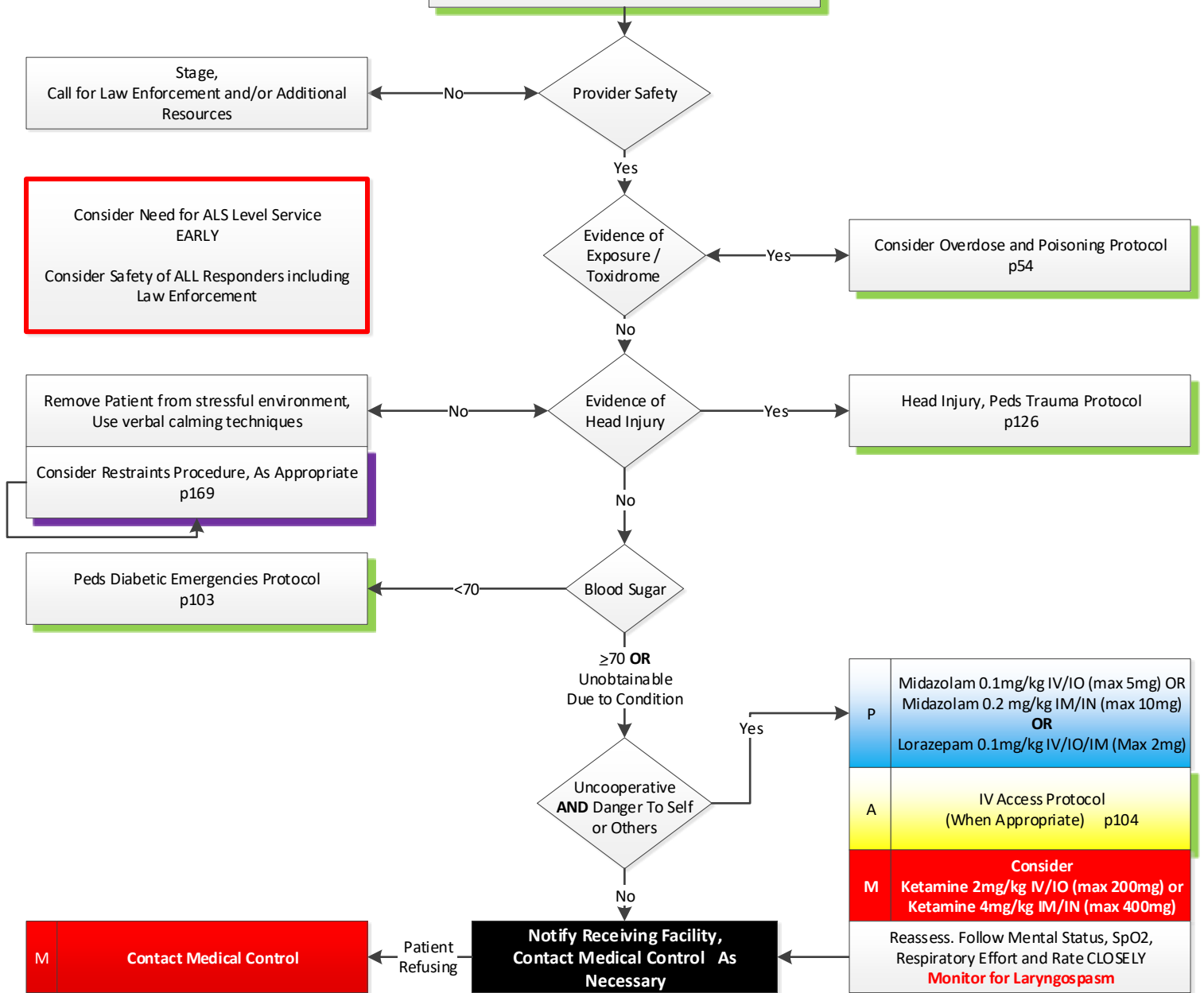
Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- Situational Crisis
- Psychiatric Illness / Medication History
- Medic Alert Bracelet, DM History
- Anxiety, Agitation or Confusion
- Suicidal / Homicidal Thoughts or History
- Evidence of Substance Use / Overdose

Differential

- EtOH Intoxication / Withdrawal
- Toxic Ingestion
- Substance Use / Abuse
- Schizophrenia
- Hypoglycemia
- Hypoxia
- Head Injury
- Occult Trauma
- Cerebral Hypoperfusion

General Approach – Peds, Medical



Pearls

REQUIRED EXAM: VS, GCS, Skin, Cardiovascular, Pulmonary

- Safety First – For Providers, Police and Patients! Never restrain any patients in the prone (face down) position.
- Physical and/or chemical restraints should ONLY be used if patient is deemed a danger to themselves or others and is uncooperative and less invasive measures to deescalate have failed or were deemed unsafe to attempt.
- All patients who require chemical restraint MUST be continuously monitored by ALS Personnel.
- Patients who are actively fighting physical restraints are at high risk for Behavioral Emergencies and In-Custody Death; Have a low threshold to activate ALS for chemical restraint.
- There are multiple possible causes of behavioral emergencies. Keep a broad differential when evaluating and treating these patients.
- Transport of patients requiring handcuffs or Law Enforcement (LE) restraint require LE to ride in the ambulance to the hospital – they have the keys!
- *Avoid Haloperidol in patients with known history of MAOI Antidepressant use (Phenelzine, Tranylcypromine) OR history of Parkinson's Disease.
- If a patient with severe agitation suddenly becomes cooperative/quiet, reassess them quickly! Sudden Cardiac Death is common in this population.



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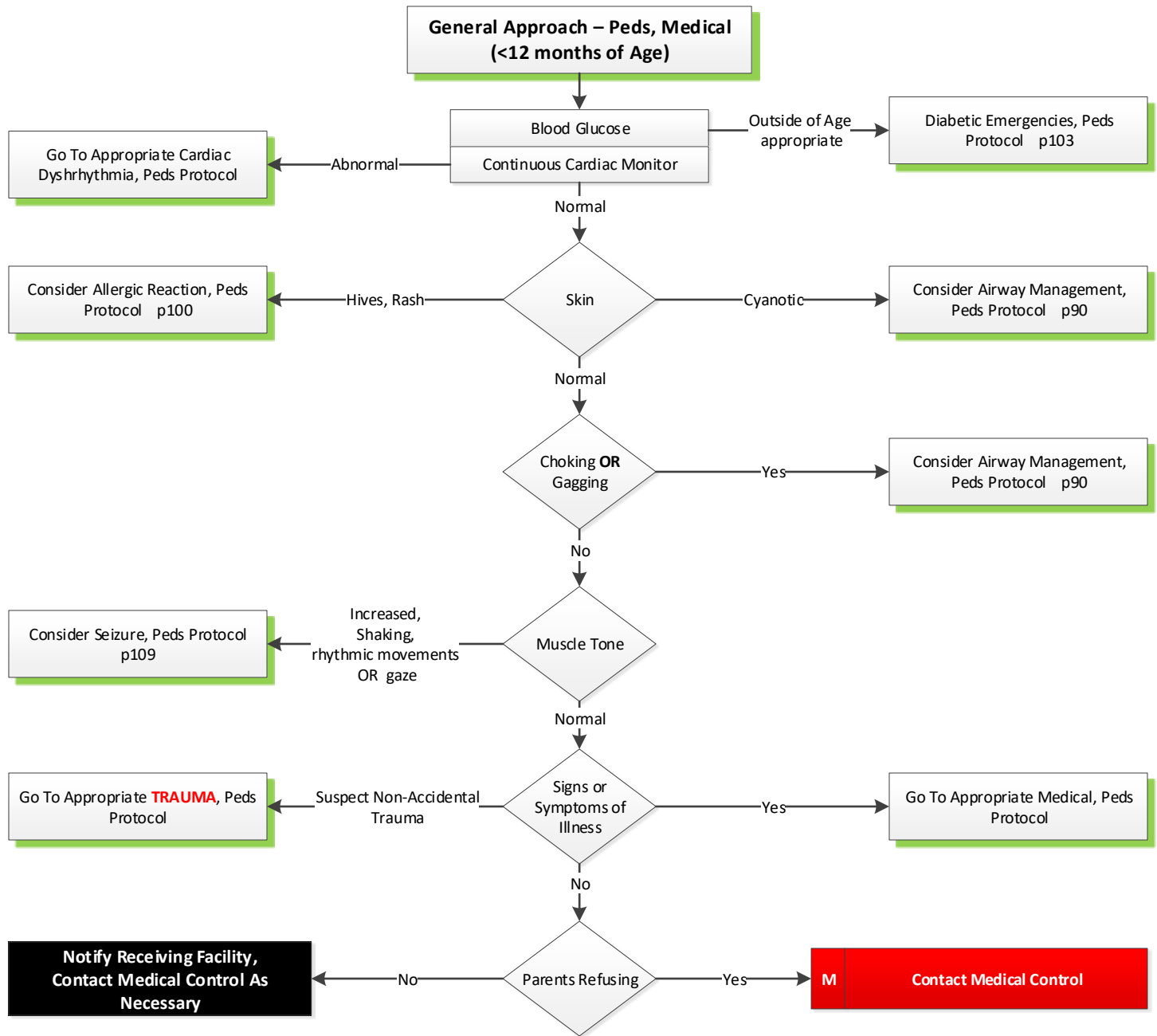
Brief Resolved Unresponsive Episode (BRUE) - Peds

Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- Events Leading up to 9-1-1
- Pregnancy History
- Complications During Pregnancy/Delivery
- Mother's GBS Status at Delivery
- Color, Tone and Appearance During Event

Differential

- Hypoglycemia
- Hyponatremia
- Seizure
- Congenital Heart Defect
- Non-Accidental Trauma
- Inborn Error of Metabolism
- Periodic Apnea
- Reflux



Pearls

REQUIRED EXAM: VS, GCS, Skin, Cardiovascular, Pulmonary

- A Brief Resolved Unexplained Episode (BRUE) occurs in children ≤ 1 year of age and may be referred to as an "Apparent Life Threatening Episode (ALTE)" or "Near-miss SIDS"; it is an episode that is frightening to the observer/caregiver and involves some combination of the following: Apnea, Color Change, Marked Change In Muscle Tone, and Choking or Gagging.
- The incidence of BRUE was found to be 7.5% in one studied out-of-hospital infant population
The overwhelming majority of BRUE patients (83%) **appeared to be in no apparent distress by EMS assessment**
Nearly half of the patients assessed by EMS to be in no apparent distress (48%) **were later found to have significant illness** upon ED evaluation
- **This is why** the history of a BRUE must always result in transport to an emergency department regardless of the infant's appearance at the time of EMS assessment
- **If the parent or guardian is refusing EMS transport, OLMC must be contacted prior to executing a refusal. Be supportive of parents as they may feel embarrassed for calling when the child now appears well.**
- **Always have a high index of suspicion for Non-Accidental Trauma (NAT). It affects all ethnicities, socioeconomic statuses and family types.**



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Diabetic Emergencies - Peds

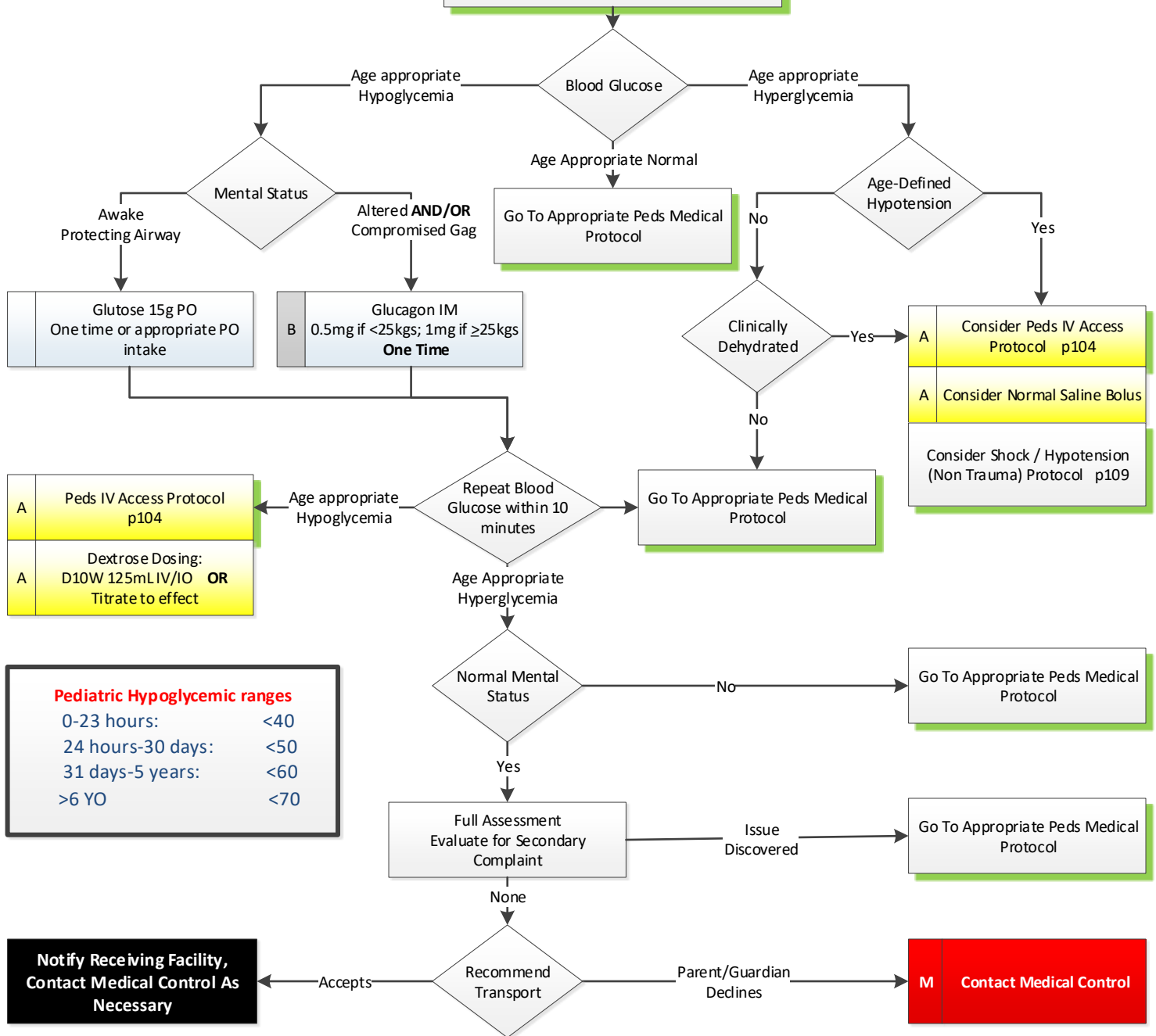
Pertinent Positives/Negatives:

- Age, VS, Blood Glucose Reading
- SAMPLE History
- OPQRST History
- Last Meal, History of Skipped Meal
- Diaphoresis
- Seizures
- Abnormal Respiratory Rate
- History of DKA

Differential

- Toxic Ingestion
- Head Injury
- Sepsis
- Stroke/TIA
- Seizure
- EtOH Abuse/Withdrawal
- Drug Abuse/Withdrawal

General Approach – Peds, Medical



Pediatric Hypoglycemic ranges

0-23 hours:	<40
24 hours-30 days:	<50
31 days-5 years:	<60
>6 YO	<70

Pearls

REQUIRED EXAM: VS, SpO2, Blood Glucose, Skin, Respiratory Rate and Effort, Neuro Exam

- Do NOT administer oral glucose to patients that can't swallow or adequately protect their airway.
- Do NOT give Bicarb to patients with hyperglycemia suspected to be in DKA – This has been proven to result in WORSE outcomes for the patients.
- Prolonged hypoglycemia may not respond to Glucagon; be prepared to start an IV and administer IV Dextrose.
- Infants and patients with congenital liver diseases may not respond to Glucagon due to poor liver glycogen stores.
- Patients on oral diabetes medications are at a very high risk of recurrent hypoglycemia and should be transported. Contact Medical Control for advice/patient counseling if patient is refusing. See Refusal after Hypoglycemia Treatment Protocol for additional information as necessary.
- Always consider intentional insulin overdose, and ask patients / family / friends / witnesses about suicidal ideation, comments or gestures.



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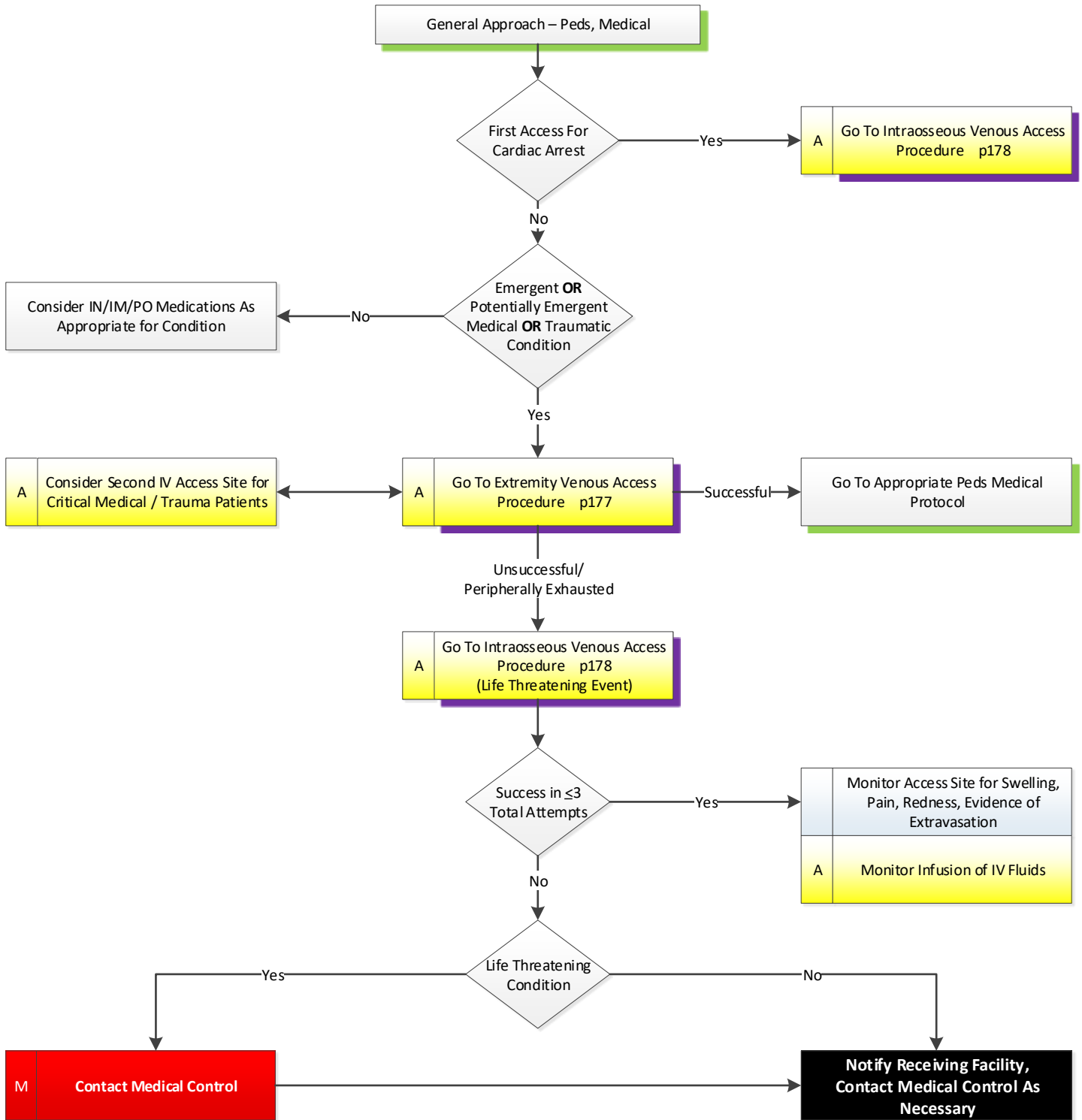
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IV Access - Peds



Pearls

- In the setting of **CARDIAC ARREST ONLY**, any preexisting dialysis shunt or central line may be used by EMS for fluid and medication administration.
- For patients who are hemodynamically unstable or in extremis, Medical Control **MUST** be contacted prior to accessing any preexisting catheters.
- Upper extremity sites are preferred over Lower Extremity sites. Lower Extremity Ivs are discouraged in patients with peripheral vascular disease or diabetes.
- In patients with hemodialysis catheters, avoid IV attempts, blood draws, injections or blood pressures in the extremity *on the affected side*.
- Saline Locks are acceptable in cases where access may be necessary but the patient is not volume depleted having an IV does not mandate IV Fluid infusion.
- The *preferred order* of IV Access is: Peripheral IV, Intraosseous IV, IN/IM access **UNLESS** medical acuity or situation dictate otherwise.
- *Remember:* Proximal Humerus IO is contraindicated in patients ≤18 years old.



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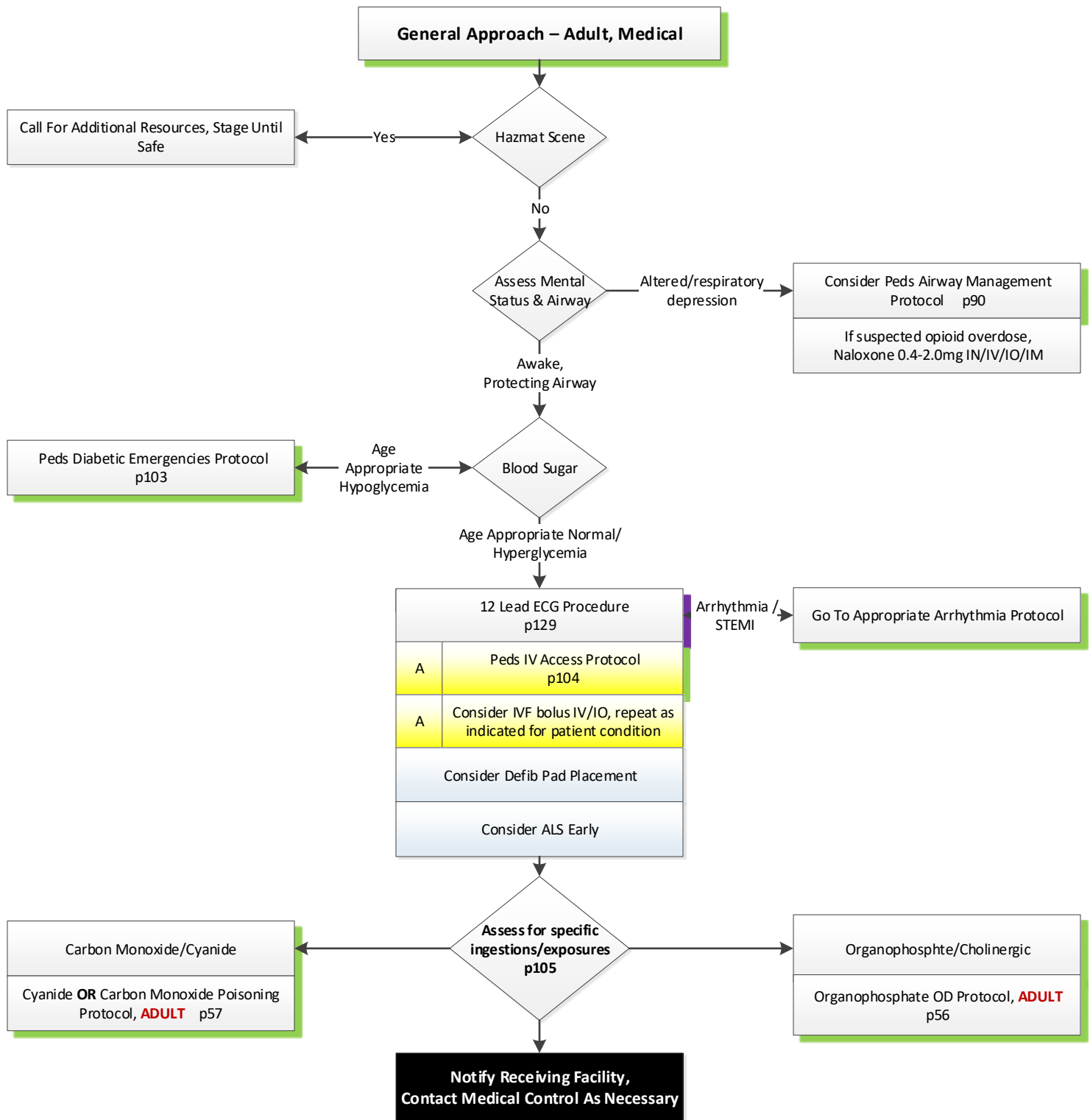
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Overdose and Poisoning, General - Peds



Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Skin, Blood Glucose

- Patients are unreliable historians in overdose situations, particularly in suicide attempts. Trust what they tell you, but verify (pill bottles, circumstances, etc.)
- Critical Scene Information: Time of Ingestion, Number and Type of meds ingested, Seizure or mental status changes; Please consider bringing pill bottles, contents, emesis and reliable contact info to the ED; this will be important in patient evaluation and assessment
- Be careful of off-gassing in cases of inhalation of volatile agents
- Many intentional overdoses involve multiple substances, some with cardiac toxicity; a 12-Lead ECG should be obtained on all overdoses situation permitting
- Contact Poison Control for all non-opiate overdoses: **1-800-222-1222**
- **SLUDGEM** – Salivation, Lacrimation, Urination, Defecation, GI Upset, Emesis, Miosis
- **DUMBBELLS** – Diarrhea, Urination, Miosis/Muscle Weakness, Bronchorrhea, Bradycardia, Emesis, Lacrimation, Lethargy, Salivation/Sweating



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Overdose and Poisoning, Reference - Peds

Beta Blocker Overdose

Clinical Features:

Cardiovascular – hypotension, bradycardia, AV block
Pulmonary – bronchospasm, wheezing
Metabolic – Hypoglycemia, Hyperkalemia
Neuro – Stupor

Common Beta Blockers -

Metoprolol (Lopressor, Toprol-XL) Propranolol (Inderal LA, InnoPran XL)
Atenolol (Tenomin) Sotalol
Labetalol Carvedilol (Coreg)

Many beta blocker ingestions do not cause symptoms; exceptions are the elderly, poor cardiac/respiratory reserve, and coingestions with other cardiac medications

P	Consider Glucagon 2mg IV/IO may repeat if available Manage symptoms of Bradycardia per Protocol p99
---	--------------------------------------------------------------------------------------------------------

Calcium Channel Blocker Overdose

Clinical Features:

Cardiovascular – hypotension, bradycardia, shock
Pulmonary – pulmonary edema, rales, crackles
Metabolic – Hyperglycemia (can be a marker of severity)
Neuro – Seizures, myoclonus, dizziness, syncope
GI – Nausea and vomiting

Common Calcium Channel Blockers -

Amlodipine (Norvasc)
Diltiazem (Cardizem, Tiazac)
Nifedipine (Procardia)
Verapamil (Calan, Verelan)

Sustained release preparations may have delayed onset of toxic symptoms (up to 12 hours)

Overdoses with Calcium Channel Blockers have a high mortality!! Electrical conduction abnormalities, vasodilation, myocardial depression are severe

P	Consider Calcium Chloride 20mg/kg IV/IO (max 1gm) Consider Glucagon 2mg IV/IO, if available for hypotension, may repeat if available Manage symptoms of Bradycardia per Protocol p99
---	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Antipsychotic/Acute Dystonic Reaction

Clinical Features:

Dystonia refers to sustained muscle contractions, frequently causing twisting, repetitive movements or postures, and may affect any part of the body

Common -

Antipsychotics – i.e. Haldol, Prolixin, Thorazine
Antiemetics – i.e. prochlorperazine, metoclopramide
Antidepressants – i.e. buspirone, sumatriptan
Antibiotics – i.e. erythromycin
Anticonvulsants – i.e. carbamazepine, vigabatrin
H2 Receptor Blockers – i.e. ranitidine, cimetidine
Recreational Drugs – i.e. cocaine

Acute dystonic reactions are extrapyramidal side effects of antipsychotic and certain other medications. 90% occur within 5 days of starting a new med

P	Diphenhydramine 1mg/kg IV/IO/IM/PO (max 50mg) If not improving, consider Midazolam 0.1mg/kg IV/IO (max 5mg) -OR- Midazolam 0.2mg/kg IM/IN (max 10mg)
---	---------------------------------------------------------------------------------------------------------------------------------------------------------------

Cocaine or Sympathomimetic Overdose

Clinical Features:

Hypertension, Tachycardia, Agitation, Seizure, Dilated Pupils

Common Sympathomimetics -

Cocaine Pseudoephedrine
Ephedrine Methamphetamine
Phenylephrine Amphetamines
Terbutaline

Patients on MAOIs for depression may have symptoms of a Sympathomimetic Overdose after eating certain foods such as aged cheese, beer, mushrooms
Patients with Cocaine or Sympathomimetic Overdose are at high risk of Arrhythmias, Myocardial Infarction and Stroke

Sympathomimetics are drugs that mimic the effects of the sympathetic nervous system

P	Midazolam 0.1mg/kg IV/IO (max 5mg) -OR- Midazolam 0.2mg/kg IM/IN (max 10mg) -OR- Lorazepam 0.1mg/kg IV/IO/IM (max 2mg)
---	------------------------------------------------------------------------------------------------------------------------------

TCA Overdose

Clinical Features:

Neuro – AMS, seizures
Cardiovascular – Hypotension, arrhythmias, wide QRS interval

Common Tricyclic Antidepressants:

Amitriptyline
Clomipramine
Doxepin
Imipramine
Nortriptyline
Protriptyline

P	If QRS >0.12ms, Sodium Bicarb 1mEq/kg IV/IO slow push May repeat every 5 minutes until narrowing of QRS
---	------------------------------------------------------------------------------------------------------------

Opioid Overdose

Clinical Features:

Cardiovascular – hypotension
Pulmonary – respiratory depression
Neuro – AMS, pin point pupils

Common Opioid Medications:

Oxycodone (Percocet, Oxycontin, MS Contin)
Hydrocodone (Vicodin, Norco, Vicoprofen)
Morphine
Heroin
Dilaudid
Fentanyl
Codeine (T3)
Methadone

P	Naloxone 0.4-2.0mg IN/IV/IO/IM
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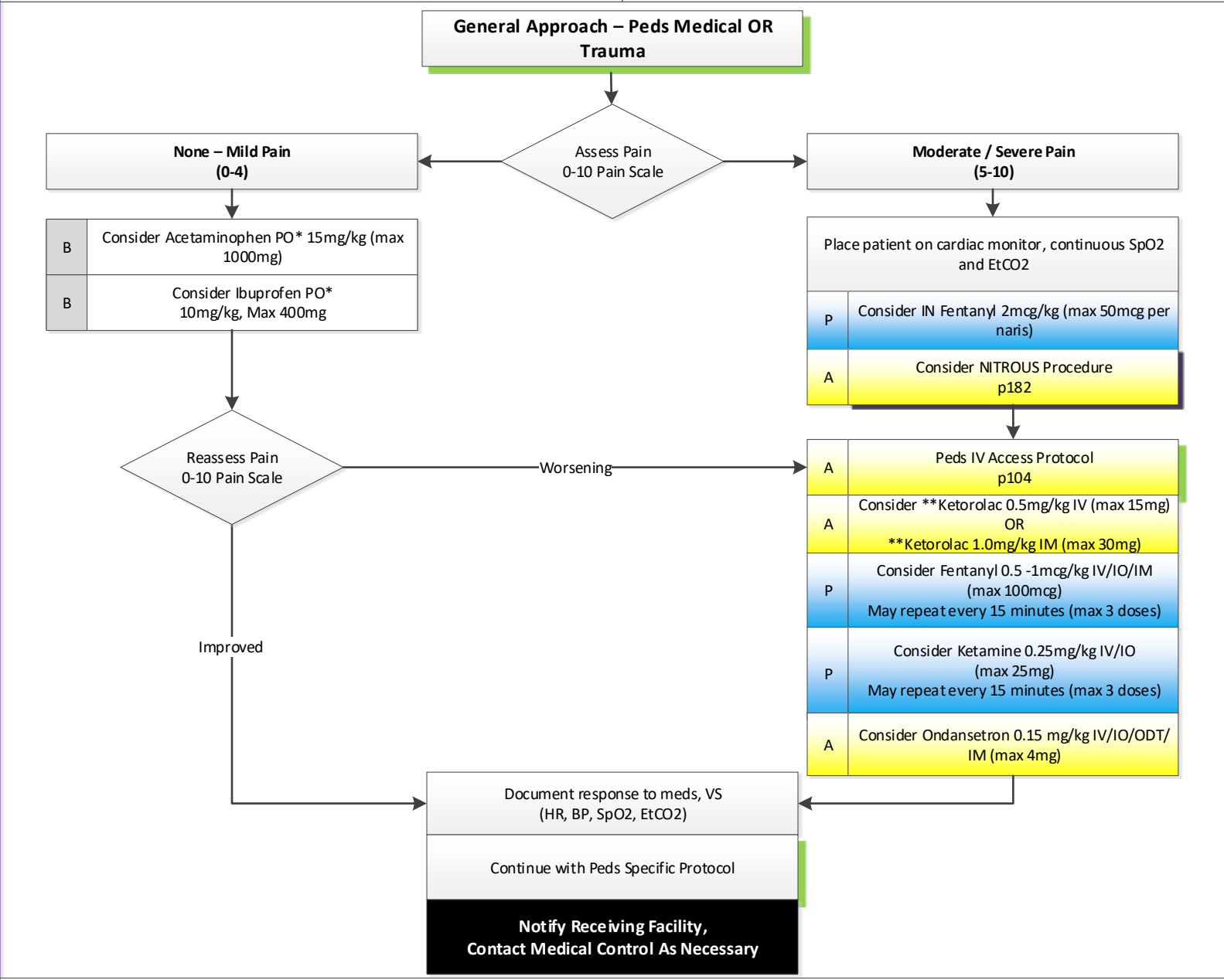


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Pain Management - Peds

Pertinent Positives and Negatives <ul style="list-style-type: none"> Age, VS, GCS SAMPLE History OPQRST History History of chronic pain 	Differential <ul style="list-style-type: none"> Head injury Spine Injury Compartment Syndrome Fracture, Sprain, Strain Pneumo/hemo-thorax Pericardial effusion Aortic Dissection Internal organ injury
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Pearls
REQUIRED EXAM: Vital Signs, GCS, Neuro Exam, Lung Sounds, Abdominal Exam, Musculoskeletal Exam, Area of Pain

- Provider Discretion to be used for patients suffering from chronic pain related issues. Please note that history of chronic pain does not preclude the patient from treatment of acute pain related etiologies.
- Pain severity (0-10) is a vital sign to be recorded pre- and post-medication delivery and at disposition.
- As with all medical interventions, assess and document change in patient condition pre- and post-treatment.
- Opiate naive patients can have a much more dramatic response to medications than expected; start low and titrate up as appropriate.
- Allow for position of maximum comfort as situation allows.
- Acetaminophen and/or Ibuprofen if not contraindicated may be considered for analgesic benefit in fever.
- **Ketorolac is contraindicated in: <2 years old, pregnancy, anticoagulation or bleeding diatheses, anticipated surgery, NSAID use (including EMS administered ibuprofen), GI bleeding, possible intracranial hemorrhage, known renal disease. Extreme caution in females of reproductive age and potential renal insufficiency.**
- *Oral medications are contraindicated in anyone who may need an emergent surgery or procedure; "if in doubt, don't give PO".**



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Refusal Protocol - Peds

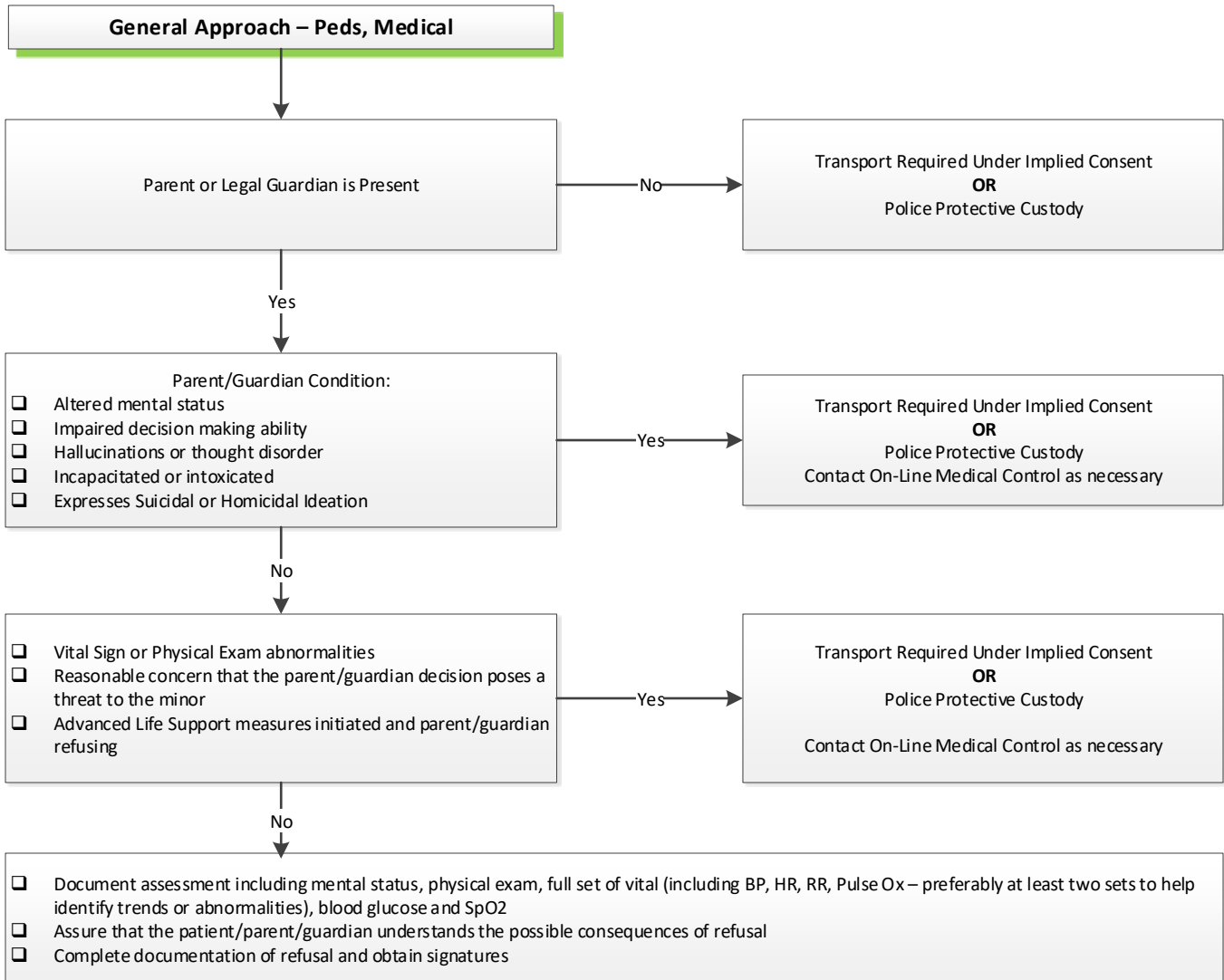
Pertinent Positives and Negatives

- Age, VS, BP, RR, SpO2
- SAMPLE history
- OPQRST history

- Mental Status
- Pale, Cool Skin
- Delayed Cap Refill

Differential

- Cardiac Dysrhythmia
- Hypoglycemia
- Overdose
- Toxidrome
- Sepsis
- Occult Trauma
- Adrenal Insufficiency



Pearls

REQUIRED EXAM: VS, GCS, Nature of Complaint

- ***Incapacitated definition:** A person who, because of alcohol or drug consumption or withdrawal, is unconscious or whose judgment is impaired such that they are incapable of making rational decisions as evidenced by extreme physical debilitation, physical harm or threats of harm to themselves, others or property.
 - Evidence of incapacitation include but are not limited to: inability to stand on one's own, staggering, falling, wobbling, vomit/urination/defecation on clothing, inability to understand and respond to questions, DTs, unconsciousness, walking or sleeping where subject to danger, hostile toward others.
- ****Intoxicated definition:** A person whose mental or physical functioning is substantially impaired as a result of the use of alcohol or drug consumption or withdrawal.
- If there is ANY question, do not hesitate to involve Law Enforcement to ensure the best decisions are being made on behalf of the patient.
- Infants and Neonates are higher risk refusals due to difficulty with assessments and may appear well, consider OLMC and low threshold for transporting.



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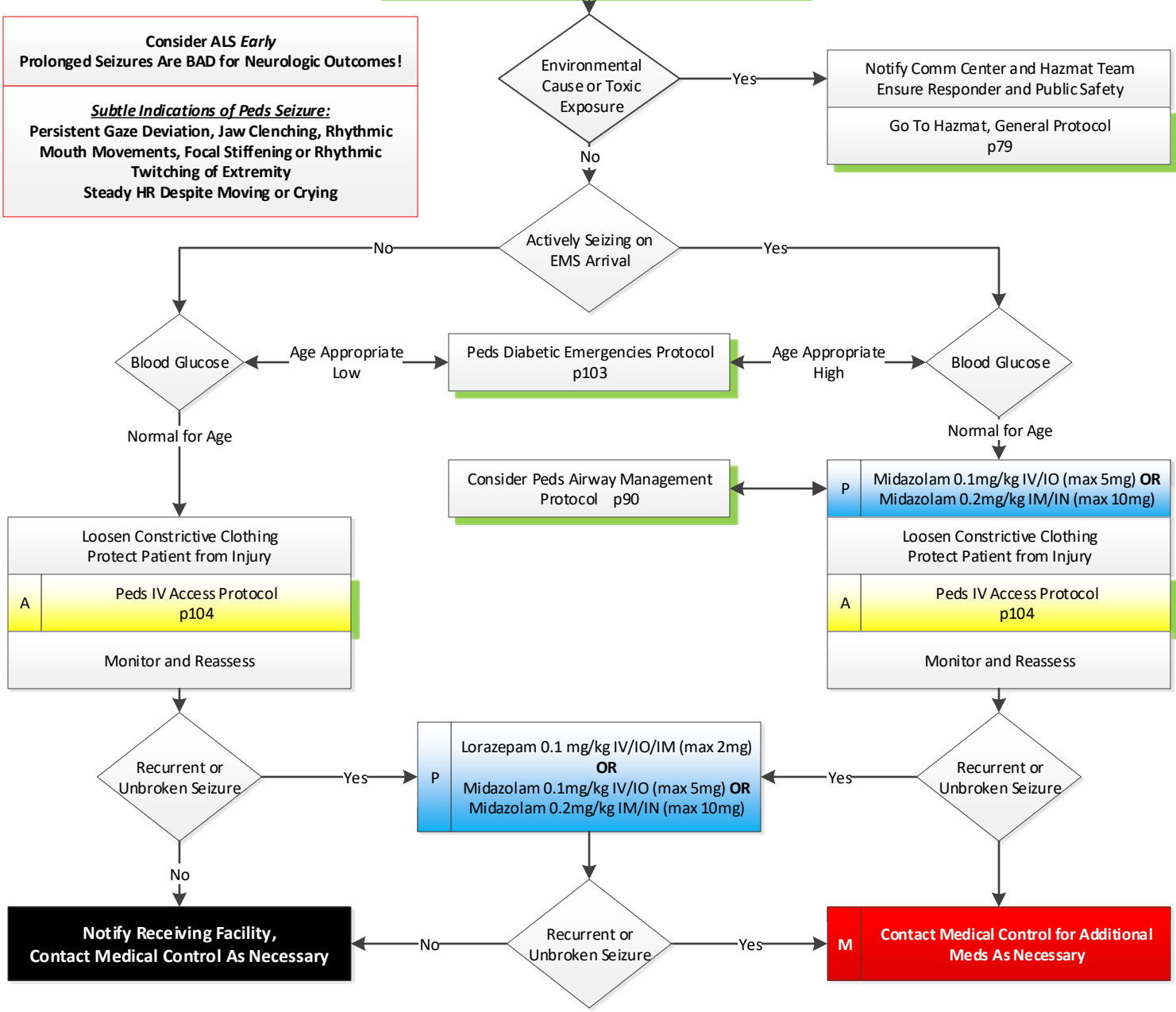
Seizure - Peds

Pertinent Positives and Negatives <ul style="list-style-type: none"> Age, VS, GCS, SpO2, Blood Sugar SAMPLE History OPQRST History Seizure History, Med Compliance 	<ul style="list-style-type: none"> Bowel or Bladder Incontinence Tongue Biting Recent Fever History Evidence of Head Trauma Number of Seizures and Duration 	Differential <ul style="list-style-type: none"> Hypoxia Hypoglycemia Electrolyte Imbalance Eclampsia 	<ul style="list-style-type: none"> Drugs, EtOH Abuse Drugs, EtOH Withdrawal Occult Head Injury Non-Accidental Trauma Syncope
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General Approach – Peds, Medical

Consider ALS Early
Prolonged Seizures Are BAD for Neurologic Outcomes!

Subtle Indications of Peds Seizure:
 Persistent Gaze Deviation, Jaw Clenching, Rhythmic Mouth Movements, Focal Stiffening or Rhythmic Twitching of Extremity
 Steady HR Despite Moving or Crying



- Pearls**
- REQUIRED EXAM: Blood Sugar, SpO2, GCS, Neuro Exam**
- Consider antipyretic treatment in setting of suspected febrile seizure and patient has returned to baseline mental status.
 - Midazolam is effective in terminating seizures. **Do not delay IM/IN administration to obtain IV access in an actively seizing patient.**
 - Do not hesitate to treat recurrent, prolonged (>1 minute) seizure activity. Have a low threshold to give IN Midazolam rather than spend time on IV Access.
 - Status epilepticus is a seizure lasting greater than 5 minutes OR ≥2 successive seizures without recovery of consciousness in between. These patients require airway management and rapid transport to the most appropriate Pediatric ICU Capable facility.
 - Assess for possibility of occult trauma, substance abuse.
 - Active seizure in known or suspected pregnancy >20 weeks, give Magnesium 4gm IV/IO over 2-3 minutes.
 - Some children may be on a Ketogenic Diet Goal of Blood Sugar <50 to manage seizures, consider contacting Medical Control.



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Hypotension / Shock - Peds

Pertinent Positives and Negatives

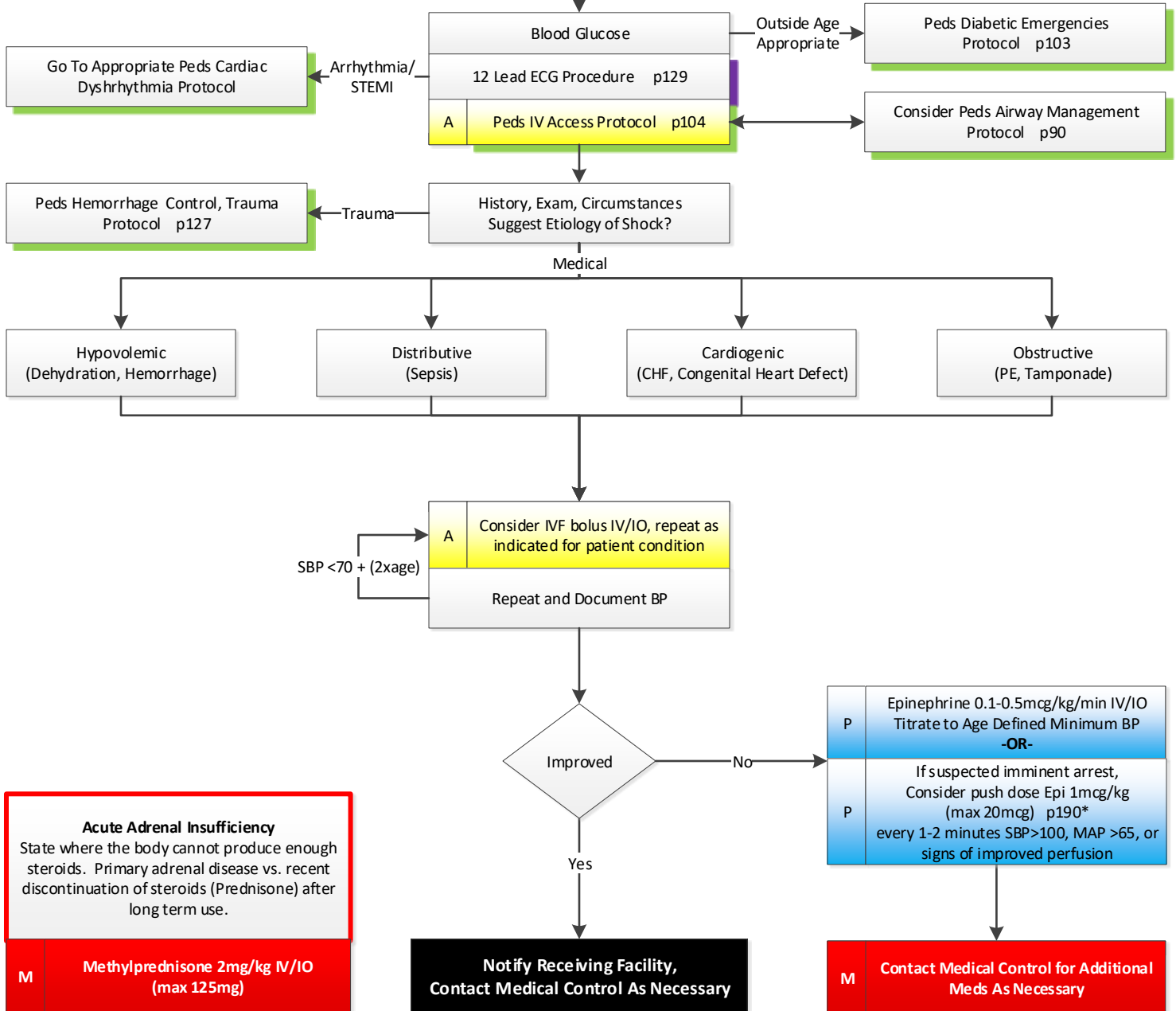
- Age, VS, BP, RR, SpO2
- SAMPLE history
- OPQRST history
- Source of blood loss, if any (GI, vaginal, AAA, ectopic)
- Source of fluid loss, if any (vomiting, diarrhea, fever)
- Pregnancy history

- Mental Status
- Pale, Cool Skin
- Delayed Cap Refill
- Coffee Ground Emesis
- Tarry Stools
- Allergen Exposure

Differential

- Cardiac Dysrhythmia
- Hypoglycemia
- Ectopic Pregnancy
- AAA
- Sepsis
- Occult Trauma
- Adrenal Insufficiency

General Approach – Peds, Medical



Pearls

REQUIRED EXAM: VS, GCS, RR, Lung sounds, JVD

- Shock may present with initially normal VS and progress insidiously; follow frequent blood pressures, particularly if the patient “looks sicker than Vital Signs”
- *if <40kg use saline bag procedure
- Tachycardia may be the first and only sign of shock in the pediatric population; remember – Peds patients compensate to a point, then crash quickly
- If evidence or suspicion of trauma (accidental OR non-accidental), move to Hypotension/Shock (Trauma) Protocol early
- Hypotension is a LATE finding in pediatric patients, and is an ominous sign that they are losing their ability to compensate



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Sickle Cell Crisis - Peds

Pertinent Positives and Negatives

- Age, VS, GCS
- SAMPLE History
- OPQRST History
- History of chronic pain

- History of Sickle Cell Anemia
- Signs of Infection
- Hypoxia
- Dehydration
- Painful Joint(s)

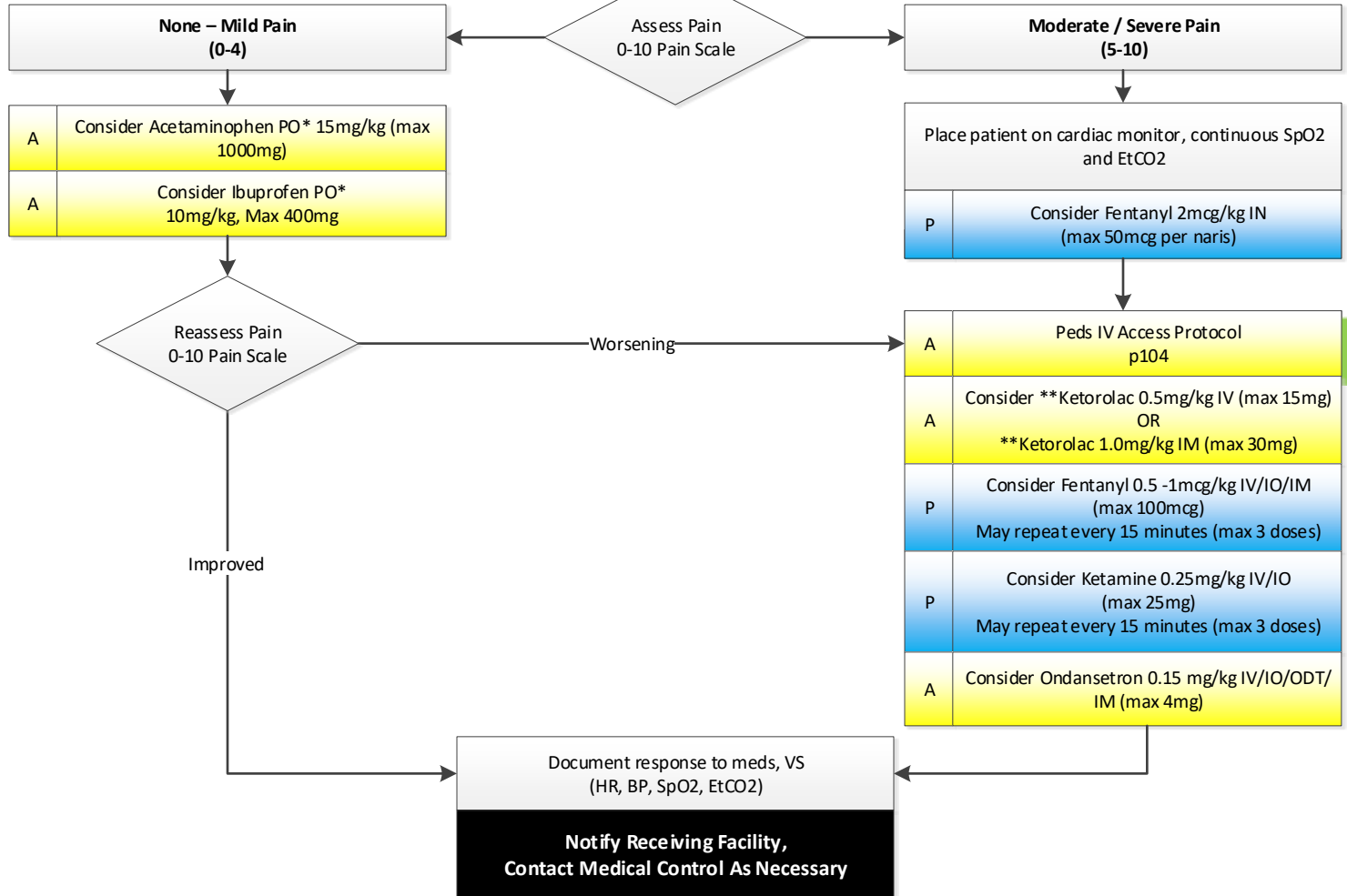
Differential

- Dehydration
- Sepsis
- Pneumonia
- Fracture, Sprain, Strain
- Vaso-Occlusive Crisis
- Acute Chest Syndrome
- Splenic Sequestration
- Acute Stroke

General Approach – Peds Medical

Supplemental O2 at 2LPM NC
Titrate Up As Appropriate

Warm Blanket if available



Pearls

REQUIRED EXAM: Vital Signs, GCS, Neuro Exam, Lung Sounds, Abdominal Exam, Musculoskeletal Exam, Area of Pain

- Provider Discretion to be used for patients suffering from chronic pain related issues. Please note that history of chronic pain does not preclude the patient from treatment of acute pain related etiologies.
- Pain severity (0-10) is a vital sign to be recorded pre- and post-medication delivery and at disposition.
- Sickle Cell Anemia is a chronic hemolytic anemia occurring almost exclusively in African Americans; pain crises result from the occlusion of blood vessels by masses of misshapen blood cells during times of crisis.
- Sickle Pain Crises occur typically in the joints and back. Liver, Pulmonary and CNS involvement can present with RUQ pain, hypoxia or stroke.
- Patients with sickle cell disease have a high incidence of life-threatening conditions at a very young age.
- Remember: sickle cell patients live with pain every day, and frequently use distraction techniques to cope. Just because a sickle cell patient does not show classic signs of acute pain or are using a distraction device (like phones) does not mean they are not in pain.



