Best Practice Medicine
Clinical Practice Guidelines

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Best Practice Medicine

Foreward

Best Practice Medicine

Clinical Practice Guidelines

The guidelines are meant to be used in addition to the most recent Montana State Board of Medical Examiners EMS Protocol set.

J. Coil, D.O. 1/13/21

Effective May, 1 2019 Approved by,
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Destination Hospital Choice
PROTOCOL: Patients should be transported to the closest appropriate receiving hospital unless: • In consultation with medical control it is determined that a more distant hospital is more appro-priate to meet the needs of the patient;
-OR- • The patient meets criteria or published EMS guidelines for transport to a specialty care center (i.e., Trauma, STEMI);
-OR- • The patient requests a specific hospital, • **AND** The patient's condition is considered stable to tolerate additional transport time without need for more urgent stabilization before more lengthy transport; • **AND** The EMS transport service has determined that such a transport would not unreasonably remove the unit from its primary area of response causing a decrease of 911 coverage to the local area; • **AND** The patient has been informed that the transport to a more distant location will be more expensive and may not be covered by insurance if the added transport is not felt to be medically necessary by the insurance company.

Interfacility Transfers

The stability of the patient to be transferred is the primary factor to determine the need for critical care level providers for interfacility transports. However , there are some patients that require critical care providers for interfacility transports due to certain medications or situations (this is not an ex-haustive

Patients that require critical care level providers for interfacility transports due to certain medica-tions or situations (this is not an exhaustive list):
• Blood products actively being given
• Intubated patients
• Patients under medical sedation
• Patients with vasopressors requiring active titration

Certain situations will allow a paramedic to transfer a patient from one facility to another **ONLY** if they have received specific training on the situation by their agency prior to the expected need.

Situations that allow a paramedic to transfer a patient from one facility to another (**ONLY** if they have received specific training on the situation by their agency prior to the expected need.)
• Patients with a stable chest tube that has been in place for 1 hour and which is not expected to require any ad ustment or change in management during transfer . • Patients with routine (ie: not amphotericin) antibiotic infusions that have already begun prior to the transfer and where the patient has no sign of adverse reaction. • Patients with a Nitroglycerin drip • Patients with a Diltiazem
NOTE: If there are any questions about the stability or appropriateness of a certain patient for inter-facility transport by an ALS level paramedic without critical care certification, please contact **Dr. Coil.** **If Dr. Coil is unavailable, defer to critical care level providers for the transport.**

Triage & Transport

Air Medical Activation & Cancellation

Air Medical Activation Guidelines

INDICATIONS:

- The decision for mode of transport for both field and interfacility transfer patients is based on the premise that the time to definitive care and quality of care are critical to achieving optimal outcomes.
- Factors of distance, in ury severity, road conditions, weather and traffic patterns must be consid-ered when choosing between air or ground transport. The skill level of the transport team must also be considered.
- The potential benefit to the patient should outweigh the risks associated with air transport

In general, use of air ambulances should be considered in the following situations:

Crew-based reasons: The skill set or medical equipment of the critical care air medical team is required for the patient's condition. ***Example:*** Expected need for rapid sequence intubation in a patient with airway difficulties.

Aircraft-based reasons: The specific qualities of aircraft transport, such as speed of transport over large distances, are expected to benefit the patient. The National Association of State EMS Officials' National Model of EMS Guidelines (2017 Version 2.0 p 11) recommends considering "air medical transport, if available, for patients with time-critical conditions where ground transport time exceeds 45 minutes."

Provider discretion: Local providers are often aware of resource limitations and/or challenges spe-cific to certain cases and incidents or specific to a certain location. Use of air ambulance resources may be considered per incident command discretion based on circumstances specific to an incident.

Canceling Air Medical Transport

- When Air Medical Transport (AMT) has been requested, consideration for canceling it should only be made by trained EMS providers who are on scene and able to evaluate the situation and patient care needs.
- Discretion will still go to the AMT team as to whether they will continue to the scene.
- Resources are often dispatched before the full details of a situation are known. If AMT arrives on scene, it is appropriate to make a decision to transport the patient by ground EMS, if it is felt by all providers that the patient does not require the higher level services of the AMT team.
- Optimal communications will enhance the decision process

Triage & Transport

Definition of a Patient

Defining A Patient:
FIRST/SECOND PARTY CALLS: All first party calls (the patient calls to summon assistance for themselves) **and second party calls** (someone who knows the patient or who is involved in the situation summons EMS) **should gener-ate a refusal of care (including lift assists).** If the patient refuses vitals/ assessment/etc., then that should be documented.
EXAMPLE: • A family member calls for a choking relative who is better by arrival • A motorist calls for someone they have hit in a MVC • Law enforcement calls for someone involved in a MVC
THIRD PARTY CALLS: If it is a third party call (someone who doesn't know the patient or the situation) and the parties refuse EMS and state there is no medical problem (as in the guy sleeping in the park, or multiple parties involved in an MVC), and they do not appear obviously in ured, ill, or impaired, then it is "no patient found." (Providers are encouraged to document that they made a visual assessment of the scene and the person(s) involved on the paperwork to demonstrate due diligence.)
EXAMPLE: • Someone passes an accident on the road and calls 911 without knowledge of the individuals involved • Someone driving down the road calls for someone unknown to them who was lying in the grass

Refusal Protocol:

PURPOSE:
To define who is considered to be a patient and how to decide when to allow a patient to decline treatment and/or transportation to the hospital based on the patient having the capacity to refuse.

PROTOCOL:
Any patient (See definition of patient) refusing treatment must be informed of the risk of potential worsening of their condition, and the possibility it could possibly lead to death or permanent disability.

- IF patient has capacity (see below)
- AND has no signs of being under the influence of an intoxicating substance,
- AND is alert and oriented to person, place and time,
- AND is not a minor,
- AND is not showing signs of suicidal ideation or homicidal intent,
- AND still refuses,
- THEN he/she must sign a refusal form indicating they understand and are accepting the risk of refusal and cannot hold anyone responsible for any bad outcome as a result of their refusal. If there are any questions or concerns about a patient' s state of mind (capacity, intoxication or altered mental status) that is refusing care or transport, involve medical direction, enlist the help of family members, and/or notify law enforcement as appropriate.

NOTE: Multiple services do not have to obtain refusals from the same patient, and the responsibility to obtain a refusal should fall to the agency with urisdiction for the call, the agency holding Incident Command or the transporting EMS agency. Refusals should be obtained by ALS level providers when available.

Triage & Transport

Patient Refusals

Refusals - All Providers:

A BLS level provider may obtain a refusal:

- If there is no ALS provider on scene, including before ALS has arrived to the scene, if en route.
- If the ALS provider is occupied with care of a more seriously ill or in ured patient on scene.
- If there are multiple patient refusals within the same scene or call.

For the purpose of EMS, a patient with CAPACITY is defined as:

- At least 18 years old (unless emancipated minor)
- **AND** is alert, responsive, oriented to person, place, time and situation
- **AND** has no signs of in ury or illness which may impair the ability to make an informed decision
- **AND** displays no signs of the patient's udgment being impaired by an intoxicating/mind altering substance (including carbon monoxide)
- **AND** is not suicidal or homicidal and does not want to hurt themselves
- **AND** the patient must demonstrate an understanding of:

1. **Diagnosis, possible diagnosis, or current medical problem;** (i.e., does the patient understand the condition/medical problem for which the specific treatment/transport is being offered)
2. **Nature and purpose of treatment;** (i.e., is the person able to explain the nature of the treatment and understand relevant information)
3. **Risk and benefits of proposed treatment/transport;**

- (i.e.: is the person aware of the possible outcomes of treatment, alternatives or lack of care,
- and is able to verbalize the potential danger/risk to their health and well-being by refusing transport/care)
- Is the person able to make a decision and communicate a choice, and or the expectations realistic Is the person able to manipulate the information rationally

DOCUMENTATION:

- Documentation of the refusal requires a patient care report with as much information regarding the patient's evaluation as possible, including but not limited to:
- Any history obtained any physical exam performed. This may include visual descriptions if the patient deferred any hands on' exam.
- Documentation describing the discussions about risks of refusal and options presented to the patient.

POLST/Palliative Care Guidelines[1]

POLST forms have replaced the previous program of Comfort One in Montana. However , Comfort One forms are still valid and still present in the community. They should be honored if one is presented to you in the course of patient care.

POLST:

Out-of-Hospital Protocol when presented with POLST Documentation

- POLST documentation, if presented to the out-of-hospital provider , MUST be followed.
- POLST Documentation MUST accompany the patient and be presented to other health care pro-viders who subsequently attend the patient.
- The out-of-hospital patient care documentation must include the POLST documentation and care provided based on the POLST documentation.
- Never delay patient care to determine if the patient has POLST documentation.
- COMFORT One bracelet identifies a patient who has a POLST document and a DNR (sec. A).
- A POLST document can be disregarded if the patient requests or if the terminal condition no longer exists.
- A verbal DNR order from a physician MUST be followed.
- If there is a question regarding POLST, contact Medical Control.

End-Of-Life Care/Palliative Care

PATIENT CARE GOALS:

- When providing care for a patient near end-of-life,
- Provide relief from pain and other distressing symptoms
- Affirm dying as a normal process
- Integrate psychological and spiritual aspects of patient care
- Offer a support system to help the family cope during the patient' s illness and in their own be-reavement

Inclusion Criteria

- Patient enrolled in hospice or palliative care, or who have advance care directives, experiencing complaints related to the illness for which the patient is receiving those services.

