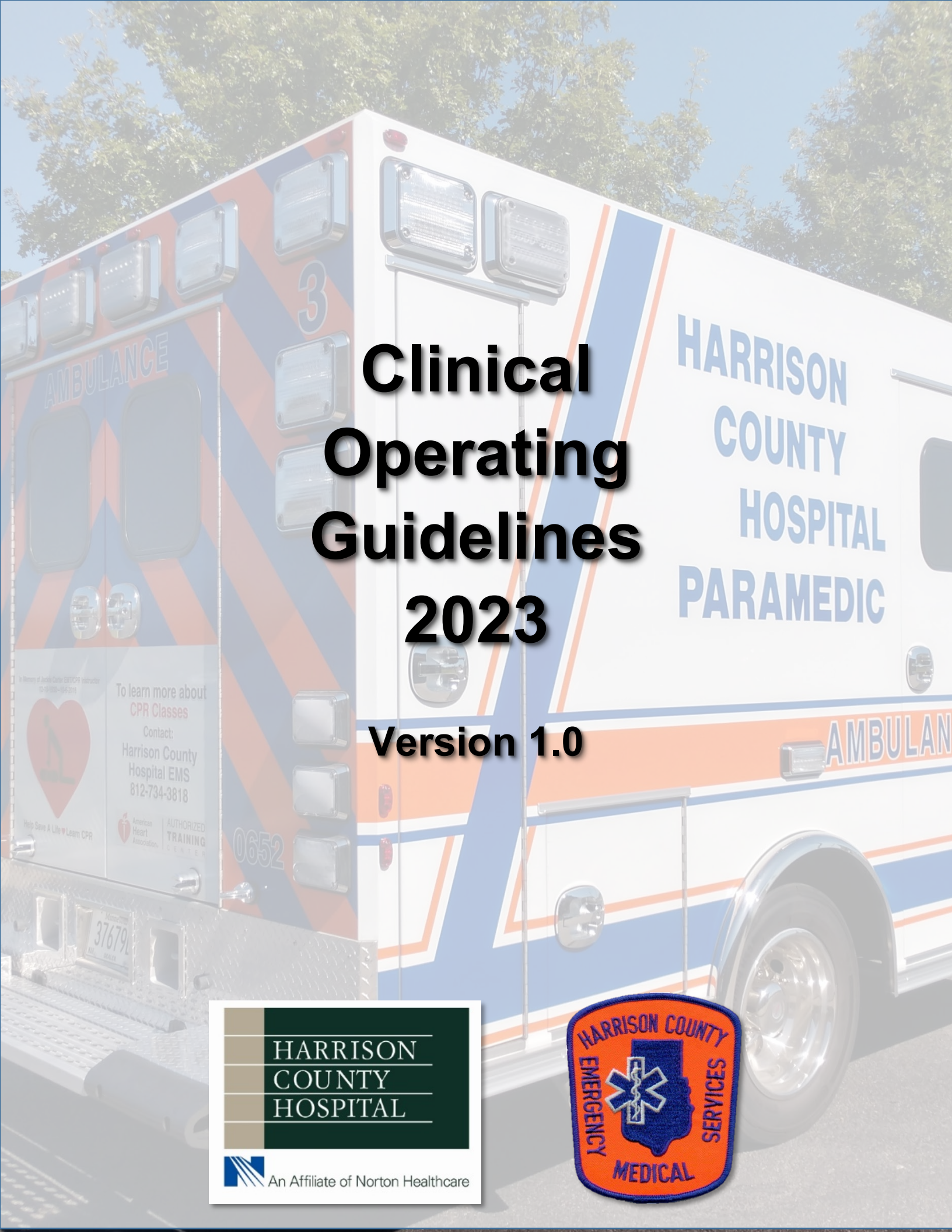

Clinical Operating Guidelines 2023

Version 1.0

HARRISON COUNTY HOSPITAL

An Affiliate of Norton Healthcare

HARRISON COUNTY EMERGENCY MEDICAL SERVICES

Harrison County Hospital EMS

Introduction

This document describes the Standing Orders and Clinical Operating Guidelines by which Harrison County Hospital EMS will continue to provide the highest quality pre-hospital patient care available. This document incorporated evidence-based guidelines with historically proven practices. While it is impossible to address every possible variation of disease or traumatic injury, these policies, protocols and procedures do provide a foundation for treating the vast majority of patients the EMS provider will encounter. Our education, experience, and clinical judgment will assist us as we provide patient care. Additionally, on-line medical control is available for those patient presentations that do not fall within the scope of this document.

The protocols are designed to be used interchangeably between emergency responses, inter-facility, routine transfers and critical care transports. Entry into each protocol is with the "Universal Patient Care Protocol". This protocol contains such processes as scene safety, PPE, basic ABC's, etc. All of the protocols are intended for each certification level as noted on each protocol. Each EMS professional is responsible to know their scope of practice. So, as you are working down a protocol and you come to an intervention that is outside your scope of practice, you will stop there. References to certification and licensure levels are consistent with the Indiana EMS Commission, the National EMS Scope of Practice Model and the National EMS Education Standards.

The protocols are designed to show where Medical Control Contact must be made. Remember, all verbal orders must come from Harrison County Hospital Emergency Physicians. If your destination hospital is other than Harrison County Hospital and you don't need physician orders, you would contact the destination hospital to give a patient report, instead of contacting Harrison County Hospital. If you are unable to contact Medical Control because of a lack of radio or cellular coverage, you may proceed through the protocol, however, you must attempt all available methods to contact Medical Control and you must document your attempts in the PCR.

You will notice this document is divided into Policies, Procedures, Protocols and Appendices.

Policies are longer documents that explain special circumstances and how these situations are to be handled.

Procedures are a collection of many of the procedures we perform and how they should be performed. This section is not all inclusive.

Protocols are in a traditional algorithm or flow chart format. Protocols indicate the providers who can perform certain tasks, order of treatment, medical control contact and transport.

The Appendices are a collection of items you might find helpful, such as dosing charts, and a drug list for all medication we carry and a collection of critical care transport medications.

Many protocols will have various notes along the margins of the page. These notes are designed to give you guidance and help you remember specific things.

New to this document is color-coding and designation of scope of practice on each page.

Harrison County Hospital EMS

R	EMR
E	EMT
A	AEMT
P	Paramedic

This diagram indicates which provider level can perform certain tasks in our EMS system. The protocols build from the lowest level to the highest level. Everything starts with the Emergency Medical Responder (EMR). The Emergency Medical Technician (EMT) can provide care that the EMR would provide as well as anything designated by the EMT symbol. The Advanced Emergency Medical Technician (AEMT) can provide care the EMR and EMT would provide as well as anything designated at the AEMT symbol. The Paramedic can provide care that the EMR, EMT, AEMT provide as well as anything designated by the Paramedic symbol.

Statement of Responsibility

It is expected that the highest level of certification or licensure is ultimately responsible for the care of the patient. If the provider with highest level of certification or licensure chooses to hand the patient off to a provider with a lower level of certification or licensure, that provider holds joint responsibility for the patient with the lower level provider.

Acknowledgements and Medical Director Approval

This document was prepared using a variety of resources. Specific resources are listed in alphabetical order:

1. American Heart Association: 2020 Guidelines for CPR and ECC.
2. Wake County North Carolina EMS System. Clinical Operating Guidelines, 2023.
3. Austin/Travis County Texas EMS System. Clinical Operating Guidelines, 2023.
   a. © 2013 City of Austin, Texas All Rights Reserved.
4. National Association of State EMS Officials. Model EMS Clinical Guidelines, Version 3.

Approved by Paul L. Fleming, MD

Medical Director Approval: _____ Date: 11-21-2023

Revised 10/6/2023

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Harrison County Hospital EMS

Criteria for Death / Withholding Resuscitation

R	EMR
E	EMT
A	AEMT
P	Paramedic

Policy:

CPR and ALS treatment are to be withheld only if the patient is obviously dead or a valid Indiana POST and/or Do Not Resuscitate form is present.

Purpose:
The purpose of this policy is to:

- Honor those who have obviously expired prior to EMS Arrival.

Indication: One or more of the following is present

- Rigor mortis (in the non-hypothermic patient)
- Dependent lividity
- Decapitation
- Incineration
- Damage or destruction of the body which is incompatible with life

Procedure:

1. If a patient is in complete cardiopulmonary arrest (clinically dead) and meets one or more of the criteria below, CPR and ALS therapy need not be initiated:
   - Body decomposition
   - Rigor mortis (in the non-hypothermic patient)
   - Dependent lividity
   - Injury not compatible with life (i.e., decapitation, burned beyond recognition, massive open or penetrating trauma to the head or chest with obvious organ destruction.

   If arrest is traumatic in origin, go to Trauma Arrest Protocol.

2. If a bystander, first responder, or non-EMS medical provider has initiated CPR or automated defibrillation prior to EMS arrival and any of the above criteria (signs of obvious death) are present, the paramedic may discontinue CPR and ALS therapy.

3. If resuscitation efforts are in progress and a Paramedic is not available, the highest level of EMS certification should contact medical control for permission to cease resuscitative efforts.

4. If doubt exists, start resuscitation immediately. Once resuscitation is initiated, continue resuscitation efforts until either:
    a. Resuscitation efforts meet the criteria for implementing the **Discontinuation of Prehospital Resuscitation Policy**.
    b. Patient care responsibilities are transferred to the destination hospital staff.

5. If resuscitation is not started or ceased, notify the county coroner through the Harrison County Dispatch Center.

Documentation:

The provider shall document all routine information in the Patient Care Report, including the usual patient assessment, medical history, events surrounding the incident and all criteria met above to determine the death. It is especially important to note:

- Body position and location when discovered, including differences from when last seen alive.
- Patient condition when last seen alive.
- Clothing and condition of clothing.
- Conditions of residence/business/location found.
- Statements made on the scene by significant individuals.
- Any unusual circumstances.

Contraindications:

- Drowning or hypothermia

Harrison County Hospital EMS

R	EMR
E	EMT
A	AEMT
P	Paramedic

Determination of Level of Care

Policy:

This policy was developed to aid the EMS crew in determining the appropriate level of care that a patient should receive. First class patient care begins with highest level of provider assessing the patient and determining the appropriate management for that patient. Each patient has a right to the appropriate level of care and decision making for their complaint and potential medical problems they may suffer while in our care. ***Therefore, this policy establishes that the highest level provider is ultimately responsible for all care delivered from the time patient contact is made until the patient is turned over to an equal or higher level of care.***

Indication:

This policy is applicable to all EMS encounters except when a mass casualty incident occurs and the EMS crew must be separated to adequately provide patient care and other functions of an Incident Command System.

Exception:

If the required level of care is not available with the crew configuration, the highest level provider available will be responsible for patient care. A higher level intercept is at the discretion of the provider responsible for patient care.

Procedure:

The following types of runs will have the indicated level of provider in the patient compartment during transport and in control of patient care. The indicated level of provider is responsible for all patient care documentation.

Patient Complaint/Problem	Required Level of Care
1. Difficulty breathing from any etiology.	Paramedic
2. Any patient in need of airway control.	Paramedic
3. Cardiac arrest or if cardiac arrest has been witnessed by police, fire or EMS.	Paramedic
4. Chest pain from any etiology.	Paramedic
5. Seizures described from bystanders or witnessed by police, fire or EMS.	Paramedic
6. Electrocution described from patient, bystanders, police, fire or EMS.	Paramedic
7. Unconsciousness	Paramedic
8. Any Paramedic level intervention ordered, written or verbal.	Paramedic
9. Altered Mental Status: any witnessed Altered Mental Status from the patients' normal mental status.	Advanced EMT, Paramedic

Reviewed 8/31/2023

Discontinuation of Prehospital Resuscitation (Non-Traumatic)

Policy:

Unsuccessful cardiopulmonary resuscitation (CPR) and other advanced life support interventions may be discontinued prior to transport when this procedure is followed.

Purpose:

The purpose of this policy is to:

- With Medical Control consultation, allow for discontinuation of prehospital resuscitation after the delivery of adequate and appropriate advanced life support therapy, in the non-traumatic patient.

Indications:

- Patient must be 18 years of age or older, and
- Patient must be in asystole or agonal rhythm, and
- Patient must be pulseless and apneic for at least 30 minutes, and
- Patient must have had advanced life support resuscitation for at least 20 minutes, and
    - Advanced life support resuscitation includes all of the following:
        - Adequate CPR has been administered.
        - Airway has been successfully managed with verification of device placement. Acceptable devices include endotracheal intubation, iGel, Combitube, King LT.
        - IV or IO access has been achieved and used for at least 20 minutes.
- Patient must have had no return of spontaneous circulation (ROSC).
- If the paramedic believes that discontinuing resuscitation is warranted and the indications above have not been met, contact medical control.

Contraindications:

- Patients who are exhibiting any neurological activity such as spontaneous respiration, eye opening, or motor response.
- Patients under 18 years old.
- Patients with suspected hypothermia.

Procedure:

1. Follow the appropriate protocol and obtain Medical Control.
2. Request that the consulting physician authorize termination of resuscitation.
3. If approved, discontinue resuscitation and leave all invasive equipment in place.
4. Tactfully, explain discontinuation of resuscitation to family.
5. Offer to contact clergy, friends or other family members that the family may want called.

Documentation:

Document all patient care and interactions with the patient's family, personal physician, coroner, law enforcement and medical control in the patient care report (PCR).

E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

Do Not Resuscitate / Advanced Directives

Physician Order for Scope of Treatment

Policy:

Any patient presenting to an EMT, Advanced EMT or Paramedic, with a valid Do Not Resuscitate (DNR) order, Physician Order for Scope of Treatment (POST) or Living Will form, shall have the form honored, after consultation and agreement by the Medical Control physician.

Purpose:

- To honor the terminal wishes of the patient.
- To prevent the initiation of unwanted resuscitation.

Procedure:

1. When confronted with a cardiac arrest patient, the following conditions must be present in order to honor the DNR request and withhold CPR and advanced life support therapy:

    - A valid Physician Order for Scope of Treatment (POST) is presented to the highest certification level.
    - A valid Indiana Out Of Hospital Do Not Resuscitate Declaration and Order are presented to the highest certification level.
    - An Advanced Directive or Living Will is presented to the highest level of certification.
    - The Harrison County Hospital Emergency Department physician has been consulted and agrees to honor the DNR, Living Will or Advance Directives.

2. A DNR/POST request may be disregarded by the request of:

    - The patient
    - The guardian of the patient
    - The attending physician
    - The health care provider, if he/she believes in good faith that the Out of Hospital DNR Declaration and Order has been revoked
    - The health care provider, if he/she believes in good faith that the Out of Hospital DNR Declaration and Order must be disregarded to avoid verbal or physical confrontation at the scene.

3. If family members or other persons are present and ask that resuscitative efforts be withheld in the absence of an advance directive:

    - Begin Basic Life Support resuscitative measures immediately.
    - Determine the family members' relationship to the patient.
    - Determine the patient's past medical history, including obvious life-limiting illness (terminal cancer, advanced neurological disease, etc.).
    - Contact Medical Control and advise them of the situation and seek their guidance.

Documentation:

All standard documentation should be included on the patient care report (PCR) including the following:

- The presence of the DNR, POST, Living Will form and Order;
- The attending physicians name; and
- The date the DNR, POST, Living Will and Order was signed;
- Any type of DNR, POST, Living Will identification device.

R	EMR
E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

Documentation of Vital Signs

Policy:
Every patient encounter by EMS will be documented. Vital signs are a key component in the evaluation of any patient and a complete set of vital signs is to be documented for any patient who receives some assessment component.

Purpose:

To insure:

- Evaluation of every patient's cardiovascular status.
- Documentation of a complete set of vital signs.

Procedure:

1. An **initial** complete set of vital signs includes:
    - Pulse rate
    - Systolic **AND** diastolic blood pressure (preferably manual)
    - Respiratory rate
    - Pain / severity (when appropriate to patient complaint)
    - GCS

2. For **REPEAT** vital signs, automated blood pressure is acceptable.
    - Repeat vitals signs on critical patients at least every 10 minutes
    - Repeat vital signs on non-critical patients at least every 20 minutes
    - Repeat vital signs on hospital discharges to residence, skilled nursing facility or extended care facility should be repeated at least every 30 minutes.

3. Based on patient condition and complaint, vital signs may also include:
    - Pulse oximetry
    - Temperature
    - End tidal CO2 (required with any advanced airway)
    - Breath sounds

4. If the patient refuses any aspect of vital signs assessment, a note must be made in the PCR.

5. When automated vital signs are inconsistent with previously taken manual vital signs, manual vital signs should be repeated to check the accuracy of the automated vital signs.

6. Document situations that prevent the evaluation of a complete set of vital signs.

7. Record the time vital signs were obtained.

8. Any abnormal vital sign should be repeated and monitored closely.

Harrison County Hospital EMS

R	EMR
E	EMT
A	AEMT
P	Paramedic

Documentation with Multiple Providers

Purpose:

- Provide a consistent method for documenting patient care encounters that include multiple providers.

Policy:

1. All providers involved in the patient care activity are responsible for ensuring accurate and complete patient care documentation. The lead provider (listed as "Primary Patient Caregiver") on the PCR is ultimately responsible for the report, however, ALL providers should read the entire report once all documentation is complete to ensure accuracy.

2. In the situation where all providers are present during the completion of the documentation, the care team may coordinate the recording of their participation and care, and a single provider may document the patient care encounter with review by all care providers.

3. In the situation where all providers are not present during the completion of the documentation (for example, a supervisor or another crew provides initial care and then hands off to another ambulance.), the following shall be accomplished:
    a. The primary transport unit will complete a full PCR to include patient name, demographics, assessment, interventions, narrative, all procedures and care provided by them on the call.
    b. All providers who provided patient care to the patient will be listed on the PCR as crew members.
    c. If significant assessment, patient care, and/or interventions are provided by the initial crew that initial crew will document any assessment, care, or interventions that they provide. This initial crew will write a narrative up to the time when care was turned over to the transport crew.
    d. The transport crew will verify all information is correct from the initial crew and the transport crew will document assessments, patient care, interventions, and narrative for their part of the encounter.

R	EMR
E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

EMS Documentation and Data Quality

Policy:
Every patient encounter by EMS will be documented appropriately and per agency guidelines. Vital signs are a key component in the evaluation of any patient and a complete set of vital signs is to be documented for any patient who receives any assessment component. There are also instances where Indiana rules and regulation require the documentation of information for data collection.

Purpose:

To insure:

- Documentation of a complete evaluation of every patient.
- Documentation of a complete set of vital signs.
- Documentation of interventions provided to the patient.
- Documentation of information required by the Indiana Department of Homeland Security for data import.

Procedure: Complete evaluation of every patient.

1. A primary survey or assessment must be completed on every patient.

2. Depending on the patient complaint, either a head-to-toe assessment or a focused, body system assessment must be completed on every patient.
    - If a patient refuses a hands-on assessment, this must be documented in the patient care report.

Procedure: Vital Signs

1. An **initial** complete set of vital signs includes:
    - Pulse rate
    - Systolic **AND** diastolic blood pressure (preferably manual)
    - Respiratory rate
    - Pain / severity (when appropriate to patient complaint)
    - GCS

2. For **REPEAT** vital signs, automated blood pressure is acceptable.
    - Repeat vitals signs on critical patients at least every 10 minutes
    - Repeat vital signs on non-critical patients at least every 20 minutes
    - Repeat vital signs on hospital discharges to residence, skilled nursing facility or extended care facility should be repeated at least every 30 minutes.

3. Based on patient condition and complaint, vital signs may also include:
    - Pulse oximetry
    - Temperature
    - End tidal CO2 (required with intubation or supraglottic airway)
    - Breath sounds

4. If the patient refuses any aspect of vital signs assessment, a note must be made in the PCR.

5. When automated vital signs are inconsistent with previously taken manual vital signs, manual vital signs should be repeated to check the accuracy of the automated vital signs.

6. Document situations that prevent the evaluation of a complete set of vital signs.

7. Record the time vital signs were obtained.

8. Any abnormal vital sign should be repeated and monitored closely.

Procedure: Interventions

1. All BLS or ALS interventions, time of the intervention, and effect of the intervention are to be documented in the PCR.

Procedure: IDHS Required Documentation

1. Any patient care information required by Indiana code, rules or regulations must be documented in the patient care report (PCR).
    - Any naloxone use by the patient or administration of naloxone to the patient, during the current incident, either prior to or after the arrival of EMS.
    - If naloxone was administered to the patient prior to EMS arrival, the appropriate “prior to arrival” (PTA) checkbox should be marked on the PCR.

E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

Interfacility Transfers

Indication:

Transporting a patient from Harrison County Hospital to any other hospital.

Procedure:

1. The transporting EMS provider may maintain any infusion, provided it is within their scope of practice according to Indiana Department of Homeland Security, provided:

    a. The provider is familiar with the fluid or medication being infused.
    b. The provider is familiar with any infusion device that is being utilized.

2. If patient is receiving an infusion of potassium, the patient must have continuous monitoring of their ECG.

3. The transporting provider should ensure that all appropriate documentation accompanies the patient. This includes all physician orders.

4. The sending physician is responsible for the patient until the patient is released to the receiving physician. Make sure you know how to contact them should the need arise.

5. While in transit to the receiving facility, all appropriate standing orders or protocols shall remain in place.

6. If an emergency situation develops during the transport, the provider may divert to the closest, appropriate hospital for stabilization. The transferring facility or physician should be notified as soon as possible.

7. If the patient deteriorates, the transferring facility should be notified via radio or cellular phone.

8. If additional orders are needed, Harrison County Hospital Medical Control should be contacted to issue those orders.

R	EMR
E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS
Mechanical CPR

Policy:

In general, research shows that high-quality mechanical CPR is no better than high-quality manual chest compressions in terms of likelihood of ROSC or survival.

1. In our rural EMS system there is often a lack of personnel to adequately perform team-based, high-quality manual CPR. The benefits of mechanical CPR are:
    a. The variability of human-performed CPR is unpredictable while mechanical CPR is constant performance.
    b. Fatigue of manual compressions are taken out of the equation.
    c. If the patient needs to be moved to a different location, manual compressions are ineffective.
    d. During transport to the hospital, mechanical CPR is more effective for the patient and safer for the crew.

2. GREAT CARE should be taken to maximize compression fraction (i.e. minimize pauses in compressions) when a mechanical CPR device is being deployed.

3. If a mechanical CPR device from another agency is utilized, a member of that agency MUST be present and accompany the device to the emergency department.

4. If a patient achieves ROSC, the mechanical CPR device should be left on the patient in the event there is a re-arrest.

5. In the event an emergency department wishes to use the AutoPulse as they continue care for the arrest, an employee from HCH EMS will stay with the AutoPulse to operate it and troubleshoot if necessary.

6. The mechanical CPR device is designed to mimic high-quality chest compressions of an appropriate rate and depth for an ADULT. Mechanical CPR devices are not designed to be used on PEDIATRIC patients. In general, the Zoll AutoPulse is designed with the following limitations:
    a. Chest Circumference: 30 - 51 inches
    b. Chest Width: 10 - 15 inches
    c. Maximum Patient Weight: 300 lbs.

7. Contraindications for using the mechanical CPR device:
    a. If it is not possible to position the device correctly on the chest per the manufacturer's recommendations.
    b. If the patient is too small or too large for the device, per manufacturer's recommendations.

8. The mechanical CPR device SHALL NOT be used in trauma arrests.

Reviewed 8/31/2023

R	EMR
E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

Medical Consent

Policy:

The State of Indiana has codified who may give medical consent for another person. This policy serves as summary of the Indiana code for medical consent. (IC 16-36)

Purpose:

- To honor the wishes of the patient.

Health Care Representative (IC 16-36-1-2)

1. A health care representative is someone or some entity that has been given the authority to represent the wishes of the patient. A representative can be any of the following. (IC 16-36-1-2)
    a. An individual > 18 years of age;
    b. A business entity (corporation, limited liability company, partnership, business trust);
    c. A trust;
    d. An estate;
    e. A government or political subdivision;
    f. An agency;
    g. Any other legal or commercial entity.

Consent for own health care (IC 16-36-1-3)

1. An adult; or
2. A minor and:
    a. is emancipated; and is:
        i. ≥ 14 years of age;
        ii. not dependent on a parent for support;
        iii. living apart from the parents or an individual in loco parentis (acting in place of parents);
        iv. managing their own affairs;
    b. is or has been married;
    c. is in the military service of the United States.
3. ***NOTE:*** Emancipation is a legal term that requires a court to determine the minor can live on their own and take care of themselves. The minor will have court documents showing this decision (IC 31-37-19-27).

Harrison County Hospital EMS

Medical Consent, continued

Consent by pregnant minor (IC 16-36-1-3.5)

1. A minor who is at least 16 years old and is pregnant, in labor, or up to 60 days post partum can give consent to her health care and treatment with respect to the pregnancy, delivery, and postpartum care.
2. Except in an emergency, a reasonable attempt must be made to contact the parent or guardian of the minor for consent.

Persons authorized to consent for incapable parties, if the incapable party has not appointed a health care representative, the representative is not available or declines to act. In order of priority: (IC 16-36-1-5)

1. A court appointed person or representative.
2. Spouse
3. Adult child.
4. Parent
5. Adult sibling
6. Grandparent
7. Adult grandchild
8. The next degree of kinship not list above.
9. A friend who:
    a. is an adult;
    b. has maintained regular contact with the individual; and
    c. is familiar with the individual's activities, health, and religious or moral beliefs.
10. The individuals religious superior, if the individual is a member of a religious order.

Consent for minor. If the minor is NOT pregnant, consent may be given by any of the following, in order of priority. (IC 16-36-1-5b)

1. A court appointed guardian or representative.
2. A parent or individual in loco parentis (in place of parents) if the court appointed guardian or representative is not available or declines to act.
3. An adult sibling.
4. A grandparent.

Delegated authority. An representative who has been authorized to consent for health care may delegate their authority, if they will be unavailable. The delegation must be: (IC 16-36-1-6)

1. in writing;
2. signed by the delegate;
3. witnessed by an adult; and
4. may specify conditions of the delegation.

Unless written in the delegation, the delegate may not delegate authority to another representative. The delegate may revoke the delegation orally or in writing.

Medical Consent, continued

Persons who may not provide consent. (IC 16-36-1-9.5)

1. A spouse who is legally separated or has filed for divorce, legal separation, or annulment from the person incapable of providing consent.
2. An individual who has a protective order against them or a court has ordered an individual to avoid contact with the person incapable of providing consent.
3. An individual who has a pending criminal charge in which the individual incapable of providing consent was the alleged victim.

Immunity of health care providers or consenting persons. (IC 16-36-1-10)

A health care provider acting or declining to act in reliance on the representative who the provider believes in good faith is authorized to consent to health care is not subject to:

1. criminal prosecution;
2. civil liability; or
3. professional disciplinary action.

Disclosure of medical information to representative authorized to consent. (IC 16-36-1-11)

A representative allowed to consent has the same right to receive relevant information as the authorizing individual.

E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

On-Scene Medical Cardiac Arrest Requirement

Policy:
The goal of working any cardiac arrest is to give the patient the best chance of survival. Following the intent of the American Heart Association guidelines, with providing quality, uninterrupted chest compressions, Harrison County Hospital EMS will work medical cardiac arrests on scene for at least 20 minutes following initiation of Paramedic care. This policy does not apply to patients who are obviously dead (see Determination of Obvious Death policy) or who have a valid Do Not Resuscitate order (see Do Not Resuscitate/Advance Directives policy).

Purpose:

- To provide the patient with the best chance of survival.
- To provide the patient with quality, uninterrupted chest compressions.
- To provide for the safety of EMS personnel and first responders.

Procedure:

1. If an EMT or Advanced EMT is the highest level of care, initial care, including quality CPR, artificial ventilation and airway management, should be done. Transport to an appropriate facility should be initiated after this initial care is completed.

2. When an ambulance with a Paramedic on board, arrives at the scene of a medical cardiac arrest, the Paramedic will provide the patient with at least 20 minutes of advanced life support care on the scene.

3. If the patient is in an environment of poor weather conditions, the patient may be moved inside a structure or the ambulance to better facilitate patient care. Moving the patient should be done as to minimize the interruption of chest compressions.

4. After 20 minutes of advanced life support care and the Paramedic wishes to stop the resuscitation, the Paramedic must contact medical control to advise them of the situation.

5. Contact with medical control should be as soon as possible. Medical Control must be contacted before loading the patient into the ambulance. If the patient is loaded due to a safety or environmental reason, medical control must be contacted before leaving the scene.

6. This 20 minute window of advanced life support care can be shortened if any of the following occur:

    - Danger to EMS personnel, law enforcement or first responders.
    - The patient has a return of spontaneous circulation (ROSC).
    - If directed by medical control.

R	EMR
E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS
Physician On Scene

Policy:

The medical direction of prehospital care at the scene of an emergency is the responsibility of those most appropriately trained in providing such care. All care should be provided within the statutes, rules and regulations of the State of Indiana. At no time will an EMS provider exceed their scope of practice.

Purpose:

- To identify a chain of command to allow field personnel to adequately care for the patient.
- To assure the patient receives the maximum benefit from prehospital care.
- To minimize the liability of the EMS system as well as the on-scene physician.

Procedure:

1. When a physician offers assistance to EMS or the patient is being attended by a physician with whom they do not have an ongoing patient relationship and the physician wishes to direct medical care, the EMS provider should state he/she is under the direction of an emergency department physician and ask the on-scene physician to notify by radio/phone the physician in the emergency department of Harrison County Hospital to be granted permission to treat the patient. The on-scene physician should present his or her Indiana medical license card and be willing to accompany the patient to the hospital.

2. Urgent medical care should not be delayed to establish identities or medical control.

3. Early radio/phone contact with Harrison County Hospital emergency department is imperative.

4. When the patient is being attended by a physician with whom they have an ongoing patient relationship, EMS personnel may follow orders given by the physician if the orders conform to current EMS protocols, guidelines and policies. Notify medical control at the earliest opportunity. Any deviation from local EMS protocols requires the physician to accompany the patient to the hospital.

5. EMS personnel may accept orders from the patient's physician over the phone with the approval of medical control. The EMS provider should obtain the specific order and the physician's phone number for relay to medical control so that medical control can discuss any concerns with the physician directly.

Documentation:

All standard patient information will be recorded on the patient care report, including the name of the on-scene physician and any orders received from that physician.

Revised 8/31/2023

R	EMR
E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

Refusal of Care, Transportation or Recommended Destination

Purpose:

To establish guidelines for the management and documentation of situations where patients refuse treatment or transportation, or insist on transportation to a destination other than that recommended by the ambulance personnel.

The intent of the policy is to protect the patient, the EMS clinician, Harrison County Hospital and the Medical Director.

Guidelines:

I. Patient Assessment

A. Providers should attempt to obtain a history and physical, in as much detail as is permitted by the patient.

B. Conduct Three Assessments: Providers should attempt to assess three major areas prior to permitting a patient to refuse care and/or transportation:

1. Legal competence

a. Ensure that patient is at least 18 years of age in order to refuse care or meets at least one of the criteria stated in the policy “Medical Consent”.

2. Mental capacity

a. Start with the presumption that all patients are mentally competent unless your assessment clearly indicates otherwise.

b. Ensure that patient is oriented to person, place, time and purpose.

c. Establish that patient is not a danger to himself or others.

d. Ensure that patient is capable of understanding the risks of refusing care or transportation and any proposed alternatives.

e. Check to be sure that patient is exhibiting no other signs or symptoms of potential mental incapacity, including drug or alcohol intoxication, unsteady gait, slurred speech, etc.

3. Medical or situational assessment

   a. Ensure that patient is suffering from no acute medical conditions that might impair his or her ability to make an informed decision to refuse care or transportation.

   b. If possible, rule out conditions such as hypovolemia, hypoxia, head trauma, unequal pupils, metabolic emergencies, hypothermia, hyperthermia, etc.

   c. Attempt to determine if patient lost consciousness for any period of time.

   d. If any conditions in (a) – (c) impair patient's decision-making ability, patient *may* not have the mental capacity to refuse care and your documentation should clearly establish that the patient understood the risks, benefits and advice given to him.

II. Medical Control

A. Contact medical control for refusal of transport for a patient in need of ALS care. This would include care when an intravenous access has been established or a medication has been administered.

B. Contact medical control if you believe patient is in need of further medical attention yet refuses care; medical control may be able to help persuade patient.

C. Obtain medical control approval of any refusal where required by protocol.

III. Who May Refuse Care (Also see Medical Consent policy)

A. The patient

1. If patient is legally competent and has adequate mental capacity, the patient has a right to refuse care. Obtain refusal signature.

2. Implied consent -- if patient is unconscious and seriously injured or in need of further medical attention, treat and transport patient despite patient's inability to consent or the unavailability of another party to provide consent.

B. Parent

1. A custodial parent (i.e., a parent with a legal right to custody of a minor child) may refuse care on behalf of a minor child. Obtain refusal signature from parent.

2. A parent of a patient who is 18 years of age or older may not refuse care on behalf of his or her child (unless the parent also happens to be a legal guardian – see below)

3. A minor (i.e., under 18 years of age) may refuse care for his or her child. Obtain refusal signature from the minor parent.

C. Guardian

1. A legal guardian is one who is appointed by a court to act as "guardian of the person" of an individual who has been found by a court to be incapacitated

2. Legal guardian may also be appointed in lieu of parents for a minor

3. If a person indicates they are a legal guardian to the patient, attempt to obtain documentation of this fact (court order, etc.) and attach to PCR. If no such documentation is available, you may obtain refusal signature from the guardian as long as you do so in good faith and do not have any evidence or knowledge that the person is misrepresenting himself as a legal guardian of the patient.

D. Health Care Representative

1. A person appointed by the patient in a durable power of attorney document or a health care representative document may refuse care on behalf of the patient if the power of attorney contains such authorization.

2. Attempt to obtain a copy of the durable power of attorney document to attach to the PCR. If no such documentation is available, you may obtain refusal signature from a health care agent ("attorney-in-fact") as long as you do so in good faith and do not have any evidence or knowledge that the person is misrepresenting himself as the health care agent or "attorney-in-fact" of the patient.

E. Incompetent Patient

1. If patient has been determined to be legally incompetent, and no other authorized individual is available to provide a refusal signature, patient may be treated and transported as long as you act in good faith and without knowledge that the patient or authorized individual would refuse care.

2. Take all reasonable steps to secure treatment or transportation for a patient who is legally or mentally incompetent to refuse care, but do not put yourself or your crew in jeopardy.

IV. Refusal Procedure (See HCH EMS Informed Voluntary Refusal of Service(s) Release)

A. The paramedic will complete the refusal form if an ALS assessment, ALS interventions or ALS diagnostics have been performed, the provider with the appropriate licensure/certification level will complete the PCR.

B. If patient refuses care, or insists on being transported to a facility that is on diversion or a facility other than the destination recommended by the ambulance personnel, utilize the approved "Patient Refusal Form".

C. Conduct assessment as outlined in Section I above

D. Contact Medical Control if necessary

E. Determine who may sign refusal form as outlined in Section III above

F. Complete all sections of "Informed Voluntary Refusal of Service(s) Release".

G. Review form with patient or authorized signer

H. Provide detailed explanation of possible risks and danger signs to patient or other authorized signer

I. Inform the patient to call 911, call their doctor or go to an emergency department if symptoms persist or get worse or any of the danger signs you inform them of appear

J. Complete Section C of the form by filling in the appropriate blanks and by documenting the advice or instructions you gave to the patient on the appropriate line.

K. Read Section D of the refusal form to patient or authorized signer.

L. Obtain the signature of the patient or authorized signer. If the patient refuses to sign, document this fact on the Refusal Form as well as the PCR.

M. Have the patient or authorized signer date the form.

N. Obtain signature of a witness; preferably the witness should be someone who witnessed your explanation of risks and benefits to the patient, heard you read Section D to the patient, and who watched the patient sign the form. If no witness is a available, a crew member may sign as a last resort. Witnesses may include law enforcement personnel. All witnesses should be 18 years of age or older if possible. If no witnesses are available, leave blank. Write the witnesses' address and telephone number on the back of the refusal form.

O. The crew member who obtained the refusal and completed the Refusal Form should also sign the form on the appropriate line.

P. Complete the PCR in addition to Refusal Form. PCR must include the following documentation:

1. Competency assessments (listed above).
2. Results of history and physical exam.
3. The clinical symptoms upon which the need for transport was based.
4. Information provided to fully inform the patient and/or other authorized individual of the consequences of their refusal of treatment/transport.
5. The patient's understanding of the risk and complications of his/her choice to refuse.
6. Medical control instructions, if any
7. Alternatives offered
8. Crew signatures

R	EMR
E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

"Safe Haven" Law

Policy:

The Indiana Safe Haven Law provides a mechanism for unwanted infants to be taken under temporary custody by EMS providers, if the infant is presented by the parent within 45 days of birth. Emergency Medical Services will accept and protect infants who are presented to EMS in this manner, until custody of the child can be released to the Department of Child Services.

Summary of IC 31-34-2.5
"An emergency medical services provider shall, without a court order, take custody of a child who is, or who appears to be, not more than thirty (30) days of age if: (1) the child is voluntarily left with the provider by the child's parent or in a newborn safety device; and (2) the parent does not express an intent to return for the child. An emergency medical services provider who takes custody of a child under this section shall perform any act necessary to protect the child's physical health or safety. Any person who in good faith voluntarily leaves a child with an emergency medical services provider or in a newborn safety device is not obligated to disclose the parent's name or their name. Immediately after an emergency medical services provider takes custody of a child under this law, the provider shall notify the department of child services that the provider has taken custody of the child."

Purpose:

To provide:

- Protection to infants that are placed into the custody of EMS under this law.
- Protection to EMS agencies and personnel when confronted with this issue.

Procedure:

1. Take the infant and document any information the parent will give about the infant and parents.
2. Initiate a medical assessment and provide any medical treatment necessary, within the EMS agencies protocols.
3. Keep infant warm.
4. Have dispatch notify the local Department of Child Services as soon as the infant is stabilized.
5. Transport the infant to Harrison County Hospital.
6. Document assessment, procedures and agency notifications in the PCR.

E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

Airway: CPAP

Clinical Indications for Continuous Positive Airway Pressure (CPAP) Use:

- CPAP is indicated in patient's for whom inadequate ventilation is suspected. This could be as a result of pulmonary edema, pneumonia, COPD, asthma, etc. Continuous monitoring is required to reduce the risk of respiratory depression or arrest.

Contraindications:

1. Pneumothorax
2. Respiratory arrest
3. Agonal respirations
4. Unconsciousness
5. Shock associated with cardiac insufficiency
6. Penetrating chest trauma
7. Persistent nausea/vomiting
8. Facial anomalies or facial trauma
9. Suspicion of stroke
10. Active upper GI bleeding or history of recent gastric surgery

Procedure:

1. Ensure adequate oxygen supply to ventilation device.
2. Explain the procedure to the patient and be prepared to coach the patient through the procedure.
3. Assure that the provider is monitoring waveform capnography.
4. Assemble the CPAP device, ventilation circuit, mask, CPAP valve and headgear
5. Connect the CPAP device to oxygen source and set to appropriate flow rate for the desired pressure.
6. Place the delivery mask over the mouth and nose. Oxygen should be flowing through the device at this point.
7. If nebulizer treatment is desired, fill medication container and reattach to mask, turn nebulizer to on position and set the appropriate flow rate.
8. Secure the mask with the provided headgear until minimal air leak occurs.
9. Evaluate the response of the patient assessing breath sounds, oxygen saturation, waveform capnography and general appearance.
10. Encourage the patient to allow forceful ventilation to occur. Observe closely for signs of complications. The patient must be breathing for use of the CPAP device.
11. Contact receiving hospital as soon as possible so they can prepare for the patient's arrival.
12. Document time and response on patient care report.

Harrison County Hospital EMS

Airway: Endotracheal Tube Introducer (Bougie)

P	Paramedic

Clinical Indications:

1. Patients meet clinical indications for oral intubation.
2. Initial intubation attempt(s) unsuccessful.
3. Predicted difficult intubation.

Contraindications:

1. Three attempts at orotracheal intubation (utilize failed airway protocol)
2. Use of endotracheal tube less than 4 mm.

Procedure:

1. Prepare, position and oxygenate the patient with 100% oxygen;
2. Select proper ET tube without stylette, test cuff and prepare suction;
3. Lubricate the distal end and cuff of the endotracheal tube (ETT) and the distal ½ of the Endotracheal Tube Introducer (Bougie) (NOTE: Failure to lubricate the Bougie and the ETT may result in being unable to pass the ETT);
    a. Pediatric Bougie fits ETT sizes 4 mm to 6 mm.
    b. Adult Bougie fits ETT sizes 6 mm to 11 mm.
4. Using either video laryngoscopy or direct laryngoscopy, visualize the vocal cords.
5. Introduce the Bougie with curved tip anteriorly and visualize the tip passing the vocal cords or above the arytenoid cartilages if the cords cannot be visualized.
6. Once inserted, gently advance the Bougie until you meet resistance. (if you do not meet resistance you have a probable esophageal intubation and insertion should be re-attempted or the failed airway protocol implemented as indicated);
7. Withdraw the Bougie ONLY to a depth sufficient to allow loading of the ETT while maintaining proximal control of the Bougie;
8. Gently advance the Bougie and loaded ET tube until you meet resistance again, thereby assuring tracheal placement and minimizing the risk of accidental displacement of the Bougie;
9. While maintaining a firm grasp on the proximal Bougie, introduce the ET tube over the Bougie passing the tube to its appropriate depth;
10. If you are unable to advance the ETT into the trachea and the Bougie and ETT are adequately lubricated, withdraw the ETT slightly and rotate the ETT 90 degrees COUNTER clockwise (to the left) to turn the bevel of the ETT posteriorly. If this technique fails to facilitate passing of the ETT you may attempt direct or video laryngoscopy while advancing the ETT (this will require an assistant to maintain the position of the Bougie and, if so desired, advance the ETT);
11. Once the ETT is correctly placed, hold the ET tube securely and remove the Bougie;
12. Confirm tracheal placement according to the intubation protocol, inflate the cuff, auscultate for equal breath sounds and reposition accordingly;
13. When final position is determined secure the ET tube, reassess breath sounds, apply end tidal CO2 monitor, and record and monitor readings to assure continued tracheal intubation.

R	EMR
E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

Airway: Foreign Body Obstruction

Clinical Indications:

- Sudden onset of respiratory distress often with coughing, wheezing, gagging, or stridor due to a foreign-body obstruction of the upper airway.
- Respiratory arrest where ventilation cannot be accomplished after repositioning or airway.

Procedure:

1. Assess the degree of foreign body obstruction
    a. Do not interfere with a mild obstruction allowing the patient to clear their airway by coughing.
    b. In severe foreign-body obstructions, the patient may not be able to make a sound. The victim may clutch his/her neck in the universal choking sign.
2. **For an infant**, deliver 5 back blows (slaps) between shoulder blades, followed by 5 chest thrusts repeatedly until the object is expelled or the victim becomes unresponsive.
3. **For a child**, perform a subdiaphragmatic abdominal thrust (Heimlich Maneuver) until the object is expelled or the victim becomes unresponsive.
4. **For Adults,** a combination of maneuvers may be required.
    a. First, subdiaphragmatic abdominal thrusts (Heimlich Maneuver) should be used in rapid sequence until the obstruction is relieved.
    b. If abdominal thrusts are ineffective, chest thrusts should be used. Chest thrusts should be used primarily in the morbidly obese patient and in patients who are in the late stages of pregnancy.
5. If the victim becomes unresponsive, begin CPR immediately but look in the mouth before administering any ventilations. If a foreign-body is visible, remove it.
6. **Do not perform blind finger sweeps in the mouth and posterior pharynx. This may push the object farther into the airway.**
7. In unresponsive patients, Paramedic level providers should visualize the posterior pharynx with a laryngoscope to potentially identify and remove the foreign-body using Magill forceps.
8. Document the methods used and result of these procedures in the PCR.

E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

Airway: i-gel (Supraglottic Airway)

Clinical Indications:

1. Inability to adequately ventilate a patient with a Bag Valve Mask.
2. Cardiac arrest where a paramedic is not available.
3. Endotracheal intubation is impossible due to patient access or difficult airway anatomy.
4. Inability to secure an endotracheal tube in a patient who does not have a gag reflex where at least one failed intubation attempt has occurred.
5. Patient must be unconscious and has no gag reflex.
6. ***WARNING:*** **This airway may not prevent aspiration of stomach contents!**

Procedure:

1. Preoxygenate the patient. Consider the use of passive oxygenation before and during any airway management.
2. Select the appropriate tube size for the patient. See table below.
    a. The weight guidance below is based on ***ideal body weight*** which uses height as a component.
3. Lubricate back (posterior) of the tube with a water soluble lubricant.
4. Grasp the lubricated i-gel along the integral bite block.
5. Position the i-gel cuff outlet facing towards the chin of the patient.
6. Place the patient's head in a "sniffing position", with head extended and neck flexed.
7. The patient's chin should be gently pressed down before proceeding.
8. Introduce the leading soft tip into the patient's mouth in a direction towards the hard palate.
9. Glide the device downwards and backwards along the hard palate with a continuous but gentle push until a definitive resistance is felt.
10. Slide the widest area of the airway support strap under the occipital portion of the patient's head.
11. Lift one end of the strap over the patient's face and secure to the i-gel by placing an appropriate hole on the strap over the lug on the hook ring located at the top of the integral bite block.
12. Lift the other side of the strap over the other side of the patient's face and secure in the same manner.
13. Ensure there is sufficient tension to hold the i-gel securely in place but not an excessive tension that may cause trauma to the patients neck or face or that may cause unwanted downward pressure of the i-gel
14. Confirm tube placement using end-tidal CO2 detector.
15. **It is required that the airway be monitored continuously through waveform capnography (HCH EMS) and pulse oximetry.**

Patient Size	i-gel Size	Color	Height Guidance	Patient Weight Guidance based on Ideal Body Weight
Infant	1.5	Blue	Use Broselow Tape	5-12 kg (11-25 lbs)
Small Adult	3	Yellow	5 feet tall	30-60 kg (65-130 lbs)
Medium Adult	4	Green	6 feet tall	50-90 kg (110-200 lbs)
Large Adult	5	Orange	> 6 ½ feet tall	90+ kg (200 + lbs)

P Paramedic

Harrison County Hospital EMS

Video Laryngoscope Procedure - Intubrite

Therapeutic Goal:

1. Provide a tool to effectively secure an airway with an endotracheal tube, especially a difficult airway.
2. Provide a means to document the procedure for the PCR through photographs.

Equipment:

1. IntuBrite Video Laryngoscope handle and screen
2. Non-Disposable video wands
3. Disposable sheaths
4. USB transfer cable
5. Bag Valve Mask device
6. Appropriately sized endotracheal tube
7. Continuous Cardiac, SaO2, and ETCO2 monitoring

Clinical Indications:

1. Any patient requiring placement of an oral endotracheal tube for ventilation purposes.

Contraindications:

1. None

Procedure:

1) A video laryngoscope "check-out" should be performed <u>at the beginning of each shift.</u>
   (a) To include checking that the battery is charged, as well as all applicable wands, sheaths, and cable are present.
2) Video laryngoscope usage:
   a) Turn on the screen that is attached to the handle of the laryngoscope.
   b) Attach the appropriately sized non-disposable wand to the laryngoscope handle.
   c) This should be done at least 30 seconds prior to the planned usage of the device as that is the time that is required to heat the device.
   d) Secure the appropriately sized disposable sheath to the wand that is being utilized.
   e) Insert the sheath covered wand into the oropharynx utilizing the shallow to deep insertion method until the tip of the sheath slides into the vallecula.
   f) Once the tip of the sheath slides into the vallecula a forward-upward lifting motion should occur to bring a complete view of the glottic opening into view.
      i) A rocking or prying motion should be avoided.
   g) Once a complete view of the glottic opening is visible a still picture should be taken using the "SNAP" button on the display screen of the laryngoscope handle.
   h) Pass the endotracheal tube through the vocal cords, watching the tube pass through the cords.
   i) Once the endotracheal tube has been placed through the cords a second still picture should be taken using the "SNAP" button on the display screen of the laryngoscope handle.

3) Placement of the endotracheal tube should be completed as it would be with any other means of intubation.
   a) The video laryngoscope can be utilized at any point to verify that the endotracheal tube remains in proper position through the vocal cords. Picture documentation of this is acceptable.

Documentation of usage of the video laryngoscope:

1. The usage of the video laryngoscope will need to be documented in the PCR under the interventions section. This is done in the Intubation intervention.
2. The pictures that were taken earlier while performing the intubation will need to be uploaded and attached to the PCR. The following is a step by step process to complete that:
   a) Attach the video laryngoscope screen, with it turned on, to the computer that you are using to complete the PCR by using the USB cable in the case.
   b) This should appear on the computer as a removable disk.
   c) At the bottom of the PCR screen you will see an Attach icon (has a paperclip on it). Select that icon.
   d) On the next screen that appears you will see Add icon, select that icon.
   e) The next screen that appears you will see an Other File icon, select that icon.
   f) You will need to locate the file/s that you wish to attach on the removable disk (the video laryngoscope shows up as a removable disk).
   g) Highlight the file to attach.
   h) Open that file.
   i) The file will show as attached.
   j) Repeat for any other files that need to be attached to the PCR.
   k) Photographs and video of actual patient procedures are protected by HIPAA. No photographs or video are to be removed from the Intubrite device to be used for any other purpose other than attaching to the patient care record (PCR), quality assurance, or quality improvement activities.

Harrison County Hospital EMS

Airway: King (Supraglottic Airway)

E	EMT
A	AEMT
P	Paramedic

Clinical Indications:

1. Inability to adequately ventilate a patient with a Bag Valve Mask.
2. Cardiac arrest where a paramedic is not available.
3. Endotracheal intubation is impossible due to patient access or difficult airway anatomy.
4. Inability to secure an endotracheal tube in a patient who does not have a gag reflex where at least one failed intubation attempt has occurred.
5. Patient must be unconscious and has no gag reflex.
6. ***WARNING:*** **This airway may not prevent aspiration of stomach contents!**

Procedure:

1. Preoxygenate the patient. Consider the use of passive oxygenation before and during any airway management.
2. Select the appropriate tube size for the patient.
3. Lubricate the tube.
4. Grasp the patient's tongue and jaw with your gloved hand and pull forward.
5. Gently insert the tube rotated laterally 45-90 degrees so that the blue orientation line is touching the corner of the mouth. Once the tip is at the base of the tongue, rotate the tube back to midline. Insert the airway until the base of the connector is in line with the teeth and gums.
6. Inflate the pilot balloon with 45-90 mL of air depending on the size of the device used.
7. Ventilate the patient while gently withdrawing the airway until the patient is easily ventilated.
8. Auscultate for breath sounds and sounds over the epigastrium and look for the chest to rise and fall.
9. The large pharyngeal balloon secures the device.
10. Confirm tube placement using end-tidal CO2 detector, if available.
11. Once placement is confirmed, secure tube prior to movement/transport.
12. **It is required that the airway be monitored continuously through waveform capnography (HCH EMS) and pulse oximetry.**

	Pediatric				**Adult**		
Tube Size	**Size 0**	**Size 1**	**Size 2**	**Size 2.5**	**Size 3**	**Size 4**	**Size 5**
Connector Size	Transparent	White	Green	Orange	Yellow	Red	Purple
Patient Weight	< 5 kg	5-12 kg	12-25 kg	25-35 kg	4-5 feet	5-6 feet	> 6 feet
Cuff Volume	10 mL	20 mL	25-35 mL	30-40 mL	40-55 mL	50-70 mL	60-80 mL

Revised 8/31/2023

Harrison County Hospital EMS

Post Intubation Sedation

This protocol is to be used following an endotracheal or nasotracheal intubation for sedation when needed. It is not intended to be used as pharmacological induced intubation.

Clinical Indications:

1) A conscious patient who has been intubated, to control anxiety, restlessness or combativeness.
2) An inter-facility transfer, when patient has been previously intubated and sedation or neuromuscular blockade becomes ineffective.
3) The following things must be accomplished prior to use of Post Intubation Sedation:
   a) Oxygen administration
   b) Bag-Valve-Mask ventilation
   c) ECG monitor application
   d) Pulse oximetry
   e) Capnography (EtCO2)
4) The goal is sedation, not elimination of the respiratory drive.

Absolute Contraindications:

1. CNS depression
2. Shock
3. Hypovolemia
4. Suspected stroke
5. Known or suspected pregnancy

Precautions:

1. Systolic BP < 90 mmHg
2. Known or suspected use of opiate agonists
3. Suspected increased intracranial pressure
4. Women who are breast feeding
5. Hepatic disease
6. Age > 60
7. Debilitated patients
8. Neuromuscular disease, such as muscular dystrophy, myotonia, myasthenia gravis
9. Parkinson's disease
10. Depressive disorders, such as bipolar disorder
11. Known glaucoma

Post Intubation Sedation, continued

Procedure:

1. Make sure intubation has been verified by multiple methods. Waveform capnography and pulse oximetry are required anytime an advanced airway is used.
2. One clinical person must be dedicated to managing the airway.
3. See Post Intubation/Supraglottic Airway Management protocol for medication specifics.
   - Utilize Fentanyl and/or Midazolam.
   - Utilize Ketamine for hypotensive patients.
4. Contact destination facility as soon as possible.
5. For additional sedative over the amounts listed in the Post Intubation/Supraglottic Airway Management protocol, contact medical control.
6. Document on the PCR, all clinical indications that were present, your actions and results of the medication administration, medical control contact.