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Syncope / Near-Syncope - Peds

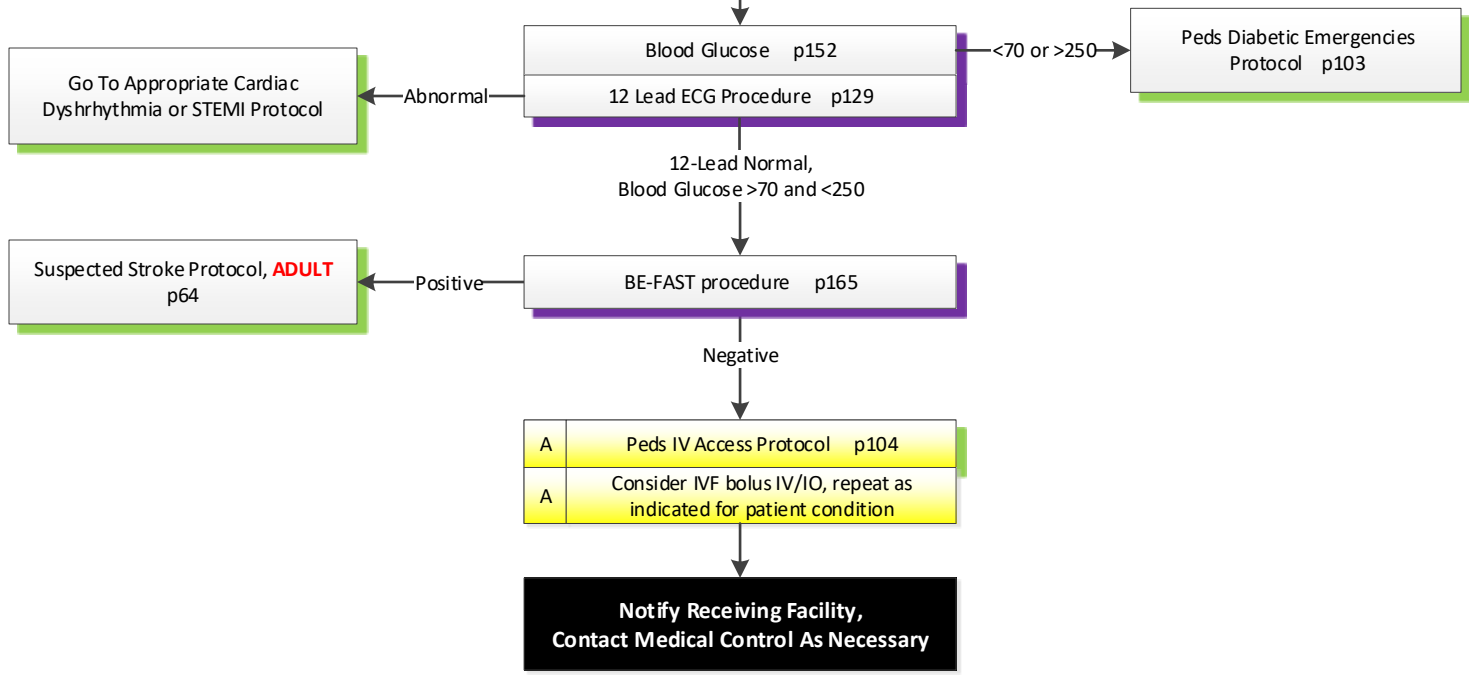
Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- History of DM, medic alert bracelet

Differential

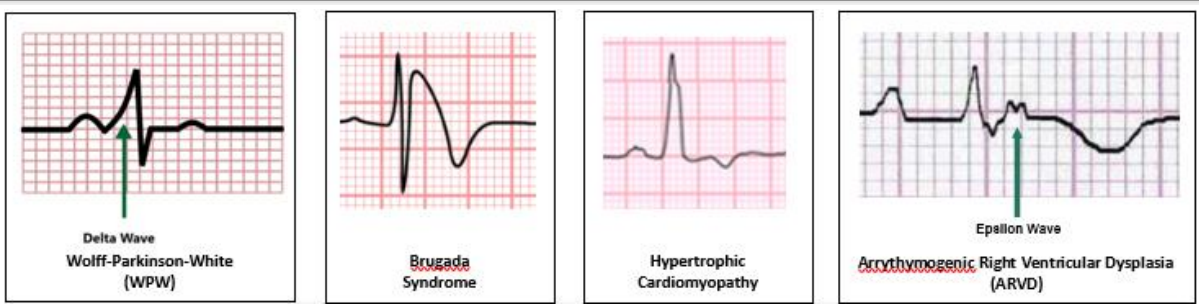
- Head Injury
- Electrolyte Abnormality
- Psychiatric Disorder
- Cardiac Dysrhythmia
- DM, CVA, Seizure, Tox
- Sepsis
- Hypothermia
- Hypothyroidism
- Pulmonary

General Approach – Adult, Medical



Consider causes of presyncope/impending arrest syndrome:

- Acute coronary syndrome (ACS) : look for evidence of ischemia
- Tachydysrhythmias
- Bradydysrhythmias and heart blocks
- Wolff-Parkinson-White (WPW): look for short PR, prolonged QRS and a delta wave
- Brugada Syndrome: look for rugada sin with coved ST segment elevation >2mm in >1 V1-V3 followed by a negative T Wave
- Hypertrophic Cardiomyopathy (HCM): look for evidence of left ventricular hypertrophy with deep narrow "dagger like" Q waves in lateral and inferior leads, may also have left atrial enlargement
- Long or short QT-intervals: look for a QTc <300 or >450
- Arrhythmogenic Right Ventricular Dysplasia (ARVD): look for epsilon waves +/- T wave inversions in V1-V3
- Miscellaneous: PE, right sided heart strain, electrolyte abnormalities, ICH, etc.



Pearls

REQUIRED EXAM: VS, GCS, Head, Neck, Blood Glucose

- Pay special attention to head and neck exam for bruising or signs of injury.
- Syncope/Altered Mental Status may be the presenting sign of environmental hazards / toxins. Protect yourself and other providers / community if concern. Involve Hazmat early.
- Safer to assume hypoglycemia if doubt exists. Recheck blood sugar after dextrose/glucose administration and reassess.
- **Do not let EtOH fool you!** Alcoholics frequently develop hypoglycemia, Alcoholic ketoacidosis (AKA) and often hide traumatic injuries!



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Quick Reference Page – Peds (<18 y/o)

Normal Vital Signs In Children

Age	Heart Rate (Beats Per Minute)		Respiratory Rate (Breaths Per Minute)	Systolic Blood Pressure	Weight (kg)
	Awake Rate	Sleeping Rate			
Newborn	100-180	80-160	30-60	60-90	2-3
Infant (1-12mos)	100-170	75-160	30-60	87-105	4-10
Toddler (1-2yrs)	80-150	60-90	24-40	85-102	10-14
Preschool (3-5yrs)	70-130	60-90	20-34	89-108	14-18
School Age (6-12yrs)	65-120	60-90	15-30	94-120	20-42
Adolescent (13-17yrs)	55-90	50-90	12-20	107-132	>50

Modified Glasgow Coma Scale for Infants and Children

	Child	Score	Infant
Eye Opening	Spontaneous	4	Spontaneous
	To Speech	3	To Speech
	To Pain	2	To Pain
	None	1	None
Best Verbal Response	Oriented, Appropriate	5	Coos and Babbles
	Confused	4	Irritable, Cries
	Inappropriate Words	3	Cries in Response to Pain
	Incomprehensible Sounds	2	Moans in Response to Pain
	None	1	None
Best Motor Response	Obeys Commands	6	Moves Spontaneously and Purposely
	Localizes Painful Stimulus	5	Withdraws in Response to Touch
	Withdraws in Response to Pain	4	Withdraws in Response to Pain
	Flexion in Response to Pain	3	Abnormal Flexion Posture to Pain
	Extension in Response to Pain	2	Abnormal Extension Posture to Pain
	None	1	None

Wisconsin EMS Recommended Weight Conversion (2.2lbs = 1kg -OR- 1lb = 0.45kg)

Lbs.	Kgs.	Lbs.	Kgs.	Lbs.	Kgs.
5 lbs	2 kgs	20 lbs	9 kgs	35 lbs	16 kgs
6	3	21	10	36	16
7	3	22	10	37	17
8	4	23	10	38	17
9	4	24	11	39	18
10 lbs	5 kgs	25 lbs	11 kgs	40 lbs	18 kgs
11	5	26	12	41	19
12	5	27	12	42	19
13	6	28	13	43	20
14	6	29	13	44	20
15 lbs	7 kgs	30 lbs	14 kgs	45 lbs	20 kgs
16	7	31	14	46	21
17	8	32	15	47	21
18	8	33	15	48	22
19	9	34	15	49	22
www.chawisconsin.org				50 lbs	23 kgs

Equipment	GRAY 3-5kg	PINK Small Infant 6-7kg	RED Infant 6-9kg	PURPLE Toddler 10-11kg	YELLOW Small Child 12-14kg	WHITE Child 15-18kg	BLUE Child 19-23kg	ORANGE Large Child 24-29kg	GREEN Adult 30-36kg
Resuscitation Bag		Infant/Child	Infant/Child	Child	Child	Child	Child	Child	Adult
Oxygen Mask (NRB)		Pediatric	Pediatric	Pediatric	Pediatric	Pediatric	Pediatric	Pediatric	Pediatric/Adult
Oral Airway (mm)		50	50	60	60	60	70	80	80
Laryngoscope Blade (Size)		1 Straight	1 Straight	1 Straight	2 Straight	2 Straight	2 Straight OR Curved	2 Straight OR Curved	3 Straight OR Curved
Endotracheal Tube (mm)		3.5 Uncuffed 3.0 Cuffed	3.5 Uncuffed 3.0 Cuffed	4.0 Uncuffed 3.5 Cuffed	4.5 Uncuffed 4.0 Cuffed	5.0 Uncuffed 4.5 Cuffed	5.5 Uncuffed 5.0 Cuffed	6.0 Cuffed	6.5 Cuffed
King Airway	Size 0 (Clear)	Size 1 (White)	Size 1 (White)	Size 1 (White)	Size 2 (Green)	Size 2 (Green)	Size 2.5 (Orange)	Size 3 (Yellow)	Size 3 (Yellow)
LMA	NA	#1	#1	#1.5	#2	#2.5	#3	#3.5	#4
Suction Catheter (French)		8	8	10	10	10	10	10	10-12
BP Cuff	Neonatal #5/ Infant	Infant/Child	Infant/Child	Child	Child	Child	Child	Child	Small Adult
IV Catheter (ga)		22-24	22-24	20-24	18-22	18-22	18-20	18-20	16-20
IO (ga)		18/15	18/15	15	15	15	15	15	15
NG Tube (French)		5-8	5-8	8-10	10	10	12-14	14-18	16-18

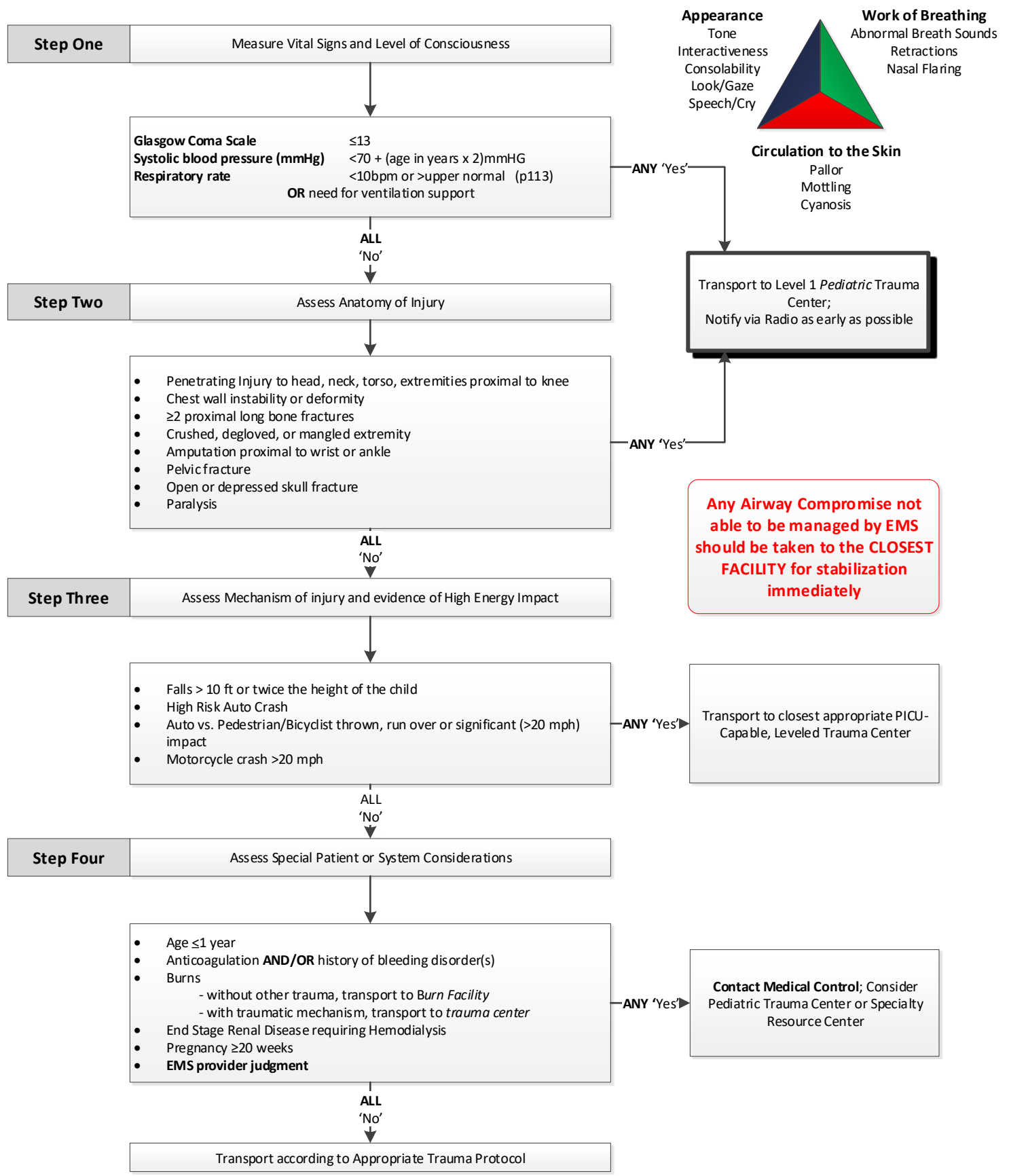


Trauma Protocols - Pediatric



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Destination Determination – Peds (<18 y/o)



<https://www.dhs.wisconsin.gov/publications/p0/p00730.pdf>



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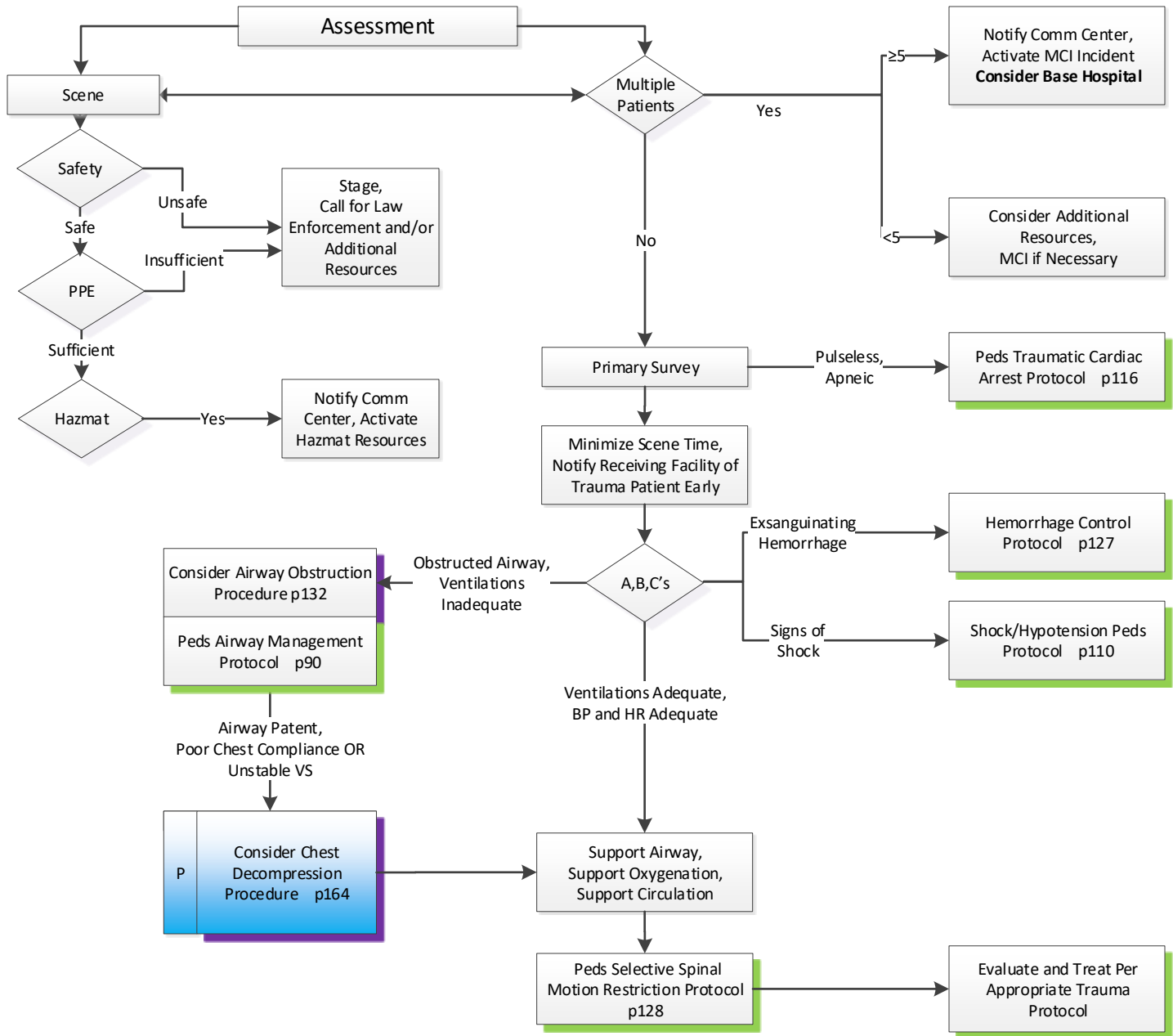
General Approach – Peds, Trauma

Pertinent Positives and Negatives

- Age, VS, GCS
- Time of Injury, Mechanism of Injury
- DCAP-BTLS
- SAMPLE History
- OQRST History
- Pain / Swelling
- Mental Status
- Hypotension / Shock

Differential

- Stroke
- STEMI
- Overdose
- Child Abuse / Non-Accidental Trauma
- Domestic Violence
- Non-Accidental Trauma



Pearls

REQUIRED EXAM: Vital Signs, GCS, Loss of Consciousness, Location of Pain (then targeted per Appropriate Trauma Protocol)

- Assess for major trauma criteria immediately upon patient contact
 - RR <10 or >upper normal (**p.112**); SBP <70 + (age in years x 2)mmHG; Pulse <50 or >upper normal (**p.112**); GCS <13; SpO2<93%
 - Transport to Trauma Center, minimize scene time to goal of <10 minutes
- Disability – assess for neuro deficits including paralysis, weakness, abnormal sensation
- Suspect Tension Pneumothorax when:
 - Mechanism consistent with Chest Trauma; Resp Distress; Decreased Breath Sounds; JVD; Low BP; Tachycardia; Tracheal Deviation
 - Signs and Symptoms of Tension Pneumothorax may be present *with or without* positive pressure ventilations
 - Needle Decompression should be performed with an 18-20ga needle at the 2nd intercostal space, *midclavicular line*
 - If repeat decompression necessary, continue to move laterally along the superior aspect of the 3rd rib

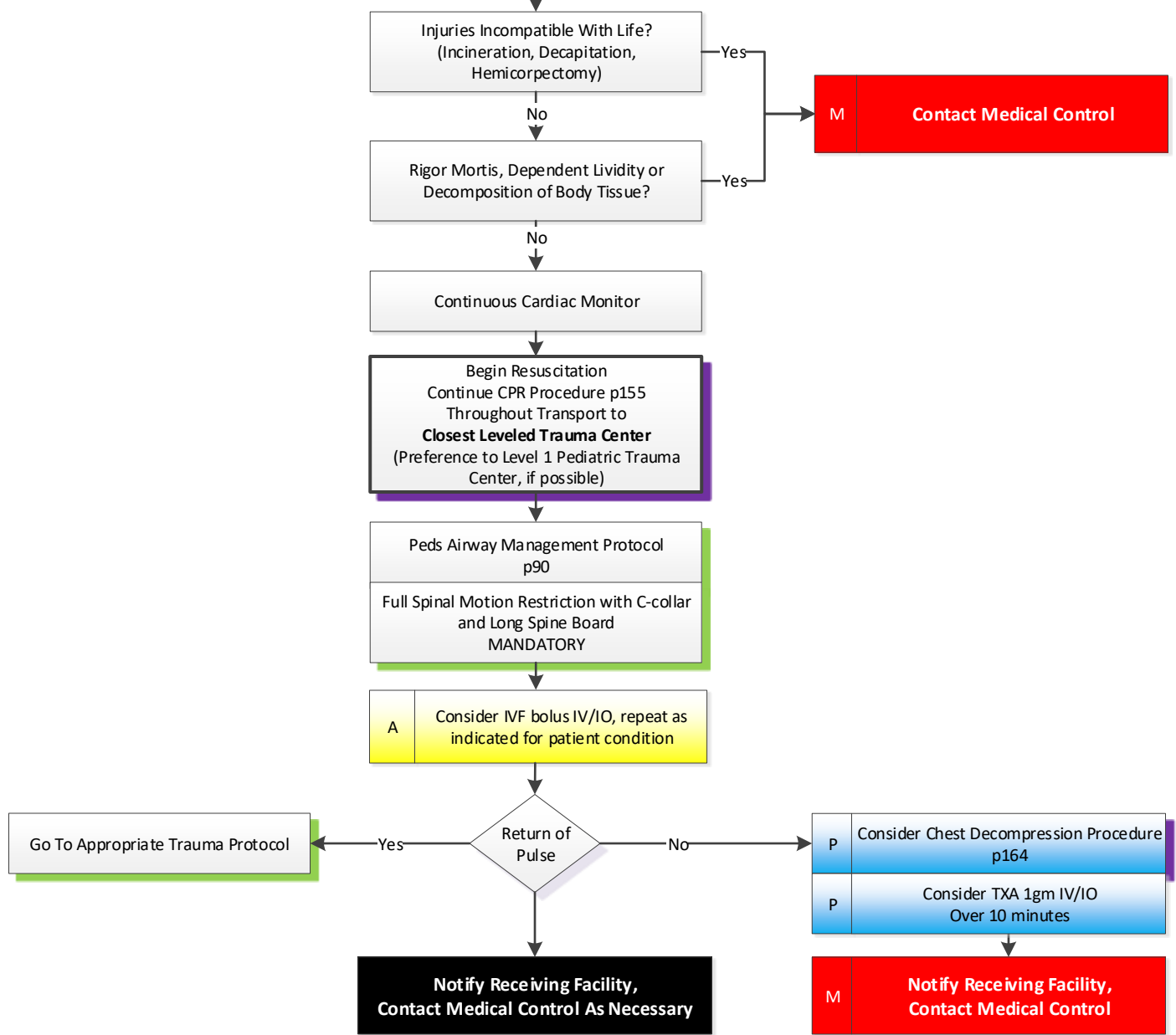


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Traumatic Cardiac Arrest – Peds, Trauma

Pertinent Positives and Negatives <ul style="list-style-type: none"> Age, if known Mechanism of Injury Events leading up to arrest 	Differential <ul style="list-style-type: none"> Hypovolemic Shock <ul style="list-style-type: none"> -External Hemorrhage -Internal Hemorrhage -Unstable Pelvic Fracture Tension Pneumothorax Medical Condition Causing Trauma (i.e. Cardiac Arrest)
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General Approach – Peds, Trauma



Pearls

REQUIRED EXAM: Pupillary Light Reflex, Palpation of Pulses, Heart and Lung Auscultation

- This protocol is compliant with the Joint Position Statement of the ACS, ACEP, NAEMSP and AAP and can be referenced here: [http://www.annemergmed.com/article/S0196-0644\(14\)00074-2/fulltext#sec6](http://www.annemergmed.com/article/S0196-0644(14)00074-2/fulltext#sec6)
- Injuries incompatible with life include; decapitation, incineration, massively deforming head or chest injury, dependent lividity, rigor mortis
- As with all trauma patients, DO NOT delay transport
- Consider using medical cardiac arrest protocols if uncertainty exists regarding etiology of arrest
- Use of a long spine board will make chest compressions more effective; however, if spinal immobilization interferes with CPR use reasonable effort to limit patient and spine movement
- Be aware that these may be crime scenes: do your best to avoid disturbing forensic evidence
- If provider safety becomes a concern, transport of deceased patients to the hospital *is acceptable*



Trauma Protocols - Pediatric



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Bites and Envenomations – Peds, Trauma

Pertinent Positives and Negatives

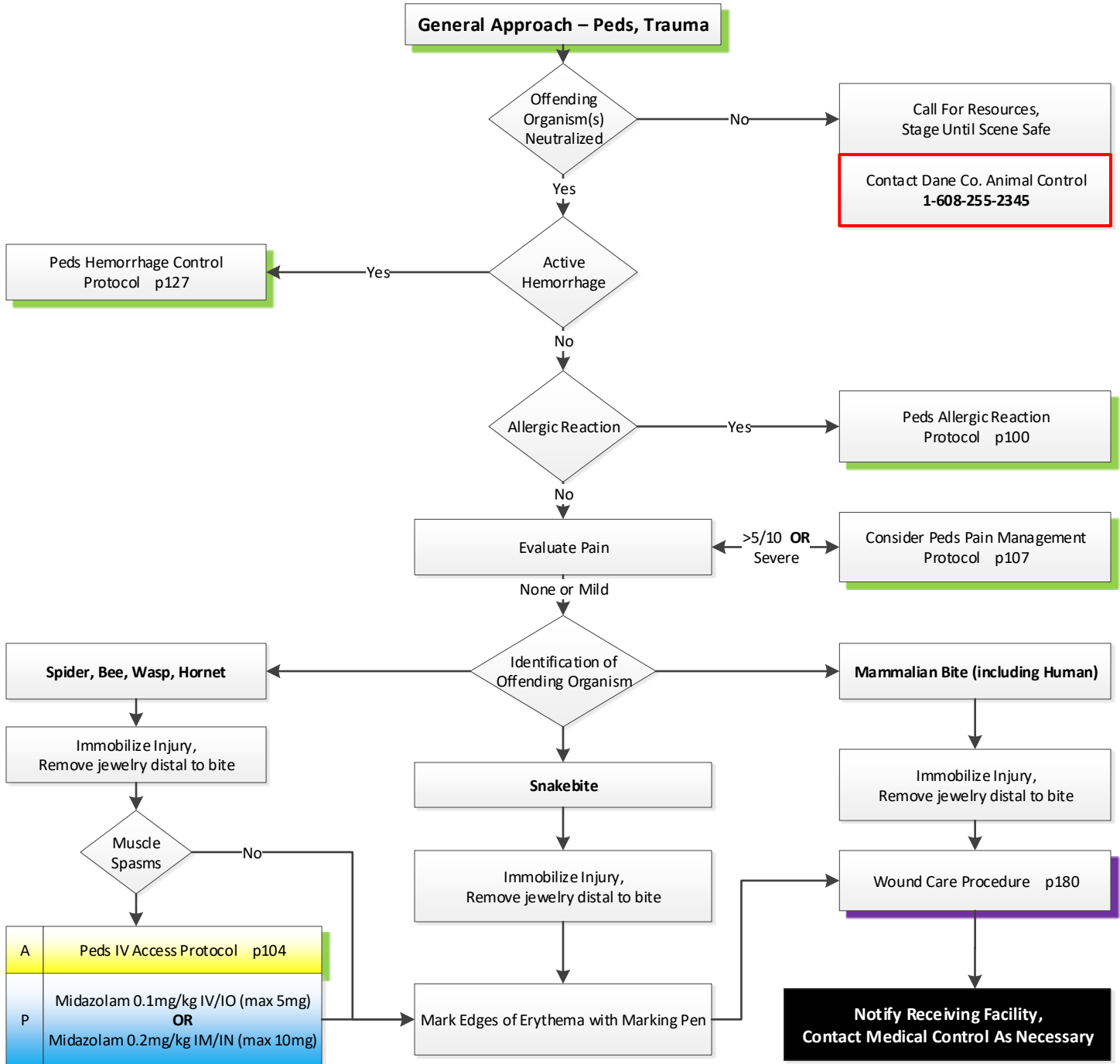
- Age, VS, Pulses distal to wound
- SAMPLE History
- OPQRST History
- Description or photo of offending creature
- Tetanus status

- Immunization History of Creature (if known)
- Domestic vs. Wild Animal
- Allergic Reaction
- Hypotension, Shock, Fever

Differential

- Penetrating Trauma
- Dry Bite (Snake)
- Abscess/Cellulitis
- Non-Accidental Trauma

General Approach – Peds, Trauma



Pearls

REQUIRED EXAM: VS, GCS, Evidence of Intoxication, Affected Extremity Neurovascular Exam

- Cat bites may not initially appear serious, but can progress rapidly to severe infection
- Human bites have higher rates of infection than animal bites and need to be evaluated in the Emergency Department for antibiotics
- Bites on the hands and lacerations over knuckles should be assumed to be "Fight Bites" until proven otherwise, and need evaluation
- It is not necessary to bring the offending insects, animals or reptiles to the ED for identification; this may result in added danger to others
- Brown recluse spider bites are usually painless at the time of bite. Pain and tissue necrosis develops over hours to days
- Immunocompromised patients have higher risk of infection – Think: Diabetes, Chemotherapy, Organ Transplant



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Burns – Peds, Trauma

Pertinent Positives and Negatives

- Age, VS
- SAMPLE History
- OPQRST History
- Mechanism of Burn (heat, gas, chemical)
- Time of Injury

- Singed Facial Hair
- Wheezing, Hoarseness
- Subjective Throat Swelling
- Loss of Consciousness

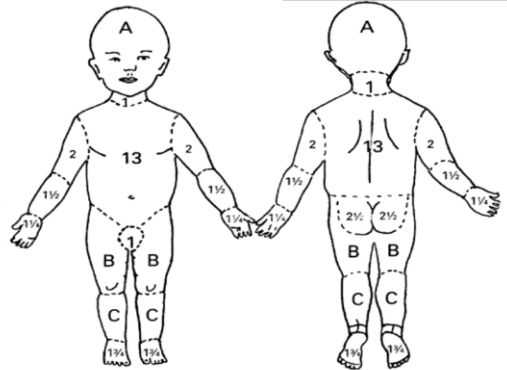
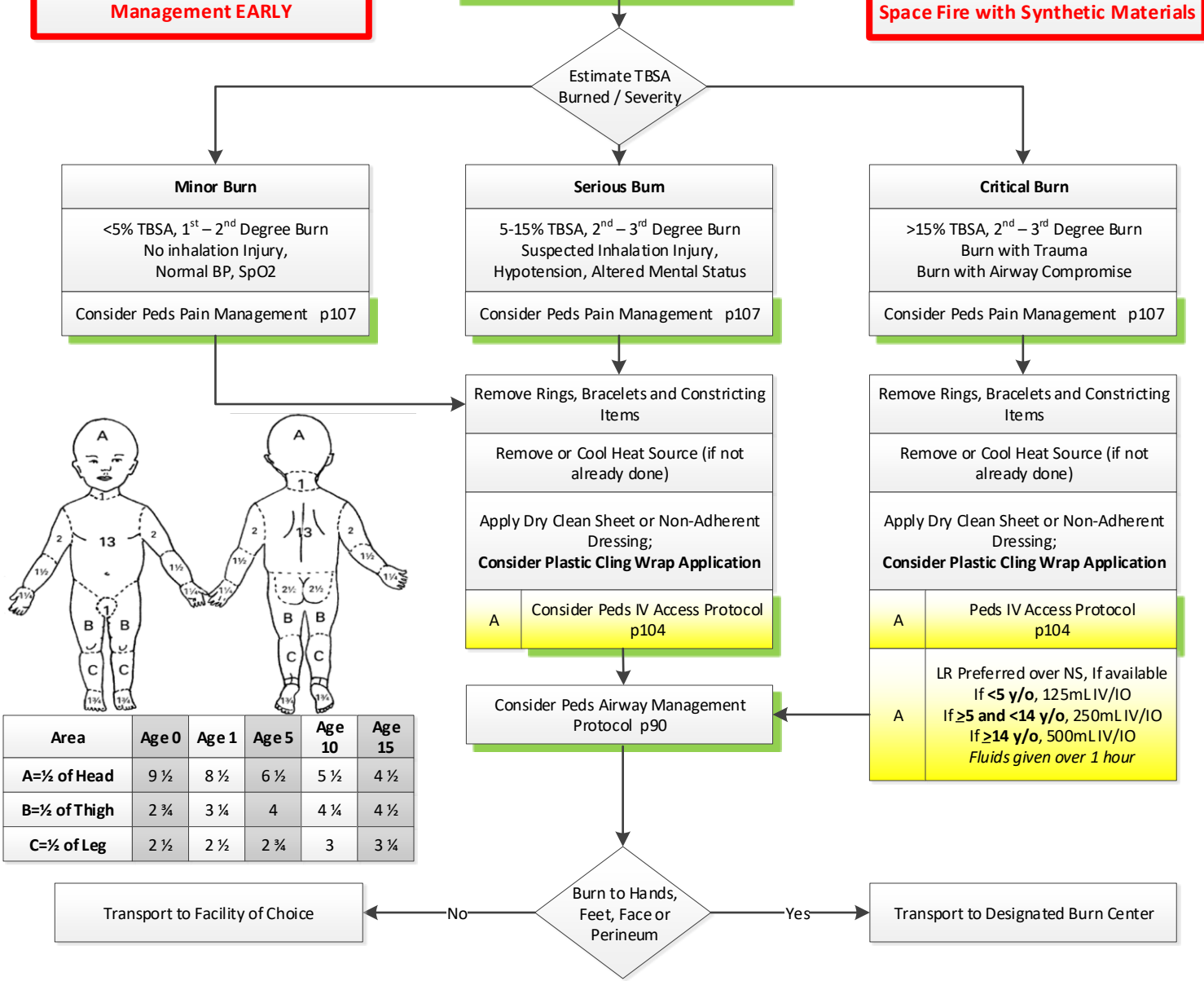
Differential

- Blast Injury
- Radiation Injury
- Electrical Injury
- Cyanokit Need?
- Cellulitis
- Dermatitis
- Drug Reaction (Stevens-Johnson Syndrome)

Consider Need for Airway Management EARLY

General Approach – Peds, Trauma

Consider CN Exposure for Enclosed Space Fire with Synthetic Materials



Area	Age 0	Age 1	Age 5	Age 10	Age 15
A=½ of Head	9 ½	8 ½	6 ½	5 ½	4 ½
B=½ of Thigh	2 ¾	3 ¼	4	4 ¼	4 ½
C=½ of Leg	2 ½	2 ½	2 ¾	3	3 ¼

Pearls

- REQUIRED EXAM: VS, GCS, Lung Sounds, HEENT, Posterior Pharynx**
- Safety First! Assure a Chemical source of burn is NOT a hazard to responders. Assure an Electrical source of burn is OFF or no longer contacting pt. Never overlook the possibility that a burn injury may be the result of child abuse / non-accidental trauma.
 - High Voltage Electrical Burns (>600 volts) require spinal immobilization, continuous cardiac monitor and IV access regardless of external appearance of injury
 - Chemical burns require removal of contaminated clothing, brush away dry powder before irrigation. Flush with copious warm water on scene and continue irrigation en route. Be sure to brush excess away and remove contaminated clothing BEFORE beginning irrigation Burns to face and eyes, remove contact lenses prior to irrigation
 - Early intubation is strongly recommended if suspicion of inhalation injury. Suspicion is high in patients involved in an enclosed space fire, who have facial burns or show signs of airway involvement; carbonaceous sputum, facial burns or edema, hoarseness, singed nasal hairs, agitation, hypoxia or cyanosis
 - **Indications of possible Cyanide Poisoning** - Exposure to fumes from burning Nitrile (polyurethane, vinyl) Seizures, coma, cardiac arrest, headache, vertigo and/or cherry red skin color from increased venous O2 concentration



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M Medical Control

Chest Injury – Peds, Trauma

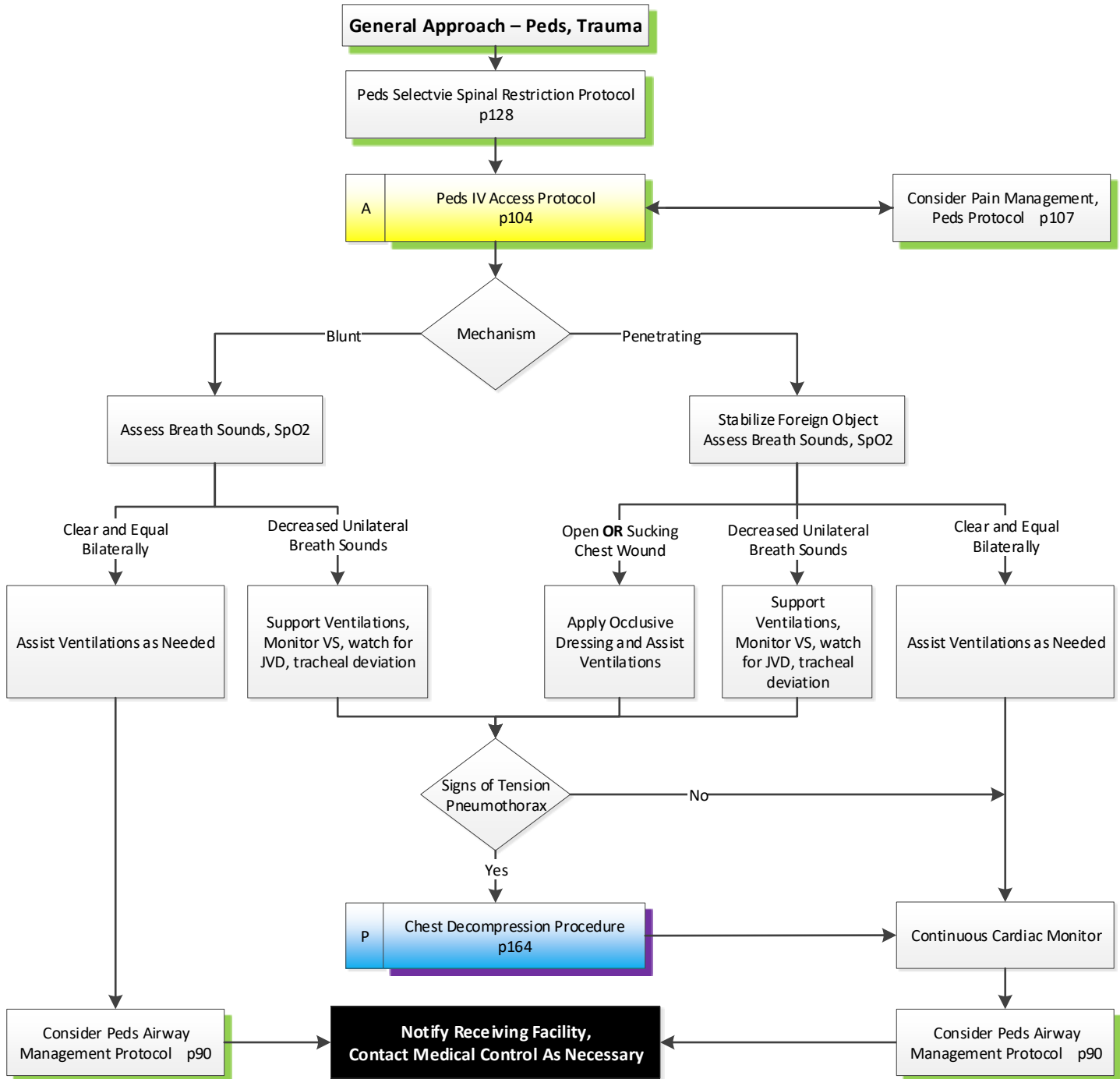
Pertinent Positives and Negatives

- Type of injury
- Mechanism (blunt vs. penetrating)
- Respiratory Effort, Adequacy
- Abnormal Breath Sounds (unilateral vs. bilateral)

- SAMPLE History
- OPQRST History
- Evidence of Intoxication
- Evidence of Multi-System Trauma

Differential

- Simple Pneumothorax
- Tension Pneumothorax
- Pericardial Tamponade
- Aortic Root Disruption
- Bronchial Tree Injury
- Tracheal Disruption
- Great Vessel Laceration
- Cardiac Contusion
- Cardiac Laceration



Pearls

- REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro**
- Consider tension pneumothorax in any patient with penetrating chest trauma, OR blunt chest trauma with decreased unilateral breath sounds, hypotension, tachycardia, hypoxia, tracheal deviation (late) or JVD (late)
 - Aortic root injuries, bronchial disruption and tracheal disruptions are common with major deceleration injuries (i.e. MVC)
 - Cardiac contusions are common with blunt chest trauma, and may present with ectopy, PVCs or even STEMI appearance on cardiac monitor
 - Pericardial Tamponade is a surgical emergency and needs rapid transport. Look for muffled heart tones, hypotension, tachycardia



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Prolonged Crush Injury – Peds, Trauma

Pertinent Positives and Negatives

- Age, VS, GCS
- SAMPLE History
- OPQRST History
- Crushed under heavy load ≥30 min
- Building collapse, trench collapse, industrial accident, heavy equipment pinning

Differential

- Compartment Syndrome
- Entrapment without Crush
- Fracture, Sprain, Strain
- Pelvic Fracture
- Hypothermia

General Approach – Peds, Trauma

A	Peds IV Access Protocol p104
A	Consider IVF bolus IV/IO, repeat as indicated for patient condition

Management of Crush Injury Patient
Crush Injury should be suspected in prolonged pinnings >1 hour, AND proximal to the knee or elbow.

This protocol is **NOT** intended for hands or feet trapped in machinery or farm equipment

Continuous Cardiac Monitor

12-Lead ECG Procedure p129 (when possible)

Hemodynamically Unstable

Yes

P Sodium Bicarbonate 1mEq/kg IV/IO
AND*
Calcium Chloride 20mg/kg IV/IO over 3 min, max 1g

No

Go To Appropriate Peds Cardiac Arrest Protocol

At risk of crush syndrome hyperkalemia/rhabdo

Yes

Immediately Prior to Extrication

P	Sodium Bicarbonate 1mEq IV/IO AND* Calcium Chloride 20mg IV/IO over 3 min
	Albuterol 2.5mg/3mL Neb Repeat as needed to run continuously

No

Consider Peds Pain Management Protocol p107

Peds Shock / Hypotension Protocol p110

Monitor and Reassess for Fluid Overload

Notify Receiving Facility, Contact Medical Control As Necessary

Pearls

REQUIRED EXAM: Vital Signs, GCS, Lung Sounds, Neuro Exam, Musculoskeletal Exam

- Structural Collapse, Crush Scenes are often full of hazards, provider safety is the most important consideration
- Patients may become hypothermic, even in warm environments
 - Hypothermia can lead to coagulopathy, which will increase bleeding times and have worse outcomes for the patient
- Crush injuries can result in hyperkalemia from shift of Potassium out of injured cells. Cardiac monitoring is required and 12-lead ECG preferred whenever possible (as dictated by the situation)
- Monitor extremities for signs of compartment syndrome after crush injury; **Pain, Pallor, Paresthesias, Paralysis, Pulselessness** and **Poikilothermia** (inability to regulate core body temperature)
- * Sodium Bicarb Infusion: 1mEq/kg added to 1L NS, administered 20mL/kg IV just prior to extrication
- **Utilize different IV lines or flush between bicarb and calcium to prevent precipitation in the line



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Near-Drowning / Submersion Injury – Peds, Trauma

Pertinent Positives and Negatives

- Submersion in water regardless of depth
- SAMPLE History
- OPQRST History
- Temperature of water
- Mental Status Changes
- Degree of Water Contamination
- Vomiting
- Coughing, Wheezing, Rales, Rhonchi, Stridor

Differential

- Spinal Trauma
- Pre-Existing Medical Condition
- Hypothermia
- Aspiration
- The Bends
- Pressure Injury
- Barotrauma
- Decompression Sickness
- Post-Immersion Syndrome

General Approach – Peds, Trauma



Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- Have a HIGH index of suspicion for possible spinal injuries. Any diving injury or submersion with unclear details should be fully immobilized
- Hypothermia is often associated with near-drowning and submersion injuries. Consider the Hypothermia Protocol as appropriate
- All patients with Near-Drowning / Submersion Injury should be transported for evaluation due to delayed presentation of respiratory failure
- With diving injuries (decompression / barotrauma) consider availability of a hyperbaric chamber; contact Medical Control early.
- Near-drowning patients who are awake and cooperative but with respiratory distress may benefit from CPAP / Positive Pressure Ventilation



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Environmental, Hyperthermia – Peds, Trauma

Pertinent Positives and Negatives

- Age, VS, Mental Status
- SAMPLE History
- OPQRST History
- Time and length of exposure to hot environment

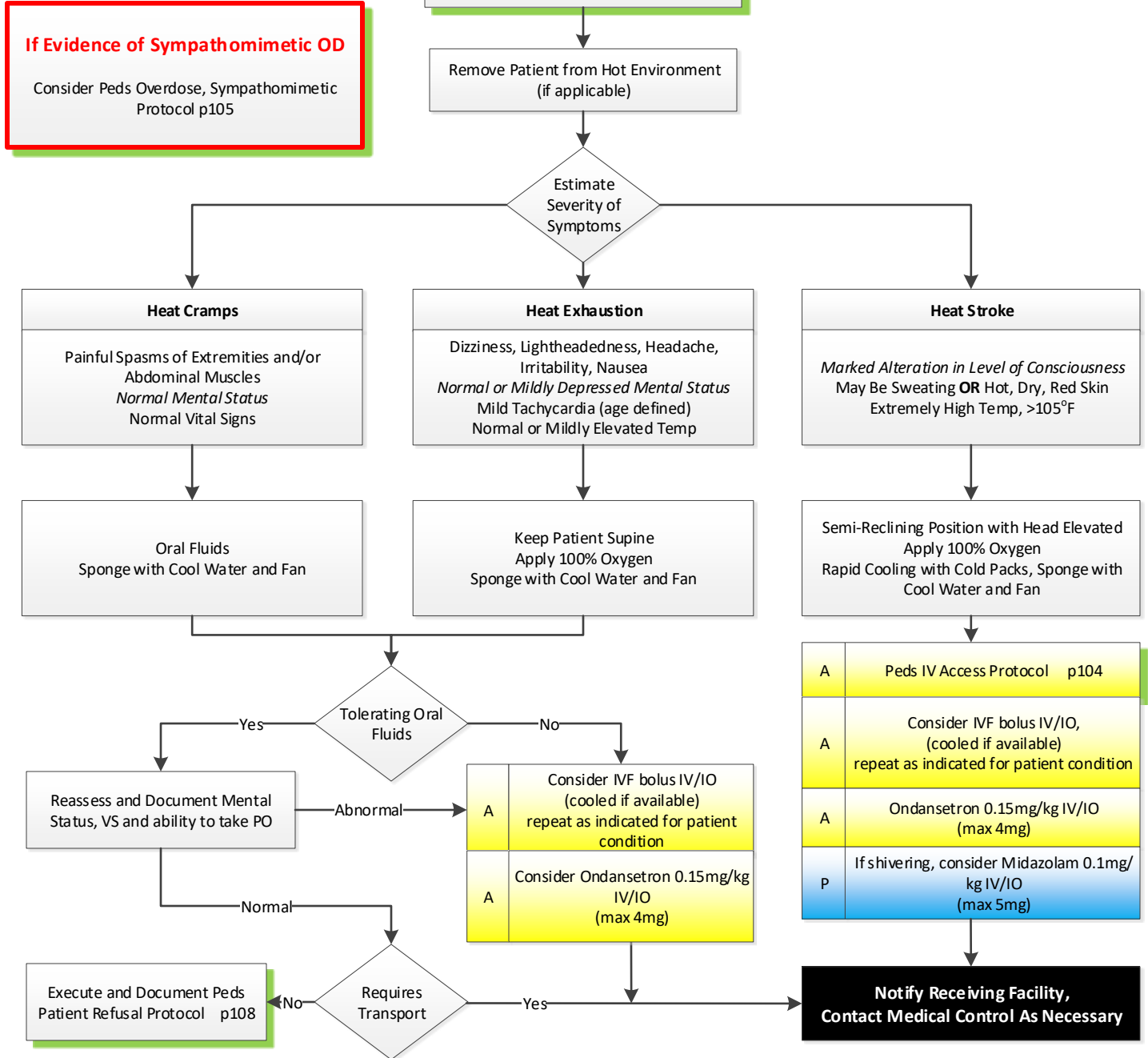
- Hot, dry or sweaty skin
- Seizures
- Nausea
- Hypotension, Shock, Fever

Differential

- Alcohol Withdrawal (DTs)
- Hyperthyroidism (Thyroid Storm)
- Dehydration
- Cocaine or Sympathomimetic OD
- Sepsis

- CNS Lesion or Head Injury
- Abuse or Neglect (Elderly or disabled)
- Medication (Serotonin Syndrome, Malignant Hyperthermia)

General Approach – Peds, Trauma



Pearls

REQUIRED EXAM: VS, GCS, Skin, HEENT, Neuro, Evidence of Intoxication, Mental Status

- Extremes of Age are more prone to heat emergencies due to inability to easily self-extricate from hot environments
- Patients on Tricyclic Antidepressants, Anticholinergics, Diuretics (i.e. Lasix) are more susceptible to heat emergencies due to medication effects
- Cocaine, amphetamines and salicylates all may elevate body temperature or interfere with the ability to auto-regulate
- Sweating generally disappears as body temperature rises above 104°F
- If Heat Cramps resolved without IV Access or Medications, patients may refuse transport, **IF** tolerating oral fluids **and** VS normal



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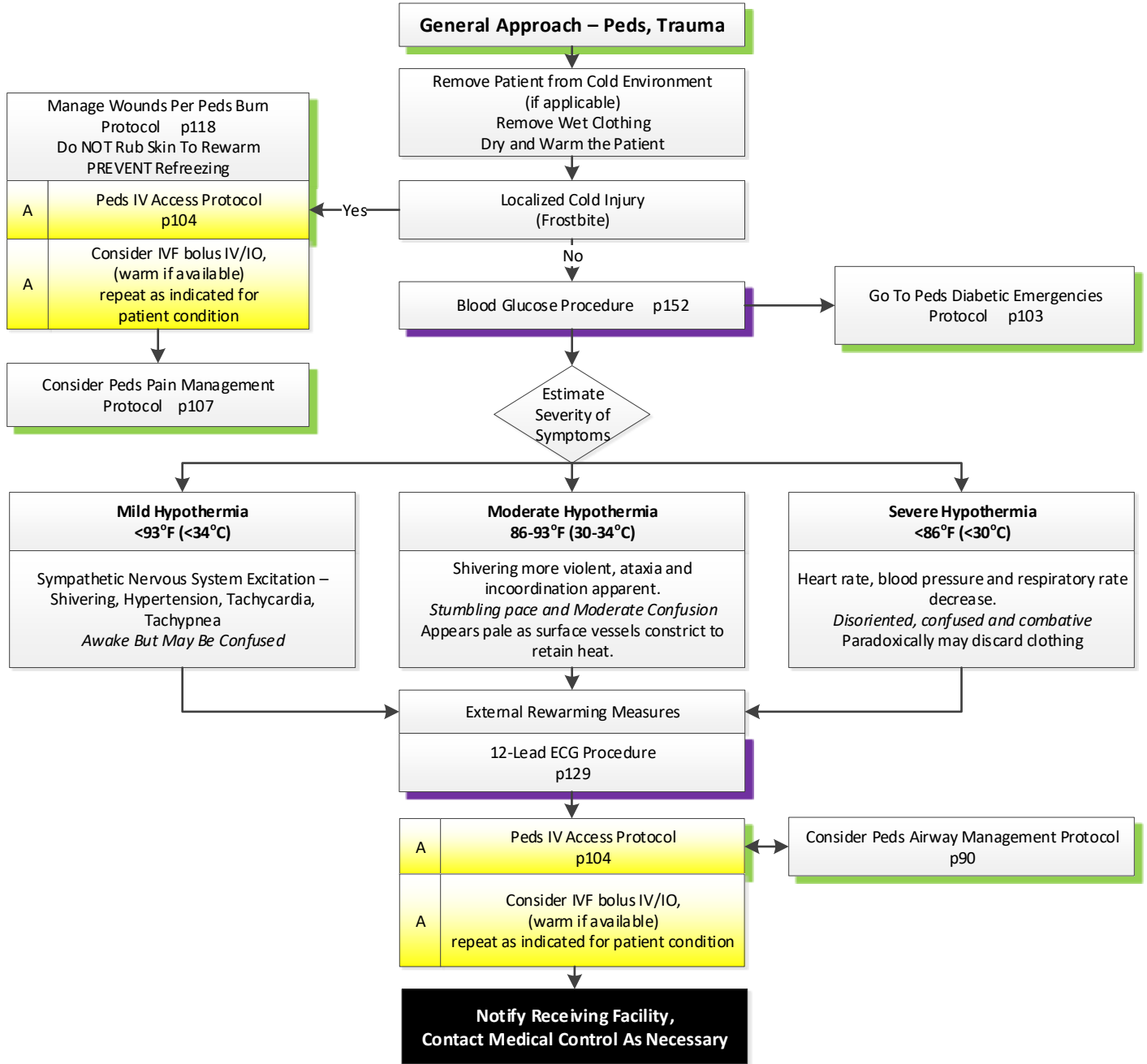


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Environmental, Hypothermia – Peds, Trauma

- | | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Pertinent Positives and Negatives</p> <ul style="list-style-type: none"> • Age, VS, Mental Status • SAMPLE History • OPQRST History • Time and length of exposure to cold environment | <ul style="list-style-type: none"> • Cold or clammy skin • Confusion • Arrhythmias, J-waves on ECG • Hypotension, Shock | <p>Differential</p> <ul style="list-style-type: none"> • Alcohol Intoxication • Hypothyroidism (Myxedema Coma) • Dehydration • Sepsis | <ul style="list-style-type: none"> • CNS Lesion or Head Injury • Abuse or Neglect (Elderly or disabled) • Medication (beta blocker overdose, opiate overdose) |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



Pearls

REQUIRED EXAM: VS, GCS, Skin, HEENT, Neuro, Evidence of Intoxication, Mental Status

- Consider ECMO early if patient arrests
- Hypoglycemia is found in many hypothermic patients, because hypothermia may be a result of hypoglycemia
- Severe hypothermia may cause myocardial irritability and rough handling can theoretically cause V-fib. Please handle carefully.
-Do not withhold advanced airway or CPR for this concern, but only the most experienced provider available should *gently* attempt advanced airway
- Below 86°F (30°C), antiarrhythmics may not be effective. If given, they should be given at reduced intervals. Do NOT attempt to pace below 86°F. If antiarrhythmics necessary for severely hypothermic patient, Contact Medical Control
- Extremes of age, malnutrition, EtOH and drug abuse and outdoor hobbies / employment all predispose to hypothermia