Exclusion Criteria

- Complaints unrelated to the illness for which the patient is receiving those services.

PATIENT MANAGEMENT:[2]

Patients with decision making capacity:
If the patient is able to communicate and has the capacity to make decisions regarding treatment and transport, consult directly with the patient before treatment and/or transport

Triage & Transport

POLST/Palliative Care

Patients without decision making capacity:
If the patient lacks the capacity to make decisions regarding treatment and/or transport, identify any advanced care planning in place for information relating to advanced care planning and consent for treatment:

- Advanced care directives
- POLST or similar forms
- Guardian, power of attorney, or other accepted healthcare proxy
- In collaboration with hospice or palliative care provider , coordinate with guardian, power of attor-ney, or other accepted health care proxy if non-transport is considered

OTHER CONSIDERATIONS:

If the patient has **EXCESSIVE SECRETIONS:**

- provide suction

If the patient requires **PAIN RELIEF**:

- *see Pain Management protocol*

If the patient has **NAUSEA:**

- see *Nausea and Vomiting guidelines*

PATIENT SAFETY CONSIDERATIONS:
Careful and thorough assessments should be performed to identify complaints not related to the illness for which the patient is receiving hospice or palliative care. Care should be delivered with the utmost patience and compassion

KEY CONSIDERATIONS:

- Social interactions with family may affect end-of-life care
- Scene safety should be considered when deciding on management

PERTINENT ASSESSMENT FINDINGS:

- Vital signs
- Pain score
- Neurologic exam
- Lung sounds

KEY DOCUMENTATION ELEMENTS:

- Interaction with hospice or palliative care provider
- Confirmation of advanced directive or other advanced care documentation
- Pain score if applicable

PERFORMANCE MEASURES:

- If in patient in pain, pain score change.
- If patient is nauseated, symptom relief

Determination of Death in the Field

In addition to those factors discussed in the Montana State Protocols, determination of death in the field without initiating resuscitative efforts should be considered under the following conditions:

- Patient qualifies as a "Comfort One"/POLST patient. (Follow directions on the appropriate docu-ment for the appropriate level of resuscitation).
- Any situation that puts the rescuers at risk.
- The patient has suffered blunt traumatic arrest, is pulseless and apneic, has had verification of a patent airway, and there has been consideration of treatment for a tension pneumothorax if there is evidence of significant chest trauma.

AVALANCHE/SNOW BURIAL:

In an avalanche rescue or snow burial situation, resuscitation should NOT be attempted if:

- The victim was buried greater than 30 mins with no air pocket, airspace, or breathing device.
- The victim's airway is occluded with ice/snow and time of burial has been 30 minutes or more.

BACKCOUNTRY CPR:

In addition to the above, after 30 minutes of CPR and resuscitation efforts for cardiac arrest in a backcountry situation (ie: any situation where CPR cannot be adequately performed during extrica-tion/transport and medical control contact is not available), consideration should be given to stop-ping resuscitation efforts even if medical control cannot be contacted and a defibrillator is unavailable.

ENVIRONMENTAL EXPOSURE EXCEPTION:

All victims of electrocution, lightning strikes, and cold-water drowning should have resuscitative efforts begun with communication to online medical control. Any decision to determine death in the field in these cases should be made only after consultation with the medical control physician.

DOCUMENTATION:

- Patient care documentation will include procedures performed and time performed.
- Conversations with medical control will include physician's name, time, and instructions.
- Documentation must include the patient's name, age, date of birth at a minimum.
- If the EMS provider is unable to acquire a name, a police report number is to be documented.
- In non-traumatic deaths, all non-resuscitation or stopped resuscitation cases should have an ECG strip attached (when available based on provider level and equipment) to the field report that shows the patient's rhythm/cardiac activity AND confirmation of the absence of cardiac activity in two leads

LEAVING THE SCENE:

- All unattended deaths in the field are coroner's cases.
- Care must be exercised to not unnecessarily disturb the scene. Do not remove ECG patches; pick up material, etc. that could potentially alter the scene.
- Prior to leaving the scene where resuscitation is not performed, make sure an officer (either fire or police) is in charge of the scene, or the coroner is on scene.

Airway Management - Basic

Simple Airways & Bag Valve Mask
PROVIDER LEVEL: Basic Above
PROTOCOL: • Bag-valve-mask (BVM) devices should be used prior to or in con unction with advanced airway insertion. • Ideally, usage of a BVM is a two (2) or three (3) person procedure. • Monitoring of on-going BVM ventilation rates and volumes using end-tidal CO2 monitoring is encouraged when this expertise and equipment are available.
Proper BVM usage should follow this mnemonic:
C - Cervical-spine control, where indicated
O - Oral airway (and/or 1-2 Nasal airways) in place
P - Proper head and neck positioning
E - Elevate the aw
S - Seal the mask (two hands)
-
S - Steady, slow, single-hand, 1 second squeeze followed by quick release on the bag
O - Oxygen supply sufficient and functioning properly
S - Sellick's maneuver (cricoid pressure)
NOTE: If an effective airway is being maintained by BVM with continuous pulse oximetry readings >90 , it is acceptable for basic and/or advanced level providers to continue with these measures instead of using a supraglottic airway or endotracheal intubation, especially if a difficult airway is anticipated.

Airway/Breathing

Intermediate Interventions

Airway Management - Intermediate/Advanced

Supraglottic Airways
PROVIDER LEVEL: Endorsed EMT Above Endorsed EMT-Basics may insert an approved supraglottic airway provided: • The individual carries an appropriate and current endorsement at this level.
INDICATION: Any approved supraglottic airway is a suitable alternative to endotracheal intubation for all patients where laryngeal swelling (anaphylaxis, or airway burns) is not a concern, and is preferable in many circumstances (to minimize disruptions in chest compressions during cardiac arrest).
PROTOCOL: The use of continuous waveform capnography is mandatory for monitoring ongoing placement and ventilation with use of supraglottic airways, when the equipment and expertise is available and the provider's level of licensure permits its use.

Airway Management - Advanced

Endotracheal Intubation

PROVIDER LEVEL: Paramedic Above

INDICATION:
- Apnea: No spontaneous respiratory effort
- Inadequate spontaneous respiratory effort and lack of a gag reflex
- Inability to protect or maintain airway with other less invasive means

PROTOCOL:
EMS personnel must use assessment ad uncts to aid in intubation decisions and for confirmation of advanced airway placement, with the following caveats:

- **ADJUNCTS:** Use of ad uncts such as a gum elastic bougie and/or video larygoscope is strongly encouraged for all intubation attempts when appropriate and when the provider has been ade-quately trained on the available device. Specific devices used should be approved by medical direction.

TUBE PLACEMENT CONFIRMATION:
- End-tidal CO2 (EtCO2) - The use of End-tidal CO2 is mandatory (when approved for your licensure level) for verifying initial advanced airway placement. Use of continuous waveform capnography for ongoing airway and ventilation surveillance is mandatory if available. Be aware that certain conditions (e.g., prolonged cardiac arrest, massive pulmonary embolus, and poor chest com-pressions) may not produce detectible quantities of carbon dioxide.

CONFIRMATION OPTIONS:
- **Option 1:** assess initial placement with qualitative colorimetric CO2 detector then transfer to continuous waveform capnography for ongoing surveillance.
- **Option 2:** assess both initial and ongoing tube placement with continuous waveform capnogra-phy.

NOTE: Pulse oximetry is a valuable tool to detect occult hypoxia, however , a normal reading does *not* rule out respiratory distress or the need for airway management. Pulse oximetry should *not* be used to confirm endotracheal tube placement.

Airway/Breathing

Advanced Interventions

ASSESSMENT & DOCUMENATION OF TUBE PLACEMENT
Proper assessment and documentation of endotracheal intubation requires the medic to:

- Visualize the tube passing between the vocal cords (for oral intubation)
- Ensure no sounds are heard over the stomach when ventilating the patient via the ET tube
- Ensure good bilateral breath sounds when ventilating the patient through the ET tube
- Observe the chest rising and falling with each ventilation
- Observe the chest rising and falling with each ventilation
- Confirm initial and ongoing placement with waveform capnography (less sensitive in certain cardiac arrest situations) unless unavailable, and document results. If waveform capnography is unavailable, colorimetric end-tidal capnometry is mandatory.

NOTE: Do not assume either a tube is in the correct or the incorrect position based on any one of these steps in isolation. Continue to re-evaluate every few minutes (preferably with each set of vital signs) and particularly after patient movement. If there is ANY doubt as to the appropriate placement of an endotracheal tube, REMOVE the tube and ventilate the patient using a BVM.

ET INTUBATION ATTEMPTS:

- Providers may make only two endotracheal intubation attempts per patient.
- An endotracheal intubation attempt is defined as the passage of an endotracheal tube past the teeth.
- An attempt made by a paramedic student counts as an attempt.
- If the attempts are unsuccessful, medics should insert an approved supraglottic airway or provide
- Effective ventilation with a BVM.

SEDATION:
In a patient who has been successfully intubated (with appropriate confirmation as above), sedation with the following may be considered for patient agitation, gagging against the tube or other activity likely to displace the airway or interfere with appropriate ventilation:

Midazolam (Versed)

PROVIDER LEVEL: Paramedic Above

INDICATION: May be considered for patient agitation, gagging against the tube or other activity likely to displace the airway or interfere with appropriate ventilation:

DOSING:

- 2-5 mg IV,
- may repeat once to max of 10 mg.

SPECIAL CIRCUMSTANCES:

- Call Medical Control for further dosing or combination opiate/benzodiazapine dosing.

