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ADMINISTRATIVE BULLETIN

No. 22-BUL-005

TO: All EMS System Staff

FROM: Dr. Senai Kidane, EMS Medical Director

DATE: April 11, 2022

SUBJECT: **Proposed Changes for 2023 Field Treatment Guidelines, Field Procedures, and Drug References**

The Contra Costa County EMS Agency has released the Proposed Changes for 2023 Field Treatment Guidelines, Field Procedures, and Drug References packet for the first round of public comment. Field Personnel perspective and feedback is invaluable in our review process; please encourage all personnel to participate in this important step.

All public comments must be submitted using the online public comment form link or QR code located below, no later than **April 29, 2022,** at 5:00pm.

Online Public Comment Form link: https://forms.office.com/g/4fEGaerTkj

Online Public Comment form QR Code:

Questions regarding this bulletin should be directed to: contracostaems@cchealth.org

FTG Public Comment
Summary of Changes 2022-2023

Field Treatment Guideline	2023 Summary of Updates	Reason for change/ Evidence/ other notes
General		
	No changes to General FTGs	
Adult Cardiac		
AC01 Cardiac Arrest	1. Updated wording for Determination of Death to "Follow Policy 1004 for Termination of Resuscitation Criteria" 2. Updated Airway management direction to "Consider advanced airway placement if patient achieves ROSC" 3. PEARL #9 moved to PEARL #1 regarding Maternal Arrest	*2020 AHA recommendations*
AC02 Asystole/PEA	1. Updated wording for Determination of Death to "Follow Policy 1004 for Termination of Resuscitation Criteria" 2. Updated algorithm format to enter from FP09 3. Updated remaining algorithm to prioritize administration of EPI in non-shockable rhythms 4. Updated remaining algorithm to clarify direction for transport with ROSC or consideration for termination of resucistation 5. Updated Airway management direction to "Consider advanced airway placement if patient achieves ROSC" 6. Added new PEARL #1 regarding Maternal Arrest	*2020 AHA recommendations*
AC03 V-Fib/ Pulseless V-Tach	1. Updated wording for Determination of Death to "Follow Policy 1004 for Termination of Resuscitation Criteria" 2. Updated algorithm to provide guidance for administration of EPI after 2nd defibrillation 3. Added wording, "if indicated" to defibrillation to prompt reassessment of rhythm 4. Updated remaining algorithm to clarify direction for transport with ROSC or consideration for termination of resucistation 5. Updated Airway management direction to "Consider advanced airway placement if patient achieves ROSC" 6. Added new PEARL #1 regarding Maternal Arrest	*2020 AHA recommendations*
AC04 Post-Resuscitation (ROSC)	1. Updated wording in intervention regarding "Optimize ventilation and oxygenation" to SPO2 92-98%; respiratory rate to 10 breaths/min 2. Updated wording in intervention "Advanced Airway…" to Advanced Airway placement unless contraindicated" 3. Updated wording in intervention "Establish IV/IO" to "Establish IV/IO, if not previously established" 4. Updated algorithm to prioritize Push Dose Epi for blood pressure management and blood pressure monitoring 5. Removed 1:10,000 Epinephrine Mixing Instructions,	*2020 AHA recommendations* To encourage preparation of Push Dose Epi and minimize confusion for mixing instructions

Submit feedback at: https://forms.office.com/g/4fEGaerTkj

FTG Public Comment
Summary of Changes 2022-2023

AC06 Tachycardia	1. Add 20ml NS rapid IV push	Align with Drug Reference
ACO8 Chest Pain Suspected Cardiac	1. Separate "Designated Hospitals from out of county list and update hospital name & include city 2. Change ASA to Yellow (EMT) scope of practice	Provides clarity for county designated vs. out of county approved STEMI receiving centers. Update to allow EMT state scope of pratice to administer
Adult Medical		
A02 Airway	Updated midazolam dosing guidance to 2-5 mg for intubated patients	Provides consistency with Drug Reference
A04 Allergic Reaction	1. Change order for treatment Algorithm: 1st. Normal Saline 2nd. If hypotensive or no improvement, Epinephrine 3rd. Consider Diphenhydramine 4th. Consider Albuterol 2. ADD lanague to Sytemic: Systemic reaction: involving 2 or more body systems	Medical Director request to reprioritize order of treatment Updates FTG to support definition of Systemic
A09 Shortness of Breath	1. Remove Periarrest 2. Arrange order of care to : 1)CPAP 2)Albuterol 3) Epinephrine	Medical Director Request to prioritize CPAP for first treatment in severe respiratory distress with posssible peri-arrest symtoms.
A12 Hypotension Shock	1. Add Consideration for Push Dose Epi with Base Hospital Order	Add indications for Push Dose Epi
A13a Suspected Opioid Overdose	1. Update EMT administration of Naloxone	Provide conisistency with Equipment lists
A15 Respiratory Distress with Tracheostomy	1. Update language in PEARL #6 to add ... "with" suction.	
A16 Seizure	1. May repeat to a max dose of 10 Mg	Added to provide max dose for Midazolam
A18 Suspected Stroke	1. Change 12-Lead to Consider 12-Lead ECG if monitor suggests arrhythmia 2. Remove langage "Keep scene time to <10 minutes and move Orange box to go below 2nd box(above BG) 3. Separate "Designated Hospitals from out of county list and update hospital name & include city	Changes 12-Lead to guideline if indicated, not required to help minimize scene time and prioritize early transport Removes time requirement but maintains priority for early transport and importance of bringing family member Provides clairity for county designated vs. out of county approved stroke receiving centers.
Pediatric Cardiac		
PC02- PEDS Asystole/PEA	1. New box with language to include "Do not interrupt chest compressions to administer medications"	AHA guidelines

Submit feedback at: https://forms.office.com/g/4fEGaerTkj

	2.Addition of PEARL "Added to Epinephrine 1:10,000 IV/IO- first dose of Epinephrine preferable within 5 minutes from start of CPR :	AHA guidelines
	3. Addition of PEARL "Efforts should be directed at high quality chest compressions with limited interruptions. "	
	4. Removed language "Consider chest decompression procedure"	Medical Director request
PC03 Peds V-fib/Pulseless V-tach	1. New language stating "Do not interrupt chest compressions to administer medications "	AHA guidelines
	2. New language "Early administration of Epi within 5 minutes from start of chest compressions :	AHA guidelines
PC04 Peds ROSC	1. addition of exit to Seizure TG if applicable	Recognized a need for additional condition to be listed
	2. additional PEARL- Hypotension is age dependent. This is not always reliable and should be interpreted in context with the patient's typical BP, if known. Shock may be present with a seemingly normal blood pressure initially.	Medical Director requested for clarity and reference
	3. additional PEARL-Hypotension is defined as: • Neonate: < 60mmHg or weak pulses • Infant: < 70mmHg or weak pulses • 1-10 years: < 70mmHg + (age in years x2) • Over 10 years: < 90mmHg	Medical Director requested for clarity and reference
PC05 Peds Bradycardia	1. New language stating "goal oxygen saturation greater than or equal to 94% SPO2 "	AHA guidelines
	Pediatric Medical	
P01 Pediatric Airway	1. New language in treatment stating "supplement oxygen"	AHA guidelines
	2. Reference to rescue breathing for all pediatric patients	Medical Director requested for clarity and reference
P03 Pediatric Altered Mental Status	1. New language stating "Supplement oxygen- goal oxygen saturation greater than or equal to 94% SPO2 "	AHA guidelines
P07 Pediatric Hypotension/Shock	1. New language stating "Supplement oxygen- goal oxygen saturation greater than or equal to 94% SPO2 "	AHA guidelines
P09 Pediatric Overdose/Toxic Ingestion	1. New language stating "goal oxygen saturation greater than or equal to 94% SPO2 '	AHA guidelines
	2. New language stating "Supplement oxygen to maintain RR 12 "	Medical Director request
P11 Pediatric Respiratory Distress	1. New title "Pediatric Respiratory Distress/Wheezing"	Medical Director request

	2. New language stating "Oxygen titrate to greater than or equal to 94% SPO2 via blow by or NRB"	Medical Director request
	3. New language stating for Albuterol Nebulizer "via mask or BVM"	Medical Director request
	4. New language to "severe" arm to include "moderate/severe"	Medical Director request
	5. New language to moderate/severe arm stating "Assist respirations via blow by or BVM	Medical Director request
P12 Pediatric Seizure	1. New language stating "Supplement oxygen- goal oxygen saturation greater than or equal to 94% SPO2 "	AHA guidelines
P13 Pediatric Vomiting and Diarrhea	1. New language stating "goal oxygen saturation greater than or equal to 94% SPO2	AHA guidelines
Trauma		
T01 Trauma Triage	Update to clarify decision tree between "unmanageable airway vs traumatic arrest"	Unmanageable airway should go to the closest hospital but traumatic arrest should be filtered through Policy 1004- Determination of Death Criteria
Interfacility Transfer		
I01 STEMI Transfer	1. Added NGT Box to match AC08 Chest Pain "Consider NTG if not previously administered at hospital"	Updates FGT to support providing NGT for STEMI or ACS patients if not given at sending facility.
	2. Separate "Designated Hospitals from out of county list and update hospital name & include city	
	3. Removed Pearl #2 second bullet that stated: Nitroglycerin treatment is not required and is generally ineffective in patients with a confirmed STEMI	NTG is given with STEMI now
IO3 Stroke Transfer	Separate "Designated Hospitals from out of county list"	
Field Procedures		
FP01: 12-Lead	1. Removed Stroke from clinical indications	Stroke is not considered a clinical indication for 12-Lead
	2. Changed Procedure #2 to: Enter the required patient information: Age, Gender, incident number and patient's first and last initials. Under consideration to replace patient intials with DOB	Provides clear direction for required information prior to transmission of 12-lead
	3. Updated Procedure #12 for documentation to include: the 12-Lead procedure time, the EGC results, and the time of transmission to the STEMI receiving Center for a STEMI positive EGG.	Added Time of transmission to the STEMI Center for positive STEMI. Supports goal of 12-Lead acquisition to transimssion within 10 minutes
FP03 Airway: Bougie Device	1. Clarify Indication for Use and Contraindications	Bougie device is indicated for all intubation attempts.
FP04 Airway: Endotracheal Intubation	1. Added visual for Cormack-Lehane difficult airway assessment tool and BURP manuever	Provide clarity in procedure instructions.
	2. Added wording "#15. Use caution when transferring intubated patient to and from gurney as this is where there is the highes likelihood for tube dislodgement. Reassess tube placement at these events.	

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FTG Public Comment
Summary of Changes 2022-2023

FP09 Cardiac Arrest Management	1. Reconfigure CPR HD script time to left column	Updated CPR HD script to support early administration of EPI in non-shockable rhythms and EPI administration after 2nd shock in shockable rhythms.
	2. Replaced Paramedic heading to Provider #1 role	*2020 AHA recommendations*
	3. Remove EPINEPHRINE medication entries; replaced with "Non-Shockable: EPINEPHRINE every 4 mins" at the 2-4 min. and "Shockable: EPINEPHRINE every 4 mins" at the 4-6 min. marks 4. Updated Airway management direction to "Consider advanced airway placement if patient achieves ROSC"	Support new ROSC FTG
	5. Updated wording to Principle #4 to read "In cardiac arrest, early administration of Epinephrine in non-shockable rhythms and high quality compressions and defibrillations in shockable rhythms are important." 6. Updated wording to Principle #6 ro read "Placement of an advanced airway should be deferred unless a provider is unable to ventilate the patient with a BLS airway and BVM or when the patient maintains ROSC. "	
FP15 Intraosseous Access	1. Edit placement of figures on page 2	
FP23 Vascular Access	1. Updated wording for Procedure 4.d. by removing "e.g…" and adding label "Adult Only" to EJ	
	2. Updated wording for Procedure 4.c. by removing text "or are in cardiac arrest" to support FTG changes	
Drug Reference		
Diphenhydramine	change text in Drug reference to 50 mg/IV/IO/IM for dystonic reaction	was 25-50mg IV/IO or 50 IM for dystonic reaction - change to 50mg IV/IO/IM
Fentanyl	change to 50 mcg each nare	was 100mcg IN
Midazolam (Behavioral)	Remove IN option for Midazolam	Remove to match FTG
Naloxone	Update to align with FTG for suspected Opioid overdose 2-4 mg IN or 1-2mg IV/IM	Updated to match FTG

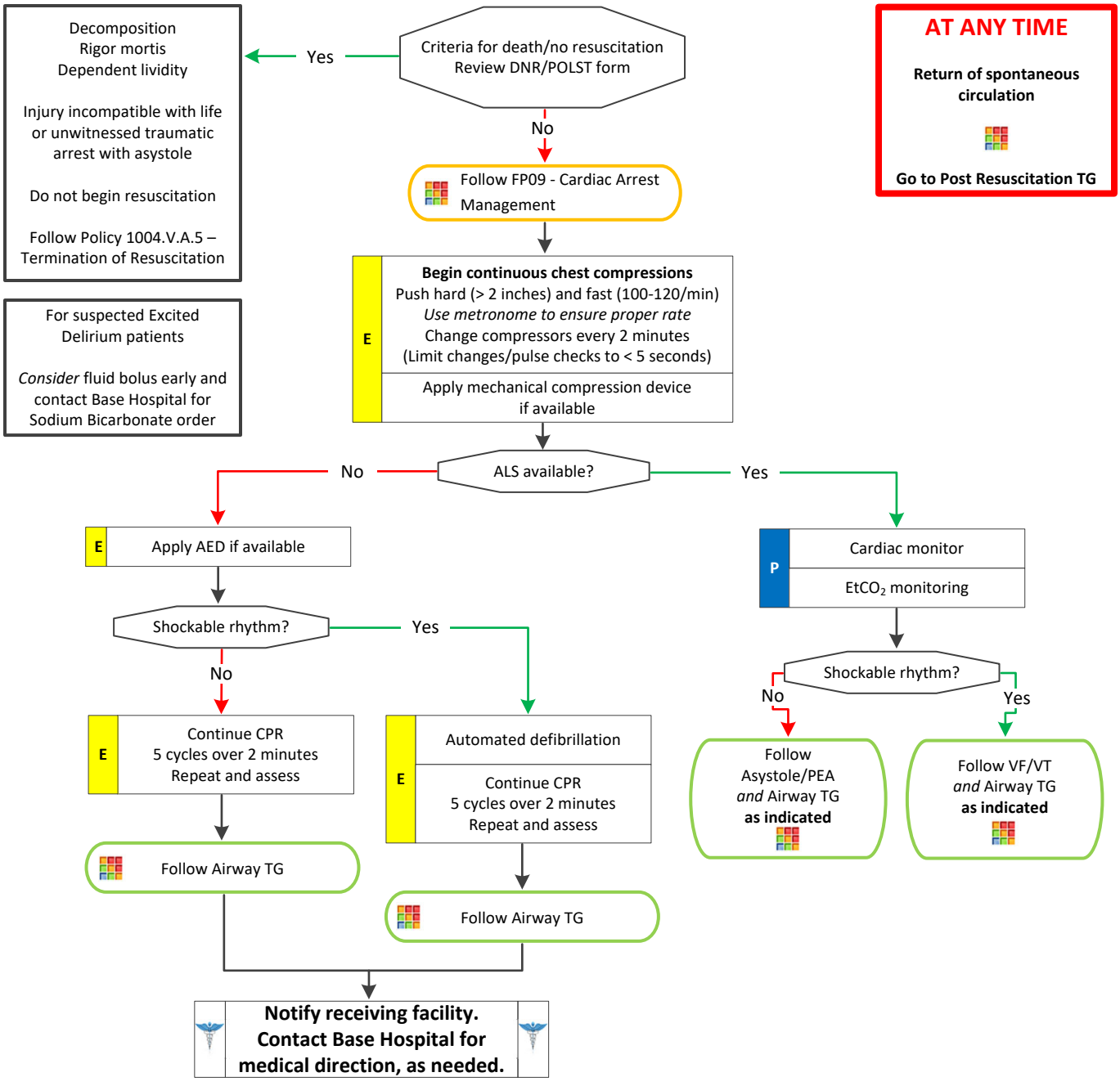
Submit feedback at: https://forms.office.com/g/4fEGaerTkj

Cardiac Arrest

History
- Code status (DNR or POLST)
- Events leading to arrest
- Estimated downtime
- History of current illness
- Past medical history
- Medications
- Existence of terminal illness

Signs and Symptoms
- Unresponsive
- Apneic
- Pulseless

Differential
- Medical vs. trauma
- VF vs. pulseless VT
- Asystole
- PEA
- Primary cardiac event vs. respiratory arrest or drug overdose



Adult Cardiac Treatment Guidelines

Treatment Guideline AC01

CONTRA COSTA EMERGENCY MEDICAL SERVICES
A Division of Contra Costa Health Services

Effective Jan. 2023

Cardiac Arrest

Pearls

- Maternal arrest: Treat mother per appropriate TG with immediate notification to the Base Hospital along with rapid transport. Place pillows or padding underneath mother to displace fetus from inferior vena cava as to ensure continued fetal blood circulation; left lateral position. IV/IO access should be preferably placed above the diaphragm. Defibrillation is safe at all energy levels.
- Resuscitation is based on proper planning and organized execution. Procedures require space and patient access. Make room to work. Utilize a team focused approach assigning responders to predetermined tasks.
- Efforts should be directed at high quality and continuous chest compressions with limited interruptions.
- Passive ventilation for the first three cycles (6 minutes) of CPR. After that time, the patient should be ventilated using a BLS airway and BVM at a rate of 6 ventilation/minute (1:10 seconds) with continuous CPR.
- Placement of an advanced airway should be deferred unless a provider is unable to ventilate the patient with a BLS airway and BVM.
- Do not delay chest compressions while applying any device or intervention.
- Use a metronome during chest compression to ensure proper rate.
- In cases of clear-cut traumatic arrest, epinephrine is not indicated in PEA or asystole. Epinephrine will not correct arrest caused by a tension pneumothorax, cardiac tamponade, or hemorrhagic shock. If there is any doubt as to the cause of arrest, treat as a non-traumatic arrest.
- If a non-shockable rhythm persists for 30 minutes despite aggressive resuscitative efforts, consider cessation of efforts as outlined in the Determination of Death policy.
- The AutoPulse device is limited to 80 compressions/minute, which is acceptable when using this device during cardiac arrest.
- Reassess and document ETT placement and $EtCO_2$ frequently, after every move, and at transfer of care.

Asystole/PEA

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

Signs and Symptoms
- Pulseless
- Apneic or agonal respirations

Differential
- Hypovolemia (e.g. trauma, AAA or other)
- Cardiac tamponade
- Hypothermia
- Drug overdose (e.g. tricyclic, digitalis, beta blockers, or calcium channel blockers)
- Massive myocardial infarction
- Hypoxia
- Tension pneumothorax
- Pulmonary embolus
- Acidosis
- Hyperkalemia

Decomposition
Rigor mortis
Dependent lividity

Injury incompatible with life or unwitnessed traumatic arrest with asystole

Do not begin resuscitation

Follow Policy 1004.V.A.5 – Termination of Resuscitation

Reversible Causes

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

Enter from Cardiac Arrest TG

P
- Establish IV/IO
- **Epinephrine (1:10,000) 1mg IV/IO every 4 minutes**
- **Normal Saline bolus 1000ml IV/IO**
- Assess for reversible causes and treat appropriately
- Early transport to a SRC is indicated for witnessed arrest with suspicion of pulmonary embolism or V. Fib arrest resistant to four (4) shocks (refractory V-Fib)

AT ANY TIME

Return of spontaneous circulation

Go to Post Resuscitation TG

Follow FP09 Cardiac Arrest Management

Rhythm Change? — Yes → Follow rhythm appropriate TG

No

ROSC? — Yes → **Notify receiving facility. Contact Base Hospital for medical direction, as needed.**

No

Discontinue Resuscitation

Follow Policy 1004.V.A.5 – Termination of Resuscitation

Adult Cardiac Treatment Guidelines

CONTRA COSTA EMERGENCY MEDICAL SERVICES
A Division of Contra Costa Health Services
Effective Jan. 2023

Asystole/PEA

Pearls

- Maternal arrest: Treat mother per appropriate TG with immediate notification to the Base Hospital along with rapid transport. Place pillows or padding underneath mother to displace fetus from inferior vena cava as to ensure continued fetal blood circulation; left lateral position. IV/IO access should be preferably placed above the diaphragm. Defibrillation is safe at all energy levels.Efforts should be directed at high quality and continuous chest compressions with limited interruptions and early defibrillation when indicated. Consider early IO placement if available or direct IV access if anticipated.
- Passive ventilation for the first three cycles (6 minutes) of CPR. After that time, the patient should be ventilated using a BLS airway and BVM at a rate of 6 ventilation/minute (1:10 seconds) with continuous CPR.
- Placement of an advanced airway should be deferred unless a provider is unable to ventilate the patient with a BLS airway and BVM or when the patient maintains ROSC.
- Use a metronome during chest compression to ensure proper rate.
- If a non-shockable rhythm persists for 30 minutes despite aggressive resuscitative efforts, consider cessation of efforts as outlined in the Determination of Death policy.
- The AutoPulse device is limited to 80 compressions/minute, which is acceptable when using this device during cardiac arrest.
- SURVIVAL FROM PEA OR ASYSTOLE is based on identifying and correcting the CAUSE: consider a broad differential diagnosis with early and aggressive treatment of possible causes.
- Potential association of PEA with hypoxia may exist, so placing an effective BLS airway with oxygenation early may provide benefit.
- PEA caused by sepsis or severe volume loss may benefit from higher volume of normal saline administration.
- Return of spontaneous circulation after Asystole/PEA requires continued search for underlying cause of cardiac arrest.
- Treatment of hypoxia and hypotension are important after resuscitation from Asystole/PEA.
- Asystole is commonly an end stage rhythm following prolonged VF or PEA with a poor prognosis.
- Discussion with the Base Hospital can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.