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Extremity Injury – Peds, Trauma

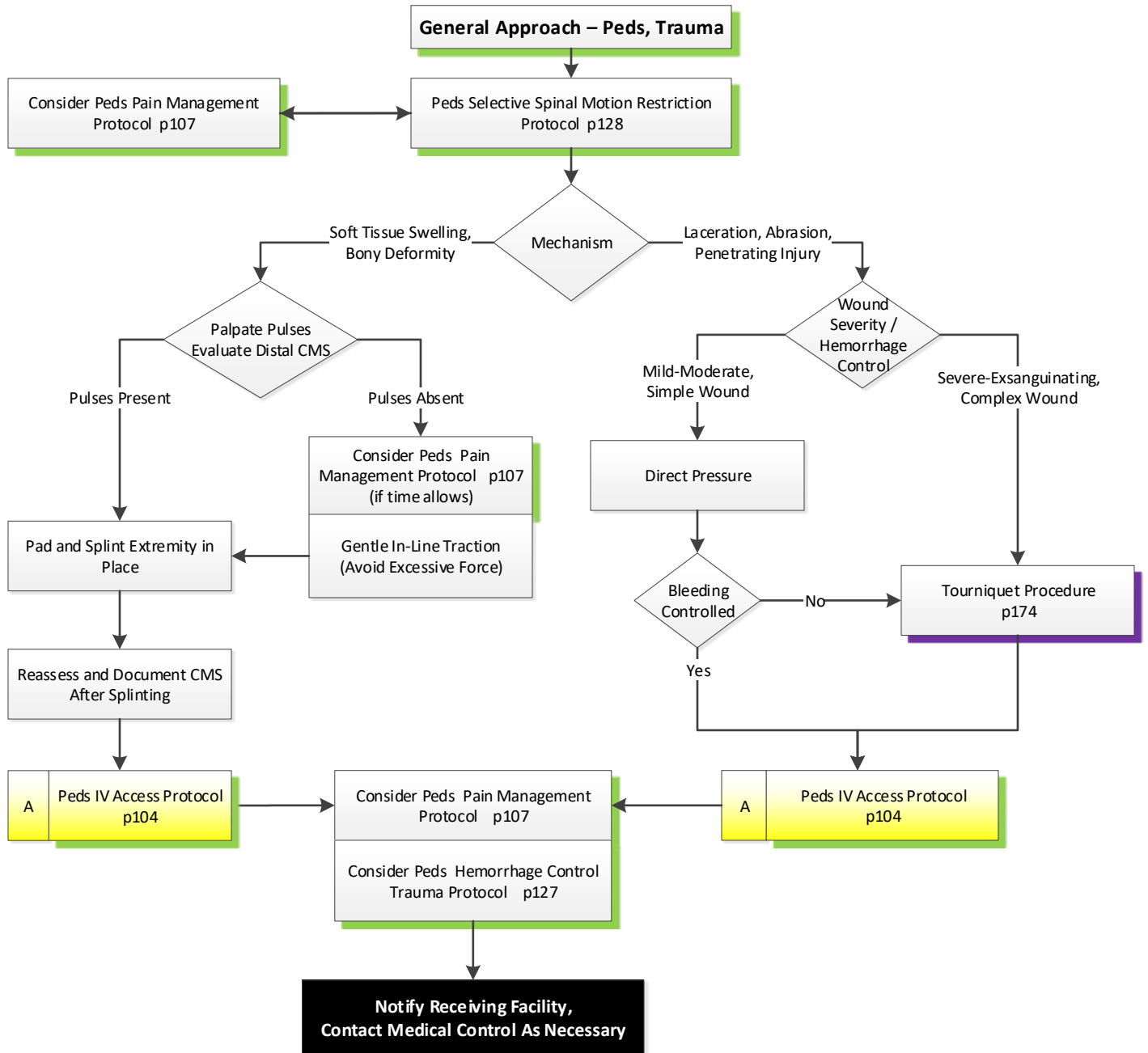
Pertinent Positives and Negatives

- Type of injury
- Mechanism (blunt vs. penetrating)
- Central and Peripheral Pulses
- Neuro Function Distal to Injury

- SAMPLE History
- OPQRST History
- Evidence of Intoxication
- Evidence of Multi-System Trauma

Differential

- Vascular Disruption
- Amputation
- Fracture, Dislocation
- Sprain, Strain
- Abrasion
- Contusion
- Laceration
- Compartment Syndrome



Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- Immobilization of bony injuries should include the joint above and below. Joint injuries require immobilization of bone above and below
- Palpate and document Circulation, Movement and Sensation both before and after splint application
- Tourniquets should remain in place once hemorrhage control is adequate. The tourniquet is tight enough when the bleeding stops!
- If active hemorrhage and bony/soft tissue deformity, priority should be put on hemorrhage control *first*, then splinting – remember A,B,C's
- If amputated extremities available, seal in a plastic bag and place in cool water and bring to the hospital with the patient



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Eye Pain – Peds, Trauma

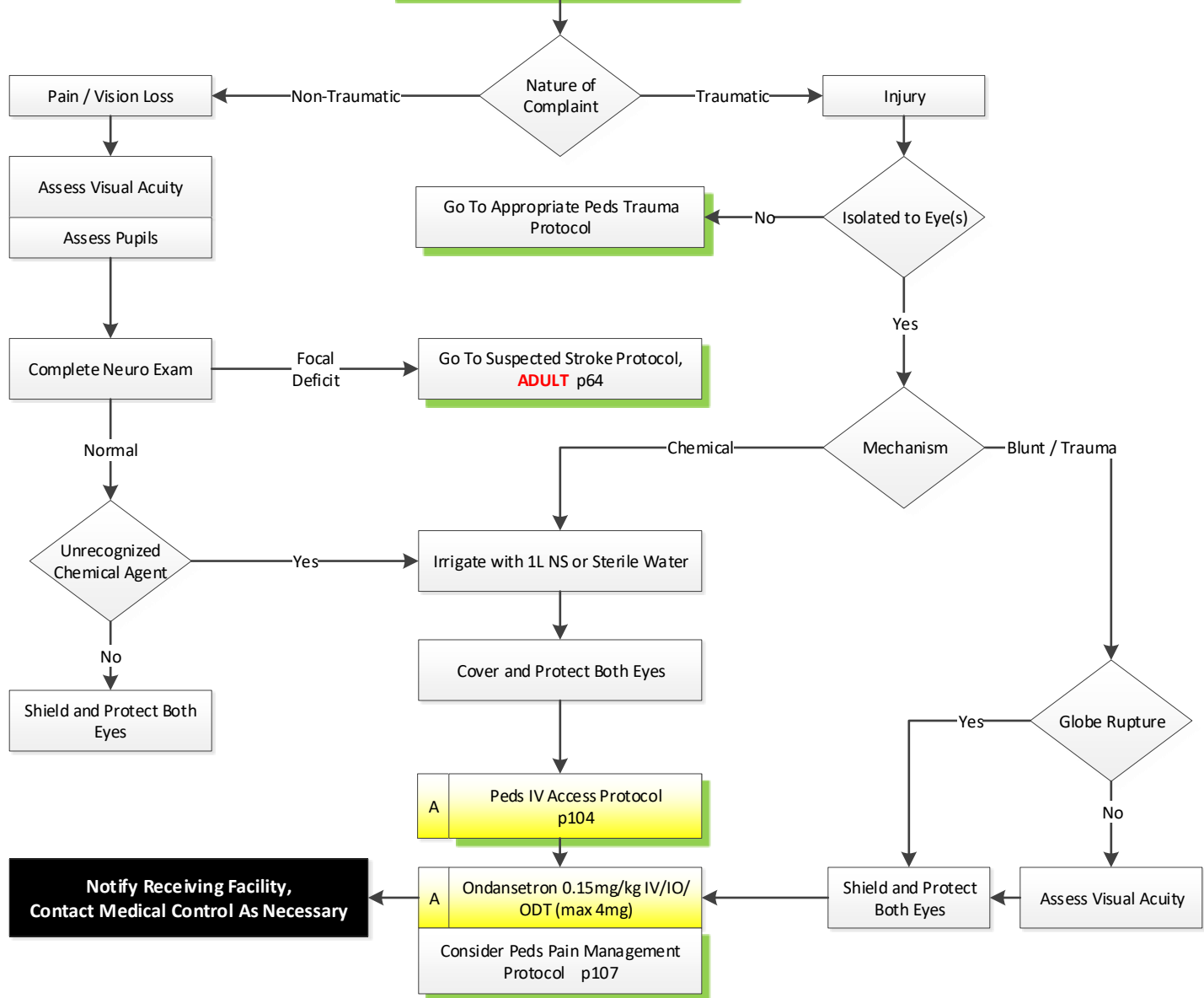
Pertinent Positives and Negatives

- Age, VS, Visual Acuity
- SAMPLE History
- OPQRST History
- Time of Injury
- Involved Chemical MSDS
- Contact / Corrective Lens Use
- “Shooting” or “Streaking” Lights
- Rust Ring
- “Lowering Shade” in Vision

Differential

- Globe Rupture
- Acute Closed Angle Glaucoma
- Stroke
- Retinal Artery Occlusion
- Chemical Burn
- Retinal Venous Thrombus

General Approach – Peds, Trauma



Pearls

REQUIRED EXAM: VS, GCS, Visual Acuity, Neuro Exam, Extraocular Movements

- Stabilize any penetrating objects. DO NOT remove any embedded / impaled objects
- If Long Spine Board not indicated, transport with head of stretcher elevated to 60 degrees to help reduce intraocular pressure
- Remove contact lenses when possible
- Always cover both eyes to prevent further injury
- Orbital fractures increase concern for globe or optic nerve injury; follow visual acuity and extraocular movements for changes
- Normal visual acuity can be present, even with severe injury



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Head Injury – Peds, Trauma

Pertinent Positives and Negatives

- Type of injury
- Mechanism (blunt vs. penetrating)
- Loss Of Consciousness
- Vomiting, Altered Mental Status

- SAMPLE History
- OPQRST History
- Evidence of Intoxication
- Evidence of Multi-System Trauma

Differential

- Skull fracture
- Epidural hematoma
- Concussion, Contusion, Laceration, Hematoma
- Non-Accidental Trauma
- Spinal Cord Injury
- Subdural Hematoma
- Subarachnoid Hemorrhage

General Approach – Peds, Trauma

Elevate Head of Stretcher 15-30 degrees while maintaining Spinal Precautions

Peds Selective Spinal Motion Restriction Protocol p128

Nasal Airways are CONTRAINDICATED in patients with significant Maxillofacial trauma – the cribriform plate may be broken and result in an NPA going into the patient's brain

Peds Diabetic Emergencies Protocol p103

Lower than Appropriate

Blood Glucose

Severe Head Injury Cases Should Be Transported to The Peds Trauma Center, Unless Patient Condition Dictates

Within Appropriate Range

Consider Midazolam 0.1mg/kg IV/IO (max 5mg) or 0.2mg/kg IN/IM (max 10mg) or Lorazepam 0.1mg/kg IV/IO/IM (max 2mg)

Agitation

Altered Mentation

Peds Seizure Protocol p109

Peds Airway Management Protocol p90

If evidence of herniation, Goal EtCO₂ is 30-35mmHg

Increase Respiratory Rate
 <1 year of age, 35bpm
 ≥1 year of age, 25bpm

Consider TXA 15mg/kg N/IO (max 1gm) over 10min

≤8

Document GCS

Consider Peds Airway Management Protocol p90

Consider TXA 15mg/kg IV/IO (max 1gm) over 10min

Maintain SpO₂ >93%
 Goal EtCO₂ 35-45mmHg

Peds IV Access Protocol p104

Peds Pain Management Protocol p107

≥6/10

Pain

<6/10

Monitor and Reassess Frequent Airway and GCS Evaluations

Document Response to Meds, Repeat GCS, SpO₂, EtCO₂

Notify Receiving Facility, Contact Medical Control As Necessary

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- If GCS ≤13 consider Air transport or Rapid Transport to Leveled Trauma Facility
- **Airway interventions can be detrimental to patients with head injury by raising intracranial pressure, worsening hypoxia (causing secondary brain injury) and increasing risk of aspiration. Whenever possible these patients should be managed in the least invasive manner to safely maintain O₂ saturation >90% (ie. NRB, BVM with 100% O₂, etc.)**
- Acute herniation should be suspected when the following signs are present: acute unilateral dilated and non-reactive pupil, abrupt deterioration in mental status, abrupt onset of motor posturing, abrupt increase in blood pressure, abrupt decrease in heart rate.
- **Only** in suspected acute herniation – increase ventilatory rate with target EtCO₂ 30-35mmHg
- Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushings response)
- Hypotension usually indicates injury or shock unrelated to the head injury and should be treated aggressively
- Most important vital sign to monitor and document is level of consciousness (GCS)
- Concussions are periods of confusion or loss of consciousness (LOC) associated with trauma which may have resolved by the time EMS arrives. Any confusion or mental status abnormality should be transported to an Emergency Department. **Any questions or clarifications, contact Medical Control.**



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Hemorrhage Control – Peds, Trauma

Pertinent Positives and Negatives

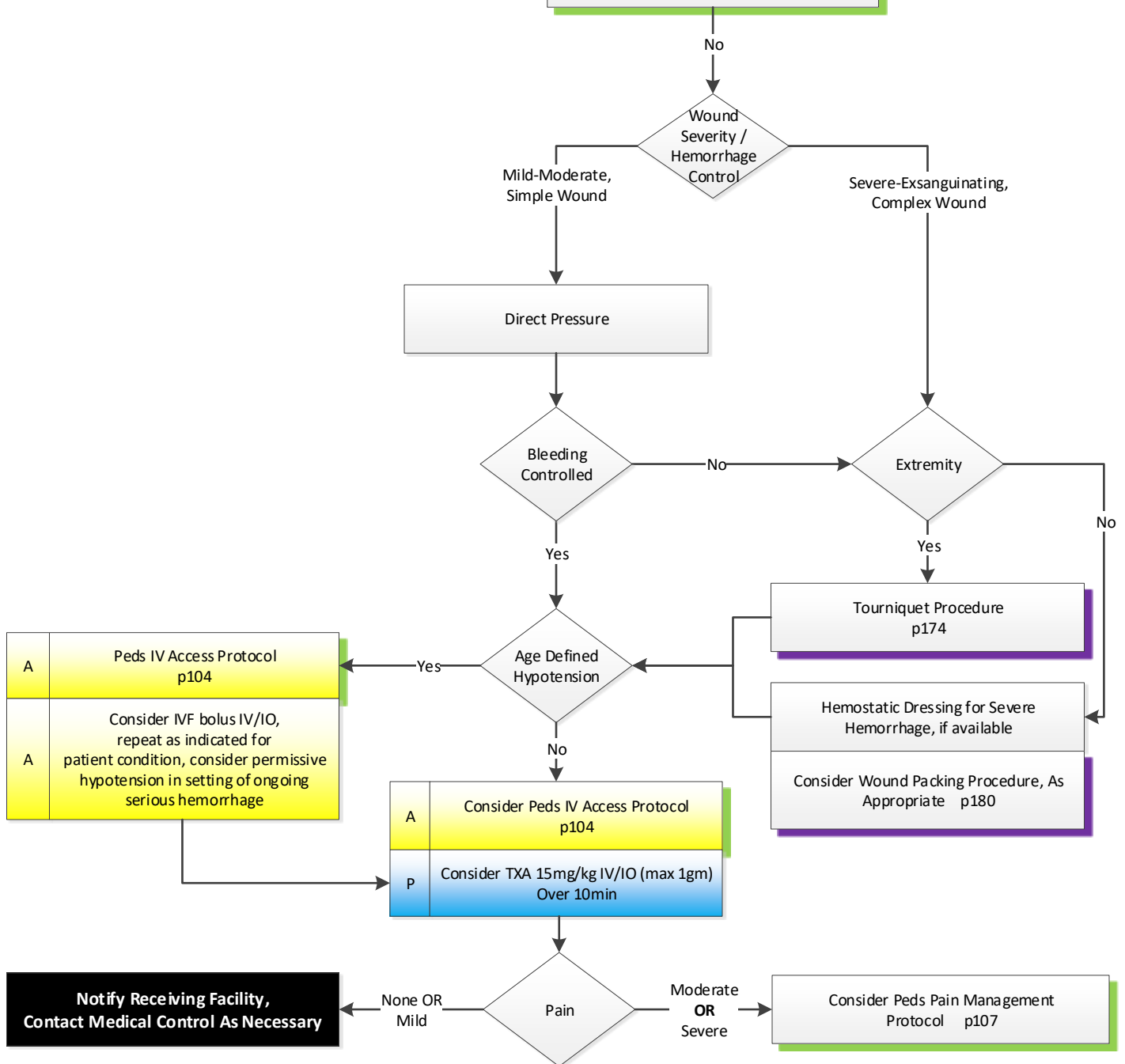
- Type of injury
- Mechanism (blunt vs. penetrating)
- Central and Peripheral Pulses
- Neuro Function Distal to Injury

- Time of Injury
- Deformity
- Diminished pulse / capillary refill

Differential

- Vascular Disruption
- Amputation
- Fracture, Dislocation
- Sprain, Strain
- Abrasion
- Contusion
- Laceration
- Compartment Syndrome

General Approach – Peds, Trauma



Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- Hypotension in trauma needs blood products early, so minimize scene time. Goal for scene time in major trauma cases should be <10 min
- Multiple casualty incident or obvious life threatening hemorrhage, consider Tourniquet Procedure and/or Hemostatic Dressing FIRST
- Hemostatic Dressings are appropriate for hemorrhage that can't be controlled with a tourniquet, such as junctional wounds in the groin or axilla.
- Remember - hemostatic agents are contraindicated in wounds that violate the thoracic or abdominal cavity; if unsure, use sterile roll gauze.
- Signs/Symptoms of Shock include: altered mental status, pallor, cap refill >3 sec, faint/absent peripheral pulses, hypotension (age defined)



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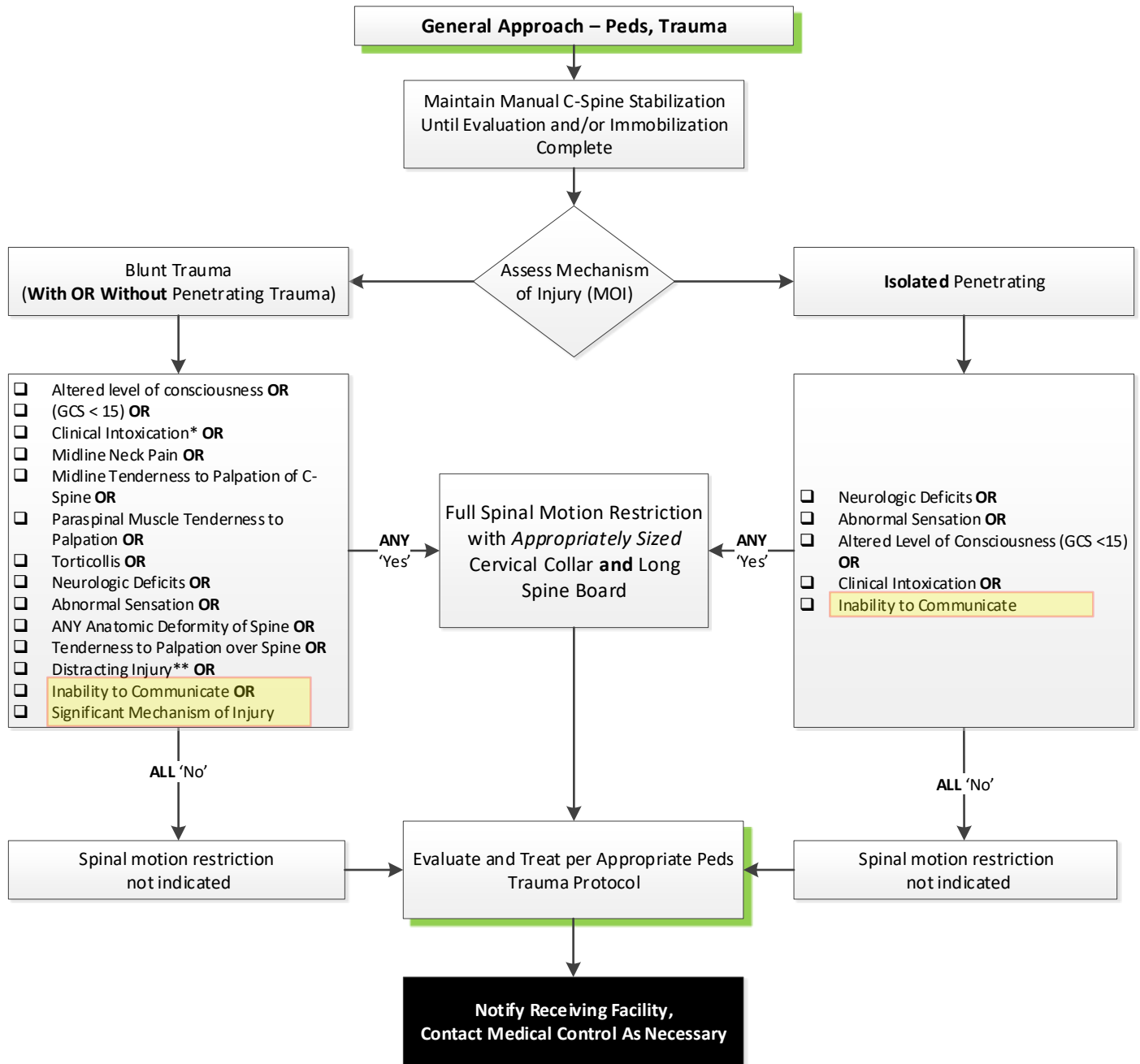
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Selective Spinal Motion Restriction - Peds, Trauma



Pearls

REQUIRED EXAM: Motor Function both upper and lower extremities, Sensation of upper and lower extremities, subjective abnormal sensation, Tenderness to palpation of bony prominences OR paraspinal muscles

- ***Clinical Intoxication** – A transient condition resulting in disturbances in level of consciousness, cognition, perception, affect or behavior, or other psychophysiological functions and responses. Common examples include; ataxia, emotional instability, flight of ideas, tangential thought or motor incoordination.
- ****Distracting Injury** – Examples include, but are not limited to: long bone fracture, dislocations, large lacerations, deforming injuries, burns OR any condition preventing patient cooperation with history.
- Torticollis, also known as wryneck, is a twisting of the neck that causes the head to rotate and tilt at an odd angle.
- It is always safer and better patient care to assume that a Spinal Cord injury has occurred and provide protection, and should be the standard of care in trauma patient management
- Rigid cervical collars and long spine boards have risks and benefits for patients. Spinal immobilization should always be applied when **any** doubt exists about the possibility of spinal trauma.
- EXTREMELY thoughtful consideration and careful physical exam should be part of any decision to apply or not apply the spinal immobilization, and *must be well documented*.



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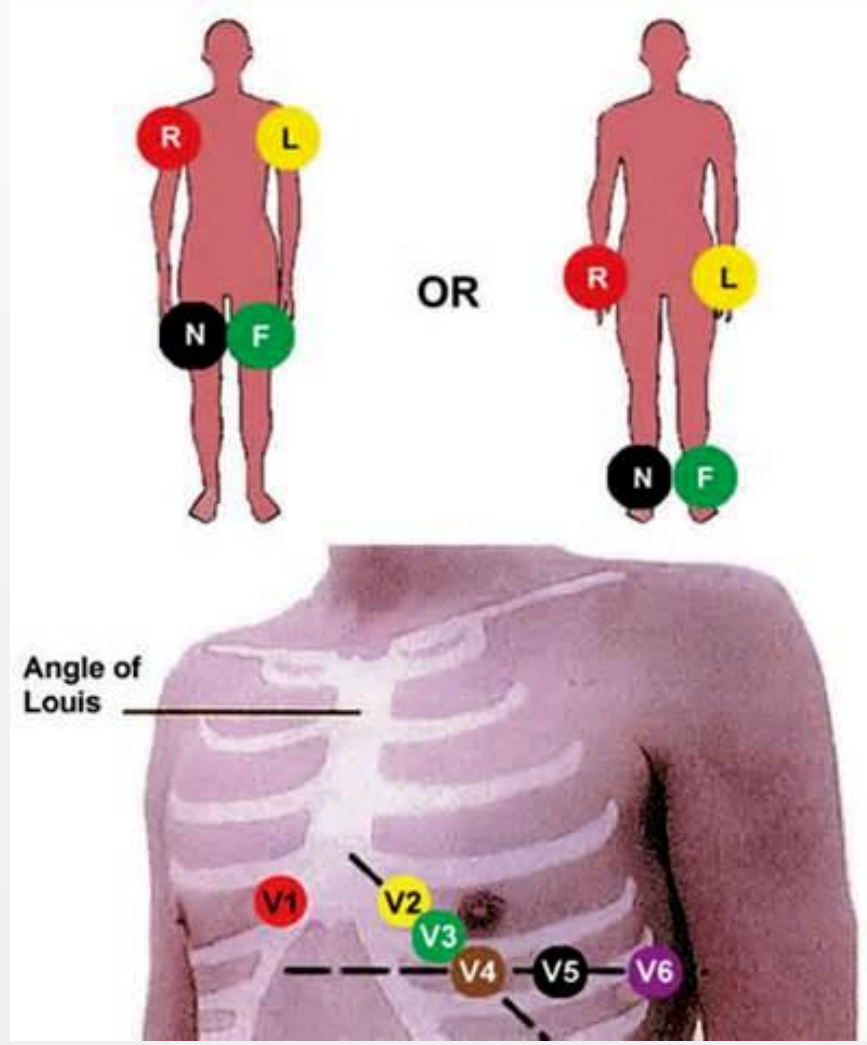
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ECG, 12-Lead - Procedures

Procedure:

- 1. Prepare ECG monitor and connect patient cable to electrodes
- 2. Expose chest and prep as necessary. Modesty of the patient should be respected.
- 3. Apply chest leads and extremity leads using the following landmarks: (Distal to shoulder and distal to hip joint for most accurate ECG)
 - 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
- 4. Instruct patient to remain still, minimize artifact as able (examples include stopping motion of ambulance and instructing patient to remain still)
- 5. Press the brand specific button to acquire the 12-Lead ECG (complete age and gender questions correctly)
- 6. Provide 12 Lead to hospital staff, transmit when appropriate
- 7. Document the procedure, time, and results on/with the PCR



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ECG, Right-Sided - Procedures

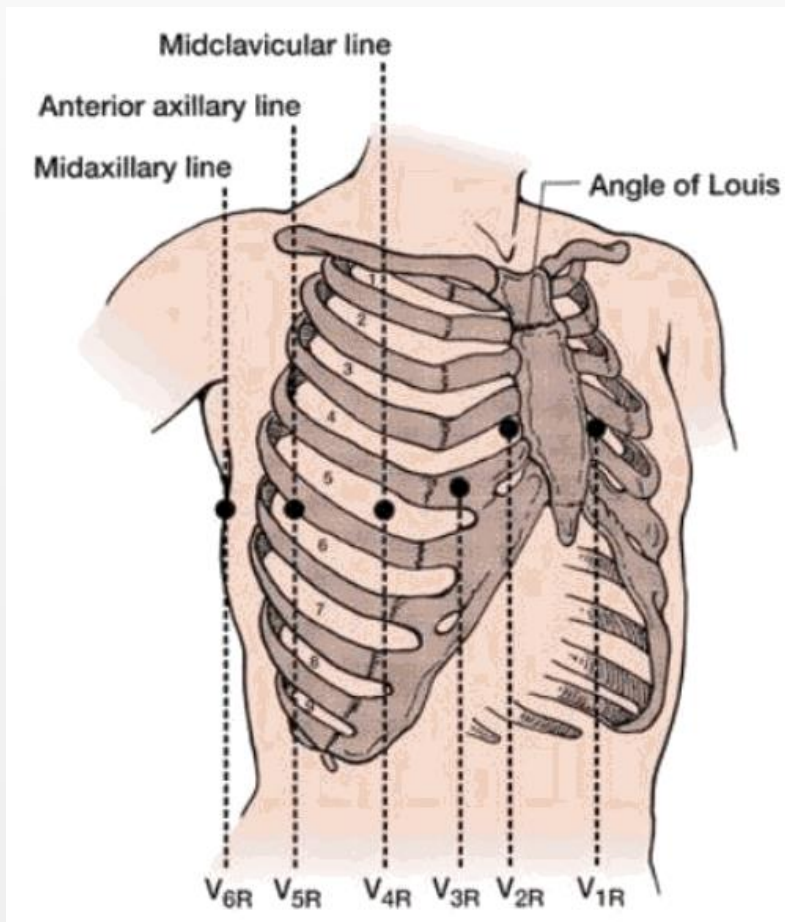
To detect right ventricular STEMI associated with occlusion of the Right Coronary Artery, obtain a Right Sided ECG.

Indications of a Right Ventricle Wall infarct may include:

- ST elevation in the inferior leads, II, III and aVF
 - ST elevation that is greatest in lead III is especially significant
- ST elevation in V1 (the only precordial lead that faces the RV on standard 12-lead ECG)
- Right Bundle Branch Block, 2nd and 3rd Degree AV Blocks, ST elevation in V2 50% greater than the ST depression in aVF

Procedure:

- 1. Prepare ECG monitor and connect patient cable to electrodes
- 2. Expose chest and prep as necessary. Modesty of the patient should be respected.
- 3. Apply chest leads and extremity leads using the following landmarks: (Distal to shoulder and distal to hip joint for most accurate ECG)
 - V1R: 4th intercostal space, left sternal border
 - V2R: 4th intercostal space, right sternal border
 - V3R: halfway between V2R and V4R, on a diagonal line
 - V4R: 5th intercostal space, right midclavicular line, same horizontal line as V5R and V6R
 - V5R: right anterior axillary line, same horizontal line as V4R and V6R
 - V6R: right mid-axillary line, same horizontal line as V4R and V5R
- 4. Instruct patient to remain still, minimize artifact as able (examples include stopping motion of ambulance and instructing patient to remain still)
- 5. Press the brand specific button to acquire the 12-Lead ECG (complete age and gender questions correctly)
- 6. Provide Right Sided ECG to hospital staff, transmit when appropriate
- 7. Document the procedure, time, and results in the electronic Patient Care Report (ePCR)



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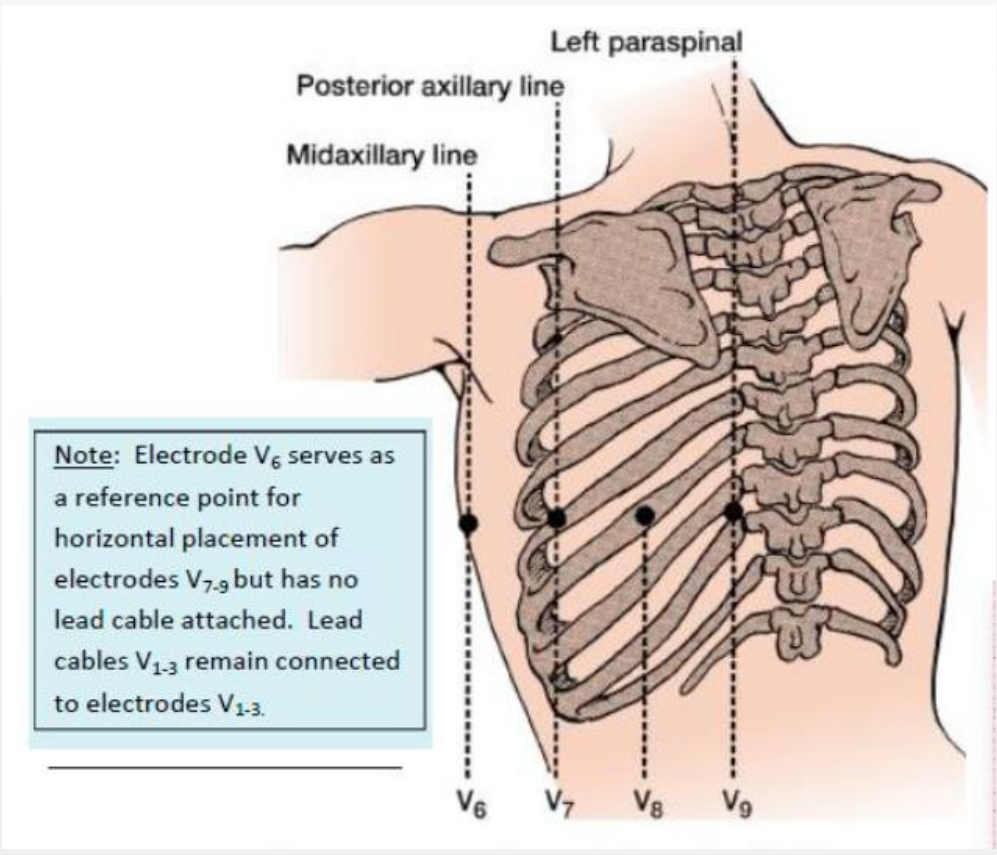
ECG, Posterior - Procedures

To detect posterior STEMI associated with occlusion of the circumflex artery or dominant right coronary artery, obtain a posterior ECG. Indications of a posterior wall infarction may include:

- Changes in V1-V3 on the standard 12-lead ECG predominantly, which include
 - Horizontal ST depression
 - A tall, upright T-wave
 - A tall, wide R-wave
 - R/S wave ratio greater than one
- Inferior or lateral wall MI (especially if accompanied by ST depression or prominent R waves in leads V1-V3)

Procedure:

- 1. Prepare ECG monitor and connect patient cable to electrodes
- 2. Expose chest and prep as necessary. Modesty of the patient should be respected.
- 3. Place three additional ECG electrodes. TIP: start at V9 (the last electrode) and work forward
 - V9: Left spinal border, same horizontal line as V4-6
 - V8: midscapular line, same horizontal line as V7 and V9
 - V7: posterior axillary line, same horizontal line as V4-6
- 4. Place ECG lead cables as follows (using standard 12-Lead)
 - Lead cable V6 connects to electrode V9
 - Lead cable V5 connects to electrode V8
 - Lead cable V4 connects to electrode V7
 - Lead cables V1-V3 are connected the same way as when obtaining a standard 12-lead ECG
- 5. Instruct patient to remain still, minimize artifact as able (examples include stopping motion of ambulance and instructing patient to remain still)
- 6. Press the brand specific button to acquire the 12-Lead ECG (complete age and gender questions correctly)
- 7. Provide Posterior Sided ECG to hospital staff, transmit when appropriate
- 8. Document the procedure, time, and results in the electronic Patient Care Report (ePCR)



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Airway Obstruction - Procedures

Procedure:

Foreign Body Airway Obstruction – 1 Year Old Or Less, Conscious

- If coughing, wheezing and exchanging air, do not interfere with the victims efforts to expel the foreign body.
- If unable to cry or speak, weak or absent cough or no air exchange
 - 1. Support the victim in the head down position with your non-dominant hand and forearm.
 - 2. Perform 5 back slaps with the heel of your dominant hand between the should blades
 - 3. Perform 5 chest thrusts with two fingers in the center of the chest
 - 4. Repeat the steps above until the object is expelled or the victim becomes unresponsive

Foreign Body Airway Obstruction – Greater Than 1 Year Old, Conscious

- If coughing, wheezing and exchanging air, do not interfere with the patient’s efforts to expel the foreign body.
- If unable to speak, weak or absent cough OR no air exchange, perform abdominal thrusts (Heimlich Maneuver).

Foreign Body Airway Obstruction – All Ages, Unconscious

- 1. If patient was responsive and then became unresponsive
 - lower the victim to the ground and begin CPR, starting with compressions (do not check for a pulse)
 - Every time you open the airway to give breaths, open the mouth wide and look for the object
 - If you see an object that can easily be removed, remove it with your finger
 - If you do not see an object, continue CPR
- 2. If a foreign body is visualized but cannot be removed with finger, attempt to remove it under direct visualization using the Laryngoscope blade and Magill forceps
 - Assemble Laryngoscope and check bulb on blade
 - Hold Laryngoscope in left hand,
 - Place patient in sniffing position
 - Using tongue-jaw lift or cross-finger technique to open mouth
 - Insert laryngoscope blade into right corner of mouth and move to midline, sweeping tongue out of way
 - Elevate mandible to visualize obstruction without using teeth or gums as a fulcrum
 - Grasp Magill forceps in right hand and remove obstruction under direct visualization
- 3. Provide suction as needed
- 4. Resume appropriate CPR and airway management

P	Paramedic
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Paramedic:

- If the obstruction is not visualized or cannot be retrieved, attempt endotracheal intubation with appropriate size ET tube or 0.5 smaller if ≥ 12 years old
- If ETT cannot pass and patient is ≥ 12 years old perform cricothyrotomy with pertrach.
- If patient is ≥ 1 year old but < 12 years old perform needle jet insufflation

TRANSPORT RAPIDLY TO THE CLOSEST FACILITY!



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Pulse Oximetry - Procedures

Procedure:

- 1. Apply probe to patient finger or toe, as recommended by the device manufacturer.
- 2. Allow machine to register oxygen saturation level
- 3. Record time and initial saturation percent on room air if possible on/with the PCR
- 4. Verify pulse rate on machine or with actual manual pulse check of the patient
- 5. Monitor critical patients continuously until arrival at the hospital. If recording a one-time reading, monitor patients for a few minutes as oxygen saturation can vary
- 6. Document percent of oxygen saturation every time vital signs are recorded and in response to therapy to correct hypoxemia
- 7. In general, normal saturation is 97-99%. Below 93% suspect a respiratory compromise
- 8. Use the pulse oximetry as an added tool for patient evaluation. Treat the patient, not the data provided by the device
- 9. The pulse oximeter reading should never be used to withhold oxygen from a patient in respiratory distress or when it is the standard of care to apply oxygen despite good pulse oximetry readings, such as chest pain
- 10. Factors which may reduce the reliability of the pulse oximetry reading include:
 - Poor peripheral circulation (blood volume, hypotension, hypothermia)
 - Excessive pulse oximeter sensor motion
 - Fingernail polish (may be removed with acetone pad)
 - Carbon monoxide bound to hemoglobin
 - Irregular heart rhythms (atrial fibrillation, SVT, etc.)
 - Jaundice
 - Placement of Blood Pressure cuff on same extremity as pulse ox probe

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Adult Endotracheal Intubation - Procedures

P Paramedic

When Considering Intubating Any Patient, Prepare Materials EARLY:

- Laryngoscope handle with appropriate size blade
- Proper Size Endotracheal Tube (ETT) *PLUS* Backup ETT 0.5-1.0mm smaller and BIAD
- Water-soluble lubrication gel, (lubricate distal end of tube at cuff)
- 10cc syringe (larger syringe if low pressure cuff)
- Stylet, (insert into ET tube and do not let stylet extend beyond tip of ET tube) – if not already incorporated into ETT
- Tape or ETT securing device
- Proper size oral pharyngeal airway
- BVM
- Oxygen Source
- Suction Device
- Stethoscope
- Continuous Digital Waveform Capnography
- Oxygen saturation monitor
- Medications to maintain and support hemodynamic stability (fluids, infusions, push-dose epinephrine, etc.)

Procedure:

- 1. Maintain cervical alignment and immobilization, as necessary
- 2. Attach proper blade to laryngoscope handle and check light
- 3. Check endotracheal tube cuff, lubricate distal end of the tube
- 4. Confirm patient attached to cardiac monitor and oxygen saturation monitor
- 5. Ready ETCO2 detection device
- 6. Specify personnel to:
 - Maintain cervical alignment and immobilization during procedure
 - Watch cardiac and oxygen saturation monitors
- 7. Preoxygenate patient with 100% Oxygen (BVM or NRB) before intubation attempt to achieve O2 saturation $\geq 93\%$ or 8 vital capacity breaths.
- 8. Remove all foreign objects, such as dentures, Oropharyngeal Airways (OPA), etc., and suction the patient's airway if needed.
 - May leave an esophageal ETT if prior unsuccessful attempt to use as landmark for second attempt
- 9. Insert the blade into the right side of the patient's mouth sweeping the tongue to the left side
- 10. Visualize the vocal cords while avoiding any pressure on the teeth
- 11. Insert the endotracheal tube until the cuff passes the vocal cords.
 - Insert far enough so that balloon port tubing is even with the lips
 - Typical depth = tube size (ID) x3 (example would be tube depth of 24 for a 8.0mm tube)
- 12. Remove the laryngoscope blade
- 13. Inflate the endotracheal cuff with the syringe with 5-10cc of air (low pressure cuff may require larger volume) and remove the syringe from inflation valve
- 14. Ventilate with BVM and confirm tube placement:
 - Observe immediate (within 6 breaths) EtCO2 waveform and number with capnography
 - Watch for chest rise AND
 - Auscultate abdomen, listening for air movement in the stomach to ensure tube is not esophageal
 - Auscultate bilateral breath sounds to confirm tube placement
- 15. Observe oxygen saturation

Note: Regardless of apparent presence of lung sounds, tube misting, chest rise, AND/OR lack of gastric sounds: if EtCO2 does NOT indicate proper tube location (alveolar waveform), ETT must be removed.



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Adult Endotracheal Intubation - Procedures

P Paramedic

Procedure (continued):

- 16. If unilateral right sided breath sounds are heard, consider:
 - Right mainstem intubation
 - Deflate the cuff and withdraw tube 1-2cm
 - Reinflate cuff and repeat auscultation procedure as above for breath sounds
- 17. If bowel sounds heard with bagging or EtCO₂ device does not indicate proper ETT placement, deflate cuff, remove tube and ventilate with BVM for two minutes
 - **IF AND ONLY IF** intubation attempted for medical reason AND unsuccessful on first attempt, may return to Step 7 of Procedure and repeat
- 18. If intubation attempt unsuccessful, refer to the next step in the Airway Management, Adult protocol.

IF successful intubation confirmed by Steps 13-15 above:

- 19. Secure tube using an endotracheal securing device
- 20. Document depth of tube
- 21. Reassess and document lung sounds, Vital Signs and patient clinical status
- 22. Insert Oropharyngeal Airway (OPA), or use commercially available bite block with ET Tube holder (if available)
- 23. Ensure Cervical Spine is immobilized to prevent accidental dislodgement of ETT during procedures or patient movement
- 24. Continue ventilations at a rate of 8-10 breaths per minute; adjust rate to maintain SpO₂ ≥93% and EtCO₂ 35-45mmHg, and as appropriate for patient condition
- 25. Document EtCO₂ waveform and reading continuously at time of EACH patient movement, including waveform and reading at time of transfer of care at the Emergency Department.

P Paramedic

Video Assisted Laryngoscopy (VAL)

- Video Assisted Laryngoscopy (VAL) shall be performed in accordance with documented manufacturer recommendations.
- Follow Intubation procedure with the addition of VAL technology.
- It is *essential* that every operator of a VAL be competent in Direct Laryngoscopy (DL) in preparation for unsuccessful VAL operation or equipment malfunction.

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Peds Endotracheal Intubation - Procedures

P Paramedic

When Considering Intubating ANY Patient, Prepare Materials EARLY:

- Video Laryngoscope on and functioning; Direct Laryngoscope handle with appropriate size blade and bulb function verified
- Proper Size Endotracheal Tube (ETT) *PLUS* Backup ETT 0.5-1.0mm smaller and BIAD
- Water-soluble lubrication gel, (lubricate distal end of tube at cuff)
- 10mL syringe (larger syringe if low pressure cuff)
- Appropriate size bougie, (insert into ET tube and do not let bougie extend beyond tip of ET tube)
 - 10fr bougie for use with ETT sizes 4.0 – 6.0
 - 15fr bougie for use with ETT sizes 6.0 – 8.0
- Tape or ETT securing device
- Proper size oropharyngeal airway
- BVM
- Oxygen Source
- Suction Device
- Stethoscope
- Continuous Digital Waveform Capnography
- Oxygen saturation monitor
- Medications to maintain and support hemodynamic stability (fluids, infusions, push-dose epinephrine, etc.)

Procedure:

- 1. Maintain cervical alignment and immobilization, as necessary
- 3. Check endotracheal tube cuff, lubricate distal end of the tube
- 4. Confirm patient attached to cardiac monitor and oxygen saturation monitor
- 5. Ready EtCO₂ detection device
- 6. Specify personnel to:
 - Apply cricoid pressure
 - Maintain cervical alignment and immobilization during procedure
 - Watch cardiac and oxygen saturation monitors
- 7. Preoxygenate patient with 100% Oxygen (BVM or NRB) before intubation attempt to achieve O₂ saturation $\geq 93\%$ for 5 minutes or 8 vital capacity breaths. Have assistant apply cricoid pressure (Sellick's Maneuver) during entire procedure.
- 8. Remove all foreign objects, such as dentures, Oropharyngeal Airways (OPA), etc., and suction the patients airway if needed.
 - May leave an esophageal ETT if prior unsuccessful attempt to use as landmark for second attempt
- 9. Insert the video laryngoscope midline into the patient's mouth
- 10. Visualize the vocal cords while avoiding any pressure on the teeth
 - Ensure that the video laryngoscope is recording the intubation procedure
 - Bougie use is mandatory for video laryngoscopy
- 11. Insert the endotracheal tube until the cuff is visualized passing the vocal cords.
 - Insert far enough so that balloon port tubing is even with the lips
 - Typical depth = tube size (ID) x3 (example would be tube depth of 24 for a 8.0mm tube)
- 12. Remove the laryngoscope blade
- 13. Inflate the endotracheal cuff with the syringe with 5-10cc of air (low pressure cuff may require larger volume) and remove the syringe from inflation valve
- 14. Ventilate with BVM and confirm tube placement:
 - Observe immediate (within 6 breaths) EtCO₂ waveform and number with capnography
 - Watch for chest rise AND
 - Auscultate abdomen, listening for air movement in the stomach to ensure tube is not esophageal
 - Auscultate bilateral breath sounds to confirm tube placement
 - **Note: Regardless of apparent presence of lung sounds, tube misting, chest rise, AND/OR lack of gastric sounds: if EtCO₂ does NOT indicate proper tube location (alveolar waveform), ETT must be removed.**
- 15. Observe oxygen saturation
- 16. Verify ETT cuff pressure using manometer



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Peds Endotracheal Intubation - Procedures

P Paramedic

Procedure (continued):

- 16. If unilateral right sided breath sounds are heard, consider:
 - Right mainstem intubation
 - Deflate the cuff and withdraw tube 0.5-1cm
 - Reinflate cuff and repeat auscultation procedure as above for breath sounds
- 17. If bowel sounds heard with bagging or EtCO₂ device does not indicate proper ETT placement, deflate cuff, remove tube and ventilate with BVM for two minutes
 - **IF AND ONLY IF** intubation attempted for medical reason AND unsuccessful on first attempt, may return to Step 7 of Procedure and repeat
- 18. If intubation attempt unsuccessful, refer to the next step in the Airway Management, Peds protocol.

IF successful intubation confirmed by Steps 13-15 above:

- 19. Secure tube using an endotracheal securing device
- 20. Document depth of tube
- 21. Reassess and document lung sounds, Vital Signs and patient clinical status
- 22. Insert Oropharyngeal Airway (OPA), or use commercially available bite block with ET Tube holder (if available)
- 23. Ensure Cervical Spine is immobilized to prevent accidental dislodgement of ETT during procedures or patient movement
- 24. Continue ventilations at a rate of 8-10 breaths per minute; adjust rate to maintain SpO₂ ≥93% and EtCO₂ 35-45mmHg, and as appropriate for patient condition
- 25. Document EtCO₂ waveform and reading continuously at time of EACH patient movement, including waveform and reading at time of transfer of care at the Emergency Department.

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King LT-D and King LTS-D Laryngeal Tube Airway - Procedures

Prepare All Procedure Specific Materials:

- Correctly sized Laryngeal Tube Airway (LTA) – see chart below
- Bag Valve Mask
- Oxygen Reservoir
- Suction Device
- Bite Block AND/OR endotracheal tube holder (if available)
- Appropriately sized syringes for inflating cuff
- End Tidal CO₂ and Oxygen Saturation Monitoring Devices

Airway Size	Connector Color	Patient Weight	OD/ID (mm)	Cuff Volume (ml)	Gastric Tube (Fr.)
0	Transparent	<5kg	NA	10ml	10
1	White	5-12kg	NA	20ml	10
2	Green	12-25kg	NA	25-35	16
2.5	Orange	41-51 inches	NA	30-40	16
3	Yellow	4-5 feet	18/10mm	45-60	Up to 18
4	Red	5-6 feet	18/10	60-80	Up to 18
5	Purple	>6 feet	18/10	70-90	Up to 18

Procedure:

1. Pre-oxygenate patient with 100% Oxygen via Bag Valve Mask or spontaneous ventilation to achieve O₂ saturation of $\geq 93\%$ if possible
2. Check the integrity of the cuff inflation system and pilot balloon
3. Fully deflate the cuff with the syringe
4. Lubricate the posterior distal tip of the device with a water soluble lubricant
5. Place patient in neutral sniffing position (if no Cervical Spine/Spinal Injury suspected)
 - For patient with suspected Cervical Spine injury, perform two-person insertion technique
 - One person maintains manual in-line cervical spine stabilization while the other person proceeds with procedure
6. Pull mandible down to open mouth
7. Insert uninflated device into oral cavity with midline or a lateral technique
8. Advance the tip behind the base of the tongue while rotating tube back to midline so that the blue orientation line faces the chin of the patient.
9. Without exerting excessive force, advance tube until base of the colored connector is aligned with teeth or gums
10. Inflate the King with the appropriate volume:
 - If inflated King Airway insertion is difficult, perform jaw thrust, pulling the tongue forward. Alternately, a laryngoscope may be used to lift the jaw/mandible to facilitate insertion.
11. Attach the BVM to the King.
12. While bagging the patient, gently withdraw the tube until ventilation becomes easy and free flowing (large tidal volume with minimal airway pressure).
13. Adjust cuff inflation if necessary to obtain a seal of the airway at the peak ventilatory pressure employed.
14. Obtain End-tidal CO₂, auscultate breath sounds bilaterally, look for chest excursion, and check oxygen saturation
 - If digital capnography is not available, arrange for intercept with capable service **MUST** be completed.
15. Secure in the midline to help maintain a good seal over the larynx.
16. Place bite block, oral airway or endotracheal tube holder (if available) between teeth to prevent biting tube
17. Place orogastric tube and attach to low continuous suction as directed in the applicable procedure to assist in gastric decompression
18. Ensure C-spine is still immobilized
19. If repeated attempts are made, oxygenate with 100% O₂ for 2 minutes between attempts
20. ****Follow manufacturers suggested guidelines at all times****
21. Document EtCO₂ waveform and reading continuously at time of EACH patient movement, including waveform and reading at time of transfer of care at the Emergency Department.

Note: regardless of the apparent presence of lung sounds, tube misting and chest rise, or lack of gastric sounds, if ETCO₂ does NOT indicate proper tube location (alveolar waveform), Advanced Airway must be removed.



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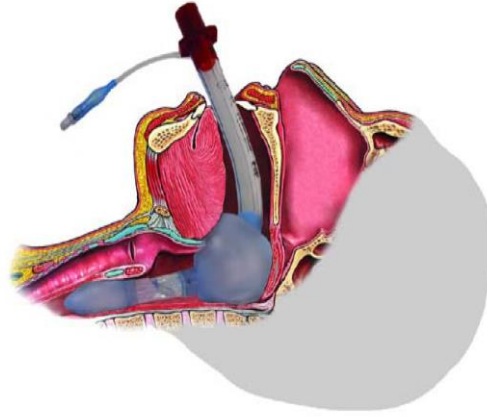
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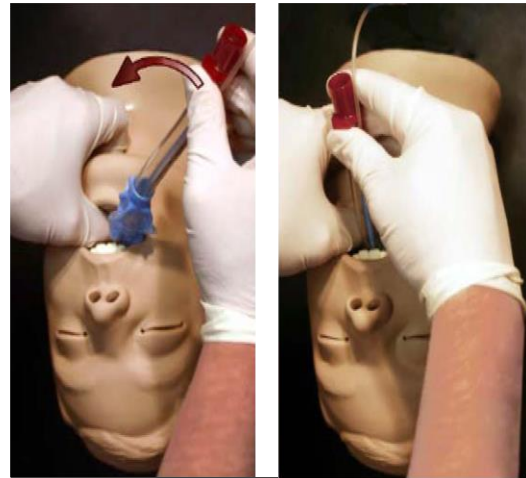
King LTD and King LTS-D Laryngeal Tube Airway - Procedures



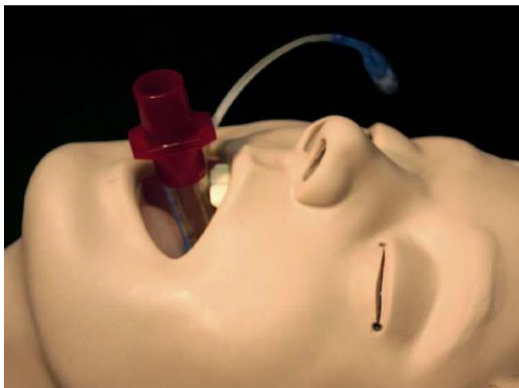
King LT Airway – The correctly placed King LT airway lies with the tip resting in the upper esophagus. The distal cuff inflates in the esophagus, isolating the laryngopharynx from the esophagus. The proximal cuff inflates at the base of the tongue. It isolates laryngopharynx from the oropharynx and the nasopharynx.



1. Place Patient in neutral (sniffing position if no cervical spine injury suspected) and pull down on the mandible to open the mouth. Insert the King LT into the oral cavity from either a midline or lateral approach.



2. Advance the tip of the tube behind the base of the tongue (see figure 1). Then rotate the tube back to the midline so that the blue orientation line faces the chin of the patient (see figure 2).



3. Without exerting force, advance tube until base of connector is aligned with the teeth or gums. Then inflate cuff with appropriate volume.



4. Attach BVM to King LT. While bagging the Patient, gently withdraw the tube until ventilation becomes easy and free flowing (large tidal volume with minimal airway pressure). Adjust cuff inflation to maintain seal at the peak ventilatory pressure employed.



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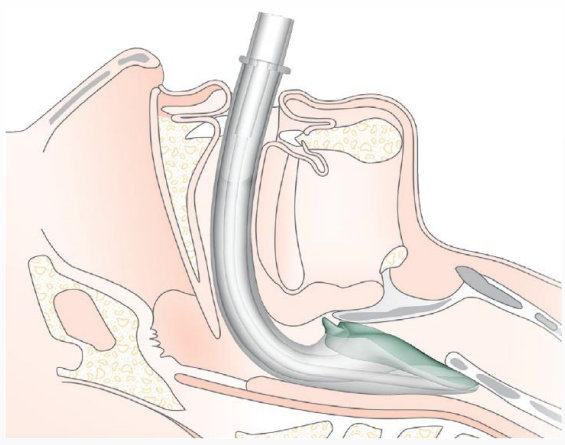
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i-gel Airway - Procedures



Prepare All Procedure Specific Materials:

- Correctly sized i-gel Airway Device – see chart below
- Bag Valve Mask
- Oxygen Reservoir
- Suction Device
- Appropriate endotracheal tube holder (if available)
- End Tidal CO₂ and Oxygen Saturation Monitoring Devices



	Patient Size	Size	Weight
--	--------------	------	--------

	Neonate	1	2-5kg
	Infant	1.5	5-12kg
	Small paediatric	2	10-25kg
	Large paediatric	2.5	25-35kg
	Small adult	3	30-60kg
	Medium adult	4	50-90kg
	Large adult	5	90+kg

Procedure:

1. Pre-oxygenate patient with 100% Oxygen via Bag Valve Mask or spontaneous ventilation to achieve O₂ saturation of $\geq 93\%$ if possible
2. Lubricate the posterior distal tip of the device with a thin layer of water soluble lubricant
3. Place patient in neutral sniffing position (if no Cervical Spine/Spinal Injury suspected)
 - For patient with suspected Cervical Spine injury, perform two-person insertion technique
 - One person maintains manual in-line cervical spine stabilization while the other person proceeds with procedure
4. Pull mandible down to open mouth
5. Insert device into oral cavity with midline or a lateral technique
6. Advance the tip behind the base of the tongue with the i-gel cuff outlet facing toward the chin of the patient
 - NOTE: If necessary, the upper airway should be suctioned prior to attempted insertion
7. Without exerting excessive force, advance tube downwards and backwards along the hard palate with a continuous but gentle push until definitive resistance is felt.
 - WARNING: Do not apply excessive force on the device during insertion.
8. The incisors should be resting on the device integrated bite block.
9. Attach the BVM to the i-gel.
10. Obtain End-Tidal CO₂, auscultate breath sounds bilaterally, look for chest excursion, and check oxygen saturation
 - If digital capnography is not available, arrange for intercept with capable service **MUST** be completed.
11. Secure in the midline to help maintain a good seal over the larynx.
12. Place orogastric tube in side port and advance to appropriate position. Attach to low continuous suction as directed in the applicable procedure to assist in gastric decompression
13. Ensure C-spine is still immobilized
14. If repeated attempts are made, oxygenate with 100% O₂ for 2 minutes between attempts
15. ****Follow manufacturers suggested guidelines at all times****
16. Document EtCO₂ waveform and reading continuously at time of EACH patient movement, including waveform and reading at time of transfer of care at the Emergency Department.