Cricothyrotomy
PROVIDER LEVEL: Paramedic & Above
INDICATION: Cricothyrotomy (with a device approved by medical direction) is a LAST option to be used only in a circumstance where you cannot oxygenate and/or ventilate the patient by ANY other means (BVM, endotracheal intubation, or supraglottic airway).
PROTOCOL: Proper assessment and documentation of surgical airway placement should be identical to endo-tracheal intubation as above, aside from visualizing the tube pass the vocal cords and documenting failure of all other available airway management techniques.

Airway/Breathing

Advanced Interventions

CPAP (Continuous Positive Airway Pressure)

PROVIDER LEVEL: Paramedic & Above

INDICATIONS:
Any patient who is in respiratory distress with signs and symptoms consistent with asthma, COPD, Pulmonary Edema, CHF, or pneumonia
AND who is:

- Awake and able to follow commands
- Over 12 years old and is able to fit the CP AP mask
- Has the ability to maintain an open airway

***AND* who exhibits two or more of the following:**

- A respiratory rate greater than 25 breaths per minute
- Pulse Oximetry of less than 90 at any time
- Use of accessory muscles during respirations

CONTRAINDICATIONS:

- Patient does not have adequate spontaneous respiratory effort.
- Patient unable to follow commands.
- Patient unable to protect airway or active vomiting.
- Systolic blood pressure 90 mmHg
- Respiratory distress secondary to trauma or suspected pneumothorax.

NOTE: Note that CPAP does not take the place of pharmacology. Note that although CP AP is listed in the protocol in a linear list, it need not be interpreted that all interventions must be completed in the written order. Providers should use good clinical udgment to determine at what point in the course of the various therapies CP AP should be initiated.

CPAP SETTINGS:

- 5 cm H2O for moderate distress
- 5 cm H2O for moderate or severe distress when systolic BP 90-100 (observe closely for BP change)
- 10 cm H2O for severe distress

CPAP PROTOCOL: Cont'd

REASSESS, REASSESS, REASSESS

BE ALERT for circumstances in which the patient continues to deteriorate despite CP AP and/or medication therapy, terminate CPAP administration and perform BVM ventilation and/or endotra-cheal intubation if necessary.

- Slowing respirations do not necessarily indicate improvement
- Be cognizant of hypotension.Be aware for need for more aggressive airway interventions if the patient shows signs of further respiratory decompensation.

POTENTIAL CPAP COMPLICATIONS

- Continued decompensation in respiratory status.
- Decrease in blood pressure.
- Panic or anxiety from claustrophobia.
- Gastric distension
- Pneumothorax
- Exhaustion of oxygen supplies.

CLAUSTROPHOBIA:

Claustrophobia is a common complaint with CPAP masks

- It is recommended that in the case of a claustrophobic patient, they be allowed to hold the mask and remove it if necessary.
- It is common that when benefits are felt, patients will be inclined to keep the mask on their face.
- Straps can then be attached as the patient becomes more comfortable

NOTE: Some patients will not tolerate the mask and should not be forced.

Cardiac

High Performance CPR

Cardiac Arrest and High Performance CPR Guidelines - Rationale

Continuous Chest Compression (CCC) CPR Note:
The science of CPR/Resuscitation is constantly being updated and improved. The AHA standards for CPR and Resuscitation have been revised several times in the past to reflect the newest advances. CCC-CPR is a new CPR protocol that strives to eliminate any pause in chest compressions. There is compelling data currently available that indicates any unnecessary pause in chest compressions, including during patient ventilations or establishing an advanced airway, is detrimental to patient outcome.

Hi-Performance CPR (HP CPR) is identical to CCC-CPR but also stresses the importance of CPR quality, specifically maintaining the proper minimum CPR rate, as well as adequate depth and recoil during chest compressions. This is alternatively referred to loosely as "Pit Crew CPR." **Best Practice Medicine** Direction believes that Hi-Performance CPR provides potential benefit to cardiac arrest patients and prefers that this protocol be followed during the resuscitation of cardiac arrest patients. EMS providers that have not been trained or are not comfortable with Hi-Performance CPR may default to the current AHA standards.

Research indicates that HP CPR can save lives. In order to create an environment of sustained HP CPR, everyone must be on board. EMTs or first responders who are first on scene must take responsibility or "OWN" the CPR portion of the resuscitation. When paramedics arrive, they will perform the advanced life support measures of the resuscitation and work in coordination with ongoing CPR.

For systems in which an EMT/paramedic team arrives first at the scene the EMT must assume responsibility for CPR while the paramedic assumes responsibilities for ALS. The goal is for additional resuscitation care such as defibrillation, medication therapies, or airway management to compliment CPR. CPR should be the default action at all times. The paramedic should integrate ALS care in a way that enables the EMT to achieve consistent CPR. This partnership between EMTs and paramedics will provide the basis to achieve HP CPR and in turn improve the chances of successful resuscitation.

Note: This section is meant to be a supplement to the Montana State Protocol for Cardiac Arrest as well as the current AHA cardiac arrest treatment guidelines.

The purpose of these standing orders is to enable a properly qualified Emergency Medical Responder to provide prompt CPR and cardiac defibrillation using an AED for patients 15 years of age or older who have confirmed circulatory arrest from non-traumatic causes. These protocols are for the adult only. Follow AHA/PALS standards to your level of licensure and training for neonates, infants and children with close attention to good quality chest compressions with minimal interruptions.

13 Principles of High Performance CPR
1. EMTs own CPR
2. Minimize interruptions in CPR at all times.
3. Ensure proper depth of compressions (>2 inches).
4. Ensure full chest recoil/decompression.
5. Ensure proper chest compression rate (100-120/min).
6. Use of a metronome set at 110 beats/min is strongly recommended.
7. Rotate compressors every 2 minutes.
8. Hover hands over chest during shock administration and be ready to compress as soon as patient is cleared.
9. If using an AED, use the analysis time to change compressors and rotate crew members.
10. If using a manual defibrillator, precharge the device 15 seconds before the pause for pulse and rhythm check.
11. Intubate or place advanced airway with ongoing CPR.
12. Place IV or IO with ongoing CPR. IO is preferred as it interferes less with ongoing CPR.
13. Coordination and teamwork between EMTs and paramedics.

Other Expectations:

- **UNWITNESSED ARREST:** If there is no CPR happening at the time of the first EMS provider arrival at a cardiac arrest, 2 minutes of CPR should be performed before the first attempt at defibrillation. This allows a period of blood flow to the heart, and allows the heart to better "accept" the shock making it more likely to be successful. If any CPR is ongoing at the time of defibrillator arrival, defibrillation can be attempted before doing further cycles of CPR, as the desired blood flow is already happening.

- **AIRWAY PLACEMENT:** CPR should not be stopped to allow airway placement. BVM ventilations or a supraglottic airway such as a King airway should be used if intubation cannot be completed on the first attempt without stopping chest compressions. Pay strict attention to ventilation rates. When an advanced airway is in place the patient should be ventilated every 10 chest compressions.

- **ANALYSIS/DATA COLLECTION:** CPR data from the monitor that was used during the cardiac arrest must be uploaded for data analysis and quality assurance. The ALS unit on scene is responsible for notifying a supervisor and the medical director of a cardiac arrest case and the presence of a data set to upload for quality review purposes.

Cardiac

High Performance CPR

High Performance CPR

1

IMMEDIATELY UPON ARRIVAL (or arrest, if witnessed) verify circulatory arrest by the absence of:
- consciousness
- carotid pulse
- normal/regular respiration (ignore agonal respirations)

CHOOSE

2

If the cardiac arrest **IS *NOT* WITNESSED** by EMS pro-viders:

PROVIDE 2 MIN OF CHEST COMPRESSIONS

Compression Person will immediately begin continu-ous chest compressions for 2 minutes at a rate of 100 compressions/minute.

Do NOT interrupt chest compressions.

2

If the cardiac arrest **IS WITNESSED** by EMS providers:
- **Compression person** begin immediate chest compressions while **AED person** attaces defibrillator.
- Once defibrillator is connected STOP CPR and push "ANALY E" button.
- Continue starting at steps 6 and 7 above.

3

DEFIBRILLATION Designated
AED Person will :

1. TURN ON the AED as soon as cardiac arrest has been verified.
2. Cut clothing as necessary
3. Place the AED electrodes on the patient in the appropriate locations:
   - one patch under the right clavicle,
   - one patch ust below the left nipple line on the chest wall

Do NOT interrupt chest compressions.

CHOOSE

4

If "SHOCKK ADVISED":
- AED will charge.
- Deliver shock and immediately begin 2 min. of CPR.
- Do NOT Check for Pulse after Shock.

4

If "NO SHOCK ADVISED":
- Check for Pulse. (10 seconds)
- If no pulse, immediately begin 2 min. of CPR

5

AIRWAY/VENTILATION

The **Designated Ventilation Person** will begin ventilations.
- Ventilate the patient at a rate of 30 compression to 2 breaths unless an advanced airway is in place
- Prepare suction equipment
- Do NOT interrupt chest compressions.

If there is no **Designated Ventilation Person available, ithe **Designative AED Peson** will immediately as-sume the responsibilities of the Designated Ventilation Person after the AED is operational.

6

IV/IO PLACEMENT
- If ALS personnel or BLS personnel with an IV endorsement are available, the IV Person will prepare the patient for IV placement and begin to assemble the IV set
- Consider IO access as this has less risk of interfering with chest compressions.