Harrison County Hospital EMS

Airway: Surgical (Rusch QuickTrach)

Clinical Indications:

Surgical Airway as indicated by the Failed Airway Protocol.

Procedure:

1. Pre-oxygenate patient when possible.
2. Assemble all available additional personnel
3. Have suction machine available and close at hand.
4. Locate cricothyroid membrane at the inferior portion of the thyroid cartilage (with head in neutral position, membrane is approximately 3 finger widths above the sternal notch).
5. Have assistant hold skin taunt over membrane and locate the midline.
6. Prep area with betadine if possible.
7. Hold the needle bevel up at a 90 degree angle, aimed inferiorly as you approach the skin.
8. Puncture the skin with the needle and continue with firm, steady pressure while aspirating for air with the syringe.
9. As soon as air is aspirated freely, stop advancing the needle/airway assembly.
10. Modify the angle to 60 degrees from the head and advance to level of the red stopper.
11. Remove the stopper while holding the needle/airway assembly firmly in place. Do not advance the needle further.
12. Hold the needle and syringe firmly and slide only the plastic cannula along the needle into the trachea until the flange rests on the neck. Carefully remove the needle and syringe.
13. Secure the cannula with the neck strap.
14. Apply the EtCO2 sensor, then the connecting tube to the EtCO2 sensor and connect the other end to the BVM.
15. Confirm placement with the use of breath sounds, pulse oximetry and EtCO2.
16. Ensure 100% oxygen to BVM via supplemental O2.

Harrison County Hospital EMS

Airway: Combitube (Supraglottic Airway)

E	EMT
A	AEMT
P	Paramedic

Clinical Indications:

1. Inability to adequately ventilate a patient with a Bag Valve Mask.
2. Cardiac arrest where a paramedic is not available.
3. Endotracheal intubation is impossible due to patient access or difficult airway anatomy.
4. Inability to secure an endotracheal tube in a patient who does not have a gag reflex where at least one failed intubation attempt has occurred.
5. Patient must be unconscious and has no gag reflex.
6. ***WARNING:*** **This airway may not prevent aspiration of stomach contents!**

Procedure:

1. Preoxygenate the patient. Consider the use of passive oxygenation before and during any airway management.
2. Select the appropriate tube size for the patient.
3. Test cuff inflation by injecting the maximum recommended volume of air into the cuffs. Remove all air from cuffs before insertion.
4. Lubricate the tube.
5. Grasp the patient's tongue and jaw with your gloved hand and pull forward.
6. Insert the tube in the same direction as the natural curvature of the pharynx. Maintain a midline position, insert the tube along the tongue until the teeth lie between the two printed bands.
7. Inflate the #1 blue pilot balloon with the appropriate amount of air, then inflate the #2 white pilot balloon with the appropriate amount of air.
8. Ventilate through the #1 blue tube. Auscultate for breath sounds and gastric sounds. If breath sounds and chest expansion is heard and no gastric sounds are heard, ventilate at the recommended rate.
9. If after ventilating through #1 blue tube and there are no breath sounds heard, no chest expansion and gastric sounds are heard, begin ventilation through the #2 white tube. Listen for breath sounds, chest expansion and no gastric sounds.
10. If no sounds are heard through either tube in either the lungs or gastric area, deflate both cuffs and withdraw the tube 2-3 cm out of the patient's mouth and return to step #7.
11. Confirm tube placement using end-tidal CO2 detector, if available.
12. Once placement is confirmed, secure tube prior to movement/transport.
13. **It is required that the airway be monitored continuously through waveform capnography and pulse oximetry, if available.**

	37 French	41 French
Height of Patient	4 to 6 feet	≥ 5 feet
Air: #1 Balloon	85 mL	100 mL
Air: #2 Balloon	12 mL	15 mL

R	EMR
E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

Blood Glucose Analysis

Regulatory Note:

1. Performing blood glucose analysis with a glucometer requires at minimum at CLIA waived certificate from the Centers for Medicare and Medicaid Services (CMS).

Clinical Indications:

1. Patients with suspected hypoglycemia or hyperglycemia (diabetic emergencies, change in mental status, bizarre behavior, etc.)

Procedure:

1. Gather and prepare equipment.
2. Blood samples for performing glucose analysis can be obtained through a finger-stick or when possible simultaneously with intravenous access.
3. Place correct amount of blood on reagent strip or site on glucometer per the manufacturer's instructions.
4. Time the analysis as instructed by the manufacturer.
5. Document the glucometer reading and treat the patient as indicated by the analysis and protocol.
6. Repeat glucose analysis as indicated for reassessment after treatment and as per protocol.
7. Perform quality assurance on glucometers at least once every 7 days, or more often based on agency policies, if clinically suspicious readings are noted, and/or as recommended by the manufacturer and document in a log.

E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

Orthostatic Blood Pressure Measurement

Clinical Indications:

- Patient situations with suspected blood loss, fluid loss, or dehydration with no indication for spinal immobilization.
- Patient's > 8 years of age, or patients larger than the Broslow tape.

Procedure:

1. Gather and prepare standard sphygmomanometer and stethoscope.
2. With the patient supine, obtain pulse and blood pressure.
3. Have the patient sit upright.
4. After 30 seconds, obtain blood pressure and pulse.
5. If the systolic blood pressure falls more than 30 mmHg or the pulse rises more than 20 bpm, the patient is considered to be orthostatic.
6. If a patient experiences dizziness upon sitting or is obviously dehydrated based on history or physical exam, formal orthostatic examination should be omitted and fluid resuscitation initiated.

R	EMR
E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

Pain Assessment and Documentation

Clinical Indications:

- Any patient

Definitions:

- Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage.
- Pain is subjective (whatever the patient says it is).

Procedure:

1. Initial and ongoing assessment of pain intensity and character is accomplished through the patient's self report.

2. Pain should be assessed and documented in the PCR during initial assessment, before starting pain control treatment, with each set of vital signs after pharmacological pain management intervention, and until resolved or the last set of vital signs for non-drug therapies.

3. Two pain scales are available: the 0 – 10 scale, and the Wong-Baker "faces" scale.
    - 0 – 10 Scale: This is the most familiar scale used by EMS for rating pain with patients. It is primarily for adults and is based on the patient being able to express their perception of the pain as related to numbers. Avoid coaching the patient; simply ask them to rate their pain on a scale from 0 – 10, where 0 is no pain at all and 10 is the worst pain ever.
    - Wong – Baker "faces" Scale": This scale is primarily for use with pediatrics but may also be used with geriatrics, patient with a language barrier, or any patient who doesn't possess the cognitive ability to use the 0-10 scale. The faces correspond to numeric values from 0-10. This scale can be documented with the numeric value.

0	2	4	6	8	10
No hurt	Hurts little bit	Hurts little more	Hurts even more	Hurts whole lot	Hurts worst

R	EMR
E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

Stroke Screen: Cincinnati Prehospital

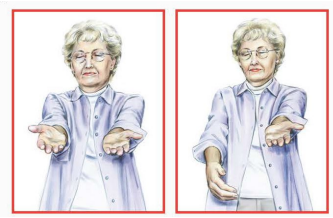
Clinical Indications:

- Suspected stroke patient

Procedure:

1. Assess and treat suspected stroke patients as per protocol.
2. The Cincinnati Prehospital Stroke Screen should be completed for all suspected stroke patients.
3. Establish the "Last Known Well" for the patient. This will be the presumed time of onset.
4. Perform the screen through physical exam:
    - Facial Droop
        i. Normal: Both sides of face move equally well
        ii. Abnormal: One side of face does not move as well as the other side.

    - Arm Drift (patient closes eyes and holds both arms out)
        i. Normal: Both arms move the same or both arms do not move at all.
        ii. Abnormal: One arm does not move or one arm drifts down compared with the other.



    - Speech
        i. Have the patient say, "You can teach an old dog new tricks."
        ii. Normal: Patient uses correct words with no slurring.
        iii. Abnormal: Patient slurs words, uses inappropriate words, or is unable to speak.
5. Evaluate blood glucose level results.
6. The completed stroke screen procedure should be documented on the PCR.

E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

Waveform Capnography

Clinical Indications:

1. Capnography is required for tube placement confirmation in conjunction with endotracheal intubation, nasotracheal intubation, cricothyrotomy and non-visualized airways..
2. Capnography is suggested as soon as possible in conjunction with respiratory patients who are not referenced above.

Procedure For Intubated/Non-Visualized Airway Patients:

1. Attach the capnography sensor of the ECG monitor to the endotracheal tube or non-visualized airway device.
2. It may take up to 30 seconds for the waveform and quantitative measurement to be displayed on the monitor.
3. Note CO_2 level and waveform changes. These will be documented on every patient who is intubated or has a non-visualized airway inserted.
4. The capnometer shall remain in place with the airway and be monitored throughout the prehospital care and transport.
5. Any loss of CO_2 detection or waveform indicates an airway problem and should be documented.
6. The capnogram should be monitored as procedures are performed to verify or correct the airway problem.
7. Document the procedure and results on the PCR.
8. Normal EtCO2 is 35-45 mmHg.
9. In all patients with a pulse, an $EtCO_2 > 20$ is anticipated.

Procedure For Non-Intubated Patients:

1. Utilize the capnography nasal cannula. This device can be used with other sources of oxygen administration as well.
2. Connect the orange end to the ECG monitor and apply the nasal cannula to the patient.
3. It may take up to 30 seconds for the waveform and quantitative measurement to be displayed on the monitor.
4. Note CO_2 level and waveform changes.
5. The capnometer shall remain in place with the airway and be monitored throughout the prehospital care and transport.
6. Any loss of CO_2 detection or waveform indicates an airway problem and should be documented.
7. The capnogram should be monitored as procedures are performed to verify or correct the airway problem.
8. Document the procedure and results on the PCR.
9. Normal EtCO2 is 35-45 mmHg.
10. In all patients with a pulse, an $EtCO_2 > 20$ is anticipated.

E	**EMT** Acquisition/Transmission
A	**AEMT** Acquisition/Transmission
P	**Paramedic** Interpretation

Harrison County Hospital EMS

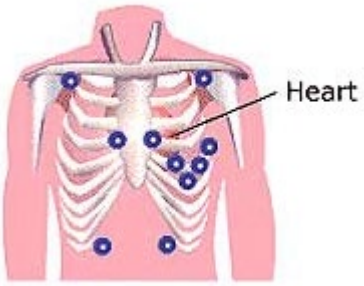
12 Lead ECG Procedure

Clinical Indications:

- Suspected cardiac patient
- Suspected tricyclic overdose
- Electrical injuries
- Syncope
- Any other condition that may indicate cardiovascular involvement

Procedure:

1. Assess patient and monitor cardiac status.
2. Administer oxygen as patient condition warrants. Target SpO2 between 94% and 99%
3. If patient is unstable, definitive treatment is the priority. If patient is stable or stabilized after treatment, perform a 12 Lead ECG. In general, 12 Lead should be obtained in the first 10 minutes of the patient encounter, unless unstable.
4. Prepare ECG monitor and connect patient cable with electrodes.
5. Enter the required patient information (sex, age) into the 12 lead monitor.
6. Expose chest and prep as necessary. Modesty of the patient should be respected.
7. Apply chest leads and extremity leads using the following landmarks.
   - RA – Right arm
   - LA – Left arm
   - RL – Right leg
   - LL – Left leg
   - V1 – 4th intercostal space at right sternal border
   - V2 – 4th intercostal space at left sternal border
   - V3 – Directly between V2 and V4
   - V4 – 5th intercostal space at midclavicular line
   - V5 – Level with V4 at the left anterior axillary line
   - V6 – Level with V5 at the left midaxillary line



8. Instruct patient to remain still.
9. Acquire the 12 Lead ECG.
10. If 12 Lead indicates STEMI or consultation is required, transmit the 12 lead to the ER at the receiving hospital, if transmission capabilities are available.
11. If medication orders are required, attempt to transmit the 12 lead to Medical Control, if transmission capabilities are available, at Harrison County Hospital.
12. For patients with cardiac complaint, keep all leads connected at all times practical to allow automatic ST-segment monitoring to proceed.
13. Contact destination facility to notify them that a 12 lead has been sent.
14. Monitor the patient while continuing with the treatment protocol.
15. Leave a copy of the 12 lead ECG with the receiving hospital.
16. Document the procedure, time, results and a copy of the 12 lead ECG on the PCR.

R	EMR
E	EMT
A	AEMT
P	Paramedic

Procedure (Skill) Section

Cardiac: Defibrillation - Automated

Clinical Indications:

- Patient's in cardiac arrest (pulseless, non-breathing)
- Age < 8 years, use Pediatric Pads if available; if unavailable use adult pads.

Contraindication:

- Pediatric patients who are so small that the pads cannot be placed without touching one another.

Procedure:

1. **If multiple rescuers are available, one rescuer should provide uninterrupted chest compressions while the AED is being prepared for use.**
2. Turn the AED on. Follow the voice prompts.
3. Apply defibrillator pads per manufacturer recommendations. Follow pictures on pads for placement. Do not place pads directly over implanted devices (pacemaker, AICD).
4. If pads would be placed where a medication patch is located, remove the medication patch and wipe off any residue.
5. If necessary, connect pads to AED.
6. When AED begins to analyze, **stop CPR and clear the patient for rhythm analysis**. Compressor should hover over the chest and begin compressions when analysis is complete. Keep interruption of CPR as brief as possible.
7. If AED advises to shock, press the "shock" button. **Assertively state "CLEAR" and visualize that no one, including yourself, is in contact with the patient prior to defibrillation.**
8. Begin CPR (chest compressions and ventilations) IMMEDIATELY after pressing the "shock" button.
9. After 2 minutes of CPR the AED will re-analyze the rhythm and defibrillate if indicated. Repeat this step every 2 minutes.
10. If "no shock advised" from the AED, perform CPR for two minutes and then the AED will re-analyze.
11. Transport and continue treatment as indicated.
12. **Keep interruption of chest compressions as brief as possible. Adequate CPR is a key to successful resuscitation.**
13. If pulse returns please use the Post Resuscitation Protocol

E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

CODE STEMI

Applies only to Norton Hospital Downtown

Access Center 1-888-486-6786

State "CODE STEMI", give patient's name and any other demographic information you have time to give.

Before Coming To This Protocol:

Begin treatment following the Chest Pain – Cardiac & STEMI protocol.

Clinical Criteria for Catheterization Lab Activation:

ALL MUST BE PRESENT FOR ACTIVATION!

1. Active chest pain or equivalent symptoms (dyspnea, nausea, weakness, etc.).
2. An especially high index of suspicion, considering risk factors for coronary artery disease (hypertension, hypercholesterolemia, smoking, diabetes, etc).
3. 12 lead ECG of good quality showing STEMI.
    a. ST elevation >2 mm in at least 2 anatomically contiguous leads.
    b. QRS duration <0.12 seconds **(No LBBB)**
4. Age <85
5. No major active bleeding.
6. No major surgery in past 6 weeks.
7. No significant trauma (No RED criteria on Trauma Triage and Destination Plan)
8. Patient is able to provide informed consent or a legal representative is with the patient to provide consent.
9. Ask the patient if they have a cardiologist and get the name.

Documentation:

1. All information above must be documented in the PCR as well as the Zoll X-Series data imported into the PCR. If the X-Series data cannot be imported due to an IT problem, contact the EMS Education Coordinator to have the data removed manually from the monitor.

If patient goes into cardiac arrest during transport, divert to the nearest ER. If you have crossed the Sherman Minton bridge when cardiac arrest occurs, proceed to Norton Downtown. Notify the Emergency Department as soon as possible at (502) 629-3434.

R	EMR
E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

Cardiopulmonary Resuscitation (CPR)

Clinical Indications:

- Basic life support for the patient in cardiac arrest

Procedure:

1. Assess the patient's level of consciousness and signs of obvious breathing.
2. If the patient is unresponsive and shows no signs of obvious breathing, immediately begin chest compressions.
3. For a neonate with a pulse of 60 bpm or less, provide 30 seconds of ventilations. If heart rate is still below 60 bpm, begin chest compressions.

Age	Location	Depth	Rate	Compression to Ventilation Ration
Neonate *(birth to 28 days)*	Over lower half of the sternum, 2 thumb-encircling hands technique	1/3 of the anterior-posterior chest dimension	2 compressions per second.	3:1
Infant *(28 days to 1 year)*	Over lower half of the sternum, 2-3 fingers or thumbs/encircling hands technique	1/3 of the anterior-posterior chest dimension or about 1 ½ inches	100 to 120 compressions per minute	1-Rescuer = 30:2 2-Rescuer = 15:2
Child *(1 year to puberty)*	Over to lower half of the sternum, either the heel of 1 hand or 2-handed	About 2 inches	100 to 120 compressions per minute	1-Rescuer = 30:2 2-Rescuer = 15:2
Adult *(puberty and above)*	Over the lower half of the sternum, 2-handed	2" to 2 ½ inches	100 to 120 compressions per minute	30:2

4. Go to Cardiac Arrest Protocol. Begin ventilations in the adult as directed in the Cardiac Arrest Protocol. In this procedure and all cardiac arrest protocols, 5 cycles of compressions means 2 minutes of uninterrupted chest compressions.
5. Do not hyperventilate the patient. Use $EtCO_2$ to guide your ventilations as directed in the Cardiac Arrest Protocol.
6. Chest compressions should be provided in an uninterrupted manner. Interruptions in chest compressions must be kept to less than 10 seconds.
7. Document the time and procedure in the PCR.

Harrison County Hospital EMS

A	AEMT
P	Paramedic

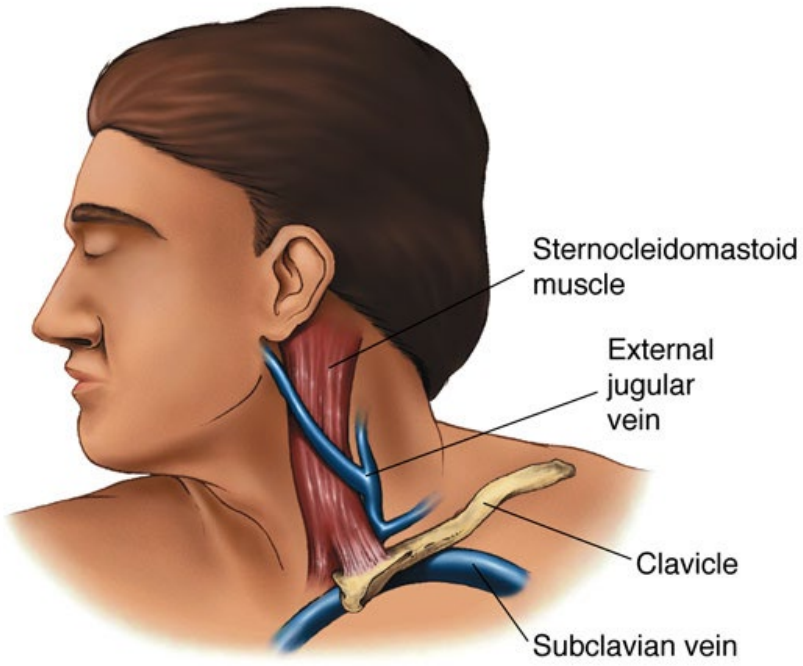
Venous Access: External Jugular Access

Clinical Indications:

- External jugular vein cannulation is indicated in a critically ill patient, over 8 years of age, who requires intravenous access for fluid or medication administration and in whom an extremity vein or intraosseous access is not obtainable.
- For critically ill patients, consider IV or IO access in addition to or instead of an EJ attempt.
- External jugular cannulation may be attempted initially in life threatening events where no obvious peripheral site is noted and intraosseous access is contraindicated or undesirable.

Procedure:

1. Place the patient in a supine head down position. This helps distend vein and prevents air embolism.
2. Turn the patient's head toward the opposite side if no risk of cervical injury exists.
3. Prep the site in the same manner as a peripheral IV site.
4. Align the catheter with the vein and aim toward the same side shoulder.
5. Compressing the vein lightly with one finger above the clavicle, puncture the vein midway between the angle of the jaw and the clavicle and cannulate the vein in the usual method.
6. Attach the IV and secure the catheter avoiding circumferential dressing or taping.
7. Avoid the use of cervical collars with external jugular venous access. If needed, other methods of SMR should be used.
8. Document the procedure, time and result (success) on the PCR.



A	AEMT
P	Paramedic

Intravenous Access: Extremity

Clinical Indications:

- Any patient where intravenous access is indicated (significant trauma, emergent or potentially emergent medical condition).

Procedure:

1. Saline locks may be used as an alternative to an IV tubing and IV fluid in every protocol at the discretion of the ALS professional.
2. Paramedic/AEMT can use intraosseous access where threat to life exists as provided for in the Intravenous Access-Intraosseous procedure.
3. Fluid and setup choice is preferably:
    a. Normal Saline with a macro drip (10-20 drops/mL) for trauma or hypotension.
    b. Normal Saline with a micro drip (60 drop/mL) for medication infusions or keep vein open.
4. Inspect the IV solution for expiration date, cloudiness, discoloration, leaks, or the presence of particles.
5. Connect IV tubing to the solution in a sterile manner. Fill the drip chamber half full and then flush the tubing, bleeding all air bubbles from the line.
6. Place a tourniquet around the patient's extremity to restrict venous flow only.
7. Select a vein and an appropriate gauge catheter for the vein and the patient's condition.
8. Prep the skin with an antiseptic solution.
9. Insert the needle with the bevel up into the skin in a steady, deliberate motion until the bloody flashback is visualized in the catheter.
10. Advance the catheter into the vein. **Never** reinsert the needle through the catheter. Dispose of the needle into the proper container without recapping.
11. Draw blood samples when appropriate.
12. Remove the tourniquet and connect the IV tubing or saline lock.
13. Open the IV to assure free flow of the fluid and then adjust the flow rate as per protocol or as clinically indicated.

    Rates are preferably:
    - Adult: KVO/TKO: 60 mL/hour (1 drop / 6 seconds for a macro drip set)
    - Pediatric: KVO/TKO: 30 mL/hour (1 drop / 12 seconds for a macro drip set)

    If shock is present:
    - Adult: 500 mL fluid boluses repeated as long as lungs are dry and BP < 90. Consider a second IV line
    - Pediatric: 10 - 20 mL/kg boluses repeated PRN for poor perfusion.
14. Cover the site with a sterile dressing and secure the IV and tubing.
15. Document the procedure, time and result (success) on the patient care report (PCR) and on any documentation left at the receiving facility.

Venous Access: EZ-IO, Humerus

Clinical Indications:

- When IV access is required for a critical patient and peripheral IV access is not available.
- This procedure should not be used for "routine" IV access or if there is obvious peripheral IV access available.

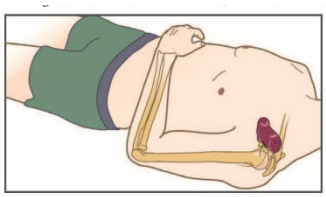
Contraindications:

1. Fracture of the bone selected for IO infusion.
2. Excessive tissue at insertion site with the absence of anatomical landmarks.
3. Previous significant orthopedic procedures.
4. Infection at the site selected for insertion.

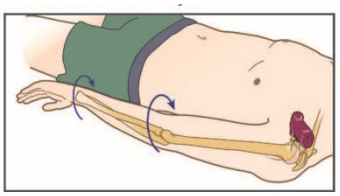
Procedure:

Arm Positioning - 2 Options

1. Place the patient's hand over the abdomen with arm tight to the body. ; OR
2. Place the arm tight against the body, rotate the hand so the palm is facing outward, thumb pointing down.



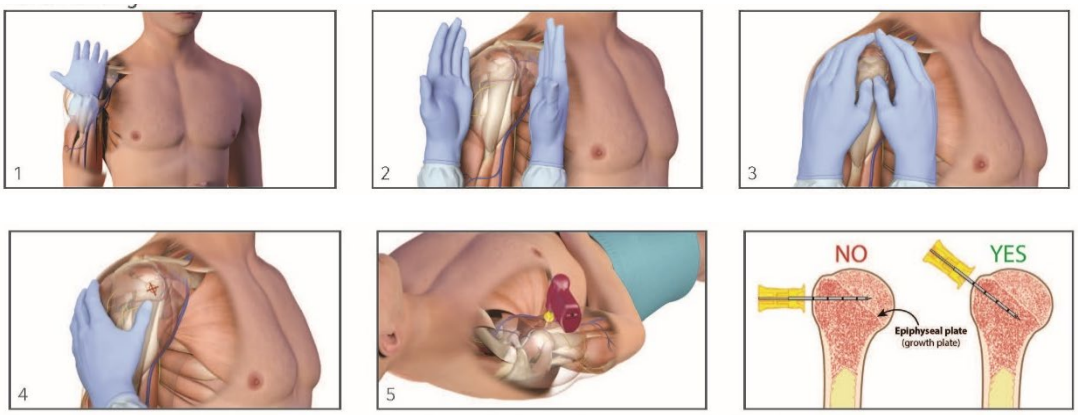
Option 1



Option 2

Landmarking: (See below for photos)

1. Place your palm on the patient's shoulder anteriorly. The area that feels like a "ball" under your palm is the general target area.
2. Place the ulnar aspect of one hand vertically over the axilla. Place the ulnar aspect of the opposite hand along the midline of the upper arm laterally.
3. Place your thumbs together over the arm. This identifies the vertical line of insertion on the proximal humerus.
4. Palpate deeply as you climb up the Humerus to the surgical neck. It will feel like a golf ball on a tee. The spot where the "ball" meets the "tee" is the surgical neck. The insertion site is on the most prominent aspect of the greater tubercle, 1 to 2 cm above the surgical neck.
5. Point the needle tip at a 45-degree angle to the anterior plane and posteromedial.
6. Remove power driver and stylet.
7. Confirm catheter stability.
8. Attach the supplied extension set to the catheter hub's luer lock.
9. Aspirate a small amount of blood to confirm placement.
10. Flush the adult EZ-IO catheter with 10 ml of Normal Saline, flush the pediatric EZ-IO catheter with 5 ml of Normal Saline.
11. Slowly administer Lidocaine 2% for pain:
    a) Adult 40 mg
    b) Pediatric 0.5 mg/kg
12. Connect IV line to the extension set and use as any other IV line.
13. Document time and procedure on PCR.



Warning:

- Do not leave the EZ-IO catheter in for more than 48 hours.

A	AEMT
P	Paramedic

Harrison County Hospital EMS

Venous Access: EZ-IO, Tibia

Clinical Indications:

1. When IV access is required for a critical patient and peripheral IV access is not available.
2. This procedure should not be used for "routine" IV access or if there is obvious peripheral IV access available.

Contraindications:

1. Fracture of the bone selected for IO infusion.
2. Excessive tissue at insertion site with the absence of anatomical landmarks.
3. Previous significant orthopedic procedures.
4. Infection at the site selected for insertion.

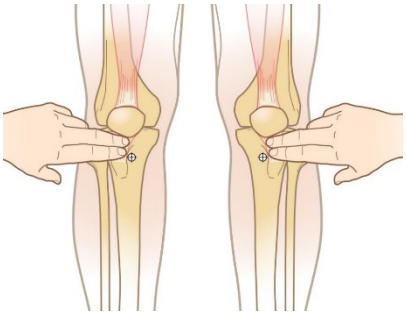
Procedure:

1. Consider pain medication if patient is conscious.
2. Locate proximal tibia insertion site.
3. Using an aseptic technique, prep the insertion site.
4. Select proper size needle and attach to driver.
5. Remove and discard the needle safety cap.
6. Insert the needle at a 90º angle to the insertion site.
7. Stop insertion when the needle enters the medullary space, you will feel a "give" or "pop".
8. Remove power driver and stylet.
9. Confirm catheter stability.
10. Attach the supplied extension set to the catheter hub's luer lock.
11. Aspirate a small amount of blood to confirm placement.
12. Flush the adult EZ-IO catheter with 10 ml of Normal Saline, flush the pediatric EZ-IO catheter with 5 ml of Normal Saline.
13. Slowly administer Lidocaine 2% for pain:
    - Adult 40 mg
    - Pediatric 0.5 mg/kg
14. Connect IV line to the extension set and use as any other IV line.
15. Document time and procedure on PCR.

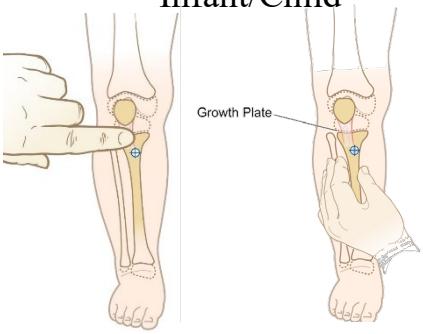
Warning:

1. Do not leave the EZ-IO catheter in for more than 48 hours.

Adult



Infant/Child



Harrison County Hospital EMS

E	EMT
A	AEMT

Peripheral IV Maintenance

Authority: 836 IAC 1-2-3(f)
Paul Fleming, Medical Director

Clinical Indications:

- Any patient who is being transferred from one healthcare facility to another healthcare facility, after being evaluated by a physician and an intravenous infusion has been started by the sending facility and the physician orders the IV infusion to continue during the inter-facility transport.

- An EMT or AEMT may transport a patient with the following:
  - Patient controlled analgesia (PCA) pump with any medication or fluid infusing through a peripheral IV;
  - Medication infusing through a peripheral IV or continuous subcutaneous catheter via a closed or locked system;
  - A central catheter that is clamped off;
  - A feeding tube that is clamped off;
  - Holter monitor;
  - Peripheral IV infusing vitamins;
  - IV fluids infusing through a peripheral IV via gravity or an infusion system that allows the technician to change the rate of infusion, limited to D5W, Lactated Ringers, Sodium Chloride 0.9% or less.

Contraindication:

- This procedure does not allow a piggyback or secondary intravenous line, blood products, or any IV device, fluid, additives or medications not specifically on the above list. Any infusion other than what is stated must be transported with a Paramedic as the primary caregiver.

Procedure:

1. Verify you have written orders indicating type of fluid, type of additive, flow rate, and total amount of fluid to run.
2. Verify size of IV catheter and that the IV is patent. There should not be any sign of infiltration, redness or swelling.
3. Clinician should have the necessary supplies to discontinue IV, change IV bag with the ordered fluid when necessary.
4. Document the orders on the patient care report (PCR), any problems with the IV, any additional fluid that was added or changes in flow rate.

Harrison County Hospital EMS

Venous Access: Port-A-Cath

Clinical Indications:

1. Any patient having a previously implanted "Port-A-Cath" or similar device; and
2. Venous access is needed to administer medications or fluids.

Procedure:

1. This should be a sterile procedure.
2. Use pre-made Port-A-Cath kits and lay out materials.
    a. You MUST use Huber or Gripper needle.
3. Locate silicone top of the Port-A-Cath.
4. Wipe the skin with betadine or iodine for 2 minutes, then with alcohol for 2 minutes. If patient is allergic to betadine or iodine, use alcohol only.
5. Stabilize the Port-A-Cath implant with one hand.
6. With the other hand, make a needle stick at a 90º angle, through the skin.
7. Insert the needle to metal base of the Port-A-Cath.
8. Withdraw 10 ml of blood to ensure the Port-A-Cath is functioning properly. Discard the 10 ml of blood.
9. Draw appropriate amount of blood for lab tests, if necessary.
10. Connect IV of Normal Saline to Port-A-Cath.
11. Flush Port-A-Cath with 20 ml of Normal Saline.
12. Secure needle as an impaled object and tape IV tubing to patient's chest.
13. Use Port-A-Cath as any other IV.
14. Document time and procedure on PCR.

P Paramedic

Harrison County Hospital EMS

pNeuton Pneumatic Transport Ventilator

Therapeutic Goal:

To provide adequate support of ventilation and oxygenation to intubated patients during transport.

Equipment:

- Ventilator – pNeuton
- Disposable ventilator circuit
- Compressed oxygen source yielding 50 psi output
- Bag-valve-mask with oxygen reservoir
- Continuous Cardiac, SaO2, and ETCO2 monitoring
- Miscellaneous ventilator circuit adjuncts (filters)

Clinical Indications:

1. Any patient requiring placement of an advanced airway to support ventilation and/or oxygenation.

Contraindications:

1. None

Patient Utilization:

1. **Interfacility Transfers:** Continue the current settings that the patient is on at the hospital. If you have questions about the settings, contact the sending physician. The patient will be placed on the ventilator at the hospital bedside. If the hospital ventilator is using SIMV or the settings are outside the parameters of the pNeuton, the Zoll critical care ventilator must be used.
2. **Scene Calls:** The ventilator will help meet specific ventilator requirements – e.g., patients with decreased lung compliance secondary to lung disease or other restrictive processes, head injury patients, or patients presenting with "resuscitative" needs.

Procedure:

1) A ventilator "check-out" should be performed at the beginning of each shift.
2) Initiating Mechanical Volume Ventilation:
   a) Verify airway patency and position by use of ETCO2 detection and pulse oximetry equipment in order to verify artificial airway placement and to evaluate effectiveness of current ventilation technique.
   b) Prepare the BVM device for emergent use in case of ventilator failure.
   c) Attach ventilator to appropriate oxygen source. (50 psi outlet)

d) Attach disposable ventilator circuit to ventilator. Attach gas outlet and pressure transducer to corresponding connections.
e) Set PEEP at 3 to 5 cm H_2O for field initiation. When used for an interfacility transfer use sending physicians settings.
f) Select appropriate Respiratory Rate (RR)
   i) Adult: 12-14 / min
   ii) Child: 16-20 / min
g) Select desired Tidal Volume (Vt).
   i) Patients should typically be ventilated with a Vt of 6-8 mL/kg, based on ideal body weight (IBW).
   ii) Use Vt of 10-12 mL/kg (IBW) with lower RR (6-8/min) for hypotensive patients with SBP<80 mmHg.
   iii) Use lower volumes in patients at risk for barotrauma (e.g., ARDS, COPD).
   iv) Calculate ideal body weight (IBW).
      (1) Male: 50 kg + (2.3x[Height (in.) – 60 inches])
      (2) Female: 45.5 kg + (2.3x[Height (in.) – 60 inches])

Example (IBW): Your patient is a male, 5' 8" tall.
Height = 68 inches
50 kg + (68-60) * 2.3
50 kg + 8*2.3
50 kg + 18.4 = 68.4 kg

Example Vt: Using 6 mL/kg

68.4 kg * 6 mL = 410.4 mL of tidal volume

h) Select desired FiO2. 65 or 100 %.
i) If Positive End Expiratory Pressure (PEEP) is required, select the desired amount and set via the ventilator's PEEP/CPAP function.
j) Turn the Mandatory Breaths to the ON position.
k) Attach patient to the ventilator and observe peak inspiratory pressure (PIP). Set Peak Pressure function 10-15 cmH2O above the PIP.
l) Observe delivery of several breaths. Evaluate patient for adequate chest rise, ETCO2, and SpO2.
m) If at any time the ventilator should fail or an alarm is received that cannot be corrected, the patient should be immediately ventilated with a BVM attached to 100% oxygen source.
n) At the completion of the transport, dispose of the ventilator circuit and clean ventilator as necessary.

Harrison County Hospital EMS

Ideal Body Weight (IBW) & Tidal Volume Calculation

Normotensive

Height (ft, in)	Male Tidal Volume (mL)	Female Tidal Volume (mL)
5’ 5”	369	342
5’ 6”	383	356
5’ 7”	397	370
5’ 8”	410	383
5’ 9”	424	397
5’ 10”	438	411
5’ 11”	452	425
6’ 0”	466	439
6’ 1”	479	452
6’ 2”	493	466
6’ 3”	507	480
6’ 4”	521	494
6’ 5”	535	508
6’ 6”	548	521
6’ 7”	562	535
6’ 8”	576	549
6’ 9”	590	563
6’ 10”	604	577
6’ 11”	617	590
7’ 0”	631	604
7’ 1”	645	618
7’ 2”	659	632
7’ 3”	673	646
7’ 4”	686	659
7’ 5”	700	673
7’ 6”	714	687

Harrison County Hospital EMS

Ideal Body Weight (IBW) & Tidal Volume Calculation

Hypotensive – SBP <80 mmHg

Height (ft, in)	Male Tidal Volume (mL)	Female Tidal Volume (mL)
5’ 5”	615	570
5’ 6”	638	593
5’ 7”	661	616
5’ 8”	684	639
5’ 9”	707	662
5’ 10”	730	685
5’ 11”	753	708
6’ 0”	776	731
6’ 1”	799	754
6’ 2”	822	777
6’ 3”	845	800
6’ 4”	868	823
6’ 5”	891	846
6’ 6”	914	869
6’ 7”	937	892
6’ 8”	960	915
6’ 9”	983	938
6’ 10”	1006	961
6’ 11”	1029	984
7’ 0”	1052	1007
7’ 1”	1075	1030
7’ 2”	1098	1053
7’ 3”	1121	1076
7’ 4”	1144	1099
7’ 5”	1167	1122
7’ 6”	1190	1145

Harrison County Hospital EMS

R	EMR
E	EMT
A	AEMT
P	Paramedic

Childbirth

Clinical Indications:

- Imminent delivery with crowning

Procedure:

1. Delivery should be controlled so as to allow a slow controlled delivery of the infant. This will prevent injury to the mother and infant.
2. Support the infant's head as needed.
3. Check the umbilical cord surrounding the neck. If it is present, slip it over the head. If unable to free the cord from the neck, double clamp the cord and cut between the clamps.
4. Suction the airway with a bulb syringe.
5. Grasping the head with hands over the ears, gently guide the fetus downward to allow delivery of the anterior shoulder.
6. Gently pull up on the head to allow delivery of the posterior shoulder.
7. Slowly deliver the remainder of the infant.
8. Clamp the cord 2 inches from the abdomen with 2 clamps and cut the cord between the clamps.
9. Record APGAR scores at 1 and 5 minutes.
10. Follow the **Newly Born Protocol** for further treatment.
11. The placenta will delivery spontaneously, usually within 5 minutes of the infant. Do not force (or pull on) the placenta to deliver.
12. Massaging the uterus may facilitate delivery of the placenta and decrease bleeding by facilitating uterine contractions.
13. Continue transport to the hospital.

E	EMT[1]
A	AEMT
P	Paramedic

Harrison County Hospital EMS

Injections: Subcutaneous and Intramuscular

Clinical Indications:

- When medication administration is necessary and the medication must be given via the SQ or IM route

Procedure:

1. Receive and confirm medication order or perform according to protocol.
2. Prepare equipment and medication expelling air from the syringe.
3. Explain the procedure to the patient and reconfirm patient allergies.

   Confirm the "rights" of medication administration with your partner and VERIFY THE CORRECT ANSWER to each of the "rights" before administration.
   - Right Patient
   - Right Drug
   - Right Time
   - Right Dose
   - Right Route

4. The most common site for subcutaneous injection is the arm.
   a. SQ Injection volume should not exceed 1 cc.
5. The possible injection sites for intramuscular injections include the arm, buttock and thigh.
   a. IM Injection volume should not exceed 1-2 cc for the arm.
   b. IM Injection volume should not exceed 2-3 cc in the thigh or buttock.
6. The thigh should be used for injections in pediatric patients and injection volume should not exceed 1 cc.
7. Expose the selected area and cleanse the injection site with alcohol or the provided cleanser.
8. Insert the needle into the skin with a smooth, steady motion.

   SQ: 45-degree angle **Skin pinched** | **IM: 90-degree angle** **skin flattened**

9. Aspirate for blood.
10. Inject the medication.
11. Withdraw the needle quickly and dispose of properly without recapping.
12. Apply pressure to the site.
13. Monitor the patient for the desired therapeutic effects as well as any possible side effects.
14. Document the medication, dose, route, and time on the patient care report (PCR).

[1] EMT may administer Epinephrine (1 mg/mL) for anaphylaxis by IM route.

Harrison County Hospital EMS

Chest Decompression (SPEAR Device)

Clinical Indications:

1) Peri-arrest patients with hypotension (systolic BP < 90), clinical signs of shock, and at least one of the following signs:
   a) Jugular vein distention.
   b) Tracheal deviation away from the side of the injury (often a late sign)
   c) Absent or decreased breath sounds on the affected side.
   d) Hyper-resonance to percussion on the affected side.
   e) Increased resistance when ventilating a patient.
2) In patients with penetrating trauma to the chest or upper back, or gunshot wound to the neck or torso, who are in respiratory distress where signs or tension pneumothorax are present.

Procedure:

1. Wear proper personal protective equipment (gloves, eye protection, etc.).
2. Administer high flow oxygen.
3. Identify and prep the site. The lateral placement is preferred, however, the anterior approach is also acceptable. Both have their advantages and disadvantages.
   a. Lateral placement may be used at the fifth intercostal space, anterior axillary line on the same side as the pneumothorax.
   b. Anterior placement is at the second intercostal space in the mid-clavicular line on the same side as the pneumothorax.
   c. Prepare site with betadine or other similar cleanser.
4. Insert the SPEAR into the skin over the fourth rib and direct it just over the top of the rib (superior border) into the interspace.
5. Advance the catheter through the parietal pleura until a “pop” is felt and air or blood exits under pressure through the catheter, then advance catheter only to chest wall.
6. Remove the needle, leaving the plastic catheter in place.
7. Place the commercial one-way valve on top of the catheter.
8. Secure the catheter hub to the chest wall with dressings and tape.
9. Document the procedure, time and result in the PCR.

R	EMR
E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

Combat Application Tourniquet (C-A-T)

Clinical Indications:

- The C-A-T is designed to control external hemorrhage of an extremity that cannot be controlled with direct pressure.
- The C-A-T can be applied with a two-handed technique, to another person, or with a one-handed technique, to yourself.

Procedure (2-Handed)

1. Wear proper personal protective equipment (gloves, eye protection, etc.).
2. Remove clothing from wound and area where C-A-T will be applied.
3. Pull band out of buckle and wrap band around the limb, as high as possible on the limb. (High and Tight)
4. Pass red tip through slit on buckle.
5. Pull band tightly and fasten to itself. Do not cover rod clips.
6. Band should be tight enough that three fingers cannot slip under the band.
7. Twist rod until bleeding stops and secure rod inside clip to lock in place.
8. Reassess for bleeding and distal pulse.
9. If bleeding is not controlled, tighten band further or consider application of a second C-A-T above and next to first C-A-T.
10. Reassess patient.
11. Secure rod and band with time strap and write application time on time strap.

Procedure (1-Handed)

1. Wear proper personal protective equipment (gloves, eye protection, etc.).
2. Insert injured limb through C-A-T.
3. Position C-A-T as high on the limb as possible. (High and Tight)
4. Pull band tightly.
5. Fasten band onto itself, around the limb, but no over rod clips.
6. Band should be tight enough that three fingers cannot slip under the band.
7. Twist rod until bleeding stops and secure rod inside clip to lock in place.
8. Reassess for bleeding and distal pulse.
9. If bleeding is not controlled, tighten band further or consider application of a second C-A-T below the first C-A-T.
10. Reassess bleeding.
11. Secure rod and band with time strap and write application time on time strap.

Important Points

1. Never place C-A-T over a joint.
2. If C-A-T must be applied over clothing, never apply over items in clothing, i.e. keys, wallet, etc.
3. For larger limbed individuals, two C-A-T's can be used but must be placed side by side with rods not interfering with each other.

E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

Spinal Motion Restriction

Purpose:

The traditional practice of spinal immobilization based solely on mechanism of injury has been found to either provide minimal or no patient benefit and in some cases can cause harm to patients. It also takes time away from the severely injured patient when other more beneficial interventions could be performed.

Policy:

Each patient where there is a mechanism of injury suggestive of possible spinal injury will have a Spinal Motion Restriction (SMR) exam performed to see if there is a need of spinal motion restriction.

1. Long spine boards or similar rigid devices should be utilized for extrication and / or patient transfers to the stretcher, as well as support for manual chest compressions. They DO NOT improve outcomes and can induce pain, agitation / anxiety, respiratory compromise, and decreased tissue perfusion at pressure points.
2. Devices such as the long or short spine board, scoop stretcher, "Reeves Sleeve", vacuum splints, etc., should be considered extrication and/or patient movement devices.
3. Spinal Motion Restriction includes a rigid cervical collar, manual in-line spine stabilization as necessary to maintain spinal alignment with movement and transfers, and securing the patient FLAT to the ambulance stretcher (i.e. no sitting up or head elevation). ***Patients with need for Spinal Motion Restriction / Spinal Precautions DO NOT have a "clear" spine and SHOULD NOT sit up or be transferred to a wheelchair or the waiting room at the destination facility prior to evaluation of the spine by an emergency physician.***
4. Patients with penetrating trauma to head, torso, or back with no evidence of spinal injury do not require Spinal Motion Restriction.

Procedure:

1. The provider will begin each exam with the Universal Patient Care Protocol.
2. Gather long spine board, scoop, ambulance cot or other Spinal Motion Restriction device, securing devices, and appropriate C-collar.
3. Explain the procedure to the patient and assess / record neurological exam and pulse status.
4. Place the patient in an appropriately sized C-collar while maintaining in-line stabilization of the C-spine by a second provider. In-line stabilization should not involve traction / tension, but rather maintain head in a neutral, midline position while the first rescuer applies the collar.
5. One the collar is secure, the second rescuer should still maintain their position to ensure stabilization (the collar is helpful but will not do the job by itself).

6. If indicated, place patient on a Spinal Motion Restriction device with log-roll or similar technique dependent on circumstances, if patient is supine or prone. During extrication or where otherwise unable to be placed prone or supine, place on Spinal Motion Restriction device by the safest method available that allows maintenance of in-line spinal stability.
7. Once patient is safely positioned on an ambulance cot, transfer or extrication device may be removed if an adequate number of trained personnel are present to minimize unnecessary movement during the removal process. The risks of patient manipulation must be weighed against the benefits of device removal. If the decision is made to remove the extrication device in the field, SMR should be maintained by assuring that the patient remains securely positioned on the ambulance cot with a cervical collar in place.
8. Stabilize the patient with straps / head rolls / tape / other device as needed. Once the head is secured to the Spinal Motion Restriction device / stretcher, the second rescuer may release manual in-line stabilization.

NOTE: Spinal precautions may be achieved by many methods. Never force a patient into a certain position to immobilize them. Such situations may require a second rescuer to maintain manual stabilization throughout the transport to the hospital. Special equipment such as football players in full pads and helmet may remain immobilized with helmet and pads in place.

Procedure for Children:

1. Age alone should not be a factor in decision-making for prehospital spinal care, both for the young child and the child who can reliably provide a history.
2. Apply a cervical collar if the patient has any of the following:
    a. Complaint of neck pain;
    b. Torticollis (a twisting of the neck muscles and/or ligaments that causes the head to rotate and tilt at an odd angle);
    c. Neurologic deficit;
    d. Altered mental status including GCS <15, intoxication, and other signs (agitation, apnea, hypopnea, somnolence, etc.)
    e. Involvement in high-risk motor vehicle collision, high impact diving injury, or has substantial torso injury.
    f. Minimize the time of backboards or consider padding to minimize the risk of pain and pressure ulcers if the time on the backboard is to be prolonged.
    g. Because of the variation in the head size to body ratio in young children relative to adults, additional padding under the shoulders is often necessary to avoid excessive cervical spine flexion with SMR.

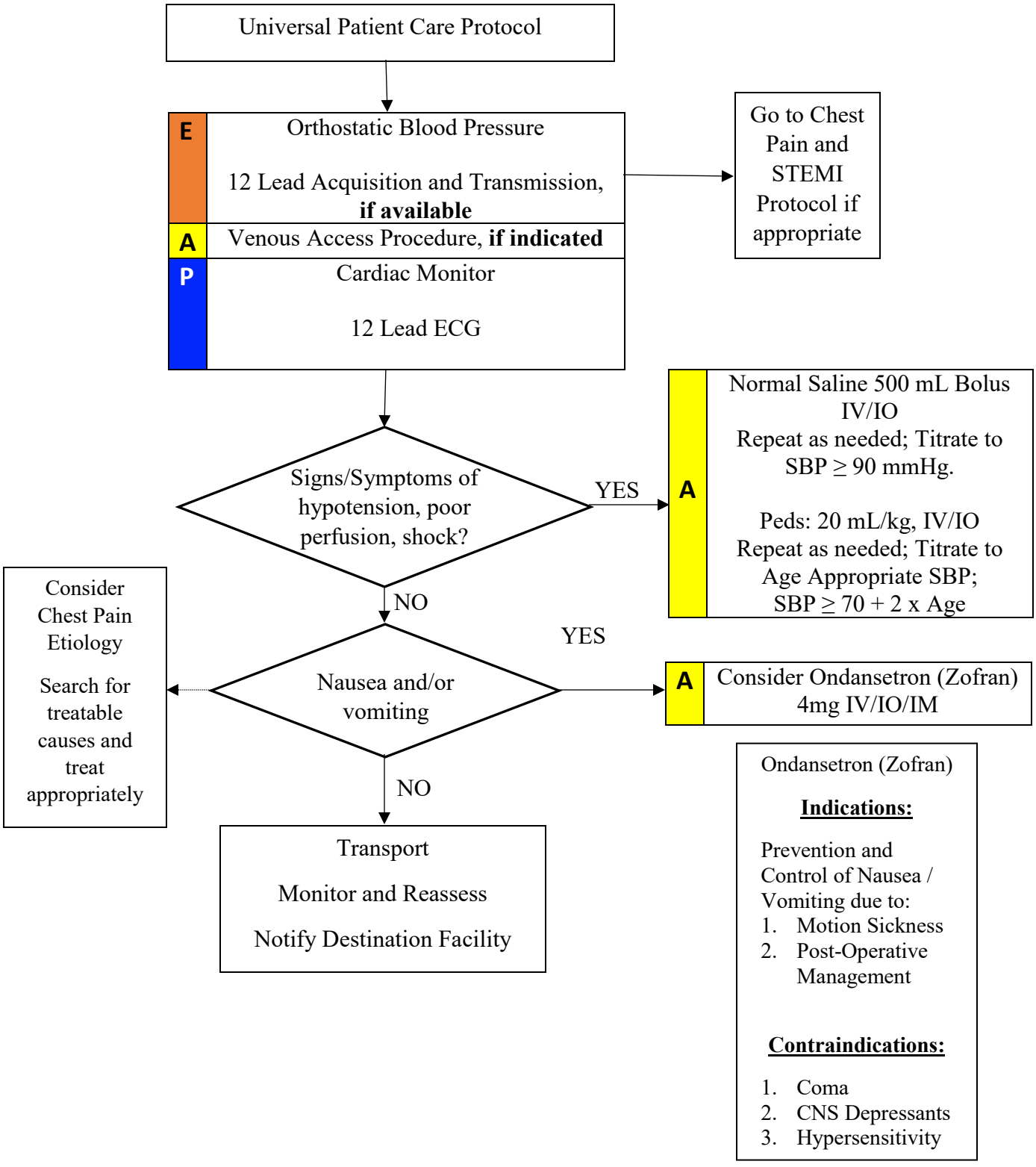
Documentation:

All standard documentation should be included on the patient care report (PCR). With the exam necessary for Spinal Motion Restriction, including pertinent negatives is very important. The following items must be documented in the PCR when utilizing Spinal Motion Restriction.

- The age of the patient.
- The neurological exam.
- The Glasgow Coma Scale.
- Any evidence of intoxication by alcohol, medications or illicit drugs.
- Any distracting injuries.
- The spinal exam.