Note: regardless of the apparent presence of lung sounds, tube misting and chest rise, or lack of gastric sounds, if ETCO₂ does NOT indicate proper tube location (alveolar waveform), Advanced Airway must be removed.



Procedures



i-gel Airway - Procedures

Adult sizes



1. Open the i-gel package, and on a flat surface take out the protective cradle containing the device.



2. Remove the i-gel and transfer it to the palm of the same hand that is holding the protective cradle, supporting the device between the thumb and index finger.



3. Place a small bolus of a water-based lubricant, such as K-Y Jelly®, onto the middle of the smooth surface of the protective cradle in preparation for lubrication.



4. Grasp the i-gel with the opposite (free) hand along the integral bite block and lubricate the back, sides and front of the cuff with a thin layer of lubricant.



5. Inspect the device carefully, confirm there are no foreign bodies or a BOLUS of lubricant obstructing the distal opening. Place the i-gel back into the protective cradle in preparation for insertion.

Go to step 6. for insertion technique

Paediatric sizes



1. Open the i-gel package, and on a flat surface take out the cage pack containing the device.



2. Open the cage pack and transfer the i-gel into the lid of the cage.



3. Place a small bolus of a water-based lubricant, such as K-Y Jelly®, onto the middle of the smooth surface of the cage pack ready for use.



4. Grasp the i-gel along the integral bite block and lubricate the back, sides and front of the cuff with a thin layer of lubricant.



5. Inspect the device carefully, confirm there are no foreign bodies or a BOLUS of lubricant obstructing the distal opening. Place the i-gel back into the cage pack in preparation for insertion.

Go to step 6. for insertion technique

Insertion technique

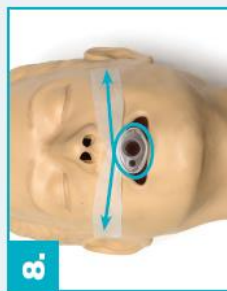


6. Remove the i-gel from the protective cradle or cage pack. Grasp the lubricated i-gel firmly along the integral bite block. Position the device so that the i-gel cuff outlet is facing towards the chin of the patient. The patient should be in the 'sniffing the morning air' position with head extended and neck flexed. The chin should be gently pressed down before proceeding. Introduce the leading soft tip into the mouth of the patient in a direction towards the hard palate.



7. Glide the device downwards and backwards along the hard palate with a continuous but gentle push until a definitive resistance is felt.

The tip of the airway should be located into the upper oesophageal opening (a) and the cuff should be located against the laryngeal framework (b). The incisors should be resting on the integral bite block (c).



8. The i-gel should be taped down from 'maxilla to maxilla'.

<http://www.intersurgical.com/info/igel>



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Suctioning (Basic) - Procedures

Procedure:

- 1. Ensure suction device is in proper working order with suction tip in place.
- 2. Set mechanical suction device to appropriate setting (Adult: 120-150mmHg **OR** Pediatric: 80-100mmHg).
- 3. Preoxygenate the patient.
- 4. Explain the procedure to the patient, if they are coherent.
- 5. Examine the oropharynx and remove any potential foreign bodies or material that may occlude the airway if dislodged by the suction device.
- 6. If applicable, remove ventilation devices (i.e. BVM, OPA) from the mouth and upper airway.
- 7. Insert into mouth without finger hole covered
- 8. Once inserted, cover the finger hole with a gloved finger to remove any secretions, blood, or other substances. The alert patient may assist with this procedure. Continue to cover the finger hole while removing.
- 9. Max suction time:
 - Adult - 15 seconds
 - Pediatric - 10 seconds
 - Infant - 5 seconds
- 10. Reattach ventilation device (i.e. BVM) and resume ventilations or patient assistance, as applicable.
- 11. Record the time and result of the suctioning procedure in the electronic Patient Care Report (ePCR).

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Stoma Care (Basic) - Procedures

Procedure:

Permanent Tracheostomy (upper airway structures surgically removed and trachea surgically attached to skin stoma)

- Suction of visible structures in opening in neck (upper airway is surgically absent and aspiration not possible)
- Ventilate as necessary through stoma
- Consider ALS Intercept for intubation if any concerns about airway, ventilation or patient stability

Temporary Tracheostomy (a metal or plastic tube is placed through the anterior neck and is held in place with ties around the neck)

- Suction visible entrance to inner trach tube only
- Ventilate as necessary by attaching bag-valve directly to tube (an adapter from an ET tube may be needed to make the connection)
- If ventilating through stoma with uncuffed tube, block the upper airway
- Consider ALS Intercept for intubation if any concerns about airway, ventilation or patient stability

Notes:

Suctioning removes air as well as secretions. Be sure to over-ventilate for 20-30 seconds after suctioning
 "Fresh" Tracheostomies (<3 months) are very fragile and have a high potential for creating a false tract if manipulated without trach tube in place – this should be avoided unless all other airway options have been exhausted and the patient is in extremis

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Suctioning Endotracheal Tube - Procedures

P Paramedic

Procedure:

- 1. Ensure suction device is in proper working order with suction tip in place.
- 2. Preoxygenate the patient.
- 3. Attach suction catheter to suction device, keeping sterile plastic covering over catheter.
- 4. For all devices, use the suprasternal notch as the end of the airway. Measure the depth desired for the catheter (judgement must be used regarding the depth of suctioning with Endotracheal, Cricothyrotomy and Tracheostomy tubes).
- 5. If applicable, remove ventilation devices (i.e. BVM, OPA) from the airway.
- 6. With the thumb port of the catheter uncovered, insert the catheter through the airway device.
- 7. Once the desired depth (measured in #4 above) has been reached, use a gloved finger to occlude the thumb port and remove the suction catheter slowly.
- 8. A small volume (<10mL) of normal saline may be used to lavage secretions as needed, with supplemental oxygen and/or ventilations x 5 tidal volumes between lavages.
- 9. Reattach ventilation device (i.e. BVM) and ventilate or assist the patient as needed.
- 10. Record the time and result of the suctioning procedure in the electronic Patient Care Report (ePCR).

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Tracheostomy Care - Procedures

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Purpose:

- To maintain a patent airway and adequate oxygenation of the patient with a temporary or permanent tracheostomy.

Clinical Indications:

- Patient with temporary or permanent tracheostomies obstructed by secretions.
- Patient unable to replace own tracheostomy tube.

Procedure:

Permanent Tracheostomy (upper airway structures surgically removed and trachea surgically attached to skin stoma)

- Suction through opening in neck (upper airway is surgically absent and aspiration not possible)
- If secretions are very thick, instill 2.5-5mL NS to liquefy secretions
- Ventilate as necessary through stoma
- Consider intubation
- Insert ET tube through stoma until cuff is past opening
- Inflate cuff with 6-8mL of air
- Auscultate bilaterally over axilla and stomach to confirm placement
- Connect end-tidal CO2 monitoring as standard
- Secure ET tube
- ET tube may only be shortened to where the balloon inflation line separates from the tube

Temporary Tracheostomy (a metal or plastic tube is placed through the anterior neck and is held in place with ties around the neck)

- Suction through inner trach tube
- If secretions are very thick, instill 2.5-5mL NS to liquefy secretions
- If outer tube has been displaced or is blocked, remove and replace it with patient's spare tube or an ET tube
- Ventilate as necessary by attaching bag-valve directly to tube (an adapter from an ET tube may be needed to make the connection)
- If ventilating through stoma with uncuffed tube, block the upper airway
- Consider intubation

IF ABLE To Intubate Through Stoma

- Remove tracheostomy tube
- Insert ET tube through stoma until cuff is past skin opening
- Inflate cuff with 6-8mL of air
- IF uncuffed ET tube was used, upper airway must be blocked when ventilating
- Auscultate bilaterally over the axilla and stomach to confirm placement
- Connect End-tidal CO2 monitoring as standard
- Secure ET tube
- ET tube may only be shortened to where the balloon inflation line separates from the tube

IF NOT ABLE To Intubate Through Stoma

- Intubate through upper airway
- Pass cuff of tube BELOW stoma opening in anterior neck (partner or assistant to visually verify externally)
- Inflate cuff with 6-8mL of air
- Ventilate, blocking opening in anterior neck
- Auscultate bilaterally over axilla and stomach to confirm placement
- Connect End-tidal CO2 monitoring as standard
- Secure ET tube
- No shortening of ET tube permitted

Notes:

- Suctioning removes air as well as secretions. Be sure to over-ventilate for 20-30 seconds after suctioning
- "Fresh" Tracheostomies (<3 months) are very fragile and have a high potential for creating a false tract if manipulated without trach tube in place – this should be avoided unless all other airway options have been exhausted and the patient is in extremis



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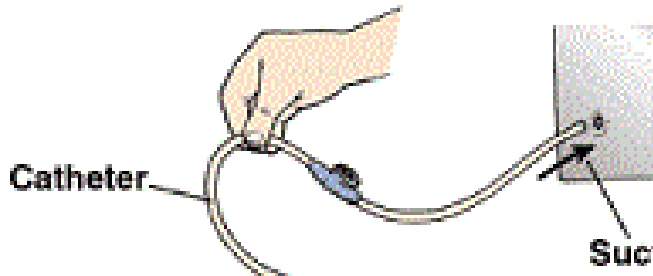


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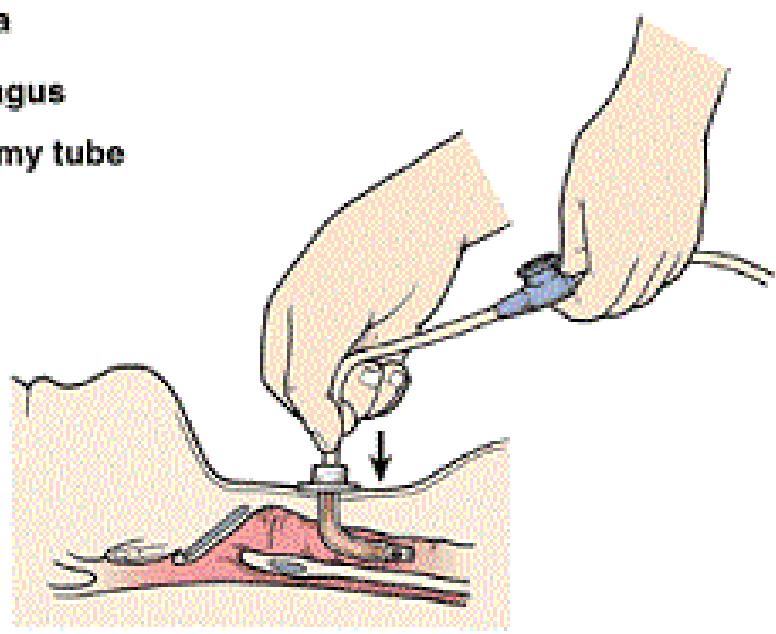


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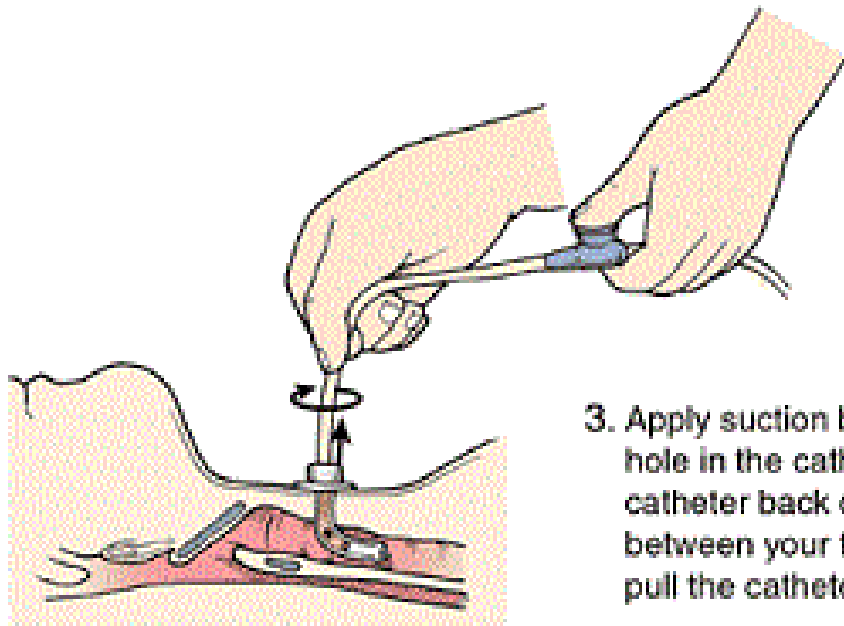
How to Suction a Tracheostomy Tube



1. Connect the catheter to the suction machine. Do not touch the end of the catheter that will go into the trach tube.



2. Insert the catheter the proper distance into the trach tube (usually the length of the trach tube plus 1/4 inch.)



3. Apply suction by putting your thumb over the hole in the catheter while you gently pull the catheter back out. Gently roll the catheter between your thumb and forefinger as you pull the catheter out.

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Continuous Positive Airway Pressure (CPAP) - Procedures

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Prepare All Procedure Specific Materials:

- Medical Director approved Continuous Positive Airway Pressure (CPAP) Device as per manufacturer written procedure.

Procedure:

- 1. Attach cardiac monitor, End-tidal CO₂ (EtCO₂) and continuous pulse oximetry (SpO₂).
- 2. Assemble device according to manufacturer procedure. Attach supplemental Oxygen per manufacturer procedure.
- 3. Verbally instruct patient and coach breathing with the device.
 - Patient must be able to follow commands and interact with EMS Provider to use this tool effectively.
- 4. Instruct patient to slowly breathe in through the nose and exhale through the mouth.
 - Inhalation to exhalation ratio should be roughly 4:1.
- 5. Set positive end-expiratory pressure (PEEP) to 5cmH₂O.
- 6. Secure mask in place with head strap.
- 7. Reassess patient and titrate PEEP to desired effect, per protocol.
- 8. Record and monitor vital signs, EtCO₂, and SpO₂ frequently.
 - Changes in patient condition, patient complaint or clinical picture should all result in repeat of full VS and documentation.
- 9. In the event of worsening respiratory status after initiation of CPAP:
 - Evaluate patient compliance and offer reassurance, verbal coaching if appropriate.
 - Remove CPAP mask and stop treatment if patient unable to tolerate CPAP **OR** if clinically deteriorating.
 - Institute BLS and ALS care per appropriate protocol.
 - Document adverse reactions, and reasons why CPAP was discontinued in electronic Patient Care Report (ePCR).

Consider CPAP protocol if:

- Tachypnea, nasal flaring, subcostal/intercostal retractions, tracheal tugging
- Suspected bronchospasm on clinical exam
- Rales suggesting pulmonary edema and patient with history of congestive heart failure (CHF) or renal insufficiency
- Respiratory rate >25 per minute
- Oxygen saturation <93% on high flow Oxygen

Contraindications

- Respiratory Arrest
- Agonal Respirations
- Unconsciousness or obtundation
- Shock associated with cardiac insufficiency
- Persistent nausea and vomiting
- Facial anomalies or trauma
- Inability to cooperate with the procedure
- Current tracheostomy

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Capnography - Procedures

Nasal End-tidal CO₂ (EtCO₂)

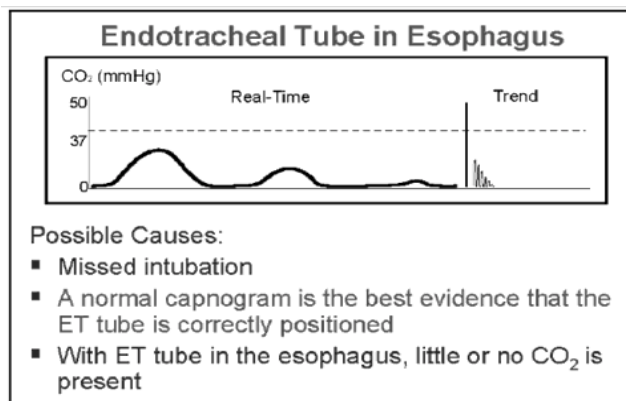
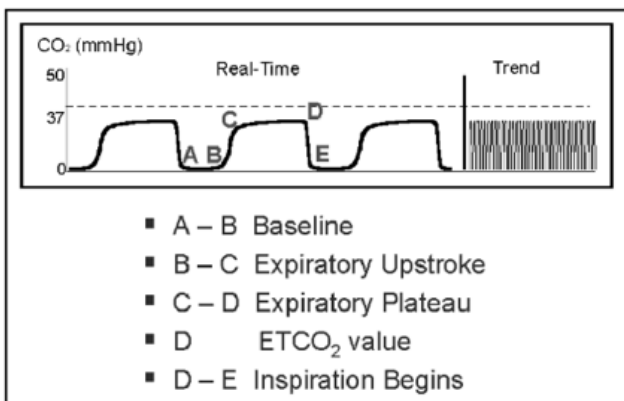
Procedure:

1. Attach capnography tubing to device
2. Attach tubing to patient (may supplement with NRB mask if needed)
3. Record readings initially and throughout treatment as with other vital signs
4. Document the procedure and results on/with the electronic Patient Care Report (ePCR)

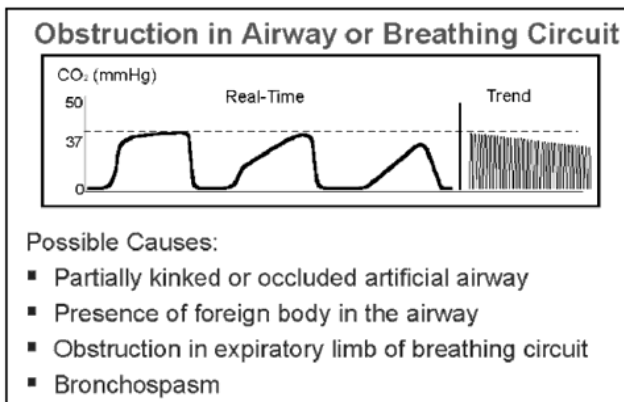
Advanced Airway End-tidal CO₂ (EtCO₂)

Procedure:

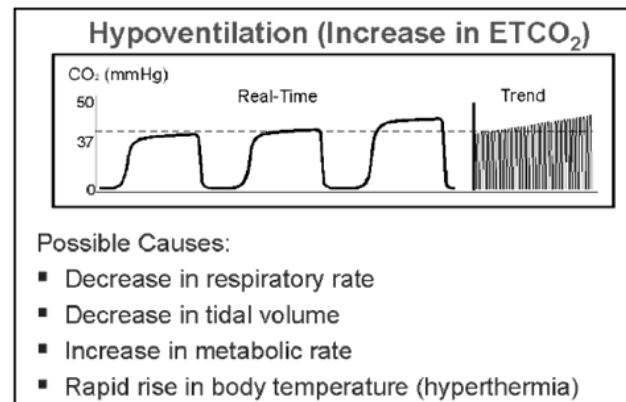
1. Attach capnography sensor to Advanced Airway.
2. Note CO₂ level and waveform.
3. Record readings on scene, en route to the hospital and upon patient delivery to receiving facility.
4. Any loss of EtCO₂ detection of waveform indicates an airway problem – recheck tube placement and remove if appropriate
5. End-tidal CO₂ goal is 40mmHg
 - Above 45mmHg, increase ventilation rate
 - Below 35mmHg, slow down ventilation rate
6. Document the procedure and results on/with the Patient Care Report (PCR)



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<http://kidocs.org/wp-content/uploads/2013/11/ONSTRUCTION.png>



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Cricothyrotomy - Procedures

P Paramedic

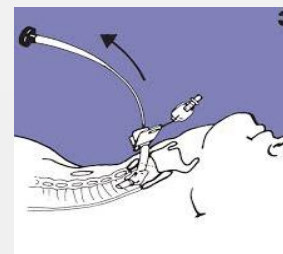
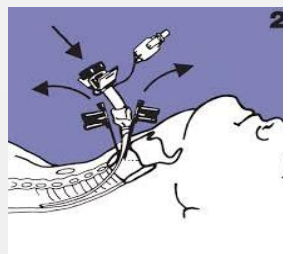
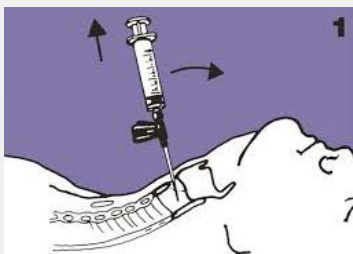
- When all airway interventions have failed and the patient needs a secure airway immediately, consider performing cricothyrotomy. **The percutaneous approach is preferred to the open.**
- If the patient is not able to be ventilated via BVM, ETT or BIAD and the Paramedic feels a surgical airway is necessary, Medical Control should be contacted first. If time and situation do not allow it, this Procedure may be completed prior to authorization by Medical Control.

Prepare All Procedure Specific Materials:

- 14 gauge or larger IV catheter
- Needle
- 10 mL syringe
- Adapter from a 3.0mm ETT
- Saline
- Alcohol pad
- 4x4 gauze pad
- Tape
- Suction

Procedure:

1. Position patient supine in the sniffing position with slight extension of the neck – identify landmarks of the cricothyroid membrane by palpation utilizing anatomical landmarks (below the thyroid cartilage and above the cricoid cartilage).
2. Cleanse anterior neck
3. Fill a 10mL syringe with 5mL of 0.9% Normal Saline
4. Remove dilator from the package and sheath and advance into the tracheostomy tube
5. Insert the splitting needle perpendicular to the skin and cricothyroid membrane while gently holding negative pressure and aspirating with the syringe. Upon entering the trachea there will be a loss of resistance and free flow of air with bubbles flowing easily into the syringe.
6. Drop the angle of the needle ≥ 45 degrees and aim the tip of the needle toward carina (toward the feet) and complete insertion of needle, while continuing to aspirate to ensure the needle remains in the trachea.
7. While stabilizing the needle in place, disconnect the needle from the syringe and advance guidewire (attached to the dilator) into the hub of the splitting needle until resistance is met.
8. Squeeze wings of needle together. The needle should split in half and allow the guidewire/dilator to be advanced.
9. When the dilator meets resistance at the skin, remove the needle by pulling in opposite directions, while securing the guidewire in the trachea and the dilator at the skin.
10. Place thumb on dilator knob while first and second fingers are curved under flange of trachea tube. With gentle, continuous pressure, advance the dilator and tracheostomy tube into position until flange is secure against the skin.
11. Remove dilator and inflate cuff until device is secure in the airway (max 5mL).
12. Attach EtCO₂ and BVM.
13. Secure tube in place using the provided twill tape behind the neck of the patient.
14. Confirm placement with gentle ventilation via BVM, continuous digital waveform capnography, and physical exam. Be sure air movement is fluid with bilateral symmetric chest rise and that no visible neck or soft-tissue distortion is noted
15. If tracheal placement is unclear, remove device and transport immediately to the closest Emergency Department.
16. Consider Sedation Protocol as appropriate.
17. If not previously done, immediately contact receiving facility and Medical Control



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Cricothyrotomy (Open) Surgical - Procedures

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Paramedic

Clinical Indication:

- Failed airway management when standard airway procedures cannot be performed or have failed in an adult patient that requires airway management.
- Upper airway obstruction (eg. facial or neck trauma occluding airway patency, foreign body unable to be removed, angioedema) and inability to adequately oxygenate and ventilate using less invasive methods.
- If Possible Contact Medical Control Before Proceeding. If not possible, notify receiving hospital as soon as possible.

Prepare All Procedure Specific Materials:

- Scalpel
- Antiseptic swab
- 6.0 mm endotracheal tube
- 10cmL syringe
- Tracheal hook (if available)
- Bougie device
- Continuous Digital Waveform Capnography

Contraindications:

- Ability to oxygenate and ventilate using less invasive methods.
- Pediatric Patients
- Suspected fractured larynx and/or cricoid cartilage
- Suspected tracheal transection
- Inability to find anatomical landmarks

Procedure:

1. Have suction and supplies available and ready.
2. Position patient supine in the sniffing position with slight extension of the neck – identify landmarks of the cricothyroid membrane by palpation utilizing anatomical landmarks (below the thyroid cartilage and above the cricoid cartilage).
3. Prep the area with an antiseptic swab.
4. Using the non-dominant hand, spread the overlying skin taut with the thumb and fingers, and slightly depress the skin over the cricothyroid membrane with the index finger to mark the site of cricothyrotomy. Do not release the non-dominant hand from the neck until the procedure is complete. Once the anatomy is found and defined, avoid movement of the anatomy to promote proper cricothyrotomy airway placement.
5. Using a sterile scalpel, make a vertical incision in the mid-line of the neck extending from just above the lower edge of the thyroid cartilage to the middle of the cricoid cartilage. Make the depth of this incision sufficient to extend through the skin and fatty tissue underneath.
6. Using the same scalpel, make a short horizontal incision in the middle of the cricothyroid membrane into the trachea.
 - If a tracheal hook *is* available: prior to removing scalpel from incision, use a tracheal hook to pull anterior and inferior on the thyroid cartilage (lower edge of horizontal incision). Exercise caution when manipulating the tracheal hook into the incision – the tip of most tracheal hooks is particularly sharp-edged.
 - If tracheal hook *is not* available: a bougie device should be used as introducer into the tracheal opening prior to passing the ET tube.
7. Pass a 6.0mm Endotracheal Tube through the horizontal incision in the cricothyroid membrane, angling the tube inferior and posterior along the tracheal anatomy.
8. Inflate the endotracheal cuff with 5-10mL of air and verify airway placement with EtCO₂ (continuous digital capnography monitoring) and physical exam (chest rise, breath sounds).
9. Confirm placement with gentle ventilation via BVM, continuous digital waveform capnography, and physical exam. Be sure air movement is fluid with bilateral symmetric chest rise and that no visible neck or soft-tissue distortion is noted
10. If tracheal placement is unclear, remove device and transport immediately to the closest Emergency Department.
11. Consider Sedation Protocol as appropriate.
12. If not previously done, immediately contact receiving facility and Medical Control
13. Continually monitor for respiratory changes during transport, especially after any patient movement/transfers.
14. Monitor for complications (ie hemorrhage, expanding neck hematoma, dislodgement).
15. Document procedure.



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Control-Cric - Procedures

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- When all airway interventions have failed and the patient needs a secure airway immediately, consider performing cricothyrotomy. **The percutaneous approach is preferred to the open.**
- If the patient is not able to be ventilated via BVM, ETT or BIAD and the Paramedic feels a surgical airway is necessary, Medical Control should be contacted first. If time and situation do not allow it, this Procedure may be completed prior to authorization by Medical Control.

Prepare All Procedure Specific Materials:

- Control-Cric Kit
- Alcohol pad
- 4x4 gauze pad
- Tape
- Suction

Procedure:

1. Position patient supine in the sniffing position with slight extension of the neck – identify landmarks of the cricothyroid membrane by palpation utilizing anatomical landmarks (below the thyroid cartilage and above the cricoid cartilage).
2. Cleanse anterior neck
3. If Right-Handed, operator should be positioned on the right side of the patient; if Left-Handed, operator should be positioned on the left. Operator should stabilize the larynx with the thumb and middle finger of non-dominant hand. Identify the cricothyroid membrane, typically 4 finger breadths below the mandible and 3 finger breadths above the sternal notch.
4. Use the Cric-Knife to incise the skin. A vertical incision should be made initially to allow positive identification of the cricothyroid membrane. Once the cricothyroid membrane has been identified, rotate the knife horizontally and make a single, perpendicular “plunge” incision through the membrane.
5. Once the horizontal incision is made, maintain downward pressure on the knife; do NOT remove knife from the tracheal opening. Slide the attached tracheal hook through the newly formed stoma until it “pops” through the cricothyroid membrane and stops against the posterior wall of the trachea. With your non-dominant hand, grab the handle of the tracheal hook and pull back on the thyroid cartilage to hold stable placement.
6. While maintaining traction with the trach hook, insert the Cric-Key through the incision. Confirmation of proper placement can be made by moving the Cric-Key along the anterior wall of the trachea and feeling the tracheal rings with the device. Once correct placement is obtained, insert the Cric-Key tube down to level of the flange. Flange should rest on the patient’s anterior neck.
7. Rotate the Cric-Key towards patient shoulder and retract to remove from airway.
8. Firmly stabilize the Cric-Key tube and remove the Cric-Key introducer with slow, steady pull. Inflate the cuff until resistance is met.
9. Ventilate with BVM and 100% O₂.
10. Confirm placement with gentle ventilation via BVM, continuous digital waveform capnography, and physical exam. Be sure air movement is fluid with bilateral symmetric chest rise and that no visible neck or soft-tissue distortion is noted.
11. Secure tube with supplied tube holder.
12. Observe for subcutaneous air, which may indicate tracheal injury or extra-tracheal tube position.
13. If tracheal placement is unclear, remove device and transport immediately to the closest Emergency Department.
14. Consider Sedation Protocol as appropriate.
15. If not previously done, immediately contact receiving facility and Medical Control



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Needle Jet Insufflation - Procedures

P Paramedic

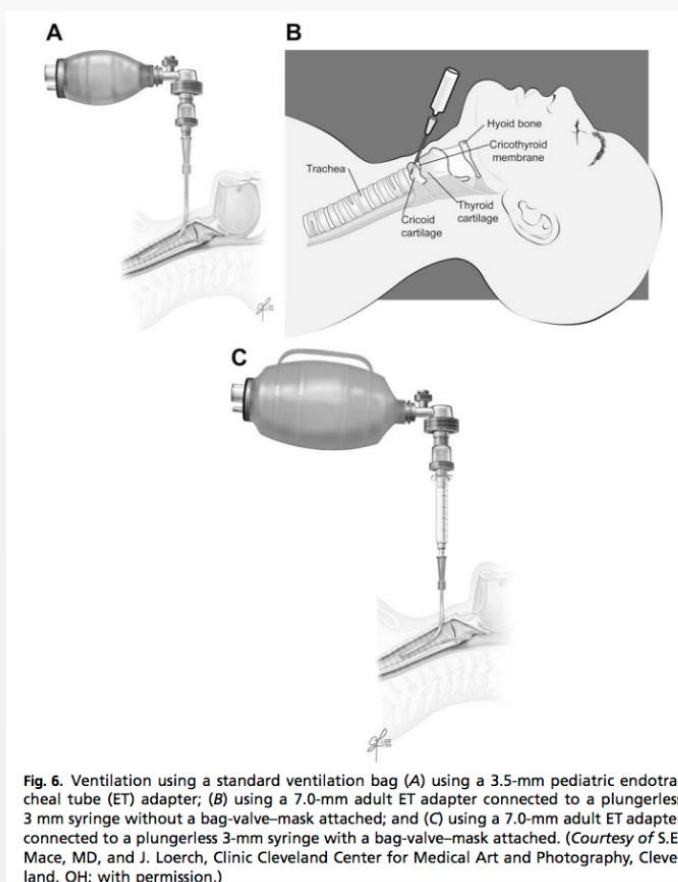
- When all airway interventions have failed and the patient needs oxygenation immediately, consider performing needle jet insufflation.
- If the patient is not able to be ventilated via BVM, ETT or BIAD and the Paramedic feels needle jet insufflation is necessary, Medical Control should be contacted first. If time and situation do not allow it, this Procedure may be completed prior to authorization by Medical Control.

Clinical Indications:

Life threatening upper airway obstruction where all other BLS and ALS maneuvers and techniques have failed.

Procedure:

1. Use personal protective equipment, including gloves, gown and mask as indicated.
2. Locate the cricothyroid membrane and prep the area with antiseptic wipe
3. Extend the neck to bring the cricothyroid membrane anterior and as close to the skin as possible
4. Insert the #10 gauge angiocath through the membrane at 90° to the skin until loss of resistance
 - Use a 3mL syringe and apply negative pressure to confirm free aspiration of air and needle presence in the trachea
 - Consider using a second angiocath through the same insertion site if first needle becomes occluded during procedure
5. Drop the angle of the needle to approximately 60° with the tip aimed toward the patient's feet
 - Continue negative pressure on the syringe to confirm continued placement in the trachea
6. Attach the 7.0 Endotracheal Tube BVM adapter to the end of the syringe
7. Ventilate at a ratio of 1:5 inhalation:exhalation
8. If the airway resistance continues to increase, disconnect the BVM to allow for exhalation
 - Consider addition of second angiocath for use as an exhalation port
9. If subcutaneous emphysema develops, stop insufflation and remove angiocath
 - Repeat steps 2-7 as above
10. Notify the receiving facility of Failed Airway Protocol use and need for Needle Jet Insufflation.
11. Document the procedure and patient response to care in the electronic Patient Care Report (ePCR).



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Blood Glucose Analysis - Procedures

Prepare All Procedure Specific Materials:

- Glucometer
- Test Strip
- Lancet
- 2x2 gauze pad
- Alcohol prep pad
- Bandage

Procedure:

1. Select appropriate site.
2. Blood samples for performing glucose analysis may be obtained simultaneously with intravenous access when possible .
3. Cleanse site appropriately with alcohol prep .
4. Puncture skin with lancet.
5. Dispose of sharps in proper container .
6. Wipe first drop of blood with 2x2 gauze.
7. Place correct amount of blood on reagent strip or site on glucometer per the manufacturers instructions .
8. Apply direct pressure and cover site with bandage as needed .
9. If result does not fit patient clinical picture:
 - Consider presumptive management per Diabetic Emergencies Protocol while reassessing .
 - Consider equipment error, may redraw sample and repeat analysis .
10. Record the time and result of the blood glucose analysis in the electronic Patient Care Report (ePCR).

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Carbon Monoxide Measurement - Procedures

Procedure:

- 1. Apply probe to patient's digit(s) as recommended by the manufacturer. If near strobe lights, cover the finger to avoid interference and/or move away from the lights if possible. Where the manufacturer provides a light shield it should be used.
- 2. Allow machine to register percent circulating carboxyhemoglobin values
- 3. Verify pulse rate on machine with palpated pulse of the patient
- 4. Record levels in electronic Patient Care Report (ePCR) or on the scene rehabilitation form
 - If CO \leq 5%, assess for other possible illness or injury
 - If CO $>$ 5% to \leq 15% and symptomatic from Carbon Monoxide – treat per Carbon Monoxide Exposure Protocol
 - If CO $>$ 15% - treat per Carbon Monoxide Exposure Protocol

Signs and symptoms of Carbon Monoxide (CO) poisoning – altered mental status, dizziness, headache, nausea/vomiting, chest pain, respiratory distress, neurological impairments, vision problems, reddened eyes, tachycardia, tachypnea, arrhythmias, seizures and/or coma.

- 5. Monitor critical patients continuously with continuous pulse oximetry (SpO₂) and SpCO until arrival at the hospital.
- 6. Document percent of carboxyhemoglobin values every time vital signs are recorded during therapy for exposed patients.
- 7. Use the SpO₂ feature of the device as an added tool for patient evaluation. Treat the patient, not the data provided by the device. Utilize the relevant protocol for guidance.
- 8. The SpO₂ reading should never be used to withhold oxygen from a patient with respiratory distress or complaining of shortness of breath.
- 9. Factors which may reduce the reliability of the reading include:
 - Poor peripheral circulation (hypovolemia, hypotension, hypothermia).
 - Excessive external lighting, particularly strobe/flashing lights
 - Excessive sensor motion.
 - Fingernail polish (should be removed with acetone pad).
 - Irregular heart rhythms (atrial fibrillation, SVT, etc.).
 - Jaundice.
 - Placement of BP cuff on same extremity as SpO₂ probe.

CO poisoning can look a lot like influenza, particularly in the winter months. Have a high index of suspicion when seeing multiple patients from the same environment with flu-like illnesses and consider Carbon Monoxide.



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Synchronized Cardioversion - Procedures

Procedure:

- 1. Ensure the patient is attached properly to a cardiac monitor/defibrillator capable of synchronized cardioversion.
- 2. Have all equipment prepared for unsynchronized cardioversion/defibrillation, if the patient fails synchronized cardioversion and/or the clinical condition worsens.
- 3. Firmly apply defib pads to patients chest – assure it is clean, dry, with minimal chest hair.
- 4. Consider the use of Sedation Protocol, as appropriate.
- 5. Set energy selection to the appropriate setting, per Protocol.
- 6. Set monitor/defibrillator to synchronized cardioversion mode, per manufacturer’s instructions.
- 7. Make certain all personnel are clear of the patient.
- 8. PRESS and HOLD the “Shock” button to deploy the charge and cardiovert. Stay clear of the patient until you are certain the energy has been delivered.
 - NOTE: It may take the monitor/defibrillator several cardiac cycles to “synchronize”, so there may be a delay between activating the cardioversion and the actual delivery of energy.
- 9. Note patient response – immediately refer to Appropriate Cardiac Dysrhythmia Protocol.
 - Document patient response to intervention, VS and clinical condition as situation permits.
- 10. Repeat per protocol until maximum setting or until efforts successful.
- 11. Note procedure, response, and times in electronic Patient Care Report (ePCR).

AHA Initial Recommended Doses	
Narrow Regular	50-100 J
Narrow Irregular	120-200 J
Wide Regular	100 J

Escalate the second and subsequent shock dose as needed
Follow manufacturer recommendations if available

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	EMR
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Cardiopulmonary Resuscitation - Procedures

Procedure:

- 1. Check for responsiveness and feel for a pulse
 - Carotid pulse for adults and older children, brachial or femoral pulse for infant
- 2. If compressions are ongoing on EMS arrival, evaluate rate and depth while attaching the Cardiac Monitor **OR** AED
 - If compressions adequate, charge the monitor for rhythm analysis and shock evaluation immediately if appropriate **OR** begin AED analysis
 - If no compressions **OR** felt to be inadequate, initiate high quality chest compressions at >100 compressions per minute for two minutes.
- 3. Open the patient's airway
 - Head-tilt, chin-lift technique if no head or neck trauma suspected
 - Jaw-thrust if head or neck trauma suspected or unknown
- 4. For arrests without advanced airway, perform compressions:breaths as age appropriate
 - Once advanced airway established, transition to >100 compressions per minute *uninterrupted* with 8-10 breaths per minute.
- 5. At first rhythm analysis:
 - If shock advised by AED or interpreted as V-fib / Pulseless V-tach, defibrillate and notify dispatch of first defibrillation time.
 - If no shock advised by AED or interpreted to be non-shockable, discard shock and continue.
- 6. At 2 minutes if no response to resuscitation, consider advanced airway placement (BIAD or ETT) if situation and clinical presentation appropriate.
 - If good chest rise and air exchange achieved, it is acceptable to continue BVM with an airway adjunct (NPA or OPA)
- 7. Begin charging the monitor to prepare for defibrillation approximately 20 seconds before the 2 minute mark
- 8. At every 2 minute mark (200 chest compressions)
 - Rotate compressors (as allowed by personnel on scene)
 - Perform a rhythm and pulse check.
 - If V-fib / Pulseless V-tach, deliver shock as per Appropriate Cardiac Arrest Protocol
 - Medications delivered *after* shock as per Appropriate Cardiac Arrest Protocol
 - If no shockable rhythm, safely dump pending charge to prevent negligent discharge and/or responder injury.
 - Medications delivered *after decision* as per Appropriate Cardiac Arrest Protocol
- 9. Resume compressions at 100 per minute, ventilations at 8-10 breaths per minute (as age appropriate if no advanced airway).
 - Minimize interruptions in chest compressions as much as possible.
- 10. Repeat steps 7-9 until change in patient condition or decision made to terminate resuscitation after 20 minutes (4 rounds of ACLS medications)
- 11. Contact Medical Control as needed for orders or with any questions.

Age	Location	Depth	Rate
Neonate	Lower 1/3 of the sternum, between nipples, 2 thumbs technique	(1/3 of the anterior-posterior chest dimension)	90 compressions and 30 breaths per minute 1 or 2 Rescuers - 3:1
Infant (<1 year excluding newborns)	Over sternum, between nipples (inter-mammary line), 2-3 fingers	1.5 inches (1/3 the anterior-posterior chest dimension)	At least 100-120 per minute 1 Rescuer - 30:2 2 Rescuers - 15:2
Child (1 year to puberty)	Over sternum, between nipples (inter-mammary line), heel of one hand	2 inches (1/3 the anterior-posterior chest dimension)	At least 100-120 per minute 1 Rescuer 30:2 2 Rescuers 15:2
Adult (puberty through adulthood)	Over sternum, just above the xiphoid process, hands with interlocked fingers	At least 2 inches (1/3 the anterior-posterior chest dimension)	At least 100-120 per minute 1 or 2 Rescuers - 30:2

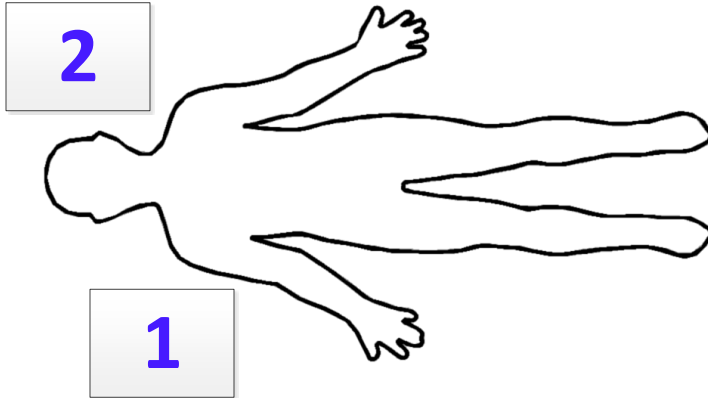


	EMR
B	EMT
A	A-EMT
P	Paramedic

High Performance CPR - Procedures

High Performance CPR is a basis for increasing communication and efficiency during resuscitation of a cardiac arrest. It is based on four guiding principles taken from proven tactics developed by The Resuscitation Academy in Seattle, WA:

- 1. "BLS owns CPR" - focusing on fundamentals, predetermined roles, coordinated movement and minimized interruptions **WILL** improve outcomes
- 2. "It isn't complicated, but it isn't easy" - standardization of the approach across all of Dane County takes time, but **WILL** increase efficiency and patient survival
- 3. "Measure, improve, measure, improve..." - tracking our survival rates and making incremental improvements **WILL** have enormous effects
- 4. "Everyone in V-Fib survives" - If we can get to patients who are in shockable rhythms – OR use HPCPR to get them back to shockable – plan on getting ROSCI



2 Person Resuscitation Crew

#1 – Compressor (Patient Right)

- Checks Pulse - <10 seconds
- Immediately starts CPR (100-120 / minute)
- 30:2 Compressions:Ventilations
- Don't pause compressions until #2 (Airway) ready

#2 – AED / Airway (Patient Left)

- Applies pads without interrupting compressions
- Operates AED / Monitor (if manual, charge at 1min45sec)
- Manages Airway – OPA with BVM
 - (Advanced Airway placed at 6minutes or as resources allow)
- Alternates with Compressor every 2 minutes

BLS owns CPR – depth 2-2.4 inches, rate 100-120 compressions minute, rock palms to allow chest recoil, rotate in <5 sec, hover hands during shock delivery

Eliminate ALL unnecessary interruptions in compressions – coordination and communication among expert resuscitators, count down the last 15sec

Controlled ventilations – 1 second breath delivery, 350-500mL (just enough for chest rise); with advanced airway, 1 breath every 10sec (6x/min) with same volume

AED / Monitor integration – begin charges BEFORE rhythm / pulse check to defibrillate ASAP, hover hands to keep compression delays to a minimum

Metronome always on for cardiac arrests, set to 110bpm

At 6 minutes or as soon as practical, apply **mechanical CPR device**; monitor for migration of device, particularly before/after patient movement

3+ Person Resuscitation Crew

#1 – Compressor (Patient Right)

- Checks Pulse - <10 seconds
- Immediately starts CPR (100-120 / minute)
- Alternates every 2 minutes

#2 – AED (Patient Left)

- Applies pads without interrupting compressions
- Operates AED / Monitor (if manual, charge at 1min45sec)

#3 – Airway (Patient Head)

- Alternates with Compressor every 2 minutes
- Manages Airway – OPA with BVM
 - (Advanced Airway placed at 6minutes or as resources allow)

#4 – Team Leader (Patient Foot)

- Oversight of Care
- Monitors time
- Liaison with Family, Obtains patient history

#5 – Access / ALS 1 (Patient Left Shoulder)

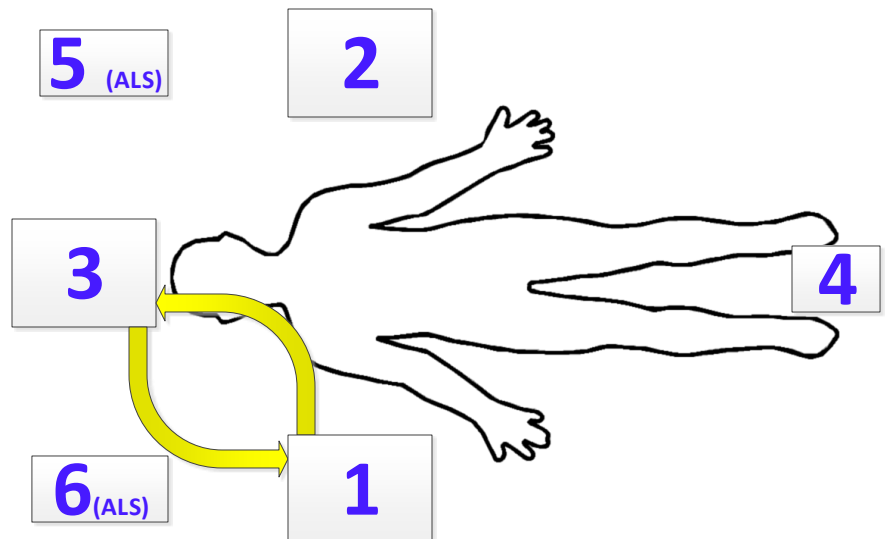
- Obtain IV / IO Access
- Initiate ACLS meds
- Transition to manual defib when reasonable

#6 – Airway / ALS 2 (Patient Right Shoulder)

- Manages Advanced Airway, if not already done
- Manages Monitor and ALS interventions as needed

Additional Providers

- Rotate with Compressors
- Assist with Family and obtaining patient history



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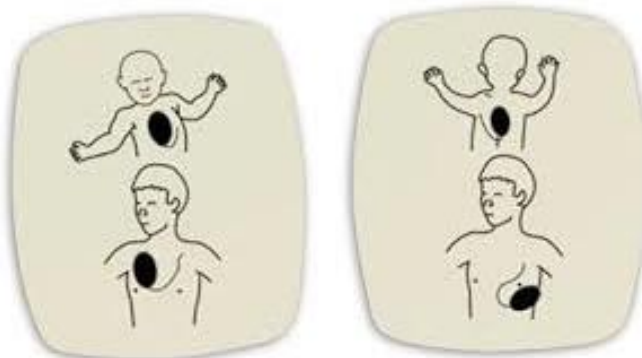
B	EMT
A	A-EMT
P	Paramedic

Defibrillation - Procedures

Manual

Procedure:

1. If multiple rescuers available, one rescuer should provide uninterrupted chest compressions while the Monitor is being prepared for use
2. Remove any medication patches on the chest and wipe off any residue
3. Apply defibrillator pads per manufacturer recommendations. Use alternate placement when implanted devices (pacemakers, AICDs) occupy preferred pad positions (front/back or shifted slightly to not rest on the implanted device). Refer to pictures for pediatric placement.
4. If necessary, connect defibrillator leads, per manufacturer recommendations
5. Charge the defibrillator per protocol. Continue chest compressions while the defibrillator is charging
6. Pause chest compressions and determine if shockable after reviewing rhythm for max of 5 seconds.
7. Assertively state "CLEAR" and visualize that no one, including yourself, is in contact with the patient prior to defibrillation.
8. Defibrillate if appropriate by depressing the "shock" button.
9. If non-shockable discard the shock, per manufacturer recommendations
10. Continue to follow protocol
11. Record the time and result of the analysis in the patient care report (PCR).



Automated

	EMR
B	EMT
A	A-EMT
P	Paramedic

Procedure:

1. If multiple rescuers available, one rescuer should provide uninterrupted chest compressions while the AED is being prepared for use
2. Remove any medication patches on the chest and wipe off any residue
3. Apply defibrillator pads per manufacturer recommendations. Use alternate placement when implanted devices (pacemakers, AICDs) occupy preferred pad positions (front/back or shifted slightly to not rest on the implanted device).
4. If necessary, connect defibrillator leads, per manufacturer recommendations
5. Activate AED for analysis of rhythm
6. Stop chest compressions and clear the patient for rhythm analysis. Keep interruption in chest compressions as brief as possible
7. Assertively state "CLEAR" and visualize that no one, including yourself, is in contact with the patient prior to defibrillation.
8. Defibrillate if appropriate by depressing the "shock" button. Biphasic defibrillators will determine the correct joules accordingly
9. Continue to follow protocol
10. Record the time and result of the analysis in the electronic Patient Care Report (ePCR).



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Double Sequential Defibrillation - Procedures

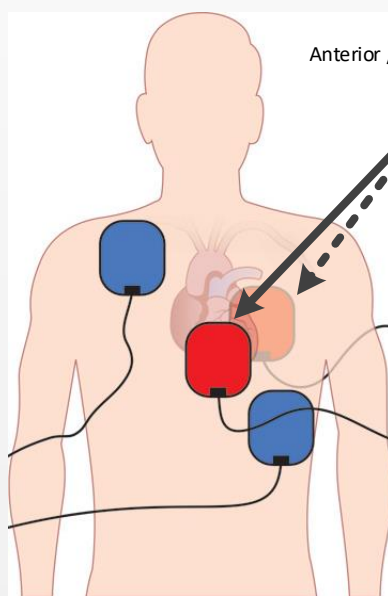
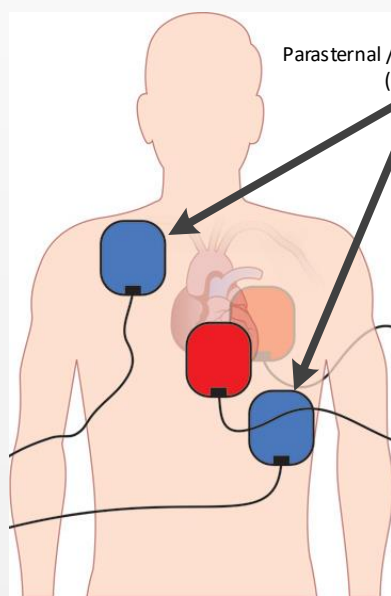
P Paramedic

Clinical Indications:

- ❑ Patients with refractory or recurrent ventricular fibrillation (V-fib) or pulseless ventricular tachycardia (V-tach) or shockable rhythm per AED analysis that has not responded to ≥ 3 standard defibrillation attempts.

Procedure:

- ❑ 1. Ensure all necessary cardiac arrest interventions have been applied up to this point.
 - Uninterrupted and effective CPR.
 - Defibrillation at maximum output for at least three rounds of shocks (including first responder AED shocks, if applicable).
 - Administration of Amiodarone 300mg.
 - Consideration of other possible causes of cardiac arrest.
- ❑ 2. Upon decision to attempt Double Sequential Defibrillation, the first set of pads should be removed from the patient
- ❑ 3. Apply the manual defibrillator in the parasternal / axillary positions as shown in the figure below (blue pads)
 - The first rhythm check after moving the pads should be completed as a single shock, as previous
- ❑ 4. Apply an AED in the anterior / posterior positions as shown in the figure below (red pads)
 - Assure that the two sets of pads do not contact one another
- ❑ 3. Select maximum energy setting for both devices. Charge devices in advance of the anticipated break in CPR and ensure chest compressions continue while both devices are being charged.
- ❑ 4. At next rhythm analysis, if patient remains in ventricular fibrillation (V-fib) or pulseless ventricular tachycardia (V-tach) OR shock advised by AED:
 - Clear patient.
 - Deliver **double sequential defibrillation** by having two operators depressing both "Shock" buttons simultaneously.
- ❑ 5. Once criteria are met for dual sequential defibrillation, *all subsequent shocks delivered shall be using this method.*



NOTE:

- ❑ There is the potential to cause damage to equipment when performing this procedure. Therefore, it is recommended that attempts be made to perform Double Sequential Defibrillation using an AED in combination with a monitor to reduce risk.
- ❑ The case reports of equipment failure have not indicated the mechanism of damage; the steps above are an attempt to improve patient outcome while mitigating risk, but have not been proven to change outcomes.
- ❑ Because of the potential for adverse equipment results, it is **important that your Service Director and Medical Director approve this procedure BEFORE attempting.**
- ❑ **Devices used for Double Sequential Defibrillation should be removed from service until a full evaluation and function check can be completed to ensure safety of subsequent patients.**



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External Cardiac Pacing - Procedures

P Paramedic

Procedure:

1. Attach standard cardiac monitor.
2. Apply defibrillation/pacing pads per manufacturer recommendations.
 - One pad to left mid chest next to sternum, one pad to left mid posterior back next to spine.
3. Place monitor into pacing mode, as specified by manufacturer.
4. Adjust heart rate to 70bpm for an adult, 100bpm for pediatric patients.
5. Note pacer spikes on EKG screen.
6. Slowly increase output until capture of electrical rhythm is noted on the monitor.
7. If unable to capture while at maximum current output, stop pacing immediately.
8. If capture observed on monitor, check for corresponding pulse and assess vital signs.
9. Mechanical capture occurs when paced electrical spikes on the monitor correspond with palpable pulse.
10. Consider Sedation Protocol as appropriate.
11. Document the dysrhythmia and the response to external pacing with ECG strips in the electronic Patient Care Report (ePCR).

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Mechanical CPR Device (LUCAS) - Procedures

Clinical Indications:

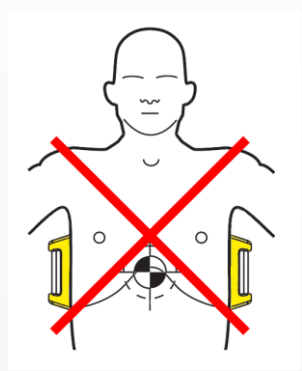
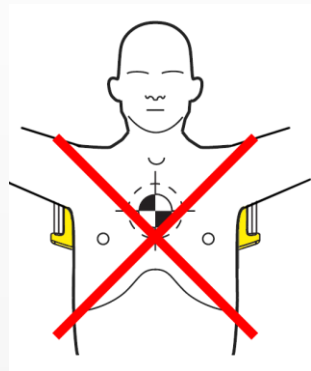
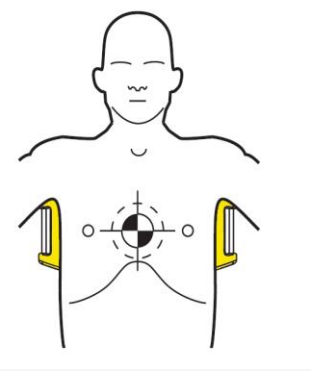
- May be used in patients 12 years of age or greater requiring chest compressions related to cardiac arrest.