ALS ARRIVAL
- Upon arrival of ALS continue the current 2 min. CPR cycle.
- Paramedics will pre-charge defibrillator and analyze/ shock at end of 2 min. of CPR.
- After each 2 min. CPR cycle paramedics should analyze or treat in 10 sec.
- Continue cycles of 2 min. CPR with breaks 10 sec. for analysis and/or treatment by paramedics.

LUCAS Chest Compression Device

PROVIDER LEVEL: EMT-Basic & Above

- All providers must be appropriately trained to use the device with both initial and ongoing train-ing per agency and state requirements.

RATIONALE:
The LUCAS is a non-invasive mechanical CPR device. It has a role in providing uninterrupted chest compressions at an appropriate rate and depth, but it has not been shown to be superior to well performed "high performance" manual chest compressions. Manual chest compressions are still considered the standard of care by the AHA.

Consider the device a tool to use in non-traumatic cardiac arrest, but use of the device should not distract from beginning high quality manual chest compressions as soon as possible, nor should use of the device cause unneeded interruptions in chest compressions at any point. Use of a LUCAS device can make chest compressions during transport more effective and safer for the transporting crew. However, availability of a LUCAS should not prompt transport when it would not have other-wise been considered. Cardiac arrests are still best managed in place unless there are extenuating circumstances mandating transport such as V-fib resistant to multiple shocks.

INDICATIONS:
Non-traumatic cardiac arrest, to include PEA requiring CPR.

CONTRAINDICATIONS:

- Too small patient: The suction cup is not being completely compressed when it is lowered as far as possible - suction cup must completely compress when lowered against patient' s chest.
- Too large patient: The support legs of LUCAS cannot be locked to the back plate without compressing the patient's chest. The claw locks on the support legs must lock WITHOUT compress-ing the patient's chest.
- Patient is a child under 12 years old.
- Traumatic arrest.
- Confirmed POLST or DNR order
- Pregnancy.

Cardiac

Lucas Device

PROTOCOL:

- The LUCAS shall be used in accordance with the manufacturer's recommendations.
- LUCAS should not be used until after two full cycles of manual compressions. A defibrillator should be applied before LUCAS. Starting manual chest compressions and initial defibrillation should take precedence over placement of the LUCAS. Use a two-step application and minimize pauses.
- The machine is a tool but not a priority.
- Placement of the device should be done to take opportunity of inevitable pauses and to minimize no-flow states.
- The LUCAS should NOT be paused for intubations
- Do NOT attempt to lift the patient or the device by the arm straps.
- A member of the agency that placed the device and has been trained on the LUCAS must remain with the patient at all times until the LUCAS is removed. That person shall be responsible for the safe operation of the device.
- One agency's hood may be exchanged for another but keep the initial back plate in place and minimize any interruptions.

DEVICE MALFUNCTION:

- If there is a device malfunction, immediately remove the device and resume high performance CPR.
- The device may be reapplied only after the problem has been addressed.

MAINTENANCE:

- Change battery and recharge after every use and per manufacturer recommendations.

Cardiac Arrest – Post-ROSC Care[4]

After Return of Spontaneous Circulation (ROSC):

ALL PROVIDERS:

Be alert for re-arrest and loss of pulses. Up to 25 of patients with ROSC will have another period ocardiac arrest during transport.

- Consider dedicating one person to keep a finger on a pulse, while packaging and during trans-port, when crew size and circumstances allow.
- Alert the receiving facility of a cardiac arrest patient with ROSC
- Pay strict attention to ventilation rates, as rates faster than 10 breaths/min can be detrimental to survival.
- Titrate O2 levels to an O2 sat of 94-99 . Too much oxygen has been shown to be harmful in pa-tients who survive cardiac arrest.
- Provide comfort and supportive information to family. Prepare them for the possibility of re-arrest.
- Obtain and transmit a 12-lead ECG

AEMT & ABOVE:

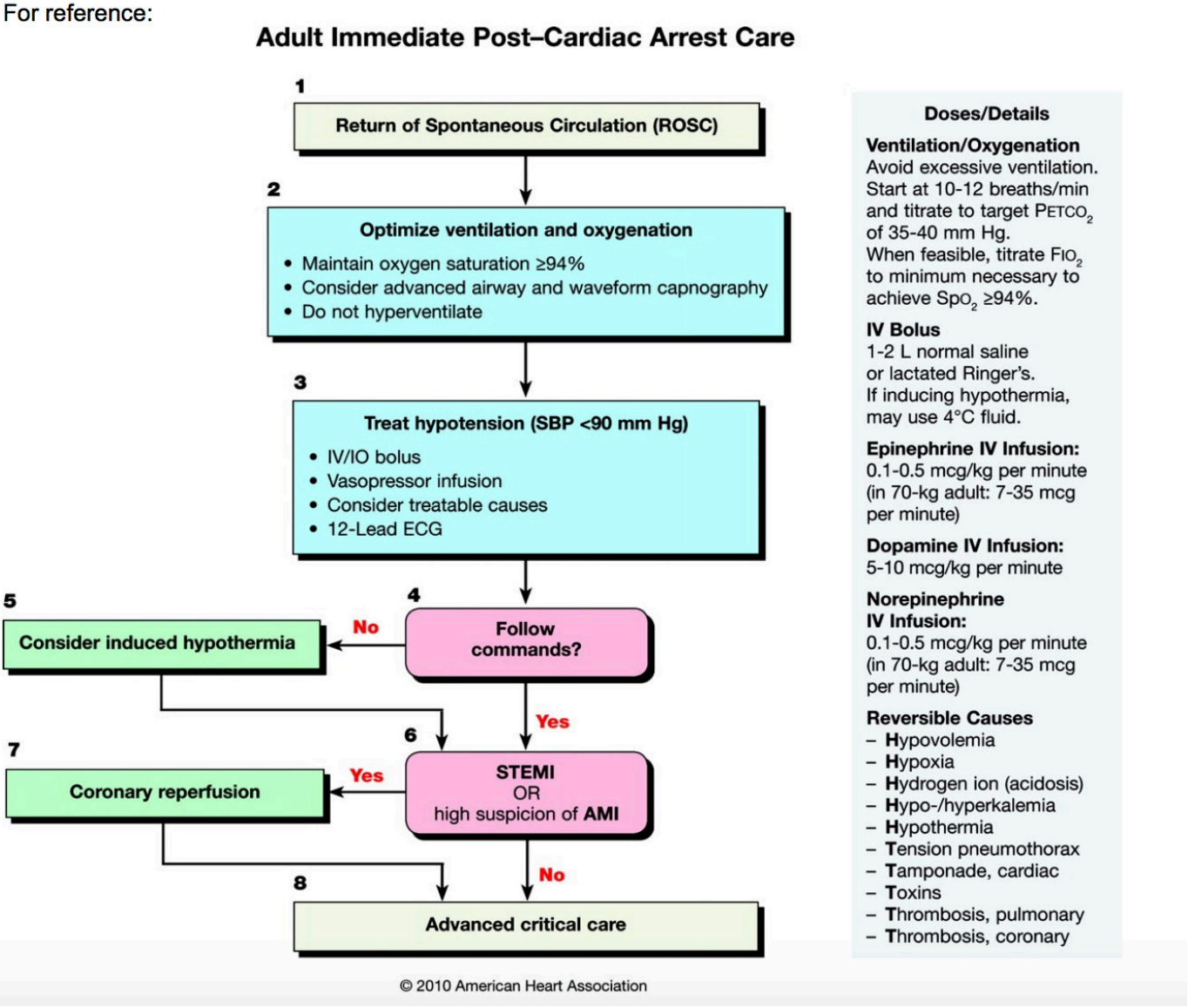
- If not already done during the resuscitation, give a bolus of 1 L saline for an adult and 20 ml/kg-for a pediatric patient.

PARAMEDIC & ABOVE:

- Prepare dopamine or other authorized vasopressor agent for infusion, per Montana state proto-cols, in case it is required.
- Alert the receiving facility of a cardiac arrest patient with ROSC and whether or not there is ST elevation findings on the ECG.

Cardiac
ROSC

For reference:



Diltiazem

PROVIDER LEVEL: Paramedic Above

RATIONALE: The following protocol for diltiazem is meant to be for transport situations of extended length or when transferring an inter-facility patient who has already been started on diltiazem.

FORM: ADD-Vantage system, 100mg/100mL

CLASS: Calcium Channel Blocker (antisyrhythmic)

PHARMACOLOGY AND ACTIONS: Blocks calcium from moving into the heart muscle cell, which pro-longs the conduction of electrical impulses through the AV node, decreasing myocardial contractility and oxygen demand. Can slow irregular narrow complex tachycardias. Also dilates coronary arteries and arterioles (weak vasodilator).

If adenosine or vagal maneuvers fail to convert narrow-complex SVT , SVT recurs after such treatment, or these treatments disclose a different form of SVT (such as atrial fibrillation or flutter), it is reasonable to use longer-acting AV nodal blocking agents such as calcium channel blockers (Dilti-azem). Their alternate mechanism of action and longer duration may result in more sustained termi-nation of SVT or afford more sustained rate control of atrial dysrhythmias (such as atrial fibrillation or flutter). For refractory SVT , further dosing should be administered under the direction of a base physician.

ONSET: IV/IO: 3 minutes

DURATION: 1–3 hours

INDICATIONS: Narrow complex tachycardia

CONTRAINDICATIONS: Second or third degree AV blocks w/o pacemaker Hypotension or cardio-genic shock Wide complex tachycardia nown sensitivity to diltiazem

PRECAUTIONS: Use with extreme caution in patients who are taking beta blockers, because these two drug classes potentiate each other's effects and toxicities.
Patients with a history of heart failure and heart block are at a higher risk for toxicity.
Diltiazem should not be given with Lasix as it will form a precipitate, use separate IV line.