Harrison County Hospital EMS

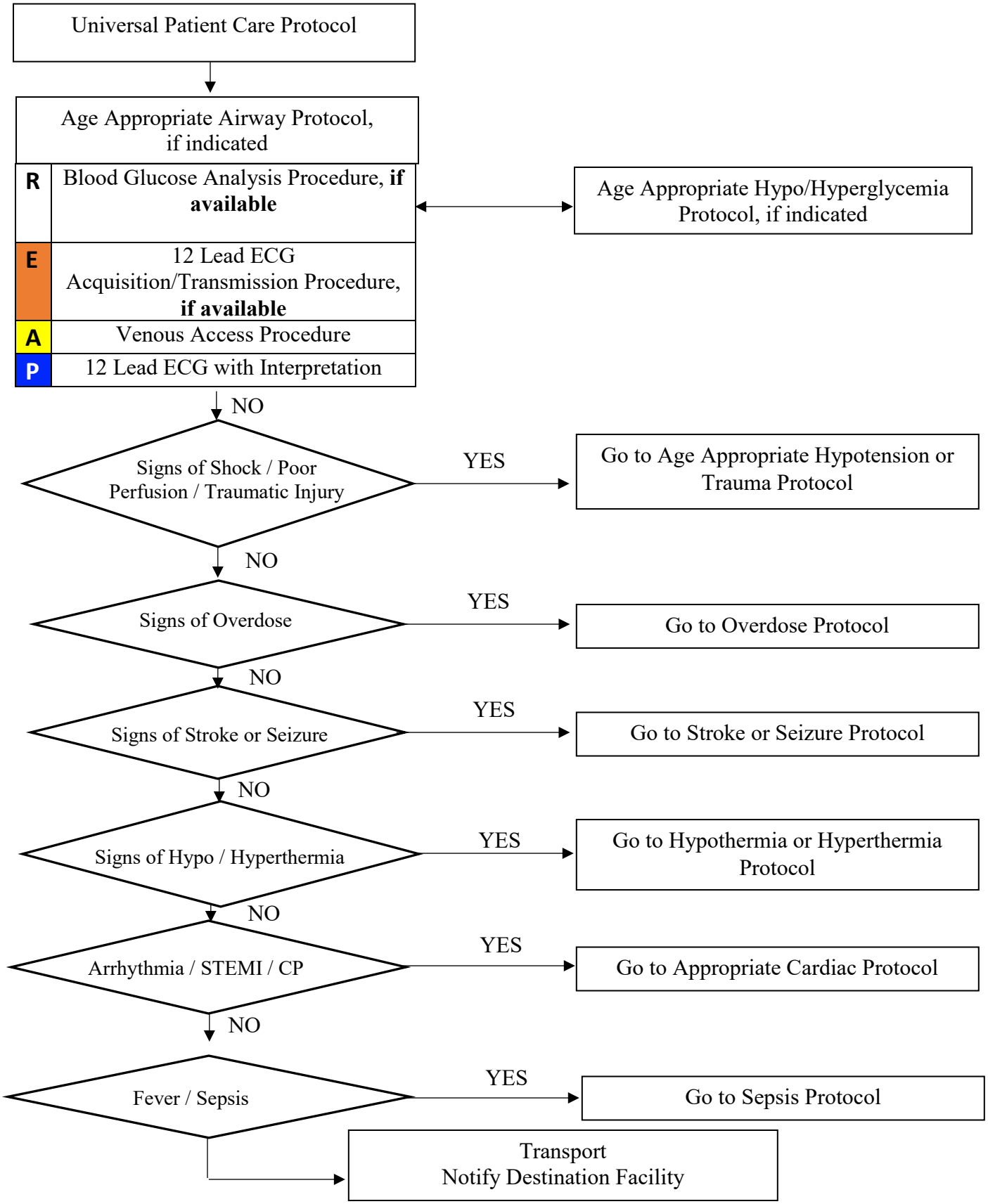
Abdominal Pain / Nausea / Vomiting



Revised 10/18/2023

Harrison County Hospital EMS

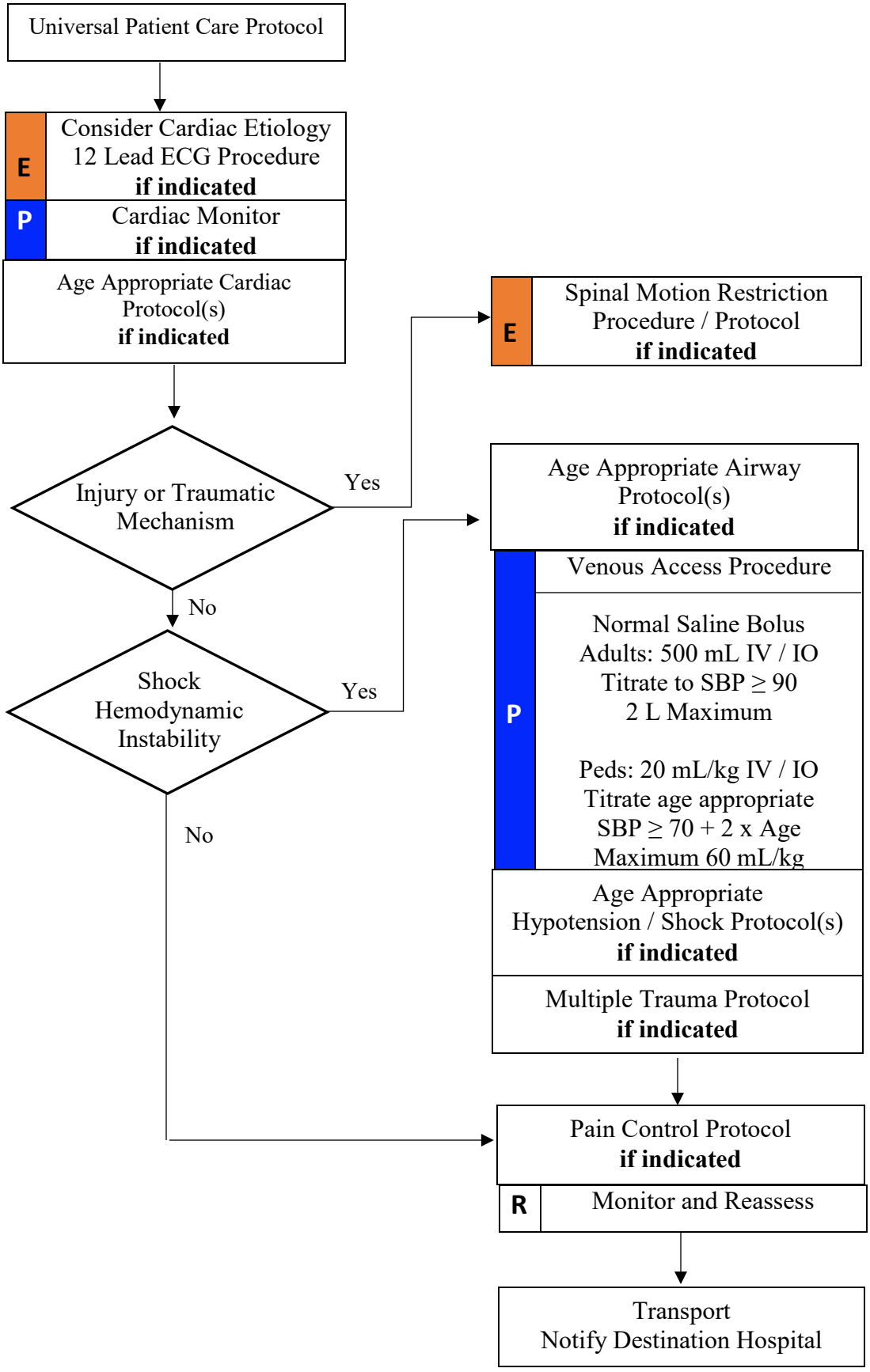
Altered Mental Status



Revised 9/5/2023

Harrison County Hospital EMS

Back Pain



Revised 9/1/2023

R	EMR
E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

Behavioral Health Crisis

Anxiety but not disruptive

Call for help.
Call for additional resources.
Stage prior to arrival
or
Withdraw from scene until safe.

Assess for underlying medical or traumatic condition causing behavioral disturbance

Diabetes?
Overdose / Toxic Ingestion?
Head Trauma?
Multiple Trauma?
Seizure / Postictal?

Universal Patient Care Protocol

↓

Screen patient for weapons
Screen for scene safety

↓

R	**<u>Establish rapport</u>** • Genuine respect for feelings / circumstances • Active listening • Eye contact and meet at eye level
	<u>Create a quiet and safe environment</u> • Only 1 provider talks to patient to limit stimuli • Decrease unnecessary stimuli
	<u>Identify major problem or crisis</u> • "What happened to upset you?" • "How are you feeling right now?"
	<u>Assess for suicidal and/or homicidal thoughts</u>
R	Pulse Oximetry, **if available**
A	Venous Access Procedure, **if possible**
P	Cardiac Monitor
P	**<u>If severe, causing physical symptoms or not responding to the above interventions</u>** Midazolam 2.5 mg IV / IN May repeat in 5 minutes up to total of 5 mg

↓

Notify Destination Hospital of pending arrival

Contact Medical Control if assistance is needed

Revised 11/8/2023

R	EMR
E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

Behavioral Health Crisis

Anxiety and disruptive, fights interventions, aggressive

Universal Patient Care Protocol

Call for help.
Call for additional resources.
Stage prior to arrival
or
Withdraw from scene until safe.

R	Screen patient for weapons. Screen for scene safety.
R	Pulse Oximetry, **if available**
A	Venous Access Procedure, **if possible**
P	ECG Monitor
P	Patient weight > 50 kg Midazolam 5 mg IM / IN OR 2.5 mg IV / IO May repeat in 5 minutes up to total of 10 mg Patient weight < 50 kg Midazolam 2.5 mg IM / IN OR 1 mg IV / IO

If Possible:

- Establish rapport
- Create a quiet and safe environment
- Identify major problem or crisis
- Assess for suicidal and/or homicidal thoughts

Transport
Contact Destination Facility

R	EMR
E	EMT
A	AEMT
P	Paramedic

See additional information on next page

Harrison County Hospital EMS

Behavioral Health Crisis

Excited / Agitated Delirium Syndrome

IMMEDIATE DANGER TO SELF OR STAFF

Enter from Behavior Emergencies Protocol

Assure other etiologies are considered such as blood glucose, trauma, other psychiatric problems.

Preferably before administration or as soon as possible after administration of Ketamine, have the following monitoring devices in place:

- oxygen by nasal cannula
- pulse oximetry
- capnography
- ECG monitor

R Assure Crew / First Responder / Patient Safety

Pulse Oximetry, **if available**

A Venous Access Procedure

P Cardiac Monitor

Ketamine - Adult
4 mg/kg IM
Maximum IM dose 400 mg
2mg/kg IV / IO
Age ≥ 65: Decrease dose by ½
Maximum IV / IO dose 200 mg

Ketamine - Pediatric (age ≤ 16)
4 mg/kg IM
2 mg/kg IV / IO
Maximum 150 mg

Call Medical Control for Additional Ketamine

R External Cooling Measures

Consider Restraint Procedure while maintaining personnel safety

Monitor per restraint procedure **if indicated**

Monitor and Reassess

Transport
Contact Destination Facility

Revised 12/6/2023

Harrison County Hospital EMS

Excited / Agitated Delirium Syndrome
Additional Information

Description

Excited / Agitated delirium (EXD) syndrome is a controversial topic and lacks high-quality evidence based research. EXD is not a recognized medical or psychological diagnosis in the United States. Responder and patient safety are paramount.

Signs/Symptoms

EXD is characterized by a sudden onset, bizarre and/or aggressive behavior, shouting, paranoia, panic, unexpected physical strength, and hyperthermia. The patient may also be naked or nearly naked.

Possible Causes

Most cases seem to be caused by stimulant drug use and in fewer cases psychiatric illness. The most common drug of abuse seems to be cocaine, but also methamphetamine, PCP and LSD.

Ketamine

Ketamine is classified as an analgesic and anesthetic. Precautions with Ketamine administration include:

- Increases in blood pressure and heart rate.
- Cardiac arrhythmias.
- Increased intracranial pressure.
- Respiratory depression
- Laryngeal spasm
- Pulmonary edema
- Hypersalivation.

Management of patient after administering Ketamine

- Be prepared for nausea/vomiting.
- Before administering, prepare for airway management with BVM, suction, oxygen, intubation equipment.

Harrison County Hospital EMS

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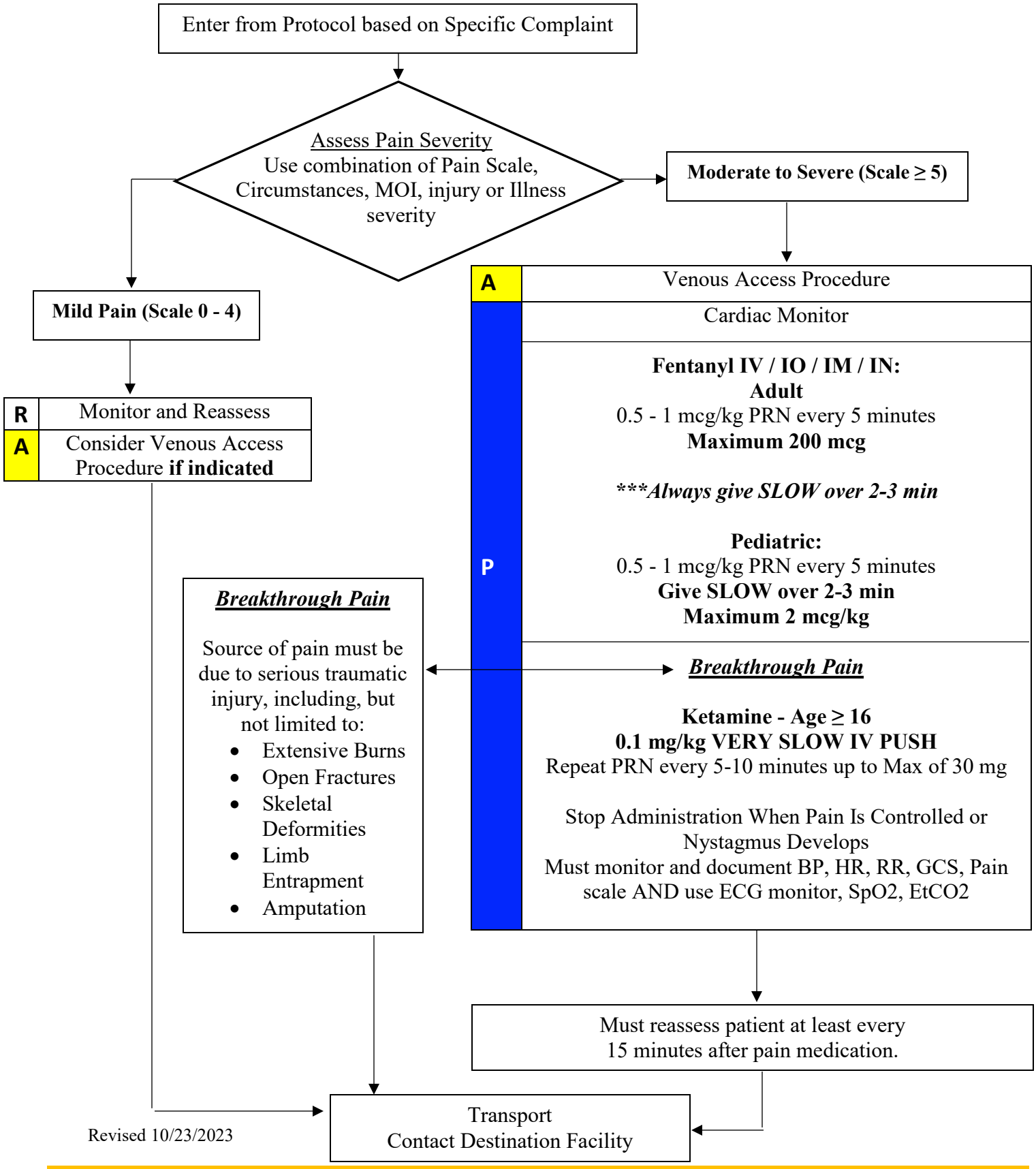
Harrison County Hospital EMS

Pain Control



Revised 10/23/2023

Harrison County Hospital EMS

Peripheral IV Line Maintenance

Authority: 836 IAC 1-2-3(f) and HCH EMS Medical Director

The following are not allowed for the EMT or AEMT

- Piggy-back or secondary intravenous line.
- Blood or blood products
- Additives, medications, or electrolytes contained in the intravenous fluid.
- Potassium

Universal Patient Care Protocol

The provider with the highest level of care should assess for actual or potential need for care or critical thinking that is outside the scope of practice or ability of the EMT.

E

EMT and AEMT may transport the following types of equipment, peripheral IV's and fluids. There is no restriction for the Paramedic.

- PCA pump infusing through a peripheral IV.
- Any peripheral IV or subcutaneous catheter via a closed, locked system.
- Central catheter that is clamped off and has nothing infusing.
- Feeding tube that is clamped off.
- Holter monitor.
- Any type of vitamin.
- IV fluids infusing by gravity or an infusing system limited to D5W, Lactated Ringers, sodium chloride 0.9% or less.

Seizure

Universal Patient Care Protocol

R
- Loosen any restrictive clothing
  Protect patient
- Blood Glucose Analysis Procedure
  If blood glucose is ≤ 59 or ≥ 250 go to Hypo/Hyperglycemia protocol

Altered Mental Status Protocol
if indicated

Behavioral Protocol
if indicated

A Venous Access Procedure

P Cardiac Monitor

Active Seizure Activity

Yes

No

Adult Airway Protocol(s)
as indicated

CONSIDER
Postictal State
Monitor and Reassess

Age Appropriate Airway Protocol(s)
as indicated

Obstetrical Emergency Protocol
Childbirth Protocol
if indicated

P

If Lorazepam is not available go directly to Midazolam

If <u>ADULT</u> patient is UNCONSCIOUS AND CONVULSING upon EMS arrival, give Lorazepam 2mg IV / IO over 2 minutes

Adult: May repeat one time 2 mg Lorazepam after 5 minutes for continued seizure activity

If seizure activity does not stop or recurs go to Midazolam

Midazolam
5 mg IV slow push
May repeat X 1 after 5 minutes
OR
10 mg IM / IN
IM preferred over IN
Maximum 10 mg

<u>PEDIATRIC:</u>
Midazolam 0.1 mg/kg IV / IO slow push
Max Dose: 4 mg
May repeat X 1 after 5 minutes
OR
0.2 mg/kg IM / IN
IM preferred over IN
Maximum 8mg

R Monitor and Reassess

Transport
Notify Destination Facility

Active Seizure in Known or Suspected Pregnancy > 20 Weeks

P

Magnesium Sulfate
4 g IV / IO Infusion over 2 - 3 minutes
For persistent seizure after 5-10 minutes, may repeat 2 g.

Harrison County Hospital EMS

Suspected Sepsis

Universal Patient Care Protocol

Consider Contact, Droplet, and Airborne Precautions

Measure Temperature

Altered Mental Status Protocol, **if needed**

E	12 Lead ECG Acquisition and Transmission, **if available**
A	Venous Access Procedure
P	Cardiac Monitor

Sepsis Screen Positive?

Yes

No

Go to Age Appropriate Condition Appropriate Protocol(s)

SEPSIS SCREEN:

Obvious or suspected source of infection AND any of these SIRS / shock criteria:

- SBP < 100 mmHg
- Heart rate > 90/minute
- Respiratory Rate > 20/minute
- GCS < 15
- Temperature ≥ 100.4 °F or < 96.0 °F

PEDIATRIC SIRS CRITERIA

Temperature

Same as adult

AND

Heart Rate

1 month - 1 year > 180

2 - 5 years > 140

6 - 12 years > 130

> 12 years > 110

A **Normal Saline bolus**

Adult: 500 mL

Repeat as needed: **Max 2 L**

Peds: 20 mL/kg

Repeat as needed: **Max 60 mL/kg**

Reassess SIRS criteria and reexamine after initial bolus. Repeat bolus as long as any SIRS criteria present, unless concern for fluid overload.

Monitor EtCO2. Is the EtCO2 ≤ 25 consistently for at least a period of 5 minutes?

No

Yes

SEPSIS ALERT

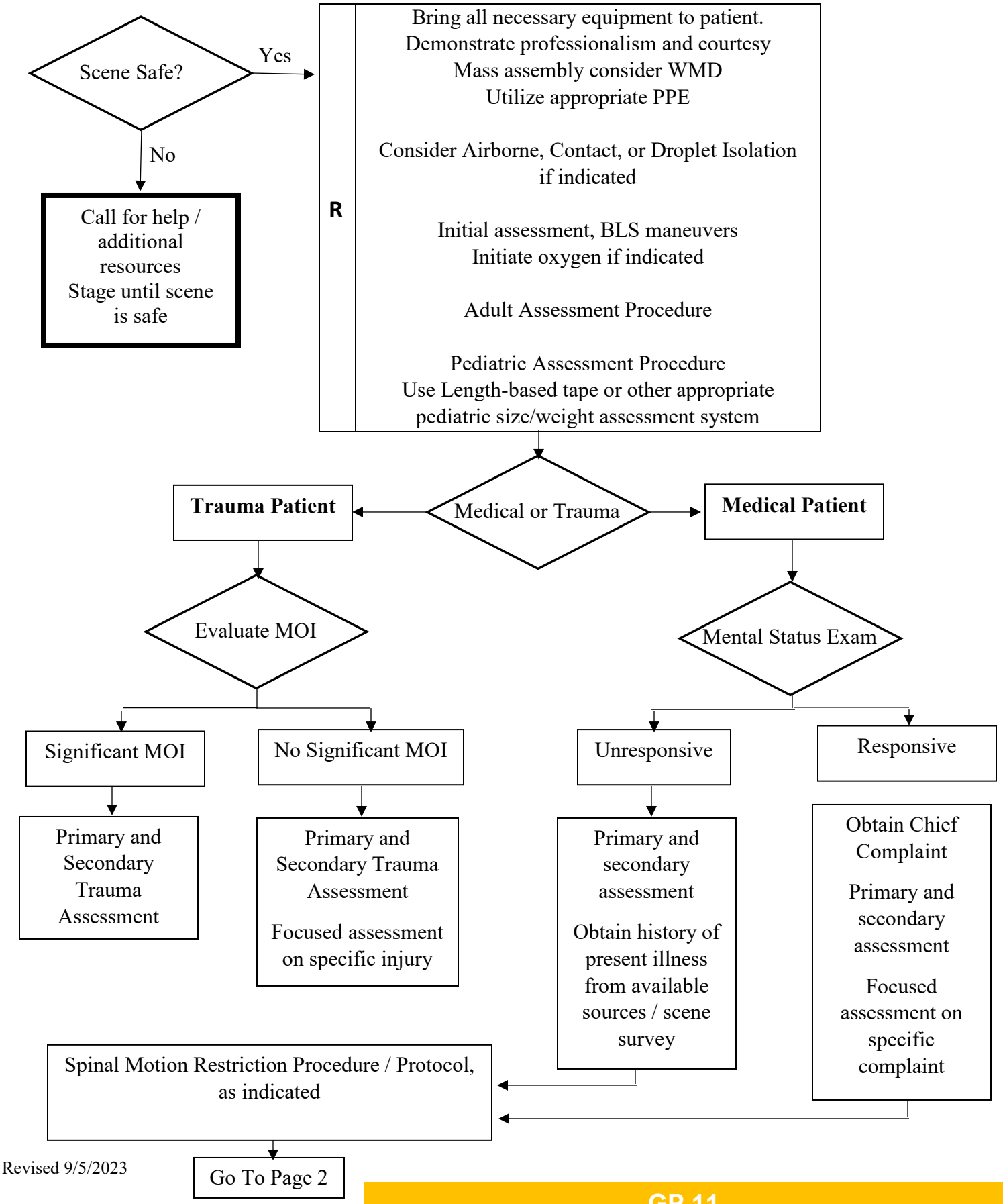
Notify receiving Facility during transport

Notify Destination Facility

Revised 9/15/2023

Harrison County Hospital EMS

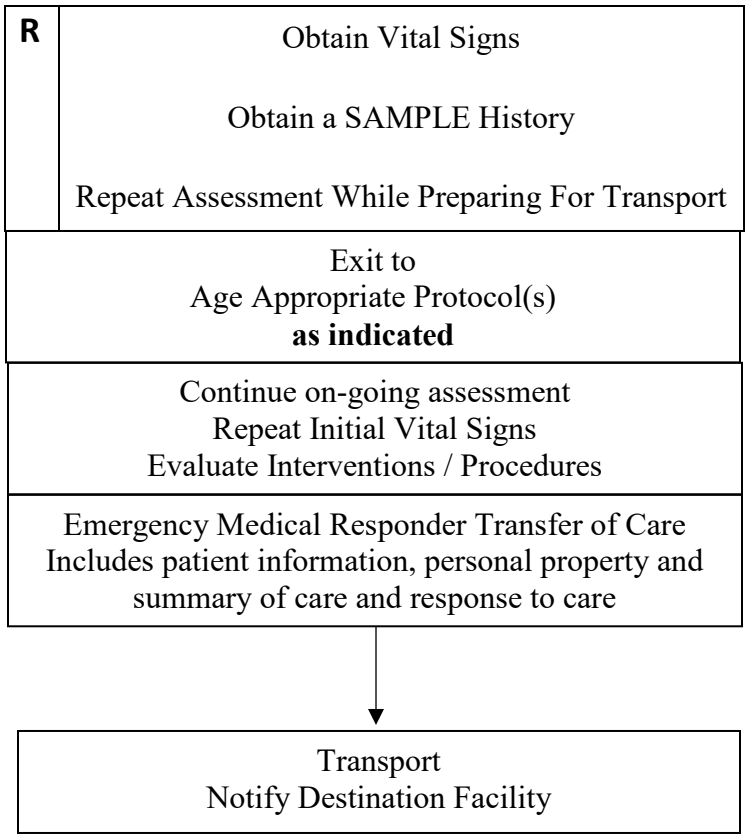
Universal Patient Care - Page 1



Revised 9/5/2023

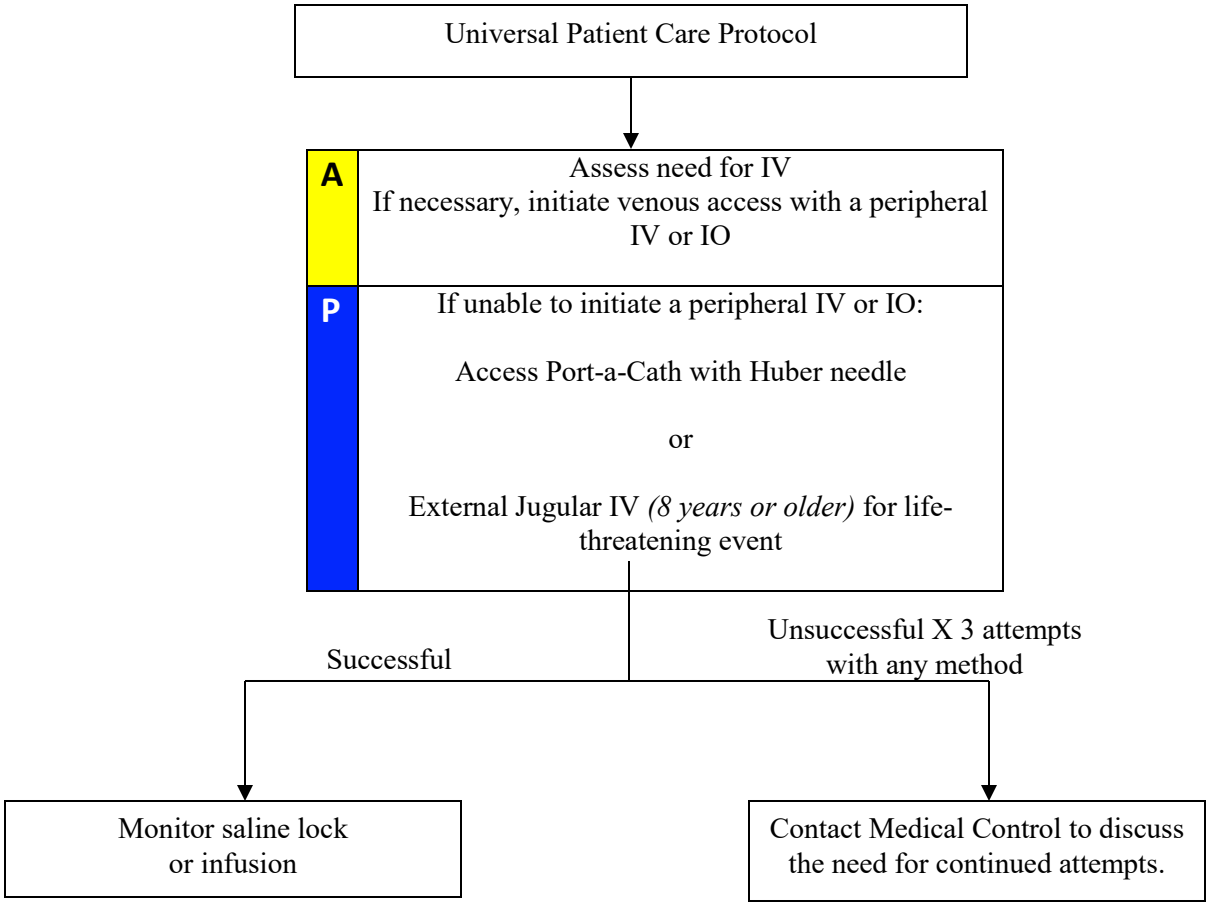
Harrison County Hospital EMS

Universal Patient Care - Page 2



Harrison County Hospital EMS

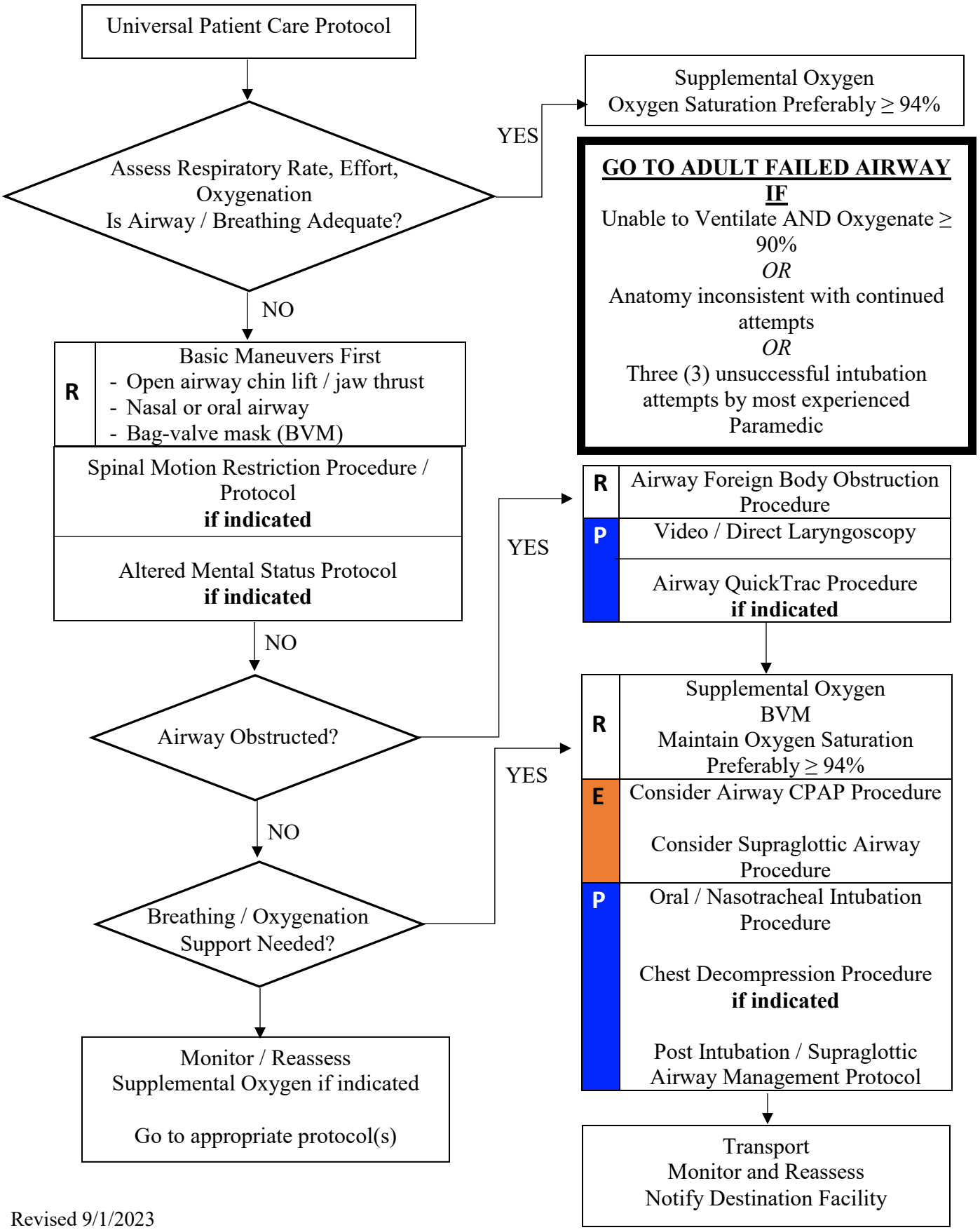
Venous Access



NOTE:
Contact Medical Control before accessing any non-traditional access devices, such as PICC, Central Venous Catheters, dialysis shunts, etc.

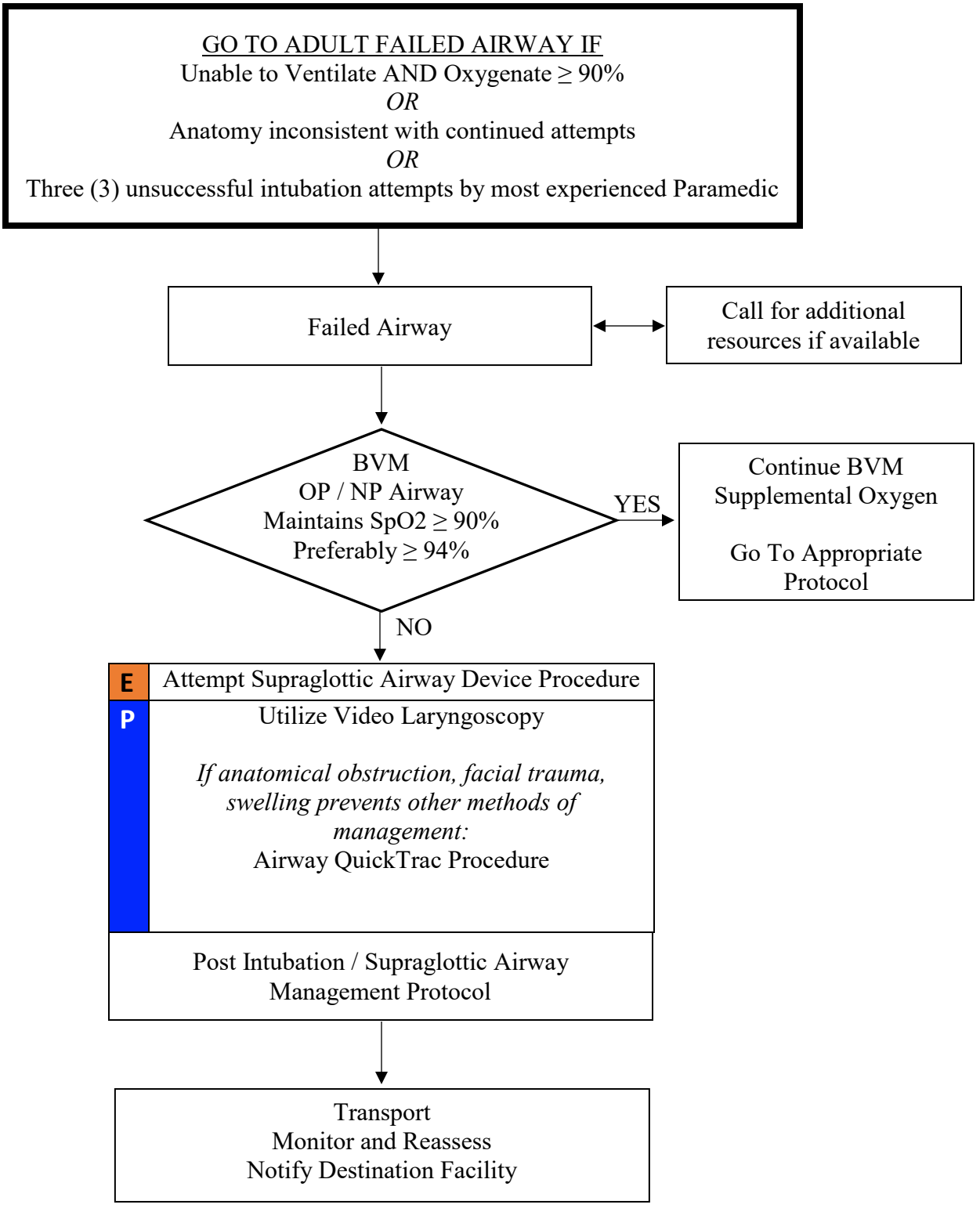
Harrison County Hospital EMS

Adult Airway



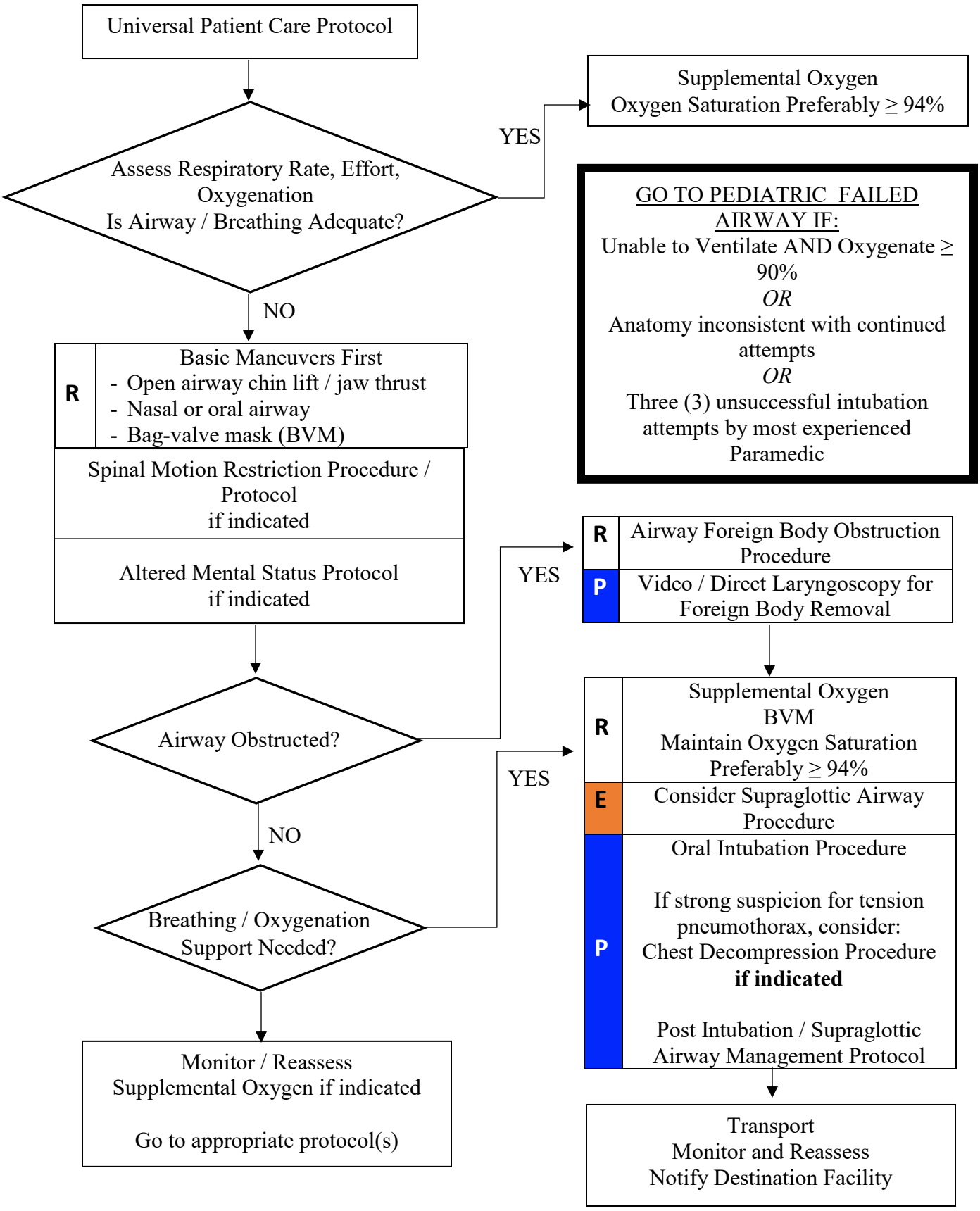
Revised 9/1/2023

Adult, Failed Airway



Harrison County Hospital EMS

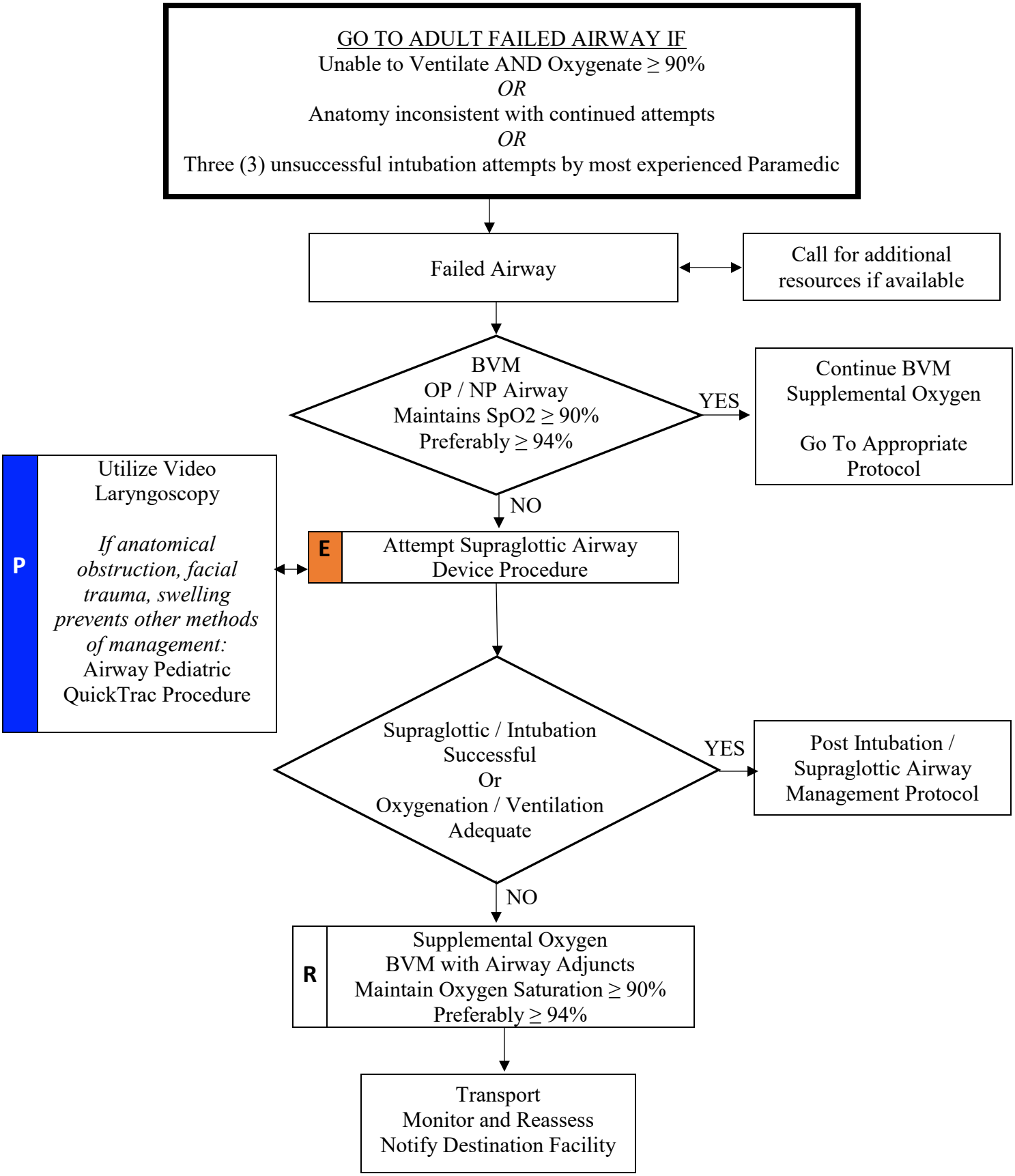
Pediatric Airway



Revised 9/1/2023

Harrison County Hospital EMS

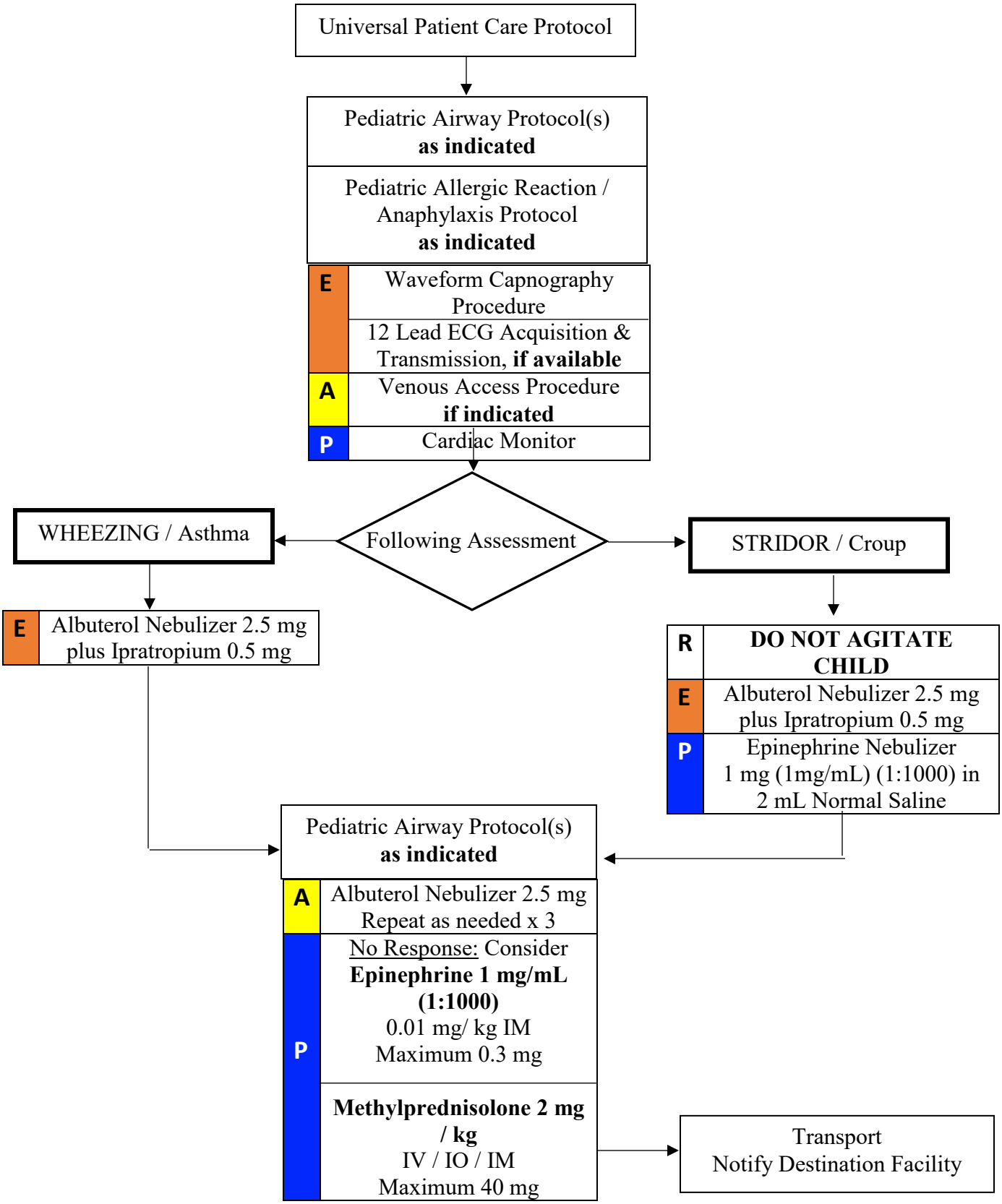
Pediatric, Failed Airway



Revised 9/1/2023

Harrison County Hospital EMS

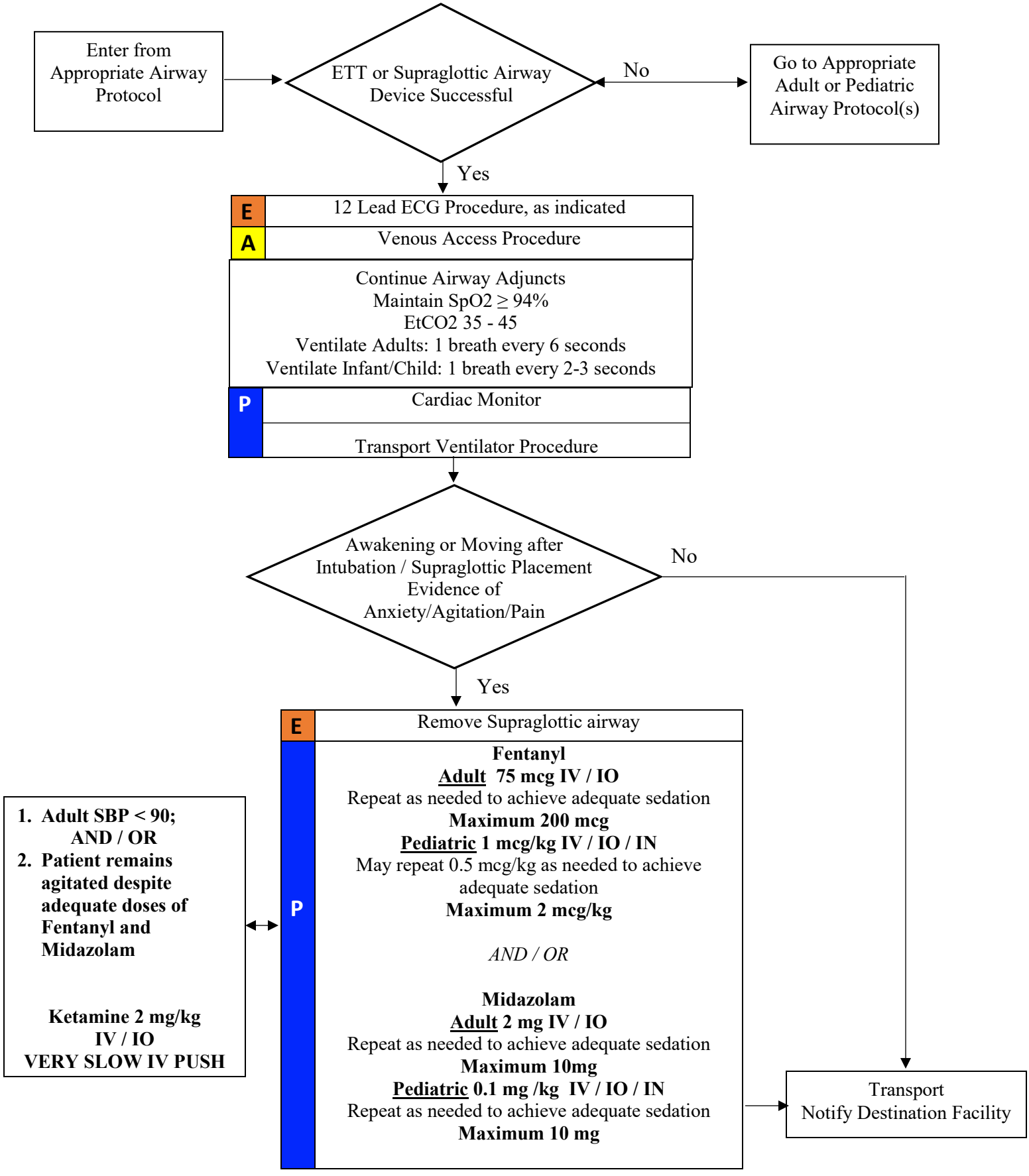
Pediatric Asthma
Respiratory Distress



Revised 11/18/2023

Harrison County Hospital EMS

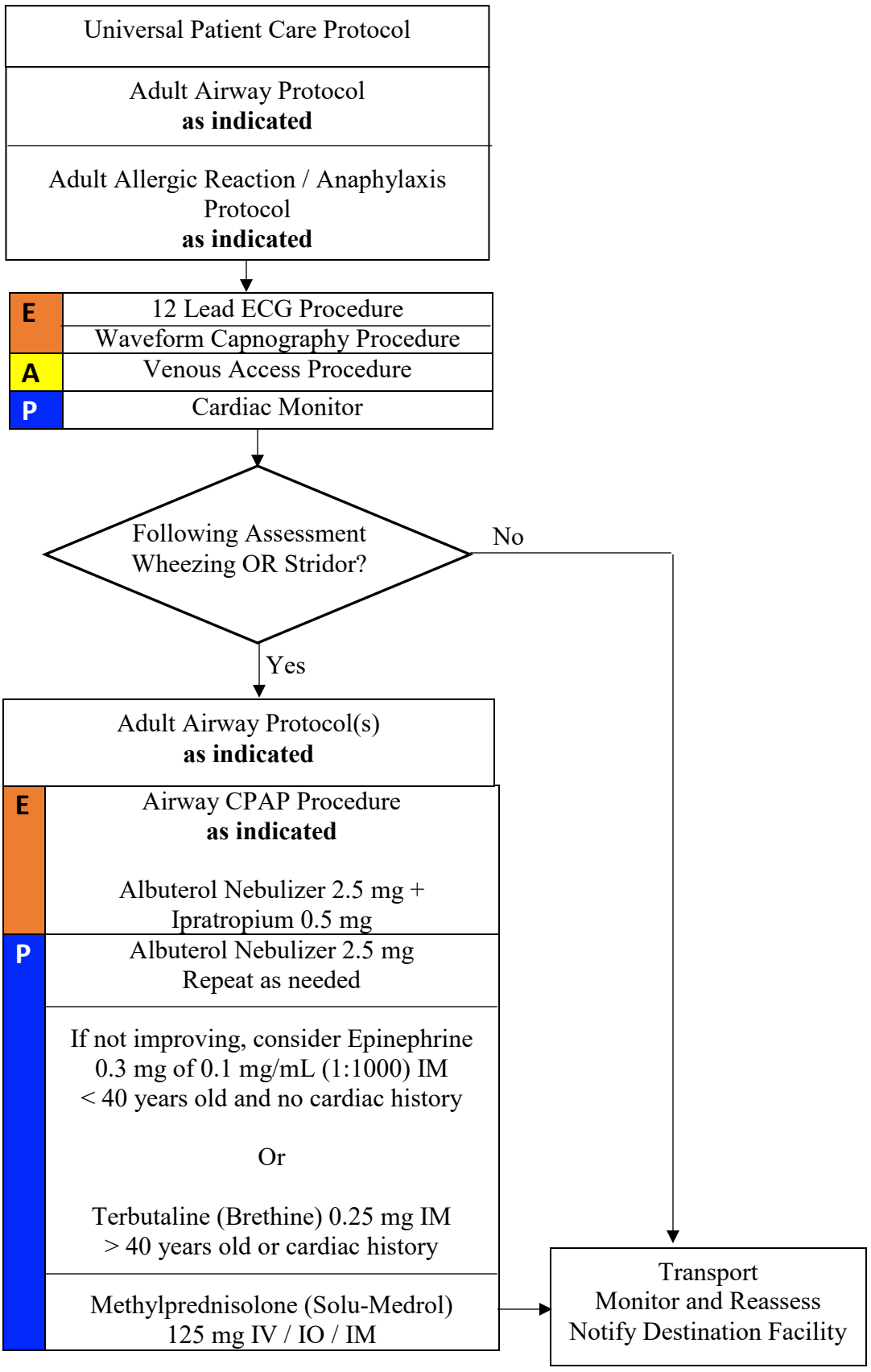
Post Intubation / Post Supraglottic Airway Management



Revised 10/23/2023

Harrison County Hospital EMS

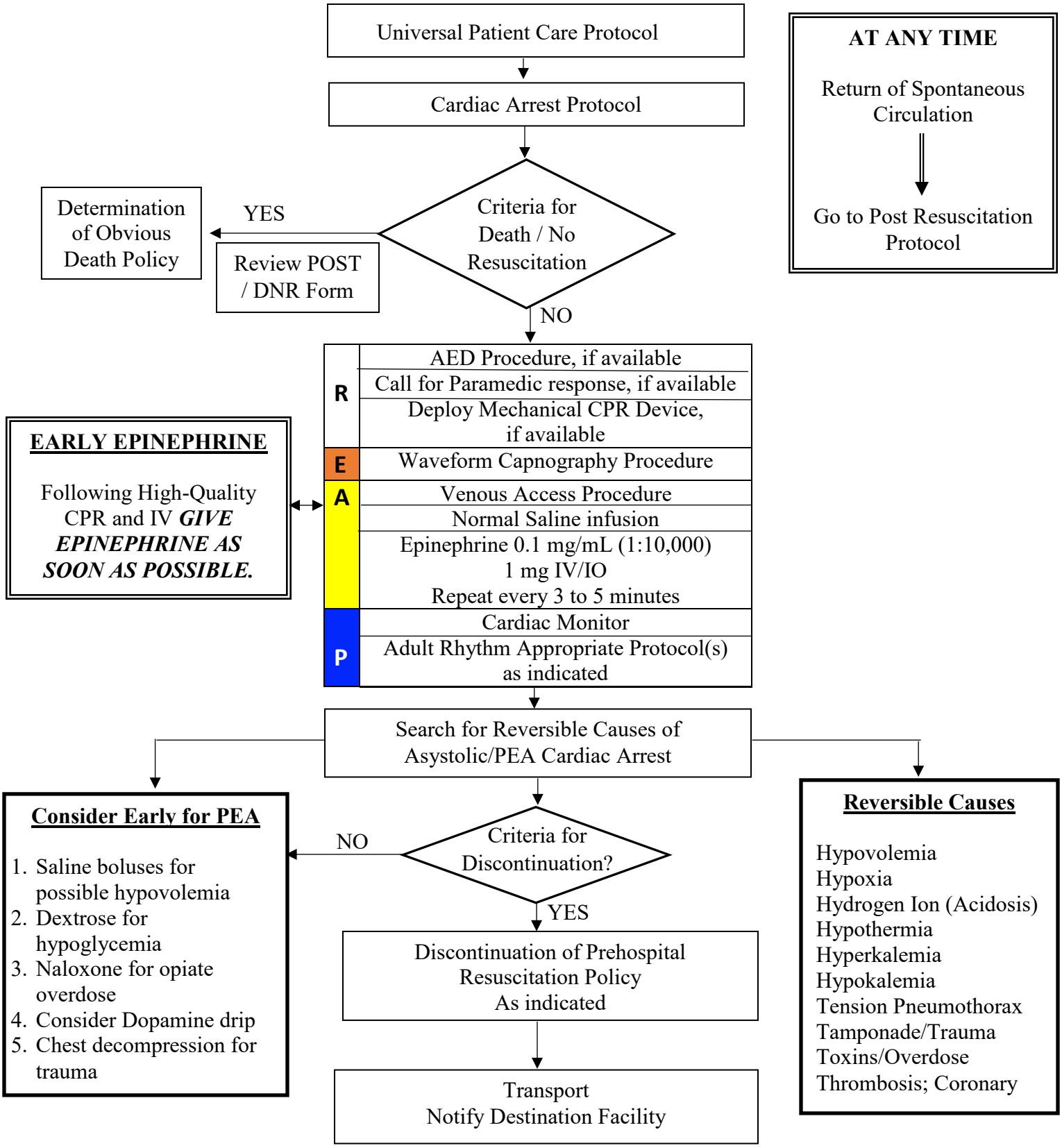
Adult COPD / Asthma (Respiratory Distress)



Revised 11/18/2023

Harrison County Hospital EMS

Adult Asystole / Pulseless Electrical Activity



Revised 11/8/2023

Harrison County Hospital EMS

Adult Bradycardia - Pulse Present

Universal Patient Care Protocol

HR < 60 / min and Symptomatic:
hypotension, acute altered mental status, chest pain/discomfort, acute CHF, seizures, syncope, or shock secondary to Bradycardia.