Contraindications:

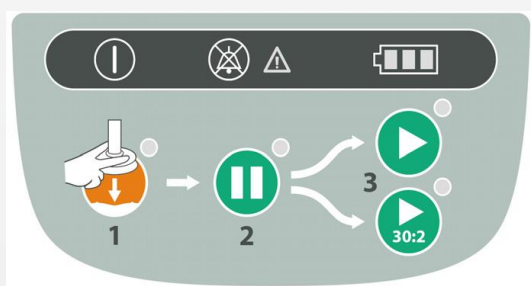
- Patients <12 years
- Patients suffering traumatic cardiac arrest or patients with obvious signs of traumatic injury
- Patients who do not fit within the device:
 - Too large and with whom you cannot press the pressure pad down 2 inches
 - Too small and with whom you cannot pull the pressure pad down to touch the sternum

Procedure:

- All therapies related to the management of cardiopulmonary arrest should be continued as currently defined .
- Initiate resuscitative measures following protocol – **DO NOT DELAY MANUAL CPR FOR THE DEVICE. CONTINUE MANUAL CPR UNTIL THE DEVICE CAN BE PLACED**
- Detailed instructions for LUCAS device follow:
 1. While resuscitative measures are initiated, the LUCAS device should be removed from its carrying device and placed on the patient in the following manner
 2. The Backplate should be centered on the nipple line and the top of the backplate should be located just below the patients armpits



- 3. In cases which the patient is already on the stretcher, place the backplate underneath the thorax. This can be accomplished by log-rolling the patient or raising the torso (placement should occur during a scheduled discontinuation of compressions [ie. After five cycles of 30:2 or two minutes of uninterrupted compressions])
- 4. Position the compressor
- 5. Turn the LUCAS Device on (the device will perform a 3 second self test)



- 6. Remove the LUCAS device from its carrying case using the handles provided on each side
- 7. With the index finger of each hand, pull the trigger to ensure the device is set to engage the backplate. Once this is complete you may removed your index finger from the trigger loop
- 8. Approach the patient from the side opposite the person performing manual chest compressions
- 9. Attach the claw hook to the backplate on the side of the patient opposite that where compressions are being provided .
- 10. Place the LUCAS device across the patient, between the staff members' arms who is performing manual CPR
- 11. At this point the staff member performing manual CPOR stops and assists attaching the claw hook to the backplate on their side
- 12. Pull up once to make sure that the parts are securely attached



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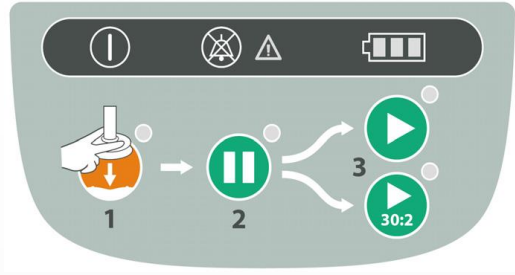
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Mechanical CPR Device (LUCAS) - Procedures

Procedure Continued:

- 13. Adjust the height of the compression arm
- 14. Use the two fingers (V pattern) to make sure that the lower edge of the Suction Cup is immediately above the end of the sternum. If necessary, move the device by pulling the support legs to adjust the position
- 15. Press the Adjust Mode Button on the control pad labeled #1 (this will allow you to easily adjust the height of the compression arm)



- 16. To adjust the start position of the compression arm, manually push down the SUCTION CUP with two fingers onto the chest (without compressing the patient's chest)
- 17. Once the position of the compression arm is satisfactory, push the green PAUSE button labeled #2 (This will lock the arm in this position), then remove your fingers from the SUCTION CUP
- 18. If the position is incorrect, press the ADJUST MODE BUTTON and repeat the steps
- 19. Start Compressions
- 20. If the patient is not intubated and you will be providing compression to ventilation ratio of 30:2 push ACTIVE (30:2) button to start
- 21. If the patient is intubated and you will be providing continuous compressions push ACTIVE (continuous) button
- 22. Place the neck roll behind the patient's head and attach the straps to the LUCAS device (this will prevent the LUCAS from migrating toward the patient's feet)
- 23. Place the patient's arms in the straps provided

-Defibrillation can and should be performed with the LUCAS device in place and in operation
 -One may apply the defibrillation electrodes either before or after the LUCAS device has been put in position
 -The pads and wires should not be underneath the suction cup
 -If the electrodes are already in an incorrect position when the LUCAS is placed, you must apply new electrodes
 -If the rhythm strip cannot be assessed during compressions, one may stop the compressions for analysis by pushing the PAUSE BUTTON (The duration of interruption of compressions should be kept as short as possible and should not be > 10 seconds. There is no need to interrupt chest compressions other than to analyze the rhythm).
 -Once the rhythm is determined to require defibrillation, the appropriate ACTIVE BUTTON should be pushed to resume compressions while the defibrillator is charging and then the defibrillator should be discharged.

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Mechanical CPR Device (AutoPulse) - Procedures

Clinical Indications:

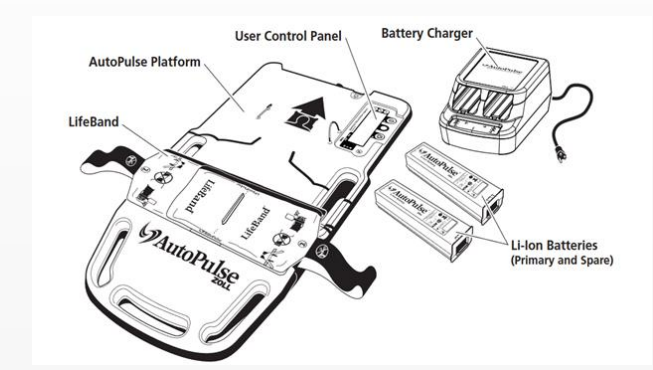
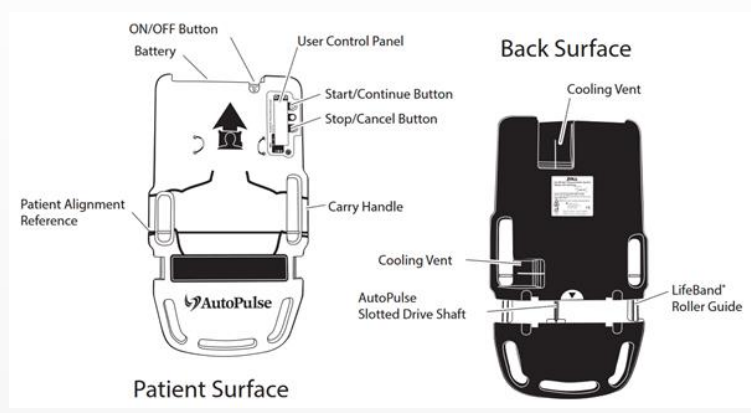
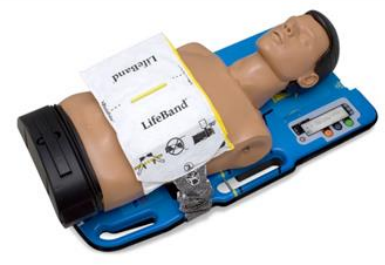
- May be used in patients 12 years of age or greater requiring chest compressions related to cardiac arrest.

Contraindications:

- Patients <12 years
- Patients suffering traumatic cardiac arrest or patients with obvious signs of traumatic injury
- Patients who do not fit within the device:
 - >300lbs or too small to get adequate tightening of the band; in both, compressions delivered will be ineffective

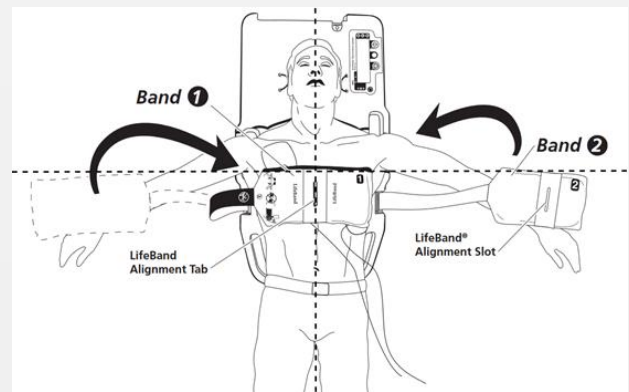
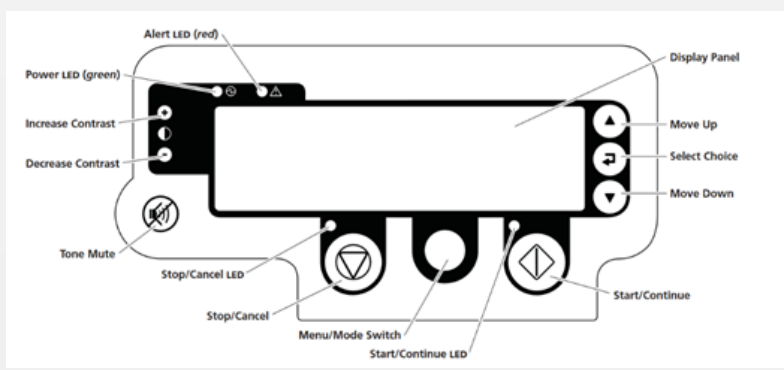
System Components:

- AutoPulse platform – Patient Surface
- LifeBand
- AutoPulse Battery and Battery Charger



Procedure:

- ☐ All therapies related to the management of cardiopulmonary arrest should be continued as currently defined.
- ☐ Initiate resuscitative measures following protocol – **DO NOT DELAY MANUAL CPR FOR THE DEVICE. CONTINUE MANUAL CPR UNTIL THE DEVICE CAN BE PLACED**
- ☐ Detailed instructions for AutoPulse device follow:
 1. Power up the device using the ON/OFF button located on the top edge of the device
 2. Make sure no user advisory, fault or system error messages display
 3. Open the Velcro LifeBand Chest Compression Assembly (CCA)
 4. At first practical 2 minute interval and coordinated with rotation of compressors, sit patient up by pulling the patient’s arms forward (use C-collar and manual stabilization if concern for C-spine injury)
 - Make a single cut down the back of any clothing at this time, in order to facilitate removal and placement of device



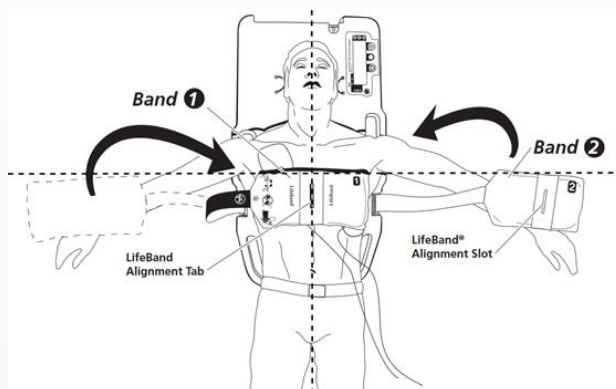
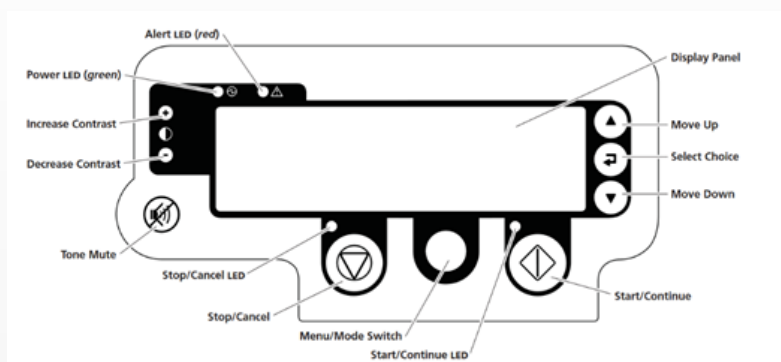
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Mechanical CPR Device (AutoPulse) - Procedures

Procedure (continued):

- ❑ 5. Slide the AutoPulse device behind the patient and lower the patient down onto the device, centering the supine patient with the armpits just above the YELLOW line
- ❑ 6. Locate mating slot of band 2 and place on top of band 1 already on chest. Press the bands together to engage and secure the Velcro fastener. Make sure the bands are not twisted
 - **If bands cannot be closed, use manual chest compressions instead**
- ❑ 7. Press and release the START/CONTINUE button once. The AutoPulse automatically adjusts the band to the patient's chest and determined the appropriate compression
 - Do not touch the patient or the LifeBand CCA while the AutoPulse is analyzing the patient's size
- ❑ 8. Verify the patient is properly aligned and that the LifeBand CCA has taken up any slack in the bands
- ❑ 9. Press the START/CONTINUE button a second time to start compression cycles and the AutoPulse will begin chest compression cycles
- ❑ 10. Set the mode to either the pre-set compression-to-ventilations or continuous compressions option
- ❑ 11. Continue to monitor the placement of the patient on the AutoPulse after moving the patient or during transport to ensure proper alignment. Using Zoll approved restraints to secure the patient to the platform is recommended.



- ❑ **NOTE: Do not stop the device for more than 10 seconds after at least 2 minutes of compressions per American Heart Association's (AHA) CPR guidelines. Intravenous cannulation, endotracheal intubation, or any other procedure should either be attempted during chest compressions or during the 10 second pause. Approved alternatives to those procedures, such as intraosseous infusion and a BLS airway (example: King Tube) should be considered. Cardiac defibrillation should be attempted during a 10 second pause.**

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Chest Decompression - Procedures

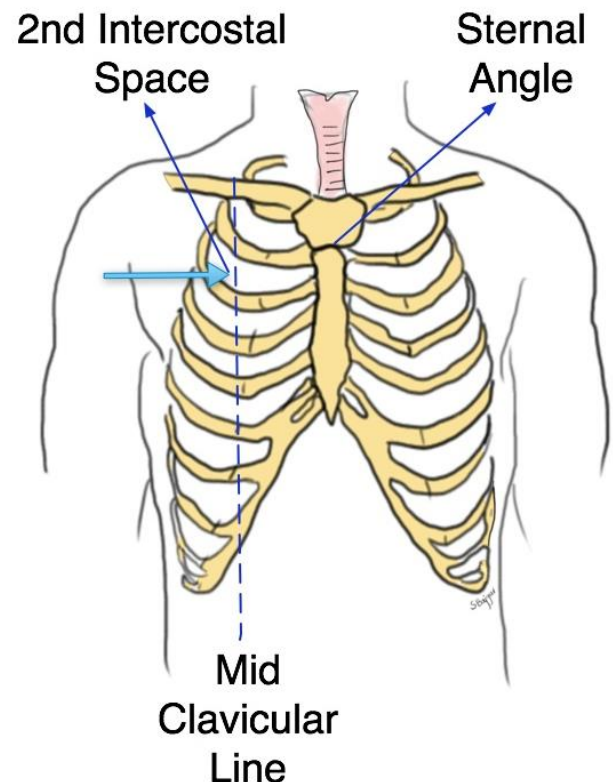
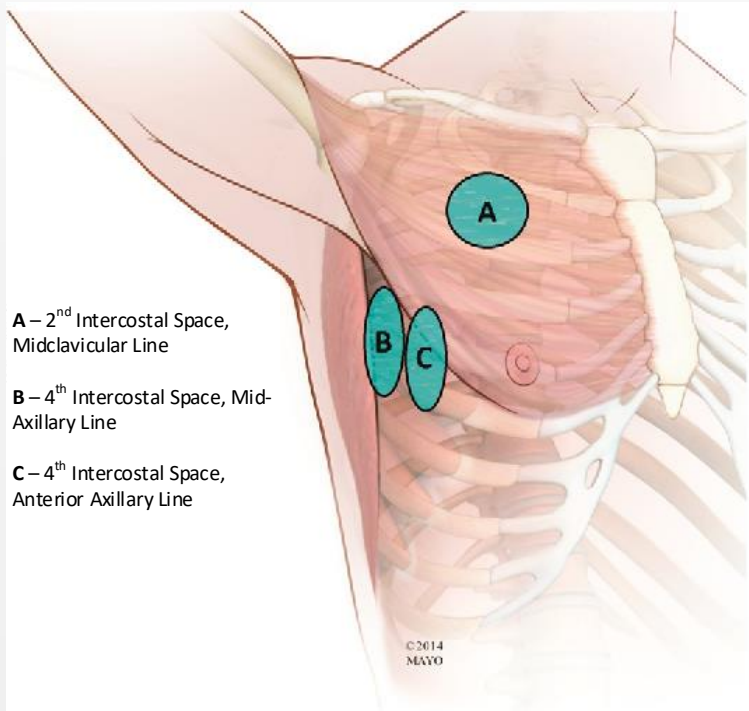
P Paramedic

Prepare All Procedure Specific Materials:

- 14 gauge 2–2.5 inch over the needle catheter
- Tape
- Sterile Gauze Pads
- Antiseptic swabs
- Occlusive dressing

Procedure:

1. Locate landmarks for needle decompression
 - Site A - 2nd intercostal space in the mid-clavicular line on the same side as the pneumothorax
 - Site B – 4th intercostal space in the mid-axillary line on the same side as the pneumothorax (Adult ONLY)
 - (This is a relatively NEW location for Prehospital Providers and requires familiarity with the anatomy, practice and appropriate credentialing with your Service)
 - BE AWARE of and avoid underlying anatomical structures in the chest (lung, heart, vasculature) as well as abdominal organs that move significantly with respiration (spleen, liver, intestine, vasculature).
2. Prepare the site with an antiseptic swab
3. Firmly introduce catheter immediately above superior edge of rib at selected site
 - Remember: the neurovascular bundle (nerve, artery and vein) run under the inferior edge of the ribs
4. Insert the needle perpendicular to the skin with downward pressure until there is a loss of resistance and a return of air.
5. Advance the needle another 1/8", to ensure the catheter is inside the thoracic cavity.
 - Hold the catheter in place with one hand while removing the needle and disposing of sharps in container .
6. Secure the catheter taking care not to allow it to kink
 - If time and situation allow, use an occlusive dressing to cover the catheter and tape on 3 sides to create a one-way valve.
7. Reassess lung sounds, pulses, tracheal deviation and patient clinical condition
8. Dress area with occlusive dressing then cover with sterile gauze pad
9. Reassess breath sounds and respiratory status
10. Document Procedure, patient response, VS and change in clinical condition in the electronic Patient Care Report



<https://rebelem.com/what-is-the-best-anatomic-location-for-needle-thoracostomy/>



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BE-FAST Stroke Scale - Procedures

Procedure:

- 1. Assess and treat suspected stroke patients as per protocol
- 2. The BE-FAST Stroke Screen should be completed for all suspected stroke patients
- 3. Establish the “time last normal” for the patient. This will be the presumed time of onset.
- 4. Perform the screen through physical exam:
 - Screen the patient for sudden loss of **B**alance or coordination
 - Ask the patient about sudden onset of blurred vision, double vision or loss of vision in one or both **E**yes
 - Look for **F**acial droop by asking the patient to smile
 - Have patient, while sitting upright or standing, extend both arms parallel to floor, close eyes, and turn their palms upward. Assess for unilateral drift of an **A**rm.
 - Evaluate the patient’s **S**peech by having the person say, “you can’t teach an old dog new tricks”, or some other simple, familiar saying. Assess for the person to slur the words, get some words wrong, or inability to speak.
 - Confirm the **T**ime of symptom onset; if possible, bring along witnesses or family to help corroborate information during assessment at the hospital
- 5. If one of these exam components is “yes”, then the stroke screen is positive
- 6. Evaluate Blood Glucose level
- 7. If the “time last normal” is ≤ 24 hours, blood glucose is between 60 and 400, and at least one of the physical exam elements is positive, follow the Suspected Stroke Protocol,
 - Alert the receiving hospital by calling a “Stroke Alert” as early as possible.
- 8. All sections of the BE-FAST screen must be completed.
- 9. The complete screening should be documented in the electronic Patient Care Report (ePCR).

B	E	F	A	S	T
					
BALANCE	EYES	FACE	ARM	SPEECH	TIME
<p>Did the person suddenly lose balance or coordination?</p>	<p>Does the person have sudden blurred or double vision, or loss of vision in one or both eyes?</p>	<p>Ask the person to smile. Does one side of the face droop?</p>	<p>Ask the person to raise both arms. Does one arm drift downward?</p>	<p>Ask the person to repeat a simple sentence. Are the words slurred? Can he/she repeat the sentence correctly?</p>	<p>If the person shows any of these symptoms, time is important. Call 911 or get to the hospital fast.</p>

Based on the Cincinnati Stroke Scale

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FAST-ED Stroke Screen - Procedures

Procedure:

- 1. Assess and treat suspected stroke patients as per protocol (p64)
- 2. Establish the “time last normal” for the patient. This will be the presumed time of onset.
- 3. The FAST-ED Stroke Screen may be considered for all stroke patients with suspected Large Vessel Occlusion (LVO)
 - Patients who are likely to have a LVO may benefit from transport to a Comprehensive Stroke Center
- 4. Perform the screen through physical exam:
 - Look for facial palsy by asking the patient to smile
 - Have patient, while sitting upright or standing, extend both arms parallel to floor, close eyes, and turn their palms upward. Assess for unilateral weakness or drift of an arm.
 - Have the person say, “you can’t teach an old dog new tricks”, or some other simple, familiar saying. Assess for the person to slur the words, get some words wrong, or inability to speak.
 - Ask the patient to look in all four cardinal directions (up, down, left, right). Assess for the ability of the pupil to cross midline
 - Assess the patient’s ability to interpret stimulus from both sides of the body.
- 5. Add up the patient score from the table (below). A score of 4 or greater has a 60-85% prediction of a large vessel occlusion
- 6. Evaluate Blood Glucose level
- 7. If the “time last normal” is ≤ 12 hours, blood glucose is between 60 and 400, and the patient has a score of 4 or greater, consider the clinical presentation of the patient
 - Patients with unstable VS or emergent airway needs should go to the closest appropriate facility
 - Patients who are clinically stable and suspected LVO, consider transport directly to a Comprehensive Stroke Center.
 - Alert the receiving hospital with Stroke Alert and FAST-ED score as early as possible.
- 8. The complete screening should be documented in the electronic Patient Care Report (ePCR).

Field Assessment Stroke Triage for Emergency Destination (FAST-ED)	
Assessment Item	Score
Facial Palsy – Weakness on one side of the face with smile	
▪ Absent or minor paralysis	0
▪ Partial or Complete paralysis	1
Arm Weakness	
▪ No drift	0
▪ Drift or some effort against gravity	1
▪ No effort against gravity OR No movement	2
Speech Changes	
▪ Speech Content Normal AND Names 2-3 Items Correctly	0
▪ Speech Content is abnormal OR names only 0-1 Items Correctly	1
▪ Cannot Understand / Cannot Show Two Fingers When Asked	2
Time of Symptom Onset (not scored)	
Eye Deviation	
▪ No Deviation, Eyes Move To Both Sides Equally	0
▪ Gaze Preference – Clear Difficulty When Looking To One Side (Left OR Right)	1
▪ Forced Deviation – Eyes Deviated To One Side And Do NOT Pass Midline	2
Denial / Neglect	
▪ Absent	0
▪ Extinction to bilateral simultaneous stimulation in only one sensory modality	1
▪ Does not recognize own hand or only orients to one side of the body	2
LVO is likely if FAST-ED score is ≥ 4	



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Intranasal - Procedures



Procedure:

- 1. Determine appropriate dose of medication per Protocol
- 2. Draw medication into syringe and dispose of the sharps, do not administer more than 1ml per nostril.
- 3. Attach intranasal device to syringe
- 4. With one hand, control the patient's head
- 5. Gently introduce device into nare, stop when resistance is met.
- 6. Aim slightly upwards and toward the ear on the same side
- 7. **Briskly** compress the syringe to administer one half of the medication, repeat the procedure with the remaining medication on the other nares.
 - It is important for the medication to be atomized or it will not be absorbed.
- 8. Document the results in the electronic Patient Care Report (ePCR).

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Orogastric Tube Insertion - Procedures

Prepare All Procedure Specific Materials:

- Tube
- Lubricating Gel
- Securing device/Tape
- Suction
- Syringe for injecting Air

Procedure:

- 1. Measure the length of the tube from the tip of nose to earlobe to ziphoid process, mark maximum insertion depth.
- 2. Lubricate the tube with water based lubricant prior to insertion.
- 3. Insert lubricated tube through the gastric port of the BIAD or lift tongue/jaw anteriorly while passing tip lateral to endotracheal tube.
- 4. Continue to advance the tube gently until the appropriate distance is reached.
- 5. Confirm placement by injecting 20cc of air and auscultate for the whoosh or bubbling of the air over the stomach. If any doubt about placement, remove and repeat the insertion.
- 6. Secure the tube.
- 7. Decompress the stomach by connecting the tube to low continuous suction (50-150mmHg).
- 8. Document the procedure, time, and result (success) on/with the electronic Patient Care Report (ePCR).

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Restraints - Procedures

Any patient who may harm himself, herself or others may be gently restrained to prevent injury to the patient or crew. This restraint must be in a humane manner and used only as a last resort. Other means to prevent injury to the patient or crew must be attempted first. These efforts could include reality orientation, distraction techniques, or other less restrictive therapeutic means. Physical or chemical restraint should be a last resort technique

Procedure:

- 1. The least restrictive means of managing the patient should always be employed first.
- 2. Ensure that there are sufficient personnel available to restrain the patient safely.
- 3. **Restrain the patient in a lateral or supine position. No devices such as backboards, splints or other devices will be on top of the patient.**
- 4. **The patient will never be restrained in the prone position.**
- 5. The patient must be under constant observation by the EMS crew at all times. This includes direct visualization of the patient as well as continuous cardiac, pulse oximetry and capnography monitoring as indicated.
- 6. The extremities that are restrained will have a circulation check at least every 15 minutes. The first of these checks should occur as soon after placement of the restraints as possible. This **MUST** be documented in the electronic Patient Care Report (ePCR).
- 7. If the above actions are unsuccessful, or if the patient is resisting the restraints, consider chemical restraint per protocol.
- 8. IF a patient is restrained by law enforcement personnel with handcuffs or other devices EMS personnel cannot remove, a law enforcement officer must accompany the patient to the hospital in the transporting EMS vehicle
- 9. Consider Behavioral Emergencies Protocol.
- 10. **Restraining a patient in the prone position is never authorized.**

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Selective Spinal Motion Restriction - Procedures

Prepare All Procedure Specific Materials:

- Backboard
- Straps
- C-collar appropriate for patient size
- Tape and/or Head Rolls

Procedure:

- 1. Explain the procedure to the patient.
- 2. Apply 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.
 - This may be performed by any credentialed responder if indicated by protocol.
- 3. Once the collar is secure, the second rescuer should continue to maintain inline neutral position to ensure stabilization.
 - The collar is helpful but will not do the job by itself.
- 4. If the patient is supine or prone, consider the log roll technique. For the patient in a vehicle or otherwise unable to be placed prone or supine, place them on the backboard by the safest method available that maximizes maintenance of in-line spinal stability
- 5. 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.
- 6. 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.
- 7. Document the time of the procedure in the electronic Patient Care Report (ePCR).

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Spinal Immobilization of Athletes with Helmets - Procedures

EMS Providers must use extreme caution when evaluating and treating an injured player, especially when the extent of the injury remains unknown. Suspect any unconscious football player to have an accompanying spinal injury until proven otherwise. If the player isn't breathing or the possibility of respiratory arrest exists, it's essential that certified athletic trainers and EMS providers work quickly and effectively to remove the face mask and administer care. In most situations, the helmet should not be removed in the field. Proper management of head and neck injuries includes leaving the helmet and shoulder pads in place whenever possible, removing only the face mask from the helmet and developing a plan to manage head-and-neck injured players using well-trained sports medicine and EMS providers.



Guidelines and Recommendations:

The following guidelines and recommendations were developed by the Inter-Association Task Force for the appropriate Care of the Spine-Injured Athlete:

- ❑ 1. General Guidelines for Care *Prior to Arrival of EMS*
 - The Emergency Medical Services system should be activated
 - Any athlete suspected of having a spinal injury should not be moved and should be managed as though a spinal injury exists.
 - The athlete's airway, breathing and circulation, neurological status and level of consciousness should be assessed
 - The athlete should NOT be moved unless absolutely essential to maintain airway, breathing and circulation
 - If the athlete must be moved to maintain airway, breathing and circulation, the athlete should be placed in a supine position while maintaining spinal immobilization.
 - When moving a suspected spine injured athlete, the head and trunk should be moved as a unit. One accepted technique is to manually splint the head to the trunk.
- ❑ 2. Face Mask Removal
 - The face mask should be removed prior to transportation, regardless of current respiratory status (see figure 1)
 - Those involved in the pre-hospital care of injured players must have the tools for face mask removal readily available.

Indications for Helmet Removal:

- ❑ 1. The athletic helmet and chin straps should *only* be removed *if*:
 - The helmet and chin strap do not hold the head securely, such that immobilization of the helmet does not also immobilize the head
 - The design of the helmet and chin strap is such that even after removal of the face mask the airway cannot be controlled, or ventilation be provided.
 - The face mask cannot be removed after a reasonable period of time
 - The helmet prevents immobilization from transporting in an appropriate position.

Helmet Removal:

- ❑ 1. If it becomes absolutely necessary, spinal immobilization must be maintained while removed the helmet
 - Helmet removal should be frequently practiced under proper supervision by an EMS supervisor or Training Division staff
 - Due to the varying types of helmets encountered, the helmet should be removed with close oversight by the team athletic trainers and/or sports medicine staff
 - In most circumstances, it may be helpful to remove cheek padding and/or deflate air padding prior to helmet removal.

Spinal Alignment:

- ❑ 1. Appropriate spinal alignment *must* be maintained during care and transport using backboard, straps, tape, head blocks or other necessary equipment.
 - Be aware that the helmet and shoulder pads elevate an athlete's trunk when in the supine position
 - Should either be removed, or if only one is present, appropriate spinal alignment must be maintained.
 - The front of the shoulder pads can be opened to allow access for CPR and defibrillation



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Splinting - Procedures

Clinical Indications:

- Immobilization of an extremity for transport due to suspected fracture, sprain or other traumatic injury
- Immobilization of an extremity for transport to secure medically necessary devices such as IV catheter

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.
 - If extended scene time, prolonged extrication and pulseless extremity, contact Medical Control for recommendations
- 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.
- 5. Place the splint and secure with Velcro, straps, or bandage material (ie. 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, reposition the splint and reassess. If no improvement, remove splint.
- 7. IF a femur fracture is suspected and there is no evidence of pelvic fracture or instability, place a traction splint.
- 8. Consider pain management per Pain Management Protocol.
- 9. Document the time, type of splint, and the pre and post assessment of pulse, sensation and motor function in the electronic Patient Care Report (ePCR).

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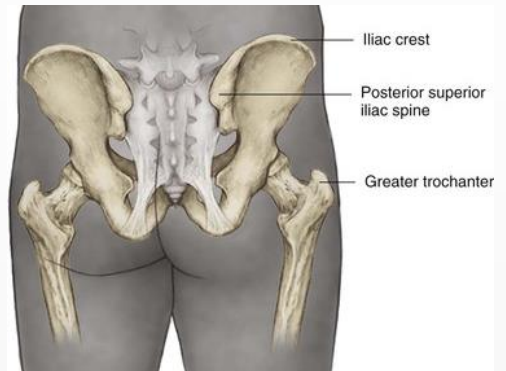
Pelvic Binder - Procedures

Clinical Indications:

- High Energy Mechanism such as Motor Vehicle Crash (MVC), pedestrians struck by vehicles, falls from significant height
 - Suspect fracture in mechanisms with pelvic, low back or groin pain **AND** SBP <90mmHg or Pediatric age specific hypotension
- Pelvic stabilization is an important intervention in the management of severe pelvic trauma, and has 4 primary objectives
 - Prevent re-injury from pathologic pelvic movement (most important), decrease pelvic volume, tamponade bleeding pelvic bones and vessels, decrease pain
 - Pelvic fractures have a high potential for significant intraperitoneal hemorrhage and blood

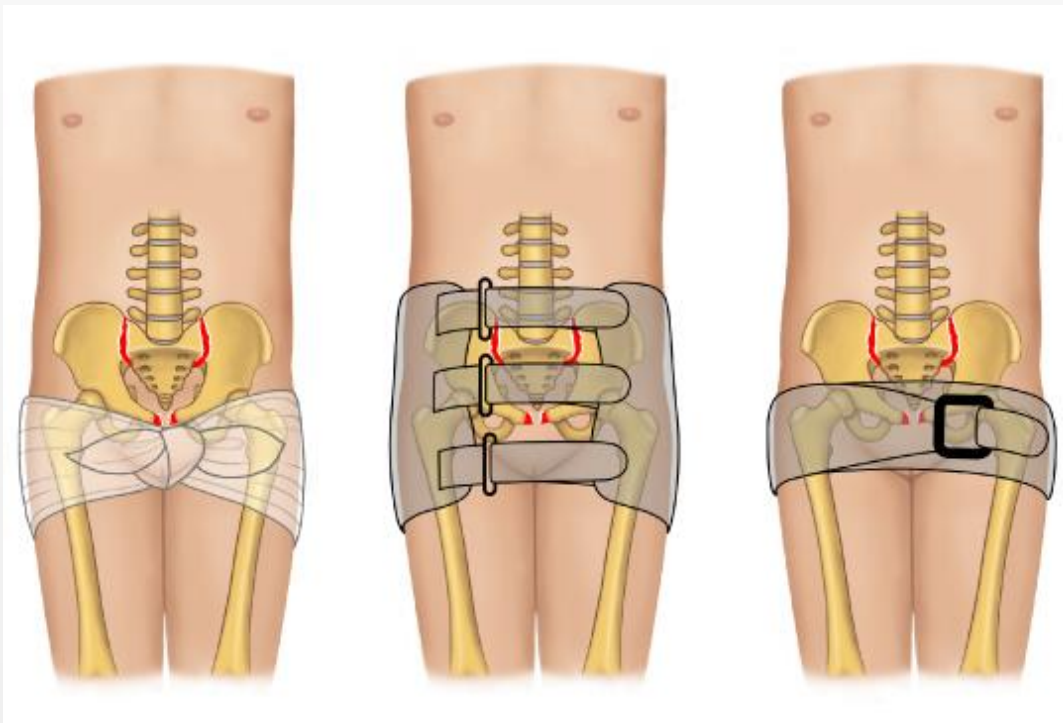
Procedure:

- Appropriately expose the patient and identify the greater trochanters bilaterally
- Assessment of the pelvis should be performed with extreme care
 - Inspect for ecchymosis, deformity, asymmetry, pelvic or lower extremity wounds
 - Palpate the skeletal structures – iliac crests, ischial tuberosity, lumbar spine and sacrum, greater trochanters
- Place a sheet or pelvic binder under the patient with the center at the level of the greater trochanters
- Tighten commercially available pelvic binder per manufacturer instruction
- With sheet binder, tighten by twisting and secure to maintain tension
- Assess for distal pulses before and after application
- Pelvic fractures have a high potential for significant intraperitoneal hemorrhage



Contraindications:

- Isolated femoral neck fracture
- Suspected traumatic hip dislocation
- Pelvic binding may exacerbate injury in iliac wing fractures and injuries with an over-riding pubic symphysis



***PEARL: The greater trochanters should be the area of pressure application, and are generally lower than you think!**



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Tourniquet (CAT – Combat Application Tourniquet) - Procedures

Principles:

- Apply Tourniquet as proximal as possible to wound, minimum of 2" above hemorrhage site. Do not cross joints or bony prominences with the Tourniquet
- Secure Tourniquet in place and expedite transport.
- Document time and location of tourniquet deployment in electronic Patient Care Report (ePCR) and on device.
- Notify receiving center of tourniquet use, location of device and time placed.
- IF hemorrhage not controlled, a second tourniquet can be deployed, proximal to the first without overlap.**

Procedure:



1. Route the self adhering band around the extremity and pass the free-running end of the band through the inside slit of the friction adapter buckle



2. Pass the band through the outside slit of the buckle, utilizing the friction adaptor buckle, which will lock the band in place.



3. Pull the self-adhering band tight and securely fasten the band back on itself.



4. Twist the rod until bright red bleeding has stopped.



5. Lock the rod in place with the Windlass Clip™



6. Hemorrhage is now controlled. Secure the rod with the strap: Grasp the Windlass Strap™, pull it tight and adhere it to the opposite hook on the Windlass Clip™



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SOF Tactical Tourniquet - Wide - Procedures

Principles:

- Apply Tourniquet as proximal as possible to wound, minimum of 2" above hemorrhage site. Do not cross joints or bony prominences with the Tourniquet
- Secure Tourniquet in place and expedite transport.
- Document time and location of tourniquet deployment in electronic Patient Care Report (ePCR) and on device.
- Notify receiving center of tourniquet use, location of device and time placed.
- IF hemorrhage not controlled, a second tourniquet can be deployed, proximal to the first without overlap.**

Procedure:



1. Release the quick disconnect buckle, then route the constricting band around the injured limb.



2. Reconnect the quick disconnect buckle



3. Remove slack by pulling on the loose end of the constricting band. Removing as much slack as possible will increase efficacy of windlass.



4. Turn windlass until bleeding stops completely. Wound may continue to seep but there should be no active blood flow.



5. Stow windlass in tri-ring once bleeding is controlled.



6. If possible, mark the time of tourniquet application so the next provider is aware.



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Accessing Peripherally Inserted Central Catheter (PICC) - Procedures

P Paramedic

Clinical Indications:

- Inability to obtain adequate alternative peripheral access
- Access of an existing catheter for medication or fluid administration
- Central venous access in a patient in cardiac arrest
- Only appropriate for critical patients

Procedure:

- 1. Use personal protective equipment, including gloves, gown and mask as indicated.
- 2. Clean the port of the catheter with alcohol wipe
- 3. Using sterile technique, withdraw 5-10mL of blood and place syringe in sharps box.
- 4. Using 5mL normal saline, access the port with sterile technique and gently attempt to flush the saline.
 - IF there is NO resistance with flush, no evidence of infiltration (i.e. No subcutaneous, collection of fluid), and no pain experienced by the patient, then proceed to step 5
 - IF there IS resistance with flush, evidence of infiltration, pain experienced by the patient, or any concern that the catheter may be clotted or dislodged, *do not use the catheter*.
- 5. Begin administration of medications or IV fluids slowly. Observe for any signs of infiltration. If difficulties are encountered, stop the infusion and reassess.
- 6. Document procedure, any complications, and fluids/medications administered in the electronic Patient Care Report (ePCR).

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Extremity Venous Access - Procedures

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Prepare All Procedure Specific Materials:

- Appropriate tubing or IV lock
- #14-#24 catheter over the needle, or butterfly needle
- Venous tourniquet
- Antiseptic swab
- Gauze pad or adhesive bandage
- Tape or commercially available securing device

Procedure:

- 1. Saline locks may be used as an alternative to IV tubing and fluid under the authorization of the Service Medical Director and at the discretion of the provider.
- 2. Intraosseous access can be used where threat to life exists as provided for in the Venous Access – Intraosseous Procedure.
- 3. Use the largest catheter bore necessary based upon the patient's condition and size of veins
- 4. Fluid and set up choice is preferably:
 - Normal Saline with macro drip (10 drops/mL) for medical/trauma conditions.
 - Normal Saline with a micro drip (60 drops/mL) for medication infusions or for patients at risk of fluid overload.
- 5. Assemble IV solution and tubing:
 - Open IV bag and check for clarity, expiration date, etc.
 - Verify correct solution
 - Open IV tubing and assemble according to manufacturer's guidelines
- 6. Insertion:
 - Explain to the patient that an IV is going to be started
 - Place the tourniquet around the patient's arm proximal to the IV site, if appropriate
 - Palpate veins for resilience
 - Clean the skin with the antiseptic swab in an increasing sized concentric circle and follow it with an alcohol swab
 - Stabilize the vein distally with the thumb/fingers
 - Enter the skin with the bevel of the needle facing upward
 - Enter the vein, obtain a flash, and advance the catheter into the vein while stabilizing the needle
 - Remove the needle while compressing the proximal tip of the catheter to minimize blood loss
 - Remove the tourniquet
 - Connect IV tubing to the catheter, or secure the IV lock to the catheter to minimize blood loss
 - Open the IV clamp to assure free flow (no infiltration, pain, etc) and set infusion rate
- 7. Secure the IV:
 - Secure the IV catheter and tubing
 - Recheck IV drip rate to make sure it is flowing at appropriate rate.
- 8. Trouble shoot the IV, (if the IV is not working well):
 - Make sure the tourniquet is off
 - Check the IV insertion site for swelling
 - Check the IV tubing clamp to make sure it is open
 - Check the drip chamber to make sure it is half full
 - Lower the IV bag below IV site and watch for blood to return into the tubing

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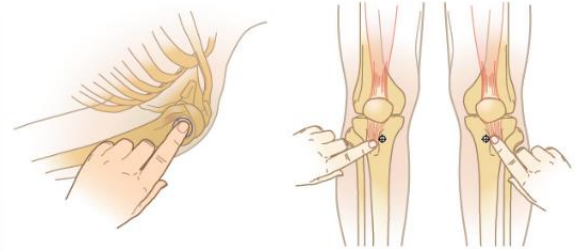
IO Intraosseous Venous Access - Procedures

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Procedure:

1. Select the appropriate insertion site and palpate the appropriate bony landmarks to identify the site of insertion .
 - **The PROXIMAL HUMERUS is contraindicated in patients ≤ 18 years old, UNLESS authorized by Medical Control.**

Anterior Tibia	Anteromedial aspect of the proximal tibia (bony prominence below the kneecap). The insertion location will be 1-2cm (2 finger widths) below this.
Proximal Humerus (Hand Over Umbilicus Technique)	Keeping the elbow flat on the floor and close to the side of the body, rotate the palm over the umbilicus (belly button) and palpate the greater tubercle of the humerus. The insertion location will be 1-2cm (2 finger widths) above the surgical neck.
Proximal Humerus ("Thumb-to-Bum" Technique)	With the arm fully extended and tight to the body, rotate the hand medially (inward) until the palm is facing out. Palpate the greater tubercle of the humerus approximately 1-2cm (2 finger widths) above the surgical neck.



2. Cleanse the site with chlorhexidine, iodine or alcohol prep pad.
3. Device insertion
 - Manual devices (Cook or Jamshidi):
 - Hold the intraosseous needle at a 90° degree angle to the bony surface, aimed away from the nearby joint and epiphyseal plate.
 - Provide pressure to push the needle tip through the skin until resistance from the bone is felt.
 - Twist the needle handle with a rotating grinding motion applying controlled downward force until a “pop” or loss of resistance is felt.
 - *Do not advance more than 1cm after the loss of resistance is felt.*
 - Powered Intraosseous Device (EZ-IO):
 - Hold the intraosseous needle at a 90° degree angle to the bony surface, aimed away from the nearby joint and epiphyseal plate.
 - Provide pressure to push the needle tip through the skin until resistance form the bone is felt.
 - Power the driver until a “pop” or loss of resistance is felt.
 - *Do not advance more than 1cm after the loss or resistance is felt.*
 - Automatic Intraosseous Device (NIO):
 - Rotate the cap 90° in either direction to unlock
 - Place dominant hand over cap, and press device against patient. While pressing down on the device with palm, pull trigger wings upwards with fingers
 - Gently pull the NIO up in a rotating motion while holding the needle stabilizer against the insertion site
 - Continue holding the needle stabilizer in place and pull up the stylet to remove.
4. Remove the stylet and place in an approved sharps container
5. Attach a 10mL syringe filled with 5mL of Normal Saline; aspirate bone marrow to verify placement, then inject 5mL of Normal Saline to clear the lumen of the needle.
6. Attach the IV line with fluids on a pressure bag.
7. Stabilize and secure the needle with dressings and tape
8. Document the procedure, time, and procedure success (or failure) on the PCR

Complications:

- Incorrect identification of landmarks
- A bent needle (more common with longer needles)
- Clogging of the needle with marrow, clot or bone spicules.
 - Can be avoided by flushing the needle or continuous infusion
- Through and through penetration of both anterior and posterior cortices caused by excess force after the needle has penetrated the cortex.
- Subcutaneous or subperiosteal infiltration, caused by incomplete placement or dislodgement of needle.
- Fractures caused by excess force or fragile bones.
- Compartment syndrome

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



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External Jugular Venous Access - Procedures

P Paramedic

Clinical Indications:

- Medical patients who are awake and alert, and require IV access but are peripherally exhausted
- External jugular cannulation can be attempted initially in life threatening events when no obvious peripheral site is noted.

Prepare All Procedure Specific Materials:

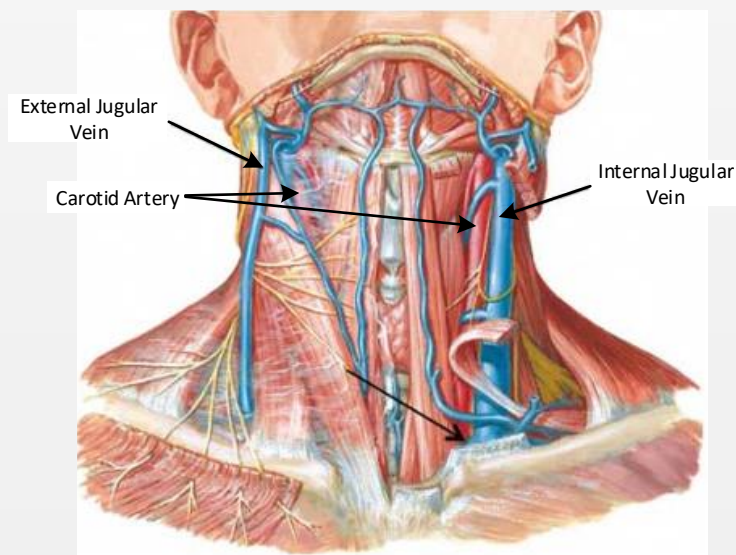
- Appropriate tubing or IV lock
- #14-#24 catheter over the needle or butterfly needle
- Antiseptic swab
- Gauze pad or adhesive bandage
- Tape or other securing device

Procedure:

1. Position yourself at the head of the patient.
2. Place the patient in a slight Trendelenburg (supine, head down) position if possible. This helps distend the vein and prevent air embolism.
3. Turn the patient's head toward the opposite side if no risk of cervical injury exists.
4. Prep the site with antiseptic swab.
5. Align the catheter with the vein (insertion direction is away from the patient's head, toward the patient's same side shoulder).
6. Anchoring the vein lightly with one finger above the clavicle, puncture the vein at a superficial angle midway between the angle of the jaw and the clavicle and cannulate the vein.
7. Confirm placement with saline flush.
8. Attach the IV and secure the catheter (avoiding circumferential dressing or taping around the neck).
9. If unsuccessful, place occlusive dressing over site and do NOT go to other side of neck
10. Document the procedure appropriately.

Contraindications:

- Patient combative or uncooperative with positioning (i.e. unable to hold still while procedure is being performed)
- Anterior neck hematoma/burn/cellulitis
- Anatomic landmarks not visible
- Medical appliance in place covering anterior neck (i.e. c-collar)
- Monitor for complications
 - Expanding hematoma
 - Tracheal shift
 - Difficulty breathing



***PEARL: Superficial insertion angle is crucial as the carotid artery is in close proximity to the EJ.**



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Wound Care - Procedures

Clinical Indications:

Skin and soft tissue wounds with associated bleeding and pain.

Procedure:

- 1. Use personal protective equipment, including gloves, gown and mask as indicated.
- 2. If active bleeding, elevate the affected area if possible and hold direct pressure. Do not rely on compression bandage to control bleeding. Direct pressure is much more effective
- 3. Consider tourniquet use early for extremity bleeding not controlled with direct pressure.
- 4. Once bleeding is controlled, irrigate contaminated wounds with saline as appropriate
 - Consider Pain Management Protocol before beginning irrigation.
 - Irrigation and decontamination are key to stopping ongoing tissue injury, preventing infection and promoting wound healing.
 - Control bleeding and address life threats first.
 - Irrigate thermal burns, chemical burns or contaminated wounds with Normal Saline, Lactated Ringer's or sterile water.
 - For chemical splashes to the eye, emergent irrigation is critical to preventing further tissue damage. If possible, have patient remove contact lenses as early as possible. Go to Eye Pain Protocol, as appropriate.
- 5. Cover wounds with sterile gauze/dressings. Check distal pulses, sensation, and motor function to ensure the bandage is not too tight.
- 6. Monitor wounds and/or dressing throughout transport for bleeding
- 7. Bolster existing bandages as necessary if saturation or
- 8. Consider second tourniquet use as indicated in protocol/procedure. Do not remove first tourniquet; apply the second higher on the limb.
- 9. If serious hemorrhage not controlled by other means:
 - Apply approved non-heat generating hemostatic agent per manufacturer's directions.
 - Supplement hemostatic agent impregnated gauze with direct pressure and standard hemorrhage control techniques
 - Apply additional hemostatic impregnated gauze and/or standard dressings as needed.
 - Hemostatic impregnated gauze is contraindicated in wounds involving the thoracic cavity or violating the peritoneum of the abdominal cavity.
- 10. Document the wound assessment and care in the electronic Patient Care Report (ePCR).

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Wound Packing - Procedures

Clinical Indications:

Skin and soft tissue wounds with MAJOR bleeding not controlled by direct pressure or tourniquet deployment as above .

Procedure:

- 1. Use personal protective equipment, including gloves, gown and mask as indicated.
- 2. Apply direct pressure to the wound
- 3. Insert finger(s) into the wound and apply firm pressure to visualized bleeding vessel to control bleeding.
- 4. Create a small ball at the beginning of the roll gauze (preferentially hemostatic impregnated)
- 5. Press the gauze deep into the wound, occluding the bleeding vessel against bone or firm tissue.
- 6. While maintaining pressure on the leading edge of the gauze, begin to feed more gauze into the wound, packing it tightly in place while continuing pressure on the bleeding vessel.
- 7. Continue packing the wound until you have filled the wound space -OR- until you have a minimum 2-3" of gauze remaining
 - Leave an adequate "tail" on packing to facilitate later removal at the hospital
- 8. Maintain manual direct pressure on the wound for 3-5 minutes.
- 9. Reassess and wrap the wound with a pressure dressing to maintain pressure for support.
- 10. If bleeding persists, apply more gauze but DO NOT remove the wound packing.
- 11. Continue monitoring the wound and assess for continued direct pressure as needed throughout transport.
- 12. Document the wound assessment and patient care in the electronic Patient Care Report (ePCR).



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Ventricular Assist Device - Procedures

Frequently Asked Questions:

What is a Ventricular Assist Device (VAD)?

A ventricular assist device (VAD) is a mechanical pump that is used to support heart function and blood flow in people who have weakened hearts. Some common reasons for VAD implantation are MI, Heart Failure, myocarditis, cardiomyopathy and heart surgery.

How does a VAD work?

The device takes blood from a lower chamber of the heart and helps pump it to the body and vital organs, just as a healthy heart would.

What are the parts of a VAD?

The basic parts of a VAD include: a small tube that carries blood out of your heart into a pump; another tube that carries blood from the pump to your blood vessels, which deliver blood to your body; and a power source.

What is the power source?

The power source is either batteries or AC power. The power source is connected to a control unit that monitors the VAD functions. The batteries are carried in a case usually located in a holster in a vest around the patient's shoulders.

What does the control unit (or controller) do?

The control unit gives warnings or alarms if the power is low or if it senses that the device isn't functioning properly.

MOST patients have a tag located on the controller around their waist that lists the type of device, the institution that put it in and a number to call.

Patient Management:

1. Assess the patient's airway and intervene per the Airway Management Protocol
2. Auscultate heart sounds to determine if the device is functioning and what type of device it is. If it is a continuous flow device, you should hear a "whirling sound".
3. Assess the device for any alarms.
4. Look on the controller located around the patient's waist or in the VAD PAK and see what device it is.
5. Assess Vital Signs – use Mean BP with Doppler, if available. The first sound you will hear is the Mean Arterial Pressure (MAP)
6. If no Doppler available, use the Mean on the Non-Invasive BP cuff
7. Intervene appropriately based on the type of alarm and patient guide.
 - If patient is not responsive, has evidence of inadequate perfusion, and LVAD appears to be functioning---Perform external chest compressions and follow ACLS protocol
 - If patient is not responsive, has evidence of inadequate perfusion, and LVAD does NOT appear to be functioning---assess for a pulse
If NO pulse, perform external chest compressions and follow ACLS protocol
If pulse palpated, follow appropriate medical protocol, consider likely decompensated heart failure and proceed to chest compressions only if pulses are lost.
8. Start one large bore IV
9. Transport to the closest VAD Center. Call the number listed on the device for advice.
10. Bring all of the patient's equipment and paperwork to the Emergency Department.
11. Allow the trained caregiver to ride in the patient compartment when possible. They may be able to serve as an expert on the device if the patient is unconscious or unable to answer for themselves.

Quick Tips for Ventricular Assist Devices (VADs)

- Let the patient and/or caregiver take the lead; they will be your on-scene experts.
- Remember not to perform chest compressions because they could dislodge the pump, making the patient bleed to death. Use the assistance of the VAD coordinator before starting compressions in the case of obvious arrest and pump failure.
- Defibrillate / cardiovert as normal. Do NOT place the pads over the device that is under the patient's skin.
- Keep in mind it may be difficult to obtain an accurate SpO2 because of little or no pulse.
- BE CAREFUL WHEN REMOVING / CUTTING CLOTHING so you don't inadvertently dislodge or cut the drive line.**
- Take the patient's emergency travel bag when leaving the scene. It should have an extra controller, batteries and the VAD Coordinator's emergency contact number.

<http://mylvad.com/sites/mylvadrp/files/FMS%20Field%20Guides/MCSO%20EMS%20GUIDE%202015%20.pdf>
<http://www.jems.com/articles/print/volume-37/issue-2/patient-care/patients-ventricular-assist-device-need.html>



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Nitrous Oxide - Procedures

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Clinical Indications:

- Adult patients with acute pain.
- Nitrous Oxide should ONLY be used by patients who have the capacity to understand and the ability to perform self-administration of inhaled medications.

Contraindications:

- Nitrous Oxide rapidly diffuses into air-filled spaces within the body and can significantly increase pressures exerted by gases. Therefore, it should NOT be used in cases where there are or are suspected to be abnormal collections of air within the body. Some common examples include but are not limited to:
 - Pneumothorax
 - Pulmonary Blebs (commonly seen in COPD)
 - Air Embolism
 - Small Bowel Obstruction
 - Pneumocephalus (air within the skull)
 - Eye Injury or Eye Surgery
 - Recent Middle Ear Surgery
- Nitrous is known to be teratogenic and is contraindicated before the end of 3rd trimester of pregnancy
- Altered mental status from head injury, alcohol or drugs
- Inability to follow commands and/or safely self-administer the medication

Preparation:

- Prepare all procedure specific materials:
- Set up Medical Director approved nitrous oxide system per manufacturer written procedure.
- Turn on exhaust fan in patient care area.
- Verify indications and contraindications prior to Nitrous Oxide administration

Procedure:

1. Instruct the patient to hold the face mask lightly on the face, covering the nose and mouth.
2. Instruct patient to breathe normally through the demand valve mask until pain at acceptable level or until patient no longer able to hold the mask to their face. Personnel must not hold mask to patient's face.
3. Turn off flow of nitrous oxide when patient completes self-administered dose.
4. Reassess patient's pain at 3-5 minutes with pain scale. If pain not controlled, consider other pain management options.
5. Document start and stop times for Nitrous Oxide use. Do not exceed time permitted by NIOSH occupational exposure standards.
 - In open, outside, well ventilated areas: no maximum time of administration
 - Ambulance with open windows and exhaust fans running: Max of 30 minutes per 8 hour period.
6. Document Nitrous Oxide canister pressure at the start of administration and at the end of administration.
7. Record vital signs during and after treatment (Nitrous Oxide may cause BP to drop in some cases).