Contra Costa County Emergency Medical Services

V-Fib/Pulseless V-Tach

History
- Events leading to arrest
- Estimated downtime
- Prior resuscitation attempts
- Past medical history
- Medications
- Known terminal illness

Signs and Symptoms
- Pulseless
- Apneic

Differential
- Medical vs. trauma
- VF vs. pulseless VT
- Asystole
- PEA
- Primary cardiac event vs. respiratory arrest or drug overdose
- Consider reversible causes

AT ANY TIME

Return of spontaneous circulation

Go to Post Resuscitation TG

Reversible Causes

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

Enter from Cardiac Arrest TG

P
- Defibrillation 360J
- **Resume high quality chest compressions** Change compressors every 2 minutes (*Limit changes/pulses checks < 5 seconds*)
- Establish IV/IO

P
- Defibrillation 360J, if indicated
- **Epinephrine (1:10,000) 1mg IV/IO every 4 minutes**
- **Resume high quality chest compressions** Change compressors every 2 minutes (*Limit changes/pulses checks < 5 seconds*)

P
- Defibrillation 360J, if indicated
- **Epinephrine (1:10,000) 1mg IV/IO every 4 minutes**
- **Resume high quality chest compressions** Change compressors every 2 minutes (*Limit changes/pulses checks < 5 seconds*)
- **Amiodarone 300mg IV/IO** *May repeat 150mg if rhythm persists*

Follow FP09 Cardiac Arrest Management

Rhythm Change? — Yes → Follow rhythm appropriate TG

No

Witnessed arrest with suspicion of pulmonary embolism? V.Fib arrest resistant to four (4) shocks (refractory V-Fib)? — Yes → **Consider early transport. Notify receiving facility. Contact Base Hospital for medical direction, as needed.**

No

ROSC? — Yes → Exit to Post Resuscitation TG

No

Follow Policy 1004.V.A.5 Termination of Resuscitation

Adult Cardiac Treatment Guidelines

V-Fib/Pulseless V-Tach

Pearls

- Maternal arrest: Treat mother per appropriate TG with immediate notification to the Base Hospital along with rapid transport. Place pillows or padding underneath mother to displace fetus from inferior vena cava as to ensure continued fetal blood circulation; left lateral position. IV/IO access should be preferably placed above the diaphragm. Defibrillation is safe at all energy levels.
- Efforts should be directed at high quality and continuous chest compressions with limited interruptions and early defibrillation when indicated. Consider early IO placement if available or direct IV access if anticipated.
- Passive ventilation for the first three cycles (6 minutes) of CPR. After that time, the patient should be ventilated using a BLS airway and BVM at a rate of 6 ventilation/minute (1:10 seconds) with continuous CPR.
- Placement of an advanced airway should be deferred unless a provider is unable to ventilate the patient with a BLS airway and BVM or when the patient maintains ROSC.
- Use a metronome during chest compression to ensure proper rate.
- If a non-shockable rhythm persists for 30 minutes despite aggressive resuscitative efforts, consider cessation of efforts as outlined in the Determination of Death policy.
- Contact Base Hospital prior to transport of non-ROSC patients.
- The AutoPulse device is limited to 80 compressions/minute, which is acceptable when using this device during cardiac arrest.
- Effective chest compressions and prompt defibrillation are the keys to successful resuscitation.
- Reassess and document ETT placement and $EtCO_2$ frequently, after every move, and at transfer of care.
- <u>Do not stop chest compressions</u> to check for placement of ETT or to give medications.

Contra Costa County Emergency Medical Services

Post Resuscitation (ROSC)

History
- Respiratory arrest
- Cardiac arrest

Signs and Symptoms
- Return of spontaneous circulation

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

E	Repeat primary assessment
	Optimize ventilation and oxygenation • Maintain SpO_2 is 92-98% • Maintain respiratory rate at 10/minute for EtCO2 35 – 45 • DO NOT HYPERVENTILATE
	Monitor vital signs
P	Advanced airway placement unless contraindicated
	Establish IO/IV if not previously established
	Systolic BP < 90 **Push Dose Epi 1 ml (10 mcg) IV/IO every 3 min** Titrate to a Systolic BP > 90
	Normal Saline bolus 500ml IV/IO May repeat as needed if lungs are clear
	Cycle Blood Pressure every 3 minutes
	Obtain 12-Lead ECG

Worsening bradycardia in ROSC patients may indicate impending rearrest

Designated STEMI Receiving Centers

John Muir – Concord
John Muir – Walnut Creek
Kaiser – Walnut Creek
San Ramon Regional
Sutter Delta

Approved Out Of County STEMI Receiving Centers

Highland – Oakland
Kaiser – Vallejo
Marin General
Summit – Oakland
Kaiser – Oakland
Valley Care – Pleasanton

Transport to STEMI Receiving Center

Notify receiving facility. Contact Base Hospital for medical direction, as needed.

1:1000 Epinephrine
Mixing Instructions

NEED:
1:1000 Epineprhine ampule
tuberculin syringe
10ml Normal Saline flush

1. Draw up 0.1ml (1 ml/mg) of 1:1000 Epi in the tuberculin syringe
2. Add the 1:1000 Epi from the tuberculin syringe into the Normal Saline flush - mix gently
3. Now you have 10mL of Epinephrine at a 0.01mg/mL (10mcg/mL) concentration
4. Label the syringe

Adult Cardiac Treatment Guidelines

Contra Costa County Emergency Medical Services

Tachycardia

History
- Medications (e.g. Aminophylline, Adderall, diet pills, thyroid supplements, decongestants, and Digoxin)
- Diet
- Drugs (e.g. nicotine and illegal drugs)
- Past medical history
- History of palpations/heart racing
- Syncope/near syncope

Signs and Symptoms
- Hypotension
- Palpitations, dizziness, chest pain, shortness of breath, altered mental status, or diaphoresis
- CHF
- Potential presenting rhythm:
  - Atrial/sinus tachycardia
  - Atrial fibrillation/flutter
  - Multifocal atrial tachycardia
  - Ventricular tachycardia

Differential
- Dysrhythmia
- Sick sinus syndrome
- Myocardial infarction
- Electrolyte imbalance
- Exertion, pain, or emotional stress
- Fever/sepsis
- Hypoxia
- Hypovolemia or anemia
- Drug effect/overdose (see **History**)
- Hyperthyroidism
- Pulmonary embolus

Unstable due to Tachycardia
HR typically >150
Hypotension/shock often with signs of poor perfusion
Altered mental status
Chest pain highly suggestive of ACS:
- Severe crushing chest pain
- Pale/diaphoretic
- With or without evidence of ischemia on EKG (STEMI, T-wave inversion/ depression)

P — Cardiac monitor

Is patient stable?

Stable

P — 12 lead or Rhythm Strip
Establish IV/IO

Narrow or Wide QRS?

Narrow

Regular rhythm?

NO
E.g. A-fib/A-flutter

P — Continue to monitor, reassess
If patient becomes unstable, go to appropriate arm

Look for and treat underlying conditions (e.g. dehydration, CHF exacerbation)

Yes
e.g. SVT

P — Attempt Vagal maneuver (FP22)

P — **Adenosine 6mg IV/IO rapid push**
Follow with 20 ml NS rapid flush
May repeat 12mg IV/IO

P — If rhythm change, repeat 12-Lead ECG
Monitor for recurrence. Treat with adenosine

Wide

Regular rhythm?

No

P — **Immediate Synchronized Cardioversion**
Narrow Regular: 100J, 150J, 200J…
Narrow Irregular: 150J, 200J, 300J…
Wide Regular: 150J, 200J, 300J…
Wide Irregular: Defibrillate 360J

If any delay in synchronized cardioversion and the patient is critical, defibrillate 360J
Contact Base Hospital for further direction if recurrent or resistant to initial three (3) shocks

Establish IV/IO

Consider sedation pre-cardioversion
Midazolam 1mg IV/IO
May repeat if needed in 1-2mg increments
Maximum 5mg

12-Lead ECG or repeat if rhythm change

Yes

P — *If symptomatic, consider*
Amiodarone 150mg IV/ IO drip
over 10 minutes
May repeat x 1 dose if needed

12-Lead ECG or repeat if rhythm change

Notify receiving facility. Contact Base Hospital for medical direction, as needed.

Adult Cardiac Treatment Guidelines

Tachycardia

Pearls

- In unstable patients with fever or other signs of sepsis, the underlying cause of the rapid heart rate is more likely fever and hypovolemia. This is particularly true in wide irregular tachycardia which is frequently underlying A fib with a bundle branch block. Initial efforts should focus on treating appropriately for underlying sepsis.
- If at any point the patient becomes unstable, move to the unstable arm of the algorithm.
- For ASYMPTOMATIC patients (or those with only minimal symptom, such as palpitations) and any tachycardia with a rate of approximately 100-120 with a normal blood pressure, consider CLOSE OBSERVATION or fluid bolus rather than immediate treatment with an anti-arrhythmic medication.
- If patient has a history or if 12 lead ECG reveals Wolfe Parkinson White (WPW), use caution with Adenosine and give only with a defibrillator immediately available.
- In Polymorphic VT: torsade de pointes, etc., the variation in QRS morphology may make it difficult to synchronize. If you cannot synchronize, move to defibrillation.
- In Wide IRREGULAR rhythm such as AFib with left or right bundle, etc, synchronize cardioversion at 360J is more likely to yield first shock conversion.
- Symptomatic tachycardia usually occurs at rates of 120-150 and typically $\geq$150 beats per minute. Patients who are symptomatic with heart rates <150 likely have impaired cardiac function, such as CHF.
- Search for underlying cause of tachycardia such as fever, sepsis, dehydration, hypovolemia, etc.
- Monitor for respiratory depression and hypotension associated with Midazolam.
- Continue pulse oximetry and ETCO2 monitoring is required for all wide complex tachycardia patients.
- Providers must export ALL MONITOR DATA to EHR when caring for and treating tachycardia patients.

Chest Pain: Suspected Cardiac or STEMI

History
- Age
- Medications
- Past medical history (e.g. MI, angina, diabetes, CAD, HTN, hyperlipidemia)
- Recent physical exertion
- **P**rovocation
- **Q**uality (e.g. pressure, constant, sharp, dull, etc.)
- **R**egion/Radiation/Referred
- **S**everity (0 – 10 scale)
- **T**ime (onset/duration/repetition)

Signs and Symptoms
- Chest pain
- Shortness of breath
- Pale, cool, diaphoretic
- Nausea, vomiting
- Hypotension or shock
- Possible bradycardia
- Syncope

Atypical presentations for elderly patients
- Epigastric pain
- Generalized weakness

Differential
- Acute coronary syndrome (MI, unstable angina)
- Pulmonary embolus
- Aortic dissection
- Pericarditis
- Pneumothorax
- Pneumonia
- Tamponade

Designated STEMI Receiving Centers

John Muir – Concord
John Muir – Walnut Creek
Kaiser – Walnut Creek
San Ramon Regional
Sutter Delta

Approved Out Of County STEMI Receiving Centers

Highland
Kaiser – Vallejo
MarinHealth
ABMC – Summit – Oakland
Kaiser – Oakland
SHC – ValleyCare

Primary assessment indicates chest pain or signs/symptoms consistent with cardiac ischemia

P
- Cardiac monitor
- **Oxygen** Titrate to $SpO_2 \geq$ 94%
- 12-Lead ECG

STEMI?

No

Yes

P
- Immediate transmission of 12 lead to STEMI receiving facility
- Make STEMI ALERT notification to STEMI receiving facility

Definition of STEMI
> 1mm ST segment elevation in inferior, or
> 2mm ST segment elevation in anterior or lateral leads,
In 2 or more contiguous leads
(See 12-Lead Procedure)

E
- **Aspirin 324mg PO**

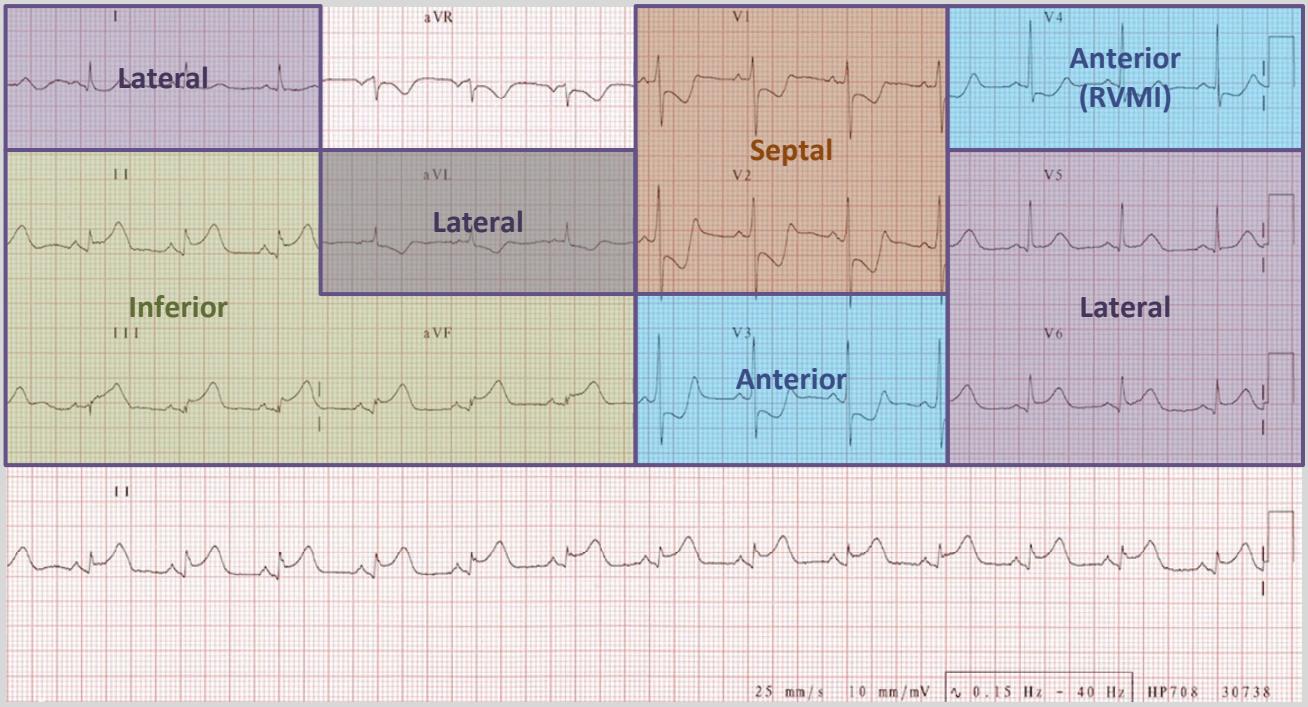
P
- Establish IV/IO
- If initial SBP > 90 **Nitroglycerin 0.4mg sublingual**
  May repeat every 5 minutes as needed. ***Maximum 3 doses.***

  Use caution and consider base contact if HR >120 prior to administration.
  Do not administer if patient has taken erectile dysfunction drugs (e.g. Viagra, Levitra) within the last 24 hours or (e.g. Cialis) within 36 hours.
- If SBP <90 or drops >30 from baseline after NTG
  Withhold further NTG administration
  and
  Normal Saline bolus 500ml IV/IO
  May repeat as needed
  Maximum 1L
- Consider **Fentanyl 25 – 200mcg IV titrated in 25 – 50mcg increments** for pain relief if SBP > 90

Notify receiving facility. Contact Base Hospital for medical direction, as needed.

Adult Cardiac Treatment Guidelines

Chest Pain: Suspected Cardiac or STEMI



ST Elevation in 2 or more leads: Leads II, III, aVF → Inferior wall MI (vessel likely RCA or LCx)
ST Elevation in 2 or more leads: Leads I, aVL, V_5, V_6 → Lateral wall MI (vessel likely LCx or LAD branch)
ST Elevation in 2 or more leads: Leads V_1, V_2 → Septal wall MI (vessel likely LCx or LAD branch)
ST Elevation in 2 or more leads: Leads V_3, V_4 → Anterior wall MI (vessel likely LCx or LAD branch)

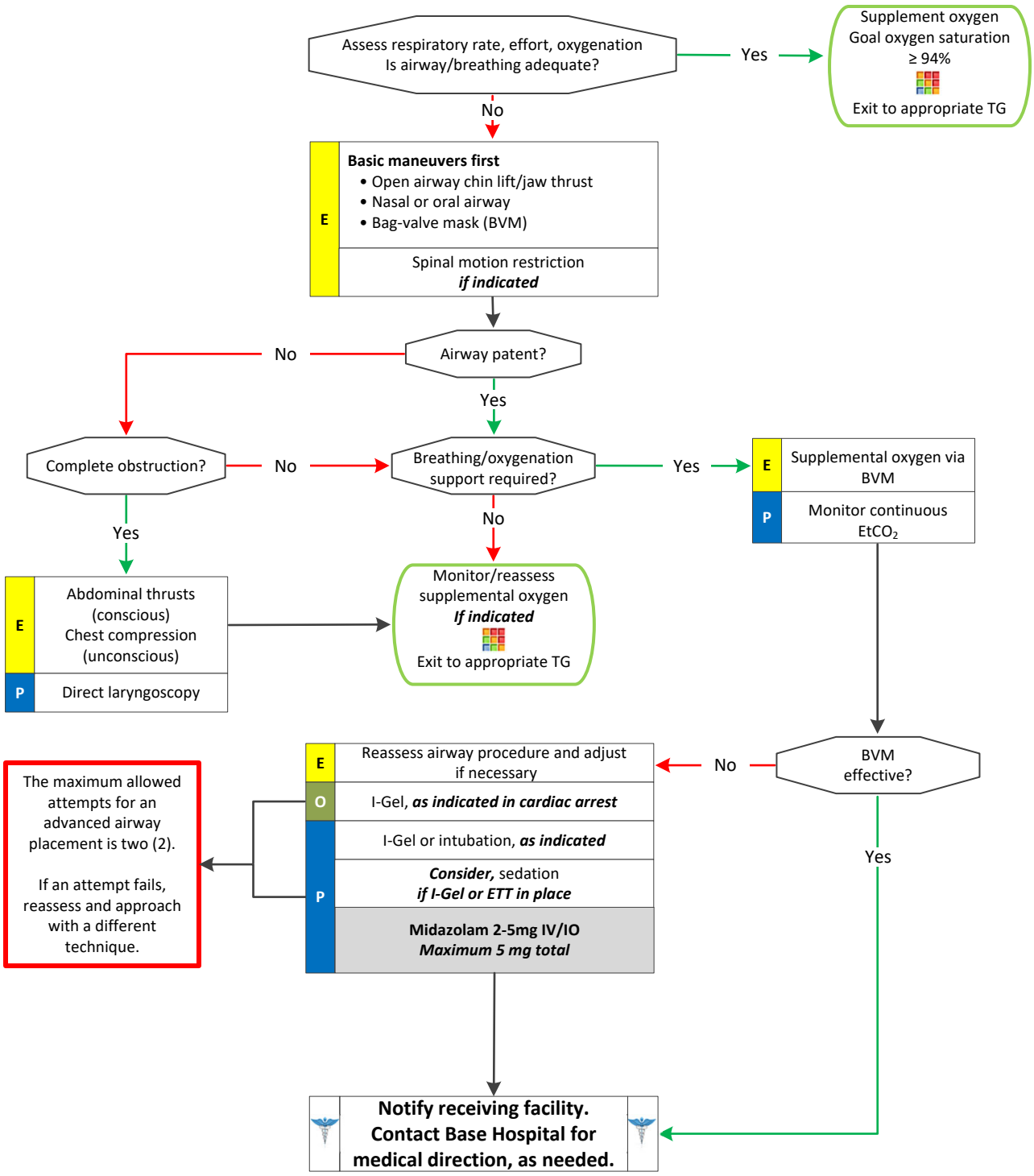
**Look for ST DEPRESSION in reciprocal leads (opposite wall) to confirm diagnosis.
**Isolated ST elevation in aVR with ST depression in all other leads should raise suspicion for a proximal LAD Artery injury or Left Main Coronary Artery abnormality. This is not STEMI criteria, but the 12-Lead ECG should be transmitted to the ED for consultation. Consider transport to a STEMI receiving center.