Airway Protocol(s) if indicated

Respiratory Distress Protocol if indicated

Chest Pain: Cardiac and STEMI Protocol if indicated

R	Call for Paramedic if available
E	Search for Reversible Causes 12 Lead ECG Acquisition / Transmission, if available
A	Venous Access Procedure Normal Saline Fluid Bolus in 500 mL increments for hypotension *(unless Acute CHF)*
P	Cardiac Monitor
	12 Lead ECG Procedure
	Atropine 1 mg IV / IO *May repeat every 3-5 minutes* **Maximum 3 mg**
	If No Improvement Transcutaneous Pacing *(Consider early in 2° or 3° AV Block)*
	And / Or Dopamine infusion Acute Symptomatic Bradycardia: 2 to 10 mcg/kg/min IV / IO Cardiogenic Shock / Hypotension: 2 to 5 mcg/kg/min

Reversible Causes
Hypovolemia
Hypoxia
Hydrogen Ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

Tension Pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

P	Consider Sedation Midazolam 1 to 2.5 mg, IV / IO slowly over 2 minutes ALTERNATIVE Fentanyl 1 mcg/kg, IV / IO Max dose 100 mcg, give slowly over 2-3 minutes **DO NOT GIVE BOTH MIDAZOLAM AND FENTANYL**

Notes:

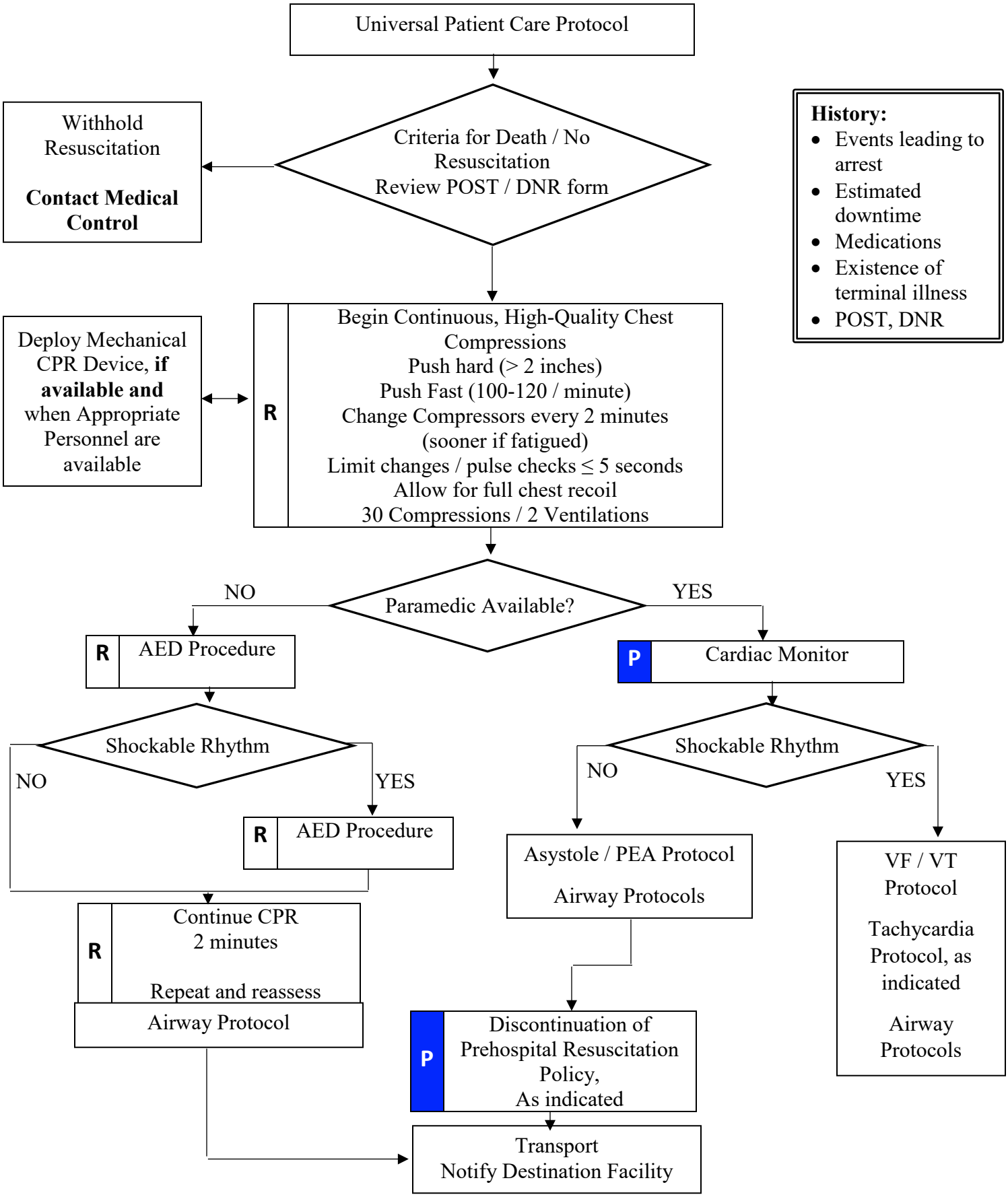
- Treat the patient, not the monitor. Bradycardia does not necessarily mean the patient is symptomatic or unstable.
- Hypoxemia is a common cause of bradycardia. Correct oxygenation issues before proceeding to other therapy.
- 12 Lead ECG should be done as soon as possible based on patient condition. However, don't delay therapy to perform a 12 Lead ECG.

Transport
Monitor and Reassess
Notify Destination Facility

Revised 9/5/2023

Harrison County Hospital EMS

Cardiac Arrest



Revised 9/5/2023

Harrison County Hospital EMS

Chest Pain: Cardiac and STEMI

Universal Patient Care Protocol

E

12 Lead Acquisition and Transmission if available

Aspirin 81 mg x 4 chewed

Assist with patient's Nitroglycerin 0.4 mg SL
May repeat every 5 minutes x 3
If prescribed to patient and blood pressure ≥ 100 mm Hg

A

Venous Access Procedure

Aspirin, if not already given

Nitroglycerine 0.4 mg Sublingual
May repeat every 5 minutes x 3
If blood pressure ≥ 100 mm Hg

P

Cardiac Monitor
12 Lead ECG Procedure

If pain not improved with Nitroglycerine, consider Morphine IV / IO, 2 mg increments to maximum of 6 mg.

OR

Fentanyl 50 mcg IV / IO
Repeat 25 mcg every 20 minutes as needed
Maximum 200 mcg

Acute MI / STEMI
STEMI = 2 mm ST Segment Elevation ≥ 2 Contiguous Leads

Transport to a Facility Capable of Cardiac Catheterization and Notify Facility As Soon As Possible

Keep Scene Time as short as possible; ideally ≤ 15 minutes

Hypotension / Shock Protocol if indicated

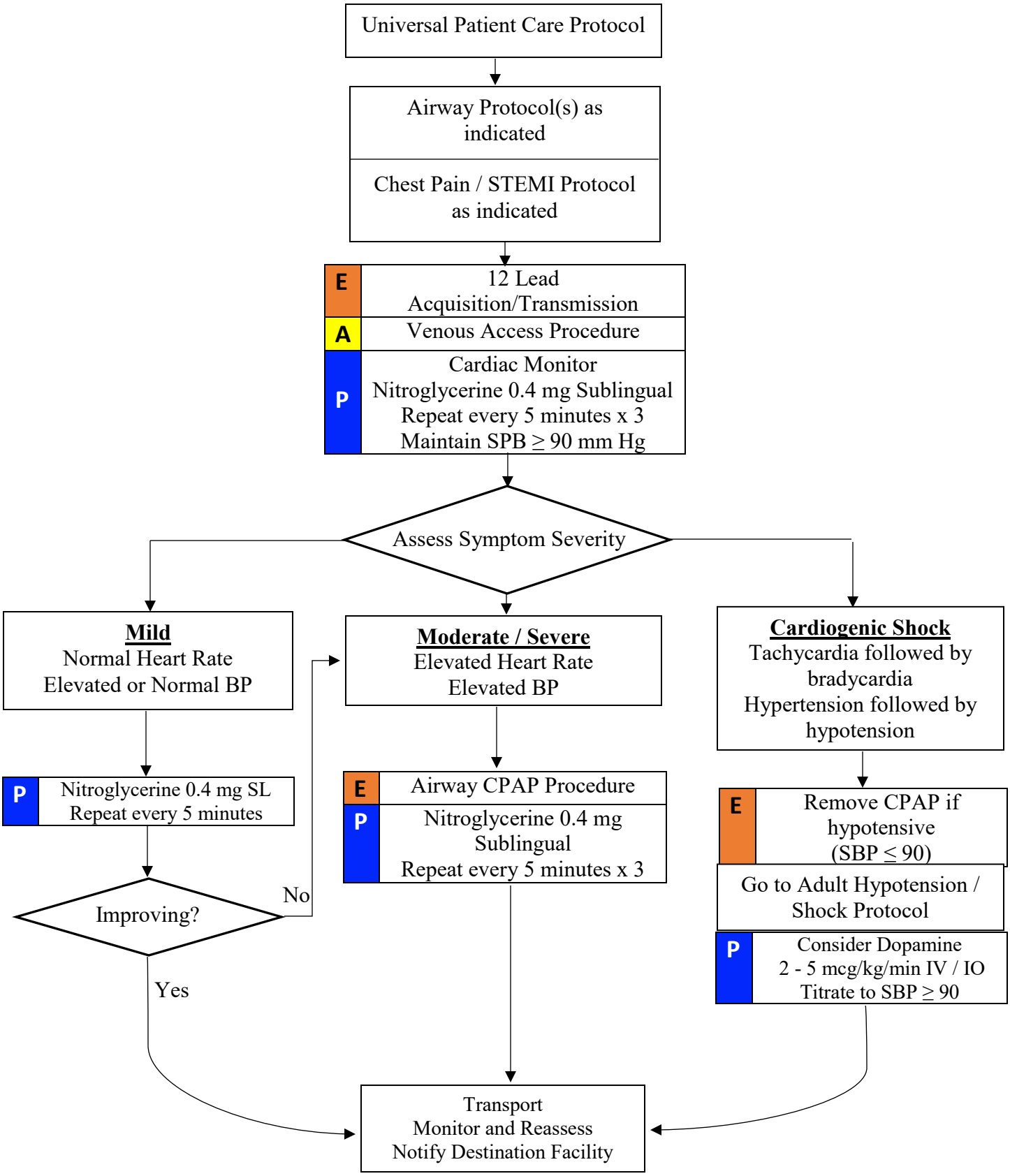
CHF / Pulmonary Edema Protocol if indicated

Transport
Monitor and Reassess
Notify Destination Facility

Revised 9/5/2023

Harrison County Hospital EMS

CHF / Pulmonary Edema



Revised 9/1/2023

Harrison County Hospital EMS

CODE STEMI - Norton Healthcare (Norton Hospital Downtown Only)

Enter from Chest Pain Protocol →

Suspected STEMI either from Paramedic 12 Lead interpretation or EMT/AEMT 12 Lead acquisition.

↓

E Verify criteria for cath lab activation from CODE STEMI procedure

↓

Call the Norton Access Center at:

1-888-486-6786

State "CODE STEMI"

Be prepared to give the following information:

- Patient's name
- Any demographic information you have, i.e. DOB, SSN

↓

If patient goes into cardiac arrest during transport

- Divert to the nearest Emergency Department.
- If you have crossed the Ohio River, proceed to Norton Hospital Downtown Emergency Department. Notify the ED as soon as possible at (502) 629-3434

↓

Contact Medical Control if necessary

Harrison County Hospital EMS
Post Resuscitation Care (ROSC)

Repeat Primary Assessment

R — **Optimize Ventilation, Oxygenation, Perfusion**
- Maintain SpO2 = 92% - 98%
- Respiratory Rate 10 breaths / minute
- EtCO2 ideally 35-45 mm Hg
- Maintain SBP ≥ 90 mm Hg
- **DO NOT HYPERVENTILATE**

Go to Airway Protocol's if indicated

E — 12 Lead ECG Procedure

A — Venous Access Procedure, establish secondary access

P — Cardiac Monitor

R — Monitor Vital Signs / Reassess

P — <u>Prepare for possible re-arrest, PREPARE to take care of a critically ill patient</u>

1. One provider should monitor pulse at all times.
2. Be prepared to use Dopamine if necessary.

Go to Appropriate Protocol as indicated
- Chest Pain / STEMI
- Hypotension / Shock
- Appropriate Arrhythmia Protocol
- Post Intubation / Supraglottic

A — Normal Saline Bolus 500 mL IV / IO
May repeat as needed if lungs remain clear.

P — Dopamine 2 - 5 mcg/kg/min IV / IO
Titrate Dopamine to SBP ≥ 90

Dysrhythmias are common and usually self-limiting after ROSC and may not need further treatment. Providers SHOULD treat worsening bradycardia, as it may precede re-arrest.

If dysrhythmia persists follow rhythm appropriate protocol.

Transport
Notify Destination Facility

Revised 9/15/2023

Harrison County Hospital EMS

Tachycardia
Narrow Complex (< 0.12 sec)

Universal Patient Care Protocol

Unstable / Serious Signs and symptoms
HR Typically > 150
Hypotension/no radial pulse, Acute AMS, Ischemic Chest Pain, Acute CHF, Seizures, Syncope, or Shock secondary to tachycardia

Yes

P

Synchronized Cardioversion Procedure

Consider Sedation Prior to Cardioversion
Midazolam 2.5 mg IV / IO slowly over 2 minutes.
Cease administration at necessary sedation level up to 2.5 mg.

Narrow QRS and Regular:
100 Joules
May repeat if needed at 120 J, and then 200 J. Check pulse and evaluate for cardiac arrest after each cardioversion.

ALTERNATIVE SEDATION/PAIN CONTROL
Fentanyl 1 mcg/kg IV/IO/IM/IN

DO NOT GIVE BOTH MIDAZOLAM AND FENTANYL

Max dose 100 mcg
Give slow over 2-3 minutes

Cease administration at necessary sedation level up to 1 mcg/kg with max dose 100 mcg

No

E	12 Lead ECG Procedure
A	Venous Access Procedure
P	Cardiac Monitor
	Attempt Vagal Maneuvers Procedure if rhythm is regular
	Adenosine, if rhythm is regular 6 mg IV / IO Rapid Push with Flush
	If Rhythm Does Not Slow in 1-2 minutes Adenosine, if rhythm is regular 12 mg IV / IO Rapid Push with Flush

Go To Appropriate Protocol(s) if rhythm converts

RHYTHM CONVERTS

Yes

R	Monitor and reassess
E	12 Lead ECG Procedure

No

Monitor and Reassess

Transport
Notify Destination Facility

Harrison County Hospital EMS

Adult Tachycardia
Wide Complex QRS (≥ 0.12 sec)

Universal Patient Care Protocol

Unstable / Serious Signs and symptoms
HR Typically > 150
Hypotension/no radial pulse, Acute AMS, Ischemic Chest Pain, Acute CHF, Seizures, Syncope, or Shock secondary to tachycardia

Yes

P	Synchronized Cardioversion Procedure
	Consider Sedation Prior to Cardioversion Midazolam 2.5 mg IV / IO over 2 minutes. Cease administration at necessary sedation level up to 2.5 mg.
	Wide QRS and Monomorphic 100 J, 120 J, 200 J successively Attempt to synchronize. If monitor does not recognize R waves and unstable patient, defibrillate May repeat 1 time, if needed up to 200 J; check pulse and evaluate for cardiac arrest if no conversion
	ALTERNATIVE SEDATION/PAIN CONTROL Fentanyl 1 mcg/kg IV / IO / IM / IN **DO NOT GIVE BOTH MIDAZOLAM AND FENTANYL** **Max dose 100 mcg** **Give slowly over 2-3 minutes** Cease administration at necessary sedation level up to 1 mcg/kg with max dose 100 mcg

Go To Appropriate Protocol(s) if rhythm converts

No

E	12 Lead ECG Procedure
A	Venous Access Procedure
P	Cardiac Monitor

REGULAR RHYTHM
Monomorphic QRS Complex

P	History of SVT with aberrancy? Adenosine 6 mg IV / IO with Rapid Flush May repeat 1 time with 12 mg IV / IO
	Amiodarone is a first-line agent for WCT Amiodarone 150 mg IV / IO in normal saline Infuse over 10 minutes

RHYTHM CONVERTS

Yes

R	Monitor and reassess
E	12 Lead ECG Procedure

No

Monitor and Reassess

Transport
Notify Destination Facility

Harrison County Hospital EMS
VENTRICULAR FIBRILLATION/PULSELESS VENTRICULAR TACHYCARDIA (VF/VT) - Adult

Cardiac Arrest Protocol → Universal Patient Care Protocol

At Any Time

Rhythm changes to non-shockable rhythm

Go to appropriate Protocol

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen Ion (acidosis)
Hypo-/Hyperkalemia
Hypothermia

Tension Pneumothorax
Tamponade, cardiac
Toxins/Overdose
Thrombosis, pulmonary (PE) or coronary (MI)

P

Defibrillate 120 Joules without delay

Begin Continuous Chest Compressions
Push Hard (≥ 2 inches) Push Fast (100 - 120 / min)
Change Compressors every 2 minutes
(sooner if fatigued)
Limit Changes / Pulse Checks ≤ 5 sec
Ventilate 2 Breaths after each 30 Compressions (30:2)
If Advanced Airway is in Place, Ventilate 1 breath every 6 seconds
Monitor EtCO2

At the end of each 2 minute cycle
Let AED Analyze / Interpret Rhythm by Filtered view / Precharge Defibrillator if Shockable Rhythm

Search for Reversible Causes Throughout Code

A

Venous Access Procedure

Epinephrine 0.1 mg/mL (1:10,000) 1 mg IV / IO
Repeat every 3 to 5 minutes

R

Continue 2 minute cycles of high-quality CPR, analyzing rhythm and defibrillation as long as VF/pVT or non-shockable rhythm persists

P

Use escalating shocks of 150 Joules, then 200 Joules as long as VF / pVT persists

After 2nd shock, if VF / pVT persists:
Amiodarone 300 mg IV / IO
May repeat if no rhythm change:
Amiodarone 150 mg IV / IO

If Rhythm is Torsades de Pointes, low magnesium states, suspected digitalis toxicity
Magnesium Sulfate 2 grams, diluted in 10 mL normal saline, give over 20 minutes

At Any Time

Return of Spontaneous Circulation

Go to Post Resuscitation

Transport
Notify Destination Facility

Revised 9/5/2023

Harrison County Hospital EMS

Allergic Reaction / Anaphylaxis

Universal Patient Care Protocol

A Venous Access Procedure, **if indicated**

P Cardiac Monitor

Assess Symptom Severity / Suspected Exposure to Allergen

Mild
Hives and/or Rash
No respiratory component

P Consider Diphenhydramine (Benadryl), 25 mg IV/IM

Transport
Monitor and Reassess
Notify Destination Facility

Moderate / Severe
Hives / Rash, itching, respiratory difficulty

R Epinephrine Autoinjector, **if available**

E
- Epinephrine 0.3 - 0.5 mg IM (1 mg/mL), **if not previously given**
- Albuterol 2.5 mg / Ipratropium 0.5 mg Nebulizer,
  Continuous Albuterol, **if indicated**
- Waveform Capnography

A
- Venous Access Procedure
- Epinephrine 0.3 - 0.5 mg IM (1mg/mL) **if not previously given**
  Normal Saline Bolus 500 mL IV
  Repeat as needed to maintain SBP ≥ 90 mmHg

P
- Cardiac Monitor
- Diphenhydramine (Benedryl), 50 mg IV/IM
- Solu-Medrol 125 mg IV

Go to Airway / Respiratory protocols, **if indicated**

Go to Hypotension protocol, **if indicated**

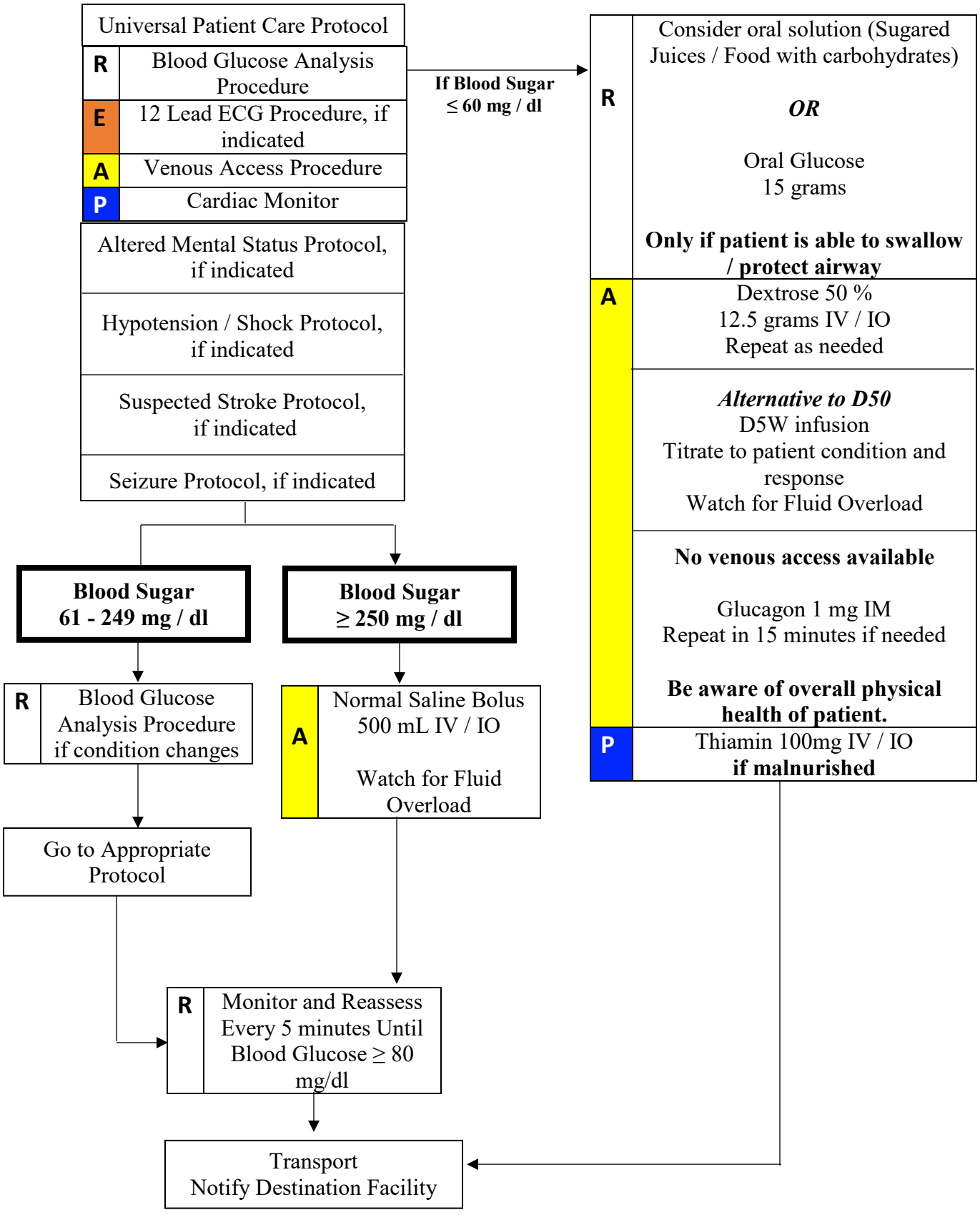
P For refractory/peri-arrest Anaphylixis, consider Epinephrine 0.1 mg/mL (1:10,000), 0.1 mg IV
May repeat to max 0.3 mg

Transport
Monitor and Reassess
Notify Destination

Revised 10/20/2023

Harrison County Hospital EMS

Diabetic; Adult



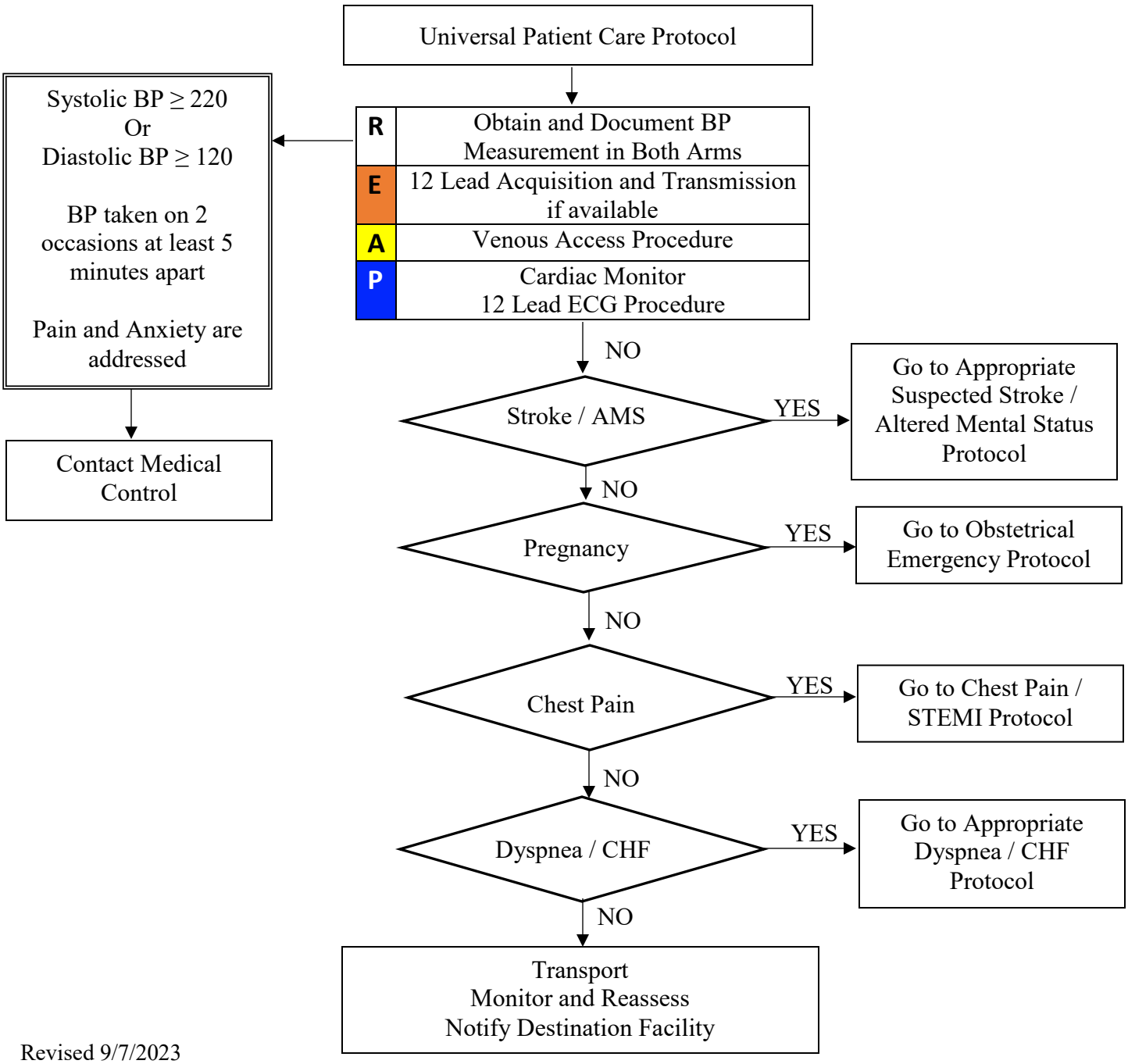
Revised 11/21/2023

Harrison County Hospital EMS

Hypertensive Emergency

Hypertension is common especially in an emergency setting. Hypertension is usually transient and in response to stress and / or pain. A hypertensive emergency is based on blood pressure along with symptoms which suggest an organ is suffering damage such as MI, CVA, or renal failure. This is very difficult to determine in the pre-hospital setting in most cases.

Aggressive treatment of hypertension can result in harm. Most patients, even with significant elevation in blood pressure, need only supportive care. Specific complaints such as chest pain, dyspnea, pulmonary edema, or altered mental status should be treated based on specific protocols and consultation with Medical Control.



Revised 9/7/2023

Harrison County Hospital EMS

Hypotension / Shock

Universal Patient Care Protocol

Go to Diabetic - Adult protocol, if indicated.

R	Blood Glucose Analysis Procedure, if available
E	12 Lead ECG Acquisition and Transmission if available
A	Venous Access Procedure
P	Cardiac Monitor

Go to Appropriate Cardiac / Arrhythmia Protocol

History and Exam Suggest Type of Shock

Cardiogenic

Go to Chest Pain / STEMI Protocol or other Appropriate Cardiac Protocol

Hypovolemic

Distributive

Allergy Protocol **if indicated**

Suspected Sepsis Protocol **if indicated**

Multiple Trauma Protocol **if indicated**

Obstructive

P — Chest Decompression - Spear Procedure **if indicated**

A

Caution with excess fluids in Cardiogenic Shock;
consider presence of pulmonary edema
(no rales or crackles)
Consider Normal Saline Bolus 500 mL IV
Repeat as necessary for SBP ≥ 90 mm Hg

P

Cardiogenic Shock
Norepinephrine (Levophed)
8 - 12 mcg/min IV infusion
OR
Dopamine 2 - 5 mcg/kg/min IV infusion

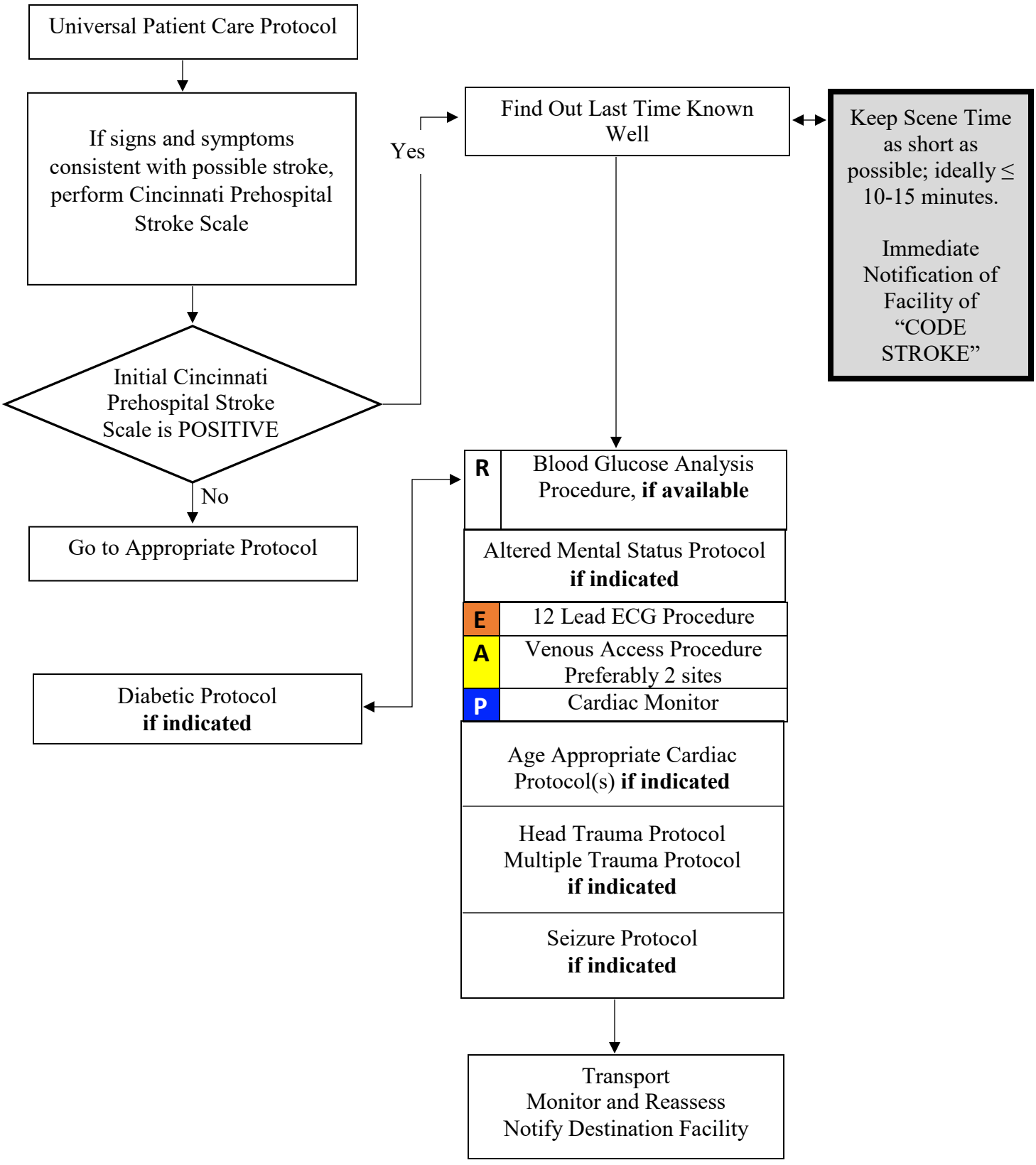
Non-Cardiogenic Shock
Norepinephrine (Levophed)
8 - 12 mcg/min IV infusion
OR
Dopamine
5 - 20 mcg/kg/min IV infusion

Titrate to systolic BP ≥ 90 mm Hg

Transport
Monitor and Reassess
Notify Destination Facility

Revised 11/18/2023

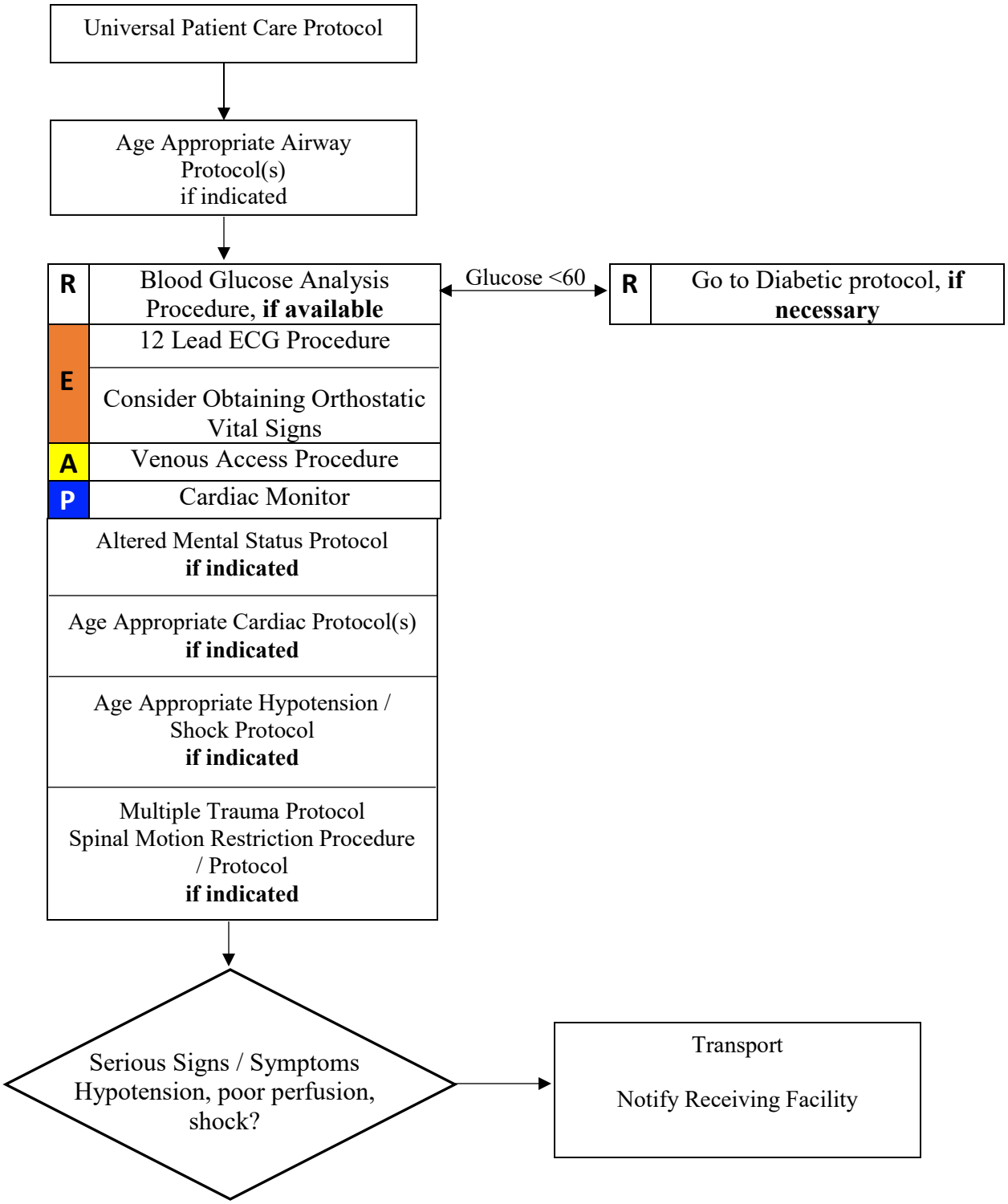
Suspected Stroke



Revised 9/7/2023

Harrison County Hospital EMS

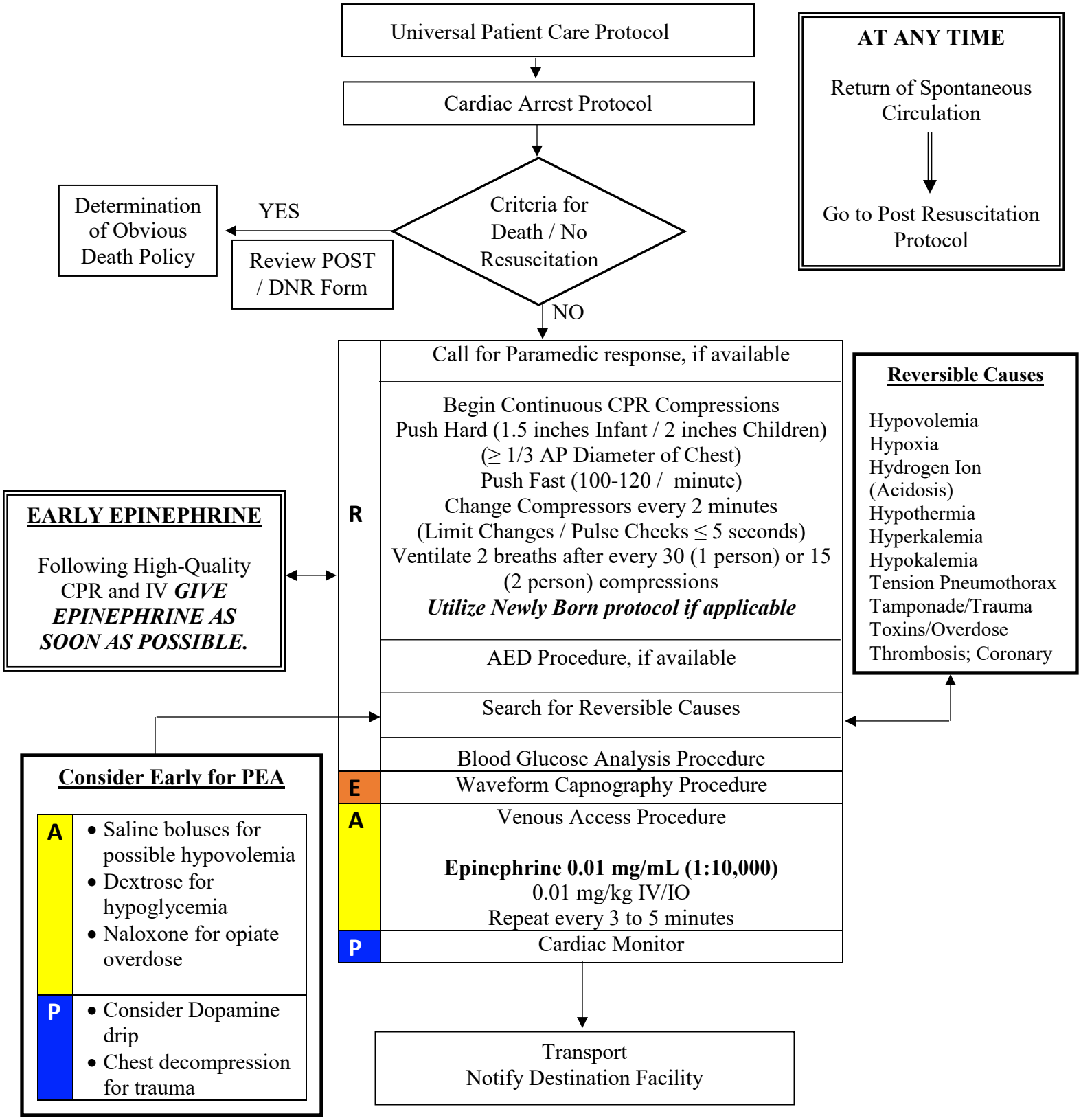
Syncope



Revised 9/7/2023

Harrison County Hospital EMS

Pediatric Asystole / Pulseless Electrical Activity



Revised 11/8/2023

Harrison County Hospital EMS

Pediatric Bradycardia with Poor Perfusion

Bradycardia causing hypotension, altered mental status, shock.

Typically HR < 50/minute

↓

Pediatric Airway Protocol, **as indicated**

R	Identify underlying cause Blood Glucose Analysis Procedure If pulse < 60/minute, assure adequate oxygenation and ventilation
R	If pulse is still <60/minute, begin CPR
P	Identify underlying cause
	Cardiac Monitor Search for reversible causes
A	Venous Access Procedure Normal Saline Bolus 20 mL/kg IV/IO Repeat as needed x 3, **Max 60 mL/kg**
P	Epinephrine 0.1 mg/mL (1:10,000) 0.01 mg/kg IV/IO Repeat every 3-5 minutes or Dopamine 5 - 20 mcg / kg / min IV / IO

↔

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

Tension Pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; Pulmonary (PE)
Thrombosis; Coronary (MI)

↓

Proceed to Page 2

Harrison County Hospital EMS

From Page 1

P

Atropine 0.02 mg / kg IV / IO

May repeat x 1

Minimum single dose 0.1 mg

Maximum single dose 0.5 mg

P

Consider Cardiac Pacing Procedure

P

Sedation For Pacing

Midazolam 0.1-0.2 mg/kg IV / IO / IM / IN
To maximum 2.5 mg initial dose.
May repeat in 5-10 minutes as needed to maximum 5mg

or

Fentanyl 1-2 mcg/kg IV / IO / IM / IN
Maximum initial dose 75 mcg
May repeat 0.5 mcg/kg every 5 minutes as needed
Maximum total dose 150 mcg

Bradycardia / Heart Rate < 60 Persists

AND

Poor Perfusion / Shock

Consider PEA cardiac arrest

Yes

Exit to Pediatric Cardiac Arrest Protocol(s)

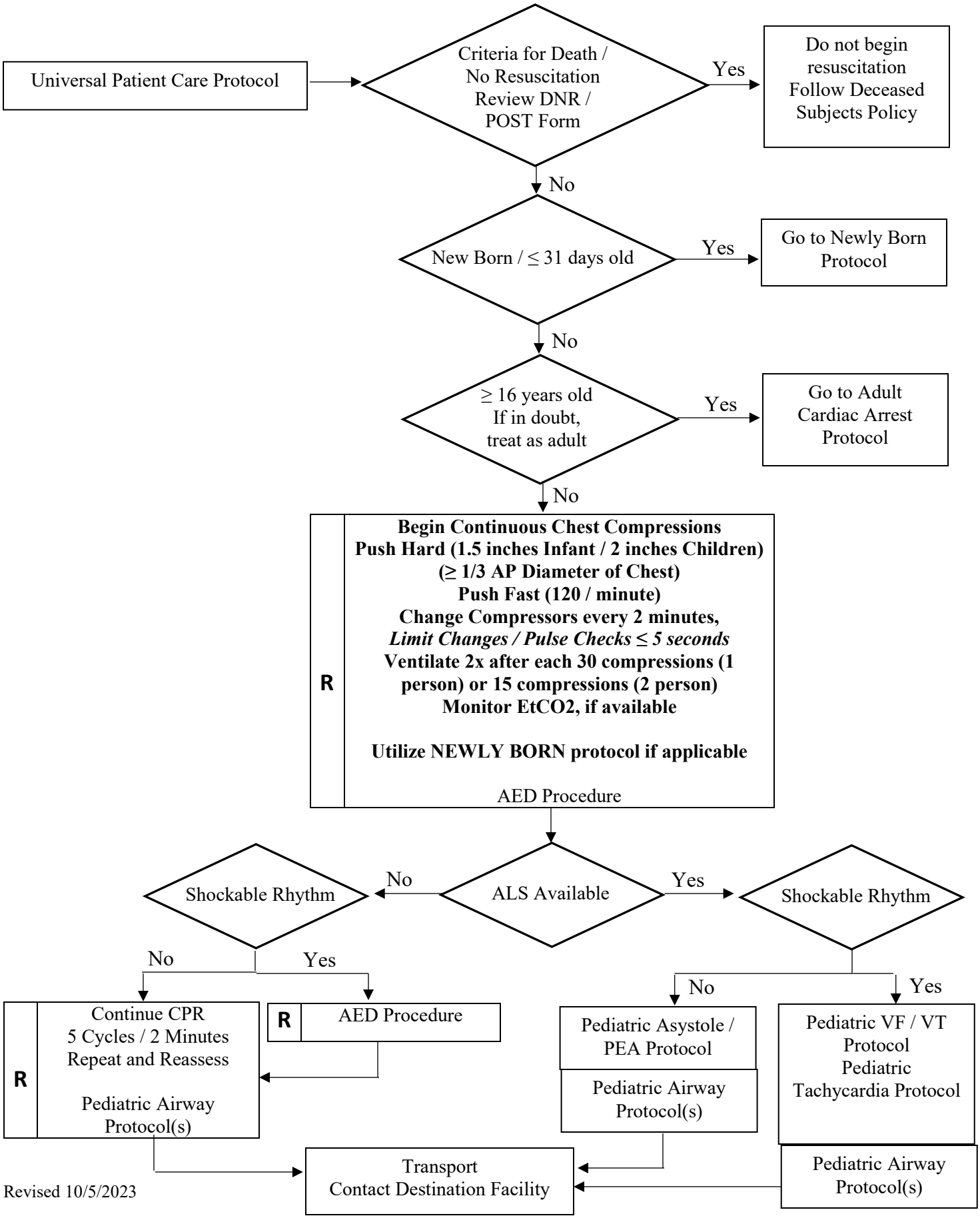
No

Notify Destination Hospital or Contact Medical Control if necessary

Revised 10/2/2023

Harrison County Hospital EMS

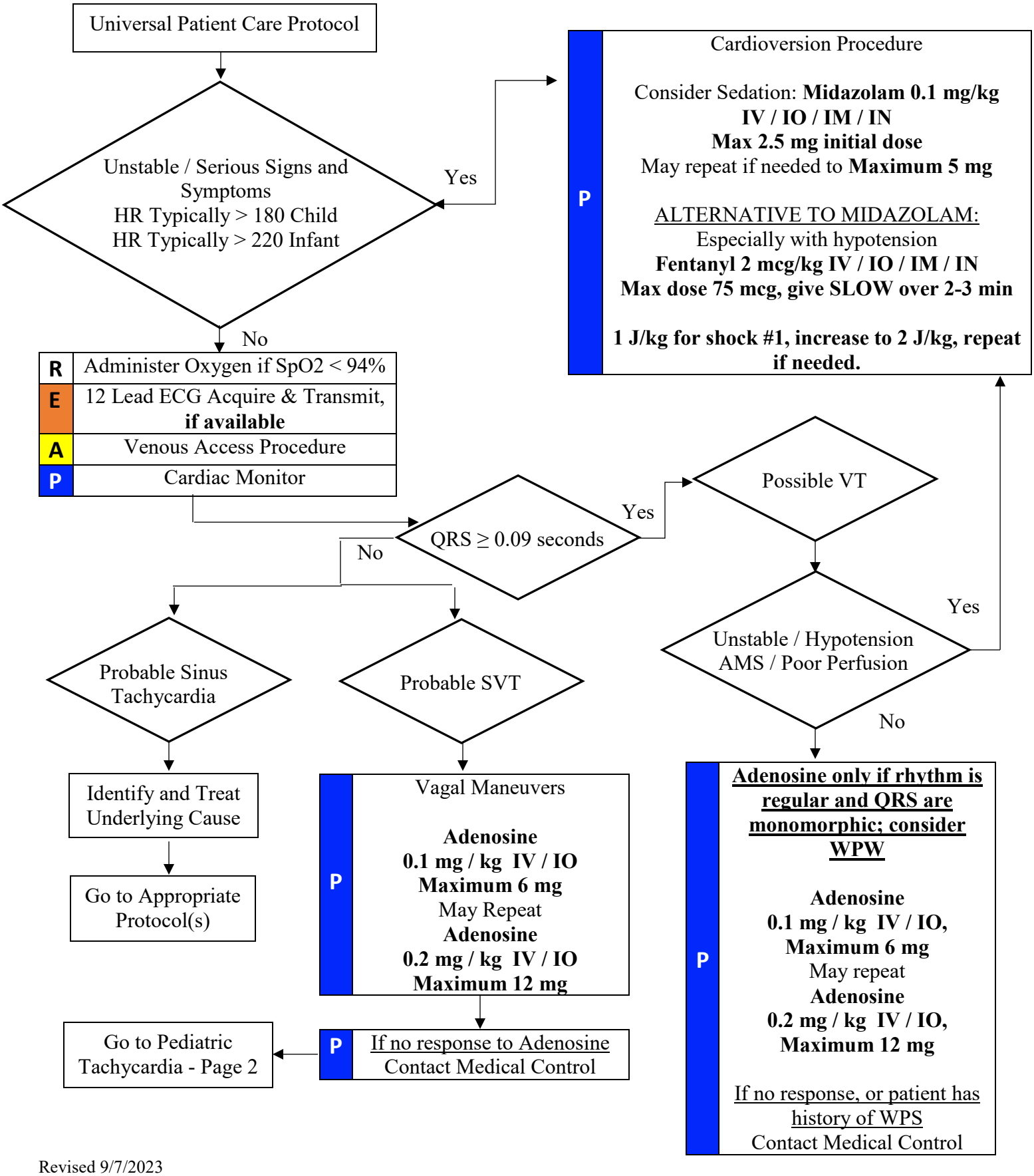
Pediatric Cardiac Arrest



Revised 10/5/2023

Harrison County Hospital EMS

Pediatric Tachycardia - Page 1



Revised 9/7/2023

Harrison County Hospital EMS

Pediatric Tachycardia - Page 2

Enter From Pediatric Tachycardia - Page 1

↓

If Rhythm Converts

E 12 Lead ECG Acquire & Transmit, **if available**

↓

Transport
Notify Destination Facility

P

Torsades de Pointes: If cardioversion doesn't resolve

Magnesium Sulfate
40 mg / kg IV / IO infusion over 10 minutes

Cardiac Arrest:
Slow IV Push over 2 - 3 minutes

Single lead ECG (Lead II) is able to diagnose and treat the arrhythmia.