Special notes:

- Nitrous oxide is in liquid state in its bottle. Ensure the bottle remains in the upright position when the bottle is open and especially during patient administration.
- Nitrous oxide can potentiate the effects of other CNS depressants such as narcotics, sedatives, hypnotics and alcohol.
- Patients on chronic opiates may be highly tolerant to the analgesic effects of nitrous.
- Nitrous oxide is minimally metabolized in humans, and therefore retains its potency when exhaled into the room by the patient; a continuous-flow fresh-air ventilation system and/or N2O scavenger system must be used to prevent waste gas buildup in the passenger compartment.**



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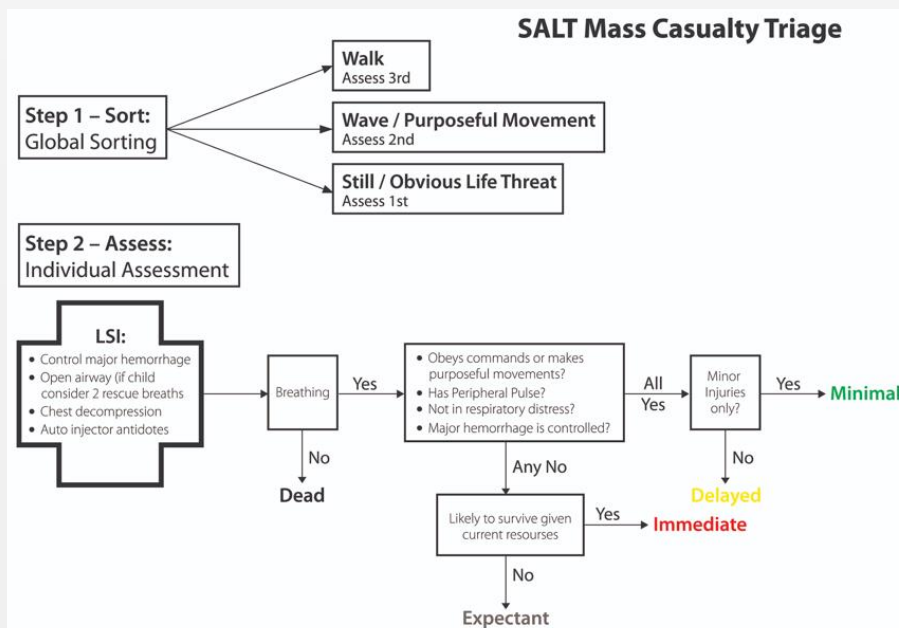
SALT Mass Casualty Triage - Procedures

Clinical Indications:

- ❑ It is important to use a Triage strategy any time there is a Mass Casualty Incident (MCI), or when limited resources need to be allocated to maximize the number of survivors
- ❑ SALT is an evidence-based, non-proprietary triage system developed in 2008. It is endorsed by the State of Wisconsin, is used by the majority of services in the Region and was adopted by Dane County EMS as the official Triage Strategy for all MCIs
- ❑ SALT stands for “Sort, Assess, Lifesaving Interventions, Treatment and/or Transport” and is based on the Model Uniform Core Criteria (MUCC) for Mass Casualty Incidents
- ❑ Only appropriate for critical patients

Procedure:

- ❑ **Step 1 – Global Sorting**
 - Patients who can walk should be asked to move to a designated area and should be assigned LAST priority for individual assessment
 - Those who remain should be asked to wave or be observed for purposeful movement, those who do not move and those with obvious life-threatening conditions should be assessed FIRST because they are the most likely to need lifesaving interventions
- ❑ **Step 2 – Assess and Lifesaving Interventions**
 - Control major hemorrhage through the use of tourniquets or direct pressure provided by other patients or other devices
 - Open the airway through positioning or basic airway adjuncts (no advanced airway devices should be used); if the patient is a child, consider giving 2 rescue breaths
 - Chest decompression procedure (see p163)
 - Autoinjector antidote administration
 - *Lifesaving interventions should be performed only within the responder’s scope of practice and only if the equipment is immediately available
- ❑ **Step 3 – Treatment and/or Transport**
 - Prioritize patients for treatment and/or transport based on 1 of 5 categories;
 - Minimal (GREEN) – Mild injuries that are self-limited if not treated, and can tolerate a delay in care without increasing mortality
 - Dead (BLACK) – Not breathing even after lifesaving interventions are attempted
 - Immediate (RED) – Do not obey commands, do not have a peripheral pulse, are in respiratory distress or have uncontrolled major hemorrhage
 - Expectant (GRAY) – Provider determines injuries are incompatible with life given the current available resources
 - Delayed (YELLOW) – All patients who do not fit into one of the categories above
 - The prioritization process is dynamic and may be altered by changing patient conditions, resources and scene safety
 - In general, treatment and/or transport should be provided for immediate patients first, then delayed, then minimal; EXPECTANT patients should be provided with treatment and/or transport when resources permit
 - Efficient use of transport assets may include mixing categories of patients and using alternate forms of transport



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Base Hospital Activation - Procedures

Clinical Indications:

- It is important to activate the Base Hospital any time there is a Mass Casualty Incident (MCI), or when limited resources need to be allocated to maximize the number of survivors
 - For Base Hospital activation on incidents inside Dane County, an MCI is defined as any incident which is expected to result in ≥ 5 patients requiring EMS transport from the scene.
- Excellent communication between EMS and receiving hospitals will help coordination of care, optimize patient distribution to real time hospital capabilities and improve outcomes during a large scale event or MCI.

Procedure:

- Step 1 – Establish Incident Command early*
 - The first in unit will generally take Command of the incident, ensure that Base Hospital has been activated and the EMResource (previously WITRAC) notification has been sent out by the Dane County 9-1-1 Center.
 - In accordance with ICS structure, EMS can keep Command, pass Command or assimilate into the Unified Command structure.
- Step 2 – Establishment of EMS Branch*
 - The person in charge of EMS activities should assume the role of EMS Branch Director. This Director is tasked with assigning and supervising the roles of: Triage Group Supervisor, Treatment Group Supervisor, Transportation Group Supervisor
 - Consider assigning a record keeper to the Transportation Group Supervisor, to complete the form for after-action reporting
- Step 3 – Establish Radio Contact with Base Hospital*
 - Transportation Group Supervisor should be on the “Base Hospital Talk Group” to speak with Base Hospital. All hospitals are expected to monitor this channel during a large event for information, but only Base Hospital has authority to speak
 - Address the Base as “Base Hospital”; the contact person will be providing objective data regarding resource availability, regardless of their primary hospital affiliation
 - Base Hospital will provide the real time capabilities of all hospitals that have answered the EMResource alert at that time
 - This will be listed as the number of each category of patients that the hospitals can manage at that moment
- Step 4 – Triage and Treatment*
 - Patients should be triaged and managed in accordance with the SALT Triage Procedure (see p183 for details)
- Step 5 – Transportation*
 - The Transportation Group Supervisor is responsible for assigning triaged patients to the most appropriate transportation mode based on acuity and resource availability
 - Transportation Group Supervisor should notify Base Hospital of destination, number and acuity of patients as they are assigned and leave the scene
 - Base Hospital will track the patient assignments, and will regularly update hospital capabilities as the event unfolds. Updates on capabilities will be regularly reported, and should be available upon request by the Transportation Group Supervisor
 - Like EMS, Hospital capabilities are NOT static; Walk-ins, security threats as well as increased staff presence can all impact the ability of our hospitals to receive and manage patients. Frequent and clear communication about the situation and the capabilities on both sides will be essential to successfully managing any event and optimizing patient outcomes.
 - Hospital communication by transporting ambulances are conducted on the same channel as routine. Reports expected to be BRIEF and CONCISE so as to keep radio traffic to a minimum; it is likely there will be many trying to access these channels
- Step 6 – Event Resolution*
 - Once all patients have cleared the scene, a final notification to Base Hospital should be made, with final tally of the number and types of patients taken to each facility. This will be important for patient tracking, family reunification and after action reports

Estimate of Injured: Adults _____ Pediatric _____

Base Hospital / Transportation Log

UW - Burns and "critical" Pediatrics if possible Meriter/St. Marys - OB if possible

Facilities	RED	YELLOW	GREEN	RED	YELLOW	GREEN	RIGS	Tag Color	Destination
	CAPACITY			SCHEDULE					
UW Children's (critical pediatric numbers)									
Meriter/Unity Point									
Stark Prairie									
St. Mary's Madison									
St. Mary's Sun Prairie									
Stoughton									
UW East - TAC									
UW Hospital									
VA Hospital									
Other - urgent care, hospital, etc.									
TOTALS									



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Base Hospital Activation - Procedures

Estimate of Injured: Adults - _____ Pediatrics - _____

Base Hospital / Transportation Log

Immediate
Delayed
Minor

UW - Burns and "critical" Pediatrics if possible Meriter/St. Marys - OB if possible

Facilities	CAPACITY			SENDING			RIGS	Tag Color	Destination
	RED	YELLOW	GREEN	RED	YELLOW	GREEN			
UW Children's (critical pediatric numbers)									
Meriter/Unity Point									
Sauk Prairie									
St. Mary's Madison									
St. Mary's Sun Prairie									
Stoughton									
UW East - TAC									
UW Hospital									
VA Hospital									
Other - Urgent Care, hospitals, etc.									
TOTALS									



Care for Law Enforcement Working Canine – Sedation (Optional)

P Paramedic

Providers utilizing this protocol should receive additional training specific to canine care if possible. EMS agencies with law enforcement working canine(s) in their jurisdiction should train on this protocol regularly.

CREW SAFETY IS PARAMOUNT

If a working law enforcement canine is injured or in need of medical attention, enlist the help of the canine handler. The canine patient should be secured in a muzzle if possible. Remember, these animals can be dangerous to EMS providers, especially when in distress. Use extreme caution when providing care to working canines.

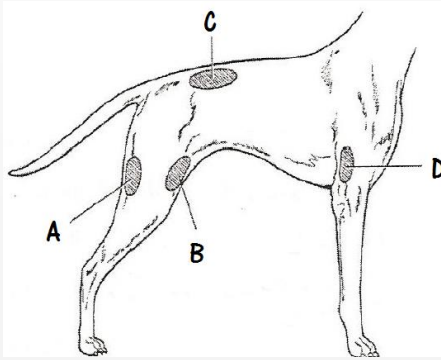
<p>Pertinent Positives and Negatives</p> <ul style="list-style-type: none"> Breed, Age, Weight Medical History Allergies 	<p>If at anytime the canine loses pulses, go to working canine CPR procedure p.187</p>	<p>Call ALS early if canine sedation may be needed</p>
------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------	--------------------------------------------------------

Normal K9 Vital Signs
 HR 60-80 bpm, resting; up to 140bpm with exertion
 Rectal temp 100-102°F; up to 106°F with exertion
 RR 10-40bpm
 SpO₂>94%
 Cap Refill <2 sec
 EtCO₂ 30-40mmHg

Working Canine Officer Ill or Injured

Canine Officer poses a safety hazard to the EMS crew, other responders, or the canine itself?

	Under 25kg	Over 25kg
P	Fentanyl 5mcg/kg IM (max 125mcg) AND Midazolam 5mg IM	Fentanyl 125mcg IM AND Midazolam 10mg IM
IM administration in the quads/thighs (A/B) is preferred		
If signs of opioid overdose Naloxone 2-4mg IM		
Naloxone reversal can result in rapid and severe aggression. DO NOT remove muzzle unless for cardiac arrest care.		



Rapid Trauma Assessment	
Hemorrhage Control, Airway Mgmt, etc.	
A	Consider Canine IV/IO Access p188

Rapid Trauma Assessment	
Hemorrhage Control, Airway Mgmt, etc.	
A	Consider Canine IV/IO Access p188

Transport to Emergency Vet Care Location
[p.188](#)
 Notify Receiving Facility Early

Pearls

- Fentanyl or midazolam alone are not advised for reliable sedation. These medications **MUST** be used together.
- Human tourniquets (CAT, SOF-T) are not advised for canine use. May use elastic tourniquets such as the SWAT.
- IM: Quad/posterior thigh are preferred. Back muscles 3 fingerbreadths cranial to the hip, lateral to the spine second option.
- Splinting/bandaging extremity: always start at toes and wrap proximally.
- Naloxone should be available when using opioid analgesics.



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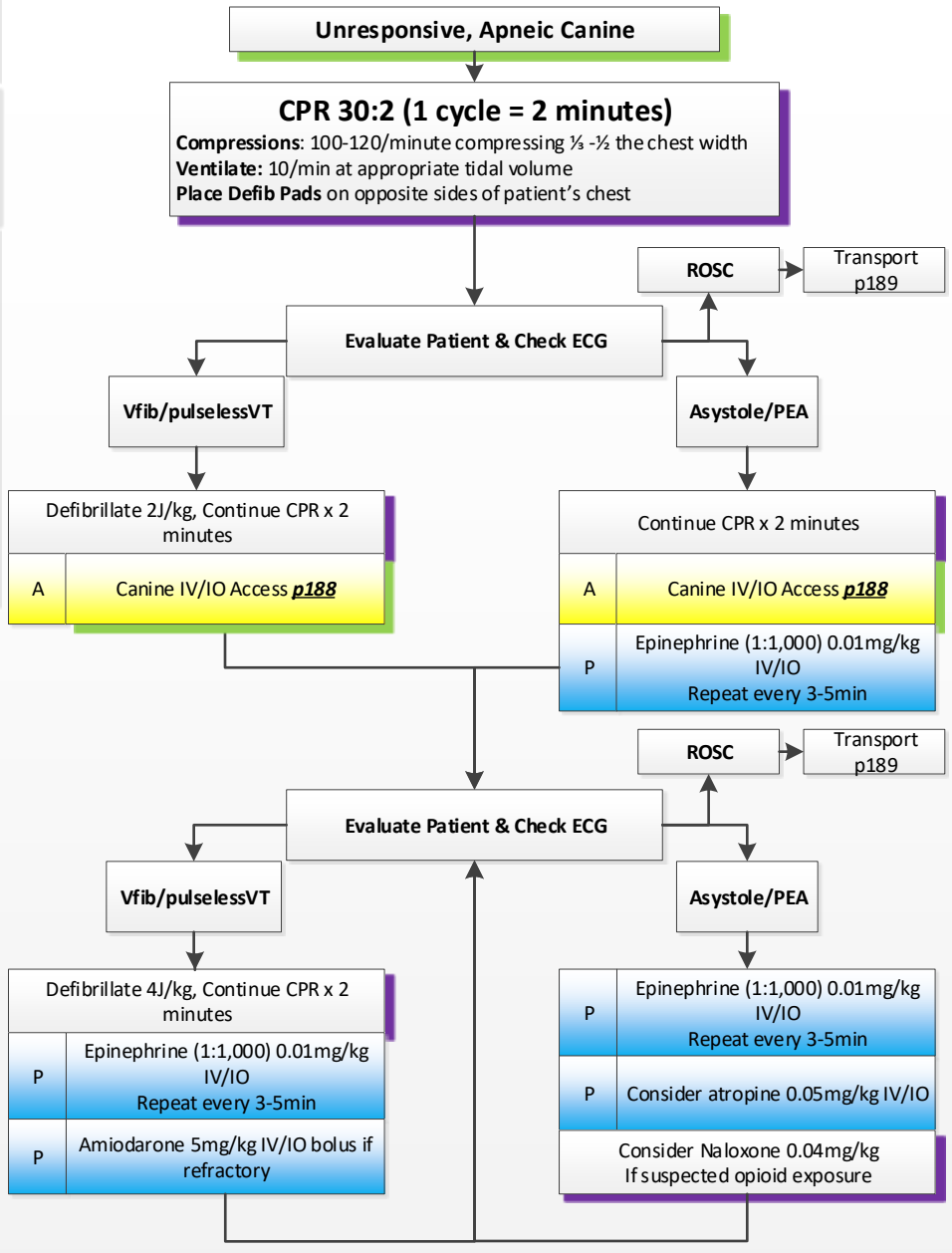
Care for Law Enforcement Working Canine – Cardiac Arrest (Optional)

RECOVER Guidelines for Veterinary Resuscitation

- Pertinent Positives and Negatives**
- Breed, Age, Weight
 - Medical History
 - Allergies

Crew Safety is Paramount
If a working law enforcement canine is injured or in need of medical attention, enlist the help of the canine handler.

- Canine CPR Notes**
- Perform in lateral recumbency
 - Rate: 100-120 compressions per minute
 - Depth: ½ the width of the chest
 - Allow full recoil between compressions
 - Larger breeds benefit from compressions over the widest portion of the thorax
 - Defib pads should be placed on opposite sides of the chest.** In figure A (below), one pad would be under the compressor's hands and the other in the same spot on the opposite side of the canine.



MEDICATION QUICK REFERENCE

	Weight (kg)	15	20	25	30	35	40	45	50
	Weight (lb)	30	40	50	60	70	80	90	100
DRUG	DOSE	ml	ml	ml	ml	ml	ml	ml	ml
P Epinephrine (1:1000)	0.01mg/kg	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5
O2 Tidal Volume USE CHILD BVM	10ml/kg	150	200	250	300	350	400	450	500
Defibrillation	First Shock: 2j/kg Subsequent Shocks: 4j/kg	30/60j	40/80j	50/100j	60/120j	70/140j	80/160j	90/180j	100/200j
DRUG	DOSE	mg	mg	mg	mg	mg	mg	mg	mg
P Atropine	0.05mg/kg	0.75	1	1.25	1.5	1.75	2	2.25	2.5
P Amiodarone	5mg/kg	75	100	125	150	175	200	225	250



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Care for Law Enforcement Working Canine – Procedures (Optional)

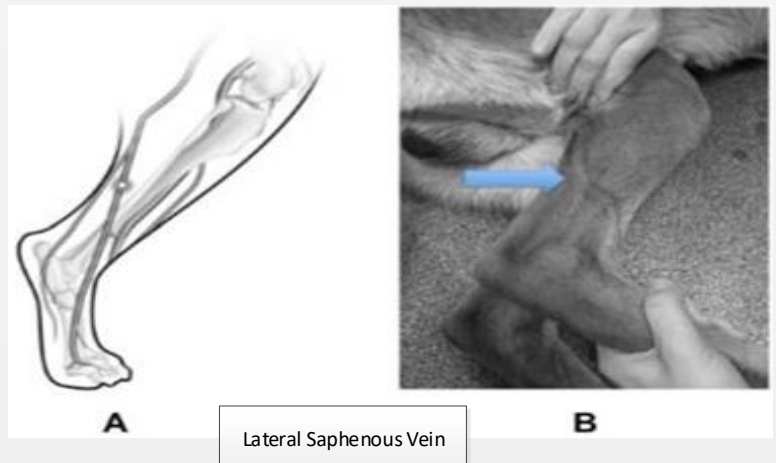
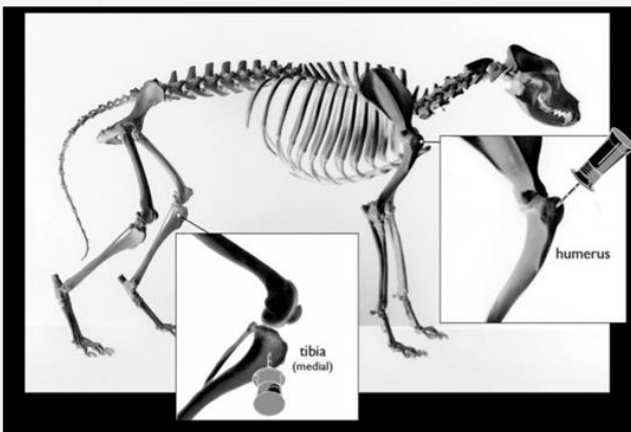
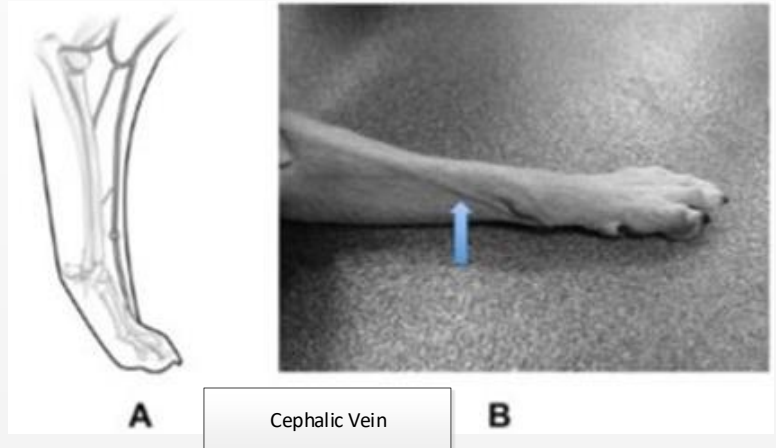
Canine Baseline Normal Vital Signs

Normal K9 vitals

- HR 60-80 bpm resting up to 140 bpm with exertion
- Rectal Temp 100-102F, up to 106F with exertion
- RR 10-40 bpm
- SpO2 >94%
- Cap refill <2 sec
- EtCO2 30-40mmHg

Preferred IV Access Sites and IVF

- IV
 - Primary – Cephalic Vein
 - Secondary – Lateral Saphenous (hind limb)
 - Tertiary – External Jugular (18g most common)
- IO
 - Medial Tibia (easy to locate and access)
 - Proximal Humerus (15g, 25-45mm)
- Fluids
 - Crystalloid Only – 20mL/kg bolus, 500mL max
 - Hypertonic Saline – 5mL/kg bolus, 125mL max
 - NO Human blood products, K9 specific only



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Care for Law Enforcement Working Canine - Procedures



EMERGENCY VETERINARY CARE LOCATIONS

If possible, please call the location ahead of time to inform them of the K9 being conveyed, ETA and any known information about injuries to help the clinic prepare to receive the patient.

- ❑ Middleton – (VES) Veterinary Emergency Services (Open 24/7)
 - 1612 High Point Rd., Suite 100
 - Middleton, WI 53562
 - **Phone: 608-831-1101**
 - Fax: 608-831-1181
- ❑ Madison (UW Campus Area) – UW Veterinary Care (Open 24/7)
 - 2015 Linden Drive
 - Madison, WI 53706
 - **Phone: 608-263-7600**
- ❑ East Madison – (VES) Veterinary Emergency Services (Open 24/7)
 - 4902 E. Broadway
 - Madison, WI 53716
 - **Phone: 608-222-2455**
 - Fax: 608-467-6014
- ❑ Madison (Beltline / Monona Area) – Madison Veterinary Specialists (Open 24/7)
 - 2704 Royal Avenue
 - Madison, WI 53713
 - **Phone: 608-274-7772**



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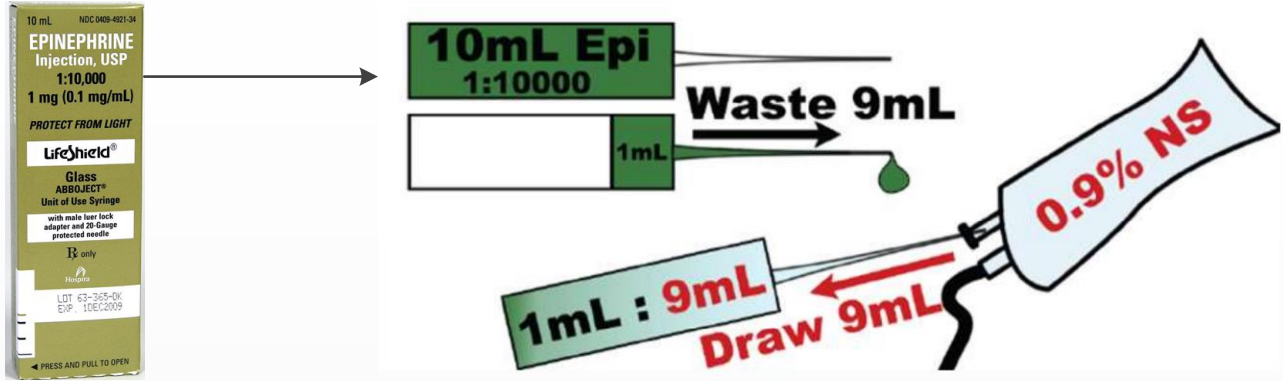
BACK

Mixing Push-Dose Epinephrine (1:100,000) - Procedures

P Paramedic

If 1:10,000 Pre-mixed Epi syringe is Available:

- ❑ 1. Waste 9mL from a pre-mixed syringe of Epinephrine 1:10,000 (leaving 1mL in the syringe)
- ❑ 2. Draw 9mL of Normal Saline back into the ampule (1mL Epinephrine + 9mL Normal Saline)
 - **Resulting Solution Concentration: 10mcg Epi per mL (1:100,000 Epi)**
- ❑ 5. Label the syringe to visually distinguish this syringe as the push-dose concentration



Equipment Needed if 1:10,000 Pre-mixed Epi syringe is NOT Available:

- ❑ 1. Expel 1mL of saline from a 0.9% Normal Saline flush, leaving 9mL remaining in the syringe



- ❑ 2. Draw up 1mL of 1:1,000 Epinephrine from vial



- ❑ 3. Expel 9mL of the solution, leaving only 1mL remaining in the syringe



- ❑ 4. Draw up 9mL of Normal Saline, filling the syringe to 10mL.

- **Resulting Solution Concentration: 10mcg Epi per mL (1:100,000 Epi)**



- ❑ 5. Label the syringe to visually distinguish this syringe as the push-dose concentration.



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Overview

Overview

The purpose of this section is to serve as a drug information supplement and to provide a brief description of the out-of-hospital medications that are authorized by the State of Wisconsin for use in the Dane County EMS System. This document in no way represents the comprehensive pharmaceutical knowledge required for use of these medications by Emergency Medical Technicians providing field care. The comprehensive information about the use of these medications by practicing EMTs and paramedics, requires reference to other detailed sources.

Pregnancy Categories are listed for each of the medications in this book. The pregnancy category of a medication is an assessment of the risk of fetal injury due to the pharmaceutical, if it is used as directed by the mother during pregnancy. It does not include any risks conferred by pharmaceutical agents or their metabolites in breast milk.

Category A – Adequate and well-controlled studies have failed to demonstrate a risk to the fetus in the first trimester of pregnancy (and there is no evidence of risk in later trimesters).


Category B - Animal reproduction studies have failed to demonstrate a risk to the fetus and there are no adequate and well-controlled studies in pregnant women.

Category C - Animal reproduction studies have shown an adverse effect on the fetus and there are no adequate and well-controlled studies in humans, but potential benefits may warrant use of the drug in pregnant women despite potential risks.

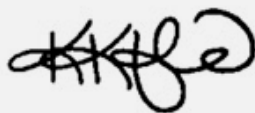
Category D - There is positive evidence of human fetal risk based on adverse reaction data from investigational or marketing experience or studies in humans, but potential benefits may warrant use of the drug in pregnant women despite potential risks.

Category X - Studies in animals or humans have demonstrated fetal abnormalities and/or there is positive evidence of human fetal risk based on adverse reaction data from investigational or marketing experience, and the risks involved in use of the drug in pregnant women clearly outweigh potential benefits.

Medications are listed alphabetically based on generic names.



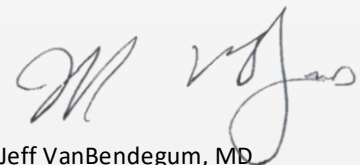
Carrie Meier
EMS Coordinator



Kacey Kronenfeld, MD
Dane Co. Medical Advisor



Michael Lohmeier, MD
Dane Co. Medical Advisor



Jeff VanBendegum, MD
Dane Co. Medical Advisor

<https://www.govinfo.gov/content/pkg/FR-2008-05-29/pdf/E8-11806.pdf>

<https://chemm.nlm.nih.gov/pregnancy/categories.htm>



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Acetaminophen

Acetaminophen

Mechanism of Action

Analgesic effect thought to be due to activation of descending inhibition of the serotonergic pathway in the CNS. Anti-pyretic effect thought to be due to inhibition of the hypothalamic heat-regulating center

Uses

Pain, Fever

Contraindications

Hypersensitivity to acetaminophen or any component of formulation

Protocol Uses

Pain Management, Adult (**p58**), Pain Management, Pediatric (**p107**)

Side Effects

GI: Nausea, vomiting

GU: Nephrotoxicity (chronic overdose)

Heme: anemia

Skin: Hypersensitivity, skin rash

Pharmacokinetics

Half-life ~ 2 hours; metabolized in liver; crosses the placenta

Pregnancy Category – B

Interactions

Increase: hepatotoxic effects – alcohol, fosphenytoin

Increase: effects of warfarin

Decrease: acetaminophen effects – barbiturates, carbamazepine

Decrease: effect of – lamotrigine

EMT Considerations

Assess: Assess mental status and appropriateness for oral medications

Evaluate: Therapeutic response

Treatment of Overdose

Discontinue product, activated charcoal, N-acetylcysteine, supportive care

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Adenosine

Adenosine

Mechanism of Action

Slows conduction through the AV node, can interrupt reentry pathways through the AV node, and can restore normal sinus rhythm in patients with paroxysmal supraventricular tachycardia; decreases cardiac oxygen demand, decreasing hypoxia

Uses

PSVT, as a diagnostic aid to assess myocardial perfusion defects in CAD, Wolff-Parkinson-White syndrome

Unlabeled Uses: Wide-complex tachycardia diagnosis

Contraindications

Hypersensitivity, 2nd- or 3rd-degree AV block, sick sinus syndrome

Precautions

Pregnancy (C), breast-feeding, children, geriatric patients, asthma, atrial flutter, atrial fibrillation, ventricular tachycardia, bronchospastic lung disease, symptomatic bradycardia, bundle branch block, heart transplant, unstable angina, COPD, hypotension, hypovolemia, vascular heart disease, CV disease

Protocol Uses

Tachycardia With A Pulse, Adult (**p43**), Tachycardia With A Pulse, Peds (**p98**)

Side Effects

CNS: Lightheadedness, dizziness, arm tingling, numbness, headache

CV: Chest Pain, pressure, atrial tachydysrhythmias, sweating, palpitations, hypotension, facial flushing, AV block, cardiac arrest, ventricular dysrhythmias, atrial fibrillation

GI: Nausea, metallic taste

Resp: Dyspnea, chest pressure, hyperventilation, bronchospasm (asthmatics)

Pharmacokinetics

Cleared from plasma in <30sec, half-life 10sec, converted to inosine/adenosine monophosphate

Pregnancy Category - C

Interactions

Increase: risk for higher degree of heart block – Carbamazepine

Increase: risk for ventricular fibrillation – digoxin, verapamil

Increase: effects of adenosine – dipyridamole

Decrease: activity of adenosine – theophylline or other methylxanthines (caffeine)

EMT Considerations

Assess cardiopulmonary status – BP, pulse, respiration, rhythm, ECG intervals (PR, QRS, QT); check for transient dysrhythmias (PVCs, PACs, sinus tachycardia, AV block)

Assess respiratory status – rate, rhythm, lung fields for crackles; watch for respiratory depression; bilateral crackles may occur in CHF patient; increased respiration, increased pulse, product should be discontinued

CNS effects – dizziness, confusion, psychosis, paresthesias, seizures; product should be discontinued

Treatment of Overdose

Defibrillation, vasopressor for hypotension, theophylline

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Albuterol

Albuterol

Mechanism of Action

Beta₂-adrenergic agonist. Activates beta₂ receptors on airway smooth muscle, increasing the cyclic AMP concentration, increasing activation of protein kinase A and lowers intracellular ionic calcium concentrations, leading to muscle relaxation.

Uses

Bronchospasm associated with asthma, exercise induced asthma, COPD

Unlabeled Uses: Hyperkalemia

Contraindications

Hypersensitivity to sympathomimetics, tachydysrhythmias, severe cardiac disease, heart block

Precautions

Pregnancy (C), breast-feeding, cardiac/renal disease, hyperthyroidism, diabetes mellitus, hypertension, prostatic hypertrophy, angle-closure glaucoma, seizures, exercise-induced bronchospasm (aerosol) in children <12 y/o, hypoglycemia

Protocol Uses

Guidelines For Use of Protocols (p9), Paramedic Intercept Guidelines (p23), Radio Report Format (p28), COPD/Asthma/Stridor – Adult (p35), Allergic Reaction – Adult (p46), Prolonged Crush Injury – Adult, Trauma (p73), Hazmat, General – Adult, Trauma (p79); Destination Determination – Pediatric (p88), Wheezing / Asthma – Pediatric (p93), Allergic Reaction – Pediatric (p100), Prolonged Crush Injury – Peds, Trauma (p120)

Side Effects

CNS: Tremors, anxiety, insomnia, headache, dizziness, stimulation, restlessness, hallucinations, flushing, irritability

CV: Palpitations, tachycardia, angina, hypo/hypertension, dysrhythmias

EENT: Dry nose, irritation of nose and throat

GI: Heartburn, nausea, vomiting

MS: Muscle cramps

Resp: Cough, wheezing, dyspnea, paradoxical bronchospasm, dry throat

Misc: Flushing, sweating, anorexia, bad taste/smell changes, hypokalemia, metabolic acidosis

Pharmacokinetics

Extensively metabolized in the liver and tissues, crosses placenta, breast mild, blood-brain barrier

INH – onset 5-15min, peak 1-1.5hr, duration 3-6hr, half-life 4hr

Pregnancy Category – C

Interactions

Increase: QTc prolongation – other drugs that increase QT prolongation

Increase: ECG changes/hypokalemia – potassium wasting diuretics

Increase: action of albuterol – tricyclics, MAOIs, other adrenergics; do not use together

Decrease: effectiveness of albuterol – other β-blockers

EMT Considerations

Respiratory Function: vital capacity, forced expiratory volume, ABGs; lung sounds, hear rate and rhythm, BP, sputum (baseline and peak); whether patient has not received theophylline therapy before giving dose

Evaluate: therapeutic response: absence of dyspnea, wheezing after 1hr, improved airway exchange, improved ABG

Treatment of Overdose

Administer β₁-adrenergic blocker, IV Fluids

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Amiodarone

Amiodarone

Mechanism of Action

Prolongs duration of action potential and effective refractory period, noncompetitive α - and β -adrenergic inhibition; increases PR and QT intervals, decreases sinus rate, decreases peripheral vascular resistance

Uses

Hemodynamically unstable ventricular tachycardia, supraventricular tachycardia, ventricular fibrillation not controlled by 1st-line agents
Unlabeled Uses: Atrial fibrillation treatment/prophylaxis, atrial flutter, cardiac arrest, cardiac surgery, CPR, heart failure, PSVT, Wolff-Parkinson-White (WPW) syndrome, supraventricular tachycardia

Contraindications

Black Box Warning – 2nd- and 3rd-degree AV block, bradycardia, severe hepatic disease, cardiac arrhythmias, pulmonary fibrosis
 Pregnancy (D), breastfeeding, neonates, infants, severe sinus node dysfunction, hypersensitivity to this product/iodine/ α -benzyl alcohol, cardiogenic shock

Precautions

Children, goiter, Hashimoto's thyroiditis, electrolyte imbalance, CHF, respiratory disease, torsades de pointes

Protocol Uses

Cardiac Arrest – Adult (**p37**), Tachycardia With a Pulse – Adult (**p43**), Tricyclic Overdose – Adult (**55**);
 Cardiac Arrest, General – Peds (**p95**), Tachycardia with a Pulse – Peds (**p98**),
 Double Sequential Defibrillation – Procedure (**p158**)

Side Effects

CNS: Headache, dizziness, involuntary movement, tremors, peripheral neuropathy, malaise, fatigue, ataxia, paresthesia, insomnia
CV: Hypotension, bradycardia, sinus arrest, CHF, dysrhythmias, SA node dysfunction, AV block, increased defibrillation energy
EENT: Blurred vision, halos, photophobia, corneal microdeposits, dry eyes
GI: Nausea, vomiting, diarrhea, abdominal pain, anorexia, constipation, hepatotoxicity
MS: weakness, pain in extremities
Resp: Pulmonary fibrosis/toxicity, pulmonary inflammation, ARDS; gasping syndrome if used with neonates
Misc: Flushing, abnormal taste or smell, edema, abnormal salivation, coagulation abnormalities

Pharmacokinetics

Metabolized by liver (CYP3A4, CYP2C8), excreted by kidneys, 99% protein binding
 Pregnancy Category – D

Interactions

Increase: QT prolongation – azoles, fluoroquinolones, macrolides
 Increase: amiodarone concentration, possible serious dysrhythmias – protease inhibitors, reduce dose
 Increase: anticoagulation effects - warfarin
 Increase: bradycardia – β -blockers calcium channel blockers

EMT Considerations

Evaluate: therapeutic response: decreased in ventricular tachycardia, supraventricular tachycardia, fibrillation
 CNS Symptoms: confusion, psychosis, numbness, depression, involuntary movements; product should be discontinued

Treatment of Overdose

O₂, artificial ventilation, ECG, administer dopamine for circulatory depression, administer diazepam for seizures

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Aspirin

Aspirin

Mechanism of Action

Blocks pain impulses in CNS, reduces inflammation by inhibition of prostaglandin synthesis; antipyretic action results from vasodilation of peripheral vessels; decreases platelet aggregation

Uses

Mild to moderate pain or fever including RA, osteoarthritis, thromboembolic disorders; TIAs, rheumatic fever, post-MI, prophylaxis of MI, ischemic stroke, angina, acute MI

Unlabeled Uses: Prevention of cataracts, Kawasaki disease, pericarditis, PCI

Contraindications

Pregnancy (D) 3rd trimester, breastfeeding, children <12 y/o, children with flu-like symptoms, hypersensitivity to salicylates, GI bleeding, bleeding disorders, intracranial bleeding, nasal polyps, urticaria

Precautions

Abrupt discontinuation, acid/base imbalance, alcoholism, ascites, asthma, bone marrow suppression in elderly, G6PD deficiency, gout, heart failure, anemia, renal/hepatic disease, gastritis, pregnancy (C) 1st trimester

Protocol Uses

CHF/Pulmonary Edema – Adult (**p36**), Chest Pain / Suspected Acute Coronary Syndrome – Adult (**p41**)

Side Effects

CNS: Stimulation, drowsiness, dizziness, confusion, seizures, headache, flushing, hallucinations, coma

CV: Rapid pulse, pulmonary edema

EENT: Tinnitus, hearing loss

Endocrine: Hypoglycemia, hyponatremia, hypokalemia

GI: Nausea, vomiting, GI bleeding, diarrhea, heartburn, anorexia, hepatitis, GI ulcer

Heme: Thrombocytopenia, agranulocytosis, leukopenia, neutropenia, hemolytic anemia, increased bleeding time

Resp: Wheezing, hyperpnea, bronchospasm

Skin: Rash, urticaria, bruising

Syst: Reye's syndrome (children), anaphylaxis, laryngeal edema

Pharmacokinetics

Enteric metabolism by liver; inactive metabolites excreted by kidneys; crosses placenta; excreted in breast milk; half-life 15-20min

Pregnancy Category – D

Interactions

Increase: gastric ulcer risk – corticosteroids, anti-inflammatories, NSAIDs, alcohol

Increase: bleeding – alcohol, plicamycin, thrombolytics, anticoagulants

Increase: hypotension - nitroglycerin

Decrease: effects of aspirin – antacids (high dose), urinary alkalizers, corticosteroids

EMT Considerations

Allergic reactions: rash, urticaria; if these occur, product may have to be discontinued; patients with asthma, nasal polyps allergies: severe allergic reaction may occur

Ototoxicity: tinnitus, ringing, roaring in ears; audiometric testing needed before, after long-term therapy

Treatment of Overdose

Lavage, activated charcoal, monitor electrolytes, VS

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Atropine

Atropine

Mechanism of Action

Blocks acetylcholine at parasympathetic neuroeffector sites; increases cardiac output, heart rate by blocking vagal stimulation in heart; dries secretions by blocking vagus nerve stimulation

Uses

Bradycardia <40-50bpm, bradydysrhythmia, reversal of anticholinesterase agents, insecticide poisoning, blocking cardiac vagal reflexes, decreasing secretions before surgery, antispasmodic with GU, biliary surgery, bronchodilator, AV heart block

Unlabeled Uses: Cardiac arrest, CPR, diarrhea, pulseless electrical activity, ventricular asystole, asthma

Contraindications

Hypersensitivity to belladonna alkaloids, closed-angle glaucoma, GI obstructions, myasthenia gravis, thyrotoxicosis, ulcerative colitis, prostatic hypertrophy, tachycardia, asthma, acute hemorrhage, severe hepatic disease, myocardial ischemia

Precautions

Pregnancy ©, breastfeeding, children <6 y/o, geriatric patients, renal disease, CHF, hyperthyroidism, COPD, hypertension, Down Syndrome, spastic paralysis, gastric ulcer

Protocol Uses

Bradycardia With a Pulse – Adult (**p44**), Cholinergic / Organophosphate Overdose – Adult (**p56**), Beta Blocker Overdose – Adult (**p55**), Cardiac Arrest, General – Peds (**p95**), Bradycardia with a Pulse – Peds (**p99**)

Side Effects

CNS: Headache, dizziness, involuntary movement, confusion, psychosis, anxiety, coma, flushing, drowsiness, insomnia, delirium

CV: Hypo/hypertension, paradoxical bradycardia, angina, PVCs, tachycardia, ectopic ventricular beats, bradycardia

EENT: Blurred vision, photophobia, glaucoma, eye pain, pupil dilation, nasal congestion

GI: Dry mouth, nausea, vomiting, abdominal pain, anorexia, constipation, paralytic ileus, abdominal distention, altered taste

GU: Retention, hesitancy, impotence, dysuria

Skin: Rash, urticaria, contact dermatitis, dry skin, flushing

Misc: Suppression of lactation, decreased sweating, anaphylaxis

Pharmacokinetics

Half-life 2-3hr, terminal 12.5hr. Excreted by kidneys unchanged (70-90% in 24hr), metabolized in liver 40-50% crosses placenta

Pregnancy Category – C

Interactions

Increase: mucosal lesions – potassium chloride tab

Increase: anticholinergic effects – tricyclics, amantadine, antiparkinson agents

Decrease: effect of atropine – antacids

EMT Considerations

Assess ECG for ectopic ventricular beats, PVCs, tachycardia. Assess for increased intraocular pressure; eye pain, nausea, vomiting, blurred vision, increased tearing

Treatment of Overdose

O₂, artificial ventilation, ECG; administer dopamine for circulatory depression; administer diazepam for seizures; assess need for antidysrhythmics

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Calcium

Calcium

Mechanism of Action

Needed for maintenance of nervous, muscular, skeletal function; enzyme reactions; normal cardiac contractility; coagulation of blood; affects secretory activity of endocrine, exocrine glands

Uses

Prevention and treatment of hypocalcemia, hypermagnesemia, hypoparathyroidism, neonatal tetany, cardiac toxicity caused by hyperkalemia, lead colic, hyperphosphatemia, Vitamin D deficiency, osteoporosis prophylaxis, calcium antagonist toxicity

Unlabeled Uses: Electrolyte abnormalities in cardiac arrest, CPR

Contraindications

Hypercalcemia, digoxin toxicity, ventricular fibrillation, renal calculi

Precautions

Pregnancy (C), breastfeeding, children, respiratory/renal disease, cor pulmonale, patient in digoxin, respiratory failure, diarrhea

Protocol Uses

Cardiac Arrest – Adult (**p37**), Beta Blocker Overdose – Adult (**p55**), Calcium Channel Blocker Overdose – Adult (**p55**), Prolonged Crush Injury – Adult, Trauma (**p73**); Cardiac Arrest, General – Peds (**p95**), Overdose and Poisoning, General – Peds (**p105**), Prolonged Crush Injury – Peds (**p120**)

Side Effects

CV: Shortened QT, heart block, hypotension, bradycardia, dysrhythmias, cardiac arrest

GI: Vomiting, nausea, constipation

Hypercalcemia: Drowsiness, lethargy, muscle weakness, headache, constipation, coma, anorexia, nausea, vomiting, polyuria,

Skin: Pain, burning at IV site, severe venous thrombosis, necrosis, extravasation

Pharmacokinetics

Crosses placenta, enters breast milk, excreted via urine and feces, half-life unknown, protein binding 40-50%

Pregnancy Category – C

Interactions

Increase: dysrhythmias – digoxin glycosides

Increase: toxicity - verpamil

Decrease: effects of atenolol, verapamil

EMT Considerations

Assess: ECG for decreased QT and T-wave inversion; seizure precautions with padded side rails, decreased stimuli, place airway suction equipment

Evaluate: therapeutic response with decreased twitching, paresthesias, muscle spasms; absence of tremor, seizure or dysrhythmia

Treatment of Overdose

Discontinue product; supportive care

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Dextrose

Dextrose

Mechanism of Action

Needed for adequate utilization of amino acids; decreases protein, nitrogen loss; prevents ketosis

Uses

Increases intake of calories; increases fluids in patients unable to take adequate fluids, calories orally; acute hypoglycemia

Contraindications

Hyperglycemia, delirium tremens, hemorrhage (cranial/spinal), CHF, anuria, allergy to corn products

Precautions

Cardiac/renal/hepatic disease, diabetes mellitus, carbohydrate intolerance

Protocol Uses

Documentation of Vital Signs (**p18**), Radio Report Format (**p28**), Cardiac Arrest – Adult (**p37**), Diabetic Emergencies – Adult (**p48**), Beta Blocker Overdose – Adult (**p55**), Calcium Channel Blocker Overdose – Adult (**p55**), Opioid Overdose – Adult (**p55**), Cocaine and Sympathomimetic Overdose – Adult (**p55**), Neonatal Resuscitation – Peds (**p94**), Cardiac Arrest, General – Peds (**p95**), Diabetic Emergencies – Peds (**p103**)

Side Effects

CNS: confusion, **loss of consciousness**, dizziness

CV: hypertension, **CHF**, **pulmonary edema**, **intracranial hemorrhage**

Endo: Hyperglycemia, rebound hypoglycemia, hyperosmolar syndrome, hyperglycemic non-ketotic syndrome, aluminum toxicity, hypokalemia, hypomagnesium

GI: Nausea

GU: Glycosuria, osmotic diuresis

Skin: Chills, flushing, warm feeling, rash, urticarial, extravasation necrosis

Resp: Pulmonary edema

Pharmacokinetics

Metabolized at the cellular level to carbon dioxide and water.

Oral – onset 10 minutes, peak 40 minutes; **IV** – onset immediate, peak 30 minutes

Pregnancy Category – C

Interactions

Increase: fluid retention/electrolyte excretion—corticosteroids

EMT Considerations

Assess: Electrolytes (Potassium), blood glucose; Injection site for extravasation (redness along vein, edema at site, necrosis, pain/tenderness), site should be changed immediately

Evaluate: Therapeutic response

Treatment of Overdose

Insulin; discontinue product; supportive care

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Diazepam

Diazepam

Mechanism of Action

Potentiates the actions of GABA, especially in the limbic system, reticular formation; enhances presympathetic inhibition, inhibits spinal polysynaptic afferent paths

Uses

Anxiety, EtOH withdrawal, seizure disorder, muscle relaxation

Contraindications

Pregnancy (D), hypersensitivity to benzodiazepines, closed -angle glaucoma, myasthenia gravis, EtOH intoxication, liver disease

Precautions

Breastfeeding, children <6 months, geriatric patients, COPD, CNS depression, labor, Parkinson's disease, psychosis

Protocol Uses

Seizure – Peds (**p109**)

Side Effects

CNS: Dizziness, drowsiness, confusion, headache, anxiety, tremors, fatigue, hallucinations, ataxia

CV: Orthostatic hypotension, tachycardia, hypotension

EENT: Blurred vision, tinnitus, mydriasis, nystagmus

GI: Constipation, dry mouth, nausea, vomiting, anorexia, diarrhea

Heme: Neutropenia

Resp: Respiratory depression

Pharmacokinetics

Metabolized by the liver via CYP2C19, CYP3A4; excreted by kidneys, crosses the placenta, excreted in breast milk; crosses the blood-brain barrier; half life 20-50 hours. **IM:** Onset 15-30min, duration 1-1½ hour; **IV:** Onset immediate, duration 15 min-1 hour

Pregnancy Category – Not Assigned

Interactions

Increase: Diazepam effect – amiodarone, diltiazem, disulfiram, ketoconazole, nifedipine, verapamil, valproic acid

Increase: toxicity – barbiturates, SSRIs, cimetidine, CNS depressants, valproic acid, CYP3A4 inhibitors

Increase: CNS depression – EtOH

Decrease: Diazepam metabolism – oral contraceptives, valproic acid, disulfiram, propranolol

Decrease: Diazepam effect – CYP3A4 inducers (rifampin, barbiturates, carbamazepine, phenytoin, fosphenytoin), smoking

EMT Considerations

Assess BP (lying, standing), pulse; respiratory rate,

Assess EtOH withdrawal symptoms, including hallucinations (visual, auditory), delirium, irritability, agitation, fine or coarse tremor

Assess IV site for thrombosis or phlebitis, which may occur rapidly

Evaluate therapeutic response – decreased anxiety, restlessness, muscle spasms

Treatment of Overdose

Discontinue product, supportive care, monitor VS

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Diltiazem

Diltiazem

Mechanism of Action

Inhibits calcium ion influx across cell membrane during cardiac depolarization; produces relaxation of coronary vascular smooth muscle, dilates coronary arteries, slows SA/AV node conduction times, dilates peripheral arteries

Uses

Angina pectoris due to coronary artery spasm, hypertension, atrial fibrillation, atrial flutter, paroxysmal supraventricular tachycardia

Contraindications

Sick sinus syndrome, AV heart block, hypotension <90mmHg systolic, acute MI, pulmonary congestion, cardiogenic shock

Precautions

Pregnancy (C), breastfeeding, children, geriatric patients, CHF, aortic stenosis, bradycardia, GERD, hepatic disease, hiatal hernia, ventricular dysfunction

Protocol Uses

Tachycardia With a Pulse – Adult (**p43**), Calcium Channel Blocker Overdose – Adult (**p55**)

Side Effects

CNS: Headache, fatigue, drowsiness, dizziness, depression, weakness, insomnia, tremor, paresthesias

CV: dysrhythmia, edema, CHF, bradycardia, hypotension, palpitations, heart block

GI: Nausea, vomiting, diarrhea, gastric upset, constipation, increased LFTs

GU: Nocturia, polyuria, acute renal failure

Skin: Rash, flushing, photosensitivity, burning or itching at injection site

Resp: Rhinitis, dyspnea, pharyngitis

Pharmacokinetics

Metabolized by the liver, excreted in the urine (96% as metabolites)

IV – onset 30-60 min; peak 2-3 hours

Pregnancy Category – D

Interactions

Increase: toxic effects – theophylline

Increase: effects of -blockers, digoxin, lithium, carbamazepine, cyclosporine, anesthetics, HMG-CoA reductase inhibitors, benzodiazepines, lovastatin, methylprednisolone

Increase: effects of diltiazem – cimetidine

EMT Considerations

Assess for CHF – look for dyspnea, weight gain, edema, jugular venous distention, rales,

Assess dysrhythmias – BP, pulse, respiratory rate, ECG and PR intervals, QRS and QT intervals

Treatment of Overdose

Discontinue product, atropine for AV block, vasopressors for hypotension

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Diphenhydramine

Diphenhydramine

Mechanism of Action

Acts on blood vessels, GI, respiratory system by competing with histamine for H₁-receptor site; decreases allergic response by blocking histamine

Uses

Allergy symptoms, rhinitis, motion sickness, antiparkinsonism, nighttime sedation, nonproductive cough

Contraindications

Hypersensitivity to H₁-receptor antagonist, acute asthma attack, lower respiratory tract disease, neonates

Precautions

Pregnancy (B), breastfeeding, children <2 years old, increased intraocular pressure, cardiac/renal disease, hypertension, bronchial asthma, seizure disorder, stenosed peptic ulcers, hyperthyroidism, prostatic hypertrophy, bladder neck obstruction

Protocol Uses

Allergic Reaction – Adult (**p46**), Antipsychotic Overdose / Acute Dystonic Reaction – Adult (**p55**), Allergic Reaction – Peds (**p100**)

Side Effects

CNS: Dizziness, drowsiness, poor coordination, fatigue, anxiety, euphoria, confusion, paresthesia, neuritis, seizures

CV: hypotension, palpitations

EENT: Blurred vision, dilated pupils, tinnitus, nasal stuffiness, dry nose, throat mouth

GI: Nausea, anorexia, diarrhea

GU: Retention, dysuria, frequency

Heme: thrombocytopenia, agranulocytosis, hemolytic anemia

Misc: **Anaphylaxis**

Resp: Increased thick secretions, wheezing, chest tightness

Pharmacokinetics

Metabolized in liver, excreted by kidneys, crosses placenta, excreted in breast milk, half life 2-7 hours. **IM** – onset ½ hour, peak 1-4 hours, duration 4-7 hours. **IV** – onset immediate, duration 4-7 hours

Pregnancy Category – B

Interactions

Increase: CNS depression – barbiturates, opiates, hypnotics, tricyclics, EtOH

Increase: diphenhydramine effect – MAOIs

EMT Considerations

Assess for urinary retention, frequency, dysuria

Assess respiratory status – rate, rhythm, increase in bronchial secretions, wheezing, chest tightness

Treatment of Overdose

Discontinue product, administer diazepam for seizures, vasopressors for hypotension, phenytoin for refractory seizures

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DuoDote Kit

DuoDote Kit

The DuoDote autoinjector provides a single intramuscular dose of the anti-nerve agent medications atropine and pralidoxime chloride in a self contained unit. The kits are only effective against the nerve agents **tabun** (GA), **sarin** (GB), **soman** (GD) and **VX**. It may also be used in cases of agricultural insecticide exposure, as organophosphates are a key component of the agent. Common examples of insecticides using organophosphates are **malathion**, **parathion**, **diazinon**, **fenthion**, **dichlorvos**, **ethion** and **trichlorfon**.

Mechanism of Action

Atropine counters the parasympathetic response from the muscarinic receptor overstimulation associated with organophosphate and nerve agent poisoning, and reverses the SLUDGEM symptoms.

Pralidoxime chloride (“2-PAM”) binds to the organophosphate or nerve agent and changes the conformation of the molecule, which causes it to lose its binding to the acetylcholinesterase enzyme. The joined poison / antidote then releases from the site and regenerates the enzyme, allowing it to function again.

Uses

Organophosphate and nerve agent poisonings.

Contraindications

None in the emergency setting.

Precautions

Known hypersensitivity to the DuoDote or Mark I Kit and Pediatric patients under the age of 3 are *relatively* contraindicated.

Protocol Uses

Cholinergic / Organophosphate Overdose – Adult (**p55**)

Each kit contains: Atropine 2.1mg and Pralidoxime chloride 600mg

Minor initial symptoms – administer **ONE** DuoDote Kit via autoinjector (IM)

Severe symptoms appearing within 10 minutes of first dose – administer **ONE additional** DuoDote Kit via autoinjector (IM)

Severe symptoms present from the beginning – administer **THREE** DuoDote Kits via autoinjector (IM)

Side Effects

HEENT: Dry mouth

Skin: Flushing

CNS: Dilated pupils, Headache, Drowsiness

CV: Tachycardia

Interactions

Morphine, theophylline, aminophylline and **succinylcholine** should be avoided in patients with organophosphate poisoning.

Barbiturates are potentiated by the anticholinesterase enzyme and should be used cautiously when treating seizures in the poisoned patient.

EMT Considerations

The use of a DuoDote Kit offers no prophylactic protection and should be administered only if symptoms are present.

There is a high potential for “off-gassing” from patients exposed to both organophosphates and nerve agents. In cases of “off-gassing”, vapors are given off by chemically contaminated clothing or exhaled by poisoned individuals. EMS Providers should use all appropriate PPE including SCBA and be vigilant when monitoring for symptoms in themselves and other responders. These patients are generally NOT safe for transport by Helicopter EMS (HEMS).