Adult Cardiac Treatment Guidelines

Pearls

- Patients with a STEMI should be transported to the closest most appropriate STEMI receiving center.
- Many STEMIs evolve during prehospital care and may not be noted on the initial 12-Lead ECG.
- An ECG should be obtained prior to treatment for bradycardia if patient condition permits.
- Transmit all 12-Lead ECGs whether STEMI is detected or not.
- If a patient has taken their own Nitroglycerin without relief, consider potency of medication. Provider maximum doses do not include patient administered doses.
- Monitor for hypotension after administration of nitroglycerin and opioids.
- Diabetics, geriatric, and female patients often have atypical pain, or only generalized complaints. Suspect cardiac etiology in these patients, and perform a 12-Lead ECG.
- Document the time of the 12-Lead ECG in the EHR as a procedure along with the interpretation.

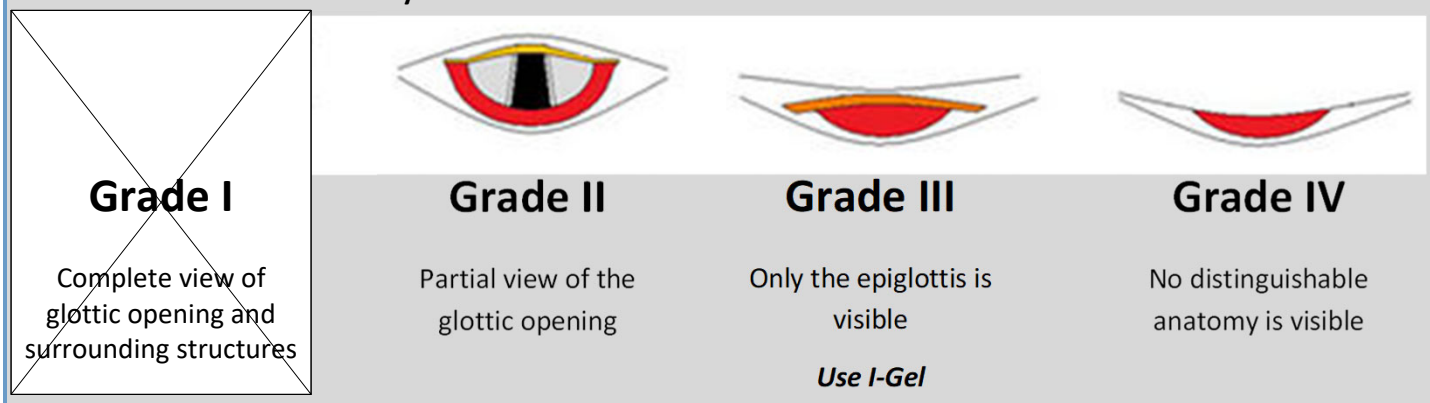
Adult Airway



Adult Airway

Always weigh the risks and benefits of endotracheal intubation in the field against transport. All prehospital endotracheal intubations are considered high risk. If ventilation/oxygenation is adequate, transport may be the best and safest option. The most important airway device is the BVM, not the laryngoscope.

Cormack-Lehane Difficult Airway Assessment:



Grade I

Complete view of glottic opening and surrounding structures

Grade II

Partial view of the glottic opening

Grade III

Only the epiglottis is visible

Use I-Gel

Grade IV

No distinguishable anatomy is visible

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

Pearls

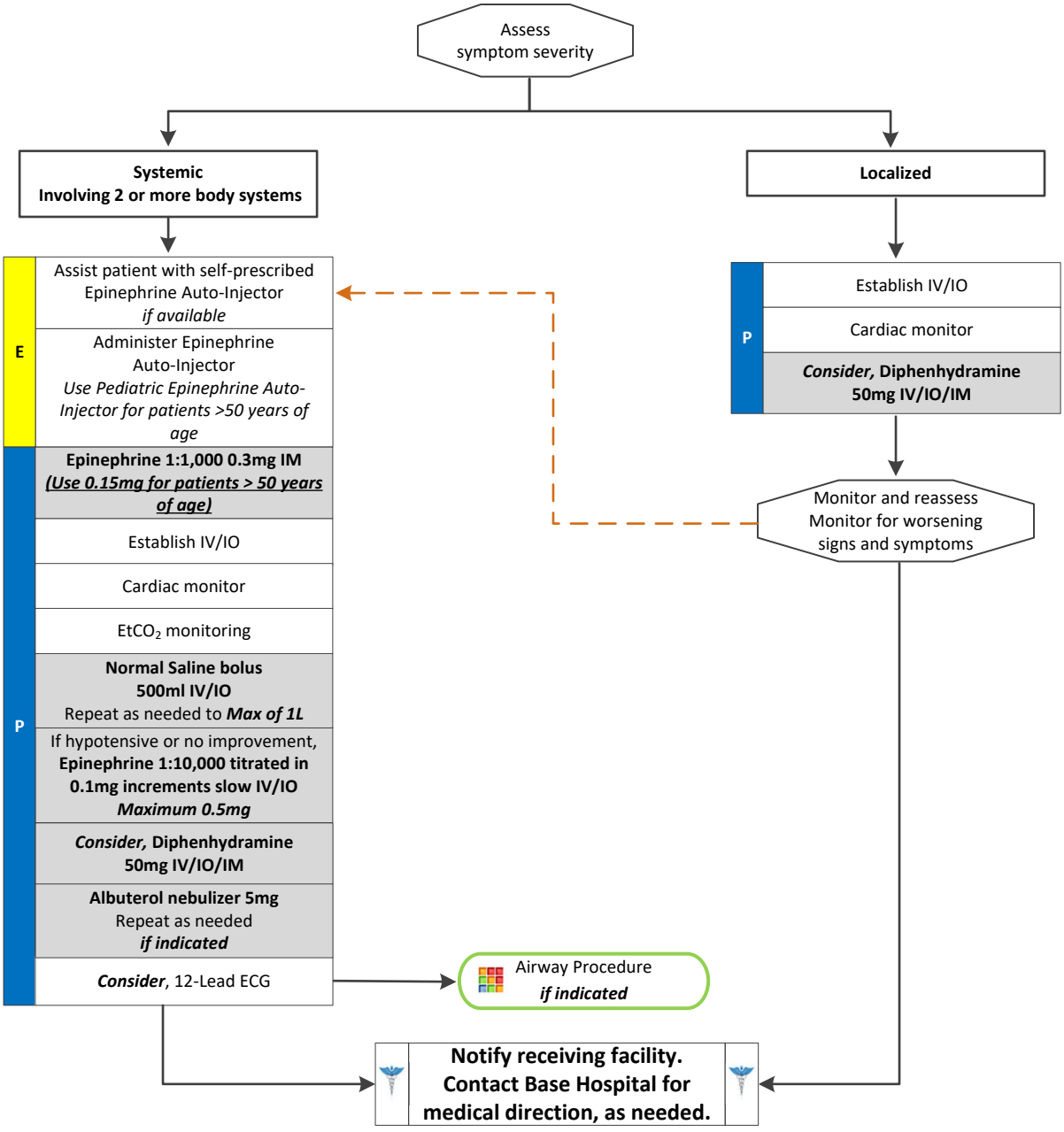
- **Continuous capnometry ($EtCO_2$) is <u>mandatory</u> with all methods of airway management. Document results.**
- **If an effective airway is being maintained with a BVM and a basic airway adjunct with continuous pulse oximetry values of ≥ 90% or values expected based on pathophysiologic condition with otherwise reassuring vital sign (e.g. pulse oximetry of 85% with otherwise normal vital signs in a post-drowning patient), it is acceptable to continue with basic airway measures rather than placing an advanced airway.**
- **For the purposes of this TG, a secure airway is achieved when the patient is receiving appropriate oxygenation and ventilation.**
- **An intubation attempt is defined as inserting the laryngoscope blade with the intent to intubate or inserting an advanced airway past the teeth.**
- **An appropriate ventilatory rate is one that maintains an $EtCO_2$ of 35 or greater. Avoid hyperventilation.**
- **A Bougie is strongly encouraged for all ET intubation attempts.**
- **Effective use of a BVM is best achieved with two (2) people.**
- **The airway should be reassessed with each patient move. Document findings and $EtCO_2$ readings for each.**
- Maintain spinal motion restriction for patients with suspected spinal injury.
- Document visualization and grading scale in prehospital record.
- Hyperventilation in deteriorating head trauma should only be done to maintain an $EtCO_2$ of 30-35.
- It is important to secure the advanced airway well and consider c-collar use (in the absence of trauma) to better maintain advanced airway placement. Manual stabilization of advanced airway should be used during all patient moves/transfers.

Allergic Reaction/Anaphylaxis

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

Signs and Symptoms
- Itching or hives
- Coughing, wheezing or respiratory distress
- Chest or throat restriction
- Difficulty swallowing
- Hypotension or shock
- Edema
- Nausea or vomiting
- Feeling of impending doom

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



Adult Medical Treatment Guidelines

Allergic Reaction/Anaphylaxis

Pearls

- Anaphylaxis is an acute and potentially lethal multisystem allergic reaction.
- Epinephrine is the drug of choice and the first drug that should be administered in acute anaphylactic reactions with moderate or severe symptoms. IM Epinephrine should be administered as priority before or during attempts at IV or IO access.
- Anaphylaxis that is unresponsive to initial treatment of IM Epinephrine may require IV Epinephrine administration.
- Allergic reactions may occur with only respiratory and gastrointestinal symptoms and have no rash or skin involvement.
- Angioedema is seen in moderate to severe reactions as swelling involving the face, lips, or airway structures. This can also be seen in patients taking ACE-inhibitor blood pressure medications such as Prinivil, Zesteril, or Lisinopril; these medications typically ending in -il.
- Epinephrine may precipitate cardiac ischemia. The following patients should receive half the adult dose of Epinephrine (0.15mg Epinephrine 1:1,000) for the initial dose and any repeated doses for:
  - Patients with a history of coronary artery disease, MI, stents, CHF, cardiac surgery;
  - Patients over 50 years of age; OR
  - EMTs use an EpiPen Junior.
- Adult patient who receive Epinephrine should receive a 12-Lead ECG at some point during their care, but this should NOT delay the administration of Epinephrine.
- All patients with respiratory symptoms must have continuous pulse oximetry and $EtCO_2$ monitoring.
- Generally, the shorter the time is from contact with an allergen to the onset of symptoms, the more severe the reaction.

Contra Costa County Emergency Medical Services

Shortness of Breath

History
- Asthma; COPD – chronic bronchitis and emphysema
- Home treatment (e.g. oxygen or nebulizer)
- Medications (e.g. Theophylline, steroids, inhalers, digoxin, lasix, Viagra, Sildenafil, levitra, vardenafil, cialis, or tadalafil)
- Toxic exposure or smoke inhalation
- Cardiac History including MI

Signs and Symptoms
- Shortness of breath
- Increased respiratory rate and effort
- Diminished or abnormal lung sounds
- Tachycardia
- Pursed lip breathing
- Use of accessory muscles
- Jugular vein distension
- Peripheral edema or diaphoresis
- Pink, frothy sputum

Differential
- Asthma
- COPD
- Congestive Heart Failure
- Myocardial Infarction
- Aspiration
- Pneumonia
- Pulmonary embolus
- Hyperventilation
- Inhaled toxin

Routine Care

E: **Oxygen** Titrate to $SpO_2 \geq 94\%$; Airway support; Lung Sounds

P: Cardiac monitor; 12-Lead ECG; $EtCO_2$ monitoring; Consider IV/IO

Airway Obstructed? — Yes → Exit to A02 - Adult Airway TG

No → Allergic Reaction/Anaphylaxis? — Yes → Exit to A04 – Allergic Reaction/Anaphylaxis TG

No → Ventilation Adequate? Oxygenation Adequate?

No → Lung Sounds

If 12-lead indicates STEMI, treat with **Nitroglycerin** as below

Wheezes, Hx of Asthma/COPD

E: Consider CPAP; Supplemental O_2 via BVM

P: **Albuterol nebulizer 5mg** Repeat as needed

Improving?

Yes → Notify receiving facility. Contact Base Hospital for medical direction, as needed

No

P: If no improvement, consider **Epinephrine 1:1,000 0.3mg IM** **(Use 0.15mg for patients > 50 years of age or HR ≥ 150)**

Rales, pedal edema, hx of heart disease

BP > 90

No → *Consider* A12 Hypotension/Shock TG

Yes

P: **Nitroglycerin 0.4mg sublingual**

If systolic BP > 150, double Nitroglycerin to 0.8mg sublingual

Repeat every 5 minutes as needed

E: Consider CPAP

Improving?

Yes → *Consider* A02 Adult Airway TG

No

Hypotensive Systolic < 90

E: Remove CPAP

→ *Consider* A12 Hypotension/Shock TG

Adult Medical Treatment Guidelines

Treatment Guideline A09

CONTRA COSTA EMERGENCY MEDICAL SERVICES
A Division of Contra Costa Health Services

Effective Jan. 2023

Shortness of Breath

Pearls

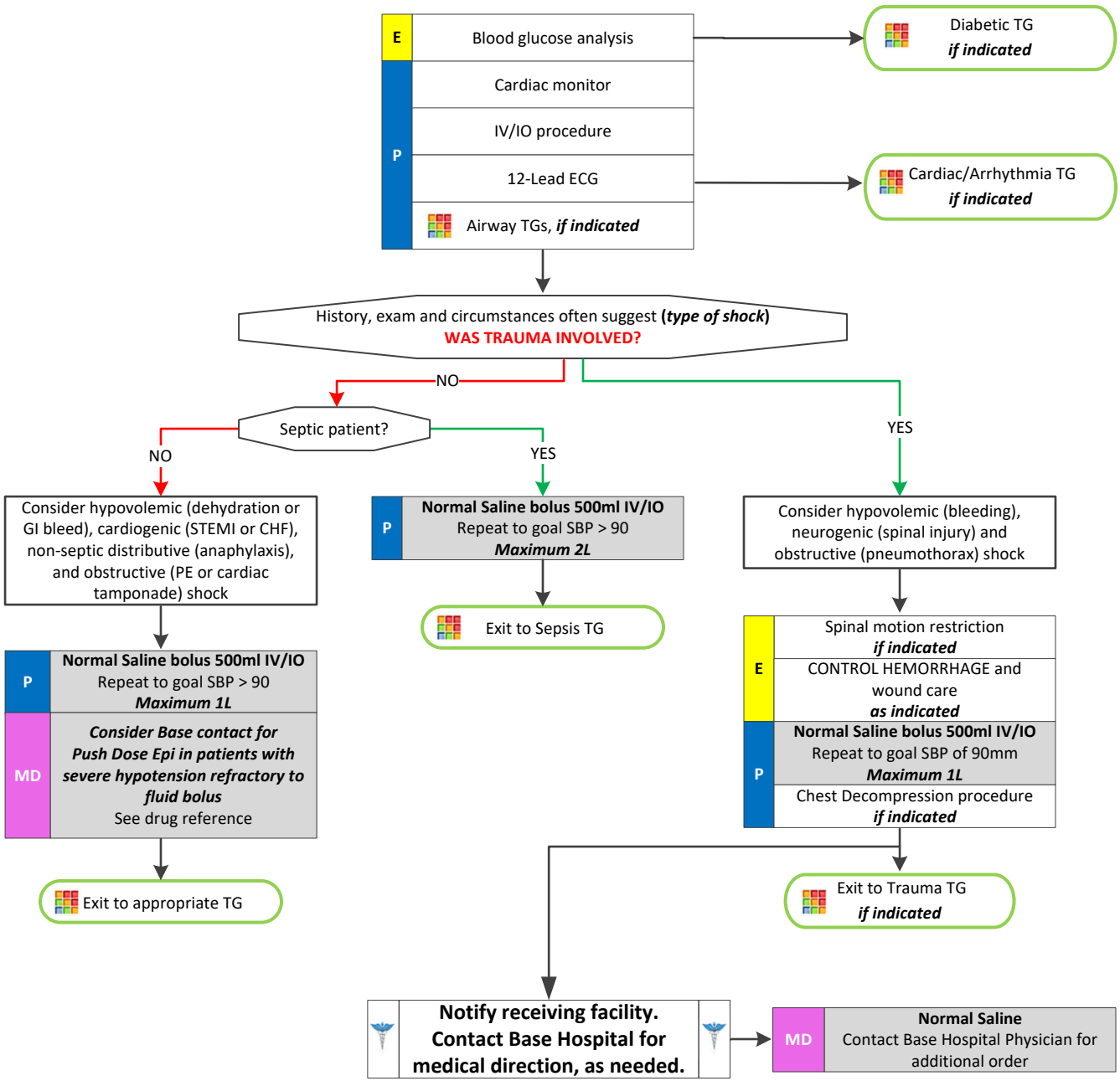
- If a patient is in CHF AND the 12-lead indicates STEMI, treat with nitroglycerine as on this treatment guideline.
- Patients receiving Epinephrine should receive a 12-Lead ECG at some point in their care in the prehospital setting, but this should NOT delay the administration of Epinephrine.
- Epinephrine may precipitate cardiac ischemia. The following patients should receive half the adult dose of Epinephrine (0.15mg Epinephrine 1:1,000) for the initial dose and any repeated doses:
  1) Patients with a history of coronary artery disease, MI, stents, CHF, cardiac surgery; OR
  2) Patients over 50 years of age or has a heart rate ≥ 150.
- Pulse oximetry and continuous $EtCO_2$ monitoring is required for all respiratory patients.
- A silent chest in respiratory distress is a sign of pre-respiratory arrest.
- CPAP is not a ventilation device. Patients with an inadequate respiratory rate or depth of respiration will need assistance with a BVM.
- Avoid Nitroglycerin in any patient who has used Viagra (Sildenafil) or Levitra (Vardenafil) in the past 24 hours or Cialis (Tadalafil) in the past 36 hours due to potential for severe hypotension.
- If a patient has taken their own Nitroglycerin without relief, consider potency of medication. Provider maximum doses do not include patient administered doses.
- Diabetic, geriatric, and female patients often have atypical pain or only generalized complaints; consider MI in all of these patients.
- Document CPAP application using the CPAP procedure in the EHR. Document the 12-Lead ECG in the EHR as a procedure along with the interpretation.