12 Lead ECG is not necessary to diagnose and treat if unstable. A 12 Lead ECG is preferable after patient is stable.

AT ANY TIME

PULSELESS

Go To Pediatric Pulseless Arrest Protocol

Unstable or Serious Signs and Symptoms Include Any of The Following:

- Pale or cyanosis
- Diaphoresis
- Tachypnea
- Vomiting
- Hypotension
- Altered Mental Status
- Pulmonary congestion
- Syncope

Harrison County Hospital EMS

Pediatric Ventricular Fibrillation
Pulseless Ventricular Tachycardia
Page 1

Pediatric Pulseless Arrest Protocol

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol

R	**Begin Continuous Chest Compressions** **Push Hard (1.5 inches Infant / 2 inches Children) (≥ 1/3 AP Diameter of Chest)** **Push Fast (120 / minute)** **Change Compressors every 2 minutes,** ***Limit Changes / Pulse Checks ≤ 5 seconds*** **Ventilate 2x after each 30 compressions (1 person) or 15 compressions (2 person)** **Monitor EtCO2, if available** **Utilize NEWLY BORN protocol if applicable** AED Procedure
P	Manual Defibrillation Procedure **2 J / kg**
A	Venous Access Procedure
P	**Epinephrine 0.1 mg/mL (1:10,000)** **0.01 mg/kg IV / IO** **Maximum Single Dose 1mg** Repeat every 3 - 5 minutes
P	Manual Defibrillation Procedure **4 J / kg**
E	***DEPLOY AUTOMATED COMPRESSION DEVICE WHEN AVAILABLE*** **Resume Continuous Chest Compressions** **Push Hard, Push Fast (120 / minute)** **Rhythm check/compressor change every 2 minutes** ***Limit Pauses ≤ 5 seconds*** **Ventilate 2x after each 30 compressions (1 person) or 15 compressions (2 person)** ***If advanced airway is in place, ventilate 1x every 2-3 seconds (20-30 breaths/min) and do not pause compressions to give breaths*** **Monitor EtCO2, if available**
P	Amiodarone 5 mg/kg IV / IO, Max initial dose 300 mg May repeat every 5 minutes Maximum repeat dose 150 mg, Maximum total dose 15 mg/kg

Go to Pediatric VF/pVT - page 2

Revised 9/7/2023

Harrison County Hospital EMS
Pediatric Ventricular Fibrillation
Pulseless Ventricular Tachycardia
Page 2

Enter from Pediatric VF/pVT - page 1

P

Manual Defibrillation Procedure **10 J / kg**
Subsequent shocks at rhythm checks (if VF/VT persists) 10 J/kg not to exceed 200 J max.

Resume Continuous CPR Compressions
If VF.VT persistent:
Continue CPR and give anti-arrhythmics / Epinephrine during compressions. Precharge the monitor prior to rhythm checks and minimize pre-shock pause.
Repeat pattern during resuscitation.

P

Persistent VF / VT
Or
Torsades de Pointes

Magnesium Sulfate
40 mg/kg IV / IO over 1-2 minutes
May repeat every 5 minutes
Maximum 2 g

Transport
Notify Destination Facility

Harrison County Hospital EMS

Pediatric Allergic Reaction

Universal Patient Care Protocol

A Venous Access Procedure, **if indicated**

P Cardiac Monitor

Assess Symptom Severity / Suspected Exposure to Allergen

Mild

Skin Only

P Consider Diphenhydramine (Benadryl)
0.5 mg / kg IV / IM
Max 50 mg

Transport
Monitor and Reassess
Notify Destination Facility

Moderate / Severe

Hives / Rash, itching, respiratory difficulty

R Pediatric Epinephrine Autoinjector, **if available**

E Epinephrine 1 mg/mL (1:1000),
≥ 30 kg 0.3 mg IM
< 30 kg 0.15 mg IM,
if not previously given

If wheezing is present, Albuterol 2.5 mg / Ipratropium 0.5 mg Nebulizer,

Continuous Albuterol, if indicated

Waveform Capnography

A Normal Saline Bolus up to 20 mL/kg

Reassess, then repeat as needed to maintain SBP ≥ 90 mm Hg

P Cardiac Monitor

Diphenhydramine (Benedryl), 1 mg / kg IV/ IO / IM
Maximum 50 mg

Solu-Medrol 40 mg IV /IO/ IM

Go to Airway protocols, **if indicated**

Go to Hypotension protocol, **if indicated**

Transport
Monitor and Reassess
Notify Destination

Revised 12/13/2023

Harrison County Hospital EMS

Pediatric Diabetic

Universal Patient Care Protocol	
R	Blood Glucose Analysis Procedure
E	12 Lead ECG Acquire & Transmit, **if indicated**
A	Venous Access Procedure
P	Cardiac Monitor
Altered Mental Status Protocol, **if indicated**	
Hypotension / Shock Protocol, **if indicated**	
Suspected Stroke Protocol, **if indicated**	
Seizure Protocol, **if indicated**	

A	Blood Glucose ≤ 60 mg / dl and symptomatic No venous access: Awake, alert and able to tolerate oral agent: Give oral glucose solution. If unable to tolerate oral Glucagon 0.1 mg/kg IM Max 1mg Repeat in 15 minutes if needed to keep blood glucose > 60 mg / dl **Be aware of overall physical health of patient.**

Blood Sugar ≤ 60 mg / dl

R	Consider oral solution (Juices / Food) ***OR*** Oral Glucose ½ to 1 tube **Only if patient is able to swallow / protect airway**
A	D5W infusion Titrate to patient condition and response **Watch for Fluid Overload** ***For patients < 50 kg*** Dextrose 25 % 12.5 grams IV / IO Repeat as needed

Blood Sugar 61 - 249 mg / dl

R	Blood Glucose Analysis Procedure if condition changes

Go to Appropriate Protocol

Blood Sugar ≥ 250 mg / dl

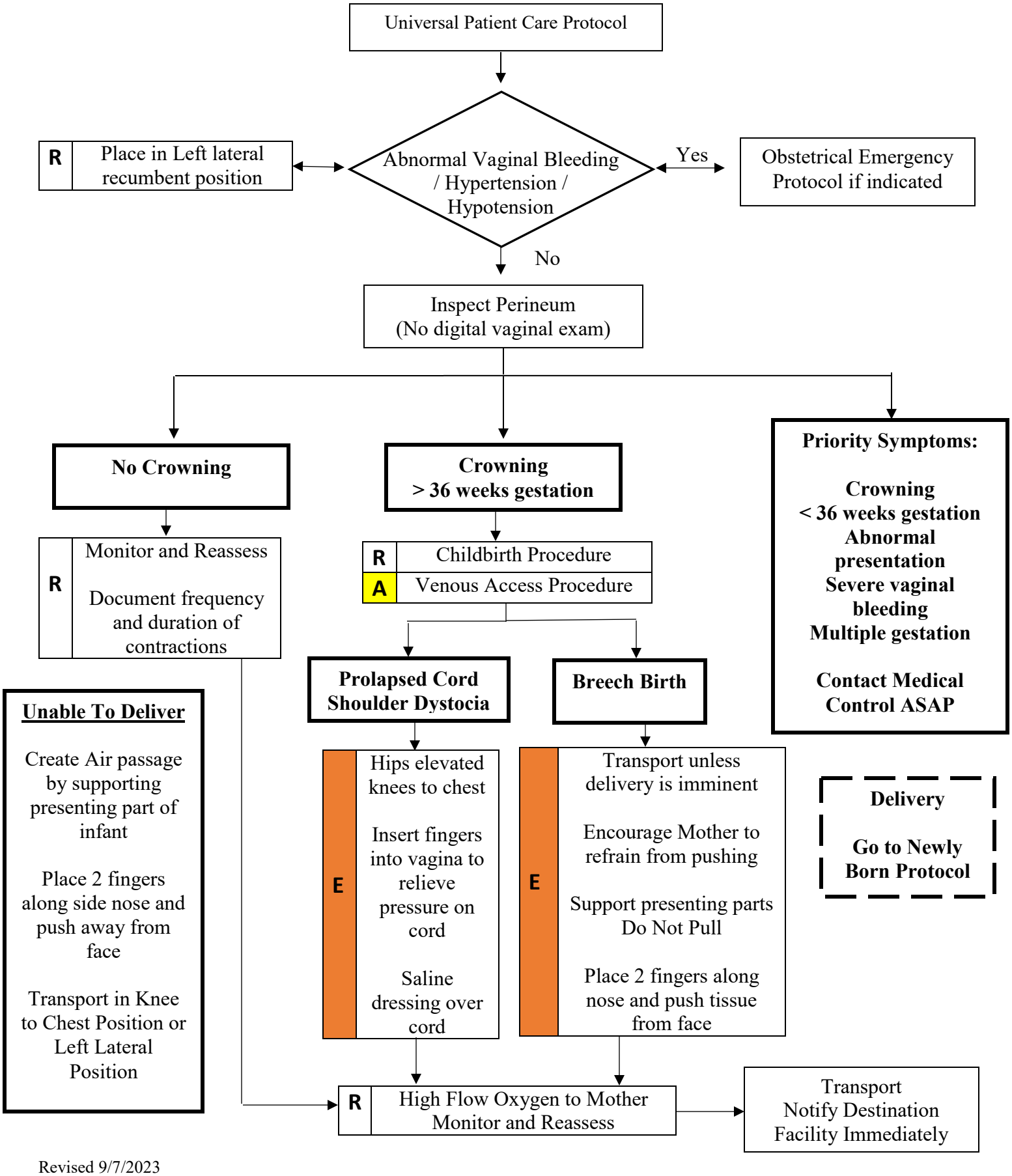
A	Normal Saline Bolus 10 mL/kg IV / IO Max 1 Liter **Watch for Fluid Overload**

R	Monitor and Reassess Every 5 minutes Until Blood Glucose ≥ 70 mg/dl

Transport
Notify Destination Facility

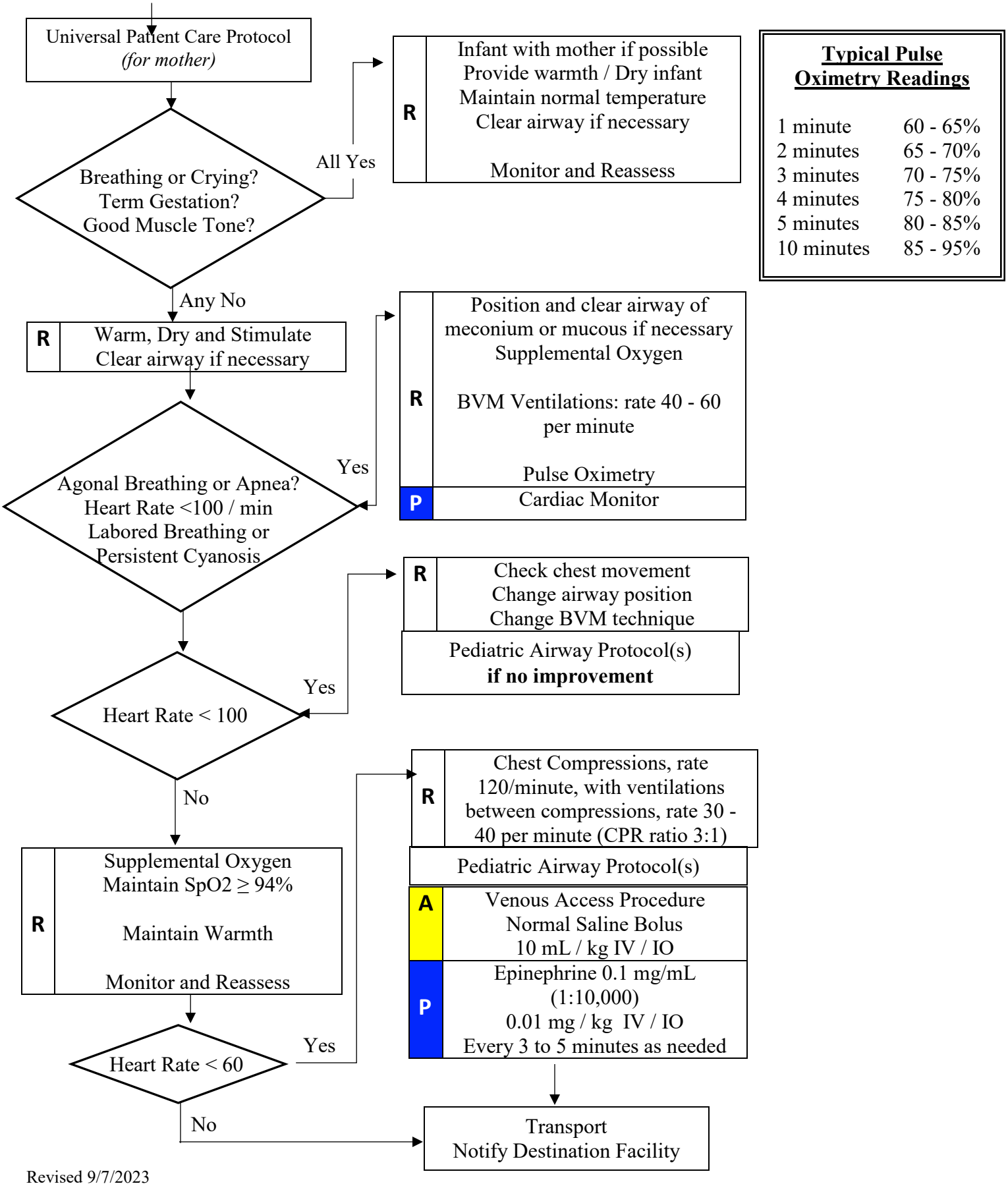
Revised 9/7/2023

Harrison County Hospital EMS
Childbirth / Labor



Revised 9/7/2023

Harrison County Hospital EMS
Newly Born



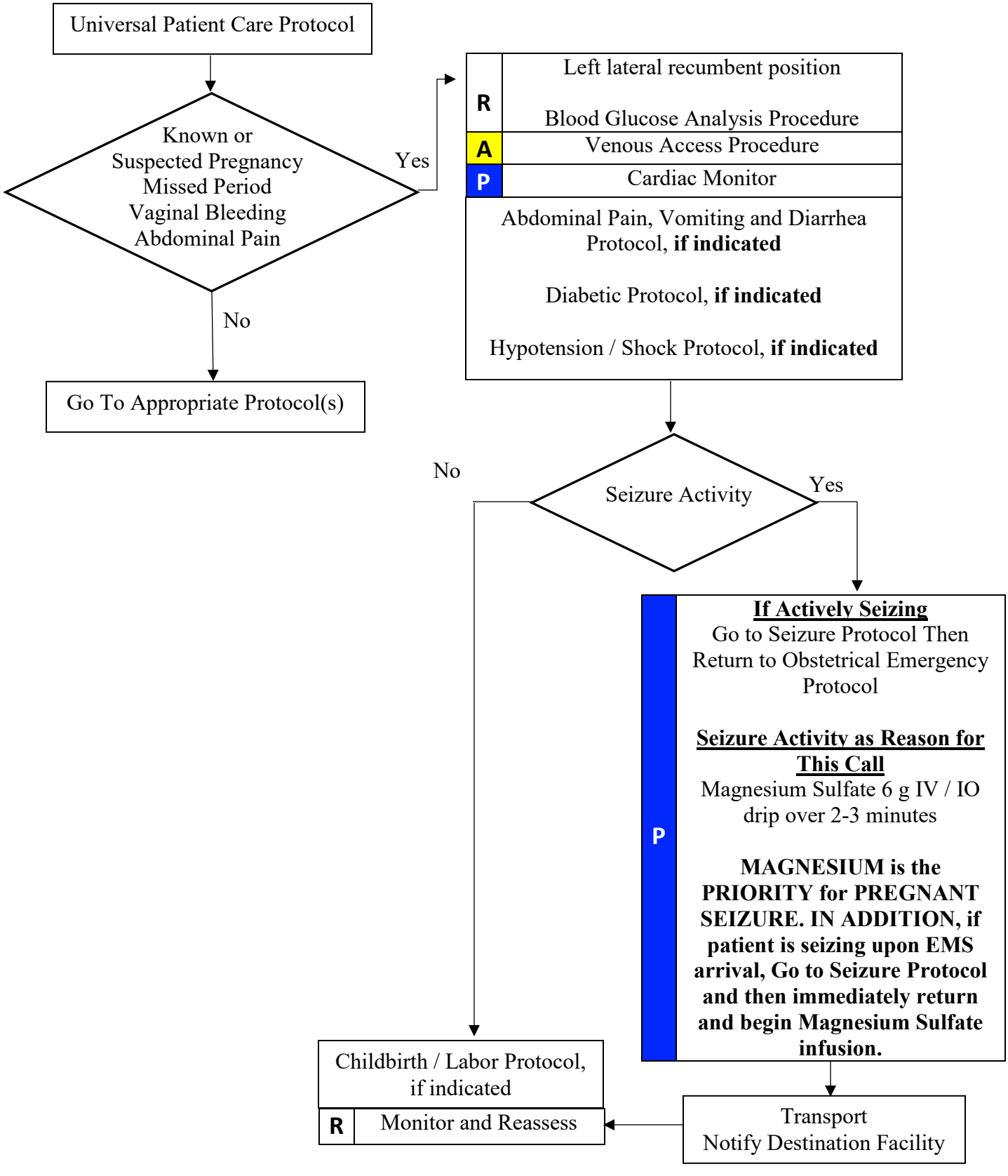
Typical Pulse Oximetry Readings

1 minute	60 - 65%
2 minutes	65 - 70%
3 minutes	70 - 75%
4 minutes	75 - 80%
5 minutes	80 - 85%
10 minutes	85 - 95%

Revised 9/7/2023

Harrison County Hospital EMS

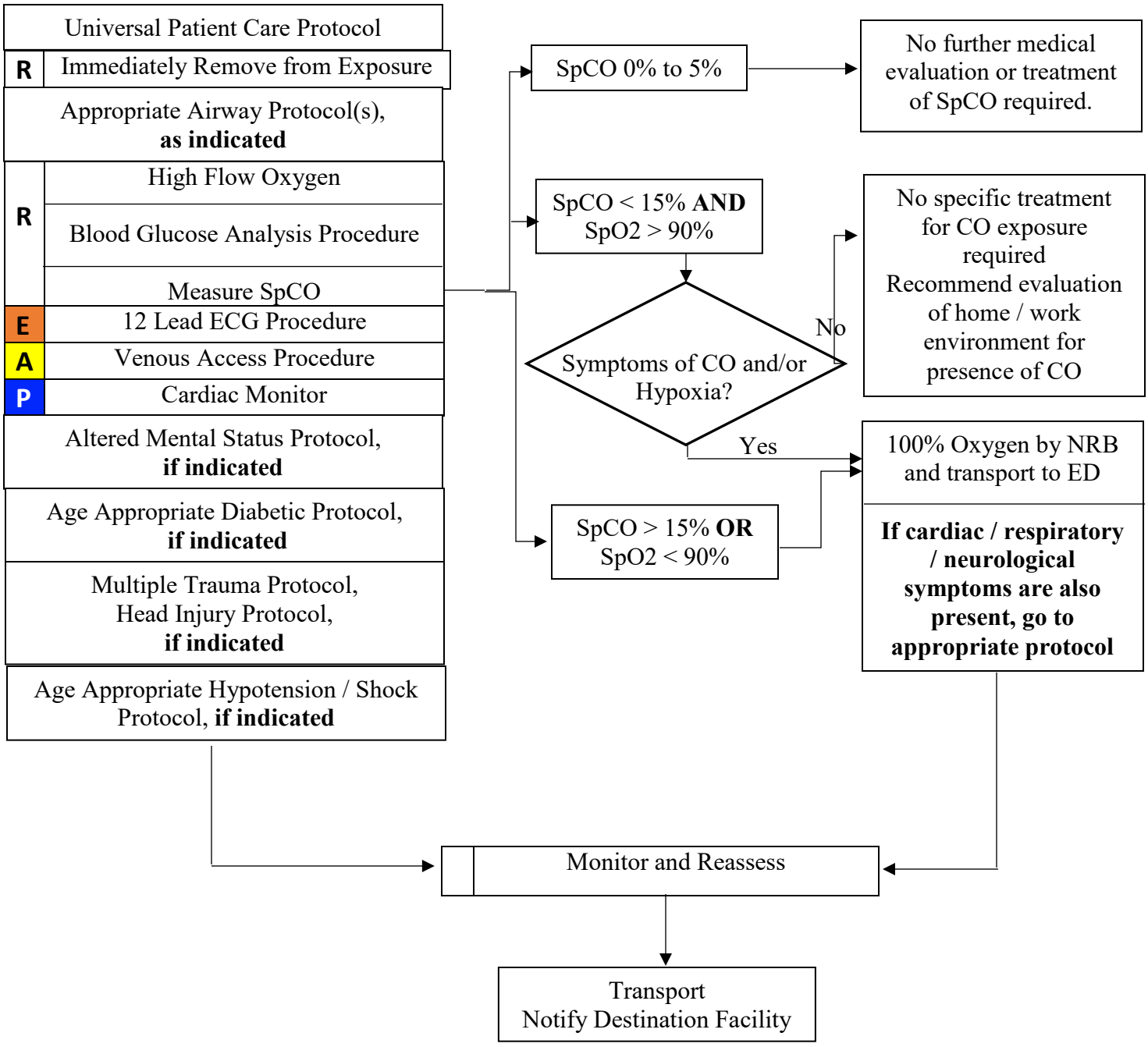
Obstetrical Emergency



Revised 9/7/2023

Harrison County Hospital EMS

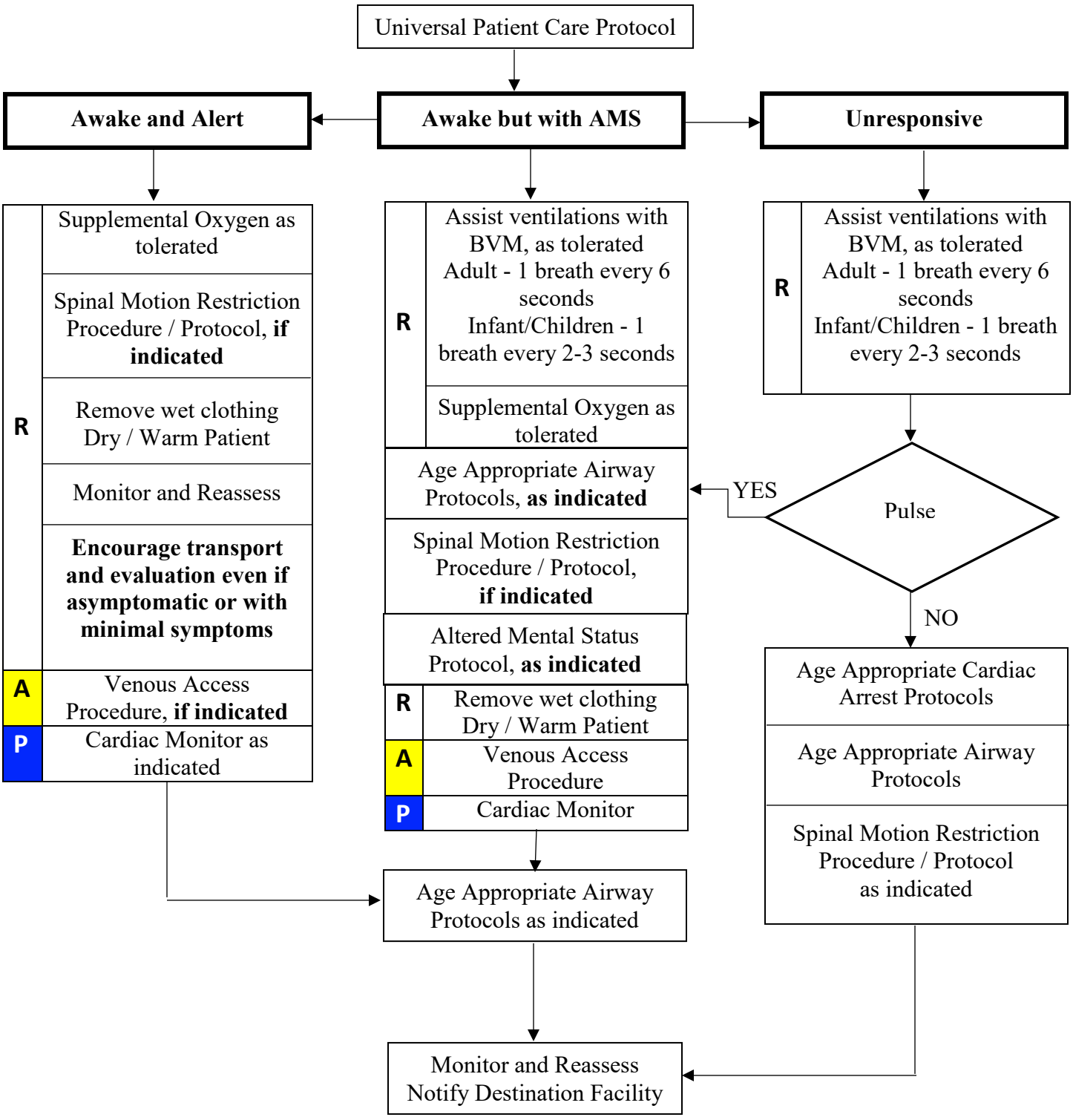
Carbon Monoxide



Revised 9/12/2023

Harrison County Hospital EMS

Drowning / Near Drowning



Revised 9/12/2023

Harrison County Hospital EMS

Hyperthermia

Universal Patient Care Protocol

R
- Remove from heat source to cool environment
- Cooling Measures
- Remove tight clothing
- Blood Glucose Analysis Procedure

Age Appropriate Diabetic Protocol, **if indicated**

Assess Symptom Severity

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

HEAT STROKE
Fever, usually > 104°F
Hot, dry skin
Hypotension, AMS / Coma

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

R Oral (PO) fluids as tolerated

Monitor and Reassess

Age Appropriate Airway Protocol, **as indicated**

Altered Mental Status Protocol, **as indicated**

E Active cooling measures
Target Temp < 102.5 °F

A Venous Access Procedure

P Cardiac Monitor

A
Normal Saline Bolus
500 mL IV / IO
Repeat to keep SBP > 90
Max 2 L

PED: Normal Saline Bolus
20 mL/kg IV / IO
Repeat to Age Appropriate
SBP ≥ 70 + 2 x Age
Max 60 mL/kg

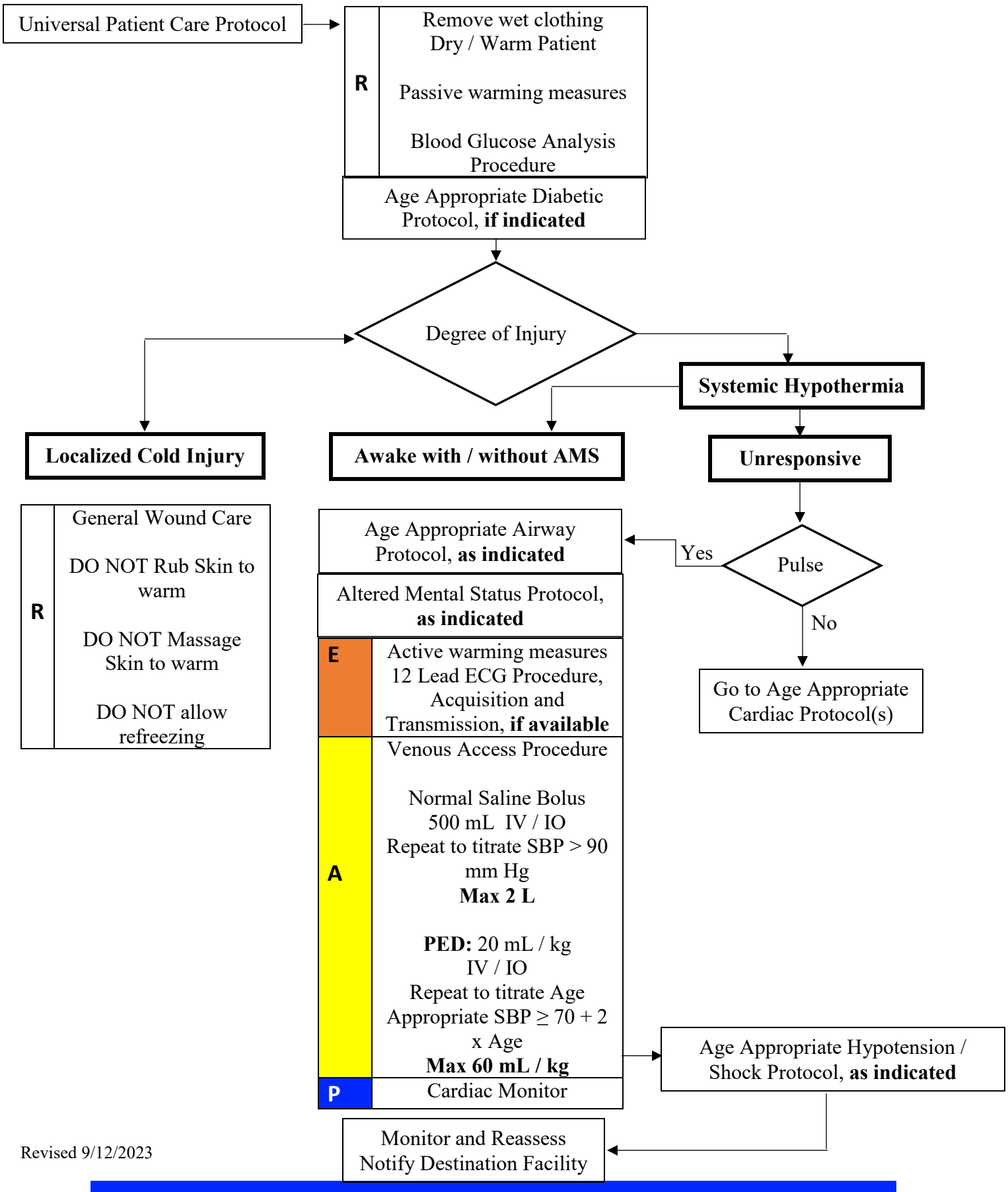
Age Appropriate Hypotension / Shock Protocol, **as indicated**

Monitor and Reassess
Notify Destination Facility

Revised 9/12/2023

Harrison County Hospital EMS

Hypothermia / Frostbite



Revised 9/12/2023

Harrison County Hospital EMS

Organophosphate / Nerve Agent Protocol

SLUDGEM
Salivation
Lacrimation
Urination
Defecation / Diarrhea
GI Upset
Emesis
Muscle Twitching

Universal Patient Care Protocol

Obtain history of exposure
Observe for specific toxidromes
Initiate triage and/or decontamination as indicated

Call for Help / Additional Resources, especially if you suspect more than 1 patient.

Seizure Activity
Go To Seizure Protocol

Symptom Severity

Asymptomatic

R	Monitory and Reassess Every 15 minutes for symptoms Initiate Treatment per Appropriate Pathway

Minor Symptoms:
Respiratory Distress + SLUDGEM
(salivation, lacrimation, urination, defecation, gastric hypermotility, emesis, miosis)

R	Administer 1 DuoDote Autoinjector, **if available**
A	IV / IO Procedure
P	**Atropine** **Adult:** 2 mg IV / IO **PED:** 0.02 mg/kg IV / IO Repeat every 3 to 5 minutes until symptoms resolve

MAJOR Symptoms:
Altered Mental Status, Seizures, Respiratory Distress, Respiratory Arrest

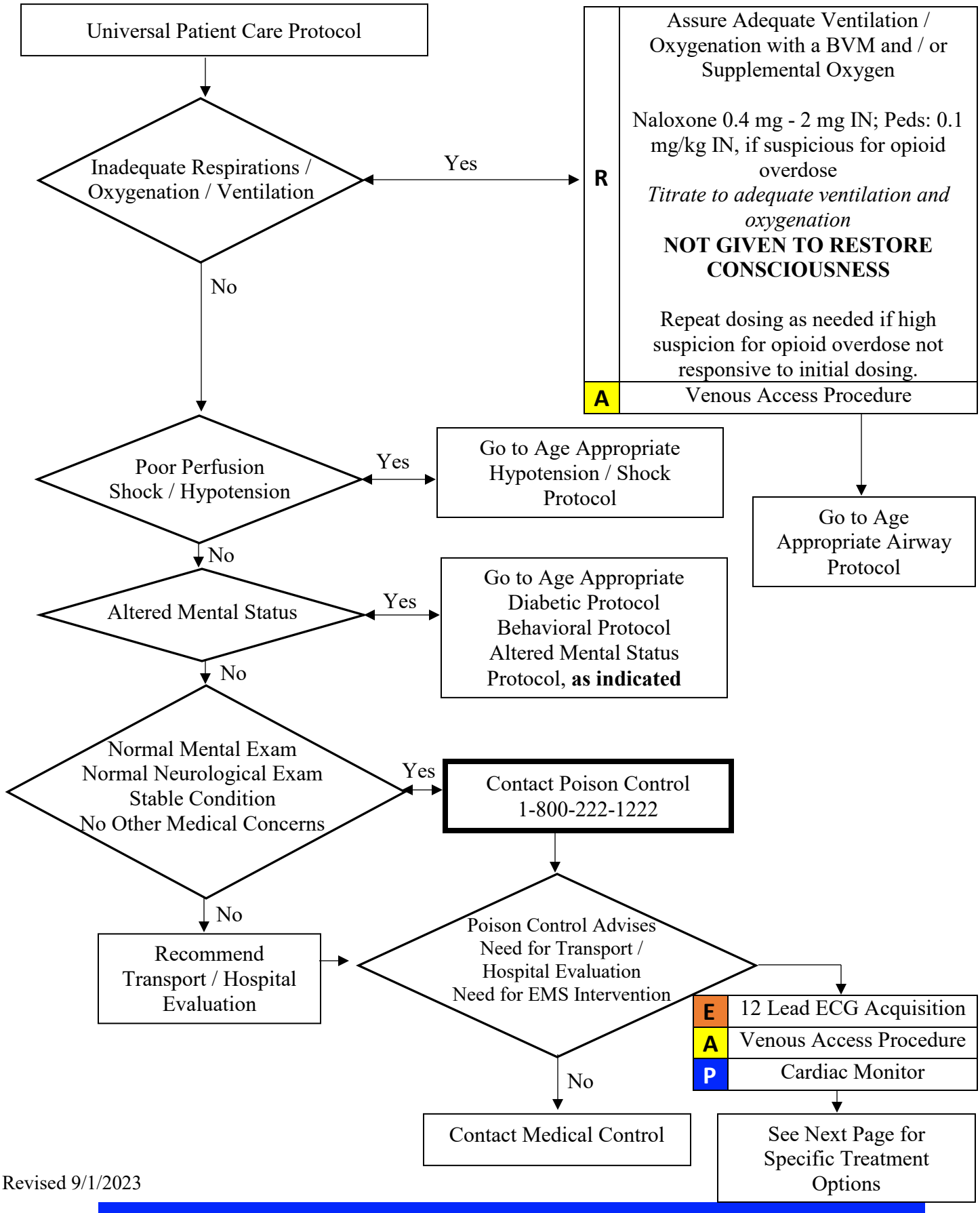
R	Administer 3 DuoDote Autoinjectors, **if available**
A	IV / IO Procedure
P	***CALL FOR ADDITIONAL ATROPINE*** Atropine Adult: 6 mg IV / IO PED: 0.05 mg/kg IV / IO

Transport
Notify Destination Facility as soon as possible

Revised 9/15/2023

Harrison County Hospital EMS

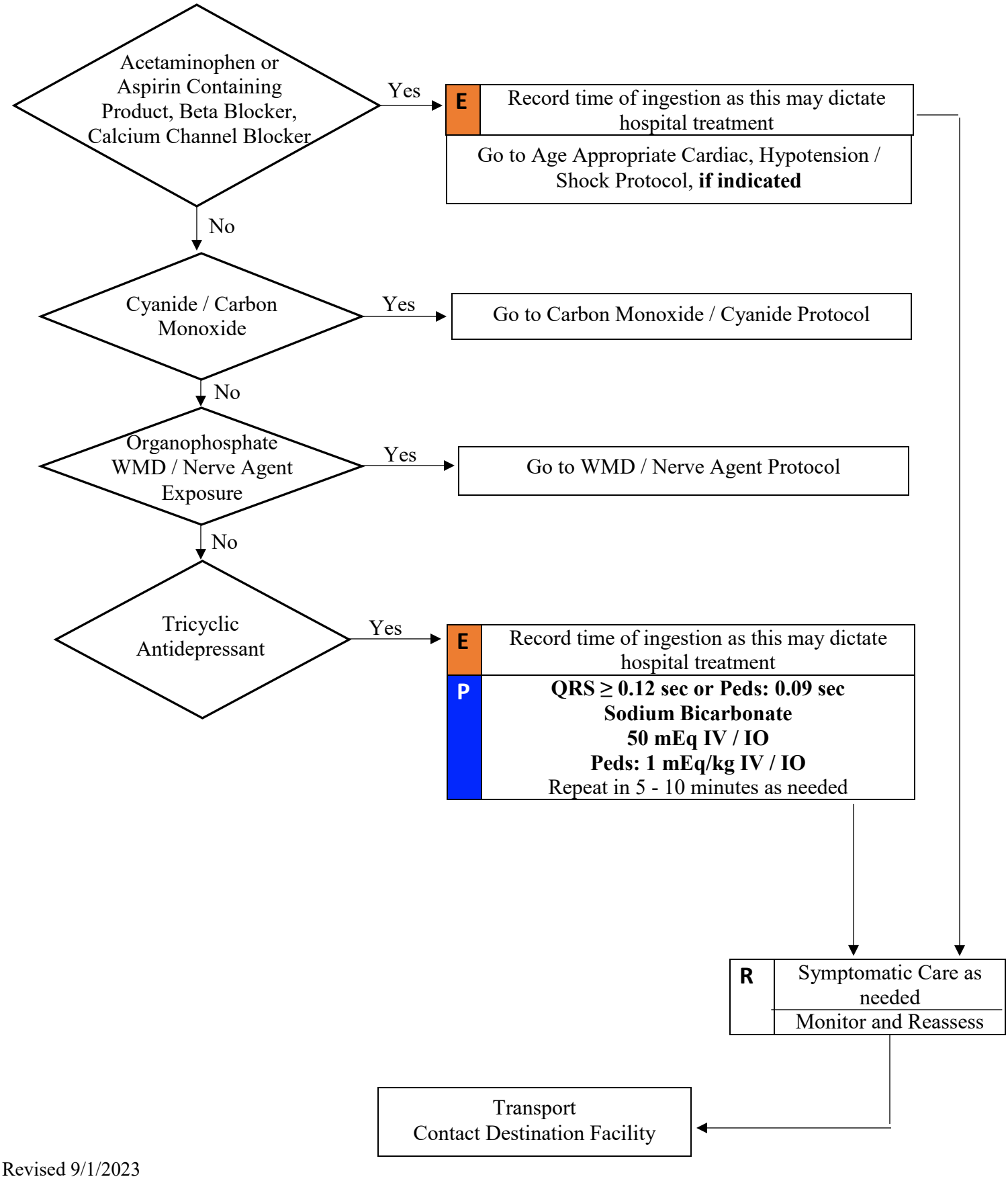
Overdose / Toxic Ingestion



Revised 9/1/2023

Harrison County Hospital EMS

Overdose / Toxic Ingestion - continued



Revised 9/1/2023

Harrison County Hospital EMS

Firefighter / Responder Rehabilitation
Page 1

This is a guideline adapted from the NFPA 1584 standard. Fire scene rehab is ultimately the responsibility of the Incident Commander (IC) of the fire scene. In the event the fire department has no guidelines for NFPA 1584, this guideline may be used. The source for the age predicted maximum heart rate is NFPA 1582

Injury / Illness / Complaint should be treated using the appropriate protocol beyond the needs listed in this guideline.

Initial Process

1. Responders ordered to report to rehab should be logged on paperwork provided by the fire department.
2. VS assessed and recorded / Orthostatic VS
3. Pulse oximetry and SpCO
4. Assess personnel for signs/symptoms of:
   a. chest pain, dizziness, shortness of breath, weakness, nausea, headache.
   b. General complaints, i.e. cramps, aches, pains
   c. Heat/cold stress
   d. changes in gait, balance, coordination, speech, behavior, mental status

Remove:
PPE
Body Armor
Chemical Suits
SCBA
Turnout Gear
Other equipment/clothing as indicated

20 Minute Rest Period After:

- 1 SCBA cylinder or;
- after 40 minutes of intense work without SCBA

Responders should consume at least 8 ounces of fluid between SCBA change-out.

- Fluid should be water or electrolyte replacement.

A Normal Saline Bolus
500 mL IV / IO
Titrate to HR ≤ 110
and
SPB ≥ 100 mmHg

Pulse Rate > 85% NFPA Age Predicted Minimum

YES

NO

No improvement after 30 minutes of additional rehab, consider transport

Systolic BP ≥ 160
OR
Diastolic BP ≥ 100

YES

Mandatory Rest Period
Rehydration is Most Important
Re-evaluate in 10 minutes

NO

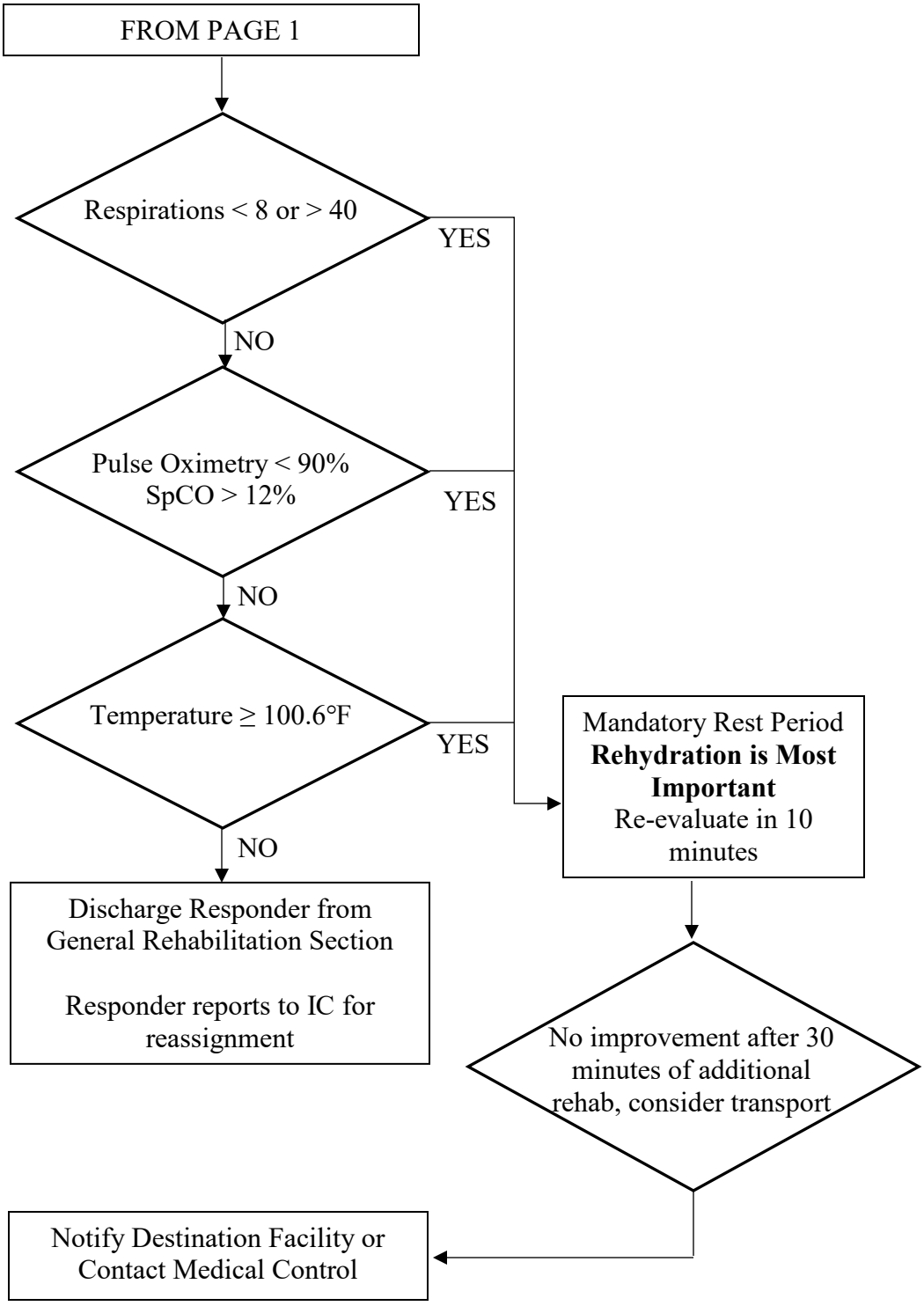
Continue to page 2

NFPA Age Predicted 85% Maximum Heart Rate		
18-19		165
20-25		163
26-30		160
31-35		157
36-40		154
41-45		151
46-50		148
51-55		145
56-61		141

Revised 10/20/2023

Harrison County Hospital EMS

Firefighter / Responder Rehabilitation
Page 2



Revised 10/20/2023

Harrison County Hospital EMS

Hazardous Materials Response (EMS Operations)

Hazardous Materials Are Any Substance That Have The Potential For Harm To Life, The Environment, And Property

R

1. Approach the scene cautiously and don proper PPE. EMS should never be in the Hot zone, rarely in the Warm Zone and only if proper PPE is provided.
2. Insure the fire department and EMA are notified.
3. Identify the substance from a distance if possible.

Personal Protective Equipment

Minimum Necessary

- Mask
- Gloves
- Gown
- Eye Protection

Promote air exchange in ambulance by opening windows or turning on exhaust fan.

R

1. If EMS is first on-scene, assume role of Incident Commander until the role can be handed off to a more appropriate person.
2. Interface with the fire department and EMA
3. Assume the assigned role in the Incident Command system
4. Refer to the Emergency Response Guide and other available resources regarding staging and initial actions

INFORM MEDICAL CONTROL OF THE FOLLOWING:

Situation
Substance On The Scene
Number Of Patients
Conditions Of The Patients
Resource Information
Name and Telephone Number Of The Substance Manufacturer
If Decontamination is Required
Special Handling On Arrival At The E.D.

TREAT ALL PATIENTS AT THE DISCRETION OF MEDICAL CONTROL

Monitor
TRANSPORT

Enroute: **Update Medical Control**

- Patient's Condition
- Treatment
- Decontamination Completed On Scene
- Special Handling Required Upon Arrival E.D.
- Results Of Treatment

Revised 9/8/2023

Harrison County Hospital EMS

Burns: Chemical and Electrical

Note:
All patients should be decontaminated before EMS receives them.

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

Universal Patient Care Protocol

Assess Burn / Concomitant Injury Severity

Burn Definitions:
Partial Thickness:
- Epidermis and varying portions of the dermis.
- Red, may be blistered, swollen, painful

Full Thickness
- Complete destruction of epidermis and dermis
- May be whitish, charred, no sensation to burned areas.