SIDE EFFECTS AND NOTES: May cause hypotension, headache, fatigue, dizziness, nervousness, confusion, nausea and vomiting, edema, Bradycardia, AV block May worsen CHF

See specific protocols for medical control requirements

ADULT DOSING			
INDICATION	ROUTE	DOSE	NOTES
Narrow Complex Tachycardia	IV/IO	10 mg Slow IVP	May repeat once (max dose of 20 mg) Additional dosing per MC
PEDIATRIC DOS-ING–Contact MC			

Nitroglycerin Drips (for inter-facility transfers)

PROVIDER LEVEL: Paramedic Above

Montana state EMS protocols authorize use of a nitroglycerin drip per "local protocol" at the para-medic level for chest pain patients. This protocol is intended to be used by paramedics who have been authorized by their agency to transport patients on a nitroglycerin drip. It is intended to be used for interfacility transports when the nitroglycerin drip has been started by the sending facility. This protocol is not meant to be used for starting nitroglycerin drips in the field during scene calls. Use of this protocol assumes the provider has had appropriate training on and familiarity with the IV pump that will be used during the transport.

STANDARD DOSING: Nitroglycerin (50 mg/250 ml D5: 200 mcg/ml)

PROTOCOL:

- Maintain cardiac monitoring during transport.
- Assess and record vital signs, to include temperature, prior to transfer and every 5 to 10 minutes en route.
- Reassess patient frequently during transport and document findings.
- Collect all transfer documentation: transfer sheet, E G's, lab, and any other pertinent informa-tion.
- Document indication and order for drug during transport.
- Document drip rate at the beginning of transport and patient' s response.

Drip rate changes during transport:

- If chest pain present: increase the nitroglycerine drip 5 mcg/min (1.5 ml/hr) or 3.3 mcg/min (1.0 ml/hr) depending on your pump, every five minutes until the chest pain resolves or systolic blood pressure drops below 100.
- If more than an additional 10 mcg/min required, contact the online medical director (medical control).
- If systolic blood pressure drops below 100, decrease the nitroglycerine by 5 mcg/min (1.5 ml/hr) or 3.3 mcg/min (1.0 ml/hr) depending on your pump
- If systolic blood pressure drops below 90, stop the nitroglycerine drip, place patient in Trendelen-berg, consider a fluid bolus

***NOTE* on heparin and Lovenox (enoxaparin) for chest pain or potential cardiac patients:** Paramed-ics may transfer patients who have been administered heparin or enoxaparin at the sending facility. However, they may not administer heparin or enoxaparin or continue a heparin drip en route without a valid critical care endorsement approved by medical direction. These patients should be considered at risk for and monitored for bleeding complications similar to any other patient on anticoagu-lants.

Cardiac

Norepinephrine

Norepinephrine

PROVIDER LEVEL: Paramedic Above

DOSING:

Start at initial dose 2 mcg/minute. Titrate to effect. Max dose for refractory shock 20 mcg/min.

- Guidelines based on 4mg norepinephrine in 250cc D5W or NS for 16mcg/cc concentration
- Use 60 gtts/cc tubing
- Frequent checks of IV patency and blood pressure are required
- Contact medical control for pediatric/neonatal dosing.
- These are only guidelines.
- Cater individual dosing to patient's clinical presentation

Dose	Drip Rate
2 mcg/min	7.5 gtts/min
5 mcg/min	20 gtts/min
10 mcg/min	35 gtts/min
15 mcg/min	60 gtts/min
20 mcg/min	75 gtts/min

PRECAUTIONS:

- Norepinephrine is preferentially given through a central line but in the field and in emergent situations it can be given peripherally through good IV access.
- Norepinephrine should *not* be given through a wrist or hand IV
- Watch closely for any signs of extravasation.
- The site should be checked every 5 minutes during peripheral infusion of norepinephrine.
- If there are any signs of extravasation of norepinephrine:
- Switch the infusion to another peripheral site or switch to IO access
- Leave the IV cannula in place at the site of the extravasation.
- Aspirate as much fluid as possible through the cannula.
- Document findings at the site and monitor for change during transport.
- Alert the destination facility of the extravasation.
- Phentolamine may be considered with administration through the IV at the site of the extravasation and/or subcutaneous administration.

Special Note: UNSTABLE BRADYCARDIA

When norepinephrine was added and dopamine was removed from the stock carried, concern was raised about the ACLS algorithm for unstable bradycardia as Norepinephrine does not primarily increase heart rate and is not indicated for bradycardia.

For unstable or symptomatic bradycardia with a pulse:
Transcutaneous pacing should be used along with dosing of epinephrine as needed (see below)

PROVIDER LEVEL: Paramedic Above

EPINEPHRINE DOSING FOR SYMPTOMATIC BRADYCARDIA:

Adult - consider EPINEPHRINE (1:10,000 1mg/10ml) (IV) 1 to 2 ml (0.1-0.2mg), repeat every 3-5 minutes to a minimum B/P 90 systolic and improvement of symptoms

Pediatric - consider EPINEPHRINE (1:10,000 1mg/10ml) (IV) 0.1ml/kg to a max of 2 ml (0.2mg), repeat every 3 TO 5 minutes to a minimum B/P 90 systolic and improvement of symptoms

This dosing is from the anaphylaxis protocol in the MT state protocols, although recommended dos-ing is lower than what is recommended in the anaphylaxis protocols.

Stroke
Code Stroke

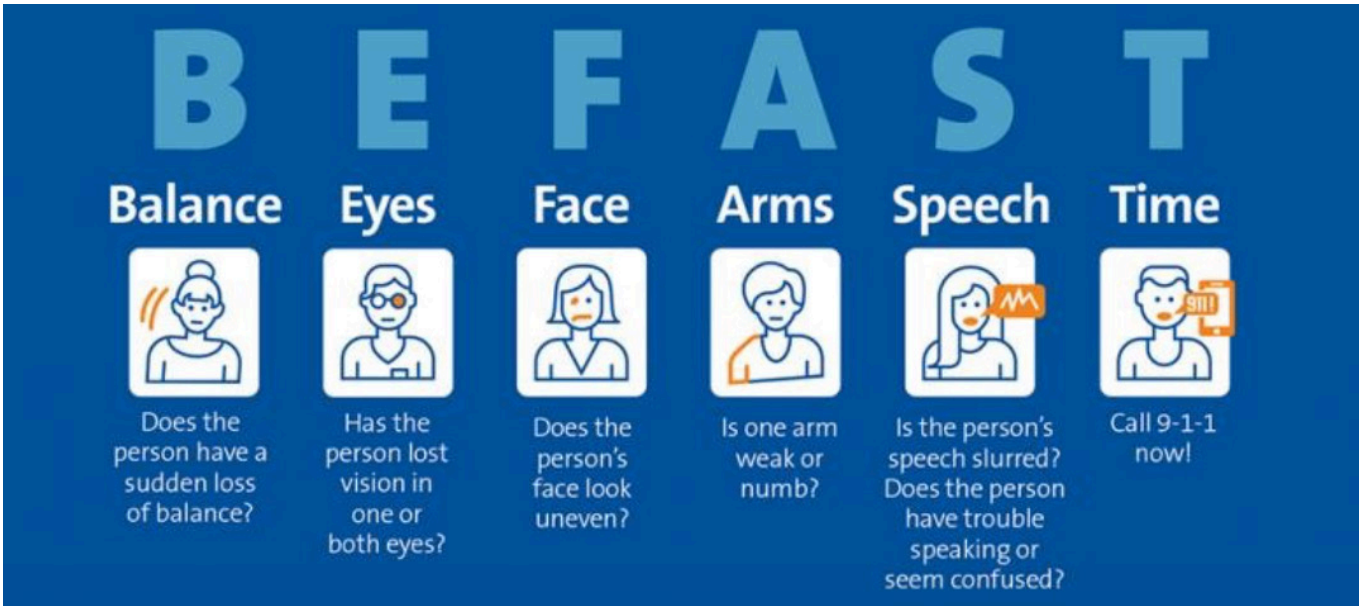
Stroke – Acute Stroke Care and Stroke Alert Criteria:
RATIONALE: For patients meeting certain criteria, treatment of stroke can be very time dependent. Treatment with thrombolytic medications (medications to dissolve clots) for ischemic strokes requires early and rapid diagnosis with a time limit on the use of this therapy.
PROVIDER LEVEL: All Care Providers
CODE STROKE: When transporting a potential stroke the following criteria should trigger a call to alert the hospital of a "Code Stroke Patient." If a patient is suspected to have had a stroke, but does NOT meet the following criteria, a standard report should be given to convey this information.
"Code Stroke" should be activated if a patient meets *both* of the following two criteria: 1. The patient has new symptoms with a positive Cincinnati Stoke Scale or positive "BE FAST" Criteria ***AND*** 2. The patient will arrive at the hospital in less than 4.5 hours from the time of onset of the suspected stroke symptoms. Patients who wake up with symptoms from sleep should have the time they went to sleep used as the time of onset.
KEY DOCUMENTATION ELEMENTS FOR SUSPECTED STROKE • "Last seen normal" must be specific • If the patient was last seen normal prior to bedtime the night before, this is the time to be docu-mented (not time the patient woke up with symptoms present) • Blood glucose results • Specific validated stroke scale used and findings • Time of notification to receiving hospital
PERFORMANCE MEASURES • Documentation of time "last seen normal" • Use of validated stroke scare Blood glucose level obtained EMS scene time minimized (goal: less than 20 minutes) • Hospital stroke team pre-arrival alert or activation occurred as early as possible after positive stroke assessment finding

Stroke Assessment Tools:

While either the Cincinnati Stroke Scale or the BE FAST scale are acceptable for use by EMS. Use of this scale will help coordinate with them. The BE FAST scale is also meant to be more sensitive as it does a better ob of picking up strokes involving the posterior circulation of the brain. This type of stroke is often missed by the Cincinnati Stroke Scale. Any positive finding on this scale should lead you to consider the possibility of stroke.