Hypotension/Shock

History
- Blood loss
- Fluid loss (vomiting, diarrhea or fever)
- Infection (e.g., UTI, cellulitis, etc.)
- Cardiac ischemia (MI or CHF)
- Medications
- Allergic reaction
- Pregnancy
- History of poor oral intake

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

Differential
- Shock (hypovolemic, cardiogenic, septic, neurogenic or anaphylaxis)
- Ectopic pregnancy
- Cardiac dysrhythmias
- Pulmonary embolus
- Tension pneumothorax
- Medication effect or overdose
- Vasovagal effect
- Physiologic (pregnancy)



Adult Medical Treatment Guidelines

Treatment Guideline A12

CONTRA COSTA EMERGENCY MEDICAL SERVICES
A Division of Contra Costa Health Services

Effective Jan. 2023

Hypotension/Shock

Pearls

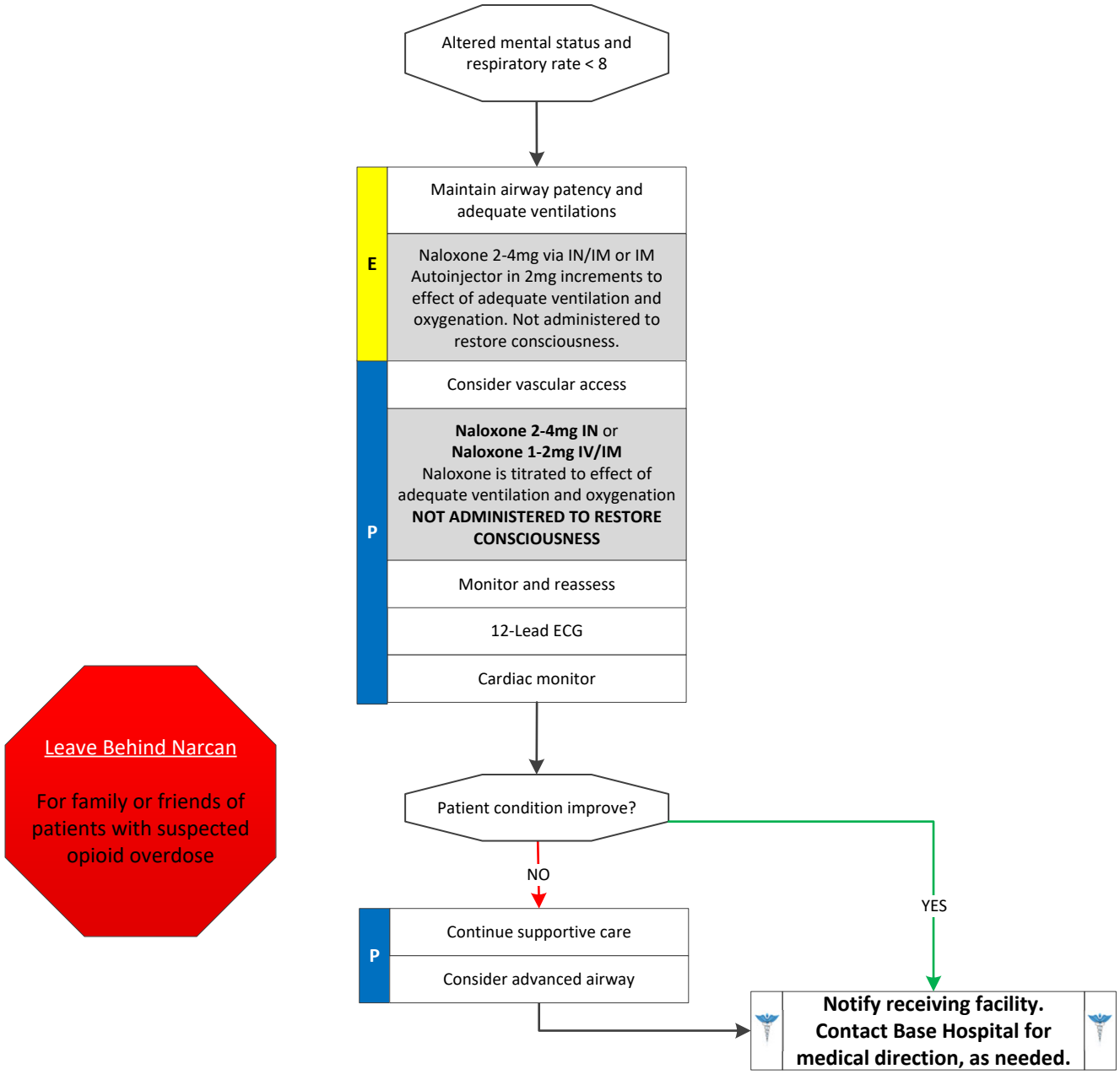
- **Hypotension can be defined as a systolic blood pressure of less than 90mmHg. This is not always reliable and should be interpreted in context with the patient's typical BP, if known. Shock may be present with a seemingly normal blood pressure initially.**
- **Shock is often present with normal vital signs and may develop insidiously. Tachycardia may be the only manifestation.**
- **Consider all causes of shock and treat per appropriate Treatment Guideline.**
- Hypovolemic shock:
  - Hemorrhage, trauma, GI bleeding, ruptured AAA, or pregnancy-related bleeding
- Cardiogenic shock:
  - Heart failure, MI, cardiomyopathy, myocardial contusion, ruptured ventricle/septum/valve or toxins
- Distributive shock:
  - Sepsis, anaphylactic, neurogenic, or toxins
  - Neurogenic shock generally presents with warm, dry, and pink skin with normal capillary refill time; patient typically alert
- Obstructive shock:
  - Pericardial tamponade, PE, or tension pneumothorax
  - Signs may include hypotension with distended neck veins, tachycardia, unilateral decreased breath sounds or muffled heart tones

Suspected Opioid Overdose

History
- Hx of recent opioid drug use
- Hx of chronic opioid drug use
- Narcotic prescriptions in the household
- Evidence of illicit drug use (needles, paraphernalia)
- Hx of chronic medical conditions requiring opioid medication

Signs and Symptoms
- Altered mental status
- Depressed respiratory drive
- Pin point pupils
- Track marks
- Unconsciousness

Differential
- Diabetic emergency
- Stroke
- Neurologic disorder
- Non-opioid overdose
- Traumatic injury



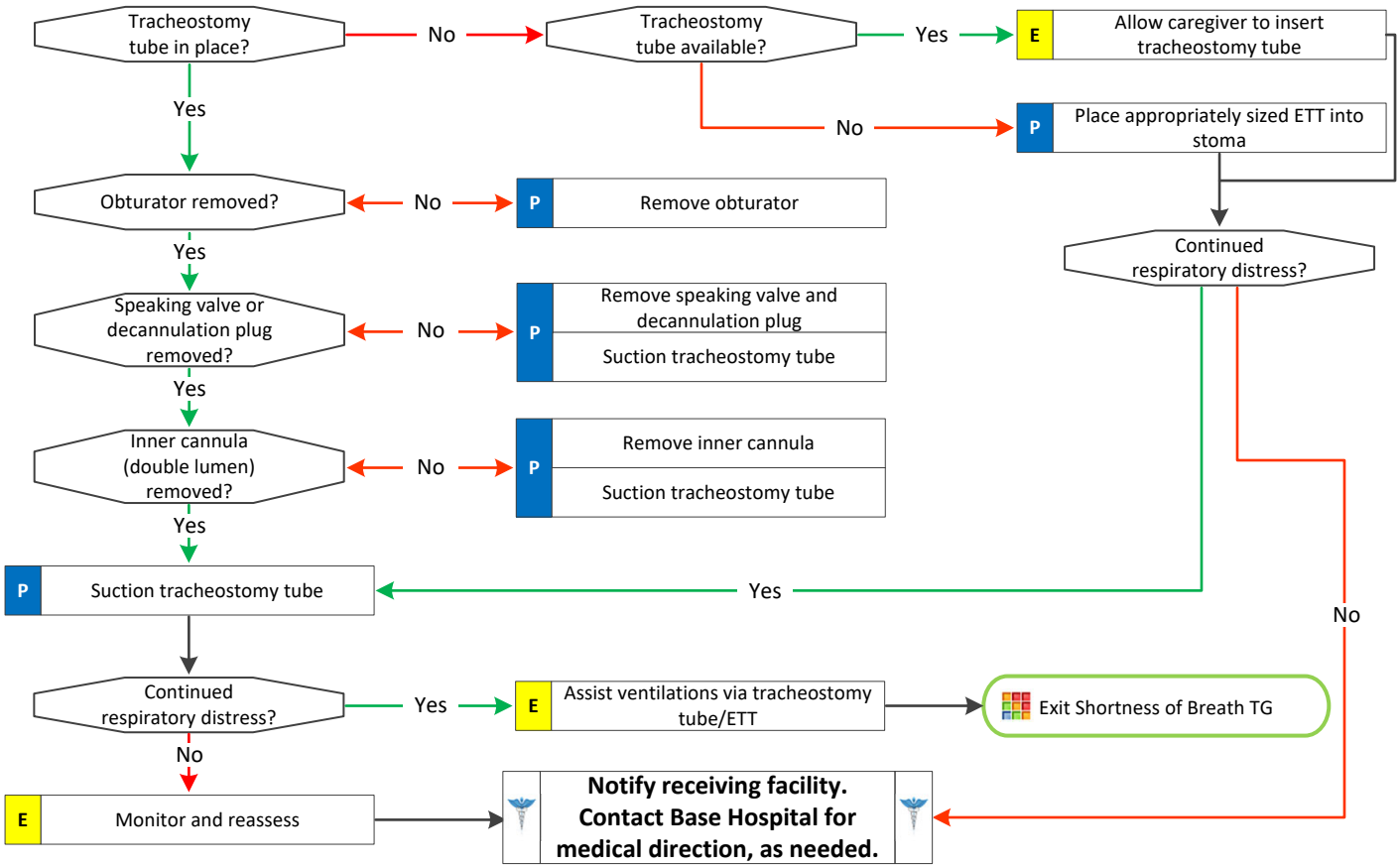
Adult Medical Treatment Guidelines

Respiratory Distress with a Tracheostomy Tube

History
- Birth defect
- Surgical complications
- Trauma
- Medical condition involving the airway or phrenic nerve

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

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



Adult Medical Treatment Guidelines

Pearls
- Always talk to family/caregivers as they have specific knowledge and skills of device(s).
- Use extreme caution when placing an ETT into a stoma. Placing the ETT too deep will result in right main stem positioning.
- Use patient's equipment if available and functioning properly.
- Estimate suction catheter size by doubling the inner tracheostomy tube diameter and rounding down.
- Suction depth: Ask family or caregiver. Suction no more than 3-6cm. Introduce 2-3ml NS before suctioning.
- Do not suction for more than 10 seconds with each attempt and pre-oxygenate before and between attempts.
- DO NOT force the suction catheter. If unable to pass, the tracheostomy tube should be changed.
- Always deflate tracheal tube cuff before removal. Use continuous pulse oximetry and $EtCO_2$ monitoring.

Seizure

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

Signs and Symptoms
- Altered mental status
- Sleepiness
- Incontinence
- Observed seizure activity
- Evidence of trauma
- Unconscious
- Incontinence

Differential
- Head trauma
- Metabolic, hepatic or renal failure
- Tumor
- Hypoxia
- Electrolyte abnormality
- Drugs or medication non-compliance
- Infection or sepsis
- Alcohol withdrawal
- Eclampsia
- Stroke
- Hyperthermia
- Hypoglycemia

Status Epilepticus
- 2 or more seizures in ≤ 5 minutes

Or
- Any seizure lasting > 5 minutes

If duration cannot be confirmed, patient should be assumed to be in status if actively seizing when you arrived.

E Ensure scene safety
E Loosen any constrictive clothing
E Assess and manage ABCs
P Cardiac monitor

Status Epilepticus?
(Confirmed or Suspected)

YES

E **Oxygen**
Titrate to $SpO_2 \geq 94\%$

E Initiate BVM ventilation for apnea or ongoing hypoxia

P **Midazolam**
IM: 10mg (preferred route)
IN: 10mg (5mg in each nare)
IV/IO*(if already established)*: **6mg – 8mg**

May repeat to a max dose of 10 mg IM/IN

If patient continues to seize, consider additional Midazolam with base contact

NO

E Monitor and reassess
E Check blood glucose
E SMR if indicated
E Manage any traumatic injuries

If BGL ≤ 60mg/dl
Exit to Diabetic TG

Notify receiving facility. Contact Base Hospital for medical direction, as needed.

Adult Medical Treatment Guidelines

Seizure

Pearls

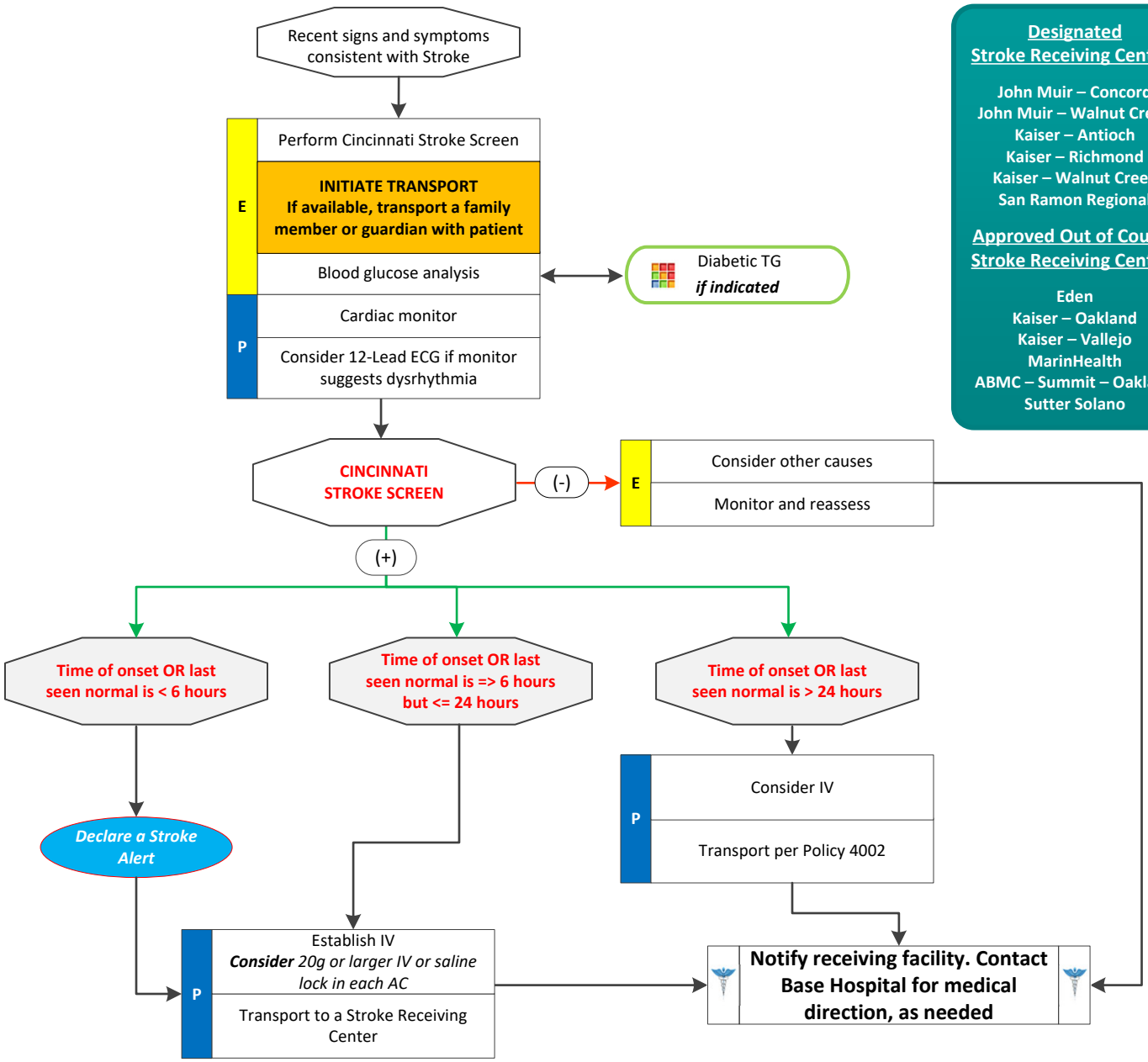
- Status Epilepticus is defined as two or more seizures without a period of consciousness or recovery, or one prolonged seizure lasting longer than 5 minutes. If patient is seizing upon EMS arrival this is likely status epilepticus. This is a true emergency requiring rapid airway control, treatment, and transport.
- Midazolam 10mg IM is effective in the termination of status epileptic. Do not delay IM administration to obtain IV or IO access in an actively seizing patient.
- Limit IN administrations to ½ dose in each nare.
- Be prepared to assist ventilations or manage the airway, especially if Midazolam is used.
- For a seizure that begins in the presence of EMS, if the patient was previously conscious, alert and oriented, take the time to assess and protect the patient and providers and CONSIDER THE CAUSE. The seizure may stop, especially in patients who have prior history of self-limiting seizures. However, do not hesitate to treat recurrent or prolonged (> 5 minute) seizure activity.
- Assess the possibility of occult trauma and substance abuse.
- Grand Mal seizures (generalized) are associated with a loss of consciousness, incontinence, and oral trauma.
- Focal seizures (Petit Mal) affect only a part of the body and are not associated with a loss of consciousness.

Suspected Stroke

History
- Previous stroke or TIA
- Previous cardiac or vascular surgery
- Associated diseases (diabetes, hypertension, CAD)
- Atrial fibrillation
- Medications (blood thinners)
- History of trauma

Signs and Symptoms
- Altered mental status
- Weakness or paralysis
- Blindness or other sensory loss
- Aphasia or dysarthia
- Syncope
- Vertigo or dizziness
- Vomiting
- Headache
- Seizure
- Respiratory pattern change
- Hypertension/hypotension

Differential
- See Altered Mental Status
- TIA
- Seizure
- Todd's paralysis
- Hypoglycemia
- Stroke
  - Thrombotic or embolic (~85%)
  - Hemorrhagic (~15%)
- Tumor
- Trauma
- Dialysis or renal failure



Designated Stroke Receiving Centers

John Muir – Concord
John Muir – Walnut Creek
Kaiser – Antioch
Kaiser – Richmond
Kaiser – Walnut Creek
San Ramon Regional

Approved Out of County Stroke Receiving Centers

Eden
Kaiser – Oakland
Kaiser – Vallejo
MarinHealth
ABMC – Summit – Oakland
Sutter Solano

Adult Medical Treatment Guidelines

Suspected Stroke

A Stroke Alert is indicated when any finding on the Cincinnati Stoke Screen is positive and the time of onset or the time last seen normal is less than 6 hours from time of patient contact. Report time last seen normal (clock time), the medical record number or name and birthdate, results of the Cincinnati Stroke Screen, physical exam, and ETA using an approved report format. Pre-arrival information is necessary for the receiving hospital to make rapid treatment and potential transfer decisions.

If a family member or guardian is available, assure their availability by either transporting them in the ambulance or obtain their name and phone number to allow the receiving physician to contact them. Encourage a family member to be available to speak with hospital staff.

- Because the patient may need to receive thrombolytic therapy, avoid multiple IV attempts.
- Avoid distal placement of IVs, if possible, as this is a preferred access site by Interventionalists.
- When turning over patient care to hospital staff, make sure to include common anticoagulants taken by the patient. Known use of these medications may affect the course of hospital treatment:
  - Warfarin (Coumadin)
  - Heparin
  - Fondaparinux (Arixtra)
  - Enaoxaparin (Lovenox)
  - Dabigatran (Pradaxa)
  - Rivaroxaban (Xarelto)
  - Apixaban (Eliquis)

Cincinnati Stroke Screen	
Finding	**Interpretation**
Facial Droop	Normal: Symmetrical smile or face **Abnormal: Asymmetry**
Arm Weakness	Normal: Both arms move symmetrically **Abnormal: Asymmetrical arm movement**
Speech Abnormality	Normal: Correct words; no slurring **Abnormal: Slurred or incorrect words**

LAMS Assessment		
Finding	**Scoring**	**Interpretation**
Facial Droop	Absent - 0 points Present - 1 point	Normal: Symmetrical smile or face **Abnormal: Asymmetry**
Arm Weakness	Absent - 0 points Drifts - 1 point Falls rapidly - 2 points	Normal: Both arms move symmetrically **Abnormal: Asymmetrical arm movement** **Falls rapidly: some or no effort**
Grip	Normal - 0 points Weak - 1 point No grip - 2 points	Normal: Equal grip in both hands **Weak: Unequal grip in one hand** **No grip: no muscle strength or contraction**
A LAMS score of ≥ 4 indicates a high likelihood of a LVO stroke		

Pearls

- Acute stroke care is evolving rapidly.
- Time last seen normal: One of the most important items that prehospital providers can obtain, on which all treatment decisions are based. Be very precise in gathering data to establish the time of onset and report as an actual time (i.e. 13:45 NOT “about 45 minutes ago”). Without this information, patients may not be able to receive thrombolytics at the hospital. For patients who “woke up and noticed stroke symptoms,” the time starts when the patient was last awake.
- The differential listed on the Altered Mental Status TG should also be considered.
- Be alert for airway problems (difficulty swallowing, vomiting and aspiration).
- Hypoglycemia can present as a LOCALIZED neurologic deficit, especially in the elderly.

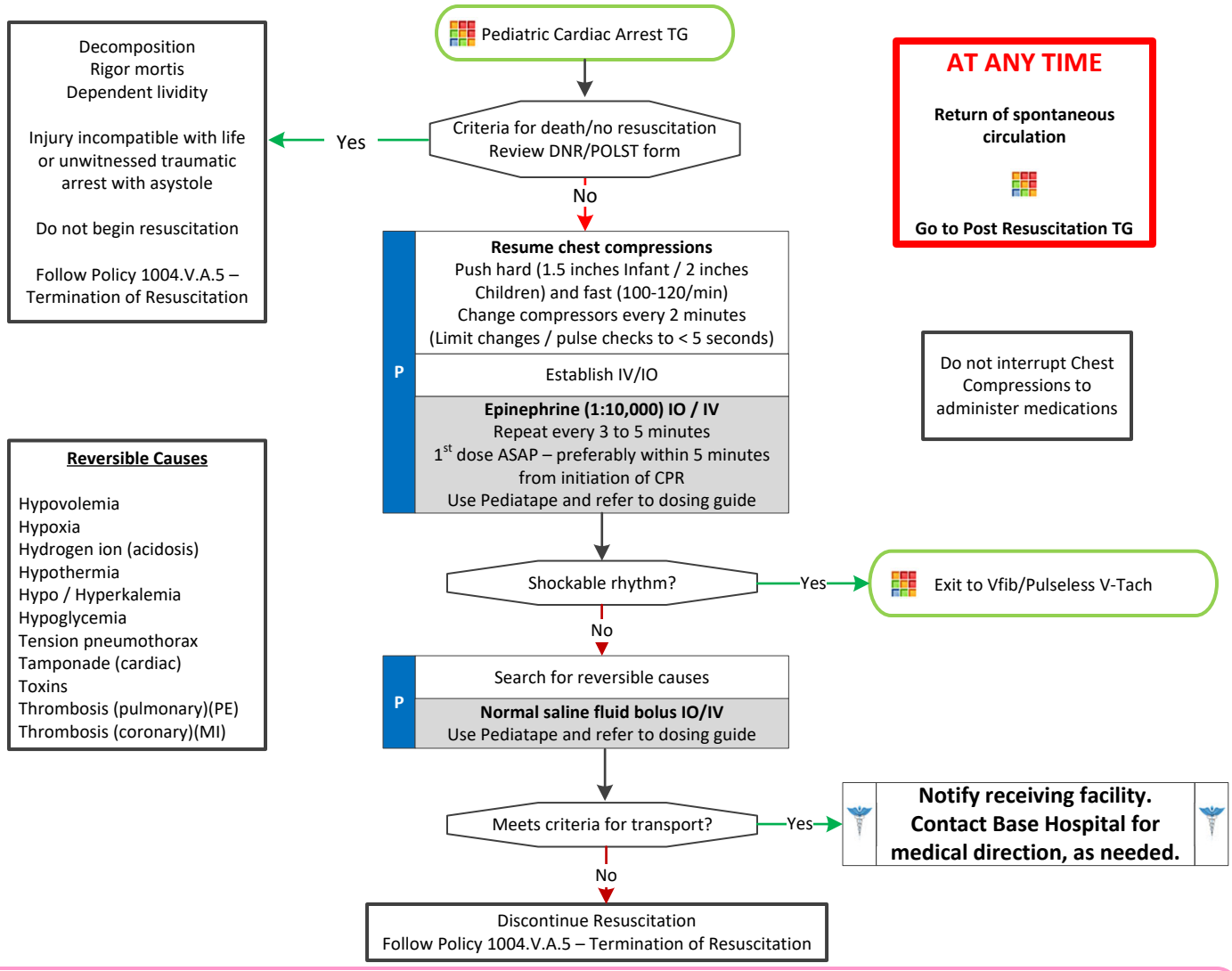
Contra Costa County Emergency Medical Services

Pediatric Asystole / PEA

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

Signs and Symptoms
- Apneic
- Pulseless

Differential
- Respiratory failure
- Foreign body
- Hypothermia
- Infection
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Toxin or medication
- Acidosis
- Hyperkalemia
- Hypoglycemia



Pearls
- Patients with a rapid pulseless rate are most likely hypovolemic. Fluid will likely reverse this condition.
- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- Respiratory arrest is a common case of cardiac arrest. Unlike adults, early airway intervention is critical.
- In most cases, pediatric airways can be maintained with basic interventions.