< 5% TBSA Partial/Full Thickness Burn
No Inhalation Injury, Not Intubated, Normotensive
GCS ≥ 14
Minor Burn

5-15% TBSA Partial/Full Thickness Burn
Suspected Inhalation injury or requiring intubation for airway stabilization.
Hypotension or GCS ≤ 13
Transport to Burn Center

>15% TBSA Partial/Full Thickness Burn
Burns with Multiple Trauma
Burns with definitive airway compromise
Transport to Trauma Center
Critical Burn

Cardiac Arrest Protocol, if necessary
Age Appropriate Airway Protocol(s), as indicated

R	Eye Involvement Irrigate involved Eye(s) with Normal Saline for 15 - 30 minutes May repeat as needed
	Chemical Exposure / Burn Flush Contact Area with Normal Saline for 15 minutes Decontamination Procedure, **as indicated**
E	AED, if necessary 12 Lead Acquisition/Transmission, **if available**
A	Venous Access Procedure
P	Cardiac Monitor, 12 Lead Interpretation Pain Protocol, **as indicated**

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

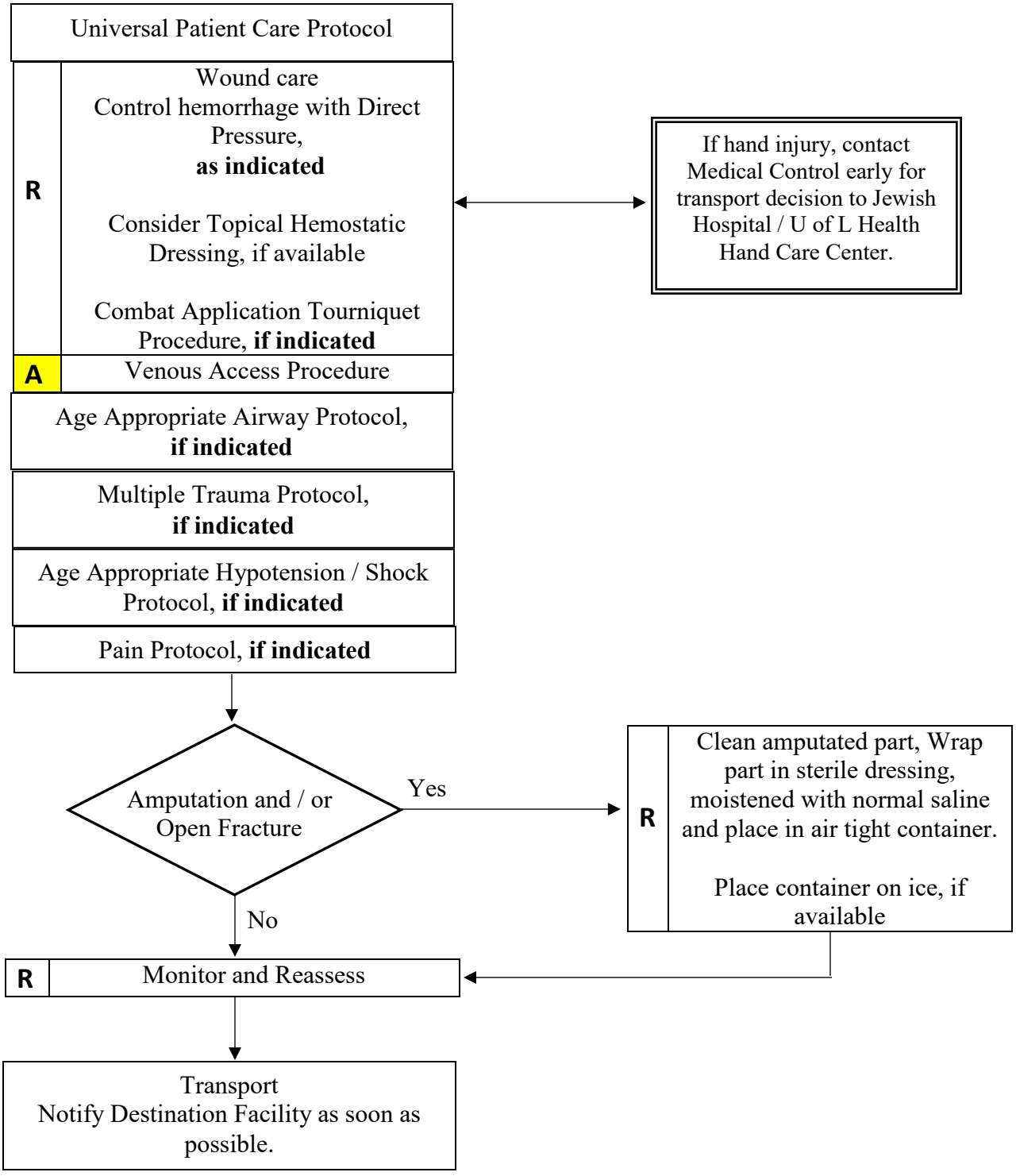
Rapid, Safe Transport to Appropriate Destination

Notify Destination Facility

Revised 9/8/2023

Harrison County Hospital EMS

Extremity Trauma, Isolated



Revised 9/12/2023

Harrison County Hospital EMS

Head Trauma - Adult/Pediatric

Universal Patient Care Protocol

↓

Age Appropriate Airway Protocol(s)
if indicated, consider GCS

↓

R	Obtain and Record GCS Supplemental Oxygen Maintain SpO2 ≥ 94% Prevent Oxygen desaturation events < 90% Blood Glucose Analysis Procedure
E	Maintain EtCO2 35 - 45 mmHg
A	Venous Access Procedure
P	Cardiac Monitor

Altered Mental Status Protocol
if indicated

Multiple Trauma Protocol
if indicated

Age Appropriate Hypotension / Shock Protocol, **if indicated**

Seizure Protocol
if indicated

Spinal Motion Restriction Procedure / Protocol, **if indicated**

Pain Control Protocol, **if indicated**

R	Monitor and Reassess

↓

Rapid, Safe Transport to appropriate destination

Notify Destination Facility

DO NOT ROUTINELY HYPERVENTILATE

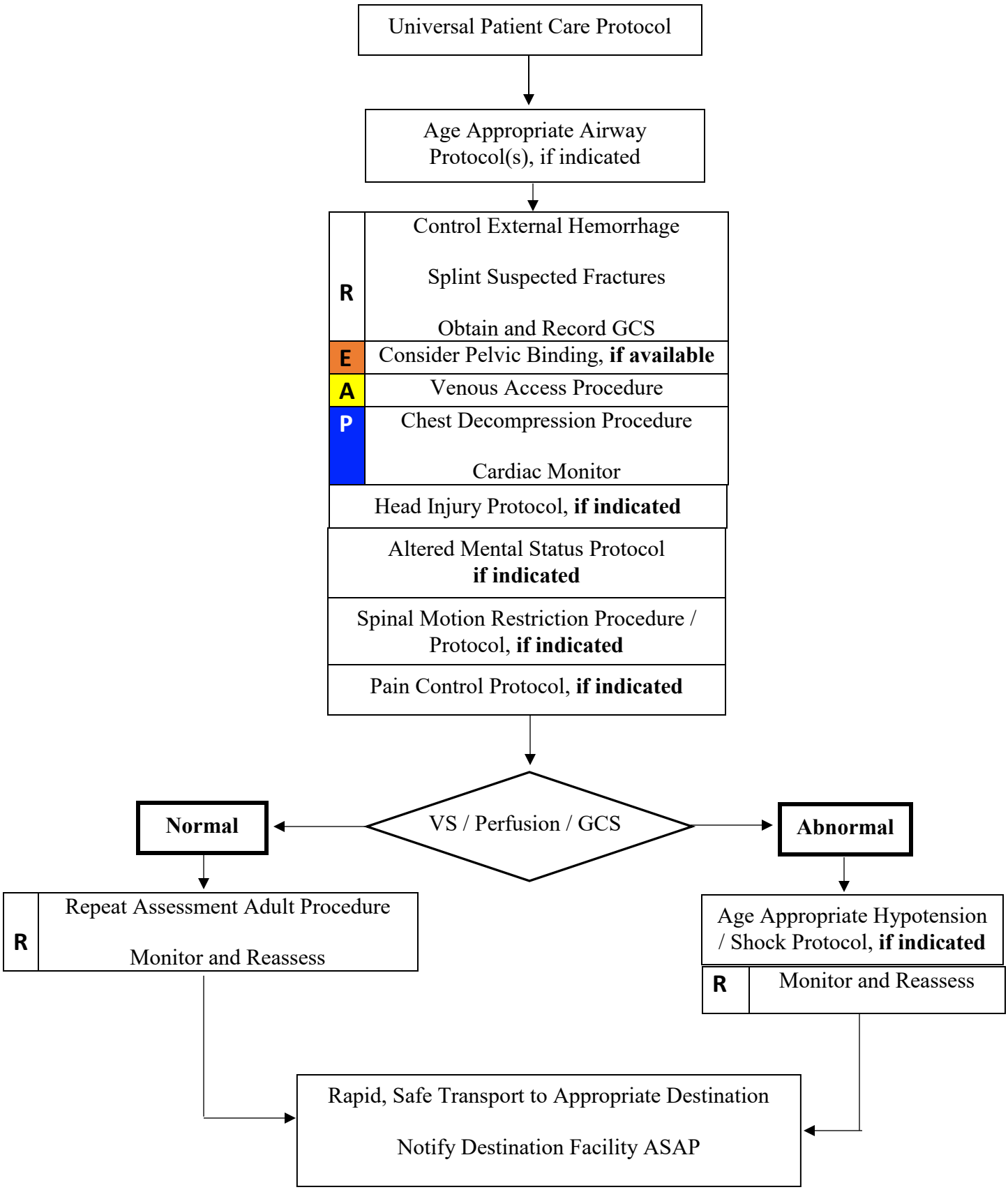
Evidence of Brain Herniation:
Unilateral or Bilateral Dilation of Pupils / Posturing

ventilate at up to 20 breaths/minute to maintain EtCO2 30 - 35 mmHg

Revised 9/15/2023

Harrison County Hospital EMS

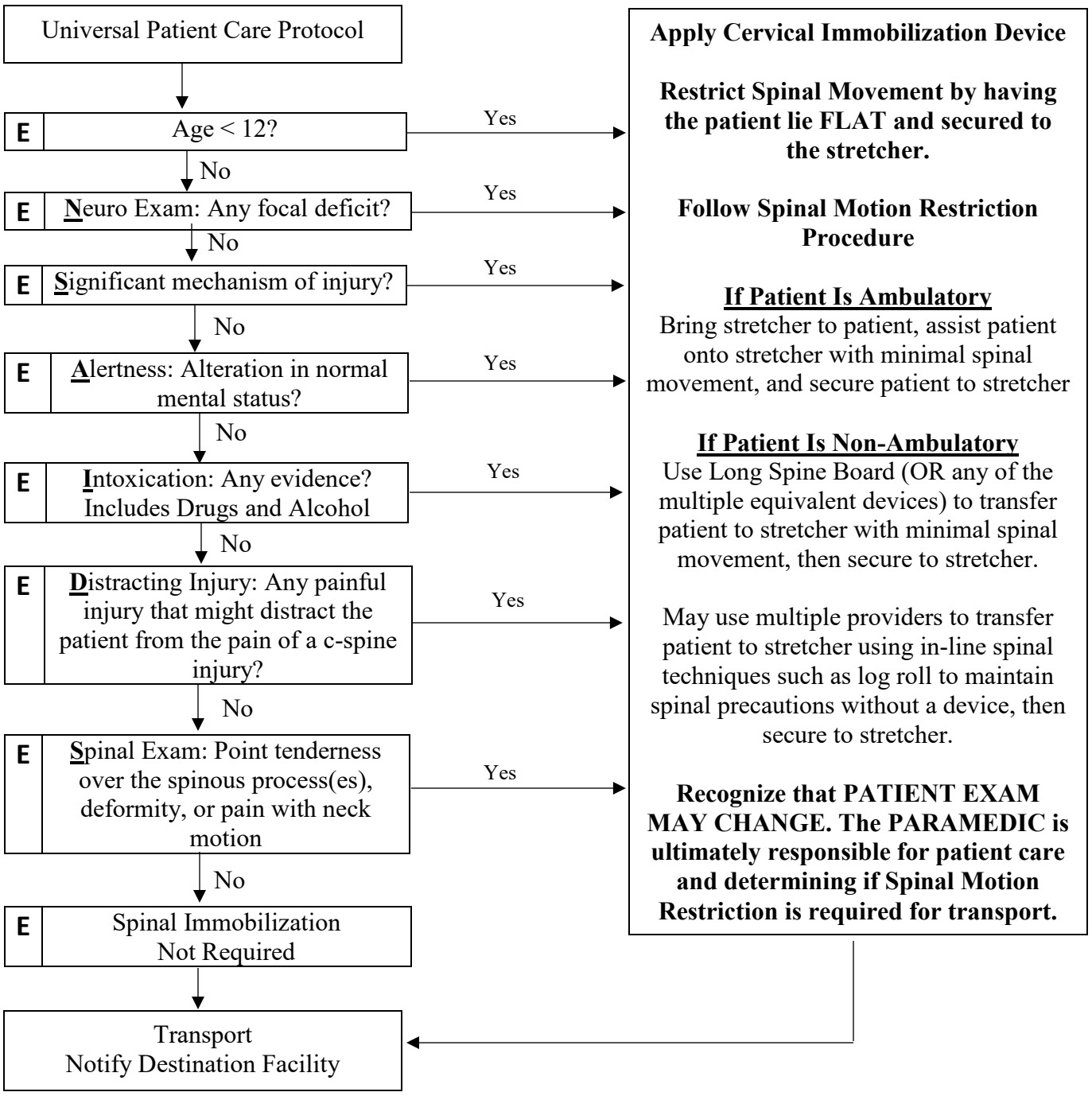
Multiple Trauma - Adult/Pediatric



Revised 9/12/2023

Harrison County Hospital EMS

Spinal Motion Restriction



Note

See Spinal Motion Restriction Procedure for rationale regarding Spinal Motion Restriction.

Harrison County Hospital EMS

Burns: Thermal

Universal Patient Care Protocol

Assess Burn / Concomitant Injury Severity

< 5% TBSA Partial / Full Thickness Burn
No Inhalation Injury, Not Intubated, Normotensive
GCS ≥ 14
Minor Burn

5-15% TBSA Partial / Full Thickness Burn
Suspected Inhalation injury or requiring intubation for airway stabilization.
Hypotension or GCS ≤ 13
Transport to Burn Center

>15% TBSA Partial / Full Thickness Burn
Burns with Multiple Trauma
Burns with definitive airway compromise
Transport to Trauma Center
Critical Burn

Age Appropriate Airway Protocol(s), if indicated

Multiple Trauma Protocol, if indicated

R	Remove Rings, Bracelets / Constricting Items
	Dry Clean Sheet or Dressings
	Cool burns with room temperature water
A	Venous Access Procedure, if indicated Consider 2 IV sites if greater than 15% TBSA Isotonic Crystalliod per Rule of 10's formula (See Rule of 10's in Appendix)
P	Cardiac Monitor, 12 Lead Interpretation Pain Protocol, **as indicated**

Age Appropriate Cardiac Arrest
Pulseless Arrest,
OR
Age Appropriate Arrhythmia Protocol(s)
as indicated

Carbon Monoxide / Cyanide Protocol, if indicated

Rapid, Safe Transport to Appropriate Destination
Notify Destination Facility

Burn Definitions:

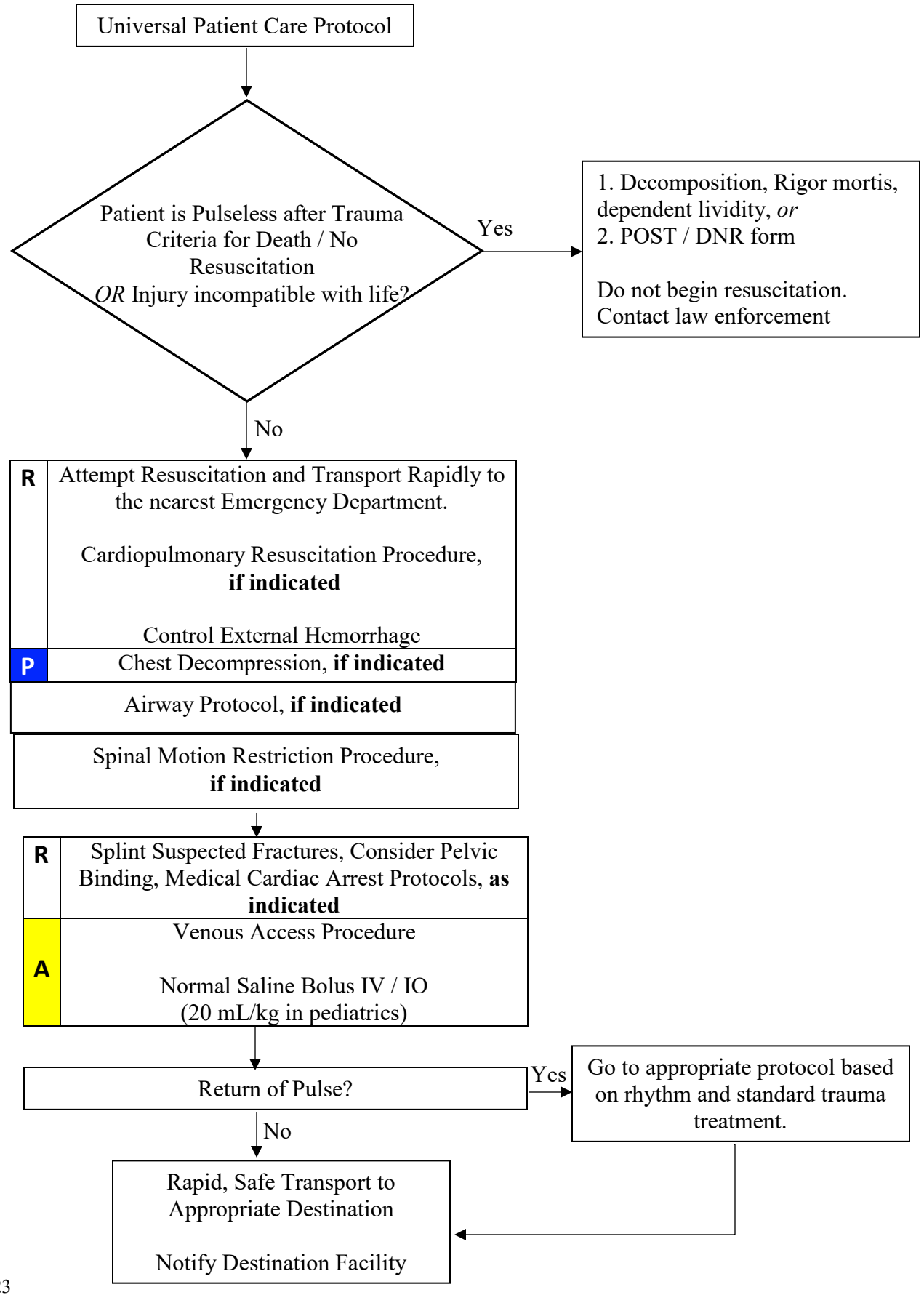
Partial Thickness:
- Epidermis and varying portions of the dermis.
- Red, may be blistered, swollen, painful

Full Thickness
- Complete destruction of epidermis and dermis
- May be whitish, charred, no sensation to burned areas.

Revised 9/8/2023

Harrison County Hospital EMS

Traumatic Cardiac Arrest



Revised 9/13/2023

Harrison County Hospital EMS

Cardiac Arrest

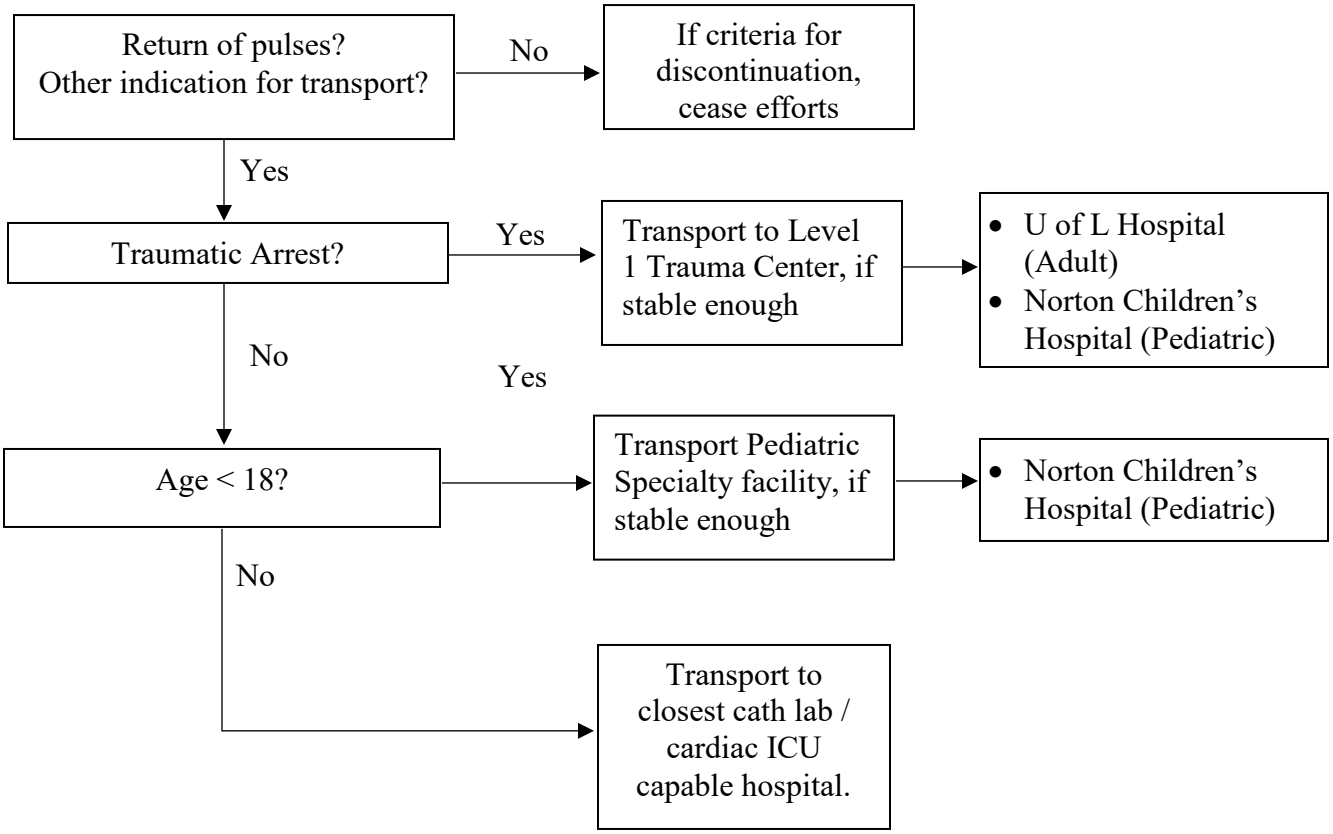
EMS Triage and Destination Plan

Cardiac Arrest Patient
Resuscitation was attempted by 911 responder.

AND / OR
CPR performed prior to EMS arrival and pulses restored.

The purpose of this plan is to:

Transport cardiac arrest and post resuscitation patients to the appropriate receiving facility.



Revised 9/13/2023

Harrison County Hospital EMS

Pediatric

EMS Triage and Destination Plan

Pediatric Patient

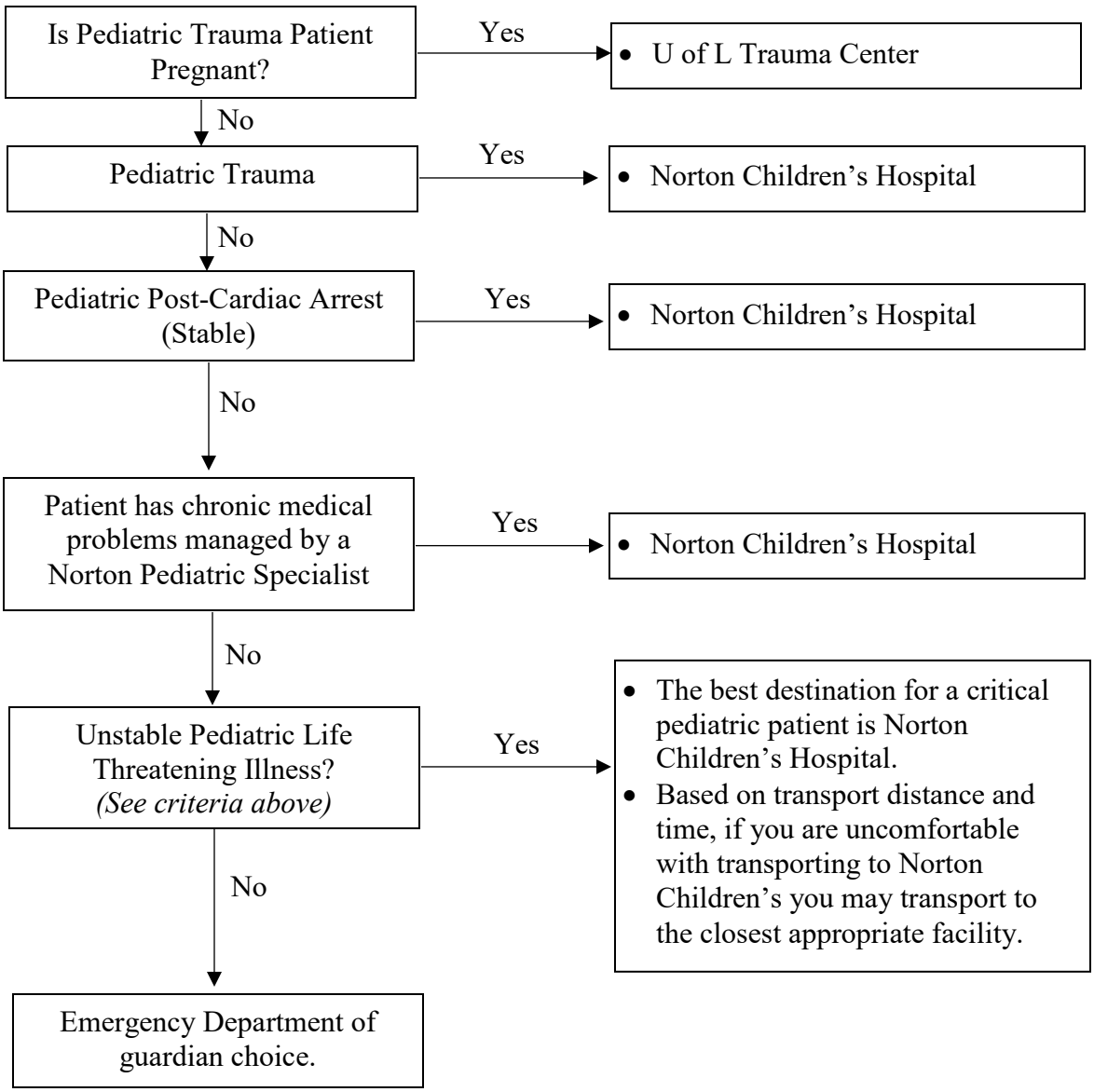
Any patient up to 18 years of age.

Unstable Pediatric Life Threatening Illness

- **Decreased Mental Status (GCS <14)**
- **Non-Responsive Respiratory Distress or Intubation**
- **Suspected Stroke or atypical seizure/AMS**
- **Post Cardiac Arrest**
- **Non-Responsive Hypotension**
- **Severe Hypothermia or Hyperthermia**
- **Status Epilepticus**
- **Potential Dangerous Envenomation**
- **Life Threatening Ingestion/Chemical Exposure**

The purpose of this plan is to:

- Rapidly identify the appropriate destination for the patient.
- Minimize the time from EMS contact to definitive care.
- Early activation/notification to the hospital prior to patient arrival.
- Provide quality EMS service and patient care to the EMS community.



Revised 10/2/2023

Harrison County Hospital EMS

STEMI

EMS Triage and Destination Plan

STEMI Patient
(ST Elevation Myocardial Infarction)

- Acute cardiac symptoms;

AND

- 12 lead ECG criteria of 2mm ST elevation in 2 or more contiguous leads.

The Purpose of this plan is to:

- Rapidly identify STEMI patients who present to EMS.
- Minimize the time from onset of STEMI symptoms to coronary reperfusion.
- Quickly diagnose a STEMI by 12 lead ECG.
- Rapidly the best hospital destination based on symptom onset time and predicted transport time.
- Early activation/notification to the hospital prior to patient arrival.
- Minimize scene time to 15 minutes or less (including a 12 lead ECG).
- Provide quality EMS service and patient care to the community's citizens.

Active Symptoms of Cardiac Chest Pain and 12 Lead ECG Findings = STEMI

↓

Early STEMI Notification/Activation of closest PCI capable hospital (unless patient expresses preference) with transmission of 12 lead when possible.

- Baptist Health Floyd
- Baptist Health Louisville
- Clark Memorial Health
- Norton Hospital
- Norton Audubon Hospital
- U of L Healthcare - U of L Hospital
- U of L Healthcare - Jewish Hospital

↔ If transporting to any Norton Healthcare Hospital, refer to CODE STEMI procedure and Access Center phone number.

Revised 9/14/2023

Harrison County Hospital EMS

STROKE

EMS Triage and Destination Plan

STROKE Patient

- A patient with symptoms of an acute stroke as identified by the Cincinnati Prehospital Stroke Screen.

Time of Symptom Onset, aka "LAST KNOWN WELL"

- Defined as the last witnessed time the patient was symptom free (i.e. awakening with stroke symptoms would be defined as the onset time of the previous night when patient was symptom free.

The Purpose of this plan is to:

- Rapidly identify acute stroke patients who present to EMS.
- Minimize the time from onset of stroke symptoms to definitive care.
- Quickly diagnose a stroke using a validated EMS stroke screen.
- Rapidly identify the best hospital destination based on symptom onset time and predicted transport time.
- Early activation/notification to the hospital prior to patient arrival.
- Minimize scene time to 10-15 minutes or less.
- Provide quality EMS service and patient care to the community's citizens.

Using Procedure: Stroke Screen: Cincinnati Prehospital Stroke Scale, determine the "Last Known Well" time and report this to the receiving facility.

Early STROKE Notification of closest stroke-ready facility.

- Baptist Health Floyd
- Baptist Health Louisville
- Clark Memorial Health
- Norton Hospital
- Norton Brownsboro Hospital
- U of L Healthcare - U of L Hospital
- U of L Healthcare - Jewish Hospital

Revised 9/14/2023

Harrison County Hospital EMS

ADULT TRAUMA
EMS Triage and Destination Plan

IF PATIENT IS < 18 YEARS OLD, GO TO PEDIATRIC TRIAGE AND DESTINATION PLAN

The Purpose of this plan is to:

- Rapidly perform Primary and Secondary Survey, measure Vital Signs, and assess level of consciousness.
- Rapidly identify injured patient presenting to the 911 system and minimize time from injury to definitive trauma care.
- Rapidly identify life or limb threatening injuries for EMS treatment and stabilization.
- Rapidly identify the most appropriate hospital destination based on time from injury, severity of injury, and estimated transport time.
- Provide early activation/notification to the receiving hospital of a trauma patient prior to EMS arrival.
- Minimize scene time following patient extrication.
- Provide quality EMS service and patient care to citizens within the EMS system.
- Comply with Indiana EMS regulation.

RED CRITERIA - High Risk for Serious Injury

Injury Patterns

- Penetrating injuries to head, neck, torso, and proximal extremities
- Skull deformity, suspected skull fracture
- Suspected spinal injury with new motor or sensory loss
- Chest wall instability, deformity, or suspected flail chest
- Suspected pelvic fracture
- Suspected fracture of two or more proximal long bones
- Crushed, degloved, mangled, or pulseless extremity
- Amputation proximal to wrist or ankle
- Active bleeding requiring a tourniquet or wound packing with continuous pressure

Injury Patterns

All Patients

- Unable to follow commands (motor GCS < 6)
- RR < 10 or > 29 breaths/minute
- Respiratory Distress or need for respiratory support
- Room-air pulse oximetry < 90%

Age 0 - 9 years

- SBP < 70 mmHg + (2 x age in years)

Age 10 - 64 years

- SBP < 90 mmHg or HR > SBP

Age ≥ 65 years

- SBP < 110 mmHg or HR > SBP

Transport to a Trauma Center if within 45 minutes

- U of L Hospital (Adults)
- Norton Children's Hospital (Pediatric

This Triage and Destination Plan complies, in substance, with Indiana 836 IAC 1-2.1

Revised 9/14/2023

Harrison County Hospital EMS

TRAUMA

EMS Triage and Destination Plan

The Purpose of this plan is to:

- Rapidly perform Primary and Secondary Survey, measure Vital Signs, and assess level of consciousness.
- Rapidly identify injured patient presenting to the 911 system and minimize time from injury to definitive trauma care.
- Rapidly identify life or limb threatening injuries for EMS treatment and stabilization.
- Rapidly identify the most appropriate hospital destination based on time from injury, severity of injury, and estimated transport time.
- Provide early activation/notification to the receiving hospital of a trauma patient prior to EMS arrival.
- Minimize scene time following patient extrication.
- Provide quality EMS service and patient care to citizens within the EMS system.
- Comply with Indiana EMS regulation.

YELLOW CRITERIA - Moderate Risk for Serious Injury

Injury Patterns

- High-Risk Auto Crash
  - Partial or complete ejection
  - Significant intrusion (including roof)
    - > 12 inches occupant site OR
    - > 18 inches any site OR
    - Need for extrication for entrapped patient
  - Death in passenger compartment
  - Child (age 0 - 9 years) unrestrained or in unsecured child safety seat
  - Vehicle telemetry data consistent with severe injury
- Rider separated from transport vehicle with significant impact (eg, motorcycle, ATV, horse, etc.)
- Pedestrian/bicycle rider thrown, run over, or with significant impact.
- Fall from height > 10 feet (all ages)

Injury Patterns

- Low level falls with significant head impact in olde4r adults or pediatrics
- Medically complex patients at baseline (multiple medical problems, anticoagulant use, special needs/resources
- Suspected child abuse
- Pregnancy > 20 weeks (even minor blunt trauma should be transported to a trauma center)
- Burns in conjunction with other trauma

EMS provider discretion may be used to determine if a patient needs to be transported to a trauma center vs a non-trauma center. ***WHEN IN DOUBT OR ANY CONCERN, CONTACT MEDICAL CONTROL OR TRANSPORT TO A TRAUMA CENTER.***

This Triage and Destination Plan complies, in substance, with Indiana 836 IAC 1-2.1

Revised 9/14/2023

R	EMR
E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

Apgar Scoring

Apgar scoring is performed on a neonate at 1 minute and 5 minutes after birth. The purpose of the score is to get a general idea of the health of the new born infant. A complete Apgar score will range from 0 to 10. Ideally, the Apgar score will improve between the 1 minute and 5 minutes scores.

Sign	0	1	2
Appearance (skin color)	Blue, pale	Body pink, blue extremities	Completely pink
Pulse Rate (heart rate)	Absent	< 100/minute	> 100/minute
Grimace (irritability)	No Response	Grimace	Cough, sneeze, cry
Activity (muscle tone)	Limp	Some flexion	Active motion
Respirations (respiratory effort)	Absent	Slow, irregular	Good, crying

A	AEMT
P	Paramedic

Burn Resources

Burn Resuscitation
Rule of 10's

Adult (40 - 80kg): See Rule of 10's Below

Children (< 40 kg)

Formula:

$$\frac{\text{TBSA x weight (kg)}}{8} \times 1.5 = \text{Rate (mL/hour)}$$

RULE OF 10'S: Adults 40-80 kg

Rule of 10's for initial fluid rate, adults only.

1. Estimate burn size to the nearest 10
2. TBSA x 10 = initial rate in mL/hour (for adult patients, weighing 40-80 kg)
3. For every 10 kg (22 lbs) above 80 kg, increase the rate by 100 mL/hour.

Example:

70kg patient with 30% TBSA burns

30 x 10 = 300 mL/hour

With at 10 gtt/mL drip set, the drip rate would be 50 gtts/minute

Revised 10/4/2024
Source: American Burn Association

Burn Resources

Flow Rate Chart using macrodrip administration set (10 drops/mL)

Weight (kg)	TBSA %	mL/hr	Drip rate/min (rounded)
40	10	50	8
	15	75	13
	20	100	17
	25	125	21
	30	150	25
	35	175	29
	40	200	33
	45	225	38
	50	250	42
	55	275	46
	60	300	50
	65	325	54
	70	350	58
	75	375	63
	80	400	67
	85	425	71
	90	450	75
	95	475	79
	100	500	83
50	10	63	10
	15	94	16
	20	125	21
	25	156	26
	30	188	31
	35	219	36
	40	250	42
	45	281	47
	50	313	52
	55	344	57
	60	375	63
	65	406	68
	70	438	73
	75	469	78
	80	500	83
	85	531	89
	90	563	94
	95	594	99
	100	625	104

Revised 10/4/2024
Source: American Burn Association

Burn Resources

Weight (kg)	TBSA %	mL/hr	Drip rate/min (rounded)
60	10	75	13
	15	113	19
	20	150	25
	25	188	31
	30	225	38
	35	263	44
	40	300	50
	45	338	56
	50	375	63
	55	413	69
	60	450	75
	65	488	81
	70	525	88
	75	563	94
	80	600	100
	85	638	106
	90	675	113
	95	713	119
	100	750	125
70	10	88	15
	15	131	22
	20	175	29
	25	219	36
	30	263	44
	35	306	51
	40	350	58
	45	394	66
	50	438	73
	55	481	80
	60	525	88
	65	569	95
	70	613	102
	75	656	109
	80	700	117
	85	744	124
	90	788	131
	95	831	139
	100	875	146

Revised 10/4/2024

Source: American Burn Association

Burn Resources

Weight (kg)	TBSA %	mL/hr	Drip rate/min (rounded)
80	10	100	17
	15	150	25
	20	200	33
	25	250	42
	30	300	50
	35	350	58
	40	400	67
	45	450	75
	50	500	83
	55	550	92
	60	600	100
	65	650	108
	70	700	117
	75	750	125
	80	800	133
	85	850	142
	90	900	150
	95	950	158
	100	1000	167

Revised 10/4/2024
Source: American Burn Association

A	AEMT
P	Paramedic

Burn Resources
Parkland Burn Formula

Parkland Burn Formula

FIRST 24 HOURS
4 mL/kg per %TBSA

TBSA x Weight x 4.0 mL

50% of the 24 hour total is given the first 8 hours. 25% of the 24 hour total is given the second 8 hours. Finally, 25% of the 24 hour total is given the third 8 hours.

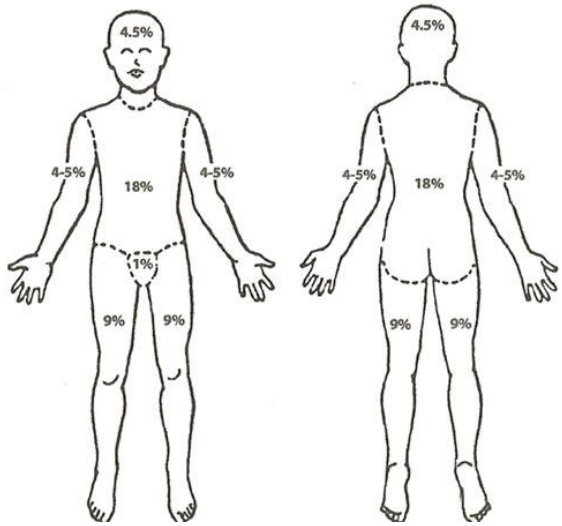
First 8 Hours
TBSA x Weight X 4.0 mL, divide by 2
This is the total amount of fluid to give in the first 8 hours.

Hourly Rate *for first 8 hours*
Take your total from above and divide by 8.

Example: 80 kg patient with 50% TBSA
(50 x 80 x 4) / 2 = 8,000 mL in first 8 hours.
8,000 mL / 8 = 1,000 mL/hr

Remember:
Weight in kg (2.2 lbs = 1.0 kg)
Example: 220 lbs adult = 100 kg

(Reminder, if two IV's are running, divide total amount to be infused each hour by 2)



Wt (kg)	% TBSA	per hr for 1st 8 hrs of care	60 gtt set, gtt/min	10 gtt set, gtt/min
10	10	25	25	4
10	20	50	50	8
10	30	75	75	13
10	40	100	100	17
10	50	125	125	21
20	10	50	50	8
20	20	100	100	17
20	30	150	150	25
20	40	200	200	33
20	50	250	250	42
30	10	75	75	13
30	20	150	150	25
30	30	225	225	38
30	40	300	300	50
30	50	375	375	63
40	10	100	100	17
40	20	200	200	33
40	30	300	300	50
40	40	400	400	67
40	50	500	500	83
50	10	125	125	21
50	20	250	250	42
50	30	375	375	63
50	40	500	500	83
50	50	625	625	104
60	10	150	150	25
60	20	300	300	50
60	30	450	450	75
60	40	600	600	100
60	50	750	750	125
70	10	175	175	29
70	20	350	350	58
70	30	525	525	88
70	40	700	700	117
70	50	875	875	146
80	10	200	200	33
80	20	400	400	67
80	30	600	600	100
80	40	800	800	133
80	50	1000	1000	167
90	10	225	225	38
90	20	450	450	75
90	30	675	675	113
90	40	900	900	150
90	50	1125	1125	188
100	10	250	250	42
100	20	500	500	83
100	30	750	750	125
100	40	1000	1000	167
100	50	1250	1250	208

Revised 10/4/2023

Harrison County Hospital EMS

Critical Care Drug List

This list contains medications that might be encountered in a Critical Care Transfer. Drug dosages are listed as a guideline. This list is not all inclusive and the transferring physicians order should be followed. If there is a question regarding dosage, contact the transferring physician.

Drug	Adult	Pediatric
Cardizem (Diltiazem) **Indications/Contraindications:** • A calcium channel blocker that slows conduction through the AV node.	• Dilute 125 mg in 100 ml of solution. • Infuse 5-15 mg/hour, titrated to heart rate.	**N/A**
Dobutamine (Dobutrex) **Indications/Contraindications:** • Synthetic catecholamine that primarily stimulates beta 1 adrenergic receptors.	• 2 – 20 mcg/kg/min IV drip	• 2 – 20 mcg/kg/min IV drip
Heparin Sodium **Indications/Contraindications:** • An anticoagulant that inhibits the clotting cascade.	• 12 IU/kg/hr IV drip	**N/A**
Insulin **Indications/Contraindications:** • A naturally occurring hormone that helps the body use glucose.	• 0.1 units/kg/hr IV drip	• 0.1 – 0.2 units/kg/hr IV drip

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Harrison County Hospital EMS

Critical Care Drug List

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Drug	Adult	Pediatric
Integrilin (Eptifibitide) **Indications/Contraindications:** • Inhibits platelet aggregation	• 0.5 – 2.0 mcg/kg/min IV drip	**N/A**
Labetalol (Normodyne) **Indications/Contraindications:** • An alpha and beta adrenergic blocker used to lower blood pressure.	• Mix 200 mg in 250 ml of D5W. • Infuse at a rate of 2 – 8 mg/hr, titrated to supine blood pressure.	**N/A**
Levofloxacin (Levoquin) **Indications/Contraindications:** • Antibiotic	**Used for a variety of bacterial infections. Exact dosage will depend on the type of infection.** **Hospital Acquired Pneumonia:** • 750 mg infusion over 90 minutes.	**Used for a variety of bacterial infections. Exact dosage will depend on the type of infection.**
Magnesium Sulfate **Indications/Contraindications:** • Cerebral edema • Eclampsia • Hypomagnesemia • Seizure • Torsades de pointes	**Eclampsia (treatment and prophylaxis)** • Maintenance: 1 to 2 g/hr IV infusion until paroxysms cease. • Maximum dosage in 24 hours 30 to 40 grams. **Hypomagnesemia** • 5 g magnesium sulfate 50% solution in 1 L over 3 hours. **Torsades de pointes** • 1 to 2 g diluted in 10 mL over 15 minutes.	**Hypomagnesemia** • 25 to 50 mg/kg IV infusion over 30 to 60 minutes. • Maximum 2 g per dose.

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Harrison County Hospital EMS

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Drug	Adult	Pediatric
Mannitol (Osmitrol) **Indications/Contraindications:** • An osmotic diuretic used to decrease cerebral edema.	• 0.5 – 1.0 g/kg in a 20% solution over 5-10 minutes.	• 0.2 – 0.5 g/kg IV infusion over 30 – 60 minutes.
Midazolam Hydrochloride (Versed **Indications/Contraindications:** • Anxiety • Sedation of mechanically ventilated patient • Seizure • Status Epilepticus	**Sedation for mechanically ventilated patient** • IV infusion 0.02 to 0.1 mg/kg/hr (1 to 7 mg/hr) **Status Epilepticus** • Maintenance Infusion: 0.75 to 10 mcg/kg/min.	**Status Epilepticus** • Maintenance Infusion: 2 mcg/kg/min, increasing at 5 minute intervals until seizure control. • Maximum 10 mcg/kg/min
Naloxone (Narcan) **Indications/Contraindications:** • Narcotic antagonist	**Nebulization** • 2mg in 3mL of normal saline. Average time to second dose is 33 minutes. **Maintenance Infusion:** • Two-thirds the initial dose to restore breathing every hour: 0.1 to 6 mg/hr.	**N/A**
Neosynephrine (Phenylephrine Hydrochloride **Indications/Contraindications** • Alpha-1 adrenergic agonist. It is a potent vasoconstrictor.	• Maximum single dose 1mg	• 5-10 mcg/kg IV

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Harrison County Hospital EMS

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Drug	Adult	Pediatric
Nitroglycerin **(Tridil and others)** **Indications/Contraindications:** • A vasodilator used for chest pain in the presence of a myocardial infarction.	• 200 – 400 mcg/ml infused at a rate of 10 – 20 mcg/min. • Increase 5 – 10 mcg/min every 5 – 10 minutes until desired effect is achieved.	**N/A**
Nitroprusside **(Nipride, and others)** **Indications/Contraindications:** • An anti-hypertensive, used to reduce after load.	• Mix 50 or 100 mg in 250 ml D5W. • Infuse at 0.1 mcg/kg/min, titrate up every 3 – 5 minutes to desired effects. • Maximum dose 5 mcg/kg/min.	**N/A**
Norcuron **Vecuronium Bromide** • A non-depolarzing, neuromuscular blocking agent.	• IV: 80-100 mcg/kg	• IV: > 10 years of age, 80-100 mcg/kg • < 10 years of age: **N/A**
Norepinephrine **Levophed** **Indications/Contraindications:** • An alpha and beta 1 adrenergic agonist.	• Dilute 4 mg in 250 ml of D5W or D5NS • Infuse at 0.5 – 1 mcg/min, titrated to desired effect. • Maximum dose is 30 mcg/min.	• 0.1 – 2 mcg/kg/min IV / IO infusion.
Oxytocin **(Pitocin)** **Indications/Contraindications:** • A hormone used to control post partum hemorrhage.	• Mix 10 – 40 units in 1000 ml NS or lactated ringers. • Infuse at 10 – 40 mU/min with microdrip tubing.	**N/A**

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Harrison County Hospital EMS

Critical Care Drug List

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Drug	Adult	Pediatric
Phenytoin Sodium (Dilantin) **Indications/Contraindications:** • Status Epilepticus	• Loading Dose: 10 to 15 mg/kg (do not exceed 50 mg/min). • Maintenance Dose: 100 mg every 6-8 hours.	• Loading Dose: 15 to 20 mg/kg. Rate not to exceed 1 to 3 mg/kg/min or 50 mg/min, whichever is slower.
Propofol **Indications/Contraindications:** • Classified as a central nervous system sedative-hypnotic • General anesthesia • Sedation for a mechanically ventilated patient. • Procedural sedation	**Sedation for a mechanically ventilated patient:** • Maintenance infusion: 5 to 50 mcg/kg/min (0.3 to 3 mg/kg/hr) or higher to achieve desired level of sedation. **General Anesthesia:** • Maintenance infusion: <55 years of age: 100 to 200 mcg/kg/min (6 to 12 mg/kg/hr). Dose varies with age and surgery type.	**Sedation for a mechanically ventilated patient: (Fresenius Propoven 2% emulsion)** • Maintenance infusion: 0.3 to 4 mg/kg/hr. • Maximum 4 mg/kg/hr. **General Anesthesia:** • Maintenance infusion: 125 to 300 mcg/kg/min (7.5 to 18 mg/kg/hr).
Sodium Bicarbonate **Indications/Contraindications:** • Metabolic acidosis • Cardiac Arrest due to hyperkalemia • Tricyclic Antidepressant Overdose • Sodium Channel Blocker Toxicity	**The dosage will depend on the use.**	**The dosage will depend on the use.**
Streptokinase (Streptase) **Indications/Contraindications:** • A fibrinolytic agent.	• 1.5 million units diluted to 45 ml. • IV infusion over 1 hours	**N/A**

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Harrison County Hospital EMS

Critical Care Drug List

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Drug	Adult	Pediatric
Succinylcholine (Anectine) **Indications/Contraindications:** • A depolarizing neuromuscular blocker.	• 0.3 – 1.1 mg/kg over 10 – 30 seconds IV push • Maintenance: 0.04 – 0.07 mg/kg	• 1 – 2 mg/kg rapid IV
Tissue Plasminogen Activator (t-PA, Activase and others) **Indications/Contraindications:** • A fibrinolytic agent.	• Follow physician orders	**N/A**
Vancomycin Hydrochloride **Indications/Contraindications:** • Antibiotic	**Methicillin resistant Staphylococcus aureus (MRSA)** • Loading Dose: 15 to 20 mg/kg • Maintenance Dose: 30 to 40 mg/kg • Maximum 60 mg/kg	**Varies by age.**

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E	EMT
A	AEMT
P	Paramedic

Harrison County Hospital EMS

Difficult Airway Evaluation

Evaluating for the difficult airway

Some patients who require endotracheal intubation have airways that make intubation difficult. Some of these factors can also affect supraglottic airway placement. Recognizing those patients who may have a difficult airway allows the paramedic to proceed with caution and to keep as many options open as possible. It also allows the paramedic to prepare additional equipment (such as a cricothyrotomy kit) that may not ordinarily be part of a standard airway kit. The pneumonic LEMON is useful in evaluating patients for signs that me be consistent with a difficult airway and should raise the paramedic's index of suspicion.

LOOK EXTERNALLY

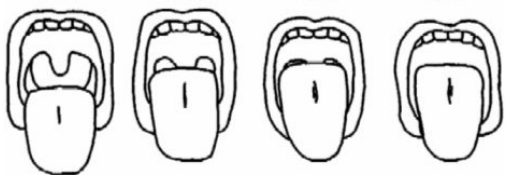
External indicators of either difficult intubation or difficult ventilation include: presence of a beard or moustache, abnormal facial shape, extreme cachexia or lack of muscle mass, lack of teeth, facial trauma, obesity, large front teeth or "buck teeth", high arching palate, receding mandible, short bull neck.

EVALUATE 3-3-2 RULE

3 fingers between the patient's teeth (patient's mouth should open adequately to permit three fingers to be placed between the upper and lower teeth)
3 fingers between the tip of the jaw and the beginning of the neck (under the chin)
2 fingers between the thyroid notch and the floor of the mandible (top of the neck)

MALLAMPATI

This scoring system is based on the work of Mallampati et al published in the Canadian Anaesthesia Society Journal in 1985. The system takes into account the anatomy of the mouth and the view of various anatomical structures when the patient opens his mouth as wide as possible. This test is performed with the patient in the sitting position, the head held in a neutral position, the mouth wide open, and the tongue protruding to the maximum. Inappropriate scoring may occur if the patient is in the supine position (instead of sitting), if the patient phonates or if the patient arches his or her tongue.



Class I Class II Class III Class IV

Class I = soft palate, fauces, uvula, pillars visable.
Class II = soft palate, fauces, uvula visable.
Class III = soft palate, base of uvula visable.
Class IV = soft palate not visible at all.

OBSTRUCTION?

Besides the obvious difficulty if the airway is obstructed with a foreign body, the paramedic should also consider other obstructers such as tumor, abscess, epiglottis, or expanding hematoma.

NECK MOBILITY

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

Harrison County Hospital EMS

Dopamine (Intropin)

This chart is provided as a guide to dosing. It is the responsibility of each clinician to make sure they are giving the proper dose of medication. The numbers below have been rounded to the closest whole number.