Cincinnati Stroke Scale: If any one of the three categories below is abnormal, it is a positive test.
FACIAL DROOP: Have the person smile or show his or her teeth. If one side doesn't move as well as the other so it seems to droop, that could be sign of a stroke. **Normal**: Both sides of face move equally **Abnormal:** One side of face does not move as well as the other (or at all)
ARM DRIFT: Have the person close his or her eyes and hold his or her arms straight out in front for about 10 seconds. If one arm does not move, or one arm winds up drifting down more than the oth-er, that could be a sign of a stroke. **Normal:** Both arms move equally or not at all **Abnormal:** One arm does not move, or one arm drifts down compared with the other side
SPEECH: Have the person say, "You can't teach an old dog new tricks, " or some other simple, famil-iar saying. If the person slurs the words, gets some words wrong, or is unable to speak, that could be sign of stroke. **Normal:** Patient uses correct words with no slurring **Abnormal:** Slurred or inappropriate words or mute
Patients with 1 of these 3 findings as a new event have a 72% probability of an ischemic stroke. If all 3 findings are present the probability of an acute stroke is more than 85%.

BE-FAST Stroke Assessment



Nausea/Vomiting

Basic/Intermediate/Advanced Interventions

Nausea / Vomiting
RATIONALE: Vomit is the most commonly aspirated material. Those most at risk are patients with an altered or decreased mental status. In addition to obstructing the airway, vomit can lead to significant damage to bronchiolar tissue and alveoli. Nausea and vomiting can be due to any number of causes and care should be directed to address the underlying pathology (cardiac event, head in ury, etc.) along with the symptoms. It is important to determine if blood is present in vomit.
PROTOCOL: *(SEE PROTOCOL PER PROVIDER LEVEL BELOW)*
EMT: • Initial Medical Care. • Consider trial of inhalation from an alcohol pad (See footnote below**). **Inhaled isopropyl alcohol has shown promise as an antiemetic and may be superior to oral ondan-setron. In a recent trial of 120 adult ED patients with nausea or vomiting who did not require IV ac-cess, inhaled isopropyl alcohol with or without oral ondansetron provided greater nausea relief than oral ondansetron alone (1). Patients were instructed to take deep nasal inhalations as frequently as required to achieve nausea relief from a standard alcohol swab, with the pad held 1 - 2 cm from the nares. No adverse events occurred. The mechanism of isopropyl alcohol's antiemetic effect remains unclear . Changing practice based upon a small, single-center study is hardly recommended, but the EM com-munity might find these results interesting given that inhaling an alcohol pad is simple and without adverse effects, and possibly quite effective. In its commentary of this study, the New England ournal of Medicine in its ournal Watch stated "these results are truly remarkable and are consis-tent with prior research. For patients not obviously requiring IV therapy, we should treat nausea with repeated inhalations from an isopropyl alcohol swab instead of administering any other drug" (2). **References:** EmedHome (1) April MD, et al. Ann Emerg Med. 2018 Feb 17. Epub ahead of print (2) Pallin D in Practice Changing Research 2018, NE M ournal Watch, April 2018.
AEMT or EMT with IV endorsement: • Initial Medical Care. • 500-1000 ml IV fluid bolus if patient presents with dehydration/hypotension. • Consider ALS resources.
PARAMEDIC: • Initial Medical Care. • 500-1000 ml IV fluid bolus if patient presents with dehydration/ hypotension. • **SEE ADDITIONAL OPTIONS BELOW**

Nausea/Vomiting
Advanced Interventions

Consider: **DIPHENHYDRAMINE**

INDICATION:
First line nausea/vomiting drug for pregnant patients, but use is not restricted to pregnancy

DOSING:
Adult dose: 12.5-25 mg PO, IV, or IM. May repeat dose x1.

PRECAUTIONS:
- Be aware of the potential for sedation.
- Diphenhydramine's antihistamine action can be helpful as an antiemetic, especially in cases of motion sickness. However, use is often limited by side effects such as sedation.

Consider: **ONDANSETRON**

INDICATION:
- Nausea/vomiting.
- In adults, oral route may be considered for prophylactic use for long-distance transports, prolonged spinal immobilization, and concurrent with narcotic administration for pain

DOSING:
Adult ONDANSETRON dose:
- 4 mg IV or 4-8 mg PO (Oral Dissolving Tablet)
- May repeat 4mg IV dose to total of 8 mg if no improvement in 15 mins.
- May be considered for prophylactic use for long-distance transports, prolonged spinal immobili-zation, and concurrent with narcotic administration for pain.

Pediatric ONDANSETRON dose:
- Oral route (preferred) 8-15 kg: 2 mg PO x1
- 15-30 kg: 4 mg PO x1
- 30kg: 4 mg PO and may repeat x1
- IV 3 year old: 0.1 - 0.15 mg/kg IV
- Maximum initial dose 4 mg, may repeat x1
- ONDANSETRON IV dosing for 3 year old: Contact Medical Control

PRECAUTIONS:
- Be aware of the potential for sedation.
- Diphenhydramine's antihistamine action can be helpful as an antiemetic, especially in cases of motion sickness. However, use is often limited by side effects such as sedation.

Consider: **PROMETHAZINE (PHENERGAN)**

INDICATION:
First line nausea/vomiting drug for pregnant patients, but use is not restricted to pregnancy

DOSING: Adult dose:

- 12.5mg - 25 mg deep IM for adults age 18-65 without significant comorbidities (such as underly-ing neurologic or cardiac disease).
- PROMETHA INE (PHENERGAN) IV dosing or IM dosing for age 18 or 65: Contact Medical Control

Trauma

Trauma Activations

Trauma Alert Criteria

RATIONALE:
Mechanism of in ury alone is not reason enough to activate the Trauma Team, although it should heighten the awareness of the EMT to the potential for serious in ury. Physiological findings with or without one of the listed mechanisms of in ury should be enough to activate the Trauma Team. Due to time constraints, it is preferable to advise ED of Mechanism of In ury and Physiologic Findings in a brief radio report. Lengthy radio reports are not helpful and can distract the EMT from other more im-portant patient teatment modalities.

It is the responsibility of the clinical team prior to EMS operations in a catchment area to contact the primary receiving facility and determine local criteria for a trauma team activation.

Example of a Level III hospital Trauma Activation Criteria:

Level One Trauma Activation Criteria: Activate a Level 1 Trauma Activation for any of the following:
PHYSIOLOGIC CRITERIA: • Glasgow Coma Scale 14 • Systolic Blood Pressure 90 mmHg in adults and age-specific hypotension in children • Respiratory Rate 10 or 29 • Transfer patients from other hospitals receiving blood to maintain vital signs • Intubated patients transferred from the scene or patients with respiratory compromise or ob-struction
ANATOMIC CRITERIA: • Significant penetrating in uries to the head, neck, torso, and extremities proximal to elbow and knee • Gunshot wounds to the head, neck, chest or abdomen • Evidence or suspicion of significant blunt chest or abdominal trauma • Burns associated with ma or trauma • Burns 15 BSA • Two or more proximal long bone fractures • Open or depressed skull fractures • Significant or unstable pelvic fracture • Crushed, degloved, mangled or pulseless extremity • Paralysis • Potential for inhalation in ury, thermal or chemical

Trauma

Trauma Activations

Level Two Trauma Activation Criteria:

Level 2 activation takes into account mechanism/patient co-morbidities in the absence of meeting anatomic or physiologic criteria Activate a Level 2 Trauma Activation for any of the following:

MECHANISM CRITERIA:

- E ection from automobile, partial or complete
- Death in the same passenger compartment
- Intrusion 12 inches at occupant site or 18 inches at any site.
- Auto versus pedestrian/bicycle thrown, run over , or with 20 MPH impact
- Motorcycle crash 20 MPH
- Falls 20 feet for adults; Children 10 feet, or 2-3 times the height of the child
- Horse/ large animal /ATV roll-over or e ection

COMORBIDITIES:

- Age 10 or 55
- Pregnancy 20 weeks
- Anticoagulation and bleeding disorders
- Acute renal/heart failure, or pulmonary disease

NOTE: Level 1 or 2 trauma activation can also be utilized solely on EMS or ED provider udgment and patients entering the system as a Level 2 activation can be upgraded to a Level 1 activation if their condition changes at any time.