Pediatric Treatment Guidelines

Contra Costa County Emergency Medical Services

Pediatric V-Fib/Pulseless V-Tach

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

Signs and Symptoms
- Apneic
- Pulseless

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

Pediatric Cardiac Arrest TG

P

Defibrillation
Use Pediatape and refer to dosing guide

Resume chest compressions
Change compressors every 2 minutes
(*Limit changes/pulses checks < 5 seconds*)

Supplement Oxygen via BVM with a goal of ≥ 94% SpO2

Monitor ETCO2

Establish IO/IV

P

Defibrillation
Use Pediatape and refer to dosing guide

Resume chest compressions
Change compressors every 2 minutes
(*Limit changes/pulses checks < 5 seconds*)

Epinephrine (1:10,000) IO / IV
Repeat every 3 to 5 minutes
1st dose ASAP – preferably within 5 minutes from initiation of CPR
Use Pediatape and refer to dosing guide

P

Defibrillation
Use Pediatape and refer to dosing guide

Resume chest compressions
Change compressors every 2 minutes
(*Limit changes/pulses checks < 5 seconds*)

If V-Fib/ Pulseless V-Tach is refractory after 3 shocks
Continue aggressive CPR and give medications during compressions

Amiodarone IO/IV
Use Pediatape and refer to dosing guide
Maximum 300mg

Return of spontaneous circulation?

→ Exit to Post Resuscitation TG

Notify receiving facility. Contact Base Hospital for medical direction, as needed.

AT ANY TIME

Return of spontaneous circulation

Go to Post Resuscitation TG

Do not interrupt Chest Compressions to administer medications

Pediatric Treatment Guidelines

Pediatric V-Fib/Pulseless V-Tach

Pearls

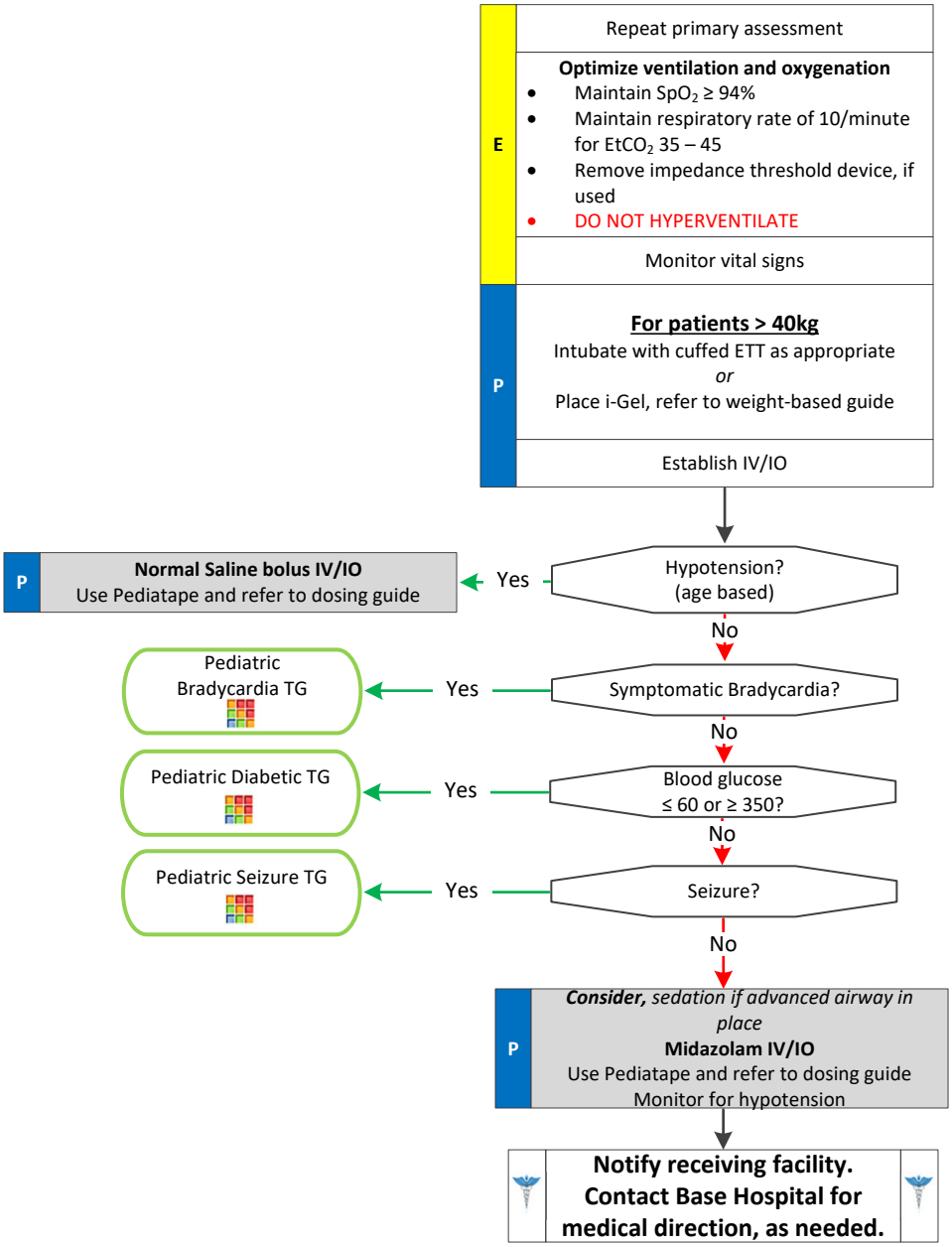
- Efforts should be directed at high quality chest compressions with limited interruptions and early defibrillation when indicated. Compress 1.5 inches in infants and 2 inches in children. Consider early IO placement if available or direct IV access if anticipated.
- DO NOT HYPERVENTILATE.
- Use a metronome during chest compression to ensure proper rate.
- Airway is a more important intervention in pediatric arrests. This should be accomplished quickly with a BVM. Patient survival is often dependent on proper ventilation and oxygenation with airway intervention.
- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- Respiratory arrest is a common cause of cardiac arrest. Unlike adults, early ventilation intervention is critical.
- In most cases, pediatric airways can be managed by basic intervention with a BVM.
- Reassess and document ETT placement (patients above 40kg) and $EtCO_2$ frequently, after every move, and at transfer of care.
- Do not stop chest compressions to check for placement of ETT or to give medications.

Post Resuscitation (ROSC)

History
- Respiratory arrest
- Cardiac arrest

Signs and Symptoms
- Return of spontaneous circulation

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



Pearls
- Hyperventilation is a significant cause of hypotension/recurrence of cardiac arrest in the post resuscitation phase and must be avoided at all costs.

Pediatric Cardiac Treatment Guidelines

Pediatric Bradycardia

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

Signs and Symptoms
- Decreased heart rate
- Delayed capillary refill or cyanosis
- Mottled, cool skin
- Hypotension or arrest
- Altered mental status
- Syncope

Differential
- Respiratory failure
  - Foreign body
  - Secretions
  - Infection (e.g. croup, epiglottitis)
- Hypovolemia
- Congenital heart disease
- Trauma
- Tension Pneumothorax
- Hypothermia
- Toxin or medication
- Hypoglycemia
- Acidosis

HR < 60 and symptomatic:
Poor perfusion, delayed capillary refill, hypotension, respiratory distress, AMS

→ Newly born < 31 days
Exit to
Newly Born TG

Yes

E
- Supplemental Oxygen with goal of Oxygen saturation ≥ 94% SpO2

P
- Cardiac monitor
- Establish IV/IO
- 12-Lead ECG
- $EtCO_2$ monitoring

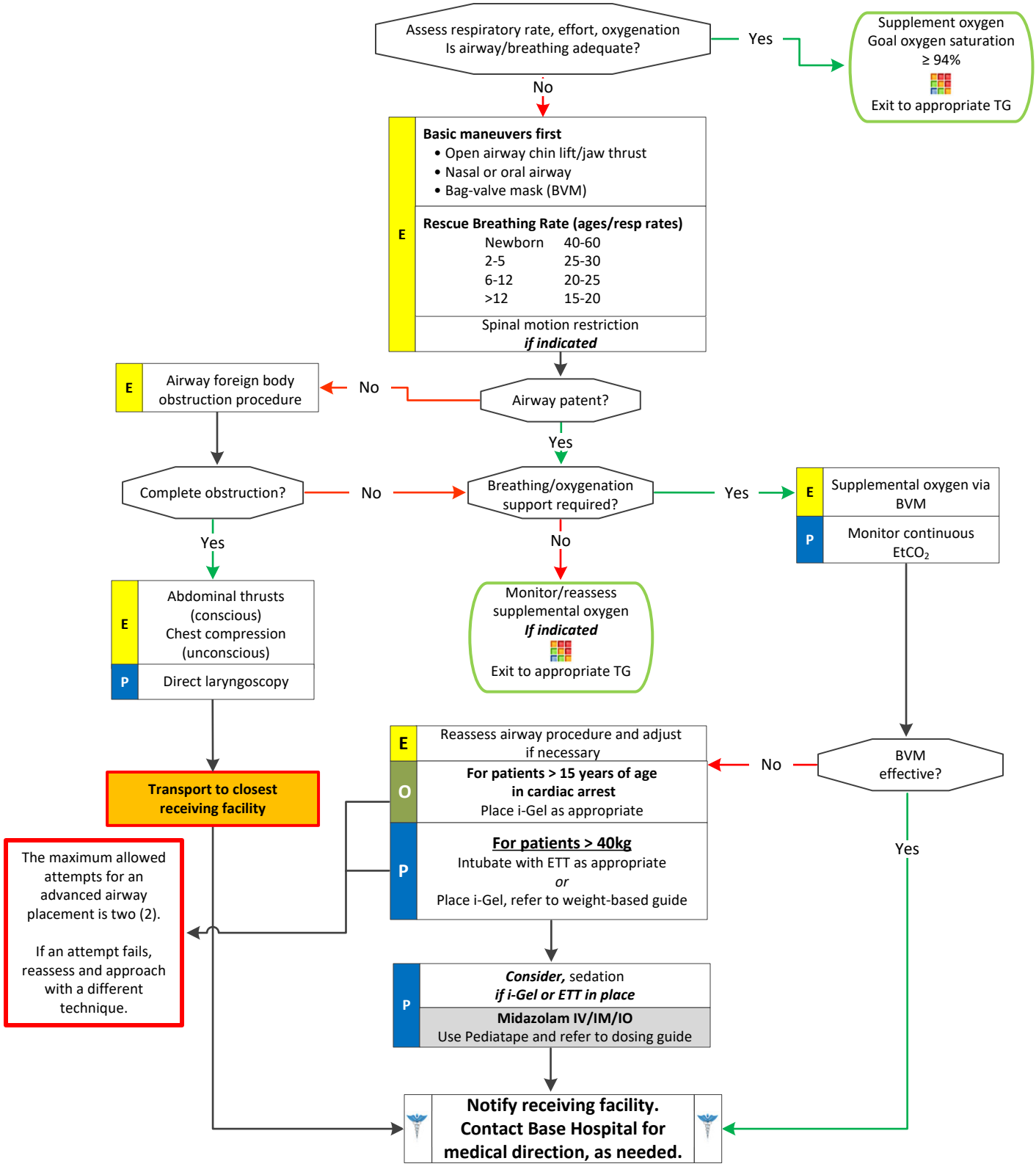
If heart rate remains < 60 with poor perfusion despite oxygenation and ventilation, begin CPR

P
- **Epinephrine 1: 10,000 IV/IO**
  Use Pediatape and refer to dosing guide
  Repeat every 3-5 minutes
- **Atropine should be considered only after adequate oxygenation/ventilation has been ensured**
- ***Consider,* Atropine IV/IO**
  Use Pediatape and refer to dosing guide

Notify receiving facility.
Contact Base Hospital for medical direction, as needed.

Pearls
- The majority of pediatric bradycardia is due to airway problems.
- Hypoglycemia, severe dehydration and narcotic effects may produce bradycardia.
- Most maternal medications pass through breast milk to the infant.

Pediatric Airway



Pediatric Treatment Guidelines

Pediatric Airway

Pearls

- Placement of an advanced airway is not a priority during the first five minutes of resuscitation unless ventilation is unable to be maintained with basic maneuvers.
- Endotracheal intubation is only approved for patients over 40kg.
- Capnometry is mandatory with all methods of airway management. Document results.
- Continuous capnometry ($EtCO_2$) is mandatory for the monitoring of all respiratory patients.
- If an effective airway is being maintained with a BVM and a basic airway adjunct with continuous pulse oximetry values of ≥ 90% or values expected based on pathophysiologic condition with otherwise reassuring vital sign (e.g. pulse oximetry of 85% with otherwise normal vital signs in a post-drowning patient), it is expected to continue with basic airway measures.
- For the purposes of this TG, a secure airway is achieved when the patient is receiving appropriate oxygenation and ventilation.
- An intubation attempt is defined as inserting the laryngoscope blade with the intent to intubate or inserting advanced airway past the teeth.
- An appropriate ventilatory rate is one that maintains an $EtCO_2$ of 35 or greater. Avoid hyperventilation.
- Patients with perfusing pulses should be managed with a BLS airway unless unable to successfully ventilate.
- Contraindications for i-Gel:
  - Presence of gag reflex
  - Laryngectomy with stoma (alternatively place ET in stoma)
  - Caustic ingestion
  - Known esophageal disease
- Effective use of a BVM requires two (2) people.
- Airway is a more important intervention in pediatric arrests. This should be accomplished quickly with a BVM and appropriately sized mask. Patient survival is often dependent on proper ventilation and oxygenation.
- Maintain spinal immobilization for patients with suspected spinal injury.
- Hyperventilation in deteriorating head trauma should only be done to maintain an $EtCO_2$ of 30-35.
- It is important to secure the advanced airway well and consider c-collar (in the absence of trauma) to better maintain advanced airway placement. Manual stabilization of advanced airway should be used during all patient moves/transfers.

Contra Costa County Emergency Medical Services

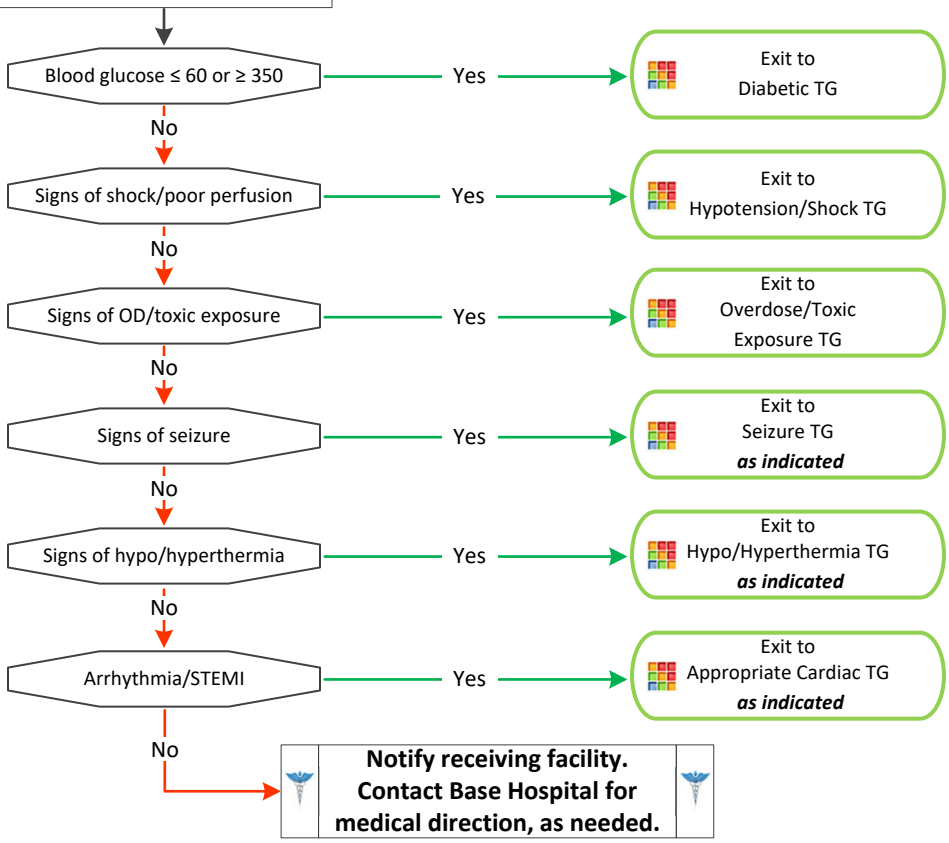
Pediatric Altered Mental Status

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

Signs and Symptoms
- Decrease/change in mentation
- Decrease/increase in blood sugar
- Cool, diaphoretic skin
- Warm, dry skin; fruity breath; Kussmaul respirations; signs of dehydration

Differential
- Hypoxia
- CNS (stroke, tumor, seizure, infection)
- Thyroid
- Shock
- Diabetes
- Toxicological
- Acidosis or alkalosis
- Diabetes
- Environmental exposure
- Psychiatric disorder
- Sepsis

E	Airway TG, ***if indicated***
	Supplemental Oxygen with goal of Oxygen saturation ≥ 94% SpO2
	Blood glucose analysis
P	Cardiac monitor
	12-Lead ECG, ***if indicated***
	Establish IV/IO



Pediatric Treatment Guidelines

Treatment Guideline P03

CONTRA COSTA EMERGENCY MEDICAL SERVICES
A Division of Contra Costa Health Services