Weight Conversion Formula

Kg = lbs / 2.2
Example: 150 lbs / 2.2 = 68 kg (rounded)

Drip Rate Formula
(To find drops/min)

$$\frac{\text{Dose x Weight (kg) x drop factor}}{\text{Concentration in 1 ml}} = \text{gtts/min}$$

Calculated with a concentration of 3200 mcg/ml (800 mg in 250 ml)
Values below are drips/min on a 60 drop/ml (Micro Drip) set

Drops/min

Weight (lbs)	Weight (kg)	5 mcg/kg/min	10 mcg/kg/min	15 mcg/kg/min	20 mcg/kg/min
66	30	3	6	8	11
77	35	3	7	10	13
88	40	4	7	11	15
99	45	4	8	13	17
110	50	5	9	14	19
121	55	5	10	15	21
132	60	6	11	17	22
143	65	6	12	18	24
154	70	7	13	20	26
165	75	7	14	21	28
176	80	7	15	22	30
187	85	8	16	24	32
198	90	8	17	25	34
209	95	9	18	27	36
220	100	9	19	28	37
231	105	10	20	30	39
242	110	10	21	31	41

Harrison County Hospital EMS

EMS Drug List

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Drug	Adult	Pediatric
Adenosine (Adenocard) **Indications/Contraindications:** • Specifically for treatment or diagnosis of Supraventricular Tachycardia	• 6 mg rapid IV push over 1-3 seconds. If no effect after 1-2 minutes; • 12 mg rapid IV push over 1-3 seconds. If no effect after 1-2 minutes; • Repeat with 12 mg IV push over 1-3 seconds. • Follow each dose with 10 ml Normal Saline flush.	• 0.1 mg/kg IV (Max 6 mg) push over 1-3 seconds. If no effect after 1-2 minutes, • Repeat with 0.2 mg/kg IV (Max 12 mg) push over 1-3 seconds. • Follow each dose with 5 ml to 10 ml Normal Saline flush.
Albuterol (Proventil) **Indications/Contraindications:** • Beta-Agonist nebulized treatment for use in respiratory distress with bronchospasm.	• 2.5 mg (3 cc) in nebulizer continuously, if no history of cardiac disease and heart rate < 150.	• 2.5 mg (3 cc) in nebulizer continuously, if no history of cardiac disease and heart rate < 200.
Amiodarone (Cordarone) **Indications/Contraindications:** • Antiarrhythmic used in Ventricular Fibrillation. • Avoid in patients with heart block or profound Bradycardia.	V-fib / pulseless V-tach • 300 mg IV push • Repeat dose of 150 mg IV push for recurrent episodes V-tach with a pulse • 150 mg in 100cc D5W over 10 minutes	V-fib / pulseless V-tach • 5 mg/kg IV push
Aspirin **Indications/Contraindications:** • An antiplatelet drug for use in cardiac chest pain	• 81 mg chewable (baby) Aspirin. Give 4 tablets to equal 324 mg.	**N/A**

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Revised 11/16/2023

Harrison County Hospital EMS

EMS Drug List

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Drug	Adult	Pediatric
Ativan (Lorazepam) **Indications/Contraindications** • A benzodiazepine used in the treatment of anxiety and status epilepticus.	• IV: 4mg, can be followed by a second dose of 4mg in 10-15 minutes.	• IV: Maximum dose 4mg, can be followed by a maximum dose of 4mg in 10-15 minutes
Atropine Sulfate **Indications/Contraindications:** • Anticholinergic drug used in bradycardia. • For Endotracheal Tube use of this drug, double the dose)	• 1.0 mg IV every 3-5 minutes, up to 3 mg.	• 0.02 mg/kg IV, IO (Max 1.0 mg per dose) • Minimum 0.1 mg per dose • May repeat dose X 1
Atrovent (Ipratropium) **Indications/Contraindications:** • Anticholinergic that results in bronchodilation. • Medication used in addition to albuterol to assist in patients with asthma and COPD.	• 500 mcg, combined with nebulized albuterol.	• 500 mcg, combined with nebulized albuterol.
Benadryl Diphenhydramine **Indications/Contraindications:** • Antihistamine for control of allergic reactions.	Mild or Moderate Allergic Reaction • 25 mg IV Severe Allegic Reaction • 25 – 50 mg IV	• 1 mg/kg IV / IO • Do not give if < 10 kg or < 3 months old. • Maximum dose 25 mg
Brethine (Terbutaline) **Indications/Contraindications:** • A bronchodilator used for bronchospasm secondary to asthma or COPD.	• 0.25 mg SQ • May repeat X 1 in 15 – 30 minutes.	**N/A**

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Revised 11/16/2023

Harrison County Hospital EMS

EMS Drug List

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Drug	Adult	Pediatric
Dextrose 10% in Water IV Solution, 250 mL bag **Indications/Contraindications:** • Alternate use in diabetics. • Monitor for fluid overload.	• Run at a rate appropriate to maintain blood sugar and to avoid fluid overload.	• Run at a rate appropriate to maintain blood sugar and to avoid fluid overload.
Dextrose 5% in Water IV Solution, 50 mL bag **Indications/Contraindications:** • Use to mix Amiodarone infusion.	• Used to mix Amiodarone and to run over 10 minutes	**N/A**
Dextrose 25% **Indications/Contraindications:** • Use in unconscious or hypoglycemic states.	**N/A**	• 2-10 ml/kg IV or IO starting at low dose • Repeat based on blood glucose results
Dextrose 50% **Indications/Contraindications:** • Use in unconscious or hypoglycemic states.	• One ampule or 25 gram IV bolus • Repeat based on blood glucose results.	**N/A**
Dopamine (Premix Bag) **(Intropin)** **Indications/Contraindications:** • A vasopressor used in shock or hypotensive states.	• 2 – 20 mcg/kg/min IV / IO titrated to BP systolic of 90 mmHg ROSC • 5 – 10 mcg/kg/min IV / IO titrated to maintain a mean arterial pressure of 90 – 100 mmHg.	• 2 – 20 mcg/kg/min IV / IO titrated to BP systolic appropriate for age.

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Revised 11/16/2023

Harrison County Hospital EMS

EMS Drug List

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Drug	Adult	Pediatric
Epinephrine 1 mg/mL (1:1,000) **(Adrenaline)** **Indications/Contraindications:** • Vasopressor used in moderate allergic reactions and respiratory distress.	Moderate Allergic Reaction • 0.3 – 0.5 mg SC Respiratory Distress • 0.3 mg SC, if < 40 years old and no cardiac history.	• 0.01 mg/kg IV or IO • Maximum dose is 0.3 mg
Epinephrine 0.1 mg/mL (1:10,000) **(Adrenaline)** **Indications/Contraindications:** • Vasopressor used in cardiac arrest and severe allergic reaction.	Pulseless Arrest • 1.0 mg IV / IO • Repeat every 3 – 5 minutes • May be given by endotracheal tube in double the IV dose. Severe Allergic Reaction • 0.5 mg IV / IO	Pulseless Arrest • 0.01 mg/kg IV / IO • Repeat every 3 – 5 minutes • May be given by endotracheal tube in double the IV dose.
Fentanyl **(Sublimaze)** **Narcotic Analgesic** **Indications/Contraindications:** • Narcotic pain relief • Avoid if BP < 110	• 2 mcg/kg IV / IO • Maximum dose 150 mcg	• 1 - 2 mcg/kg IV / IO • Maximum dose 150 mcg
Glucagon **Indications/Contraindications:** • Drug acting to release glucose into blood stream by glycogen breakdown. • Use in patients with no IV access.	• 1 mg IM • Follow up blood glucose determination in 15 minutes.	• 0.5 mg IM • Follow up blood glucose determination in 15 minutes. • Age > 3 years.
Glucose-Oral **Indications/Contraindications:** • Use in conscious hypoglycemic states.	• One tube • Repeat based on blood glucose results	• One tube • Repeat based on blood glucose result. • Minimal age = 3 years

This formulary is provided as a reference only. It does not contain all of the contraindications and potential adverse reactions for each listed drug. It is the responsibility of each EMS professional to be knowledgeable about the use of each drug in this formulary.

Revised 11/16/2023

Harrison County Hospital EMS

EMS Drug List

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Drug	Adult	Pediatric
Ketamine Hydrochloride (Ketalar) **Indications/Contraindications:** • Sedation following endotracheal intubation or supraglottic airway (SGA) insertion. • Excited / Agitated Delirium • Breakthrough and/or serious pain.	**Post Intubation/SGA Insertion (BP < 90 systolic)** • 2 mg/kg IV / IO, Very slow IV push **Excited / Agitated Delirium** • 4 mg/kg IM **OR:** • 2 mg/kg IV / IO • Maximum 300 mg **Breakthrough and / or Serious Pain (> 16 years old)** • 0.1 mg/kg very slow IV push • Repeat PRN up to maximum of 30 mg	**Excited / Agitated Delirium** • 4 mg/kg IM **OR;** • 1 mg/kg IV / IO • Maximum 150 mg **Breakthrough and / or Serious Pain (> 16 years old)** • 0.1 mg/kg very slow IV push • Repeat PRN up to maximum of 30 mg
Lasix (Furosemide) **Indications/Contraindications:** • A loop diuretic used in pulmonary edema.	• 40 mg IV slow push • If patient is currently taking Lasix, then give that dose.	• 1 mg/kg IV slow push • Maximum dose is 6 mg
Levophed (Norepinephrine) **Indications/Contraindications:** • Shock	• 8 - 12 mcg/min IV infusion • Titrate to systolic BP ≥ 90 mm Hg	**N/A**
Lidocaine 2% (Xylocaine) **Indications/Contraindications:** • Injectable anesthetic used to reduce pain associated with pressure infusion of fluids into the marrow space.	• 10 mg slow IO push. Do not flush for at least 30 seconds.	• 0.5 mg/kg slow IO push. Do not flush for at least 30 seconds.

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Harrison County Hospital EMS

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Drug	Adult	Pediatric
Lidocaine 2% Topical Jelly (Xylocaine 2% Topical Jelly) **Indications/Contraindications:** • Used for local anesthesia and lubrication for placement of nasotracheal endotracheal tubes and nasopharyngeal airways.	• Apply necessary amount to endotracheal tube or nasopharyngeal airway prior to insertion into the nostril.	• Apply necessary amount to endotracheal tube or nasopharyngeal airway prior to insertion into the nostril.
Magnesium Sulfate **Indications/Contraindications:** • An electrolyte used in treatment of Torsades de Pointes Ventricular Tachycardia.	• Dilute 1 – 2 grams in 10 ml of Normal Saline.	**N/A**
Morphine Sulfate **Narcotic Analgesic** **Indications/Contraindications:** • Suspected Cardiac Chest Discomfort/Pain • Narcotic pain relief • Possible beneficial effect in pulmonary edema • Avoid if BP < 110	Cardiac Chest Pain • 2mg IV/IO • May repeat every 5 – 10 minutes up to a total of 10mg Pain Relief • 5 mg IM/IV/IO bolus • May repeat every 5 minutes up to a total of 10 mg Pulmonary Edema • 2 mg IV / IO • May repeat X 1 after 10 minutes	Pain Relief • 0.1 mg/kg IV / IO • Single bolus only • Maximum dose 5 mg
Narcan **Naloxone** **Indications/Contraindications:** • Narcotic Antagonist	• 0.5 - 2 mg IV / IO bolus titrated to patient's respiratory response. • Utilize the lowest dose required for patient to protect their airway.	• 0.1 mg/kg IV / IO bolus titrated to patient's respiratory response. • Maximum 2 mg • Utilize the lowest dose required for patient to protect their airway.

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Revised 11/16/2023

Harrison County Hospital EMS

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Drug	Adult	Pediatric
Neosynephrine Spray (Phenylephrine) **Indications/Contraindications:** • Vasoconstrictor used with nasal intubation. • Relative Contraindication is significant hypertension. •	• 2 sprays in nostril	• 1 -2 sprays in nostril
Normal Saline Crystalloid Solution **Indications/Contraindications:** • The IV fluid of choice for access or volume infusion.	• TKO / KVO for IV / IO access. • Bolus in 250 ml increments for cardiac • Bolus in 500 – 1000 ml increments for volume. • Bolus in 1000 ml increments for burns or electrical injuries.	• TKO / KVO for IV / IO access. • Bolus in 20 ml/kg increments for volume (may be repeated X 3)
Nitroglycerine **Indications/Contraindications:** • Smooth muscle relaxer, used for vasodilation in angina, acute coronary syndromes, CHF.	Chest Pain • 1 tablet 0.4 mg SL every 5 minutes until pain free or 3 doses. • If systolic blood pressure ever < 100 mmHg, contact medical control before administration. Pulmonary Edema • 1 tablet SL every 1 – 2 minutes if BP > 110 mmHg. • If systolic blood pressure ever < 100 mmHg, contact medical control before administration.	**N/A**

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Revised 11/16/2023

Harrison County Hospital EMS

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Drug	Adult	Pediatric
Oxygen **Indications/Contraindications:** • Useful in any condition with increase in cardiac work load, respiratory distress, or illness or injury resulting in altered ventilation and/or perfusion. • Required for pre-oxygenation prior to intubation.	• 1-4 liters/min via nasal cannula • 6-15 liters/min via non-rebreather mask (sufficient to allow reservoir bag to remain full during inspiration. • 10-15 liters/min via BVM (sufficient to allow reservoir bag to completely refill between ventilations.	• 1-4 liters/min via nasal cannula • 6-15 liters/min via non-rebreather mask (sufficient to allow reservoir bag to remain full during inspiration. • 10-15 liters/min via BVM (sufficient to allow reservoir bag to completely refill between ventilations.
Sodium Bicarbonate **Indications/Contraindications:** • A buffer used in acidosis to increase the pH in cardiac arrest.	• 1 mEq/kg IV / IO • May be repeated in 10 minutes at 0.5 mEq/kg	• 1 mEq/kg IV / IO • May be repeated in 10 minutes at 0.5 mEq/kg
Thiamine **(Vitamin B1)** **Indications/Contraindications:** • A vitamin administered prior to giving Dextrose in patients with a possible history of malnutrition, alcoholism, thiamine deficiency or cancer.	• 100 mg slow IV push	**N/A**
Solu-medrol **(Methylprednisolone)** **Indications/Contraindications:** • Steriod used in respiratory distress to reverse inflammatory and allergic reactions.	• 125 mg IV	• 2 mg/kg IV • Maximum dose 125 mg

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Revised 11/16/2023

Harrison County Hospital EMS

EMS Drug List

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Drug	Adult	Pediatric
Versed **Midazolam** **Indications/Contraindications:** • Post intubation sedation anxiety, combativeness or restlessness, seizures.	• 0.01 to 0.02 mg/kg • Maximum Dose 2 mg If no IV/IO for seizure • 10 mg IM. DO NOT REPEAT.	If no IV/IO for seizure • 0.2 mg/kg IM. Maximum dose of 10mg. DO NOT REPEAT.
Zofran **(Ondansetron)** **Indications/Contraindications:** • Anti-Emetic used in control of nausea and/or vomiting.	• 4 mg IM or IV	• Contact Medical Control

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Revised 11/16/2023

EMERGENCY GUIDE

2020-2021

International Consortium of Circulatory Assist Clinicians

This guide was created in 2008 by the innovation of VAD Coordinators from some of the largest and most successful VAD implantation hospitals in the United States. ICCAC has ensured that this document continues to be a current resource for not only emergency medical services but to all healthcare workers providing care to the mechanical circulatory support patient population. The purpose is to be a quick emergency guide and should not replace the manufacturers' Instructions For Use as the primary source of information for each device listed in this guide.

Questions and Answers
MECHANICAL CIRCULATORY SUPPORT

Mechanical Circulatory Support Devices (MCS) are heart pumps that move blood from the heart to the body. They are temporary or permanent devices that either supplement or replace the action of a failing heart. MCS devices implanted are assisting the left ventricle (LVAD), the right ventricle (RVAD), or both ventricles (BiVAD) and the total heart (Total Artificial Heart – TAH). They consist of two major categories: Pulse generating (pulsatile) and pulseless devices (non-pulsatile/continuous flow). Patient management varies greatly between the two device categories.

Pulsatile or Non-pulsatile

Pulse generating devices have a chamber that fills with blood and ejects the blood similar to the rhythmic action of the human heart. These devices replace the majority of the heart and move the full amount of blood the patient needs. The Total Artificial Heart pump is a pulse generating device. Non-pulsatile or continuous flow devices use a motor at a fixed speed leading to a constant ejection of blood to the body. This is the reason patients with continuous flow VADs often lack a pulse upon palpation. The most common VADs are non-pulsatile/continuous flow devices.

What is a VAD?

A ventricular Assist Device (VAD) is an implantable mechanical heart pump that helps to pump blood from the lower chambers of the heart to the rest of the body in patients with advanced heart failure. The device helps move partial or full amount of blood meeting the patient needs. These devices can be attached to the Left (LVAD) or Right (RVAD) ventricles of the heart. Most patients have an LVAD and less common are RVADs and BiVADs (both left and right or Biventricular support).

What are the parts of a VAD?

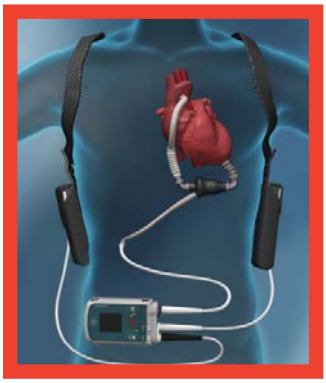
All VADs have at least 4 components. (1) A heart pump unit consisting of a short tube placed inside the ventricle pulling blood thru the pump and out a tube, delivering blood to the body's great vessel; (2) A power cord called a driveline that exits the abdomen and connects to a controller and power source; (3) A controller that displays information; (4) A power source.

What does the controller do?

The controller is a computer that operates the heart pump. It provides messages and audible alarms to help monitor the pump. It gives information about pump performance such as blood flow through the pump (L/min), pump speed (RPM) and the amount of power consumed (Watts). It also gives warnings and alarms if there is an alert/problem with the pump or with the power source, such as low battery or low flow.

What is the power source?

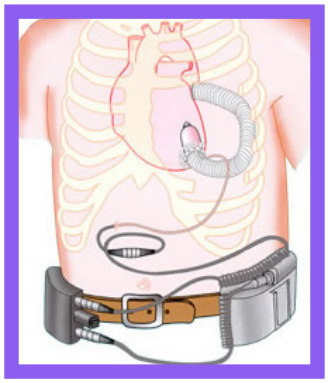
All VADs can be powered by two power sources: rechargeable batteries or AC (electricity) power. Batteries are used when patients are active throughout the day and often are kept in a holster, vest or belt for safety. AC power is recommended when the patient is planning to remain stationary. AC power should NOT be used when transporting the patient.



HEARTMATE II Page 4

HEARTMATE 3 Page 9

HEARTWARE HVAD Page 13



JARVIK 2000 Page 18

What is a TAH?

A Total Artificial Heart (TAH) is a mechanical device that replaces the two lower ventricles of the heart. Tubes connect the TAH to a power source that is outside the body. The TAH then pumps blood through the heart's major artery to the lungs and the rest of the body. This is used for people who have inadequate function of both ventricles (biventricular failure).

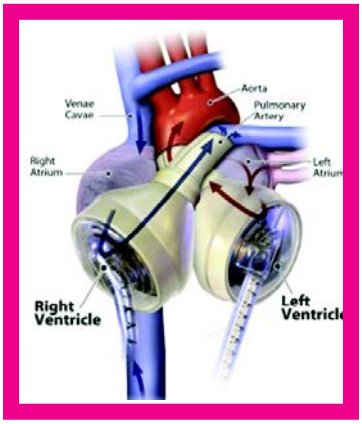
What are the parts of TAH?

The TAH has 3 components. (1) A pump assembly consisting of 2 short tubes attached to the top of the heart and 2 chambers that fill and empty using air that pushes and pulls a membrane back and forth; (2) Air tubes that exit the body and attach to a console; (3) A power source.

What is the power source?

The TAH uses a mobile console called a Freedom Driver when patients are ambulatory. The console is powered by two batteries or AC (electricity) power. The batteries must be well charged before moving the patient and the AC plug should be brought when transporting.

The devices in this MCS Emergency Guide are color coded for quick identification. Patients may have a color matching tag or identifier on their equipment or equipment bag. Patients will also have their primary VAD team contact information for an important resource.



TOTAL ARTIFICIAL HEART (TAH) Page 25

Patient Management For VADs

1. Treat the patient and follow your protocols. Do not focus only on the device. Most patients do not have a primary pump malfunction. Common MCS patient problems that arise are stroke, bleeding disorders (GI, nose bleeds), arrhythmias, dehydration and right heart failure.

2. Assess the patients airway and intervene per your protocol.

3. Auscultate heart sounds to determine if the device is functioning. If it is continuous flow device, you should hear a "humming sound".

4. Assess vital signs. Non-pulsatile or continuous flow devices provide continuous blood flow from the heart to the aorta. This continuous flow results in a narrow arterial pulse pressure. This means it may be difficult to obtain a pulse or blood pressure reading which may be a normal state for a continuous flow device patients. To obtain a blood pressure an automated cuff or doppler method can be used. If unable to obtain with automated cuff use the mean BP with a doppler (first sound you hear – MAP). Rely on other methods to assess perfusion e.g. mental status, skin color, capillary refill. The device flow shown on the controller display reflects the patient's cardiac output.

5. Start IV if indicated.

6. Assess the device for device information and alarms located on the controller display.

7. Intervene appropriately based on the type of alarm. See specific device alarm guides on the pages that follow.

8. Refer to the patient's medication list. They are typically, but not always, on anticoagulation and antiplatelet therapy.

9. Call the VAD Center's 24 hour emergency number on the patient's contact list, controller/equipment, or emergency bag for assistance in the management of the patient and transportation determination and location.

10. **Bring all of the patients equipment.**

11. **Bring the significant other if possible to act as a expert on the device in the absence of consciousness in the patient.**

HeartMate II™ Left Ventricular Assist System

1. **Can I do CPR?**

   Yes, in the right clinical scenario. Chest compressions may pose a risk of dislodgement - use clinical judgment. If compressions are administered, confirm function and positioning of the pump.

2. **Can the patient be defibrillated while connected to the device?**

   Yes you can defibrillate, and you do not have to disconnect anything.

3. **Can this patient be externally paced?**

   Yes.

4. **What type of alarm occurs in a low flow state?**

   A red heart alarm indication and steady audio alarm will sound if less than 2.5 lpm. Can give a bolus of normal saline and transport to a VAD center.

5. **Can I change the speed of the device?**

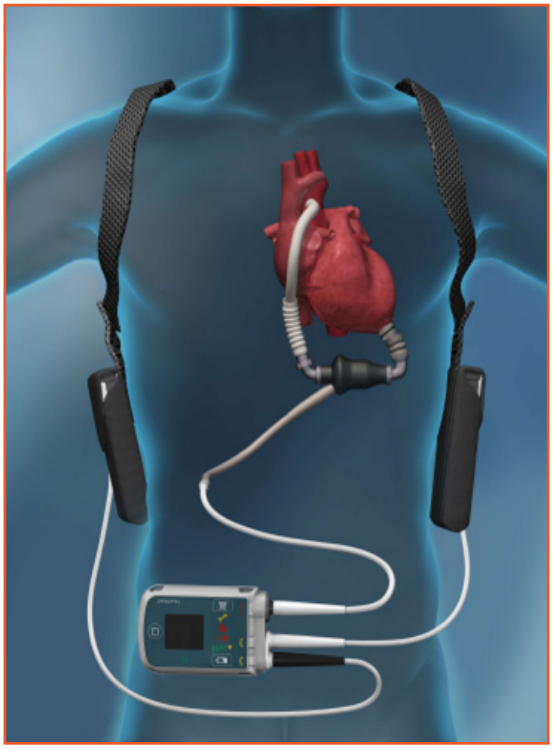
   No, it is a fixed speed.

6. **Does the patient have a pulse with this device?**

   Likely they will not because it is a continuous flow device, however some patients may have a pulse.

7. **What are acceptable vital sign parameters?**

   MAP 70 - 90 mm Hg with a narrow pulse pressure.

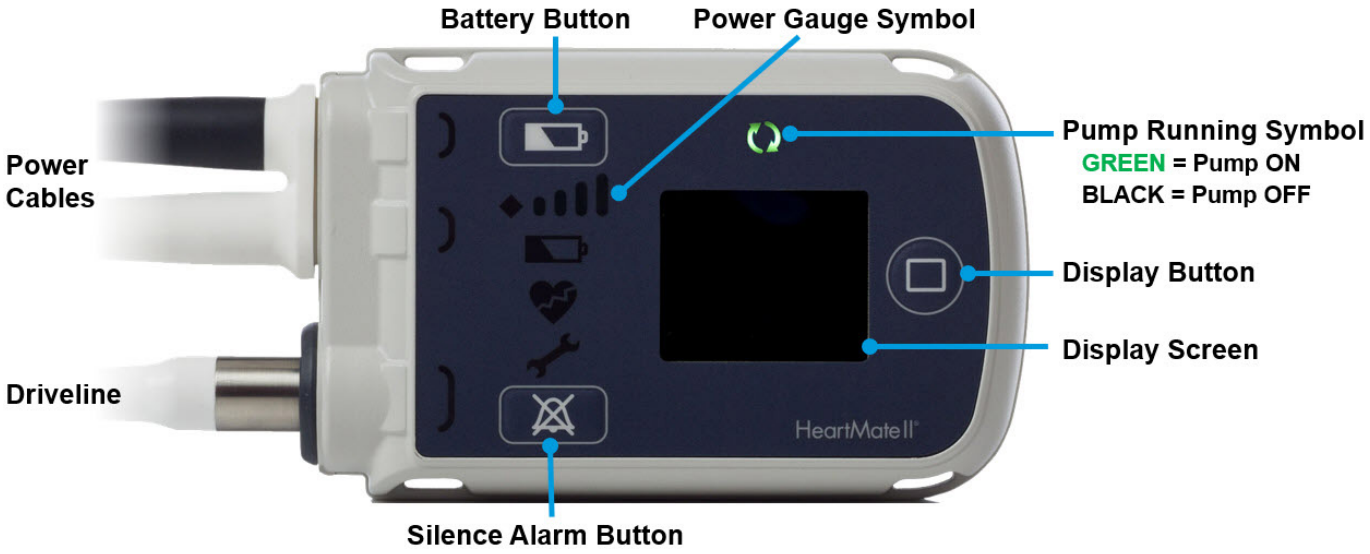


Frequently Asked Questions

- May not be able to obtain cuff pressure (continuous flow pump).
- Pump connected to driveline exiting patient's abdominal area and is attached to controller which runs the pump.
- Pump does not affect ECG.
- All ACLS drugs may be given.
- No hand pump is available.
- A pair of fully charged batteries last approximately 10 - 12 hours.
- Avoid pulling, twisting, or kinking the driveline when strapping the patient to a stretcher.
- Any emergency mode of transportation is ok. These patients are permitted to fly.
- Be sure to bring **ALL** of the patient's equipment with them.

HeartMate II™ Left Ventricular Assist System

System Controller



Changing Batteries

WARNING: At least one controller power cable must be connected to a power source AT ALL TIMES. Do not remove both batteries at the same time or the pump will stop.

- Obtain two charged batteries from patient's accessory bag or battery charger. The charge level of each battery can be assessed by pressing the button on the battery. Fully charged batteries will display 5 lights. (Figures 1 and 2)

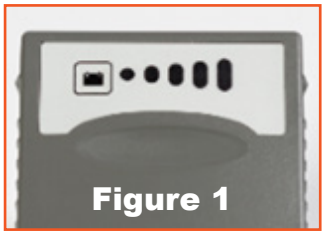


Figure 1

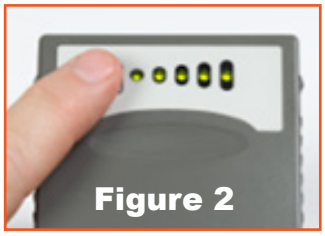


Figure 2

- Check the power level on the batteries, replace the battery with the fewest lights first. Remove only ONE battery from the clip by pressing the release button on the clip to unlock the battery. (Figure 3)

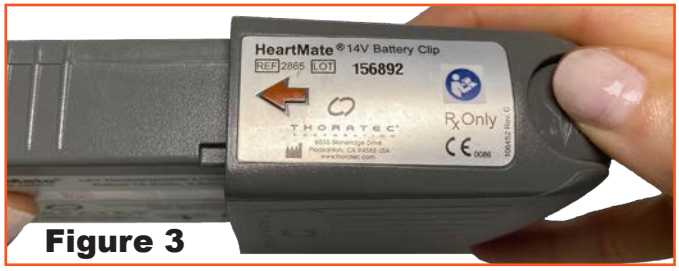


Figure 3

- Controller will start beeping and flashing yellow symbols and will read **CONNECT POWER** on the front screen.

- Insert a new, fully charged battery into the empty battery clip by aligning the **RED** arrows on the battery and clip (Figure 4). The battery will click into the clip. Gently tug on battery to ensure connection. If the battery is properly secured, the beeping and yellow flashing will stop.


Figure 4

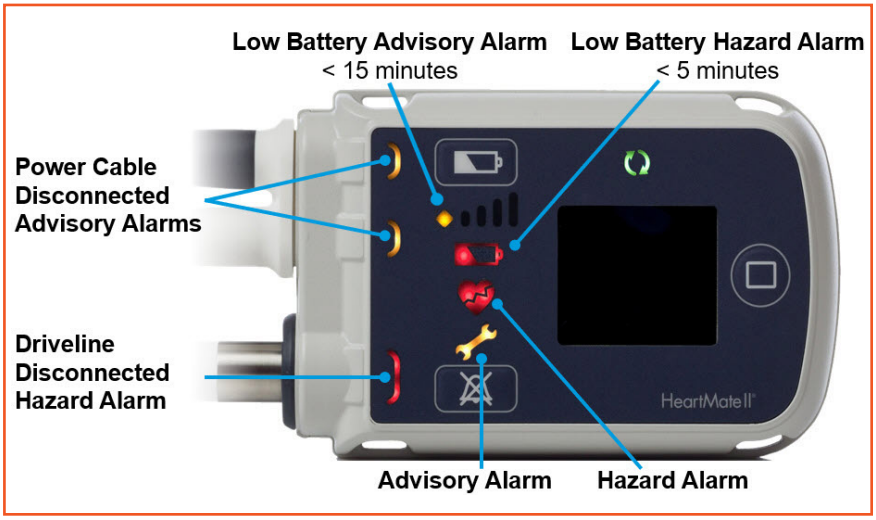
- Repeat previous steps with the second battery and battery clip.

Troubleshooting HeartMate II™ LVAS

Alarms: Emergency Procedures

When an alarm occurs:

- Contact the Implant Center for direction when possible.
- Check alarm messages on controller display screen.
- Check if pump is running:
- Allow care providers trained on LVAD emergencies to remain with the patient.



When the Pump Has Stopped

- Check the driveline and power cable connections to the controller. Fix any loose connections to restart the pump.
- If the pump does not restart and the patient is connected to batteries replace the current batteries with a new, fully-charged pair. (*see Changing Batteries section on previous page*)
- If pump does not restart, change controllers if directed by implant center. (*see Changing Controllers on next page*)
- Be sure to bring ALL of the patient's equipment with them.

HAZARD ALARMS		Continuous Audible Tone
Low Flow :03 + Call Hospital Contact :07	Pump is off.	See above, when pump has stopped
	Pump flow is < 2.5 lpm.	Ensure that a power source is connected to the controller. Evaluate the patient for low flow - treat the cause. Assess volume status, hypertension, arrhythmia, right heart failure, etc.
Connect Driveline :02	Driveline disconnected.	Immediately reconnect Driveline to the controller. Check modular cable connection.
Connect Power Immediately :05 + Backup Battery :01	Both power cables are disconnected.	Immediately connect to batteries or the Mobile Power Unit.
Low Battery :06 + Replace Power :02	Low Battery Power < 5 min. remaining.	Immediately replace batteries or switch to the Mobile Power Unit.

ADVISORY ALARMS		Intermittent Audible Tone
Low Battery :06 + Replace Power Immediately :02	Low Battery Power <15 min. remaining.	Immediately replace batteries or switch to the Mobile Power Unit.
Connect Power :04	A power cable is disconnected.	Reconnect the power cable to power.
Check display for alarm type.		Call VAD Coordinator at implant center for direction.

Troubleshooting HeartMate II™ LVAS

Changing the System Controller

Step 1: Have the patient sit or lie down since the pump will momentarily stop during this procedure.

Step 2: Place the replacement Controller within easy reach, along with the batteries/battery clips. The spare Controller is usually found in the patient's travel case.

Step 3: Attach the battery clips to the replacement controller by lining up half circles, firmly pushing together, and tightening connector nut. Insert the batteries into the clips by aligning the **RED** arrows.

Step 4: On the back of the replacement controller, slide the safety lock so the red release button is fully visible. Repeat this step on the original controller.

Step 5: Disconnect the drive-line from the original controller by pressing the red release button and pulling it out. The pump will stop and an alarm will sound. **Note:** The alarm will continue until the original controller is turned off. You can silence the alarm by pressing the silence alarm button.

Getting the replacement controller connected and the pump restarted is the first priority!

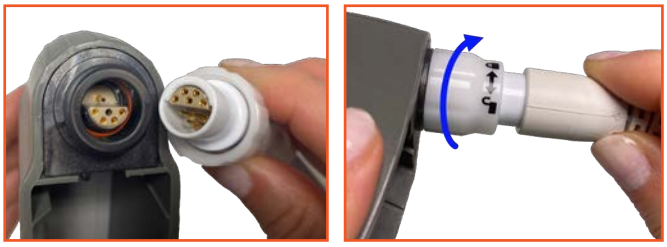
Step 6: Connect the replacement Controller by aligning the YELLOW ARROWS on the driveline and replacement Controller and firmly pushing the driveline into the replacement controller. The pump should restart, if not complete the following steps:

- Firmly press the Silence Alarm or Battery Button to restart the pump.
- Check the power source to ensure that power is going to the controller.
- Ensure the driveline is fully inserted into the socket by gently tugging on the metal end. **DO NOT** pull the driveline.

Step 7: After the pump restarts, slide the safety lock on the new controller so the red release button is fully covered. If unable to close the safety lock into fully locked position, gently push the driveline into the controller to ensure proper connection. Retry to close safety lock.

Step 8: Disconnect power from the original Controller.

Step 9: Hold down battery symbol for 5 full seconds to turn off the original controller.



Step 3

Step 4

Step 7

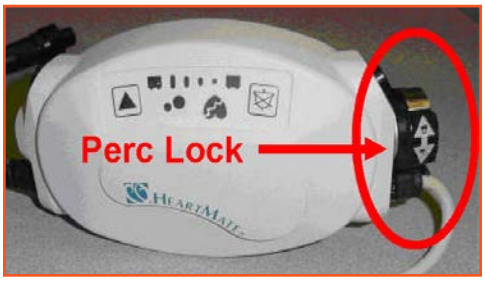
Step 5

Step 6

Step 9

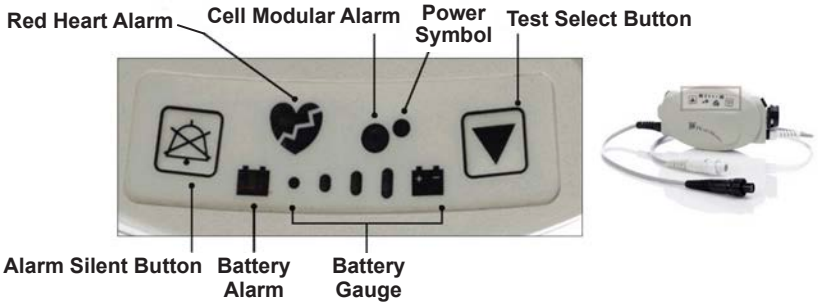
HeartMate II™ Left Ventricular Assist System

The following information applies to the original controller version called External Peripheral Controller (EPC). Some patients have this controller.



Driveline Connection: The Perc Lock must be "unlocked" in order for the driveline to be removed in a controller exchange. The Perc lock remains in locked position once the driveline has been fully inserted.

External Peripheral Controller (EPC)



2 MODES: ON, OFF

On: Driveline+Power source connected.

Off: No driveline or power source connected.

CELL MODULE BATTERY

No backup battery. The cell module battery powers an audible tone if EPC is removed from power while the driveline is connected. The cell module battery is supplied STERILE.

EVENT LOGGER

EPC does not include date/time records in event history. EPC can store 120 events.

GREEN POWER SYMBOL

Green light only mead that the controller is receiving power. Listen over the pump pocket for confirmation that the pump is running.

CONTROLLER BUTTONS

Alarm Silence Button: Displays the battery fuel gauge. Also silences hazard alarms for 2 minutes and advisory alarms for 4 hours.

Test Select Button: Activates a self test when held for 3 seconds.

Note: EPC does not include a display button or user interface screen. The Display Module is used to view pump parameter and alarm events.

SELF TEST

Press and hold the Test Select Button for 3 seconds.

LOW POWER

Yellow Battery Symbol: Displayed when only 15 minutes of external power is remaining.

Red Battery Symbol: Displayed when only 5 minutes of external power is remaining.

POWER SAVER MODE:

Entered when the battery voltage falls to a critically low level. Pump Speed is reduced to 8000 RPM.

STARTING THE PUMP

>8000 RPM: Pump starts automatically.

<8000 RPM: Start pump by pressing Alarm Silence Button or Test Select Button on EPC.

SYSTEM MONITOR EVENT HISTORY SCREEN

PI Event:

System Information:

COMPATIBILITY

System Monitors I and II, Power Module, Power Base Unit (PBU), Power Module Patient Cable (12 Volt and 14 Volt), 14 Volt Lithium-ion Batteries and Battery Clips, 12 Volt SLA and NiMH Batteries and Clips.

ALARMS

For a review of alarms and their meanings, reference the HeartMate II Alarms for Clinicians, Item 103851. Note that EPC does not include Driveline fault detection.

A battery clip can be attached to the EPC controller by lining up the half moons and gently pushing. Batteries can be attached to the battery clip by aligning the RED arrows on the battery and clip.

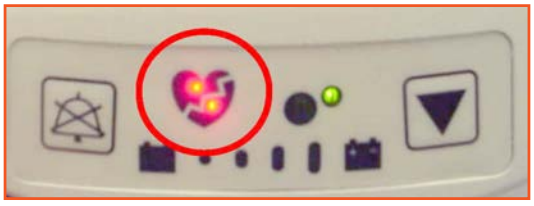
External Peripheral Controller (EPC): A percutaneous lock is located on the side of the controller.

Unlock

Locked

Alarms: Emergency Procedures

Red Heart Flashing Alarm: This may indicate a Low Flow Hazard. Check patient--the flow may be too low. If patient is hypovolemic, give volume. If patient is in right heart failure-- treat per protocol. If the pump has stopped check connections, batteries and controllers as instructed on page 5.



Yellow or Red Battery Alarm: Need to Change Batteries. See changing batteries section on page 5.

HeartMate 3™ Left Ventricular Assist System

1. **Can I do CPR?**

   Yes, in the right clinical scenario. Chest compressions may pose a risk of dislodgement - use clinical judgment. If compressions are administered, confirm function and positioning of the pump.

2. **Can the patient be defibrillated while connected to the device?**

   Yes you can defibrillate, and you do not have to disconnect anything.

3. **Can this patient be externally paced?**

   Yes.

4. **What type of alarm occurs in a low flow state?**

   A red heart alarm indication and steady audio alarm will sound if less than 2.5 lpm. Can give a bolus of normal saline and transport to a VAD center.

5. **Can I change the speed of the device?**

   No, it is a fixed speed.

6. **Does the patient have a pulse with this device?**

   Likely they will not because it is a continuous flow device, however some patients may have a pulse.

7. **What are acceptable vital sign parameters?**

   MAP 70 - 90 mm Hg with a narrow pulse pressure.

FAQs

- Pump has “artificial pulse” created by rapid speed changes in the pump. This can be heard when auscultating the heart and differs from other continuous flow devices.
- May not be able to obtain cuff pressure (continuous flow pump).
- Pump connected to driveline exiting patient’s abdominal area and is attached to controller which runs the pump.
- Pump does not affect ECG.
- All ACLS drugs may be given.
- A pair of fully charged batteries lasts up to 17 hours.
- Any emergency mode of transportation is ok. These patients are permitted to fly.
- Avoid pulling, twisting, or kinking the driveline when strapping the patient to a stretcher.
- Be sure to bring **ALL** of the patient’s equipment with them.

The HeartMate 3™ LVAD has a modular cable connection near the exit site of the driveline (Figure 1). This allows a damaged driveline to be quickly replaced (if damage is external).

- When disconnecting a driveline, NEVER use the modular cable connection.
- If the modular cable requires replacement, it must be done at and by the implanting center. Patients are not given a backup modular cable.
- If the connection is loose, a yellow line at the connection will be showing. If the line is visible, turn the connector in the locked direction. It will ratchet and stop turning once tight.

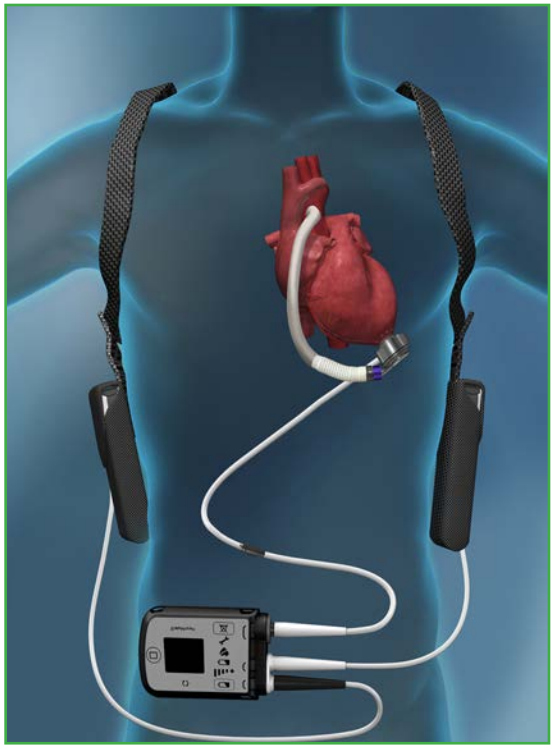
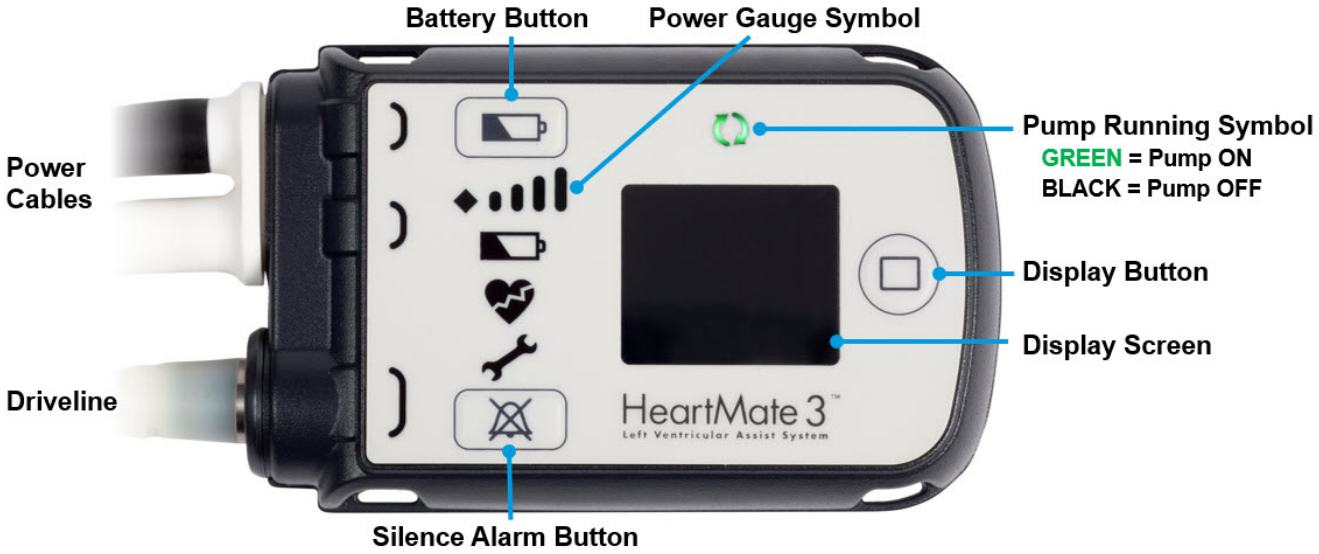


Figure 1

HeartMate 3™ Left Ventricular Assist System

System Controller



Changing Batteries

WARNING: At least one controller power cable must be connected to a power source AT ALL TIMES. Do not remove both batteries at the same time or the pump will stop.

- Obtain two charged batteries from patient's accessory bag or battery charger. The charge level of each battery can be assessed by pressing the button on the battery. Fully charged batteries will display 5 lights. (Figures 1 and 2)

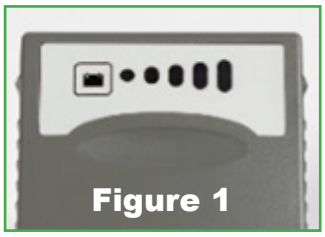


Figure 1

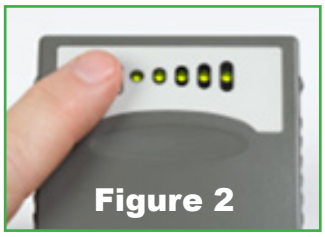


Figure 2

- Check the power level on the batteries, replace the battery with the fewest lights first. Remove only ONE battery from the clip by pressing the release button on the clip to unlock the battery. (Figure 3)

Figure 3

- Controller will start beeping and flashing yellow symbols and will read **CONNECT POWER** on the front screen.

- Insert a new, fully charged battery into the empty battery clip by aligning the **RED** arrows on the battery and clip (Figure 4). The battery will click into the clip. Gently tug on battery to ensure connection. If the battery is properly secured, the beeping and yellow flashing will stop.


Figure 4

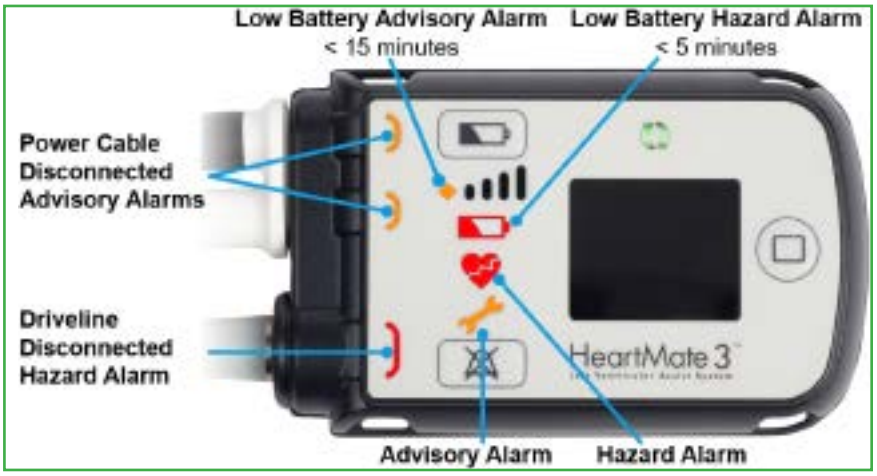
- Repeat previous steps with the second battery and battery clip.

Troubleshooting HeartMate 3™ LVAS

Alarms: Emergency Procedures

When an alarm occurs:

- Contact the Implant Center for direction when possible.
- Check alarm messages on controller display screen.
- Check if pump is running:
- Allow care providers trained on LVAD emergencies to remain with the patient.



When the Pump Has Stopped

- Check modular cable connection, driveline and power cable connections to the controller. Fix any loose connections to restart the pump.
- If the pump does not restart and the patient is connected to batteries replace the current batteries with a new, fully-charged pair. (see Changing Batteries section on previous page)
- If pump does not restart, change controllers if directed by implant center. (see Changing Controllers on next page)
- Be sure to bring ALL of the patient's equipment with them.

HAZARD ALARMS		Continuous Audible Tone
Low Flow :03 + Call Hospital Contact :07	Pump is off.	See above, when pump has stopped
	Pump flow is < 2.5 lpm.	Ensure that a power source is connected to the controller. Evaluate the patient for low flow - treat the cause. Assess volume status, hypertension, arrhythmia, right heart failure, etc.
Connect Driveline :02	Driveline disconnected.	Immediately reconnect Driveline to the controller. Check modular cable connection.
Connect Power Immediately :05 + Backup Battery :01	Both power cables are disconnected.	Immediately connect to batteries or the Mobile Power Unit.
Low Battery :06 + Replace Power :02	Low Battery Power < 5 min. remaining.	Immediately replace batteries or switch to the Mobile Power Unit.
ADVISORY ALARMS		Intermittent Audible Tone
Low Battery :06 + Replace Power Immediately :02	Low Battery Power <15 min. remaining.	Immediately replace batteries or switch to the Mobile Power Unit.
Connect Power :04	A power cable is disconnected.	Reconnect the power cable to power.
Check display for alarm type.		Call VAD Coordinator at implant center for direction.

Troubleshooting HeartMate 3™ LVAS

Changing the System Controller

Step 1: Have the patient sit or lie down since the pump will momentarily stop during this procedure.

Step 2: Place the replacement Controller within easy reach,along with the batteries/battery clips. The spare Controller is usually found in the patient's travel case.

Step 3: Attach the battery clips to the replacement controller by lining up half circles, firmly pushing together, and tightening connector nut. Insert the batteries into the clips by aligning the **RED** arrows.

Step 4: On the back of the replacement controller, slide the safety lock so the red release button is fully visible. Repeat this step on the original controller.

Step 5: Disconnect the drive-line from the original controller by pressing the red release button and pulling it out. The pump will stop and an alarm will sound. Note: The alarm will continue until the original controller is turned off. You can silence the alarm by pressing the silence alarm button.

Getting the replacement controller connected and the pump restarted is the first priority!

Step 6: Connect the replacement Controller by aligning the WHITE ARROWS on the driveline and replacement Controller and firmly pushing the driveline into the replacement Controller. The pump should restart, if not complete the following steps:

- Firmly press the Silence Alarm or Battery Button to restart the pump.
- Check the power source to ensure that power is going to the controller.
- Ensure the driveline is fully inserted into the socket by gently tugging on the metal end. **DO NOT** pull the driveline.

Step 7: After the pump restarts, slide the safety lock on the new controller so the red release button is fully covered. If unable to close the safety lock into fully locked position, gently push the driveline into the controller to ensure proper connection. Retry to close safety lock.

Step 8: Disconnect power from the original Controller.

Step 9: Hold down battery symbol for 5 full seconds for complete shutdown of old controller.

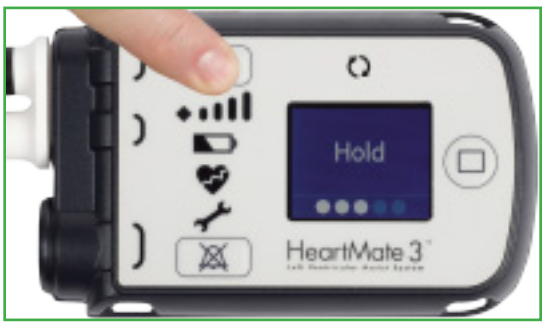
Step 3

Step 4

Step 7

Step 5

Step 6



Step 9

HeartWare™ HVAD™ System

1. **Can I do CPR?**

   Yes, in the right clinical scenario. Chest compressions may pose a risk due to pump location and position of the outflow graft on the aorta - use clinical judgment. If chest compressions have been administered, confirm function and positioning of HVAD Pump.

2. **Can the patient be defibrillated while connected to the device?**

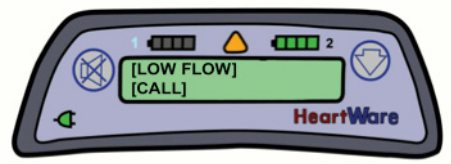
   Yes, you can defibrillate, and nothing needs to be turned off or disconnected.

3. **Can this patient be externally paced?**

   Yes.

4. **What type of alarm occurs in a low flow state?**

   If a low flow state occurs, an alarm will be heard, and the controller display will show a yellow triangle and [Low Flow] [Call] message.



5. **Can I change the speed of the device?**

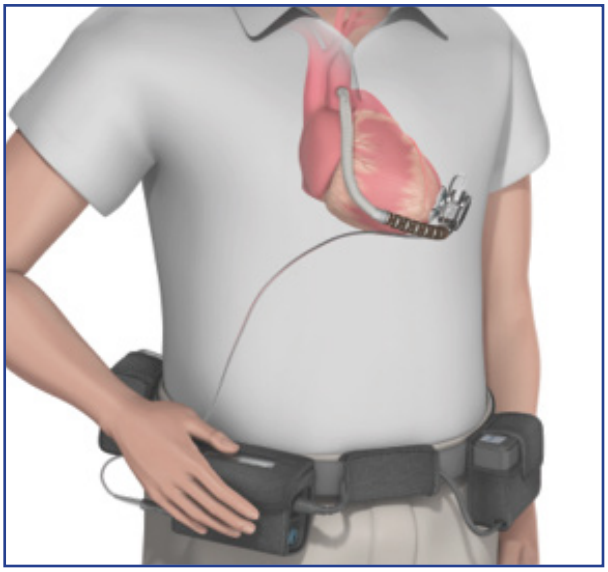
   No, the device runs at a fixed speed. It is not possible to adjust the pump speed in the pre-hospital setting.

6. **Does the patient have a pulse with this device?**

   Likely they will not because it is a continuous flow device, however some patients may have a pulse.

7. **What are acceptable vital sign parameters?**

   For patients with a palpable pulse, MAP targets should be ≤ 85 mm Hg. For patients without a palpable pulse, a manual cuff and a doppler is the preferred method with a MAP target of ≤ 90 mm Hg. If you are using a doppler, place the blood pressure cuff on the patient arm. As you release the pressure in the blood pressure cuff, the first sound you hear with the Doppler is the MAP. If that is not available, use a non-invasive BP (NIBP).