Pregnancy Category (Atropine) – C; Pregnancy Category (Pralidoxime) – C

Treatment of Overdose

Discontinue product; supportive care



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Epinephrine

Epinephrine (Adrenaline)

Mechanism of Action

β_1 - and β_2 -agonist causing increased levels of cAMP, thereby producing bronchodilation, cardiac and CNS stimulation; high doses cause vasoconstriction via alpha-receptors; low doses can cause vasodilation via β_2 -vascular receptors

Uses

Acute asthma attacks, hemostasis, bronchospasm, anaphylaxis, allergic reactions, cardiac arrest, shock

Contraindications

Hypersensitivity to sympathomimetics, sulfites, closed-angle glaucoma, nonanaphylactic shock during general anesthesia

Precautions

Pregnancy (C), breastfeeding, cardiac disorders, hyperthyroidism, diabetes mellitus, prostatic hypertrophy, hypertension, organic brain syndrome, local anesthesia in certain areas, labor, cardiac dilation, coronary insufficiency, cerebral atherosclerosis, organic heart disease

Protocol Uses

Termination of Resuscitation (**p15**), COPD / Asthma / Stridor – Adult (**p35**), Cardiac Arrest – Adult (**p37**), Bradycardia With a Pulse – Adult (**p44**), Allergic Reaction – Adult (**p46**), Calcium Channel Blocker Overdose – Adult (**p55**), Hypotension / Shock (Non-Trauma) – Adult (**p63**), Hypotension / Shock (Trauma) – Adult (**p85**), Wheezing / Asthma – Peds (**p93**), Neonatal Resuscitation – Peds (**p94**), Cardiac Arrest, General – Peds (**p95**), Post Resuscitation Care – Peds (**p97**), Bradycardia With a Pulse – Peds (**p99**). Allergic Reaction – Peds (**p100**), Hypotension / Shock (Non-Trauma) – Peds (**p110**)

Side Effects

CNS: Tremors, anxiety, insomnia, headache, dizziness, confusion, hallucinations, cerebral hemorrhage, weakness, drowsiness

CV: Palpitations, tachycardia, hypertension, dysrhythmias, increased T wave

GI: Anorexia, nausea, vomiting

MISC: Sweating, dry eyes

Resp: Dyspnea

Pharmacokinetics

Crosses placenta, metabolized in the liver. **IM** – onset variable, duration 1-4 hours; **Inhaled** - onset 1-5 minutes, duration 1-3 hours

Pregnancy Category – C

Interactions

Do not use with MAOIs or tricyclics; hypertensive crisis may occur.

Toxicity: other sympathomimetics

Decrease: hypertensive effects – β -adrenergic blockers

EMT Considerations

Assess Asthma – auscultate lungs, pulse, BP, respiratory rate and effort, sputum

ECG completed when continuous albuterol administered

Sulfite sensitivity may be life-threatening

Allergic reactions, bronchospasms

Treatment of Overdose

Discontinue product, administer α -blocker and β -blocker

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Etomidate

Etomidate

Mechanism of Action

Ultrashort-acting nonbarbiturate hypnotic used for rapid induction of anesthesia with minimal cardiovascular effects; modulates GABA_A receptors to induce general anesthesia. Does NOT have any analgesic properties

Uses

Conscious sedation, anesthesia for rapid-sequence intubation

Unlabeled uses: determine speech lateralization in patients prior to lobectomies to remove epileptogenic centers in the brain

Contraindications

Hypersensitivity

Precautions

Renal impairment, Elderly patients, Pregnancy category (C), unknown if excreted in breast milk

Protocol Uses

Rapid Sequence Airway – Adult (**p33**); Invasive Airway – Peds (**p91**)

Side Effects

Suppresses corticosteroid synthesis in the adrenal cortex by inhibiting 11-beta-hydroxylase, an enzyme important in adrenal steroid production.

CV: Arrhythmias, bradycardia, HTN, hypotension

GI: Nausea, vomiting on emergence from anesthesia

MS: Pain at injection site

Resp: Hiccups, laryngospasm, hypoventilation

Pharmacokinetics

Protein binding 76%, metabolized by hepatic and plasma esterases, excreted by kidneys, half life 1.25 hours

IV – Onset in 30-60 seconds, peak within 1 minute, duration approximately 3-5 minutes

Pregnancy Category – C

Interactions

No interactions listed on Lexi-Comp

EMT Considerations

Administer IV push over 30-60 seconds. Solution is highly irritating to small vessels

Assess vital signs, note muscle tone prior to and after injection, drug history, hepatic or renal failure

Assess for CNS changes – dizziness, somnolence, hallucinations, euphoria, LOC

Treatment of Overdose

Discontinue product; supportive care

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Famotidine

Famotidine

Mechanism of Action

Competitively inhibits histamine at histamine H₂-receptor site, thus decreasing gastric secretion while pepsin remains at a stable level.

Uses

Short-term treatment of active duodenal ulcer, maintenance therapy for duodenal ulcer, Zollinger-Ellison syndrome, multiple endocrine adenomas, gastric ulcers; gastroesophageal reflux disease, heartburn

Unlabeled uses: GI disorders in those taking NSAIDs; urticaria; prevention of stress ulcers, aspiration pneumonitis, inactivation of oral pancreatic enzymes in pancreatic disorders

Contraindications

Hypersensitivity

Precautions

Pregnancy (B), breastfeeding, children <12 years old, geriatric patients, severe renal/hepatic disease

Protocol Uses

Allergic Reaction – Adult (**p46**), Allergic Reaction – Peds (**p100**)

Side Effects

CNS: Headache, dizziness, paresthesia, depression, anxiety, somnolence, insomnia, fever, **seizures in renal disease**

CV: **Dysrhythmias, QT prolongation in impaired renal function**

EENT: Taste change, tinnitus, orbital edema

Skin: Rash, **toxic epidermal necrolysis, Stevens-Johnson syndrome**

MS: Myalgias, arthralgias

Resp: **Pneumonia**

Pharmacokinetics

Plasma protein binding 15-20%, metabolized in liver 30% (active metabolites), 70% excreted by kidneys, half life 2½-3½ hours;

IV – onset immediate, peak 30-60 minutes, duration 8-15 hours

Pregnancy Category – B

Interactions

Decrease: absorption – ketoconazole, itraconazole, cefpodoxime, cefditoren

Decrease: famotidine absorption – antacids

Decrease: effect of – atazanavir, delavirdine

EMT Considerations

Assess for signs of ulcers – epigastric pain, abdominal pain, frank or occult blood in emesis

Assess for signs of allergic reaction – redness, hives, itching

Treatment of Overdose

Discontinue product; supportive care

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Fentanyl

Fentanyl

Mechanism of Action

Inhibits ascending pain pathways in the CNS, increases pain threshold, alters pain perception by binding to opiate receptors

Uses

Controls moderate to severe pain; adjunct to general anesthetic, adjunct to regional anesthesia; conscious sedation

Contraindications

Hypersensitivity to opiates, myasthenia gravis

Precautions

Pregnancy (C), breastfeeding, geriatric patients, increased intracranial pressure, seizure disorders, severe respiratory disorders, cardiac dysrhythmias

Protocol Uses

Post Advanced Airway Sedation – Adult, Medical (p34), Opioid Overdose – Adult (p55), Pain Management – Adult (p58), Post Resuscitation Care – Peds (p97), Pain Management – Peds (p107), Sickle Cell Crisis – Peds (p111)

Side Effects

CNS: Dizziness, euphoria, sedation

CV: **Bradycardia, arrest**, hypo/hypertension

EENT: Blurred vision, miosis

GI: Nausea, vomiting, constipation

Skin: Rash, diaphoresis

MS: Muscle rigidity

Resp: **Respiratory depression, arrest, laryngospasm**

Pharmacokinetics

Metabolized by liver, excreted by kidneys, crosses placenta, excreted in breast milk. Half-life IV: 2-4 hours

IM: onset 7-8 minutes, peak 30 minutes, duration 1-2 hours. **IV:** Onset 1 minute, peak 3-5 minutes, duration ½ - 1 hour

Pregnancy Category – C

Interactions

Increase: fentanyl effect (fetal respiratory depression) – cyclosporine, ketoconazole, cimetidine, fluconazole, nefazodine, zafirlukast

Increase: hypotension – droperidol

Increase: CV depression – diazepam

Increase: fentanyl effect with other CNS depressants – EtOH, opioids, sedative/hypnotics, antipsychotics, skeletal muscle relaxants, protease inhibitors

Decrease: fentanyl effect – CYP3A4 inducers (carbamazepine, phenytoin, phenobarbital, rifampin)

EMT Considerations

Assess vital signs, note muscle rigidity, drug history, hepatic or renal failure

Assess for CNS changes – dizziness, drowsiness, hallucinations, euphoria, LOC, pupil reaction

Treatment of Overdose

Discontinue product, naloxone

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Glucagon

Glucagon

Mechanism of Action

Increases in blood glucose, relaxation of smooth muscle of the GI tract, and a positive inotropic and chronotropic effect on the heart; increases in blood glucose are secondary to stimulation of glycogenolysis

Uses

Hypoglycemia, used to temporarily inhibit movement of GI tract as a diagnostic test

Contraindications

Hypersensitivity, pheochromocytoma, insulinoma (insulin-secreting tumor)

Protocol Uses

Cardiac Arrest – Adult (**p37**), Diabetic Emergencies – Adult (**p48**), Beta Blocker Overdose – Adult (**p55**), Calcium Channel Blocker Overdose – Adult (**p55**), Diabetic Emergencies – Peds (**p103**), Overdose and Poisoning, General – Peds (**p105**)

Side Effects

CNS: Dizziness, headache,

CV: Hypotension

GI: Nausea, vomiting

Pharmacokinetics

IV: Onset immediate, peak 30 minutes, duration 1-1½ hours

IM: Onset 5-10 minutes, peak 13-20 minutes, duration 12-30 minutes

Pregnancy Category – B

Interactions

Increase: Bleeding risk – anticoagulants

EMT Considerations

Assess for hypoglycemia – monitor blood glucose levels before and after use; use other products to control hypoglycemia if patient is conscious

Treatment of Overdose

Discontinue product, supportive care

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Glucose (Oral)

Glucose

Mechanism of Action

Needed for adequate utilization of amino acids; decreases protein, nitrogen loss; prevents ketosis

Uses

Increases intake of calories; increases fluids in patients unable to take adequate fluids, calories orally; acute hypoglycemia

Contraindications

Inability to swallow effectively, impaired airway reflexes / inability to protect airway, hyperglycemia, delirium tremens, hemorrhage (cranial/spinal), CHF, anuria, allergy to corn products

Precautions

Cardiac/renal/hepatic disease, diabetes mellitus, carbohydrate intolerance

Protocol Uses

General Approach – Adult, Medical (p31), Airway Management – Adult (p32), Rapid Sequence Airway – Adult (p33), CHF / Pulmonary Edema – Adult (p36), Diabetic Emergencies – Adult (p48), Refusal Protocol – Adult (p59), Refusal After EMS Treatment – Adult (p60), Seizure – Adult (p61), Suspected Stroke – Adult (p64), Sepsis Screening – Adult (p62), Hypotension / Shock (Non-Trauma) – Adult (p63), Environmental, Hypothermia – Adult, Trauma (p76), Head Injury – Adult, Trauma (p80), Lightning Strike – Adult, Trauma (p82), General Approach – Peds, Medical (p89), Airway management – Peds (p90), Neonatal Resuscitation – Peds (p94), Brief Resolved Unexplained Event (BRUE – formerly “ALTE”) – Peds (p102), Diabetic Emergencies – Peds (p103), Overdose and Poisoning, General – Peds (p105), Refusal Protocol – Peds (p108), Seizure – Peds (p109), Hypotension / Shock (Non-Trauma) – Peds (p110), Environmental, Hypothermia – Peds, Trauma (p123), Head Injury – Peds, Trauma (p126), Blood Glucose Analysis – Procedure (p152), BE-FAST Stroke Screen – Procedure (p165), FAST-ED Stroke Screen – Procedure (p166)

Side Effects

CNS: confusion, loss of consciousness, dizziness

CV: hypertension, CHF, pulmonary edema, intracranial hemorrhage

Endo: Hyperglycemia, rebound hypoglycemia, hyperosmolar syndrome, hyperglycemic non-ketotic syndrome, aluminum toxicity, hypokalemia, hypomagnesium

GI: Nausea

GU: Glycosuria, osmotic diuresis

Skin: Chills, flushing, warm feeling, rash, urticarial, extravasation necrosis

Resp: Pulmonary edema

Pharmacokinetics

Metabolized at the cellular level to carbon dioxide and water

Oral – onset 10 minutes, peak 40 minutes

Pregnancy Category – C

Interactions

Increase: fluid retention/electrolyte excretion—corticosteroids

EMT Considerations

Assess: Mental status and appropriateness for oral medications, electrolytes (Potassium), blood glucose

Evaluate: Therapeutic response

Treatment of Overdose

Insulin, IVF, discontinue product, supportive care

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Haloperidol

Haloperidol

Mechanism of Action

Depresses cerebral cortex, hypothalamus, limbic system, which control activity and aggression; blocks neurotransmission produced by dopamine at synapse; exhibits, strong α -adrenergic, anticholinergic blocking action; mechanism for antipsychotic effects unclear

Uses

Psychotic disorders, control of tics, vocal utterances in Gilles de la Tourette's syndrome, short-term treatment of hyperactive children showing excessive motor activity, prolonged parenteral therapy in chronic schizophrenia, organic mental syndrome with psychotic features, hiccups (short-term), emergency sedation of severely agitated or delirious patients, ADHD

Unlabeled uses: Intraoperative nausea, vomiting; autism; migraine

Contraindications

Hypersensitivity, coma, Parkinson's disease

Precautions

Pregnancy (C), breastfeeding, geriatric patients, seizure disorders, hypertension, pulmonary/cardiac/hepatic disease, QT prolongation, torsades de pointes, prostatic hypertrophy, hyperthyroidism, thyrotoxicosis, children, blood dyscrasias, brain damage, bone marrow depression, EtOH and barbiturate withdrawal states, angina, epilepsy, urinary retention, closed angle glaucoma, CNS depression **Black Box Warning:** Increased mortality in elderly patients with dementia-related psychosis

Protocol Uses

Behavioral Emergencies – Adult (**p47**); Behavioral Emergencies – Peds (**p101**)

Side Effects

CNS: EPS – pseudoparkinsonism, akathisia, dystonia, tardive dyskinesia, drowsiness, headache, **seizures, neuroleptic malignant syndrome, confusion**

CV: Orthostatic hypotension, hypertension, **cardiac arrest**, ECG changes, **tachycardia, QT prolongation, sudden death, torsades de pointes**

EENT: Blurred vision, glaucoma, dry eyes

GI: Dry mouth, nausea, vomiting, anorexia, constipation, diarrhea, jaundice, weight gain, **ileus, hepatitis**

GU: Urinary retention, dysuria, urinary frequency, enuresis, impotence, amenorrhea, gynecomastia

Skin: Rash, photosensitivity, dermatitis

Resp: **laryngospasm**, dyspnea, respiratory depression

Pharmacokinetics

Metabolized by liver, excreted in urine, bile; crosses placenta; enters breast milk; protein binding 92%; terminal half-life 12-36 hours (metabolites) **IM:** Onset 15-30 minutes, peak 15-20 minutes, half life 21 hours

Pregnancy Category – C

Interactions

Increase: serotonin syndrome, neuroleptic malignant syndrome – SSRIs, SNRIs

Increase: QT prolongation – class 1A, III antidysrhythmics, tricyclics, amoxapine, maprotiline, phenothiazines, pimozide, risperidone, sertindole, ziprasidone, β -blockers, chloroquine, clozapine, dasatinib, dolasetron, droperidol, dronedarone, flecainide, methadone, erythromycin, ondansetron, tacrolimus

Increase: oversedation – other CNS depressants, EtOH, barbiturate anesthetics

Increase: toxicity – epinephrine, lithium

Decrease: effects – lithium, levodopa

EMT Considerations

Assess patient response to medications, scene safety, evaluate for dystonic reaction

Treatment of Overdose

Discontinue product, supportive care, ECG monitoring, diphenhydramine for dystonia



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Hydroxocobalamin

Hydroxocobalamin

Mechanism of Action

Precursor to cyanocobalamin (vitamin B12). Cyanocobalamin acts as a coenzyme for various metabolic functions including fat and carbohydrate metabolism and protein synthesis. In the presence of cyanide, each hydroxocobalamin molecule can bind one cyanide ion and form cyanocobalamin, which is then excreted in the urine.

Uses

Cyanide antidote, vitamin B12 deficiency, pernicious anemia, vitamin B12 malabsorption syndrome, increased requirements with pregnancy, thyrotoxicosis, hemolytic anemia, hemorrhage, renal/hepatic disease, nutritional supplementation

Contraindications

Hypersensitivity, optic nerve atrophy

Precautions

Pregnancy (A), breastfeeding, children

Protocol Uses

Cyanide Poisoning – Adult (**p57**)

Side Effects

CNS: Flushing, optic nerve atrophy

CV: **CHF**, peripheral vascular thrombosis, **pulmonary edema**

GI: Diarrhea

Skin: Itching, rash, pain at injection site

Endo: Hypokalemia

Systemic: **Anaphylactic shock**

Pharmacokinetics

Stored in liver/kidneys/stomach; 50%-90% excreted in urine; crosses placenta; excreted in breast milk

Pregnancy Category – C

Interactions

Increase: absorption—prednisone

Decrease: absorption—aminoglycosides, anticonvulsants, colchicine, chloramphenicol, aminosalicic acid, potassium preparations, cimetidine

EMT Considerations

Assess: For vitamin B12 deficiency (red/beefy tongue, psychosis, pallor, neuropathy); For pulmonary edema, worsening of CHF in cardiac patients

Perform/provide: Protection from light, heat

Evaluate: Therapeutic response:, dyspnea on exertion, palpitations, paresthesias, psychosis, visual disturbances

Treatment of Overdose

Discontinue product, IVF, supportive care

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Ibuprofen

Ibuprofen

Mechanism of Action

Reversibly inhibits cyclooxygenase-1 and 2 (COX-1 and 2) enzymes, which results in decreased formation of prostaglandin precursors, has antipyretic, anti-inflammatory and analgesic effects

Uses

Pain, osteoarthritis, rheumatoid arthritis
Off-label use: Gout (acute flares), migraines, pericarditis

Contraindications

Hypersensitivity to ibuprofen, active gastric/duodenal/peptic ulcers, active GI bleeding

Protocol Uses

Pain Management – Adult (**p58**), Pain Management – Peds (**p107**)

Side Effects

CNS: Headache, nervousness, dizziness

CV: Edema

EENT: Tinnitus

GI: Epigastric pain, heartburn, nausea, abdominal pain, abdominal distress, flatulence, nausea and vomiting

Heme: Anemia, prolonged bleeding time

Skin: Skin rash, maculopapular rash, pruritus

Pharmacokinetics

Half-life 2 hours; metabolized in liver, eliminated in the urine, crosses the placenta

Pregnancy Category – D in 3rd Trimester

Interactions

Increase: effects of anticoagulants and other blood thinners (increased bleeding)

Decrease: effects of anti-hypertensives

EMT Considerations

Assess: Assess mental status and appropriateness for oral medications

Evaluate: Therapeutic response

Treatment of Overdose

Discontinue product, supportive care

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Ipratropium

Ipratropium

Mechanism of Action

Inhibits interaction of acetylcholine at receptor sites on the bronchial smooth muscle, thereby resulting in decreased cGMP and bronchodilation

Uses

COPD, Asthma

Contraindications

Hypersensitivity to this product, atropine, bromide, soybean or peanut products

Precautions

Breastfeeding, children <12 yr, angioedema, heart failure, surgery, acute bronchospasm, bladder obstruction, closed-angle glaucoma, prostatic hypertrophy, urinary retention, pregnancy (B)

Protocol Uses

COPD / Asthma / Sridor – Adult (**p35**), Hazmat, General – Adult, Trauma (**p79**), Wheezing / Asthma – Peds (**p93**)

Side Effects

CNS: Anxiety, dizziness, headache, nervousness

CV: Palpitations

EENT: Dry mouth, blurred vision, nasal congestion

GI: Nausea, vomiting, cramps

Skin: Rash

RESP: Cough, worsening of symptoms, **bronchospasms**

Pharmacokinetics

15% of dose reaches lower airways. Protein binding <9%, half-life elimination 2 hours

INH – onset 15 minutes, peak 1-2 hours, duration 2-5 hours

Pregnancy Category – B

Interactions

Increase: toxicity—other bronchodilators (INH)

Increase: anticholinergic action—phenothiazines, antihistamines, disopyramide

EMT Considerations

Assess: Palpitations; respiratory status (rate, rhythm, auscultate breath sounds prior to and after administration)

Perform/provide: Storage at room temp

Evaluate: Therapeutic response: ability to breathe adequately

Treatment of Overdose

Discontinue product; supportive care

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Ketamine

Ketamine

Mechanism of Action

Produces a cataleptic-like state in which the patient is dissociated from the surrounding environment by direct action on the cortex and limbic system. Noncompetitive NMDA receptor antagonist that blocks glutamate in the brain. Low doses produce analgesia and modulate central sensitization, hyperalgesia and opioid tolerance. Reduces polysynaptic spinal reflexes.

Uses

Induction and maintenance of general anesthesia

Unlabeled uses: Complex regional pain syndrome, analgesia, sedation

Contraindications

Hypersensitivity, conditions in which increased blood pressure would be hazardous. Additional contraindications per American College of Emergency Physicians (ACEP) – Infants <3 months of age, known or suspected schizophrenia (even if currently stable or controlled with medications)

Precautions

Increased intracranial pressure, increased ocular pressure, thyroid disorders, cardiovascular disease, respiratory depression, airway complications, CNS depression, emergence reaction

Ketamine crosses the placenta and can be detected in fetal tissue; it is not known if ketamine is excreted in breast milk

Protocol Uses

Rapid Sequence Airway – Adult (**p33**), Post Advanced Airway Sedation - Adult, Medical (**p34**), Behavioral Emergencies – Adult (**p47**), Pain Management – Adult (**p58**); Rapid Sequence Airway – Peds (**p91**), Post-Airway Sedation – Peds (**p92**), Behavioral Emergencies – Peds (**p101**)

Side Effects

CNS: Prolonged emergence, confusion, **hallucinations**, irrational behavior, **increased CSF pressure**, hypertonia (may resemble seizures), drug dependence

CV: Bradycardia, arrhythmia, hypotension, HTN, tachycardia

Derm: Erythema (transient), morbilliform rash (transient), rash at injection site

Endo: Central diabetes insipidus

GI: Anorexia, nausea, **sialorrhea** (drooling), vomiting

EENT: Diplopia, **increased intraocular pressure**, nystagmus

Resp: **Airway obstruction**, apnea, respiratory depression, laryngospasm

Pharmacokinetics

Metabolized in liver via hydroxylation and N-demehtylation, excreted primarily in the urine

IV – onset 30 seconds, peak 5-10 minutes; IM – onset 3-4 minutes, peak 12-25 minutes. Half life 2.5 hours

Pregnancy Category – Not Assigned

Interactions

Increase: CNS depression – **alcohol**, buprenorphine, **cannabis**, **magnesium sulfate**, minocycline, mirtazapine, zolpidem, **hydrocodone**, **antihistamines**, thalidomide

Increase: active metabolites – quazepam, stiripentol, memantine

Ketamine may increase the toxic effects of – memantine, mifepristone, thioental, **SSRI antidepressants**

EMT Considerations

Assess heart rate, blood pressure, respiratory rate, SpO₂

Assess for emergence reaction

Assess cardiac function continuously in patients with increased blood pressure or cardiac decompensation

Treatment of Overdose

Discontinue product; respiratory support for laryngospasm and respiratory depression, airway suctioning for increased salivation and secretions, supportive care for psychomotor agitation and hallucinations



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Ketorolac

Ketorolac

Mechanism of Action

Reversibly inhibits cyclooxygenase-1 and 2 (COX-1 and 2) enzymes, which results in decreased formation of prostaglandin precursors, has antipyretic, analgesic and anti-inflammatory

Uses

Acute Pain

Contraindications

Hypersensitivity to ketorolac, aspirin and other NSAIDs, contraindicated during labor and delivery, active or history of peptic ulcer disease, active or recent GI bleed. *Ketorolac should not be administered to females of reproductive age without a documented negative pregnancy test.* This is due to harm that may be caused to a developing fetus, as well as potential bleeding complications in the Mother.

Elderly patients.

Patients with suspected intracranial hemorrhage, traumatic hemorrhage or anticipated emergent surgical intervention.

Protocol Uses

Pain Management – Adult (**p58**), Pain Management – Peds (**p107**)

Side Effects

CV: Edema, hypertension

EENT: Tinnitus

GI: GI pain, dyspepsia, nausea, diarrhea

Heme: Anemia, prolonged bleeding time, purpura

Skin: pruritus, diaphoresis

Pharmacokinetics

Onset IV 1 to 3 minutes, half-life elimination 5 hours, eliminated in the urine, crosses the placenta

Pregnancy Category – D

Interactions

Increase: effects of anticoagulants and other blood thinners (increased bleeding)

Increase: effects of ketorolac

Increase: effects of quinolones – neuroexcitatory and seizure potentiating

Decrease: effects of anti-hypertensives

EMT Considerations

Assess: Injection site of extravasation

Evaluate: Therapeutic response

Treatment of Overdose

Discontinue product, Supportive Care

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Lidocaine

Lidocaine

Mechanism of Action

Increases electrical stimulation threshold of ventricle, His-Purkinje system, which stabilizes cardiac membrane, decreases automaticity

Uses

Ventricular tachycardia, ventricular dysrhythmias during cardiac surgery, digoxin toxicity, cardiac catheterization

Unlabeled uses: Attenuation of intracranial pressure increases during intubation/endotracheal tube suctioning

Contraindications

Hypersensitivity to amides, severe heart block, supraventricular dysrhythmias, Adams-Stokes syndrome, Wolff-Parkinson-White syndrome

Precautions: Pregnancy (B), breastfeeding, children, geriatric patients, renal/hepatic disease, CHF, respiratory depression, malignant hyperthermia, myasthenia gravis, weight <50 kg

Protocol Uses

Cardiac Arrest, General – Peds (**p95**), IO Intraosseous Venous Access – Procedure (**p178**)

Side Effects

CNS: *Headache, dizziness*, involuntary movement, confusion, tremor, drowsiness, euphoria, **seizures**, shivering

CV: *Hypotension, bradycardia*, **heart block, CV collapse, arrest**

EENT: Tinnitus, blurred vision

GI: Nausea, vomiting, anorexia

Hematology: **Methemoglobinemia**

Skin: Rash, urticaria, edema, swelling, petechiae, pruritus

Misc: Febrile response, phlebitis at injection site

Resp: Dyspnea, **respiratory depression**

Pharmacokinetics

Half-life 8 min, 1-2 hr (terminal); metabolized in liver; excreted in urine; crosses placenta

IV: Onset 2 minutes, duration 20 min

Pregnancy Category – B

Interactions

Increase: cardiac depression, toxicity—amiodarone, phenytoin, procainamide, propranolol

Increase: hypotensive effects—MAOIs, antihypertensives

Increase: neuromuscular blockade—neuromuscular blockers, tubocurarine

Increase: lidocaine effects—cimetidine, beta blockers, protease inhibitors, ritonavir

Decrease: lidocaine effects—barbiturates, ciprofloxacin, voriconazole

Decrease: effect of—cyclosporine

Decrease: effect—coltsfoot

EMT Considerations

Assess: ECG continuously to determine increased PR or QRS segments; if these develop, discontinue or reduce rate; watch for increased ventricular ectopic beats, may have to re-bolus; Blood pressure; Malignant hyperthermia (tachypnea, tachycardia, changes in BP, increased temp); Respiratory status (rate, rhythm, lung fields for crackles, watch for respiratory depression); CNS effects (dizziness, confusion, psychosis, paresthesias, convulsions-- product should be discontinued)

Evaluate: Therapeutic response: decreased dysrhythmias

Treatment of Overdose

Discontinue product, O₂, artificial ventilation, ECG; administer Dopamine for circulatory depression, diazepam for seizures



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Lorazepam

Lorazepam

Mechanism of Action

Potentiates the actions of GABA, especially in the limbic system and the reticular formation

Uses

Anxiety, irritability with psychiatric or organic disorders, preoperatively; insomnia; adjunct for endoscopic procedures, status epilepticus

Unlabeled uses: Antiemetic prior to chemotherapy, rectal use, alcohol withdrawal, seizure prophylaxis, agitation, insomnia, sedation maintenance

Contraindications

Pregnancy (D), breastfeeding, hypersensitivity to benzodiazepines, benzyl alcohol; closed-angle glaucoma, psychosis, history of drug abuse, COPD, sleep apnea

Precautions: Children <12 yr, geriatric patients, debilitated, renal/hepatic disease, addiction, suicidal ideation, abrupt discontinuation

Protocol Uses

Tachycardia With a Pulse – Adult (**p43**), Bradycardia With a Pulse – Adult (**p44**), Behavioral Emergencies – Adult (**p47**), OB General – Adult (**p50**), Antipsychotic Overdose / Acute Dystonic Reaction – Adult (**p55**), Cocaine and Sympathomimetic Overdose – Adult (**p55**), Tricyclic Overdose – Adult (**p55**), Seizure – Adult (**p61**), Bradycardia With a Pulse – Peds (**p99**), Seizure – Peds (**p109**)

Side Effects

CNS: *Dizziness, drowsiness*, confusion, headache, anxiety, tremors, stimulation, fatigue, depression, insomnia, hallucinations, weakness, unsteadiness

CV: *Orthostatic hypotension*, **ECG changes, tachycardia**, hypotension; **apnea, cardiac arrest (IV, rapid)**

EENT: *Blurred vision*, tinnitus, mydriasis

GI: Constipation, dry mouth, nausea, vomiting, anorexia, diarrhea

Skin: Rash, dermatitis, itching

Misc: Acidosis

Pharmacokinetics

Metabolized by liver; excreted by kidneys; crosses placenta, excreted in breast milk; half-life 14 hr

IM: Onset 15-30 min, peak 1-1.5 hours; duration 6-8 hours

IV: Onset 5-15 min, peak unknown, duration 6-8 hours

Pregnancy Category – D

Interactions

Increase: Lorazepam effects—CNS depressants, alcohol, disulfiram, oral contraceptives

Decrease: Lorazepam effects—valproic acid

EMT Considerations

Assess: Anxiety (decrease in anxiety; mental status); Physical dependency (withdrawal symptoms: headache, nausea, vomiting, muscle pain, weakness, tremors, seizures)

Perform/provide: Assistance with ambulation during beginning therapy, since drowsiness, dizziness occurs; Refrigerate parenteral form

Evaluate: Therapeutic response: decreased anxiety, restlessness

Treatment of Overdose

GI lavage, VS, supportive care, flumazenil

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Magnesium

Magnesium

Mechanism of Action

When taken orally, promotes bowel evacuation by causing osmotic retention of fluid which distends the colon with increased peristaltic activity. Parenteral infusion decreases acetylcholine in motor nerve terminals and acts on myocardium by slowing rate of SA node impulse formation and prolonging conduction time. Magnesium is necessary for the movement of calcium, sodium and potassium into and out of the cells as well as stabilizing excitable membranes.

Uses

Anticonvulsant for preeclampsia/eclampsia

Unlabeled uses: persistent pulmonary hypertension of the newborn (PPHN), cardiac arrest, CPR, digitoxin/digoxin toxicity, premature labor, seizure prophylaxis, status asthmaticus, torsades de pointes, ventricular fibrillation/tachycardia

Contraindications

Hypersensitivity, abdominal pain, nausea/vomiting, obstruction, acute surgical abdomen, rectal bleeding, heart block, myocardial damage

Precautions: Pregnancy (A), renal/cardiac disease

Protocol Uses

Asthma / COPD – Adult (**p35**), Cardiac Arrest – Adult (**p37**), Tachycardia With A Pulse – Adult (**p43**), OB General – Adult (**p50**), Beta Blocker Overdose – Adult (**p55**), Seizure – Adult (**p61**), Wheezing / Asthma – Peds (**p93**), Seizure – Peds (**p109**)

Side Effects

CNS: Muscle weakness, flushing, sweating, confusion, sedation, depressed reflexes, **flaccid paralysis**, hypothermia

CV: Hypotension, heart block, **circulatory collapse**, vasodilation

GI: Nausea, vomiting, anorexia, cramps, diarrhea

Hematology: Prolonged bleeding time

Metabolic: Electrolyte, fluid imbalances

Resp: Respiratory depression/paralysis

Pharmacokinetics

Protein binding 30% to albumin, excreted in the urine as magnesium

IM – onset 1 hour, duration 3-4 hours; **IV** – onset immediate, duration 30 min

Pregnancy Category – D

Interactions

Increase: effect of neuromuscular blockers

Increase: hypotension—antihypertensives

Decrease: absorption of tetracyclines, fluoroquinolones, nitrofurantoin

Decrease: effect of digoxin

EMT Considerations

Assess: Eclampsia (seizure precautions, BP, ECG)

Evaluate: Therapeutic response (absence of seizures, stabilization of dysrhythmia, improvement in respiratory status)

Treatment of Overdose

Discontinue product; support respirations with positive pressure ventilation, supportive care

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Mark 1 Kit

Mark 1 Kit

Mark I NAAK (“Nerve Agent Antidote Kit”) is a dual-chamber autoinjector with two anti-nerve agent drugs. The kits are only effective against the nerve agents **tabun** (GA), **sarin** (GB), **soman** (GD) and **VX**. It may also be used in cases of agricultural insecticide exposure, as organophosphates are a key component of the agent. Common examples of insecticides using organophosphates are **malathion**, **parathion**, **diazinon**, **fenthion**, **dichlorvos**, **ethion** and **trichlorfon**.

Mechanism of Action

Atropine counters the parasympathetic response from the muscarinic receptor overstimulation associated with organophosphate and nerve agent poisoning, and reverses the SLUDGEM symptoms.

Pralidoxime chloride (“2-PAM”) binds to the organophosphate or nerve agent and changes the conformation of the molecule, which causes it to lose its binding to the acetylcholinesterase enzyme. The joined poison / antidote then releases from the site and regenerates the enzyme, allowing it to function again.

Uses

Organophosphate and nerve agent poisonings.

Contraindications

None in the emergency setting.

Precautions

Known hypersensitivity to the Mark I or DuoDote Kit and Pediatric patients under the age of 3 are *relatively* contraindicated.

Protocol Uses

Cholinergic / Organophosphate Overdose – Adult (**p55**)

Each kit contains: Atropine 2mg and Pralidoxime chloride 600mg

Minor initial symptoms – administer **ONE** Mark I Kit via autoinjector (IM)

Severe symptoms appearing within 10 minutes of first dose – administer **ONE additional** Mark I Kit via autoinjector (IM)

Severe symptoms present from the beginning – administer **THREE** Mark I Kits via autoinjector (IM)

Tube one (atropine) is always administered before tube two (2-PAM)

Side Effects

HEENT: Dry mouth

Skin: Flushing

CNS: Dilated pupils, Headache, Drowsiness

CV: Tachycardia

Interactions

Morphine, theophylline, aminophylline and **succinylcholine** should be avoided in patients with organophosphate poisoning.

Barbiturates are potentiated by the anticholinesterase enzyme and should be used cautiously when treating seizures in the poisoned patient.

EMT Considerations

The use of a Mark I Kit offers no prophylactic protection and should be administered only if symptoms are present.

There is a high potential for “off-gassing” from patients exposed to both organophosphates and nerve agents. In cases of “off-gassing”, vapors are given off by chemically contaminated clothing or exhaled by poisoned individuals. EMS Providers should use all appropriate PPE including SCBA and be vigilant when monitoring for symptoms in themselves and other responders. These patients are generally NOT safe for transport by Helicopter EMS (HEMS).

Pregnancy Category (Atropine) – C; Pregnancy Category (Pralidoxime) – C

Treatment of Overdose

Discontinue product; supportive care



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Methylprednisolone

Methylprednisolone

Mechanism of Action

In a tissue-specific manner, corticosteroids regulate gene expression subsequent to binding specific intracellular receptors and translocation into the nucleus. Corticosteroids exert a wide array of physiologic effects including modulation of musculoskeletal, endocrine and neurologic physiology are influenced by corticosteroids. Decreases inflammation by suppression of migration of polymorphonuclear leukocytes, reversal of increased capillary permeability, and lysosomal stabilization

Uses

Anaphylaxis, Asthma, COPD. Used primarily as an anti-inflammatory or immunosuppressant agent in the treatment of a variety of diseases.

Unlabeled uses: bronchiolitis, cadaveric organ recovery, COPD exacerbation

Contraindications

Hypersensitivity, neonates

Precautions

Pregnancy (C), breastfeeding, diabetes mellitus, glaucoma, osteoporosis, seizure disorders, ulcerative colitis, CHF, myasthenia gravis, renal disease, esophagitis, peptic ulcer, viral infection, TB, trauma.

Protocol Uses

COPD / Asthma / Stridor – Adult (**p35**), Allergic Reaction – Adult (**p46**), Wheezing / Asthma – Peds (**p93**), Allergic Reaction – Peds (**p100**)

Side Effects

CNS: Sedations, fatigue, restlessness, headache, sleeplessness, dystonia, dizziness, suicidal ideation, seizures, neuroleptic malignant syndrome, tardive dyskinesia (>3 months at high doses)

CV: hypotension, SVT

GI: Dry mouth, constipation, nausea, vomiting, diarrhea, anorexia

GU: Decrease libido, amenorrhea, galactorrhea

Hematology: Neutropenia, leukopenia, agranulocytosis

Skin: urticaria , rash

Pharmacokinetics

Metabolized by the liver, excreted in urine

Half-life 2.5-6 hours

IV: onset 1-2 minutes, duration 1-2 hours

Pregnancy Category – C

Interactions

Avoid use with MAOIs

Increase: sedation- alcohol, other CNS depressants

Increase: risk of EPS- haloperidol, phenothiazines

Decrease: action of metoclopramide, anticholinergics, opiates

EMT Considerations

Assess: respiratory status (rate, rhythm, auscultate breath sounds prior to administration)

Evaluate: therapeutic response, ability to breathe adequately

Treatment of Overdose

Discontinue product; supportive care

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Midazolam

Midazolam

Mechanism of Action

Binds to BZD receptors on the postsynaptic receptors on the postsynaptic GABA neuron at several sites within the CNS, including the limbic system, reticular formation. Enhancement of GABA on neuronal excitability results in hyperpolarization (less excitable state) and stabilization. BZD receptors and effects appear to be linked to GABA_A receptors, BZDs do not bind GABA_B receptors.

Uses

Seizure, anxiolysis, pre-sedation for intubation, anesthesia

Unlabeled uses: Status epilepticus

Contraindications

Pregnancy (D), hypersensitivity to benzodiazepines, acute closed-angle glaucoma

Precautions

Breastfeeding, children, geriatric patients, COPD, CHF, chronic renal failure, chills, debilitated, hepatic disease, shock, coma, alcohol intoxication, status asthmaticus

Protocol Uses

Airway Management – Adult (**p32**), Post Advanced Airway Sedation – Adult, Medical (**p34**), CHF / Pulmonary Edema – Adult (**p36**), Tachycardia With A Pulse – Adult (**p43**), Bradycardia With A Pulse – Adult (**p44**), OB General – Adult (**p50**), Antipsychotic Overdose / Acute Dystonic Reaction – Adult (**p55**), Cocaine and Sympathomimetic Overdose – Adult (**p55**), Tricyclic Overdose – Adult (**p55**), Seizure – Adult (**p61**), Bites and Envenomations – Adult, Trauma (**p68**), Environmental, Hyperthermia – Adult, Trauma (**p75**), Airway Management – Peds (**p90**), Post Resuscitation Care – Peds (**p97**), Bradycardia with a Pulse – Peds (**p99**), Seizure – Peds (**p109**), Bites and Envenomations – Peds, Trauma (**p117**), Environmental, Hyperthermia – Peds, Trauma (**p122**), Head Injury – Peds, Trauma (**p126**)

Side Effects

CNS: retrograde amnesia, euphoria, confusion, headache, anxiety, insomnia slurred speech, paresthesia, tremors, weakness, chills, agitation, paradoxical reactions

CV: hypotension, PVCs, tachycardia, bigeminy, nodal rhythm, cardiac arrest

EENT: blurred vision, nystagmus, diplopia, loss of balance

GI: nausea, vomiting, increased salivation, hiccups

Skin: urticaria, pain/swelling/pruritus at injection site, rash

Resp: coughing, apnea, bronchospasm, laryngospasms, dyspnea, respiratory depression

Pharmacokinetics

Protein binding 97%, half-life 1.8-6.4 hr, metabolized in liver; metabolites excreted in urine; crosses placenta and the blood brain barrier

IV – onset 3-5 minutes, duration <2 hours (6 hours in liver failure); **IM** – onset 15 minutes, duration 6 hours; **IN** – onset 4-8 minutes, duration 41 minutes

Pregnancy Category – D

Interactions

Increase: hypotension- antihypertensives, opiates, alcohol, nitrates

Increase: extended half-life—CYP3A4 inhibitors (cimetidine, erythromycin, ranitidine)

Increase: respiratory depression—other CNS depressants, alcohol, barbiturates, opiate analgesics, verapamil, ritonavir, indinavir

Decrease: midazolam metabolism—CYP3A4 inducers (azole antifungals, theophylline)

EMT Considerations

Assess: BP, pulse, respirations during IV; Injection site for redness, pain and swelling; Degree of amnesia in geriatric patients; may be increased; Anterograde amnesia; Vital signs during recovery period in obese patients, since half-life may be extended

Preform/Provide: Assistance with ambulation until drowsy period ends; Storage at room temp, protect from light; Immediate availability of resuscitation equipment, O₂ to support airway, do NOT give by rapid bolus

Evaluate: Therapeutic response

Treatment of Overdose

Discontinue product, supportive care, flumazenil (may induce seizures if used in patients with chronic benzodiazepine use), O₂

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Naloxone

Naloxone

Mechanism of Action

Pure opioid antagonist that competes and displaces opioids at opioid receptor sites

Uses

Opiate overdose, respiratory depression induced by opioids, pentazocine, propoxyphene

Unlabeled uses: opiate-induced pruritis

Contraindications

Hypersensitivity

Precautions

Pregnancy (C), breastfeeding, children, neonates, CV disease, opioid dependency, seizure disorder, drug dependency

Protocol Uses

Documentation of Vital Signs (**p18**), Cardiac Arrest – Adult (**p37**), Opioid Overdose – Adult (**p55**), Neonatal Resuscitation – Peds (**p94**), Overdose and Poisoning, General – Peds (**p105**)

Side Effects

CNS: Drowsiness, nervousness, seizures, tremor

CV: Rapid pulse, increase systolic BP (high doses), ventricular tachycardia/fibrillation, hypo/hypertension, cardiac arrest, sinus tachycardia

GI: Nausea, vomiting, hepatotoxicity

Resp: Tachypnea, pulmonary edema

Pharmacokinetics

Metabolized by liver, crosses placenta; excreted in urine/breast milk

IV – onset 1 minute, duration 45 min. Half-life 30-81 minutes

Pregnancy Category – B

Interactions

Increase: seizures - tramadol

Decrease: effect of opioid analgesics

EMT Considerations

Assess: *Withdrawal:* cramping, hypertension, anxiety, vomiting; signs of withdrawal in drug-dependent individuals may occur <2 hours after administration;

Vital Signs q3-5 minutes;

Cardiac Status: tachycardia, hypertension, monitor ECG ;

Respiratory Function: respiratory depression, character, rate, rhythm, if respiration <10/min, administer naloxone; probably due to opioid overdose; monitor LOC;

Pain: duration, intensity, location before and after administration

Preform/Provide: Dark storage at room temp

Evaluate: Therapeutic Response: reversal of respiratory depression; change in level of consciousness

Treatment of Overdose

Discontinue product; supportive care

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Nitroglycerin

Nitroglycerin

Mechanism of Action

Produces a vasodilator effect on the peripheral veins and arteries with more prominent effects on the veins. Primarily reduces cardiac oxygen demand by decreasing preload (left ventricular end-diastolic pressure). May modestly reduce afterload. Dilates coronary arteries and improves collateral flow

Uses

Unstable angina, Hypertension, Flash Pulmonary Edema

Unlabeled use: esophageal spasms, uterine relaxation, short-term management of pulmonary hypertension

Contraindications

Known hypersensitivity, increased intracranial pressure, cerebral hemorrhage

Precautions

Used with caution in postural hypotension, pregnancy, breastfeeding, children, renal disease, hepatic injury, **inferior STEMI**

Protocol Uses

CHF / Pulmonary Edema – Adult (**p36**), Chest Pain / Suspected Acute Coronary Syndrome – Adult (**p41**), ST Elevation Myocardial Infarction – Adult (**p42**)

Side Effects

CNS: Headache, flushing, dizziness

CV: Hypotension, tachycardia, collapse, syncope, palpitations

GI: Nausea, vomiting

Skin: Pallor, sweating, rash

Pharmacokinetics

Metabolized by liver, excreted in urine

Half-life 1-4 min.

Sublingual – onset 1-3 minutes, duration 30 minutes. **IV** – onset 1-2 minutes, duration 3-5 minutes

Pregnancy Category – C

Interactions

Severe hypotension, CV collapse: alcohol

Increase: effects of beta-blockers, diuretics, antihypertensives, calcium channel blockers

Increase: erectile dysfunction meds (fatal hypotension - sildenafil, tadalafil, vardenafil; do not use together)

Increase: nitrate level - aspirin

Decrease: heparin - IV nitroglycerin

EMT Considerations

Assess: Orthostatic BP, pulse; Pain: duration time started, activity being preformed, character; Tolerance: if taking over long period of time; Headache, lightheadedness, decreased BP

Perform/Provide: Storage protected from light, moisture; store in cool environment

Evaluate: Therapeutic response: decrease in anginal pain

Treatment of Overdose

Discontinue product, IV fluids, supportive care

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Nitrous Oxide

Nitrous Oxide

Mechanism of Action

The mechanism of action of nitrous oxide is not completely understood. It is trifold and includes analgesia, anxiolysis and anesthesia. Its analgesic mechanism of action is described as opioid in nature and may involve a number of spinal neuromodulators. The anxiolytic effect is similar to that of benzodiazepines and may involve gamma aminobutyric (GABA) receptors. The anesthetic mechanism may involve GABA and possibly N-methyl-D-aspartate receptors as well.

Uses

Nitrous is commonly used in dental surgery and as part of a procedural sedation during short, painful procedures in the Emergency Department. It acts as an analgesic and mild sedative when dispensed at the standard 2:1 ratio of N₂O to O₂. It is often used with other anesthetics.

Unlabeled use:

Nitrous is sometimes used in auto racing. It is safe and stable at room temperature, but at ~600°C it decomposes into a gas with 33% oxygen per unit volume. Atmospheric air has only ~21% oxygen and thus can burn less fuel in a given volume. Nitrous is commonly used as a short-term euphoric high which features audio and visual strobing effects. This use is generally illegal.

Contraindications

Respiratory compromise, or inability to reliably follow commands.

Nitrous rapidly diffuses into air-filled cavities, and patients in whom expansion of these air-filled cavities could compromise patient safety. This includes patients with pneumothorax, pulmonary blebs, air embolism, bowel obstruction, and those undergoing surgery of the eye or middle ear.

Nitrous is known to be teratogenic and is contraindicated in pregnancy.

Precautions

Patients on chronic opiates may be highly tolerant to the analgesic effects of nitrous. When animals are given morphine chronically, they develop tolerance to its pain-killing effects, and this also renders the animals tolerant to the analgesic effects of N₂O.

Because nitrous oxide is minimally metabolized in humans (with a rate of 0.004%), it retains its potency when exhaled into the room by the patient, and can pose an intoxicating and prolonged exposure hazard to the staff if the room is poorly ventilated. Where nitrous oxide is administered, a continuous-flow fresh-air ventilation system or N₂O scavenger system must be used to prevent a waste-gas buildup.

Protocol Uses

Pain Management – Adult (p58), Pain Management – Peds (p107), Nitrous Oxide – Procedure (p199)

Inhalational gas that MUST be self-administered by the patient.

Side Effects

CNS: Headache (especially if pt. not given inhaled O₂ for 5 min after administration), Blurred Vision, Lethargy

CV: Orthostatic Hypotension, Dizziness, Faintness, or Lightheadedness

GI: Nausea, Vomiting

Heme: Methemoglobinemia

Misc: Exposure to nitrous oxide may cause vitamin B₁₂ deficiency. It inactivates the cobalamin form of vitamin B₁₂ by oxidation. Symptoms of vitamin B₁₂ deficiency, including sensory neuropathy, myelopathy, and encephalopathy, may occur within days or weeks of exposure to nitrous oxide anesthesia in people with subclinical vitamin B₁₂ deficiency.

Pharmacokinetics

Onset of action: Inhalation: 2-5 minutes

Absorption: Rapid via lungs; blood/gas partition coefficient is 0.47

Metabolism: Body: <0.004%

Excretion: Primarily exhaled gases; skin (minimal amounts)

Half-life: Approximately 5 minutes; depends on patient ventilatory volume, rate and quality. In general, the clinical effects of nitrous cease when inhalation stops, with minimal residual effect.

Pregnancy Category – C

Interactions

Increase: effects of CNS depressants (EtOH, benzodiazepines, opiates, cannabis)

EMT Considerations

Assess: Vital signs for systemic hypotension

Perform/Provide: Store at room temperature, should be stored in a cool, fire resistant area away from heat sources and combustibles

Evaluate: Therapeutic response

Treatment of Overdose

Discontinue product; IV Fluids; 100% inhaled O₂ (preferably via NRB); antiemetics; supportive care



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Norepinephrine

Norepinephrine

Mechanism of Action

β_1 and α agonist causing increased contractility, increased heart rate, and vasoconstriction. Thus, increasing systemic blood pressure and coronary blood flow. Has greater alpha (vasoconstriction) than beta effects (contractility and heart rate).

Uses

Hypotension, shock

Contraindications

Extravasation, hypersensitivity to sympathomimetics or sulfites

Protocol Uses

Hypotension / Shock (Non-Trauma) – Adult (**p63**), Hypotension / Shock (Trauma) – Adult (**p85**), Hypotension / Shock (Non-Trauma) – Peds (**p110**)

Side Effects

CNS: anxiety, headache, tremor

CV: hypertension, arrhythmia

GI: Nausea, vomiting, gut ischemia

Misc: Skin necrosis with extravasation

Pharmacokinetics

Onset of action: 1-2 minutes

Excretion: Kidney

Pregnancy Category – C

Interactions

Concurrent use with the following may increase blood pressure further: linezolid, dihydroergotamine, TCAs

EMT Considerations

Assess: Vital Signs: BP and pulse

Evaluate: Change in blood pressure

Treatment of Overdose

Discontinue product, administer α -blocker and/or β -blocker

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Ondansetron

Ondansetron

Mechanism of Action

Selective 5-HT₃-receptor antagonist, blocking serotonin both peripherally on vagal nerve terminals and centrally in the chemoreceptor trigger zone

Uses

Chemotherapy associated nausea and vomiting, radiotherapy associated nausea and vomiting, postoperative nausea and/or vomiting
 Unlabeled use: Hyperemesis gravidarum (severe or refractory), breakthrough nausea and/or vomiting associated with chemotherapy

Contraindications

Hypersensitivity, congenital OR acquired prolonged QT, history of Torsades de Pointes

Precautions

Pregnancy (B), breastfeeding, children, geriatric patients

Protocol Uses

Post Advanced Airway Sedation – Adult, Medical (p34), Chest Pain / Suspected Acute Coronary Syndrome – Adult (p41), ST Elevation Myocardial Infarction – Adult (p42), Abdominal Pain / GI Bleeding – Adult (p45), Pain Management – Adult (p58), Environmental, Hyperthermia – Adult, Trauma (p75), Eye Pain – Adult, Trauma (p78), Post Resuscitation Care – Peds (p97), Pain Management – Peds (p107), Sickle Cell Crisis – Peds (p111), Environmental, Hyperthermia – Peds, Trauma (p122), Eye Pain – Peds, Trauma (p125)

Side Effects

CNS: Headache, dizziness, drowsiness, fatigue, EPS

GI: Diarrhea, constipation, abdominal pain, dry mouth

Misc: Rash, bronchospasm (rare), musculoskeletal pain, wound problems, shivering, fever, hypoxia, urinary retention

Pharmacokinetics

Metabolized in the liver, excreted primarily in urine

Half-life 3.5-4.7 hr

Pregnancy Category – B

Interactions

Decrease: ondansetron effect- rifampin, carbamazepine, phenytoin

EMT Considerations

Assess: Hypersensitivity reaction: rash, bronchospasm (rare); EPS: shuffling gait, tremors, grimacing, period rigidity

Perform/Provide: Storage at room temp

Evaluate: Therapeutic response: absence of nausea/vomiting

Treatment of Overdose

Evaluate QT for prolongation; monitor for dysrhythmias; discontinue product; supportive care

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Rocuronium

Rocuronium

Mechanism of Action

Blocks acetylcholine from binding to receptors on motor endplate inhibiting depolarization. Inhibits transmission of nerve impulses by binding with cholinergic receptor sites, antagonizing action of acetylcholine

Uses

Facilitation of endotracheal intubation; skeletal muscle relaxation during mechanical ventilation

Unlabeled use: preinduction to blunt defasciculation

Contraindications

Hypersensitivity

Precautions

Pregnancy (C), breastfeeding, children, geriatric patients, electrolyte imbalances, dehydration, respiratory/neuromuscular/cardiac/renal/hepatic disease

Protocol Uses

Rapid Sequence Airway – Adult (**p33**), Rapid Sequence Airway – Peds (**p91**)

Side Effects

CV: Bradycardia, tachycardia, change in BP, edema

GI: Nausea, vomiting

Skin: Rash, flushing, pruritus, urticarial

MSK: Myopathy

Resp: Prolonged apnea, bronchospasm, cyanosis, respiratory depression, dyspnea, pulmonary vascular resistance

Pharmacokinetics

Metabolized in liver

Half-Life 30 min, duration 60-70 min

Pregnancy Category – B

Interactions

Theophylline increases risk of dysrhythmias

Increase: neuromuscular blockade caused by amphotericin B, verapamil, aminoglycosides, clindamycin, enflurane, isoflurane, lincomcin, lithium, opiates, local anesthetics, polymyxin, anti-infectives, quinidine, thiazides

EMT Considerations

Assess: Vital Signs: BP, pulse, respirations, airway until fully recovered; Allergic reactions: rash, fever, respiratory distress, pruritus

Preform/Provide: Storage in light-resistant area, stable at room temp for 30 days

Evaluate: Therapeutic response

Treatment of Overdose

Discontinue product, Edrophonium or Neostigmine, Atropine, Monitor VS

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Sodium Bicarbonate

Sodium Bicarbonate

Mechanism of Action

Increase plasma bicarbonate which buffers hydrogen ion concentrations and reverses acidosis

Uses

Acidosis (metabolic), cardiac arrest, salicylate poisoning, tricyclic antidepressant overdose

Contraindications

Metabolic/respiratory alkalosis, hyponatremia, hypocalcemia

Precautions

Pregnancy (C), children, CHF, toxemia, renal disease, hypertension, hypokalemia, breastfeeding, hypernatremia, Cushing's syndrome, hyperaldosteronism

Protocol Uses

Cardiac Arrest – Adult (**p37**), Beta Blocker Overdose – Adult (**p55**), Tricyclic Overdose – Adult (**p55**), Prolonged Crush Injury – Adult, Trauma (**p73**), Cardiac Arrest, General – Peds (**p95**), Prolonged Crush Injury – Peds, Trauma (**p120**)

Side Effects

CNS: Irritability, confusion, headache, stimulation, tremors, hyperreflexia, weakness, seizures of alkalosis

CV: Irregular pulse, cardiac arrest, water retention, edema, weight gain

GI: Flatulence, belching, distension

MSK: Muscular twitching, tetany, irritability

Pharmacokinetics

Excreted in urine

Onset 15 minutes. Duration 1-2 hours

Pregnancy Category – C

Interactions

Increase: effects- amphetamines, mecamylamine, quinine, quinidine, pseudoephedrine, flecainide, anorexics, sympathomimetics

Increase: sodium and decrease potassium- corticosteroids

Decrease: effects- lithium, chlorpropamide, barbiturates, salicylates, benzodiazepines, ketoconazole, corticosteroids

EMT Considerations

Assess: Respiratory and pulse rate/rhythm; Fluid balance: edema, crackles, shortness of breath; Alkalosis: irritability, confusion, twitching, hyperreflexia, slow respirations, cyanosis, irregular pulse; Milk-Alkali Syndrome: confusion, headache, nausea, vomiting, anorexia, urinary stones, hypercalcemia

Treatment of Overdose

Discontinue product; ventilatory support to exhale excess CO₂; supportive care

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Succinylcholine

Succinylcholine

Mechanism of Action

Acts similar to acetylcholine, producing depolarization of the motor endplate at the myoneural junction which causes sustained flaccid skeletal muscle paralysis.