Effective Jan. 2023

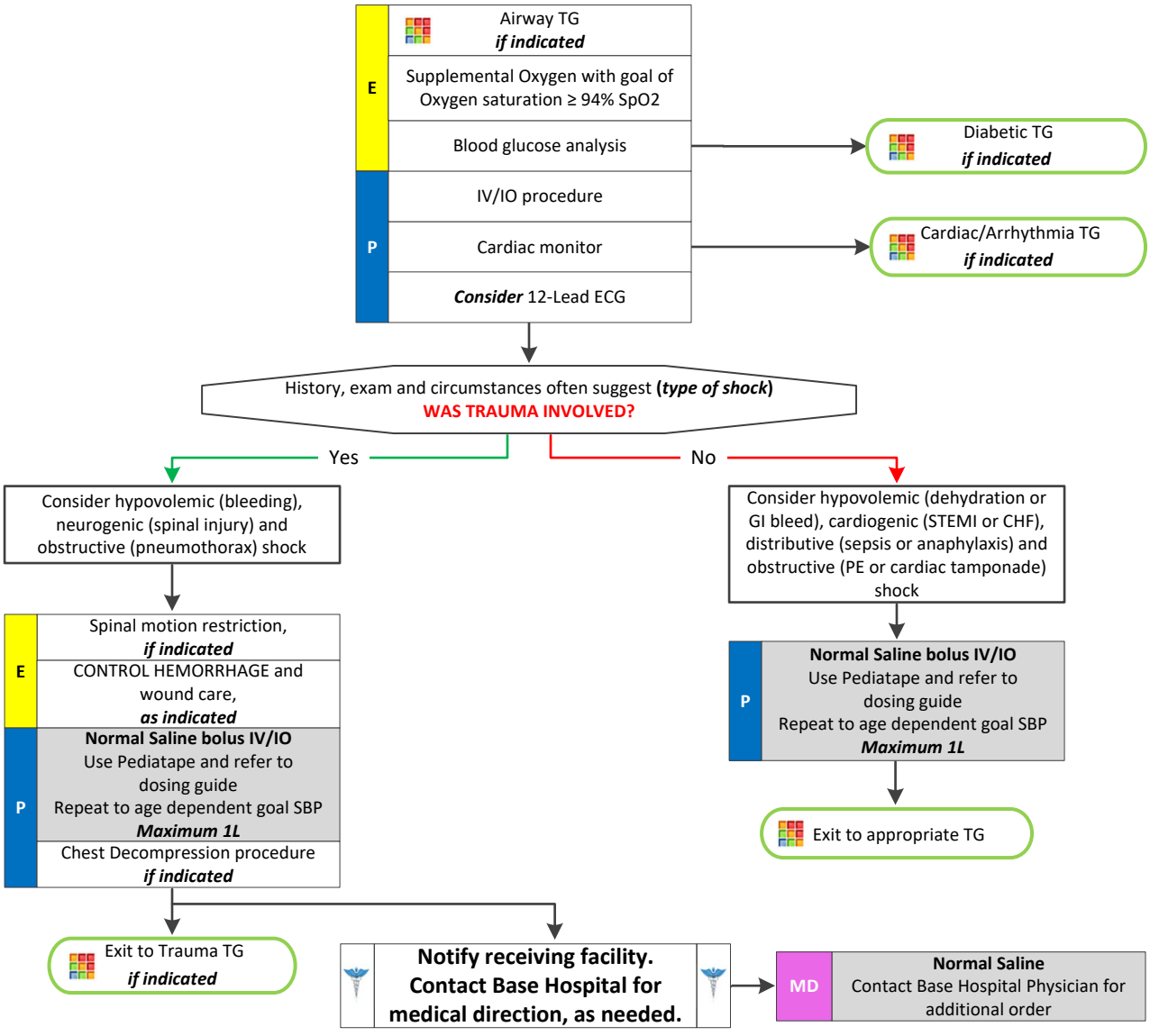
Contra Costa County Emergency Medical Services

Pediatric Hypotension/Shock

History
- Blood loss
- Vomiting
- Diarrhea
- Fever
- Infection

Signs and Symptoms
- Restlessness or confusion
- Weakness or dizziness
- Weak, rapid pulse
- Pale, cool, clammy skin signs
- Delayed capillary refill
- Hypotension
- Tarry stools

Differential
- Shock (hypovolemic, cardiogenic, septic, neurogenic, or anaphylaxis)
- Trauma
- Infection
- Dehydration
- Congenital heart disease
- Medication or Toxin



Pediatric Treatment Guidelines

CONTRA COSTA EMERGENCY MEDICAL SERVICES
A Division of Contra Costa Health Services

Effective Jan. 2023

Pediatric Hypotension/Shock

Pearls

- Hypotension is age dependent. This is not always reliable and should be interpreted in context with the patient's typical BP, if known. Shock may be present with a seemingly normal blood pressure initially.
- Common pediatric terms used to describe children are defined as:
  - Newly born are ≤ 24 hours old
  - Neonates are ≤ 28 days old
  - Infants are ≤ 1 year old
- Hypotension is defined as:
  - Neonate: < 60mmHg or weak pulses
  - Infant: < 70mmHg or weak pulses
  - 1-10 years: < 70mmHg + (age in years x2)
  - Over 10 years: < 90mmHg
- Systemic BP goals are defined as:
  - Neonate: > 60mmHg
  - Infant: > 70mmHg
  - 1-10 years: > 70mmHg + (age in years x2)
  - Over 10 years: > 90mmHg
- Normal blood pressure, delayed capillary refill, diminished peripheral pulses, and tachycardia indicates compensated shock in children.
- Hypotension and delayed capillary refill > 4 seconds indicates impending circulatory failure.
- Systolic blood pressure in children may not drop until the patient is 25-30% volume depleted. This may occur through dehydration, blood loss, or an increase in vascular capacity (e.g. anaphylaxis).
- Decompensated shock (hypotension with capillary refill > 5 seconds) may present as PEA in children.
- Sinus tachycardia is the most common cardiac rhythm in encountered in children.
- SVT should be suspected in the heart rate is greater than 180 in children ages (1-8) or greater than 220 in infants.
- Hypoglycemia may be found in pediatric shock, especially in infants.
- Pediatric shock victims are at risk for hypothermia due to their increased body surface area, exposure, and rapid administration of IV/IO fluids.

Contra Costa County Emergency Medical Services

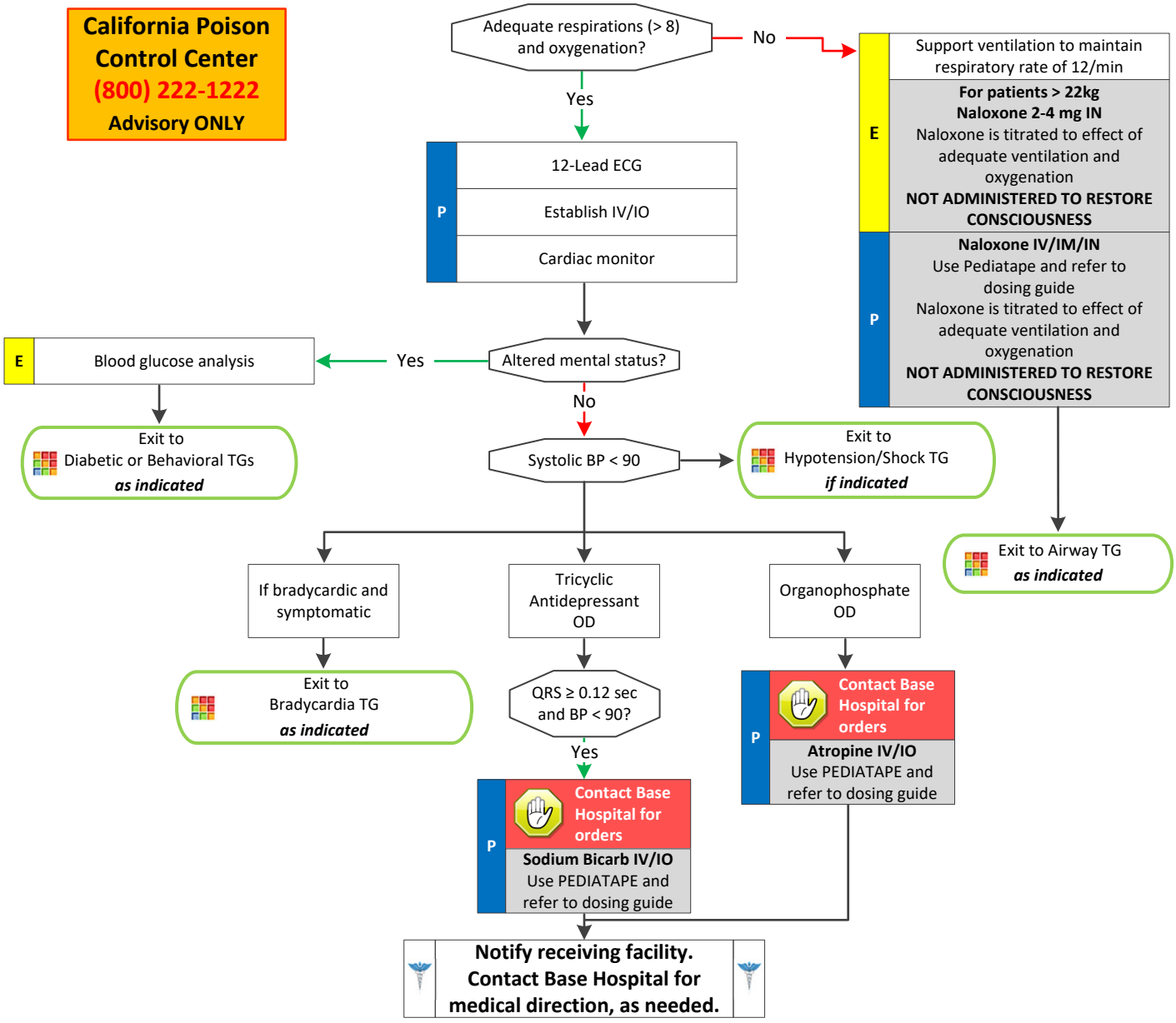
Pediatric Overdose/Toxic Ingestion

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

Signs and Symptoms
- Mental status changes
- Hypo or hypertension
- Decreased respiratory rate
- Tachycardia or dysrhythmias
- Seizures
- S.L.U.D.G.E.

Differential
- Tricyclic antidepressants (TCAs)
- Acetaminophen (Tylenol)
- Aspirin
- Depressants
- Stimulants
- Anticholinergics
- Cardiac medications
- Solvents, alcohols or cleaning agents
- Insecticides (organophosphates)

California Poison Control Center
(800) 222-1222
Advisory ONLY



Pearl
- Do not rely on patient history of ingestion, especially in suicide attempts. Make sure the patient is still not carrying other medications or weapons. Bring bottles, contents, and emesis to ED.

Pediatric Treatment Guidelines

CONTRA COSTA EMERGENCY MEDICAL SERVICES
A Division of Contra Costa Health Services

Effective Jan. 2023

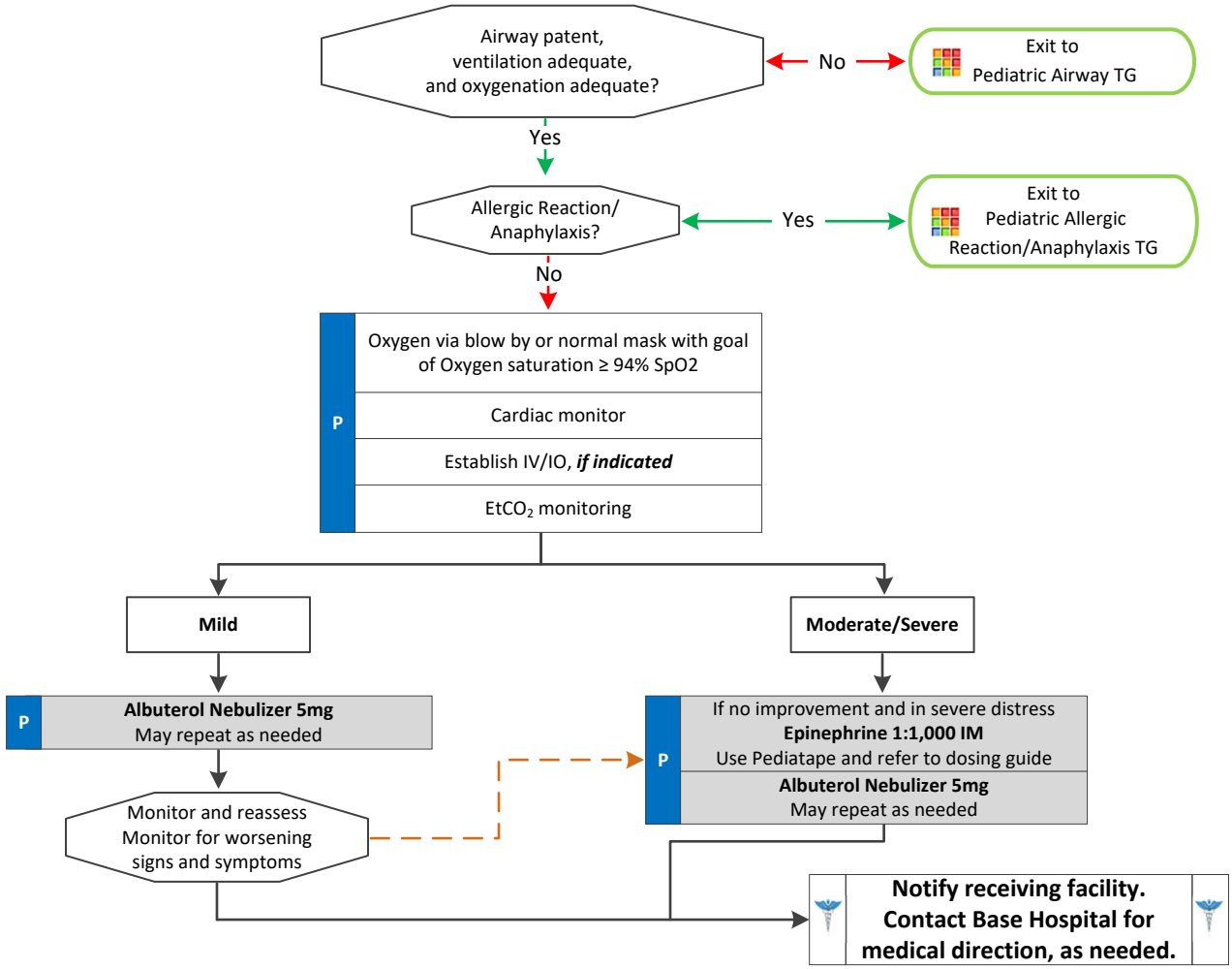
Contra Costa County Emergency Medical Services

Pediatric Respiratory Distress

History
- Time of onset
- Possibility of foreign body
- Past medical history
- Medications
- Fever/Illness
- Sick contacts
- History of trauma
- History/possibility of choking
- Ingestion/Overdose
- Congenital heart disease

Signs and Symptoms
- Wheezing/Stridor/Crackles/Rales
- Nasal flaring/Retractions/Grunting
- Increased heart rate
- AMS
- Anxiety
- Attentiveness/Distractibility
- Cyanosis
- Poor feeding
- JVD/Frothy sputum
- Hypotension

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



Pediatric Treatment Guidelines

Pearls
- All patients with respiratory symptoms must have continuous pulse oximetry and $EtCO_2$ measurement.
- Do not force a child into a position; allow them to assume a position of comfort.
- Bronchiolitis is a viral infection typically affecting infants which results in wheezing which may not respond to Albuterol.
- Croup typically affects children > 2 years of age. It is viral, possible fever, gradual onset, and without drooling.
- Epiglottitis typically affects children > 2 years of age. It is bacterial patients with fever, rapid onset, and possible who want to sit up to keep airway open and drooling is common. Airway manipulation may worsen condition.

CONTRA COSTA EMERGENCY MEDICAL SERVICES
A Division of Contra Costa Health Services

Effective Jan. 2023

Contra Costa County Emergency Medical Services

Pediatric Seizure

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

Signs and Symptoms
- Altered mental status
- Sleepiness
- Incontinence
- Observed seizure activity
- Evidence of trauma
- Unconscious
- Incontinence

Differential
- Head trauma
- Metabolic, hepatic or renal failure
- Tumor
- Hypoxia
- Electrolyte abnormality
- Drugs or medication non-compliance
- Infection or sepsis
- Alcohol withdrawal
- Eclampsia
- Stroke
- Hyperthermia
- Hypoglycemia

E
- Ensure scene safety
- Loosen any constrictive clothing
- Assess and manage ABCs
- Supplemental Oxygen with goal of Oxygen saturation ≥ 94% SpO2
- Cardiac monitor

Status Epilepticus
- 2 or more seizures in ≤ 5 minutes
  Or
- Any seizure lasting > 5 minutes

If duration cannot be confirmed, patient should be assumed to be in status if actively seizing when you arrived.

Status Epilepticus?
(Confirmed or Suspected)

YES

P **Midazolam**
IN (preferred) or IM
Use Pediatape and refer to dosing guide
Max dose:
5 mg (≤ 40kg)
10 mg (> 40kg)

Continues to seize?

YES

E Check blood glucose → If BGL ≤ 60mg/dl Exit to Diabetic TG

MD *Consider additional* **Midazolam** *with base contact*

NO

E If febrile, initiate cooling measures

NO

E
- Monitor and reassess
- SMR if indicated
- Manage any traumatic injuries

Notify receiving facility. Contact Base Hospital for medical direction, as needed.

Pediatric Treatment Guidelines

CONTRA COSTA EMERGENCY MEDICAL SERVICES
A Division of Contra Costa Health Services

Effective Jan. 2021

Pediatric Seizure

Pearls

- Simple febrile seizures are most common in ages 6 months to 5 years of age. They are, by definition, generalized seizures with no seizure history in the setting of any grade of fever, with an otherwise normal neurologic and physical exam. Any seizure confirmed to last for more than five (5) minutes should be treated with medication.
- Be prepared to assist ventilations, especially if Midazolam is used. Avoiding hypoxemia is extremely important.
- In an infant, a seizure may be the only evidence of a closed head injury.
- Status epilepticus is defined as two or more successive seizures without a period of consciousness or recovery OR seizures lasting greater than 5 minutes. This is a true emergency requiring rapid airway control, treatment and transport.
- Assess for the possibility of occult trauma and substance abuse, overdose, or ingestion/toxins.

Contra Costa County Emergency Medical Services

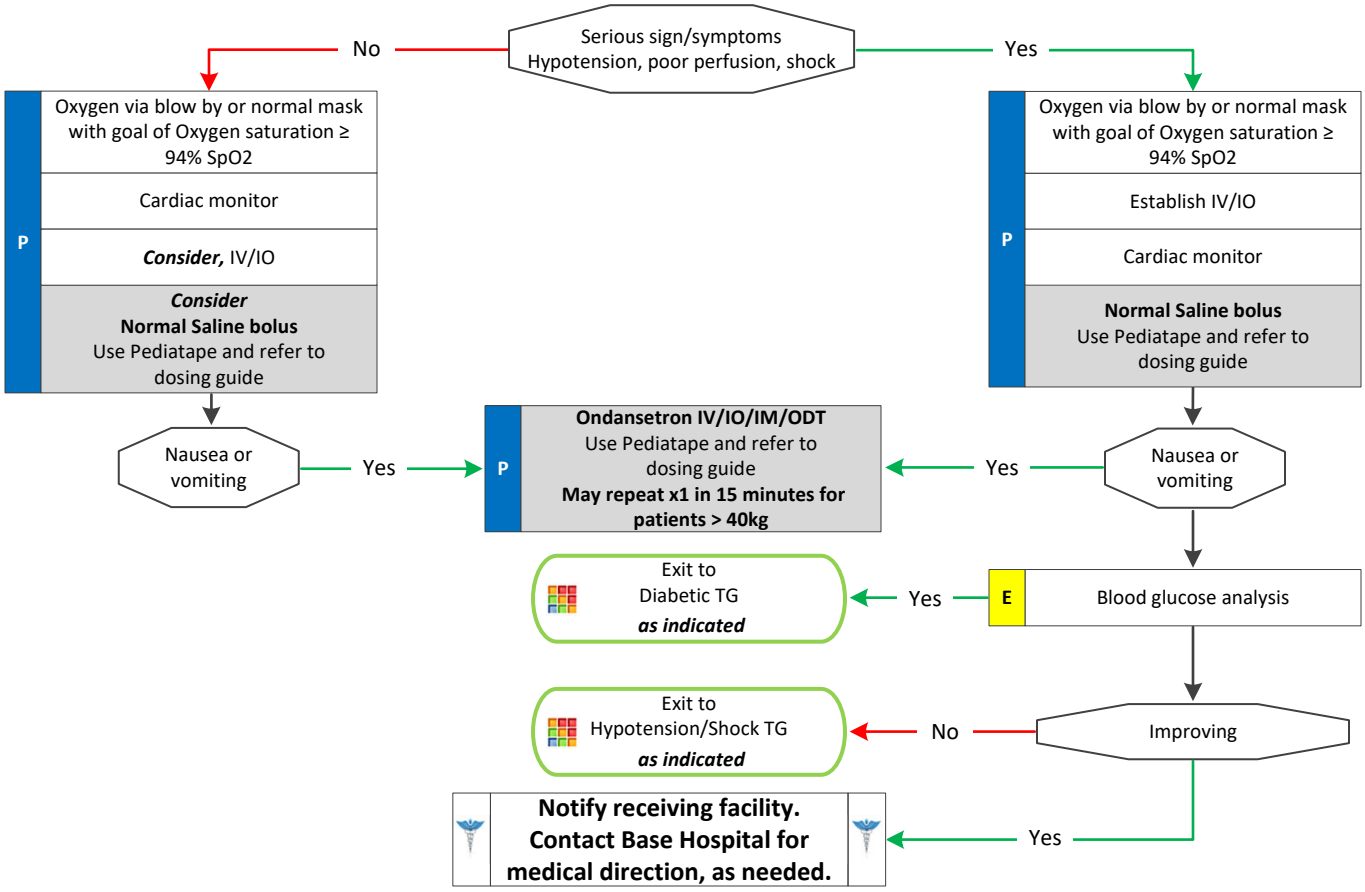
Pediatric Vomiting and Diarrhea

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

Signs and Symptoms
- Abdominal pain
- Character of pain (constant, intermittent, dull, sharp, etc.)
- Distension
- Constipation
- Diarrhea
- Anorexia
- Radiation

Associated symptoms (helpful to localize source):
Fever, headache, blurred vision, weakness, malaise, myalgia, cough, dysuria, mental status changes, and rash

Differential
- CNS (increased pressure, headache, stroke, CNS lesions, trauma or hemorrhage, vestibular)
- MI
- Drugs (NSAIDs, antibiotics, narcotics, chemotherapy)
- GI or renal disorders
- Diabetic ketoacidosis
- Gynecologic disease (ovarian cyst, PID)
- Infections (pneumonia, influenza)
- Electrolyte abnormalities
- Food or toxin induced
- Medication or substance abuse
- Pregnancy
- Psychological



Pearls
- Heart rate: One of the first clinical signs of dehydration is almost always an increased heart rate. Tachycardia increases as dehydration becomes more severe, very unlikely to be significantly dehydrated if heart rate is close to normal.
- Beware of only vomiting (without diarrhea) in children. Pyloric stenosis, bowel obstruction, and CNS processes (bleeding, tumors, or increased CSF pressures) all often present with isolated vomiting.
- Ondansetron is not indicated for motion sickness.