Tranexamic Acid (TXA) Protocol
PROVIDER LEVEL: Paramedic Above
INDICATION: • Age 16 years OR weight 100lbs (45kg) ***AND*** • Trauma with suspected hemorrhagic shock (SBP 90, measured or reported)
PHARMACOLOGY AND ACTIONS: Tranexamic Acid (T A) is a potent antifibrinolytic drug. The main action is blocking of the lysine-binding sites of the plasminogen molecule. This prevents activation of plasminogen by plas-minogen activator. There is no evidence of a thrombogenic effect.
DOSING: Adult dose: • T A Bolus (IV/IO): Infuse 1g in 100cc (NS or LR) over 10 minutes before IV fluids if possible • T A Infusion to follow bolus (IV/IO): If ETA to the receiving facility following completion of the bolus is 20 minutes - Begin infusion of 1g in 250cc NS over 8 hours via pump or dial-a-flow (31cc/hr). **Pediatric dose:** Not appropriate for children less than 16 years or under 100 lbs (45 kg)
CONTRAINDICATIONS: • Time since in ury 3 hours • Isolated traumatic brain in ury • Isolated spinal shock (cord in ury without evidence of hemorrhage) • Known clot physiology – MI, PE, DVT
SPECIAL CONSIDERATIONS: The provider should transfer the 8 hour T A infusion to the receiving center if it has been started.

Trauma

Tourniquet Use

Tourniquet Use
General: Tourniquets should be considered part of standard equipment for all prehospital personnel due to their proven lifesaving benefits in the setting of uncontrolled extremity hemorrhage. The use of windlass, pneumatic, or ratcheting type commercial tourniquets is advised instead of improvised tourniquets, elastic, or bungee type tourniquets. This is due to their proven superiority in occluding arterial flow. All providers should be familiar with and train on the use of the specific device(s) they carry or to which they have access.
PROVIDER LEVEL: All Providers
Indications: • Life threatening extremity hemorrhage that cannot be controlled by other means • Serious or life threatening extremity hemorrhage in a setting where tactical, extrication, or man-power considerations prevent the use of standard hemorrhage control techniques
Contraindications: • Non-extremity hemorrhage • Proximal extremity location where tourniquet application is not practical • Hemorrhage controllable by standard means
Procedure: 1. Place tourniquet proximal to wound 2. Tighten per manufacturer instructions until hemorrhage stops and/or distal pulses in affected extremity disappear. 3. Secure tourniquet per manufacturer instructions 4. Note time of tourniquet application and communicate this to receiving care providers ***NOTE:*** • *Dress wounds per standard wound care protocol* • *If delayed or prolonged transport and tourniquet application time > 45 minutes: consider re-at-tempting standard hemorrhage control techniques and removing tourniquet*
Key Documentation Elements: • Vital signs and vascular status of extremity after placement of tourniquet, pressure dressing, or splint • Documentation of elimination of distal pulse after tourniquet placement • Time of tourniquet placement
Performance Measures: • Proper placement of tourniquet (location, elimination of distal pulse) • Proper marking and timing of tourniquet placement and notification of subsequent providers of tourniquet placement • Appropriate splinting of fractures

Cervical Spine Immobilization Protocol

RATIONALE:
Although spinal precautions are still very important, there is increasing concern that we may be doing more harm than good with backboard use. This protocol aims to continue safe care of the in ured spine while minimizing harm from backboard use.

In the right patient (see below), it is safe to protect and care for the in ured spine without using a backboard. Backboards do an imperfect ob of immobilizing the spine, and movement is often worse on the backboard than on a soft surface that conforms to the patient, such as a stretcher mattress.

Specifically:
- Spinal precautions can be followed without the use of a backboard.
- Patients who are alert enough to follow commands can typically maintain stabilization of their own spine without assistance.
- Backboards have not been shown to prevent neurological complications from spinal in ury.
- Backboards increase mortality in certain trauma patients, i.e. penetrating trauma.
- Backboards restrict respiration, which has potential to directly harm patients.
- Backboards rapidly lead to skin breakdown and pressure ulcers, even after a short period of time, and they can be particularly harmful to elderly patients.
- Backboards increase patient anxiety and discomfort, as well as increase EMS scene times.
- Backboard use has been correlated with increased use of imaging studies and other resources in the Emergency Department.

The goals of this protocol are:
- To continue safe care of the in ured patient
- To reduce patient harm through decreasing pain, suffering, and complications
- To decrease EMS scene times by eliminating unnecessary interventions
- To reduce in uries to crews who are attempting to carry immobilized patients
- To reduce unnecessary imaging costs and radiation exposure

Trauma

Spinal Precautions

SPINAL IMMOBILIZATION PROTOCOL:
PROVIDER LEVEL: All Providers
INDICATIONS: Criteria to Consider Spinal Immobilization (note-only one of the following need be present to consider immobilization):
MECHANISM CRITERIA: • Mechanism consistent with potential for spinal in ury • Significant falls (greater than 20 feet) • Motor vehicle collisions with significant mechanism of in ury • Direct trauma to head, neck, or back
PHYSIOLOGIC/ANATOMIC CRITERIA: • Neck/Back pain or tenderness • Abnormal neurological exam or complaint of symptoms • Sensory/motor abnormalities • History of LOC with current in ury • Altered mental status • Multi-system trauma (potential for distracting in ury)
PROTOCOL: Apply spinal precautions to patients at risk for spinal in ury, based on the criteria above or other clin-ical suspicions of spinal in ury. Use either method below , and **use spinal precautions with all patient movements** (i.e., log-roll technique with in-line stabilization of the head and c-spine).
• **FULL IMMOBILIZATION** using a cervical collar, backboard, and head blocks -OR- • **SPINAL PRECAUTIONS** using a cervical collar and securing the patient directly to the stretcher mattress

Spinal Stabilization Omission:
PROVIDER LEVEL: All Providers
PROTOCOL: Patients without any of the above INCLUSION findings may be transported without a cervical collar. The findings *MUST* be documented in the patient care record. *All* of the following must be met to allow for full clearance: • Normal neurological exam in cooperative patient • Fully alert and oriented patient • Normal sensory/motor exam • Absence of intoxication • Absence of neck/back pain or tenderness • Absence of distracting in uries • No communication barriers, i.e. due to language, intellect, intoxication, emotional condition, etc. Patients without any of the above findings may be transported without a cervical collar . The above findings MUST be documented in the patient care record.

OTHER CONSIDERATIONS:

- **EXTRICATIONS:** Backboards are primarily for E TRICA TION: Use the long spine board, scoop stretcher, vacuum mattress, short board, and/or endrick Extrication Device (ED) to minimize movement of the patient when moving them from the point of in ury to the stretcher .

- **PATIENT MOVES:** Once the patient is moved to the stretcher, based on provider discretion, you may use log roll or lift-and-slide technique to lay the patient flat on the stretcher off the board and leave the c-collar in place. Elevate the back of the stretcher as needed for patient comfort and secure the patient using the stretcher belts.

- **TRANSPORTING:** Do not routinely transport patients to the hospital on a backboard, short board, ED, or vacuum mattress unless it is necessary for patient safety or for their level of in ury. Crews may also leave the patient on the board if transport time is expected to be 15 mins or less or there are other extenuating circumstances.

- **AGITATED/COMBATIVE/SEIZING PATIENT:** Patients who are markedly agitated and/or confused from head in ury may not be able to follow commands with regard to minimizing spinal movement, and combativeness may also be a factor. Patients may remain on a backboard if the crew deems it safer for the patient, and this will be at the discretion of the crew. A combative or seizing patient should not be forcefully strapped to a backboard, beyond what is required for their safety, as this can create higher forces and cause increased in ury.

Trauma

Spinal Precautions

- **MULTI-SYSTEM BLUNT TRAUMA:** A multi system blunt trauma patient, such as from a high velocity crash or significant fall, or one who is unable to follow commands due to combativeness, intoxication, or decreased mental status, should remain on the backboard, scoop, or vacuum mat-tress until handoff to the ED. For example, all patients requiring Level 1 trauma activations should be considered high risk and should be maintained on the backboard unless other circumstances apply.

- **PENETRATING TRAUMA:** Do not routinely immobilize a patient with penetrating trauma such as gunshot or stab wounds. Unless there is an obvious neurologic deficit, emphasis should be on airway and breathing management, treatment of shock, and rapid transport to the closest trauma facility.

- **AMBULATORY PATIENTS:** Eliminate the "standing take-down" for patients who are ambulatory after an in ury. Place a collar and allow the patient to sit on the cot, and then lie flat. Patients who are ambulatory and able to follow commands do a better ob of preventing movement of an in- ured spine than are rescuers.

- **AIRWAY/BREATHING PRIORITY:** All efforts should be made to secure the airway while maintaining in-line spinal immobilization. However , in the inability to secure the airway, priority should be given to airway stabilization, and c-spine motion should be allowed as required to stabilize the airway.

Ketamine for Pain
(sub-dissociative, low-dose)

Generic Name: etamine
Hydrochloride **Trade Name:** etalar
Classification: NMDA antagonist

PROVIDER LEVEL: Paramedic Above

ACTION:
etamine is a rapid-acting, general anesthetic producing an anesthetic state characterized by pro-found analgesia, amnesia, normal pharyngeal-laryngeal reflexes, normal or slightly enhanced skele-tal muscle tone, cardiovascular and respiratory stimulation, and occasionally, a transient and mini-mal respiratory depression. etamine bronchodilation relaxes bronchiolar musculature and prevents bronchoconstriction induced by histamine.