FAQs

- May not be able to obtain cuff pressure (continuous flow pump).
- Pump connected to electric line (driveline) exiting patient's abdominal area and is attached to controller which runs the pump.
- Pump does not affect ECG, but patient may or may not be symptomatic even with ventricular arrhythmias.
- All ACLS drugs may be given.
- This is a rotary (continuous flow) pump with typical speed ranges of 2400 – 3200 RPMs. The patient should have back-up equipment e.g. controller & charged batteries.
- The controller draws power from one battery at a time. A fully charged battery will provide 4-7 hours of power. Both the battery and controller have status lights to indicate the amount of power remaining.
- Transport by ground or flight to the implanting facility if possible.
- Be sure to bring **ALL** of the patient's equipment with them. e.g. back-up controller, charged batteries, ac adapter and charger.

HeartWare™ HVAD™ System

Driveline

Power Source #2

Battery Charge Indicator

ALARM ADAPTER

- Used to silence the [No Power] alarm.
- Should only be used on a controller that is NOT connected to a patient's pump.
- Insert into data port covered with a dust cap of the original controller after a controller exchange BUT before the power sources are disconnected or the [No Power] alarm will sound for up to two hours.

Red Alarm Adapter

DRIVELINE CONNECTION

To Connect to Controller:

- Align the two red marks and push the driveline connector straight into the silver driveline port. (Figure A)
- The Driveline Cover must completely cover the Controller's silver driveline connector to protect against static discharge. (Figure B)

Figure A

Figure B

NOTE: an audible click should be heard when connecting the Driveline to the controller. Failure to use the Driveline Cover may cause an Electrical Fault Alarm.

TO DISCONNECT A DEPLETED BATTERY

- Make sure there is a fully charged battery available to replace the depleted one.
- Disconnect the depleted battery by turning the connector sleeve counterclockwise until it stops.
- Pull the connector straight out from the controller.

CONNECTING POWER TO CONTROLLER

To Connect a Charged Battery:

- Grasp the cable of the charged battery at the back end of the connector (leaving front end of connector free to rotate)
- Line up the solid white arrow on the connector with the white dot on the Controller.
- Gently push (but DO NOT twist) the battery cable into the Controller until it naturally locks into place; you should hear an audible click.
- Confirm that the battery cable is properly locked on the controller by gently pulling the cable near the controller power connector.
- **DO NOT force the battery cable into** the controller connector without correct alignment as it may result in damaged connectors .

Power Source Connection

HeartWare™ HVAD™ System Emergency Operation

STEPS TO EXCHANGE THE CONTROLLER

Exchange the controller when the controller display indicates [Change Controller]. Priority is to restart the pump quickly.

It may be helpful to remember the 4 P's:

1. **POWER...** Connect a power source to the new controller.

2. **PUMP...** Restart the pump by connecting the driveline to the new controller.

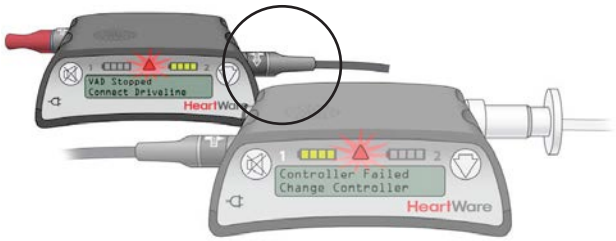
3. **PREVENT...** Prevent the [No Power] alarm on the original controller with the red alarm adapter or by pressing the Scroll and Mute buttons at the same time until a "beep" is heard, or for at least 5 seconds.

4. **POWER...** Connect a second power source to the new controller.

Step 1: Have patient sit or lie down and place the back-up controller within easy reach. The backup controller will become the new controller.

Step 2: Connect one **POWER** source to the new controller.

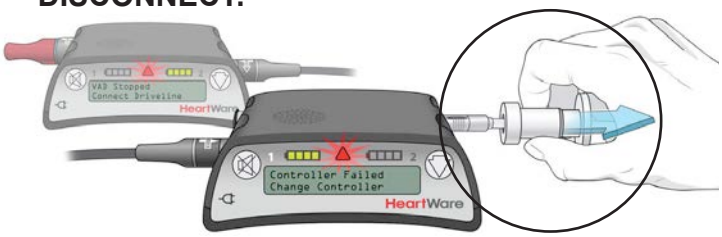
NOTE: The new controller may alarm after 10 seconds with a [VAD Stopped, Connect Driveline] high alarm. This is expected behavior.



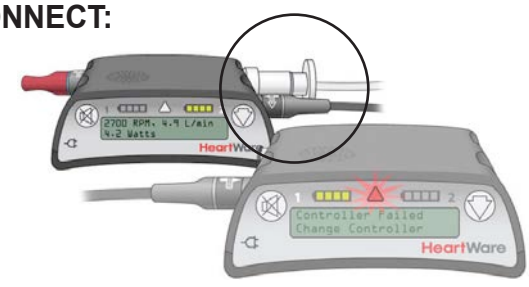
Step 3: Disconnect the driveline from the original controller and connect the driveline to the new controller. This should restart the **PUMP.**

• Verify that the pump is working. The RPM, L/min and Watts numbers should show on the Controller Display. If the pump does not restart, re-check driveline and power source connections, if it still doesn't start, call the patient's VAD team for assistance.

DISCONNECT:



CONNECT:



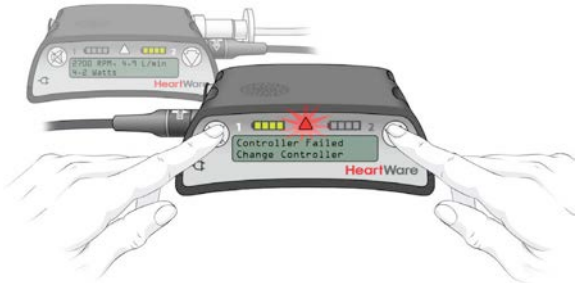
• If you have only connected 1 power source to the new controller, you will also have a [Power Disconnect, Reconnect Power] alarm.

HeartWare™ HVAD™ System Emergency Operation

Step 4: PREVENT the [No Power] alarm from sounding on the original controller. This needs to be done before removing all power. There are 2 options, see below:

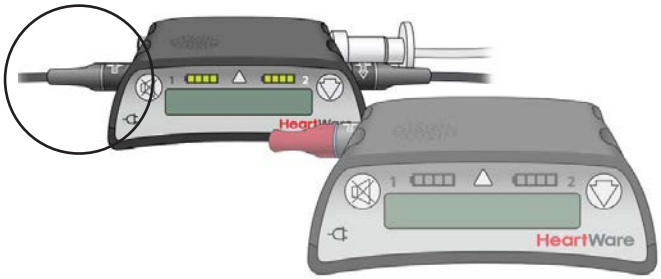
- If a red alarm adapter is available:
  - – Insert it into the connector data port on the original controller
  - – You can now remove all power from the original controller and no alarm should sound.

- If no red alarm adapter is available:
  - – Press and hold the “Alarm Mute” and “Scroll” buttons on the original controller until a “beep” is heard, or for at least 5 seconds.
  - – Release the “Alarm Mute” and “Scroll” buttons.
  - – You can now remove all power from the original controller and no alarm should sound.

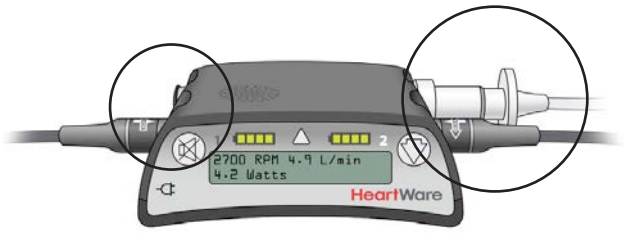


- If you removed power before silencing the [No Power] alarm, reconnect a power source and follow the steps above to silence it.

Step 5: Connect a second **POWER** source to the new controller.

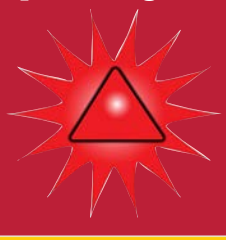
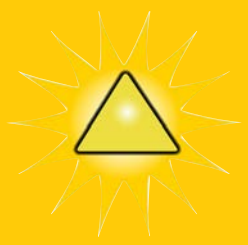


Step 6: Be sure the driveline cover is over the silver driveline connector and the data port is covered by the dust cap. If the red alarm adapter is connected to the controller that is now running the pump, remove it and close the cap on the data port.



Call the patients VAD team to obtain a new back-up controller.

HeartWare™ HVAD™ System Troubleshooting

Alarm Type	Alarm Display (Line 1)	Action (Line 2)
ALARM [No Power]	[no message]	[no message]
	When both power sources (2 batteries or 1 battery and an AC adapter or DC adapter) are removed. NO message will display on the controller. The [No Power] alarm will sound but the Alarm Indicator on the controller WILL NOT light. This indicates the pump has stopped. You should immediately connect two power sources.	
HIGH-CRITICAL [Flashing Red] 	[VAD Stopped]	[Connect Driveline]
	[VAD Stopped]	[Change Controller]
	[Critical Battery]	[Replace Battery 1]
	[Critical Battery]	[Replace Battery 2]
	[Controller Failed]	[Change Controller]
MEDIUM [Flashing Yellow] 	[Controller Fault]	[Call]
	[Controller Fault]	[Call: ALARMS OFF]
	[High Watts]	[Call]
	[Electrical Fault]	[Call]
	[Low Flow]	[Call]
	[Suction]	[Call]
LOW [Solid Yellow] 	[Low Battery 1]	[Replace Battery 1]
	[Low Battery 2]	[Replace Battery 2]
	[Power Disconnect]	[Reconnect Battery 1]
	[Power Disconnect]	[Reconnect Power 2]

[CALL] VAD team listed on the patient's contact sheet.

Jarvik 2000® Ventricular Assist System (VAS)

1. **Can I do external CPR?**
   Yes, in the right clinical scenario. Chest compressions may pose a risk of dislodgement - use clinical judgment. If compressions are administered, confirm function and positioning of the pump.

2. **Can the patient be defibrillated while connected to the device?**
   Yes, you can defibrillate, and you do not have to disconnect anything.

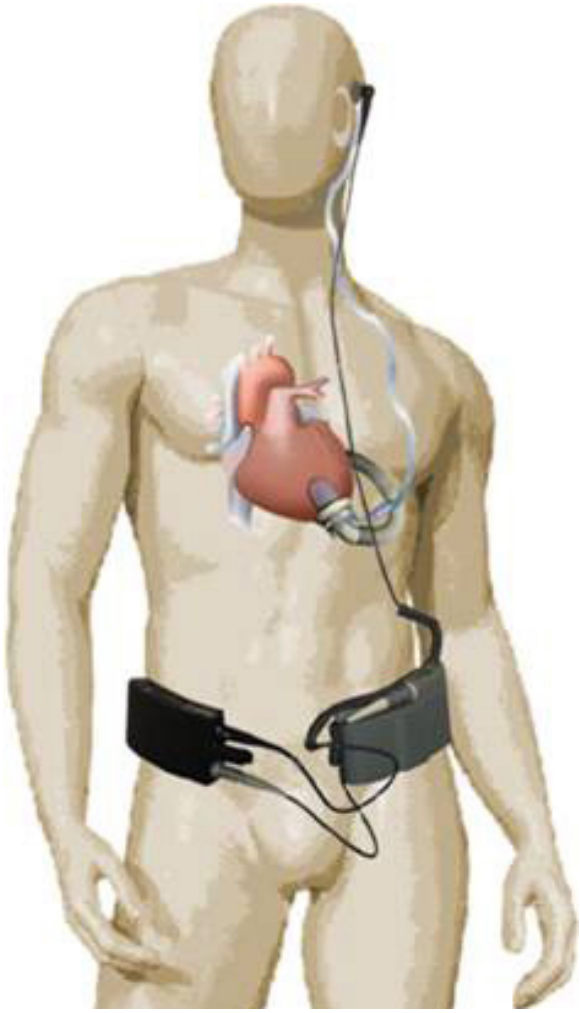
3. **Can this patient be externally paced?**
   Yes.

4. **What type of alarm occurs in a low flow state?**
   No alarm for low flow. If pump is off, the red “Pump Stop” symbol will light with a continuous alarm.

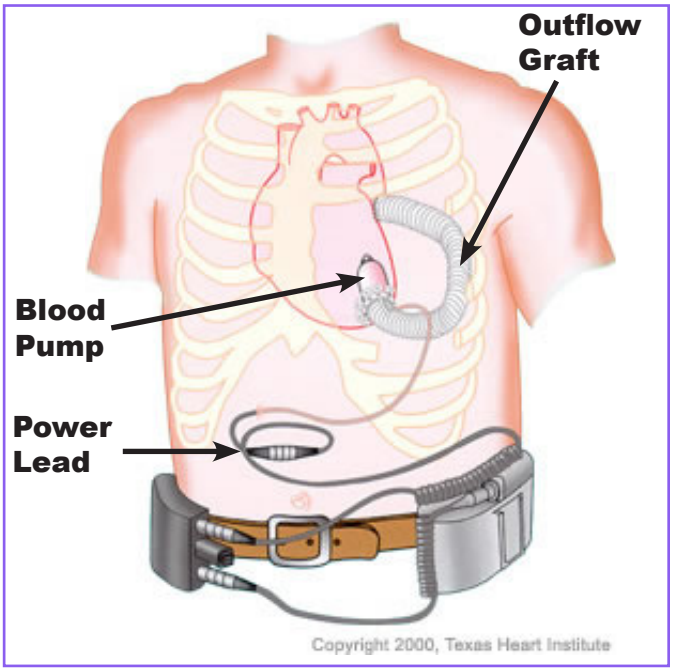
5. **Does the patient have a pulse with this device?**
   Most patients have a faint palpable pulse. If the controller is marked “ILS” (see below), the speed is automatically reduced every minute for 8 seconds & the patients pulse may increase during this time.

6. **Can I change the speed of the device?**
   There is a speed dial on the side of the controller (see picture on next page). Turning the dial in the direction of the arrow increases the speed. Each increment is 1,000 RPM. It is recommended not to change the speed without consulting the implanting center.

7. **What are acceptable vital sign parameters?**
   MAP 65 - 80mm Hg.

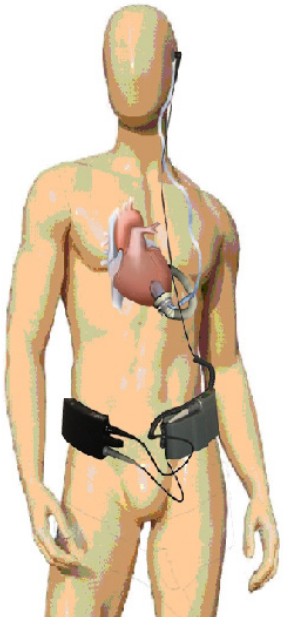


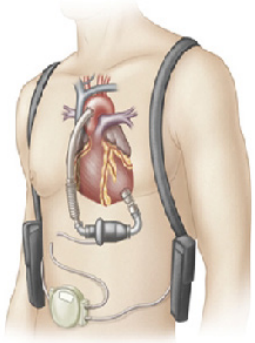
Jarvik 2000 with Post-Auricular exit site.



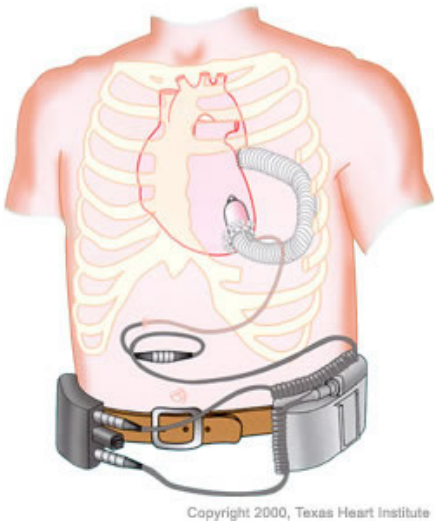
Jarvik 2000 with Abdominal exit site.

Jarvik 2000® VAS



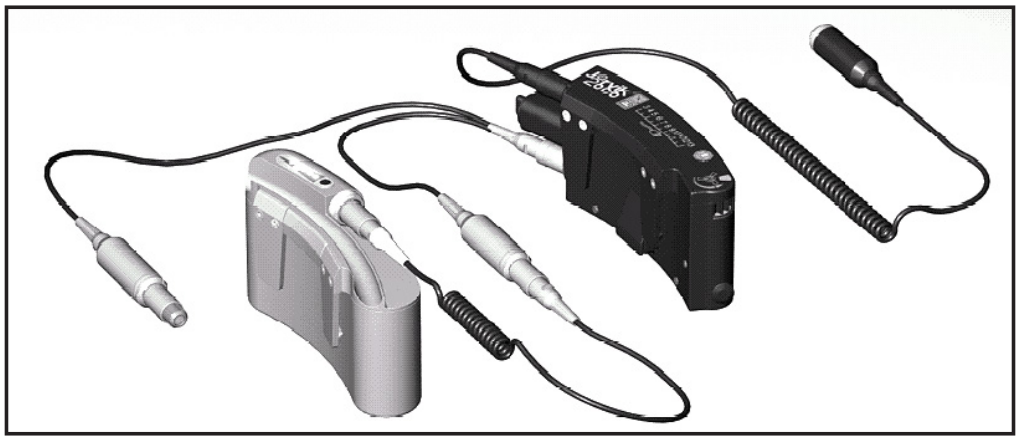


The Jarvik 2000® VAS is available in two models: the Jarvik 2000® VAS, Post-Auricular Cable (JHI-001) and the Jarvik 2000® VAS, Abdominal Cable (JHI-002). The main difference between the two models is the exit site of the drive cable. The drive cable of the Jarvik 2000® VAS, Abdominal Cable exits the abdomen and the drive cable of the Jarvik 2000® VAS, Post-Auricular Cable exits at a Pedestal surgically attached to the skull behind the ear.

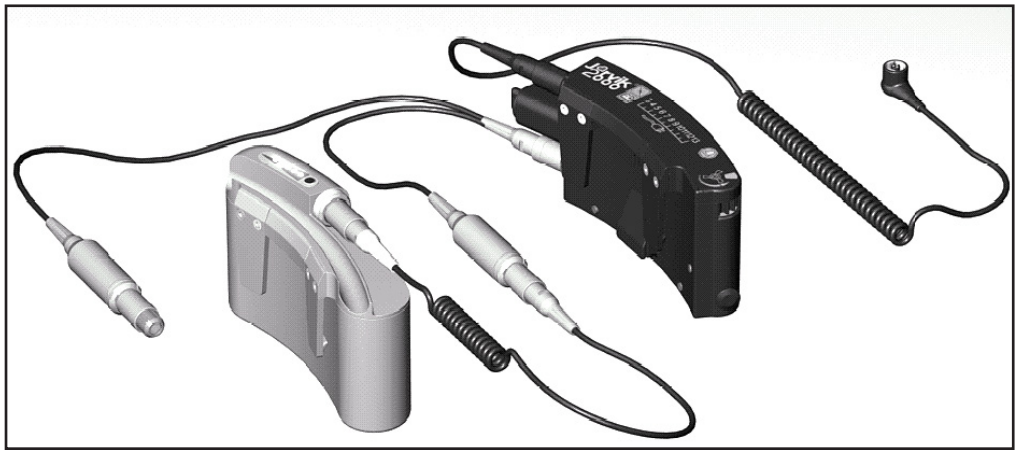


Jarvik 2000® VAS, Post-Auricular Cable.

Jarvik 2000® VAS, Abdominal Cable.



External Equipment for Jarvik 2000® VAS, Abdominal Cable.

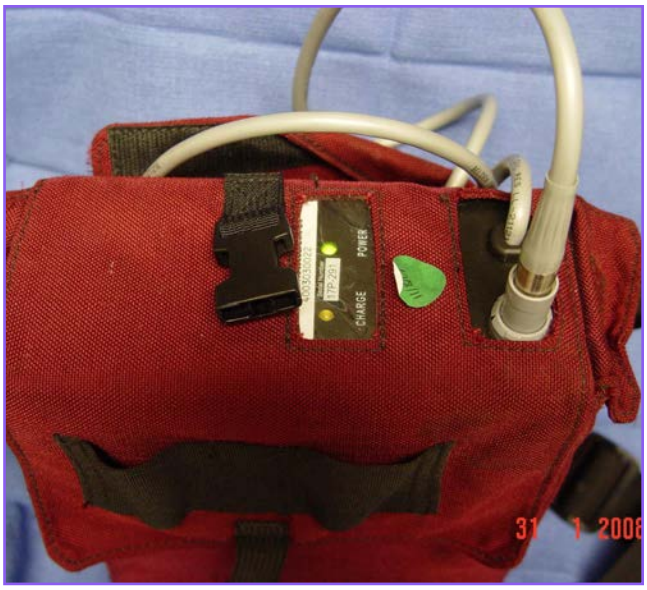


External Equipment for Jarvik 2000® VAS, Post-Auricular Cable.

NOTE: This Guide is NOT intended to replace the Operator Manual and Patient Handbook.

Jarvik 2000® VAS

Li-ion Battery.



Reserve Battery/Charger.

FlowMaker® Controller.

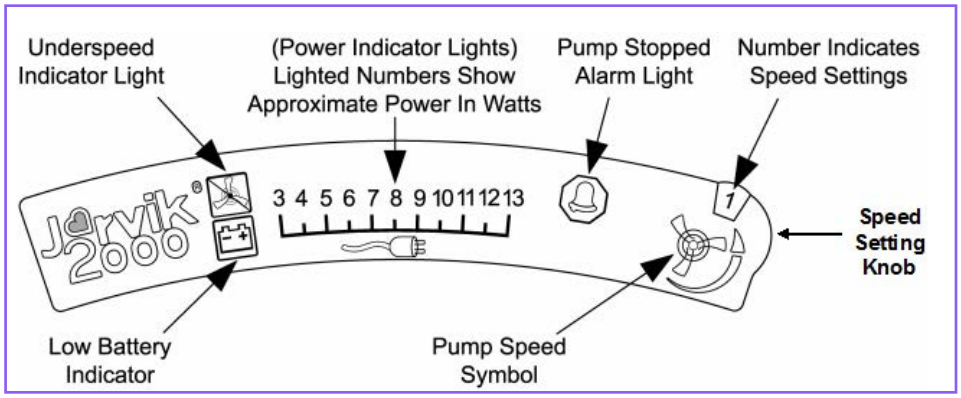


Diagram of FlowMaker® Controller Top Panel.

Dial Setting	Speed Rpm	Flow L/min	Power Watts
1	8,000	1-2	3-4
2	9,000	2-3	4-5
3	10,000	4-5	5-6-7
4	11,000	5-7	7-8-9
5	12,000	7-8.5	8-9-10

The FlowMaker Controller provides:
1. power to the implanted blood pump,
2. user settable speeds at which the pump runs, and
3. alarms and warnings.
The **FlowMaker®** Controller does not monitor the actual blood flow that the **Jarvik 2000® Ventricular Assist Device** (VAD) is pumping. In general, the higher the setting number the more blood the Jarvik 2000 VAD will pump. The tabulated flow estimates are based on research measurements in healthy animals. The actual blood flow may vary and will depend on several factors including blood pressure and the condition of the natural heart.

Jarvik HEART™

Jarvik 2000® VAS

Speed Setting, Alarms, and Warnings

Only one control adjustment to the **Jarvik 2000® VAD** can be made. The **Jarvik 2000® VAD speed** can be selected by turning the knob on the side of the **FlowMaker® Controller**. The setting number appears in the window on the top panel. The arrow indicates the direction to turn the knob to increase the speed.

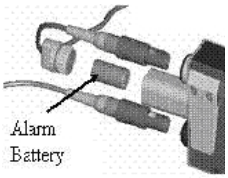
Power Indicator Lights The numbers indicate the electrical power (Watts) that the VAD is using. One, two, or three numbers may be lit at any moment, and the lights may change rhythmically with the heartbeat of the natural heart. A power measure of 13 watts or more indicates malfunction. The High Power Indicator, number 13, will light yellow. This condition should receive prompt medical attention.

When the battery powering the **Jarvik 2000® VAD** is low, the **Low Battery Alarm** on the **FlowMaker® Controller lights yellow** and the alarm sound beeps. Remaining running time with the portable Li-ion Battery is about 5-10 minutes.

If the **Jarvik 2000® VAD** stops or if the VAD speed drops to below 5,000 RPM for any reason, a steady alarm sound is heard and the **Pump Stopped Alarm** on the **FlowMaker® Controller lights red**. **The Pump Stopped Alarm** will also sound if the intermittent low speed featured on the ILS FlowMaker® Controller fails to function for any reason. Immediate attention is required. **Follow the Pump Stopped Alarm procedure for the appropriate Jarvik 2000® VAS model (Post-Auricular Cable or Abdominal Cable) which is included in this guide.**

The **Underspeed Indicator light will glow yellow** when the **Flowmaker® Controlle**r detects that the **Jarvik 2000 ® VAD** speed is slower than the dial setting selected. The most common reason is the battery voltage is too low.

In this case, corrective actions are to:
1 Select a lower speed setting on the **Flowmaker® Controller** and/or **2** Change the battery to a fully charged Li-ion Battery. If the underspeed indicator light is still lit, then the cause may be a fault in the system. Replace all external components; and if the underspeed light is still on after replacing all external components, treat the situation as an emergency and seek immediate medical attention. *See Patient Handbook and Operator Manual for more details.*



A non-rechargeable **Alarm Battery** is used to assure that the **FlowMaker Controlle**r has enough power for the alarms if the main battery fails, if the battery cable fails, or if the main battery becomes accidentally disconnected.

This **Alarm Battery** is located in a small housing on the end of the **FlowMaker® Controller** between the connectors for the cables. Be sure that the **Alarm Battery Cap** holding the Alarm Battery in place on the **FlowMaker® Controller** is screwed on finger tight whenever the **FlowMaker® Controlle**r is used. If the **Alarm Battery Cap** is not screwed finger tight in place, the backup power for the alarms will not function. Every time the **Alarm Battery Cap** is tightened, the Controller's back-up Alarm needs to be tested. With a caregiver present, briefly disconnect the main battery (Li-ion Battery or Reserve Battery/Charger) to be sure the Pump Stopped Alarm sounds. The disconnection should be brief and the main battery should be reconnected almost immediately. If the Pump Stopped Alarm does not sound, retighten the Alarm Battery Cap and repeat the test. Contact the implant center immediately if the alarm does not sound during this test.

Jarvik 2000® VAS

Procedure to Resolve Pump Stopped Alarm
Jarvik 2000® VAS, Post-Auricular Cable

The most likely reason for the **Jarvik® 2000 VAD** (pump) to stop is a completely **discharged battery** or a **disconnected** or **damaged cable.** If the cause of a component failure is clearly identifiable (i.e. low battery, physical damage, etc.) replace that cable or component **first.**
If the cause is unknown, follow these step-by-step instructions with the assistance of a support person. The patient should sit down or lie down. This procedure should be completed quickly. Back-up equipment must be immediately available.

1. Be sure the alarm is not an intermittent beeping which only indicates a low battery. If the alarm is beeping, change the battery as usual.

2. If the Jarvik 2000® VAD is stopped (steady alarm sounding, red light on):

   a. **Disconnect the Pedestal Cable from the Pedestal at the skull, and set aside all the attached components.** Disconnect the Li-ion Battery Cable and also partially unscrew the Alarm Battery Cap on the FlowMaker® Controller to silence the alarm.

   b. Plug in a backup Pedestal Cable into the Pedestal and into a backup FlowMaker® Controller. Make sure the FlowMaker® Controller is set at speed setting 1. Make sure to tighten the Alarm Battery Cap on the backup FlowMaker® Controller to activate the alarm.

   c. Using the backup Li-ion Battery Cable, plug a fully charged Li-ion Battery into the FlowMaker® Controller.

   d. If the Jarvik 2000® VAD now runs, and the patient is feeling well, red tag the original components that were set aside in step 2a.

   e. Set the FlowMaker® Controller back at the speed the user was using prior to the alarm.

3. **If the Jarvik 2000 VAD (pump) is still stopped call the medical emergency number immediately.**

4. Red tag all components of the system that were set aside before changing to the backup components in step **2a.** This should be done with the assistance of a medical support person if possible.

5. It is possible that one of the connectors is not fully plugged in and is not making contact. Recheck all connectors.

6. If the Jarvik 2000® VAD still has not started, the patient should lie down and the support person should double check batteries and connectors. Try changing batteries again. It is possible that a discharged battery was removed and the same discharged battery was accidentally plugged back into the system. It is possible that neither battery is charged. If no lights illuminate on either battery, use a third battery. It is also possible that one of the connectors is not fully plugged in and is not making contact. Recheck all connectors.

7. If all of the above steps have been followed and all cables and components have been replaced without successfully restarting the Jarvik 2000® VAD, **disconnect the power to the Jarvik 2000® VAD by unplugging the battery.** Also partially unscrew the Alarm Battery Cap on the FlowMaker® Controller. **(The alarm should stop sounding).** If the Li-ion Battery or Reserve Battery/Charger is not disconnected, the FlowMaker® Controller will apply power to the Jarvik 2000® VAD which could be harmful. Disconnecting the battery reduces the chance of a clot forming inside the Jarvik 2000® VAD by allowing the rotor to spin as blood flows across it.

Note: Return any failed or suspect component(s) to your Clinical Center for evaluation by Jarvik Heart, Inc.

Jarvik 2000® VAS

Procedure to Resolve Pump Stopped Alarm
Jarvik 2000® VAS, Abdominal Cable

The most likely reason for the **Jarvik 2000® VAD** (pump) to stop is a completely **discharged battery** or a **disconnected** or **damaged cable.** If the cause of a component failure is clearly identifiable (i.e. low battery, physical damage, etc.) replace that cable or component **first.**
If the cause is unknown, follow these step-by-step instructions with the assistance of a support person. The patient should sit down or lie down. This procedure should be completed quickly. Back-up equipment must be immediately available.

1. Be sure the alarm is not an intermittent beeping which only indicates a low battery. If the alarm is beeping, change the battery as usual.
2. If the Jarvik 2000® VAD is stopped (steady alarm sounding, red light on):

a. **Disconnect the Extension Cable from the drive cable at the abdomen, and set aside all the attached components.** Disconnect the Li-ion Battery Cable and also partially unscrew the Alarm Battery Cap on the FlowMaker® Controller to silence the alarm.

b. Plug the drive cable (the cable exiting the skin at the abdomen) directly into the backup FlowMaker® Controller (eliminating the Extension Cable). Make sure the FlowMaker® Controller is set at speed setting 1. Make sure to tighten the Alarm Battery Cap on the backup FlowMaker® Controller to activate the alarm.

c. Using the backup Li-ion Battery Cable, plug a fully charged Li-ion Battery into the FlowMaker® Controller.

d. If the Jarvik 2000® VAD now runs and the patient is feeling well, red tag the original components that were set aside in step 2a.

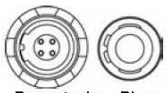
e. Set the FlowMaker® Controller back at the speed the user was using prior to the alarm.

3. **If the Jarvik 2000® VAD (pump) is still stopped call your medical emergency number immediately.**
4. Red tag all components of the system that were set aside before changing to the backup components in step **2a.**
5. Be sure that all external cables and connectors have been changed and check to see if the connector at the end of the drive cable exiting the skin at the abdomen is broken. If it is broken and has come apart – try to put it back together where it is broken. If the Jarvik 2000® VAD does not run, take the connector apart again – rotate the parts 90° and put the connector back together again. Repeat three times. The Jarvik 2000 VAD may start. The connector may then be held together with tape while the patient is transported to the hospital for it to be repaired.
6. It is possible that one of the connectors is not fully plugged in and is not making contact. Recheck all connectors.
7. If the Jarvik 2000® VAD still has not started, the patient should lie down and the support person should double check batteries and connectors. Try changing batteries again. It is possible that a discharged battery was removed and the same discharged battery was accidentally plugged back into the system. It is possible that neither battery is charged. If no lights illuminate on either battery, use a third battery. It is also possible that one of the connectors is not fully plugged in and is not making contact. Recheck all connectors.
8. If all of the above steps have been followed and all cables and components have been replaced without successfully restarting the Jarvik 2000® VAD, **disconnect the power to the Jarvik 2000 VAD by unplugging the battery.** Also partially unscrew the Alarm Battery Cap on the FlowMaker® Controller. **(The alarm should stop sounding).** If the Li-ion Battery or Reserve Battery/Charger is not disconnected, the FlowMaker® Controller will apply power to the Jarvik 2000® VAD which could be harmful. Disconnecting the battery reduces the chance of a clot forming inside the Jarvik 2000® VAD by allowing the rotor to spin as blood flows across it.

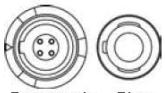
Note: Return any failed or suspect component(s) to your Clinical Center for evaluation by Jarvik Heart, Inc.

Jarvik® 2000

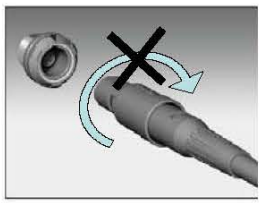
Jarvik 2000® Adult Ventricular Assist System—Quick Reference Guide



Connection from Jarvik 2000 VAD to FlowMaker Controller: The black receptacle on the FlowMaker Controller is located above the housing for the small back-up Alarm Battery. The receptacle has double key slots for a black plug. The Extension Cable and the Pedestal Cable (depending on the model of the device used) also have double key slots.



Connection from FlowMaker Controller to Y Cable or battery: The gray receptacle on the FlowMaker Controller is located below the housing for the small back-up Alarm Battery. This receptacle has a single key slot for the gray plug of the Y Cable, Li-ion Battery Cable, and Reserve Battery/Charger.



Note that the single and double keys on the plugs and receptacles are easily visible and must be placed in the proper rotational position, with the arrows on receptacle and plug lined up, for the connectors to go together. The connectors are attached and removed by a push-pull latch mechanism, not by a screw thread. Place the plug into the receptacle with slight pressure and gently rotate the plug until the key-way engages. Then push the connector together. The connector should click into place and should not come apart if the cable is tugged. To remove the plug, hold it close to the receptacle and pull.

- Never attempt to disconnect any connector by twisting.
- Do not attempt to pull the connector apart by the wire or by the strain relief.
- Never force a connector together. If the plug does not go into the receptacle easily, gently rotate it until it is aligned properly. When it is fully engaged, a soft click can be heard.
- If a connector is damaged or pins are bent, do not attempt to repair but replace the cable instead.

The **Y Cable** for the Jarvik 2000 VAS is used to allow battery changes without removing power from the Jarvik 2000 VAD. Before unplugging a discharged battery, a recharged battery should be plugged into the Y Cable. If the battery cable is unplugged prior to attaching a charged battery to the other end of the Y Cable, the Jarvik 2000 VAD stops, but the natural heart continues to beat. If this occurs, the beeping tone of the alarm will change to a steady tone, indicating that the Jarvik 2000 VAD is stopped. After the used battery is replaced with a fresh one, always remove the discharged battery from the Y Cable.

The portable **Li-ion Battery** will run the Jarvik 2000 VAS for 7-12 hours under usual conditions. The Li-ion Battery has an indicator with 5 lights that indicates how much power is remaining. Depress the black button to turn on the indicator lights:

Indicator	Approximate Remaining Time
All 5 LEDS lit	8-12 hours
4 LEDs lit	6-10 hours
3 LEDs lit	5-8 hours
2 LEDs lit	3-5 hours
1 LED lit	5 minutes - 2 hours

Li-ion Battery Charger

When the Li-ion Battery Charger is first connected to wall power, the green light next to the vertical green bar will turn on. The second light will simultaneously turn on green for approximately 1-3 seconds, followed by the startup sequence below:

- Flashing yellow for approximately 18-24 seconds
- Solid green for approximately 1-3 seconds
- Off

The Li-ion Battery Charger is not required to go through the startup sequence each time it is connected to a Li-ion Battery. It will only occur when wall power is first applied to the Li-ion Battery Charger.

Never connect the Li-ion Battery to the Li-ion Battery Charger while the second light is green. If a connection is made during this brief period of time, the Li-ion Battery will not charge.

When disconnecting the Li-ion Battery Charger from a fully charged Li-ion Battery, always wait for the second light to turn off before connecting another Li-ion Battery.

The **Reserve Battery/Charger** has both a battery and a charger built into a single unit; however, they are not electrically connected to each other.

Reserve Battery Use:

1. Unplug the gray cable from the battery charger and plug it into the gray connector of the Y cable or the FlowMaker Controller.
2. Unplug the black power cord from the Reserve Battery/Charger and the wall plug.
3. If the Reserve Battery/Charger is used for under 12 hours and then recharged, it will last for more than 1000 recharge cycles. If it is not recharged until it is fully discharged (>24 hrs capacity) and the low battery alarm sounds, it will last for fewer than 200 recharge cycles.
4. Use the Reserve Battery/Charger for less than 12 hours each night and recharge it each morning after switching to the Li-ion Battery.

Reserve Battery Use

Charging the Reserve Battery

Charging the Reserve Battery:

Disconnect the gray plug from the Y Cable or FlowMaker Controller and plug it into the gray receptacle on the Reserve Battery/Charger.

A yellow light next to the Charge label on the Reserve Battery/Charger will turn on to indicate charging. When the Reserve Battery/Charger is near fully charged, the yellow light will turn off and automatically start to safely slow charge the battery. Continue charging the battery after the yellow light goes out and whenever the battery is not in use.

The green light next to the Power label on the Reserve Battery only indicates that wall power is connected to the charger section of the unit. The green light does not indicate the Reserve Battery/Charger is fully charged.

The Reserve Battery/Charger is near fully charged only when the Charge light turns off and the gray cable is plugged into the gray receptacle on the unit.

If the gray cable is not plugged into the receptacle on the Reserve Battery/Charger while the unit is also plugged into the wall, the Reserve Battery/Charger will not charge.

It is not possible to run the Jarvik 2000 VAS from wall power even if the Reserve Battery/Charger is plugged into wall power. It is also not possible to charge the Reserve Battery/Charger while the same Reserve Battery/Charger is being used to run the Jarvik 2000 VAD. At all times, the Jarvik 2000 VAD is run only from battery power.

Patient Management For TAHs

1. Assess the patients airway and intervene per your protocol.

2. Auscultate heart sounds but you can usually hear them without a stethoscope. Since this is pulsatile you should hear two sounds if properly functioning.

3. Assess the device for device information and alarms located on the driver.

4. Intervene appropriately based on the type of alarm. See specific device alarm guide on the pages that follow.

5. Assess Vital Signs. REMEMBER THERE IS NO ECG. THE PATIENT IS ASYSTOLIC.

6. Start IV if indicated.

7. You should be able to get a systolic and diastolic blood pressure.

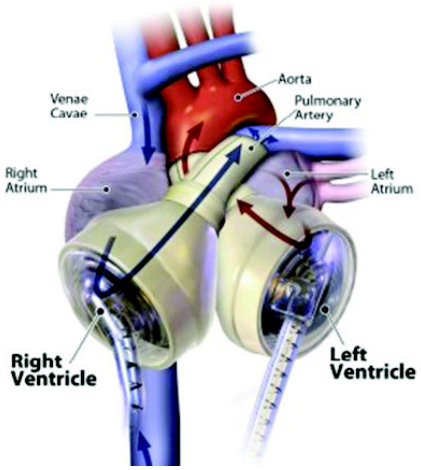
8. Call the VAD Center's 24 hour emergency number on the patient's contact list, controller/equipment, or emergency bag for assistance in the management of the patient and transportation determination and location.

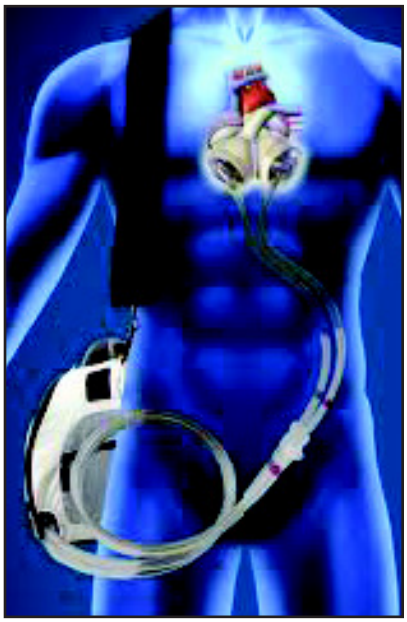
9. **Bring all of the patients equipment.**

10. **Bring the significant other if possible to act as a expert on the device in the absence of consciousness in the patient.**

Total Artificial Heart Freedom™ Driver System

This Patient is on an ARTIFICIAL HEART
(not a left ventricular assist device-LVAD)



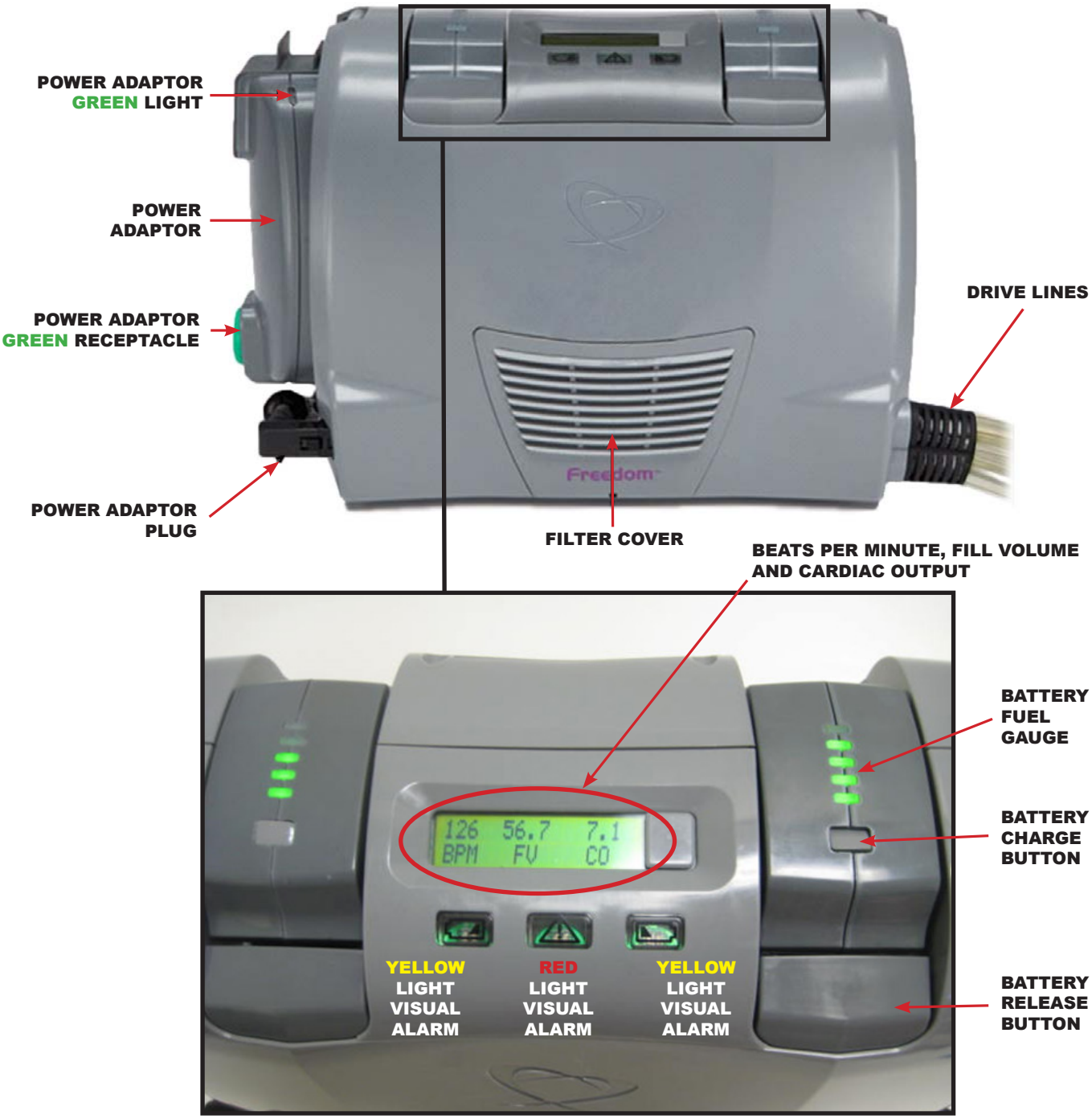


1. **Can I do CPR?**
   No. Will need to rapidly exchange to the backup driver.
2. **Can the patient be defibrillated or externally paced?**
   No, there is no native heart rhythm.
3. **Does the patient have a pulse with this device?**
   Yes. The device produces pulsatile flow. The device is pneumatically driven and is normally loud.
4. **What are acceptable vital sign parameters?**
   The BP will vary. Normal range 100-130 systolic and 60-90 diastolic.
5. **What kind of cardiac rhythm will be displayed on a monitor?**
   Asystole.
6. **Is there a "hand pump".**
   No. The priority is to secure connections to the Freedom Driver to ensure gas delivery.
7. **Can I give vasopressor IV drugs like epinephrine, dopamine or dobutamine?**
   Never give vasopressor drugs, especially epinephrine. Most IV vasopressor drugs can be fatal to a TAH patient. IV fluids are usually not required and may be unhelpful if the patient is already fluid overloaded. These patients primarily have symptomatic hypertension and rarely have symptoms of hypotension.
8. **How can symptomatic hypertension be treated?**
   Sublingual nitroglycerin.
9. **Can I speed up the rate of the device?**
   No. The device has a fixed rate between 120-140 BPM
10. **What if the patient is symptomatic and the Freedom Driver is alarming with a continuous alarm and the red light?**
    If the pump has failed or a line is disconnected or kinked, the patient may pass out within 30 seconds. Even with alarming, the device will continue to pump. Confirm the drivelines are connected and are not damaged or kinked. If the patient is conscious and can participate, assist the patient to immediately change out the Freedom Driver.

Trouble Shooting Freedom™ Driver System

This Patient is on an ARTIFICIAL HEART

(not a left ventricular assist device -LVAD)



Freedom™ Driver System

IN THE EVENT OF AN EMERGENCY

Immediately notify VAD coordinator listed on the medical alert bracelet or tag attached to the console - please identify the device as a total artificial heart.

HOW TO RESPOND TO FREEDOM™ DRIVER ALARMS

There is no way to mute an Alarm.

ALARM	HEAR	SEE	MEANING	WHAT YOU SHOULD DO
Battery Alarm	Loud Intermittent Tone	Yellow Battery LED Flashing	One or both of the Onboard Batteries have less than 35% remaining charge (only two green lights display on the Battery Fuel Gauge).	Replace each low Onboard Battery, one at a time, with a charged Onboard Battery or connect to external power (NOTE: Once the batteries are charged above 35% the Battery Alarm will stop) .
			Onboard Battery is incorrectly installed.	Reinsert Onboard Battery until locked in place. If Battery Alarm continues, insert a new Onboard Battery.
			One Onboard Battery missing.	Insert charged Onboard Battery into Freedom™ Driver until locked in place.
Temperature Alarm	Loud Intermittent Tone	Red Alarm LED Flashing	The temperature of the Driver is too hot or too cold.	Remove any objects that are blocking the Filter Cover and/or Fan and check the filter.
			The internal temperature of the Driver is too hot.	Move the Freedom Driver to a cooler or warmer area.
Fault Alarm	Loud Continuous Tone	Red Alarm LED Solid	Valsalva Maneuver: Strenuous coughing or laughing, vomiting, straining during a bowel movement, or lifting a heavy weight.	Relax/interrupt Valsalva Maneuver.
			Kinked or disconnected drive lines.	Straighten or connect drive lines.
			Driver is connected to External Power without at least one correctly inserted Onboard Battery.	Insert a charged Onboard Battery into the Freedom™ Driver until locked into place.
			One or both of the Onboard Batteries have less than 30% remaining charge.	Replace each low Onboard Battery, one at a time, with a charged Onboard Battery or connect to external power. (NOTE: the Fault Alarm will continue and will change into a Battery Alarm as the Onboard Batteries recharge. Once the Onboard Batteries are charged above 35%, the Battery Alarm will stop.)
			Malfunction of the Driver	If the steps above do not stop the Fault Alarm, switch to Backup Freedom Driver. Return to implant hospital.
Temperature Alarm	Loud Intermittent Tone	Red Alarm LED Flashing	The internal temperature of the Driver is too hot.	Remove any objects that are blocking the Filter Cover and / or Fan and check filter.
			The temperature of the Onboard Batteries is too hot or too cold.	Move the Freedom Driver to a cooler or warmer area.

You must immediately address the issue that caused the Alarm.

Switching from Primary to Backup Freedom™ Driver

CAUTION: It is recommended to have TWO people exchange the primary Freedom Driver for the backup Freedom Driver. Make sure all items and accessories are closely available before attempting to exchange Drivers.

Setting up the Backup Freedom™ Driver

1. Remove the drive line caps from the ends of the Drive lines.
2. Insert one charged Onboard Battery. The driver will immediately start pumping. (*Figure 1*)
3. Remove the Orange Dummy Battery. (*Figure 1*)
4. Insert the second charged Onboard Battery. (*Figure 2*)
5. If possible, connect the backup Driver into a wall power outlet.
6. Your Freedom™ Driver is now ready to connect to the patient.

FIGURE 1

FIGURE 2

BEATS PER MINUTE, FILL VOLUME AND CARDIAC OUTPUT

FIGURE 3

Continued on next page.

Switching from Primary to Backup Freedom™ Driver

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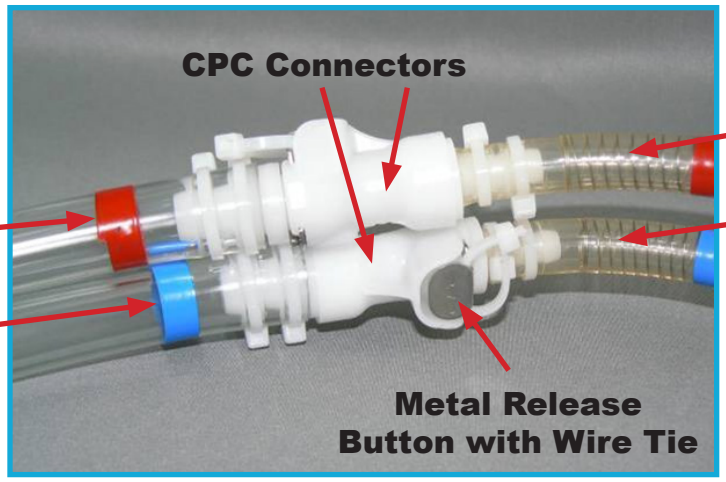

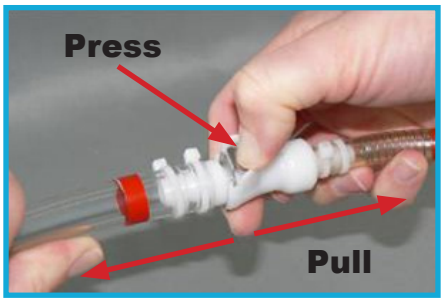

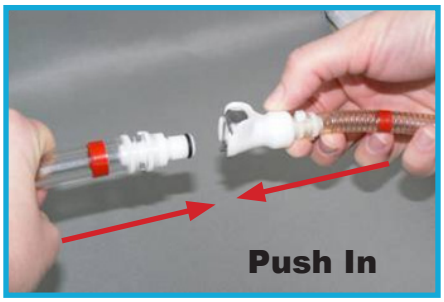

1. With the Wire Cutter Tool, cut the Wire Tie under the metal release button of the CPC Connector that secures the RED TAH-t Cannula to the RED Freedom Drive line. Gently pull to remove the Wire Tie and discard. DO NOT DISCONNECT THE CANNULA FROM THE DRIVE LINE YET.

2. With the Wire Cutter Tool, cut the Wire Tie under the metal release button of the CPC Connector that secures the BLUE TAH-t Cannula to the BLUE Freedom Drive line. Gently pull to remove the Wire Tie and discard. DO NOT DISCONNECT THE CANNULA FROM THE DRIVE LINE YET.

CAUTION: Before disconnecting the Drive lines of the primary Freedom Driver, you must have the Drive lines of the backup Freedom Driver within reach. The backup Driver must be turned on. Perform steps 3 and 4 simultaneously.

3. Disconnect the RED Cannula from the RED Drive line of the primary Freedom Driver:
- Simultaneously Press and hold down the metal release button. Pull the RED Cannula away from the RED Drive line.
- Immediately insert the RED Cannula into the new RED Drive line from the backup Freedom Drive Insert until a click is heard and lightly tug on the connection to make sure that it is secure.

4. Simultaneously disconnect the BLUE Cannula from the BLUE Drive line of the primary Freedom Driver:
- Press and hold down the metal release button. Pull the BLUE Cannula away from the BLUE Drive line.
- Immediately insert the BLUE Cannula into the new BLUE Drive line from the backup Freedom Driver.
- Insert until a click is heard and lightly tug on the connection to make sure that it is secure.

5. Slide a Wire Tie under the metal release button of each CPC connector. Create a loose loop in the tie, taking care not to depress and disconnect the connectors. Cut off the excess length of both Wire Ties.

6. Patient must notify Hospital Contact Person of the switch.

7. The Hospital should notify SynCardia Systems that the Driver has been switched and return the faulty Driver.