Pediatric Treatment Guidelines

CONTRA COSTA EMERGENCY MEDICAL SERVICES
A Division of Contra Costa Health Services

Effective Jan. 2020

Contra Costa County Emergency Medical Services

Trauma Triage

Injury incompatible with life or unwitnessed traumatic arrest with asystole

Do not begin resuscitation

Follow Policy 1004.V.A.5 – Termination of Resuscitation

ACTIVATION

Unmanageable airway

No

Yes → Closest facility

Measure vital signs and level of consciousness

1

- GCS ≤ 13
- Systolic blood pressure < 90mmHg
- Adult respiratory rate < 10 or > 29 *or* need for ventilatory support
- Infant (< l year of age) respiratory rate < 20

Yes → Trauma Center transport with early notification

No

Assess anatomy of injury

2

- All penetrating injuries to head, neck, torso, groin, pelvis, buttocks, and extremities above the elbow or knee
- Chest wall instability or deformity (e.g. flail chest)
- Two or more proximal long bone fractures
- Crushed, degloved, mangled, or pulseless extremity
- Amputation above the wrist or ankle
- Pelvic instability
- Open or depressed skull deformity
- Traumatic paralysis
- Major burn associated with trauma
- Uncontrolled bleeding with tourniquet applied and tightened

Yes → Trauma Center transport with early notification

No

Assess mechanism of injury and evidence of high-energy impact

3

- Adult fall > 20 feet
- Pediatric fall > 10 feet *or* 2-3 times height of child
- High risk auto crash with > 12 inches intrusion on patient side *or* > 18 inches at any site of passenger compartment
- Ejection (partial or complete)
- Death in same passenger compartment
- Auto vs. pedestrian/bicyclist thrown, run over *or* with significant impact > 20mph
- Any unenclosed vehicle crash > 20mph (e.g. motorcycle, bicycle, ATV, etc.)

Yes → Trauma Center transport with early notification

No

Meets Destination / Call-in Criteria?

Yes → ***Call for destination decision***

Adult and Pediatric Trauma/Environmental Treatment Guidelines

Treatment Guideline T01

CONTRA COSTA EMERGENCY MEDICAL SERVICES
A Division of Contra Costa Health Services

Effective Jan. 2023

Trauma Triage

Risk Factor Advisory

Patients with either high energy or low energy mechanisms are more prone to serious injury if they have one or more of the following risk factors:

- Pregnancy over 20 weeks
- Communication barrier (e.g., age, language, psychiatric, or developmental issues)
- Age 55 or older
- Patient taking anticoagulants or with known bleeding disorder

4

High energy mechanism
Motor vehicle crash • Estimated impact speed of > 40mph • Mechanical extrication required by fire department personnel • Rollover with unrestrained occupant
Person struck by a vehicle at < 20mph
Person ejected /fell from other object (e.g., motorcycle, horse, or ATV)
Blunt assault with weapon (e.g., pipe, bat, or golf club)
Falls > 10 but < 20 feet
This list is not all-inclusive and other high energy mechanisms encountered also merit Base Hospital contact

Contact Base Hospital for destination

Low energy mechanism
Low energy mechanisms should merit Base Hospital contact if symptoms, physical findings, or concern are encountered
Examples include, but are not limited to ground level or short falls, blunt assault without a weapon (e.g., closed fist), low speed motor vehicle crash, or other blunt trauma (e.g., sports injury)

Consider Base Hospital contact for destination

For situations not described above, consider Base Hospital contact if paramedic has concern that a serious injury may exist

Trauma Triage

Pearls

- **Do *not* let alcohol confuse the clinical picture. Alcoholics may have unrecognized injuries, particularly head bleeds.**
- **A complete hands on head-to-toe assessment is required for all trauma patients.**
- **Transport should be initiated within 10 minutes of ambulance arrival unless patient requires extrication.**

Age Categories

Adult Patient – Trauma patients 15 years of age and older.
Pediatric Patients – Trauma patients under the age of 15 years.

Trauma Receiving Facilities

Adult Trauma Centers – John Muir Medical Center – Walnut Creek is the designated trauma center for adults in Contra Costa County. In some circumstances, patients may be transported to other trauma receiving facilities. Alameda County Medical Center (Highland) and Eden Medical Center are trauma receiving facilities that, when they are the closest trauma receiving facility, may be appropriate for ground transport of trauma patients.

Pediatric Trauma Centers – UCSF Benioff Children's Hospital of Oakland (CHO) is the most appropriate destination for the majority of pediatric trauma patients.

- John Muir Medical Center – Walnut Creek may be an appropriate trauma receiving facility for critically injured pediatric trauma patients who are near arrest or have a very prolonged transport time. UC Davis Medical Center is also a pediatric trauma receiving facility and may be utilized when helicopter transport is involved.

Receiving Facilities – Local hospitals that are not trauma receiving facilities are destinations for patients who are triaged by the Base Hospital at the time of report as not requiring trauma center care. A trauma receiving facility may also serve as the receiving facility when it is the patient's facility of choice.

Low Energy Mechanism Trauma

Low energy mechanism trauma may reveal significant trauma. Examples include, but are not limited to ground level or short falls, blunt assault without a weapon (e.g. closed fist), low speed motor vehicle crash, or other blunt trauma (e.g. sports injury). Symptoms or concern may include:

- Symptoms in the presence of head injury such as headache, vomiting, loss of consciousness, repetitive questioning, abnormal, or combative behavior or new onset of confusion
- Pain level greater than 5/10 related to head, neck, or torso injury
- Any concerns due to hypotension, tachycardia, or tachypnea
- Systolic BP < 110mmHg in patients 65 years of age or older
- Torso injury with tenderness of abdomen, chest/ribs or back/flank
- Suspected hip dislocation or pelvis injury

Other Definitions

Unmanageable Airway – A patient whose airway is unable to be adequately maintained with BLS or ALS maneuvers. Adult trauma patients are candidates for immediate redirection to the trauma center following airway stabilization at a non-trauma receiving facility.

Traumatic Arrest – Patients who do not qualify for field determination of death but have or develop cardiopulmonary arrest should be transported to the closest Basic ED by ground ambulance.

Exceptions:

- Patients with penetrating trauma who arrest (pulseless, apneic, *or* pulseless with agonal respirations) after the arrival of transport personnel should be immediately transported to a trauma center if transport time is 20 minutes or less to that facility. If no Trauma Center is available within 20 minutes, patients should be transported to the closest basic emergency department.
- If a helicopter crew is present at the time of arrest (blunt or penetrating) and the air transport can be initiated immediately, use of helicopter to transport to a trauma center is appropriate.

Contra Costa County Emergency Medical Services

STEMI Transfer

History
- Age
- Medications (e.g. Viagra, Sildenafil, Levitra, Vardenafil, Cialis or Tadalafil)
- Past medical history (e.g. MI, angina, diabetes, or post menopausal)
- Allergies
- Recent physical exertion
- **P**rovocation
- **Q**uality (e.g. pressure, constant, sharp, dull, etc.)
- **R**egion/Radiation/Referred
- **S**everity (0 – 10 scale)
- **T**ime (onset/duration/repetition)

Signs and Symptoms
- Heart rate < 60 with associated hypotension, acute altered mental status, chest pain, acute CHF, seizures, syncope, or shock secondary to bradycardia
- Chest pain
- Respiratory distress
- Hypotension or shock
- Altered mental status
- Syncope

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

Diagnosed with a STEMI

P
- Cardiac monitor
- $EtCO_2$ monitoring
- **Oxygen**
  Titrate to $SpO_2 \geq$ 94%
- *Consider*
  If initial SBP > 90 **Nitroglycerin 0.4mg sublingual**
  If not previously administered at the hospital.
  May repeat every 5 minutes as needed.
  Maximum 3 doses
- *Consider*
  Fentanyl 50 – 200mcg IV
  titrated in 25 – 50mcg increments
  for pain relief if BP > 90 systolic

Notify receiving facility. Contact Base Hospital for medical direction, as needed.

N
Fentanyl
Contact Base Hospital for additional order

Designated STEMI Receiving Centers

John Muir – Concord
John Muir – Walnut Creek
Kaiser – Walnut Creek
San Ramon Regional
Sutter Delta

Approved Out Of County STEMI Receiving Centers

Highland
Kaiser – Vallejo
MarinHealth
ABMC – Summit – Oakland
Kaiser – Oakland
SHC – ValleyCare

Interfacility Transfer Treatment Guidelines

Pearls

- Patients with a STEMI needing interventional cardiac care require timely transfer. A scene time of 10 minutes or less at the sending facility is ideal.
- Treatment during interfacility transfer varies from field approach to chest pain/ACS:
- Confirmatory ECG for a STEMI has already been done by the hospital and does not need to be repeated prior to transfer or during transport to receiving facility.
- Aspirin or other anti-platelet treatment, if indicated, should be administered by sending hospital prior to transport.
- Patients generally will be directed to the cath lab upon arrival.
- Outcome of STEMI patients is directly related to timeliness of intervention to relieve coronary artery occlusion. Minimizing time delay in transfer is essential.

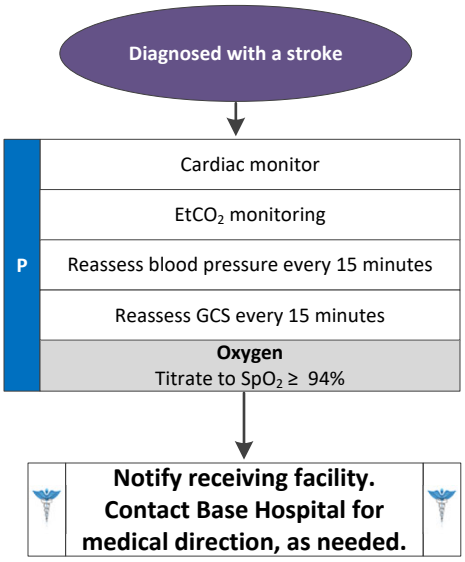
Contra Costa County Emergency Medical Services

Stroke Transfer

History
- Previous stroke or TIA
- Previous cardiac or vascular surgery
- Associated diseases (diabetes, hypertension, CAD)
- Atrial fibrillation
- Medications (blood thinners)
- History of trauma

Signs and Symptoms
- Altered mental status
- Weakness or paralysis
- Blindness or other sensory loss
- Aphasia or dysarthia
- Syncope
- Vertigo or dizziness
- Vomiting
- Headache
- Seizure
- Respiratory pattern change
- Hypertension/hypotension

Differential
- See Altered Mental Status
- TIA
- Seizure
- Todd's paralysis
- Hypoglycemia
- Stroke
  - Thrombotic or embolic (~85%)
  - Hemorrhagic (~15%)
- Tumor
- Trauma
- Dialysis or renal failure



Designated Stroke Receiving Centers

John Muir – Concord
John Muir – Walnut Creek
Kaiser – Antioch
Kaiser – Richmond
Kaiser – Walnut Creek
San Ramon Regional

Approved Out of County Stroke Receiving Centers

Eden
Kaiser – Oakland
Kaiser – Vallejo
MarinHealth
ABMC – Summit – Oakland
Sutter Solano

Interfacility Transfer Treatment Guidelines

Pearls

- Stroke patients who are transferred may have already received thrombolytic therapy or may not have qualified for thrombolytics based on the length of time from stroke onset or other medical contraindications.
- Ongoing administration of thrombolytic therapy requires additional qualified staff (nurse or physician) for transport.
- Thrombolytic therapy in stroke patients is associated with around a 6% incidence of symptomatic intracerebral hemorrhage, and around 1% of serious hemorrhage elsewhere.
- Close monitoring of stroke patients is important. Significant changes in patient vital signs or GCS during transport should be reported immediately to receiving facility staff as it may affect treatment upon arrival. Look for:
  - Hypotension may occur because of external or internal hemorrhage.
  - Hypertension may be related to an acute intracranial process or underlying disease.
  - Respiratory depression or airway compromise may occur due to stroke or intracerebral hemorrhage.
  - Decreasing level of consciousness may occur due to ischemic stroke or intracerebral hemorrhage.
- Cardiac dysrhythmias may occur in stroke patients.
- Observe for external hemorrhage in patients who have received thrombolytic therapy. Place direct pressure if hemorrhage is noted.

12-Lead ECG

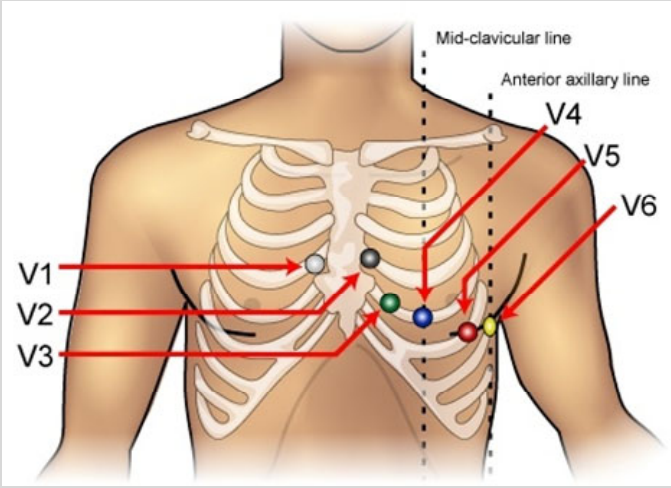
Applies to:
P Paramedic

Clinical Indications:

1. Suspected cardiac patient.
2. As required by treatment guidelines.

Procedure:

1. Prepare ECG monitor and connect patient cable with electrodes.
2. Enter the required patient information: Age, Gender, incident number and patient's first and last initials into the ECG monitor.
3. Expose chest and prep as necessary (e.g. shaving). Modesty of the patient should be respected.
4. Apply chest leads and extremity leads using the following landmarks:
   a. V1 – 4th intercostal space at right sternal border
   b. V2 – 4th intercostal space at left sternal border
   c. V3 – Directly between V2 and V4
   d. V4 – 5th intercostal space at midclavicular line
   e. V5 – Level with V4 at left anterior axillary line
   f. V6 – Level with V5 at left midaxillary line
5. Instruct the patient to remain still.
6. Acquire the 12-Lead ECG.
7. If the monitor detects signal noise (such as patient motion or a disconnected electrode), the 12-Lead acquisition may be interrupted until the noise is resolved.



8. Once acquired, as soon as possible, transmit any 12-lead ECG.
9. Contact the receiving STEMI Center to notify them of a STEMI Alert and that a STEMI positive 12-Lead ECG has been transmitted to their facility.
10. Monitor the patient while continuing with the treatment protocol.
11. Download the cardiac monitor data as required by EMS policy and attach a copy of the 12-Lead ECG to the prehospital EHR.
12. Document in the prehospital EHR: the 12-Lead procedure time, the EGC results, and the time of transmission to the STEMI receiving Center for a STEMI positive EGG.

Airway: Bougie Device

Applies to:
P Paramedic

Clinical Indications:

1. To be used with any intubation attempt.

Contraindications:

Any indication which does not meet the above indication.

Procedure:

1. Prepare, position, and oxygenate the patient with 100% oxygen.
2. Select the proper ET tube and remove stylette; test cuff and prepare suction.
3. Lubricate the distal end and cuff of the endotracheal tube (ETT) with a water-based lubricant and the distal 1/2 of the Bougie device. (Note: Failure to lubricate the Bougie and the ETT may result in being unable to pass the ETT).
4. Using the laryngoscope, visualize the vocal cords, if possible, using the BURP maneuver as needed.
5. Introduce the Bougie with the curved tip anteriorly and visualize the tip passing the vocal cords or above the arytenoids if the cords cannot be visualized.
6. Once inserted, gently advance the Bougie until you meet resistance; feel for the tracheal rings. If you do not meet resistance, you have a probable esophageal intubation and insertion should be reattempted or use a i-Gel.
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 ETT until you have feel 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 ETT 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 turn the bevel of the ETT posteriorly. If this technique fails to facilitate passing of the ETT you may attempt direct 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 ETT securely and remove the Bougie.
12. Confirm tracheal placement according to the intubation protocol, inflate the cuff with 3 – 10cc of air, auscultate for equal breath sounds, and reposition accordingly.
13. When final position is determined secure the ETT, reassess breath sounds, apply $EtCO_2$ monitoring, and record and monitor readings to assure continued tracheal intubation.

Airway: Endotracheal Intubation

Applies to:
P Paramedic

Clinical Indications:

1. Inability to adequately ventilate a patient with a Bag Valve Mask (BVM) and basic airway adjunct.
2. An unconscious patient without a gag reflex who is apneic or is demonstrating inadequate respiratory effort.

Procedure:

1. Using the Cormack Lehane difficult airway assessment tool to determine if the patient's airway will be difficult to intubate. If it is determined to be difficult, use an i-Gel.
2. Prepare, position, and oxygenate the patient with 100% Oxygen.
3. Select proper ET tube and stylette; have suction ready.
4. The use of a Bougie device is strongly encouraged with all ET intubation attempts.

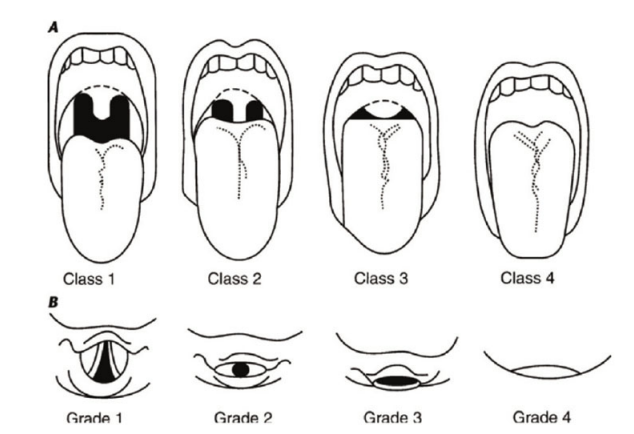


Figure 1. Cormack Lehane Assessment Tool

5. Using laryngoscope, visualize vocal cords. (Use the BURP maneuver to assist).
6. Limit each intubation attempt to 30 seconds with BVM between attempts.
7. Visualize tube passing through vocal cords.
8. **Confirm and document tube placement using an $EtCO_2$ monitoring.**
9. Inflate the cuff with 3 – 10cc of air; secure the tube using a commercial tube holder.
10. Auscultate for bilaterally equal breath sounds and absence of sounds over the epigastrium. If you are unsure of placement, remove tube and ventilate patient with a BVM.

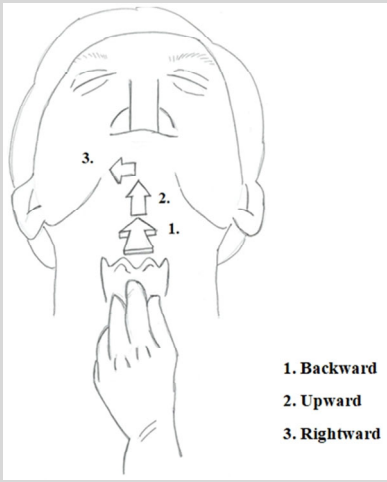


Figure 2. BURP Maneuver

11. Apply waveform capnography. After 3 ventilations, $EtCO_2$ should be >10 or comparable to pre-intubation values. If < 10, check for adequate circulation, equipment, and ventilatory rate. If $EtCO_2$ remains < 10 without physiologic explanation, remove the ETT and ventilate using an airway adjunct and BVM.

Airway: Endotracheal Intubation

12. Consider using an i-Gel if intubation efforts are unsuccessful.
13. Monitor $EtCO_2$ and record readings on scene, en route to the hospital, and at the hospital.
14. Document ETT size, time, result (success) and placement location by the centimeter marks either at the patient's teeth or lips in the EHR. Document all devices used to confirm initial tube placement. Also document positive or negative breath sounds before and after each movement of the patient.
15. Use caution when transferring intubated patient to and from gurney as this is where there is the highest likelihood for tube dislodgement. Reassess tube placement at these events.

Cardiac Arrest Management

	Applies to:
E	EMT
P	Paramedic

Clinical Indications:

Each and every out-of-hospital adult cardiac arrest (OHCA) which results in the activation of the EMS System shall be managed using CPR-Highly Defined (CPR-HD). CPR-HD is the expected standard of care for cardiac arrest in Contra Costa County.

Purpose:

The purpose of CPR-HD is to provide a structured, standardized and choreographed approach to cardiac arrest management. The CPR-HD 'Script' is time driven and serves as the 'CODE' leader.