INDICATION:
- Adult and pediatric patients (5 years old) with pain of traumatic origin
- Opioid-tolerant patients (5 years old) with an acute exacerbation of pain
- Adult and pediatric patients (5 years old) with pain that is refractory to opioids

CONTRAINDICATIONS:
- Hypersensitivity to ketamine
- Chest pain of suspected cardiac origin
- Hypertensive crisis, amphetamine abuse, acute pulmonary edema and any condition in which hypertension could lead to complications
- Pregnancy
- History of psychiatric disorders (relative contraindication)

DOSING FOR ANALGESIA:
- 0.2 mg/kg (MA 20 mg) IV, given slow IV push over 60 seconds
- May repeat once after 15 mins.
- Further doses require online medical control

KINETICS:
- Onset: 30-60 seconds (IV)
- Duration: 15 minutes (IV)

MONITORING:
- Blood pressure and heart rate
- ETCO2 is required if the patient also receives a narcotic pain medication.
- Mental status
- Pain rating - Obtain a pain score before administration, after administration, and upon ED admis-sion

Trauma

Ketamine

ADVERSE EFFECTS:

- Psychological effects may include pleasant, dream-like states, hallucinations, disorientation, delirium and agitation.
- Other adverse effects include dizziness, diplopia, dysphoria, nystagmus, nausea, vomiting, ele-vated blood pressure, elevated heart rate, laryngospasm, bronchodilation, hypersalivation and hypersensitivity.

MEDIATING ADVERSE EFFECTS:

Agitation, aggression, and negative psychological reactions requiring intervention:

- 12 years old: Administer midazolam 1 mg IV
- 5-12 years old: Administer midazolam 0.5 mg IV
- If needed, repeat doses intermittently and titrate to effect

Laryngospasm:

- Bag-valve-mask assembly
- Airway maneuvers

Hypersalivation:

- Atropine 0.5 mg IV

ADVANTAGES:

- Rapid onset
- May be used in hypotensive patients although state procotols requires BP 100 for administra-tion of ketamine.
- Accidental overdose (10-100x) not associated with long-term morbidity
- Useful in combination with opioids
- Produces synergistic analgesia, even in opioid-tolerant patients
- Decreases opioid consumption
- Results in quicker pain control

MISCELLANEOUS:

- Dissociative state produces unique sedation conditions
- Eyes remain open with a blank stare or nystagmus
- Nystagmus occurs as the dose-related effect shifts from subdissociative to dissociative
- Random movements unrelated to painful stimuli (ex. grasping nonexistent ob ects)

Dosing card for use in the field:

<table>
<tr><th colspan="10">Ketamine (Using 10 mg/ml concentration)</th></tr>
<tr><td colspan="9"><u>Indications</u>: Patients >5 years old with pain of traumatic origin or opioid-refractory pain; Opioid-tolerant patients >5 years old with an acute exacerbation of pain</td><td><u>Contraindications</u>: Ketamine hypersensitivity, chest pain of suspected cardiac origin, condition in which hypertension could lead to complications (ex. hypertensive crisis, amphetamine abuse), psychiatric problems (relative contraindication), SBP ≤100</td></tr>
<tr><td colspan="9">Ketamine Dosing Chart (0.2 mg/kg, MAX 20 mg)</td><td rowspan="2"><u>Administration</u>: Give slow IV push over 60 seconds. May repeat x1 after 15 mins. Further doses may be given only with online medical control</td></tr>
<tr><td>Weight (kg)</td><td>20</td><td>30</td><td>40</td><td>50</td><td>60</td><td>70</td><td>80</td><td>90</td><td>≥100</td></tr>
<tr><td>Dose (mg)</td><td>4</td><td>6</td><td>8</td><td>10</td><td>12</td><td>14</td><td>16</td><td>18</td><td>20</td><td rowspan="2"><u>Monitoring</u>: Blood pressure, SpO2, ETCO2, mental status, pain rating (before & after ketamine, upon ED admission), ECG</td></tr>
<tr><td>Dose (mL)</td><td>0.4</td><td>0.6</td><td>0.8</td><td>1</td><td>1.2</td><td>1.4</td><td>1.6</td><td>1.8</td><td>2</td></tr>
<tr><td colspan="10"><u>Mediating Adverse Effects</u>: Agitation or aggression: ≥12 years old: Midazolam 1mg IV, <12 years old: Midazolam 0.5mg IV, repeat doses PRN; Laryngospasm: Bag-valve-mask assembly and airway maneuvers; Hypersalivation: Atropine 0.5 mg IV</td></tr>
<tr><td colspan="10"></td></tr>
</table>

Notes & References

Notes & References

1. http://b.bsd.dli.mt.gov/license/bsd boards/med board/pdf/POLST Protocol.pdf (Accessed 1/13/18)
   http://bsd.dli.mt.gov/license/bsd boards/med board/polst.asp (Accessed 1/1/14)
2. This End-of-life/Palliative care guideline has been adapted from the 2017 NASEMSO National Model EMS Clinical Guidelines, Version 2.0..
3. The ideas and some of the information in this section were developed and graciously shared by the Medic One Foundation of Seattle, ing County, Washington.
4. Portions of these clincical care guides were developed and graciously share by Gallatin County EMS medical directors

Index

Covid-19 Vaccination Appendix

Covid-19 Vaccination

PROVIDER LEVEL: Paramedic or Above

RATIONALE: Pre-hospital providers may be called upon to provide COVID-19 immunization as necessary to assist state, county, and local officials in the event of a public health or public safety incident. This protocol is specific to administration of US FDA approved SARS-CoV-2 vaccines.

FORM: IM Injection

CLASS: mRNA Vaccine

Best Practice Medicine personnel may administer SARS-cov-2 when all of the following criteria have been met:

- Possess active Paramedic license issued by the Montana Board of Medical Examiners
- Possess active National Registry certification for Paramedic, AEMT, and EMT.
- Aligned and in good standing with Best Practice Medicine - ALS QRU
- Successfully complete medical director approved SARS-CoV-2 immunization training

INDICATIONS: Moderna, mRNA-1273: 18 years of age and older, Pfizer-BioNTech, BNT162b2: 16 years of age and older

CONTRAINDICATIONS:

- Severe allergic reaction (anaphylaxis) or an immediate allergic reaction*—even if it was not severe—to any ingredient in an mRNA COVID-19 vaccine
- Severe allergic reaction (anaphylaxis) or an immediate allergic reaction*—even if it was not severe—after getting the first dose of the vaccine
- Immediate allergic reaction of any severity to polysorbate (due to potential cross-reactive hypersensitivity with the vaccine ingredient PEG

PRECAUTIONS: History of an immediate allergic reaction to any other vaccine or injectable therapy (i.e., intramuscular, intravenous, or subcutaneous vaccines or therapies not related to a component of mRNA COVID-19 vaccines or polysorbate. Moderate to Severe Acute Illness

SIDE EFFECTS AND NOTES: Injection Site: Pain, Redness, Swelling. Systemic: Fever, Chills, Tiredness, Headache. onset >24 hours, persists 2-3 days

See specific protocols for medical control requirements

ADULT DOSING			
Vaccine	ROUTE	DOSE	NOTES
Moderna, mRNA-1273	IM-Deltoid	.5 mL	10 doses/Vial. DO NOT Dilute or combine Vaccine.
Pfizer-BioNTech, BNT162b2	IM-Deltoid	.3 mL	6 doses/Vial. MUST be diluded in 0.9% sodium chloride.

*For the purpose of this guidance, an immediate allergic reaction is defined as any hypersensitivity-related signs or symptoms, such as urticaria, angioedema, respiratory distress (e.g., wheezing, stridor), or anaphylaxis, that occur within 4 hours following exposure to a previous dose of an mRNA COVID-19 vaccine or any of its components.

ADMINISTRATION PROTOCOL:

Administration of the SARS-cov-2 vaccines may occur as part of a large mass vaccination effort led by state, county, and local government officials. In this instance, vaccinators will follow guidelines and operations procedures established by the Incident Command team and point of distribution site (PODS) Director.

In general, the vaccinator will:

- Confirm recipient is with the age range indications for the vaccine
- Prior to immunization, inform each potential immunization recipient of the potential side effects, adverse reactions as well as the appropriate course of action in the event of an untoward or adverse event.
- Before the immunization is administered, obtain consent for the immunization from the potential recipient or their responsible party in cases of minors and persons incapable of consenting.
- Have available on-site medications to treat anaphylaxis including, but not limited to, epinephrine and necessary needles and syringes.
- Coordinate with program site managers to ensure reporting of all adverse immunization outcomes.
- Coordinate with program site managers to ensure that the record of all persons immunized includes: the non-patient specific standing order and protocol utilized, recipient's name, date, address of immunization site, immunization, manufacturer and lot number of administered vaccine(s), and recommendations for future Immunizations.

SPECIAL CONSIDERATIONS:

Pfizer-BioNTech Covid-19 Vaccine & Moderna Covid-19 Vaccine:

Be prepared to manage medical emergencies. Vaccination providers should observe patients after vaccination to monitor for the occurrence of immediate adverse reactions: [3][4]

30 minutes: Persons with a history of an immediate allergic reaction of any severity to a vaccine or injectable therapy and persons with a history of anaphylaxis due to any cause [3][4]

15 minutes: All other persons [3][4]

Sources

[1] US Centers for Disease Control. (2021). Moderna COVID-19 Vaccine
https://www.cdc.gov/vaccines/covid-19/info-by-product/moderna/index.html

[2] US Centers for Disease Control. (2021). Pfizer-BioNTech COVID-19 Vaccine
https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines/Pfizer-BioNTech.html

[3] US Centers for Disease Control (2021). Pfizer-BioNTech COVID-19 Vaccine Standing Orders for Administering Vaccine to Persons 16 Years of Age and Older.
https://www.cdc.gov/vaccines/covid-19/info-by-product/pfizer/downloads/standing-orders.pdf

[4] US Centers for Disease Control (2021). Moderna COVID-19 Vaccine Standing Orders for Administering Vaccine to Persons 18 Years of Age and Older.
https://www.cdc.gov/vaccines/covid-19/info-by-product/moderna/downloads/standing-orders.pdf