Uses

Facilitation of endotracheal intubation

Contraindications

Hypersensitivity, malignant hyperthermia, trauma (crush injuries)

Precautions

Pregnancy (C), breastfeeding, geriatric or debilitated patients, cardiac disease, severe burns, fractures (fasciculations may increase damage), electrolyte imbalances (**hyperkalemia**), dehydration, **neuromuscular disease**, respiratory/cardiac/renal/hepatic disease, collagen disease, glaucoma, eye surgery

Protocol Uses

Rapid Sequence Airway – Adult (**p33**), Rapid Sequence Airway (RSA) – Peds (**p91**)

Side Effects

CV: Bradycardia, tachycardia, hypo/hypertension, sinus arrest, dysrhythmias, edema

EENT: Increased secretions, Increased intraocular pressure

Heme: Myoglobinemia

Skin: Rash, flushing, pruritus, urticaria

MSK: Weakness, muscle pain, fasciculations, prolonged relaxation, myalgia, rhabdomyolysis

Resp: Prolonged apnea, bronchospasm, cyanosis, respiratory depression, wheezing, dyspnea

Systemic: **anaphylaxis, angioedema, malignant hyperthermia**

Pharmacokinetics

Hydrolyzed in blood, excreted in urine

IV - onset 1 min, peak 2-3 min, duration 6-10 min

Pregnancy Category – C

Interactions

Dysrhythmias: theophylline

Increase: neuromuscular blockade- aminoglycosides, beta-blockers, cardiac glycosides, clindamycin, lincomycin, procainamide, quinidine, local anesthetics, polymyxin antibiotics, lithium, opiates, thiazides, enflurane, isoflurane, magnesium salts, oxytocin

EMT Considerations

Assess: Electrolyte imbalances (potassium, magnesium); may lead to increase action of product; Vital Signs: BP, pulse, respirations, airway;

Recovery: decreased paralysis; Allergic Reactions: rash, fever, respiratory distress, pruritus

Perform/Provide: Storage in refrigerator powder at room temp

Evaluate: Therapeutic response: paralysis of jaw, eyelid, head, neck rest of body

Treatment of Overdose

Discontinue product, supportive care, Neostigmine, Atropine

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Tranexamic Acid (TXA)

Tranexamic Acid (TXA)

Mechanism of Action

Displaces plasminogen from fibrin, inhibiting fibrinolysis (clot breakdown). Has inhibitory effects on plasmin, preventing further fibrinolysis.

Uses

Trauma associated hemorrhage, menorrhagia, tooth extraction in hemophilic patients

Contraindications

IV: Hypersensitivity to tranexamic acid, active intravascular clotting, subarachnoid hemorrhage
 PO: hypersensitivity to tranexamic acid, active thromboembolic disease, concurrent use with hormonal contraception

Protocol Uses

OB / Vaginal Bleeding – Adult (p51), Head Injury – Adult (p80), Hemorrhage Control – Adult (p81), Hypotension / Shock (Trauma) – Adult (p85), Head Injury – Peds (p126), Hemorrhage Control – Peds (p127)

IV indicated for trauma associated hemorrhage
 PO indicated for menorrhagia, tooth extraction in hemophilic patients

Side Effects

CNS: Headache (PO), Dizziness (IV)
CV: Hypotension (IV)
GI: Abdominal pain (PO), Diarrhea, nausea, vomiting (IV)
Heme: thromboembolic complications (i.e. DVT), anemia (PO)
Misc: Backache (PO), blurred vision (IV and PO)

Pharmacokinetics

Onset of Action: IV: 5 minutes, PO: 2.5 hours
Excretion: Renal
Half-life: IV: 2 hours, PO: 11 hours
 Pregnancy Category – B

Interactions

May enhance tranexamic acid: Estrogen derivatives, progestins

EMT Considerations

Assess: Hypersensitivity
Evaluate: Serial Blood Pressure, Mental Status, HR

Treatment of Overdose

Discontinue product, supportive care

TXA Administration Chart (To Achieve 1gm Infusion over 10min)

Diluent Volume	Drip Chamber	Rate (gtt/min)
50mL		
	Micro Drip (60 gtt/mL)	300 gtt/min
	Macro Drip (10 gtt/mL)	50 gtt/min
	Macro Drip (15 gtt/mL)	75 gtt/min
	Macro Drip (20 gtt/mL)	100 gtt/min
100mL		
	Micro Drip (60 gtt/mL)	600 gtt/min
	Macro Drip (10 gtt/mL)	100 gtt/min
	Macro Drip (15 gtt/mL)	150 gtt/min
	Macro Drip (20 gtt/mL)	200 gtt/min
150mL		
	Micro Drip (60 gtt/mL)	900 gtt/min
	Macro Drip (10 gtt/mL)	150 gtt/min
	Macro Drip (15 gtt/mL)	225 gtt/min
	Macro Drip (20 gtt/mL)	300 gtt/min
250mL		
	Micro Drip (60 gtt/mL)	1500 gtt/min
	Macro Drip (10 gtt/mL)	250 gtt/min
	Macro Drip (15 gtt/mL)	375 gtt/min
	Macro Drip (20 gtt/mL)	500 gtt/min

****Too Rapid Of Administration May Cause Hypotension****

TXA Has Only Been Evaluated With Normal Saline, LR and D5 As Diluents
 At the time of this publication, compatibility with other diluents has not been tested and is unknown. Similarly, no medications have been evaluated for compatibility in a line that is infusing TXA.

NO Medications May Be Given Through An IV Access Infusing TXA



King Guide To Parenteral Admixtures – Adult, Medical

Key To Symbols	D5W	D10NS	NS	LR	Adenosine	Amiodarone	Atropine	Calcium chloride	Diazepam	Diltiazem	Diphenhydramine	Dopamine	Epinephrine	Etomidate	Famotidine	Fentanyl	Glucagon	Haloperidol	Hydroxocobalamin	Ketamine	Ketorolac	Lidocaine	Lorazepam	Magnesium sulfate	Methylprednisolone	Midazolam	Morphine sulfate	Naloxone	Nitroglycerin	Norepinephrine	Ondansetron	Rocuronium	Sodium Bicarb	Succinylcholine	TXA	Vasopressin						
	C – May Be Compatible ■ – Incompatible ▲ – uncertain/variable data (blank) Data NA																																									
Adenosine	C		C	C	■																																					
Amiodarone	▲		▲			■	C	C	■	C	C	C	C		C	▲		C		C	■	C	C		▲	▲	C	C	C	C	▲	C	C	■	C		C					
Atropine			C	C		C	■	C	■		C	C	C	C	C	C		▲		C	C	C	C		C	C	C	C	C	C	C	C	C		C	C		C				
Calcium chloride	C		C	C		C	C	■	■	C	C	C	C		C	C		■		■	■	C	C		■	■	C	C	C	C	C	C	C	C	■	C		C				
Diazepam	▲		▲	■		■	■	■	■	■	■	■	■	■	■	▲		■	■	■	■	■	■		■	■	■	▲	■	■	■	■	■	■	■	■	■		■			
Diltiazem	C		C			C		C	■	■	■	C	C	C		C	C		C			■	C	C		▲	C	C	C	C	C	C	C	C	▲	C		C				
Diphenhydramine	C	C	C	C		C	C	C	■	■	■	C	C		C	C		▲		C	■	■	C	C	C	■	C	C	C	C	C	C	C	C	■	C		C				
Dopamine	C		C	C		C	C	C	■	C	C	■	C		C	C		▲	■	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	■	C		C				
Epinephrine	C	C	▲	C		C	C	C	■	C	C	C	■		C	C		▲		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	■	C		C			
Etomidate							C					■			■		C						C	C			C	C										C				
Famotidine	C		C	C		C	C	C	■	C	C	C	C		■	■		▲					C	C	C	▲	C	C	C	C	C	C	C	▲	C	C		C		C		
Fentanyl	C		C	C		▲	C	C	▲	C	C	C	C		C	■		▲	■	■	■	■		C	C	C	C	C	C	C	C	C	C	C	C	C	C		C			
Glucagon																	■	■											C													
Haloperidol	C		▲	▲		C	▲	■	■	C	▲	▲	▲		▲	▲		■		■	■	■	■		■	■	C	▲	▲	▲	▲	▲	C	■	■	■	■		▲		▲	
Hydroxocobalamin	C		C	C				■	■		■	■				■		■	■	■	■	■								■												
Ketamine	C		C			C	C				C	C	C					C		■	■	■		▲	C	▲	C		C	▲								■				
Ketorolac	C		C	C		■	C	■	■	■	■	■	■		C	C		■		■	■	■	■		■	■	C	C	C	C	C	C	■	C	C	■	C	C		C		
Lidocaine	C		C	C		C	C	C	■	C	C	C	C		C	C		▲					■	C	C	C	C	C	C	C	C	C	C	C	C	C	C		C			
Lorazepam	▲		▲	▲		C		C	C	C	C	C	C		C	C		C		▲	C	C	■	C	C	C	C	C	▲	C	C	■	■	■	■	■	■	■		C		
Magnesium sulfate	C		C	C		▲	C	■	■	C	C	C	C		C	C		■		C	C	C	C	■	■	■	C	C	▲	C	C	C	C	C	C	C	C	C		C		
Methylprednisolone	▲		C	▲		▲	C	■	■	▲	■	C	C		▲	C		■		▲	C	C	C	■	■	■	▲	C	C	C	C	▲	■	■	■	■	■	■		C		
Midazolam	C		C	▲		C	C	C	■	C	C	C	C		C	C		C		C	■	■	■		C	▲	■	■	C	C	C	C	C	C	C	C	■	C		C		
Morphine sulfate	C	C	▲	C		C	C	C	▲	C	C	C	C		C	C		▲		■	■	■	■		C	C	C	■	■	■	■	■	■	■	■	■	■	■	■		C	
Naloxone	C		C	C		C	C	C	■	C	C	C	C		C	C	C	▲		■	■	■	■	▲	▲	C	C	C	■	■	■	■	■	■	■	■	■	■	■		C	
Nitroglycerin	▲		▲	▲		C	C	C	■	C	C	C	C		C	C		▲	■	▲	C	C	C	C	C	C	C	C	▲	■	■	■	■	■	■	■	■	■		C		
Norepinephrine	C		C	C		▲	C	C	■	C	C	C	C		C	C		▲			■	■	■		C	C	C	C	C	C	■	■	■	■	■	■	■	■		C		
Ondansetron	C		C	C		C	C	C	▲	C	C	C	C		C	C		▲		■	■	■	■		C	▲	C	C	C	C	■	■	■	■	■	■	■	■		C		
Rocuronium	C		C	C		C		C	■	C	C	C	C		▲	C		C		■	■	■	■		C	■	■	C	C	C	C	C	C	■	■	■	■	■		C		
Sodium Bicarb	C	C	C	▲		■	C	■	■	▲	■	■	■		C	C		■		■	■	■	■		C	C	C	C	C	C	C	C	C	■	■	■	■	■	■		C	
Succinylcholine	C	C	C	C		C	C	C	■	C	C	C	C		C	C		▲				■	■		C	C	C	C	C	C	C	C	C	C	C	C	■	■	■		C	
TXA	C		C	C																																			■	■		■
Vasopressin	C		C	C		C	C	C	■	C	C	C	C		C	C		▲				■	■		C	C	C	C	C	C	C	C	C	C	C	C	C	C	■	■		■



Airway Emergency Reference – Adult, Medical

		Paralysis and Induction				Post Placement Management			
Medication Name	Etomidate	Ketamine	Succinylcholine	Rocuronium	Fentanyl	Midazolam	Ketamine		
Dose	0.3 mg/kg	2 mg/kg	2 mg/kg	1 mg/kg	1 mcg/kg	0.1 mg/kg	2 mg/kg		
Concentration	2 mg/mL	100 mg/mL	20 mg/mL	10 mg/mL	50 mcg/mL	5 mg/mL	100 mg/mL		
lbs	kg								
66	9mg / 4.5mL	60mg / 0.6mL	60mg / 3mL	30mg / 3mL	30mcg / 0.6mL	3mg / 0.6mL	60mg / 0.6mL		
88	12mg / 6mL	80mg / 0.8mL	80mg / 4mL	40mg / 4mL	40mcg / 0.8mL	4mg / 0.8mL	80mg / 0.8mL		
110	15mg / 7.5mL	100mg / 1mL	100mg / 5mL	50mg / 5mL	50mcg / 1mL	5mg / 1.0mL	100mg / 1mL		
132	18mg / 9mL	120mg / 1.2mL	120mg / 6mL	60mg / 6mL	60mcg / 1.2mL	5mg / 1.0mL	120mg / 1.2mL		
154	21mg / 10.5mL	140mg / 1.4mL	140mg / 7mL	70mg / 7mL	70mcg / 1.4mL	5mg / 1.0mL	140mg / 1.4mL		
176	24mg / 12mL	160mg / 1.6mL	160mg / 8mL	80mg / 8mL	80mcg / 1.6mL	5mg / 1.0mL	160mg / 1.6mL		
198	27mg / 13.5mL	180mg / 1.8mL	180mg / 9mL	90mg / 9mL	90mcg / 1.8mL	5mg / 1.0mL	180mg / 1.8mL		
220	30mg / 15mL	200mg / 2mL	200mg / 10mL	100mg / 10mL	100mcg / 2mL	5mg / 1.0mL	200mg / 2mL		
242	30mg / 10mL	200mg / 2mL	200mg / 10mL	100mg / 10mL	100mcg / 2mL	5mg / 1.0mL	200mg / 2mL		
264	30mg / 10mL	200mg / 2mL	200mg / 10mL	100mg / 10mL	100mcg / 2mL	5mg / 1.0mL	200mg / 2mL		
286	30mg / 10mL	200mg / 2mL	200mg / 10mL	100mg / 10mL	100mcg / 2mL	5mg / 1.0mL	200mg / 2mL		
308	30mg / 10mL	200mg / 2mL	200mg / 10mL	100mg / 10mL	100mcg / 2mL	5mg / 1.0mL	200mg / 2mL		
330	30mg / 10mL	200mg / 2mL	200mg / 10mL	100mg / 10mL	100mcg / 2mL	5mg / 1.0mL	200mg / 2mL		
Max Dose	30mg / 10mL	200mg / 2mL	200mg / 10mL	100mg / 10mL	100mcg / 2mL	5mg / 1.0mL	200mg / 2mL		



Pressor FAQs – Adult, Medical

PRESSOR	Receptor	Main Effect	Main Shock Use	Other
Epinephrine	$\alpha_1, \alpha_2, \beta_1, \beta_2$	Vasoconstriction Inotropy (increased squeeze) Dromotropy (increased conduction through AV node) Chronotropy (increased rate)	Anaphylaxis Asthma Cardiac Arrest	<ul style="list-style-type: none"> ▪ Nonspecific α and β receptor activation ▪ Hard on myocardium ▪ Typically an add-on agent to norepinephrine in septic shock when an additional agent is required and occasionally an alternative first-line agent if norepinephrine is contraindicated. ▪ Increases heart rate. ▪ May decrease mesenteric perfusion, may induce tachyarrhythmias and ischemia ▪ Must be diluted; eg, a usual concentration is 1 mg of 1:1,000 in 250 mL D5W (4 micrograms/mL).
Norepinephrine	α_1, β_1	Vasoconstriction Inotropy	Septic Shock Undifferentiated Shock	<ul style="list-style-type: none"> ▪ First line med for most kinds of shock ▪ Initial vasopressor of choice in septic, cardiogenic and hypovolemic shock. ▪ Wide range of doses used clinically. ▪ Must be diluted; a usual concentration is 4mg in 250mL of D5W or NS (16mg/mL)
Phenylephrine	α_1	Vasoconstriction	Hypotension ("push dose" pressors in the ED)	<ul style="list-style-type: none"> ▪ May cause reflex bradycardia ▪ Pure alpha-adrenergic vasoconstrictor. ▪ Alternative vasopressor for patients with septic shock who: (1) develop tachyarrhythmias on norepinephrine, (2) have persistent shock despite use of two or more vasopressor/inotropic agents including vasopressin (salvage therapy), or (3) high cardiac output with persistent hypotension. ▪ May decrease stroke volume and cardiac output in patients with cardiac dysfunction. ▪ May be given as bolus dose of 50 to 100 micrograms to support blood pressure during rapid sequence intubation.
Dobutamine	β_1, β_2	Inotropy Vasodilation	Cardiogenic Shock	<ul style="list-style-type: none"> ▪ Minimal change in heart rate ▪ Hard on myocardium ▪ Initial agent of choice in cardiogenic shock with low cardiac output and maintained blood pressure. ▪ Add-on to norepinephrine for cardiac output augmentation in septic shock with myocardial dysfunction or ongoing hypoperfusion despite adequate intravascular volume and MAP. ▪ Increases cardiac contractility and rate; may cause hypotension and tachyarrhythmias
Dopamine	$\alpha_1, \alpha_2, \beta_1, \beta_2, DA$	Vasoconstriction (high doses) Inotropy Dromotropy Chronotropy	Septic Shock (2 nd line behind Norepinephrine)	<ul style="list-style-type: none"> ▪ More adverse effects (eg, tachycardia, arrhythmias particularly at doses ≥ 20 mcg/kg/minute) and failed therapy than norepinephrine. ▪ May be useful in selected patients (eg, with compromised systolic function or bradycardia at low risk for tachyarrhythmias). ▪ Must be diluted; eg, a usual concentration is 400mg in 250mL D5W (1.6 mg/mL); use of a commercially available pre-diluted solution is preferred.
Vasopressin	V1	Vasoconstriction	Norepinephrine sparing effect at low doses	<ul style="list-style-type: none"> ▪ Add-on to another vasopressor (eg, norepinephrine) to augment efficacy and decrease initial vasopressor requirement. Not recommended as a replacement for a first-line vasopressor. ▪ Pure vasoconstrictor; may decrease stroke volume and cardiac output in myocardial dysfunction or precipitate ischemia in coronary artery disease. ▪ Must be diluted; eg, a usual concentration is 25 units in 250mL D5W or NS (0.1 units/mL).



Pressor Drip Reference – Adult, Medical

Mix 1mg of EPINEPHRINE (1:1,000) or NOREPINEPHRINE in 250mL NS or D5W (4mcg/ml)

The abbreviation gtt comes from the Latin “guttae”, meaning “drops”
Medication pump strongly recommended, when available

Use 60 gtt tubing based off of the following chart

mcg/min	gtt/min	gtt/sec
2 mcg/min	30 gtt/min	1 drop every 2 seconds
4 mcg/min	60 gtt/min	1 drop / second
6 mcg/min	90 gtt/min	1-2 drops / second
8 mcg/min	120 gtt/min	2 drops / second
10 mcg/min	150 gtt/min	2-3 drops / second
12 mcg/min	180 gtt/min	3 drops / second
14 mcg/min	210 gtt/min	3-4 drops / second
16 mcg/min	240 gtt/min	4 drops / second

All gtt/min rates on this page are based off 60 gtt tubing.
If using 10 gtt tubing, divide the listed gtt/min rate by 6.

ALWAYS check drug concentrations BEFORE using any charts in this book



Medication Quick Reference – Adult, Medical

Medication Name	Indication (Protocol Use)	First Dose	Second Dose	Max
Acetaminophen	Pain Management, Adult (p. 58)	15 mg / kg PO		1000mg
Adenosine	Tachycardia With A Pulse (p. 43)	6.0 mg IV/IO	12.0 mg IV/IO	6mg/12mg
Albuterol	COPD / Asthma / Stridor (p. 35)	2.5 mg Neb	2.5 mg Neb	3 doses
	Allergic Reaction (p. 46)	2.5 mg Neb	2.5 mg Neb	3 doses
	Prolonged Crush Injury (p. 73)	2.5 mg Neb		Run continuously as needed
	Hazmat, General (p. 79)	2.5 mg Neb		
Amiodarone	Cardiac Arrest, Adult (p. 37)	300 mg IV/IO	150 mg IV/IO	
	Tachycardia With A Pulse (p. 43)	150 mg drip infusion over 10 minutes (Polymorphic, Wide Complex)		
	Tachycardia With A Pulse (p. 43)	150 mg drip infusion over 10 minutes (Monomorphic, Wide Complex)		
Aspirin	CHF / Pulmonary Edema (p. 36)	324 mg		
	Chest Pain / Suspected ACS (p. 41)	324 mg		
	ST Elevation MI (STEMI) (p. 42)	324 mg		
Atropine	Bradycardia With A Pulse (p. 44)	1mg IV/IO	1mg IV/IO	3 mg
	Cholinergic / Organophosphate Overdose (p. 56)	Minor – 2.0 mg Major – 6.0 mg		
Calcium Chloride	Cardiac Arrest, Adult (p. 37)	1.0 g IV/IO		1 dose
	Calcium Channel Blocker Overdose (p. 55)	1.0 g IV/IO		1 dose
	Prolonged Crush Injury (p. 73)	1.0 g IV/IO over 3 min		1 dose

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Medication Quick Reference – Adult, Medical

Medication Name	Indication (Protocol Use)	First Dose	Second Dose	Max Dose
Dextrose	Diabetic Emergencies (p. 48)	D10W – 125mL D5W – 250mL		
Diltiazem	Tachycardia With A Pulse (p. 43)	0.25 mg/kg		20 mg
Diphenhydramine	Allergic Reaction (p. 46)	50 mg IV/IM/IO/PO		
	Antipsychotic OD / Acute Dystonic Reaction (p. 55)	50 mg IV/IO/IM/PO		
Epinephrine (1:1,000)	Allergic Reaction (p. 46)	0.3-0.5 mg IM	0.3-0.5 mg IM	3 doses
	COPD / Asthma / Stridor (p. 35)	0.3 -0.5mg IM		
	COPD / Asthma / Stridor (p. 35)	1 mg Neb in 2mL NS		
Epinephrine (1:10,000)	Cardiac Arrest (p. 37)	1 mg IV/IO		
Epinephrine Infusion (1mg of 1:1,000 in 250mL D5W)	Allergic Reaction (p. 46)	2-10 mcg/min (See Pressor Drip Sheet)		
	Bradycardia With A Pulse (p. 44)	2-10 mcg/min (See Pressor Drip Sheet)		
	Hypotension / Shock (Non-Trauma) (p. 63)	2-10 mcg/min (See Pressor Drip Sheet)		
	Hypotension / Shock (Trauma) (p. 85)	2-10 mcg/min (See Pressor Drip Sheet)		
Etomidate	Rapid Sequence Airway (p. 33)	0.3 mg/kg IV/IO		30mg
Famotidine	Allergic Reaction, Adult (p. 46)	20 mg IV/IO		
Fentanyl	Post Advanced Airway Sedation (p. 34)	0.5-1.0 mcg/kg IV/IO		100mcg, max 3 doses
	Tachycardia With A Pulse (cardioversion) (p. 43)	1 mcg/kg IV/IO		100mcg
	Bradycardia With A Pulse (pacing) (p. 44)	1 mcg/kg IV/IO		100mcg
	Pain Management (p. 58)	2mcg/kg IN 0.5-1.0 mcg/kg IV/IO		Max 3 doses

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Medication Quick Reference – Adult, Medical

Medication Name	Indication (Protocol Use)	First Dose	Second Dose	Max Dose
Glucagon	Cardiac Arrest (p. 37) Ca Channel and/or Beta Blocker OD	5mg IV/IO		
	Diabetic Emergencies (p. 48)	1.0 mg IM		
	Calcium Channel Blocker Overdose (p. 55)	2mg IV/IO	2mg IV/IO	
	Beta Blocker Overdose (p. 55)	2mg IV/IO	2mg IV/IO	
Glucose (Oral)	Diabetic Emergencies (p. 48)	15 g PO (1 tube)	15 g PO (1 tube)	2 tubes
Haloperidol	Behavioral Emergencies (p. 47)	5mg IM		
Hydroxycobalamin (Cyanokit)	Cyanide Poisoning (p. 57)	70 mg/kg		5 g
Ibuprofen	Pain Management, Adult (p. 58)	10mg/kg PO		400mg
Ipratropium Bromide	Asthma / COPD (p. 35)	0.5 mg Neb		2 doses
	Hazmat, General (p. 79)	0.5 mg Neb		
Ketamine	Rapid Sequence Airway (RSA) (p. 33)	2 mg/kg IV/IO		200 mg
	Post Advanced Airway Sedation (p. 34)	IV/IO		200mg
	Behavioral Emergencies (p. 47)	2 mg/kg IV/IO 4 mg/kg IM		200mg IV/IO 400mg IM
	Pain Management (p. 58)	0.25 mg/kg IV/IO		25 mg May repeat x3
Ketorolac	Pain Management (p. 58)	15 mg IV 30 mg IM		
Lidocaine 2%	Intraosseous Venous Access Procedure (p. 178) (Awake and aware of pain)	10-20 mg ½ - 1 mL of 2% at 100mg/5mL concentration		



Medication Quick Reference – Adult, Medical

Medication Name	Indication (Protocol Use)	First Dose	Second Dose	Max Dose	
Lorazepam	Tachycardia With A Pulse (cardioversion) (p. 43)	0.1 mg/kg IV/IO/IM		2 mg	
	Bradycardia With A Pulse (pacing) (p. 44)	0.1 mg/kg IV/IO/IM		2 mg	
	Behavioral Emergencies (p. 47)	0.1 mg/kg IV/IO/IM			
	OB General (seizures) (p. 50)	0.1 mg/kg IV/IO/IM		2 mg	
	Cocaine and Sympathomimetic Overdose (p. 55)	0.1 mg/kg IV/IO/IM		2 mg	
	Seizure (p. 61)	0.1 mg/kg IV/IO/IM		2 mg	
Magnesium Sulfate	COPD / Asthma / Stridor (p. 35)	2 g in 100ml NS or D5W IV/IO infusion over 10 minutes			
	Cardiac Arrest (p. 37)	2 g IV/IO push over 1-2 minutes			
	Tachycardia With A Pulse (p. 43)	2 g IV/IO push over 1-2 minutes			
	OB General (p. 50)	4 g in 100ml NS or D5W IV/IO infusion over 10 minutes			
MARK I Kit	Cholinergic / Organophosphate Overdose (p. 56)	2 mg Atropine IM & 600 mg 2-PAM IM			
Methylprednisone	Asthma / COPD (p. 35)	125 mg IV/IO			
	Allergic Reaction (p. 46)	125 mg IV/IO			



Medication Quick Reference – Adult, Medical

Medication Name	Indication (Protocol Use)	First Dose	Second Dose	Max Dose
Midazolam	Airway Management (p. 32) for CPAP compliance	2 mg IV/IN		
	Post Advanced Airway Sedation (p. 34)	0.1 mg/kg IV/IO		Max 5mg
	CHF / Pulmonary Edema (p. 36)	2 mg IV/IN		
	Tachycardia With A Pulse (cardioversion) (p. 43)	0.1 mg/kg IV/IO 0.2mg/kg IM/IN		IV/IO Max 5 mg IM/IN Max 10mg
	Bradycardia With A Pulse (pacing) (p. 44)	0.1 mg/kg IV/IO 0.2mg/kg IM/IN		IV/IO Max 5 mg IM/IN Max 10mg
	Antipsychotic Overdose / Acute Dystonic Reaction (p. 55)	0.1 mg/kg IV/IO 0.2mg/kg IM/IN		IV/IO Max 5 mg IM/IN Max 10mg
	Cocaine and Sympathomimetic Overdose (p. 55)	0.1 mg/kg IV/IO 0.2mg/kg IM/IN		IV/IO Max 5 mg IM/IN Max 10mg
		Seizure (p. 61)	0.1 mg/kg IV/IO 0.2mg/kg IM/IN	
	Bites and Envenomations (p. 68)	0.1 mg/kg IV/IO 0.2mg/kg IM/IN		IV/IO Max 5 mg IM/IN Max 10mg
	Environmental – Hyperthermia (p. 75)	0.1 mg/kg IV/IO		Max 5mg
Naloxone	Opioid Overdose (p. 55)	0.4-2.0 mg IN/IV/IO/IM		
Nitroglycerin	CHF / Pulmonary Edema (p. 36)	0.4 mg SL if IV present OR 1", 1.5" or 2" Nitro Paste	0.4 mg SL if no IV present	3 doses
	Chest Pain / Suspected ACS (p. 41)	0.4 mg SL if IV present OR 1", 1.5" or 2" Nitro Paste	0.4 mg SL if no IV present	3 doses
	ST Elevation Myocardial Infarction (STEMI) (p. 42)	0.4 mg SL if IV present OR 1", 1.5" or 2" Nitro Paste	0.4 mg SL if no IV present	3 doses
Nitrous Oxide	Pain Management (p. 58)	Nitrous Oxide – Procedure (p. 197)		
Norepinephrine	Hypotension / Shock (Non-Trauma) (p. 63)	4-16 mcg/min (See Pressor Drip Sheet)		
	Hypotension / Shock (Trauma) (p. 85)	4-16 mcg/min (See Pressor Drip Sheet)		



Medication Quick Reference – Adult, Medical

Medication Name	Indication (Protocol Use)	First Dose	Second Dose	Max Dose
Ondansetron	Post Advanced Airway Sedation (p. 34)	0.15mg/kg IV/IO/ODT/IM		4.0 mg
	Chest Pain / Suspected ACS (p. 41)	0.15mg/kg IV/IO/ODT/IM		4.0 mg
	ST Elevation MI (nausea) (p. 42)	0.15mg/kg IV/IO/ODT/IM		4.0 mg
	Pain Management (p. 58)	0.15mg/kg IV/IO/ODT/IM		4.0 mg
	Environmental – Hyperthermia (p. 75) (ODT for cramps/exhaustion only)	0.15mg/kg IV/IO/ODT/IM		4.0 mg
Rocuronium	Rapid Sequence Airway (RSA) (p. 33)	1.0 mg/kg		100 mg
	Post Advanced Airway Sedation (p. 34)	1.0 mg/kg		100 mg
Sodium Bicarb	Cardiac Arrest (hyperkalemia) (p. 37)	50 mEq IV/IO		
	Tricyclic Overdose (p. 55)	1 mEq/kg IV/IO over 5 minutes		100 mEq
	Prolonged Crush Injury (p. 73)	50 mEq IV/IO		
	Hazmat General (p. 79)	2.5mL in 5mL NS, neb		
Succinylcholine	Rapid Sequence Airway (RSA) (p. 33)	2 mg/kg IV/IO		200 mg
		2 mg/kg IV/IO		200 mg
Tranexamic Acid (TXA)	Hemorrhage Control – Trauma (p. 81)	1 gm IV/IO over 10 minutes		2 gm
	Head Injury (p. 80)	1 gm IV/IO over 10 minutes		2 gm

Mixing Directions: Tranexamic Acid (TXA) 1gm into 50mL NS (60mL total volume). Infuse over 10 minutes. 10 gtts tubing = 60 gtts/min



Airway Emergency Reference – Peds, Medical

Medication Name		Etomidate	Ketamine	Succinylcholine	Rocuronium	Fentanyl	Midazolam	Ketamine	
Dose		0.3 mg/kg	2 mg/kg	2 mg/kg	1 mg/kg	1 mcg/kg	0.05 mg/kg	2 mg/kg	
Concentration		2 mg/mL	100 mg/mL	20 mg/mL	10 mg/mL	50 mcg/mL	5 mg/mL	100 mg/mL	
lbs	kg	Paralysis and Induction				Post Placement Management			
2-4	1	0.3mg / 0.2mL	2mg / 0.1mL	2mg / 0.1mL	1mg / 0.1mL	1mcg / 0.1mL	0.05mg / 0.1mL	2mg / 0.1mL	
6-7	3	0.9mg / 0.5mL	6mg / 0.1mL	6mg / 0.3mL	3mg / 0.3mL	3mcg / 0.1mL	0.15 / 0.1mL	6mg / 0.1mL	
13-14	6	1.8mg / 0.9mL	12mg / 0.1mL	12mg / 0.6mL	6mg / 0.6mL	6mcg / 0.1mL	0.3mg / 0.1mL	10mg / 0.1mL	
17-18	8	2.4mg / 1.2mL	16mg / 0.2mL	16mg / 0.8mL	8mg / 0.8mL	8mcg / 0.2mL	0.4mg / 0.1mL	16mg / 0.2mL	
21-23	10	3mg / 1.5mL	20mg / 0.2mL	20mg / 1mL	10mg / 1mL	10mcg / 0.2mL	0.5mg / 0.1mL	20mg / 0.2mL	
26-27	12	3.6mg / 1.8mL	24mg / 0.2mL	24mg / 1.2mL	12mg / 1.2mL	12mcg / 0.2mL	0.6mg / 0.1mL	24mg / 0.2mL	
32-34	15	4.5mg / 2.3mL	30mg / 0.3mL	30mg / 1.5mL	15mg / 1.5mL	15mcg / 0.3mL	0.75mg / 0.15mL	30mg / 0.3mL	
43-45	20	6mg / 3mL	40mg / 0.4mL	40mg / 2mL	20mg / 2mL	20mcg / 0.4mL	1mg / 0.2mL	40mg / 0.4mL	
55-56	25	7.5mg / 3.8mL	50mg / 0.5mL	50mg / 2.5mL	25mg / 2.5mL	25mcg / 0.5mL	1.25mg / 0.25mL	50mg / 0.5mL	
76-78	35	10.5mg / 5.3mL	70mg / 0.7mL	70mg / 3.5mL	35mg / 3.5mL	35mcg / 0.7mL	1.75mg / 0.35mL	70mg / 0.7mL	
132-133	60	18mg / 9mL	120mg / 1.2mL	120mg / 6mL	60mg / 6mL	60mcg / 1.2mL	3mg / 0.6mL	120mg / 1.2mL	
165-166	75	22.5mg / 11.3mL	150mg / 1.5mL	150mg / 7.5mL	75mg / 7.5mL	75mcg / 1.4mL	3.75mg / 0.75mL	150mg / 1.5mL	
220-221	100	30mg / 15mL	200mg / 2mL	200mg / 10mL	100mg / 10mL	100mcg / 2mL	4mg / 0.8mL	200mg / 2mL	
Max Dose		30mg / 15mL	200mg / 2mL	200mg / 10mL	100mg / 10mL	100mcg / 2mL	4mg / 0.8mL	200mg / 2mL	



Medication Quick Reference – Peds Cardiac Arrest (General) p. 95

Medication Name		1 st Shock	Epinephrine (1:10,000)	2 nd Shock	Amiodarone	Atropine	Calcium Gluconate	Sodium Bicarb	3 rd Shock	Lidocaine
Dose		Biphasic	0.01 mg/kg	Biphasic	5 mg/kg	0.02 mg/kg	100 mg/kg	1 mEq/kg	Biphasic	1 mg/kg
Concentration		2 J/kg	0.1 mg/mL	4 J/kg	50 mg/mL	0.1 mg/mL	100 mg/mL	1 mEq/mL	4-10 J/kg	20 mg/mL
lbs	kg				May repeat x 2 OR switch to Lidocaine					May repeat at 5-10 minutes, ½ dose
2-4	1	2 J	0.01mg / 0.1mL	4 J	5mg / 0.1mL	0.1mg / 1mL (minimum)	100mg / 1mL	1mEq / 1mL	4-10 J	1mg / 0.1mL
6-7	3	6 J	0.03mg / 0.3mL	12 J	15mg / 0.3mL	0.1mg / 1mL (minimum)	300mg / 3mL	3mEq / 3mL	12-30 J	3mg / 0.2mL
13-14	6	12 J	0.06mg / 0.6mL	24 J	30mg / 0.6mL	0.12mg / 1.2mL	600mg / 6mL	6mEq / 6mL	24-60 J	6mg / 0.3mL
17-18	8	16 J	0.08mg / 0.8mL	32 J	40mg / 0.8mL	0.16mg / 1.6mL	800mg / 8mL	8mEq / 8mL	32-80 J	8mg / 0.4mL
21-23	10	20 J	0.1mg / 1mL	40 J	50mg / 1mL	0.2mg / 2mL	<u>1gm / 10mL</u>	10mEq / 10mL	40-100 J	10mg / 0.5mL
26-27	12	24 J	0.12mg / 1.2mL	48 J	60mg / 61.2mL	0.24mg / 2.4mL	1gm / 10mL	12mEq / 12mL	48-120 J	12mg / 0.6mL
32-34	15	30 J	0.15mg / 1.5mL	60 J	75mg / 1.5mL	0.3mg / 3mL	1gm / 10mL	15mEq / 15mL	60-150 J	15mg / 0.8mL
43-45	20	40 J	0.2mg / 2mL	80 J	100mg / 2mL	0.4mg / 4mL	1gm / 10mL	20mEq / 20mL	80-200 J	20mg / 1mL
55-56	25	50 J	0.25mg / 2.5mL	100 J	125mg / 2.5mL	0.5mg / 5mL	1gm / 10mL	25mEq / 25mL	100-200 J	25mg / 1.3mL
76-78	35	70 J	0.35mg / 3.5mL	140 J	175mg / 3.5mL	0.7mg / 7mL	1gm / 10mL	35mEq / 35mL	140-200 J	35mg / 1.8mL
132-133	60	120 J	0.6mg / 6mL	200 J	300mg / 6mL	1mg / 10mL	1gm / 10mL	50mEq / 50mL	200 J	60mg / 3mL
165-166	75	150 J	0.75mg / 7.5mL	200 J	300mg / 6mL	1mg / 10mL	1gm / 10mL	50mEq / 50mL	200 J	75mg / 3.8mL
220-221	100	200 J	1mg / 10mL	200 J	300mg / 6mL	1mg / 10mL	1gm / 10mL	50mEq / 50mL	200 J	100mg / 5mL
Max Dose		200 J	1mg / 10mL	200 J	300mg / 6mL	1mg / 10mL	1gm / 10mL	50mEq	200 J	3 mg/kg

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Medication Quick Reference – Peds Perfusing Arrhythmias, p. 98-99

Medication Name		Epinephrine (1:10,000)	Atropine	Midazolam INTRANASAL	Lorazepam IV	Midazolam IV	Adenosine	Adenosine	Amiodarone					
Dose		0.01 mg/kg	0.02 mg/kg	0.2 mg/kg	0.05 mg/kg	0.05 mg/kg	0.1 mg/kg	0.2 mg/kg	5 mg/kg					
Concentration		0.1 mg/mL	0.1 mg/mL	5 mg/mL	2 mg/mL	5 mg/mL	3 mg/mL	3mg/ mL	50 mg/mL					
lbs	kg	Every 3-5 min while setting up to pace	If Brady due to vagal tone	Sedation for Pacing			First Dose	Second Dose	Infuse over 20-60 minutes					
2-4	1						0.01mg / 0.1mL	0.1mg / 1mL (minimum)	0.2mg / 0.1mL	0.05mg / 0.1mL	0.05mg / 0.1mL	0.1mg / 0.1mL	0.2mg / 0.1mL	5mg / 0.1mL
6-7	3						0.03mg / 0.3mL	0.1mg / 1mL (minimum)	0.6mg / 0.1mL	0.15mg / 0.1mL	0.15mg / 0.1mL	0.3mg / 0.1mL	0.6mg / 0.2mL	15mg / 0.3mL
13-14	6						0.06mg / 0.6mL	0.12 mg / 1.2mL	1.2mg / 0.2mL	0.3mg / 0.2mL	0.3mg / 0.1mL	0.6mg / 0.2mL	1.2mg / 0.4mL	30mg / 0.6mL
17-18	8						0.08mg / 0.8mL	0.16mg / 1.6mL	1.6mg / 0.3mL	0.4mg / 0.2mL	0.4mg / 0.1mL	0.8mg / 0.3mL	1.6mg / 0.5mL	40mg / 0.8mL
21-23	10						0.1mg / 1mL	0.2mg / 2mL	2mg / 0.4mL	0.5mg / 0.3mL	0.5mg / 0.1mL	1mg / 0.3mL	2mg / 0.7mL	50mg / 1mL
26-27	12						0.12mg / 1.2mL	0.24mg / 2.4mL	2.4mg / 0.5mL	0.6mg / 0.3mL	0.6mg / 0.1mL	1.2mg / 0.4mL	2.4mg / 0.8mL	60mg / 1.2mL
32-34	15						0.15mg / 1.5mL	0.3mg / 3mL	3mg / 0.6mL	0.75mg / 0.4mL	0.75mg / 0.2mL	1.5mg / 0.5mL	3mg / 1mL	75mg / 1.5mL
43-45	20						0.2mg / 2mL	0.4mg / 4mL	4mg / 0.8mL	1mg / 0.5mL	1mg / 0.2mL	2mg / 0.7mL	4mg / 1.3mL	100mg / 2mL
55-56	25						0.25mg / 2.5mL	0.5mg / 5mL	5mg / 1mL	1.25mg / 0.6mL	1.25mg / 0.3mL	2.5mg / 0.8mL	5mg / 1.7mL	125mg / 2.5mL
76-78	35						0.35mg / 3.5mL	0.5mg / 5mL	7mg / 1.4mL	1.75mg / 0.9mL	1.75mg / 0.4mL	3.5mg / 1.2mL	7mg / 2.3mL	175mg / 3.5mL
132-133	60						0.6mg / 6mL	0.5mg / 5mL	10mg / 2mL	2mg / 1mL	2mg / 0.4mL	6mg / 2mL	12mg / 4mL	300mg / 6mL
165-166	75						0.75mg / 7.5mL	0.5mg / 5mL	10mg / 2mL	2mg / 1mL	2mg / 0.4mL	6mg / 2mL	12mg / 4mL	300mg / 6mL
220-221	100	1mg / 10mL	0.5mg / 5mL	10mg / 2mL	2mg / 1mL	2mg / 0.4mL	6mg / 2mL	12mg / 4mL	300mg / 6mL					
Max Dose		1mg / 10mL	0.5mg / 5mL	10mg / 2mL	2mg / 1mL	2mg / 0.4mL	6mg / 2mL	12mg / 4mL	300mg / 6mL					

Bradycardia With A Pulse (p. 99)

Tachycardia With A Pulse (p. 98)



Medication Quick Reference – Peds Allergic Reaction, p. 100

Medication Name		Epinephrine IM (1:1,000)	Epinephrine IV (1:10,000)	Albuterol	Diphenhydramine	Famotidine	Epinephrine gtt	Methylprednisolone
Dose		0.01 mg/kg	0.005 mg/kg	2.5 mg / 3mL	1 mg/kg	0.5 mg/kg	0.1-1 mcg/kg/min	2 mg/kg
Concentration		1 mg/mL	0.1 mg/mL		50 mg/mL	10 mg/mL	1mg of 1:1,000 in 250mL D5W	62.5 mg/mL
lbs	kg							
2-4	1	0.01mg / 0.1mL	0.005mg / 0.1mL		1mg / 0.1mL	0.5mg / 0.1mL	1mcg/min / 15gtt/min	2mg / 0.1mL
6-7	3	0.03mg / 0.1mL	0.03mg / 0.3mL		3mg / 0.1mL	1.5mg / 0.2mL	3mcg/min / 45gtt/min	6mg / 0.1mL
13-14	6	0.06mg / 0.1mL	0.06mg / 0.6mL		6mg / 0.1mL	3mg / 0.3mL	6mcg/min / 90gtt/min	12mg / 0.2mL
17-18	8	0.08mg / 0.1mL	0.08mg / 0.8mL		8mg / 0.2mL	4mg / 0.4mL	8mcg/min / 120gtt/min	16mg / 0.3mL
21-23	10	0.1mg / 0.1mL	0.1mg / 1mL		10mg / 0.2mL	5mg / 0.5mL	10mcg/min / 150gtt/min	20mg / 0.3mL
26-27	12	0.12mg / 0.1mL	0.1mg / 1mL		12mg / 0.2mL	6mg / 0.6mL	10mcg/min / 150gtt/min	24mg / 0.4mL
32-34	15	0.15mg / 0.2mL	0.1mg / 1mL		15mg / 0.3mL	7.5mg / 0.8mL	10mcg/min / 150gtt/min	30mg / 0.5mL
43-45	20	0.2mg / 0.2mL	0.1mg / 1mL		20mg / 0.4mL	10mg / 1mL	10mcg/min / 150gtt/min	40mg / 0.6mL
55-56	25	0.25mg / 0.3mL	0.1mg / 1mL		25mg / 0.5mL	12.5mg / 1.3mL	10mcg/min / 150gtt/min	50mg / 0.8mL
76-78	35	0.3mg / 0.3mL	0.1mg / 1mL		35mg / 0.7mL	17.5mg / 1.8mL	10mcg/min / 150gtt/min	70mg / 1.1mL
132-133	60	0.3mg / 0.3mL	0.1mg / 1mL		50mg / 1mL	20mg / 2mL	10mcg/min / 150gtt/min	120mg / 1.9mL
165-166	75	0.3mg / 0.3mL	0.1mg / 1mL		50mg / 1mL	20mg / 2mL	10mcg/min / 150gtt/min	125mg / 2mL
220-221	100	0.3mg / 0.3mL	0.1mg / 1mL		50mg / 1mL	20mg / 2mL	10mcg/min / 150gtt/min	125mg / 2mL
Max Dose		0.3mg / 0.3mL	0.1mg / 1mL		50mg / 1mL	20mg / 2mL	10mcg/min / 150gtt/min	125mg / 2mL

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Medication Quick Reference – Peds Seizure, p. 109

Medication Name		Midazolam INTRNASAL	Lorazepam IV	Midazolam IV	Glucagon IM	D10
Dose		0.2 mg/kg	0.1 mg/kg	0.1 mg/kg		3 mL/kg
Concentration		5 mg/mL	2 mg/mL	5 mg/mL		
lbs	kg					
2-4	1	0.2mg / 0.1mL	0.1mg / 0.1mL	0.1mg / 0.1mL	0.5mg	3mL
6-7	3	0.6mg / 0.1mL	0.3mg / 0.2mL	0.3mg / 0.1mL	0.5mg	9mL
13-14	6	1.2mg / 0.2mL	0.6mg / 0.3mL	0.6mg / 0.1mL	0.5mg	18mL
17-18	8	1.6mg / 0.3mL	0.8mg / 0.4mL	0.8mg / 0.2ml	0.5mg	24mL
21-23	10	2mg / 0.4mL	1mg / 0.5mL	1mg / 0.2mL	0.5mg	30mL
26-27	12	2.4mg / 0.5mL	1.2mg / 0.6mL	1.2mg / 0.2mL	0.5mg	36mL
32-34	15	3mg / 0.6mL	1.5mg / 0.8mL	1.5mg / 0.3mL	0.5mg	45mL
43-45	20	4mg / 0.8mL	2mg / 1mL	2mg / 0.4mL	0.5mg	60mL
55-56	25	5mg / 1mL	2mg / 1mL	2.5mg / 0.5mL	1mg	75mL
76-78	35	7mg / 1.4mL	2mg / 1mL	3.5mg / 0.7mL	1mg	105mL
132-133	60	10mg / 2mL	2mg / 1mL	6mg / 1.2mL	1mg	125mL
165-166	75	10mg / 2mL	2mg / 1mL	7.5mg / 1.5mL	1mg	125mL
220-221	100	10mg / 2mL	2mg / 1mL	10mg / 2mL	1mg	125mL
Max Dose		10mg / 2mL	2mg / 1mL	10mg / 2mL	1mg	125mL

Disposable Diaper ROUGH Weight Estimate Chart		
Diaper Size	lbs	kg
P	<6	<2.7
N	<10	<4
1	8-14	3-6
2	12-18	5-8
3	16-28	7-13
4	22-37	9-17
5	27+	12+
6	35+	16+
7	41+	18+

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Approved Abbreviations

A&O x 3	Alert and Oriented to Person, Place and Time
A&O x 4	Alert and Oriented to Person, Place, Time and Events
A-Fib	Atrial Fibrillation
AAA	Abdominal Aortic Aneurysm
ABC's	Airway, Breathing and Circulation
ABD	Abdomen
ACLS	Advanced Cardiac Life Support
AKA	Above The Knee Amputation
ALS	Advanced Life Support
AMA	Against Medical Advice
AMS	Altered Mental Status
AMT	Amount
APPROX	Approximately
ASA	Aspirin
ASSOC	Associated
BG	Blood Glucose
BILAT	Bilateral
BKA	Below The Knee Amputation
BLS	Basic Life Support
BM	Bowel Movement
BP	Blood Pressure
BS	Breath Sounds
BVM	Bag-Valve Mask Ventilations
C-SECTION	Caesarean Section
C-SPINE	Cervical Spine

C/O	Complains Of
CA	Cancer
CABG	Coronary Artery Bypass Graft
CAD	Coronary Artery Disease
CATH	Coronary Catheter
CC	Chief Complaint
CCR	Cardiocerebral Resuscitation
CHF	Congestive Heart Failure
CMS	Circulation, Motor, Sensation
CNS	Central Nervous System
COPD	Chronic Obstructive Pulmonary Disease
CP	Chest Pain
CPAP	Continuous Positive Airway Pressure
CPR	Cardiopulmonary Resuscitation
CSF	Cerebrospinal Fluid
CT	Computed Tomography (CAT Scan)
CVA	Cerebrovascular Accident (Stroke)
D5W	5% Dextrose in Water
DKA	Diabetic Ketoacidosis
DNR	Do Not Resuscitate
DOA	Dead on Arrival
DOB	Date of Birth
DOE	Dyspnea on Exertion
DT	Delirium Tremens
DVT	Deep Vein Thrombosis



Approved Abbreviations

Dx	Diagnosis
ECG	Electrocardiogram
ED	Emergency Department
EEG	Electroencephelogram
EMT-B	EMT Basic
EMT- A	Advanced EMT
EMT-P	Paramedic
ET	Endotracheal
EtOH	Ethanol (alcohol)
ETT	Endotracheal Tube
ERG	Emergency Response Guide
EXT	External (extension)
°F	Fahrenheit
FB	Foreign Body
FLEX	Flexion
Fx	Fracture
g	gram(s)
GERD	Gastroesophageal Reflux Disease
GI	Gastrointestinal
GSW	Gunshot Wound
gtts	"Guttae" (Latin for drops)
GU	Genitourinary
GYN	Gynecology (gynecological)
H/A	Headache
HEENT	Head, Eyes, Ears, Nose, Throat

HR	Heart Rate
HTN	Hypertension
Hx	History
ICP	Intracranial Pressure
ICU	Intensive Care Unit
IDDM	Insulin-Dependent Diabetes Mellitus
IM	Intramuscular
IN	Intranasal
IO	Intraosseous
IV	Intravenous
JVD	Jugular Vein Distention
kg	kilogram
KVO	Keep Vein Open
L-SPINE	Lumbar Spine
L/S-SPINE	Lumbar Sacral Spine
L&D	Labor and Delivery
LAT	Lateral
lb	pound
LLQ	Left Lower Quadrant
LMP	Last Menstrual Period
LOC	Level of Consciousness / Loss of Consciousness
LR	Lactated Ringers
LUQ	Left Upper Quadrant
MAST	Military Anti-Shock Trousers
mcg	microgram(s)



Approved Abbreviations

MD	Medical Doctor
MED	Medicine
mg	miligram(s)
MI	Myocardial Infarction (heart attack)
min	minimum/minute
MRI	Magnetic Resonance Imaging
MS	Mental Status
MVA	Motor Vehicle Accident
MVC	Motor Vehicle Crash
N/V	Nausea/Vomiting
N/V/D	Nausea/Vomiting/Diarrhea
NAD	No Apparent Distress
NG	Nasogastric Tube
NC	Nasal Cannula
NEB	Nebulizer
NIDDM	Non Insulin-Dependent Diabetes Mellitus
NKDA	No Known Drug Allergies
NRB	Non-Rebreather
NS	Normal Saline
NSR	Normal Sinus Rhythm
O2	Oxygen
OB/GYN	Obstetrics/Gynecology
PA	Physician Assistant
PALP	Palpation
PAC	Premature Atrial Contraction

PE	Pulmonary Embolus
Peds	Pediatric
PERRL	Pupils Equal, Round, Reactive to Light
PMHx	Past Medical History
PO	Per Os (By Mouth)
PRN	Pro Re Nata (As Needed)
PT	Patient
PVC	Premature Ventricular Contraction
RLQ	Right Lower Quadrant
RN	Registered Nurse
RUQ	Right Upper Quadrant
Rx	Medicine
S/P	Status Post
SOB	Shortness of Breath
SQ	Subcutaneous
ST	Sinus Tachycardia
SVT	Supraventricular Tachycardia
Sx	Symptom
SZ	Seizure
T-SPINE	Thoracic Spine
TB	Tuberculosis
Temp	Temperature
TIA	Transient Ischemic Attack
TKO	To Keep Open
Tx	Treatment



Approved Abbreviations

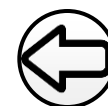
TXA	Tranexamic Acid	YO (YOA)	Years Old (Years of Age)
UOA	Upon Our Arrival	ACS-COT	American College of Surgeons Committee on Trauma
URI	Upper Respiratory Infection	ACEP	American College of Emergency Physicians
UTI	Urinary Tract Infection	SAEM	Society of Academic Emergency Medicine
VF	Ventricular Fibrillation	NAEMSP	National Association of EMS Physicians
VS	Vital Signs	NREMT	National Registry of EMTs
VT	Ventricular Tachycardia	AAP	American Academy of Pediatrics
WAP	Wandering Atrial Pacemaker	AHA	American Heart Association
WNL	Within Normal Limits	ILCOR	International Liaison Committee on Resuscitation
+	Positive	ECPR	Extracorporeal Cardiopulmonary CPR
-	Negative	TEMS	Tactical EMS
?	Questionable	HPCPR	High Performance CPR
~	Approximately		
>	Greater Than		
<	Less Than		
=	Equal		



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“In case you haven’t felt it today... **You are appreciated.**
In case you wanted to quit today... **Don’t. You are needed.**
In case you need to talk but feel no one will listen... **There are many who will.**
In case you haven’t heard it today... **THANK YOU”**

Call 2-1-1 any time for information about almost anything related to health and human services.

You can also visit <http://www.211wisconsin.org> or <http://www.referweb.net/uwdc/>

Employee Assistance Program (EAP) City of Madison..... (608) 266-6561

tmartinez@cityofmadison.com
hkrueger@cityofmadison.com
samos@cityofmadison.com

2300 S. Park St
Suite 111
Madison, WI

Employee Assistance Program (EAP) Dane County..... (608) 280-2644

Karen Smith
<http://www.journeymhc.org/>

Journey Mental Health Center
49 Kessel Ct
Madison, WI

Dane County Human Services (<http://www.danecountyhumanservices.org/default.aspx>)..... (608) 242-6200

Mental Health Services

Mental Health Crisis Line (24 Hours)..... (608) 280-2600
Emergency and Crisis Child Care (24 hours per day)..... (608) 244-5700
Parental Stress Line (8am – 10pm daily)..... (608) 241-2221
Recovery Dane..... (608) 237-1661

National Alliance on Mental Illness (NAMI) Dane County..... (608) 249-7188

contact@namidanecounty.org
National Alliance on Mental Illness

2059 Atwood Ave
Madison, WI

Transportation

Dane County Transportation Services..... (608) 242-6486

http://danecountyhumanservices.org/Transportation/key_phone_numbers.aspx

Madison Metro Transit and Paratransit

<https://cityofmadison.com/metro/> and <https://www.cityofmadison.com/metro/paratransit/>

BadgerCare / Medicaid..... (608) 907-1493

Medical Emergency : Call 9-1-1



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