Principles:

1. Resuscitation is based on proper planning and organized execution. Procedures require space and patient access. Make room to work. Utilize a team focused approach assigning responders to predetermined tasks.
2. The unit first on scene shall establish and follow the CPR-HD Script. Efforts should be dispensed to ensure adequate timekeeping occurs throughout the resuscitation.
3. Cardiac arrest management efforts should be directed at high quality and continuous chest compressions with limited interruptions. Our goal is to provide two (2) minutes of straight continuous compressions with a less than ten (<10) second pause.
4. In cardiac arrest, early administration of Epinephrine in non-shockable rhythms and high quality compressions and defibrillations in shockable rhythms are important.
5. Conduct resuscitation with goal of preserving cerebral function through meticulous attention to procedure.
6. Placement of an advanced airway should be deferred unless a provider is unable to ventilate the patient with a BLS airway and BVM or when the patient maintains ROSC.
7. Once transport is deemed appropriate and the patient has experienced a return of spontaneous circulation (ROSC) at any time throughout the resuscitation; transport to a STEMI receiving Center.

Contra Costa County Emergency Medical Services

Cardiac Arrest Management

Time (mins)	Provider #1 (ALS)	Provider #2 (BLS)
0-2	Stopwatch/Full Code App **Compressions**	Apply pads Insert OPA with O_2 via NRB Setup IV/IO supplies @1:45 charge defibrillator/AED
Shockable rhythm? DEFIBRILLATION		
2-4	NRB Establish IV/IO access Non-shockable? Epinephrine every 4 min @3:45 charge defibrillator/AED	Compressions
Shockable rhythm? DEFIBRILLATION		
4-6	Compressions Shockable? Epinephrine every 4 min	NRB @5:45 charge defibrillator/AED
Shockable rhythm? DEFIBRILLATION		
6-8	Consider Hs and Ts (hx/rx) Amiodarone 300mg* Begin PPV + $EtCO_2$ @ 6/min @7:45 charge defibrillator/AED	Compressions
Shockable rhythm? DEFIBRILLATION		
8-10	Compressions	PPV + $EtCO_2$ @ 6/min @9:45 charge defibrillator/AED
Shockable rhythm? DEFIBRILLATION***		
10-12	PPV + $EtCO_2$ @ 6/min Amiodarone 150mg* @11:45 charge defibrillator/AED	Compressions
Shockable rhythm? DEFIBRILLATION		
12-14	Compressions	PPV + $EtCO_2$ @ 6/min @13:45 charge defibrillator/AED

Consider advanced airway placement if patient achieves ROSC

*Amiodarone is only indicated in shockable rhythms refractory to three (3) shocks

***Early transport to a SRC is indicated under the following circumstances:

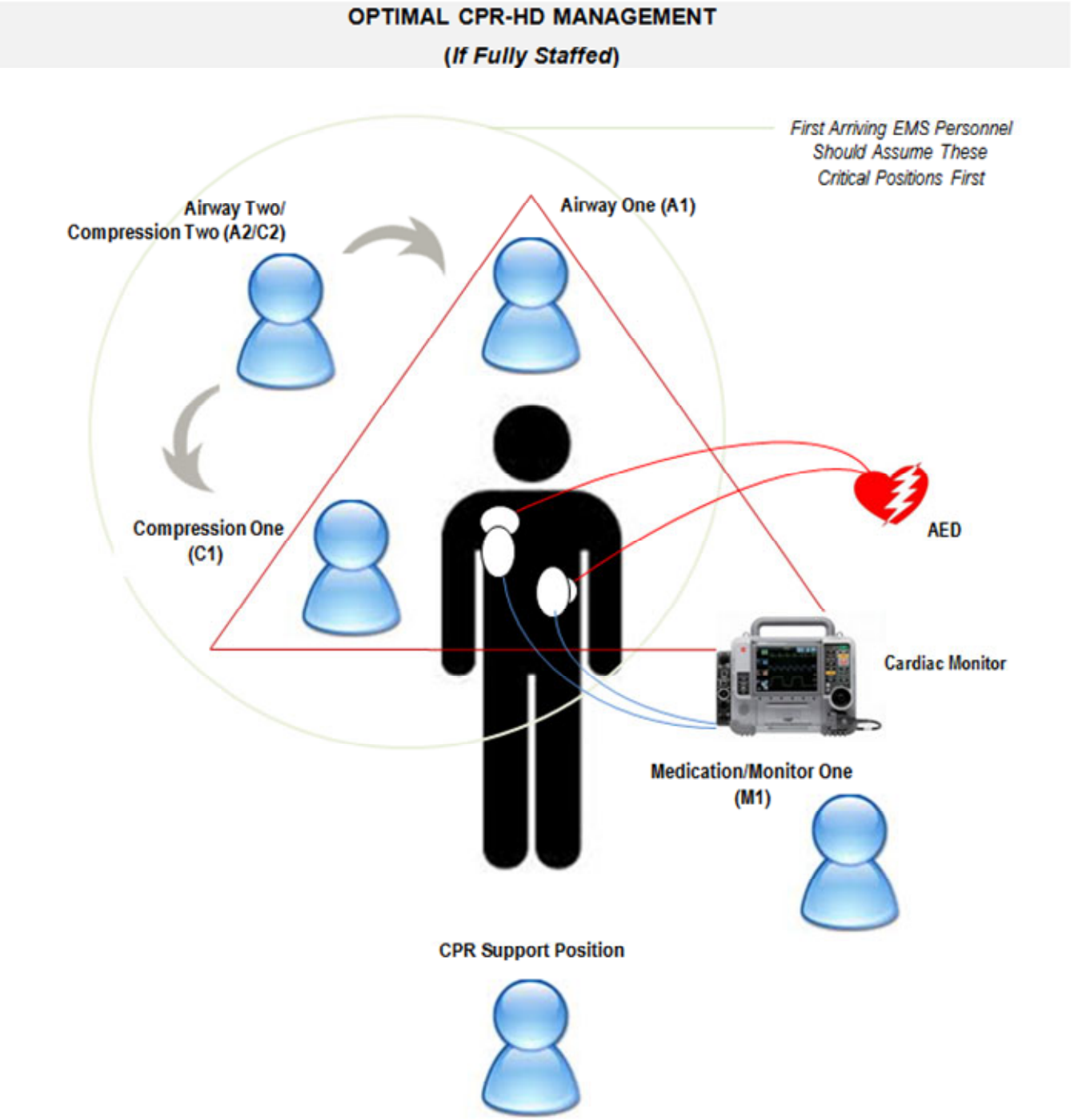
- Witnessed arrest with suspicion of pulmonary embolism; or
- V-Fib arrest resistant to four (4) shocks (refractory V-Fib).

Cardiac Arrest Management

Shockable rhythm? DEFIBRILLATION		
14-16	PPV + $EtCO_2$ @ 6/min @15:45 charge defibrillator/AED	Compressions
Shockable rhythm? DEFIBRILLATION		
16-18	Compressions	PPV + $EtCO_2$ @ 6/min @17:45 charge defibrillator/AED
Shockable rhythm? DEFIBRILLATION		
18-20	PPV + $EtCO_2$ @ 6/min @19:45 charge defibrillator/AED	Compressions
Shockable rhythm? DEFIBRILLATION		
20-22	Compressions	PPV + $EtCO_2$ @ 6/min @21:45 charge defibrillator/AED
Shockable rhythm? DEFIBRILLATION		
22-24	PPV + $EtCO_2$ @ 6/min @23:45 charge defibrillator/AED	Compressions
Shockable rhythm? DEFIBRILLATION* **		
24-26	Compressions	PPV + $EtCO_2$ @ 6/min @25:45 charge defibrillator/AED
Shockable rhythm? DEFIBRILLATION		
26-28	PPV + $EtCO_2$ @ 6/min @27:45 charge defibrillator/AED	Compressions
Shockable rhythm? DEFIBRILLATION* **		
28-30	Compressions	PPV + $EtCO_2$ @ 6/min @29:45 charge defibrillator/AED
Shockable rhythm? DEFIBRILLATION		
30	Termination of efforts: If non-shockable rhythm persists for 30 minutes despite resuscitative efforts, consider discontinuation of CPR	**Naloxone for suspected OD only, Sodium Bicarb or Calcium Chloride for renal failure or suspected hyperkalemia only, Sodium Bicarb for ext down time**

If indicated, contact the Base Hospital for order to terminate efforts

Cardiac Arrest Management



Intraosseous Access

Applies to:
P Paramedic

Clinical Indications:

1. Patients where rapid, regular IV access is unavailable with any of the following:
   a. Cardiac arrest
   b. When IV access is unsuccessful or, after evaluation of potential sites, it is determined that an IV attempt would not be successful in the setting of:
      i. Shock or evolving shock, regardless of the cause.
      ii. Impending arrest or unstable dysrhythmia.

Contraindications:

1. Fracture of the targeted bone.
2. IO within the past 48 hours in the targeted bone.
3. Infection at the insertion site.
4. Burns that disrupt actual bone integrity at the insertion site.
5. Inability to locate landmarks or excessive tissue over the insertion site.
6. Previous orthopedic procedure near the insertion site (e.g. prosthetic limb or joint).

Procedure:

1. Proximal humerus (preferred site in patients with perfusing rhythm)
2. Proximal tibia
3. Distal tibia (if proximal humerus or proximal tibia are unsuitable)

Procedure:

1. Locate the insertion site:
   a. The proximal humerus site is the greater tubercle, identifiable as a prominence on the humerus when the arm is rotated inward and the patient's hand is on the abdomen.
   b. The proximal tibia site is on the flat medial aspect of the tibia, 2 finger-breadths below the lower edge of the patella and medial to the tibial tuberosity.
   c. The distal tibia site is 2 finger-breadths above the most prominent aspect of the medial malleolus (inside aspect of ankle) in the midline of the shaft of the tibia.
2. Prep the selected site with chlorhexidine and allow to air dry.

Intraosseous Access

3. Select and load the appropriate sized needle on the driver.
   a. For humeral access, a 45mm (yellow) needle is used except in patient adults less than 40kg.
   b. For proximal and distal tibial access, the amount of soft tissue should be gauged to determine if a 25mm (blue) or 45mm (yellow) needle is appropriate.
4. Introduce the IO needle through the skin without engaging the power driver:
   a. For humeral access, the direction of the needle should be perpendicular to the skin, directed at a downward angle of 45 degrees from the frontal plane, heading slightly downward toward the feet.
   b. For tibial sites, the direction of the needle should be at a 90 degree angle to the flat surfaces of the tibia.

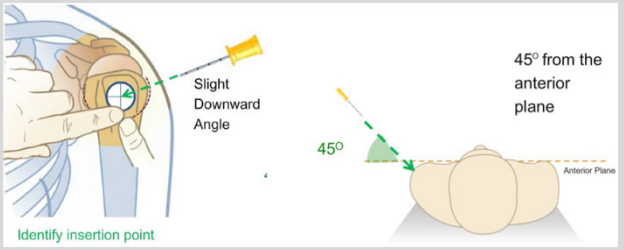


Figure 1. Humeral access

5. Once the needle has touched the bone surface, assess to see if the black line on the needle is visible. If it is not visible, either a larger needle is needed, or in the case of the 45mm needle, the soft tissue is too thick to allow the use of that needle.
6. With firm pressure, insert needle using the power driver. In most cases, the hub should be flush or touching the skin. Verify that the needle is firmly seated in the bone; it should not wobble.

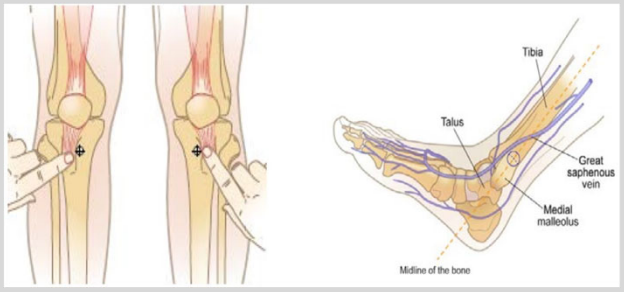


Figure 2. Tibial Sites

7. Remove the stylet and introduce Lidocaine if the patient is not in arrest.
   a. For adult patients not in arrest, 40mg of Lidocaine should be infused slowly over 1-2 minutes and allow 1 additional minute before flushing.
   b. For patients in arrest, Lidocaine is not necessary but may be needed if the patient regains consciousness.
8. Flush with 10ml Saline. In conscious patients, flush with 5ml Saline initially and repeat if necessary.
9. Attach stabilizer to skin.
10. Attach IV tubing to IO hub and begin infusion using pressure bag.
11. If painful, an additional 20mg of Lidocaine can be infused over 30 seconds, and after another minute, infusion should be restarted.
12. Monitor site for swelling or signs of infiltration and monitor pulses distal to area of placement.
13. Place wristband included with IO set on patient.

Vascular Access

Applies to:
P Paramedic

Clinical Indications:

1. Any patient where intravenous access is indicated (significant trauma, emergent, or potentially emergent medical condition) for fluid or medication therapy.

Procedure:

1. Saline locks may be used as an alternative to an IV tubing and IV fluid in every treatment guideline at the discretion of the ALS provider.
2. Paramedics can use intraosseous access where threat to life exists as provided for in the Intraosseous procedure.
3. Use the largest catheter necessary based upon the patient's condition and size of veins.
4. Select the most appropriate site:
   a. Arm – General fluid and medications. *Not* preferred site for patients in shock.
   b. Antecubital – Preferred site for patients in shock, cardiac arrest, who will receive Adenosine, or when a peripheral site is not available.
   c. Intraosseous (IO) – Preferred site for critical patients where IV access was unsuccessful.
   d. External Jugular (EJ) *Adult Only* – Unstable patients who need emergent IV medications or fluids AND no peripheral site is available AND IO access is not appropriate.
5. Inspect the IV solution for expiration date, cloudiness, discoloration, leaks, or the presence of particles.
6. Connect IV tubing to the solution in a sterile manner. Fill the drip chamber half full and flush the tubing, thus bleeding all air bubbles from the line.
7. Place a tourniquet around the patient's extremity to restrict venous flow only.
8. Prep the skin with chlorhexidine and allow to air dry.
9. Insert the needle with the bevel up into the skin in a steady, deliberate motion until a blood 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 a sharps container without recapping.
11. Remove the tourniquet and connect the IV tubing or saline lock.
12. Open the IV to assure free flow of the fluid and then adjust the flow rate as clinically indicated.

Drug Reference

Drug	Indication	Dosing	Cautions	Comments
Acetaminophen	Moderate to severe pain	1 gm over 15 minutes for patients greater than 50 kg	Active liver disease, history of transplant, patients currently taking Acetaminophen containing products such as cold/cough medicine, percocet or vicodin	Should not be directly administered into IV site. Set up as piggyback. Not for use in patients with chest pain of cardiac origin.
Adenosine	Narrow complex tachycardia	Initial – 6mg rapid IV Repeat – 12mg rapid IV Follow each dose with 20ml NS rapid IV Refer to pediatric dosing guide	May cause transient heart block or asystole. Use caution when patient is taking carmbamazepine, dipyramidole, or methylxanthines. Do not administer if patient is experiencing acute asthma exacerbation.	Side effects include: chest pressure/pain, palpitations, hypotension, dyspnea, or feeling of impending doom.
Albuterol	Bronchospasm	5mg nebulized Repeat as needed 5mg nebulized Repeat as needed	Use caution in patients taking MAOIs (antidepressants Nardil and Parnate)	None
	Crush injury - hyperkalemia	5mg nebulized continuously		
Amiodarone	V-Fib Pulseless V-Tach	Initial – 300mg IV/IO Repeat – 150mg IV/IO if rhythm persists Refer to pediatric dosing guide	In patients with pulses, may cause hypotension. Do not administer if patient is hypotensive. Do not use filter needle.	When creating infusion, careful mixing is needed to avoid foaming of medication.
	Symptomatic stable V-Tach	Initial – 150mg IV/IO drip over 10 minutes Repeat – 150mg IV/IO if needed		

Drug Reference

Drug	Indication	Dosing	Cautions	Comments
Aspirin	Chest pain – suspected cardiac or STEMI	**324mg PO**	Contraindicated in aspirin or salicylate allergy.	Blood thinner use is not a contraindication.
Atropine	Unstable bradycardia	Initial – 1mg IV/IO Repeat every 3-5 minutes to a max of 3mg Refer to pediatric dosing guide	Doses less than 0.5mg can cause paradoxical bradycardia.	Can dilate pupils, aggravate glaucoma, cause urinary retention, confusion, and dysrhythmias including V-Tach and V-Fib. Increases myocardial oxygen consumption. Bradycardia in children is primarily related to respiratory issues – assure adequate ventilation first.
	Organophosphate overdose	Initial – 1-2mg IV/IO Repeat every 3-5 minutes until relief of symptoms is achieved Refer to pediatric dosing guide		
Calcium Chloride	Hydrofluoric acid exposure Crush injury Suspected hyperkalemia	500mg IV/IO for tetany or cardiac arrest 1g IV/IO over 60 seconds	Use cautiously or not at all in patients on digitalis. Avoid extravasation. Rapid administration can cause dysrhythmias or arrest.	Administer 20ml flush IV/IO when delivering in conjunction with Sodium Bicarbonate.
Dextrose 10%	Hypoglycemia	Initial - 100ml IV Repeat – 150ml if glucose remains ≤ 60mg/dl Refer to pediatric dosing guide	Can cause tissue necrosis if IV is infiltrated	Recheck blood glucose after administration.
Diphenhydramine	Allergic reaction	50mg IV/IO/IM Refer to pediatric dosing guide	None	None
	Dystonic reaction	50mg IV/IO/IM		

Drug Reference

Drug	Indication	Dosing	Cautions	Comments
Epi 1:100,000 Push Dose Epi	Adult post resuscitation (ROSC) with systolic BP < 90mmHg	10mcg (1 ml) IV/IO every 3 minutes to a systolic BP > 90 mmHg	Use caution when mixing to make the correct concentration of EPI (1:100,000). Dose should be provided by drawing up only what will be administered to prevent possible overdosing.	**With Base contact**, Push Dose EPI can be administered in patients with hypotension (systolic BP <90mmHg) in Sepsis after fluid administration. LP15 Monitor should be set to cycle BP every 3 minutes.
Epi 1:10,000	Cardiac arrest	1mg IV/IO every 3-5 minutes	May cause serious dysrhythmias or exacerbate angina. In adult anaphylactic patients, should be used if patient is hypotensive or no improvement after Epi 1:1,000 IM dose. In pediatric anaphylactic patients, should only be administered if Epi 1:1,000 IM dose is ineffective.	Alpha and beta sympathomimetic. Use ½ dose for patients: • with history of CAD; or • > 50 years of age
	Cardiac arrest/ Bradycardia	Refer to pediatric dosing guide		
	Anaphylactic shock	0.1mg slow IV/IO increments titrated to effect to a max of 0.5mg		
		Refer to pediatric dosing guide		
Epi 1:1,000	Anaphylactic shock	0.3mg IM	Never administer IV/IO. Use with caution in asthma patients with a history of hypertension or coronary artery disease. May cause serious dysrhythmias or exacerbate angina.	Use ½ dose for patients: • with history of CAD; or • > 50 years of age
		Refer to pediatric dosing guide		
	Asthma/COPD or Pediatric respiratory distress	0.3mg IM		
		Refer to pediatric dosing guide		
EpiPen EpiPen Jr. E	Allergic reaction/ Anaphylaxis	1 auto-injector	See Epinephrine 1:1,000 and Epinephrine 1:10,000	See Epinephrine 1:1,000 and Epinephrine 1:10,000
		1 auto-injector		

Drug Reference

Drug	Indication	Dosing	Cautions	Comments
Fentanyl	Pain control	Initial - 25-50mcg IV/IO or 50-100mcg IM or 100mcg IN (50mcg each nare) May repeat to max of 200mcg Refer to pediatric dosing guide	Can cause hypotension or respiratory depression.	Recheck vital signs between each dose. Hypotension is more common in patients with low cardiac output or volume depletion. Respiratory depression is reversible with naloxone. Additional IV/IO doses can be administered every 5 minutes. IM and IN doses can be repeated once in 15 minutes.
Glucagon	Hypoglycemia	1mg IM Refer to pediatric dosing guide	None	Effect may be delayed 15-20 minutes
Ketamine	Mild to Moderate Pain	50-69 kg – 15mg IV 70-89 kg – 20 mg IV ≥ 90 kg – 30 mg IV	Contraindicated in patients with multisystem trauma, ALOC and pregnancy, chest pain of cardiac origin	Draw in a tuberculin syringe and dilute dose in 10 ml or 100 ml NS for infusion over 2 minutes
Lidocaine	IO anesthetic	Initial – 40mg IO Repeat dose – 20mg if painful Refer to pediatric dosing guide	None	Effect may be delayed 15-20 minutes
Midazolam	Seizure	10mg IM (preferred) 10mg IN (5mg each nare) 6-8 mg IV/IO (if established) May repeat to a max of 10mg Refer to pediatric dosing guide	Use caution in patients over 60 years of age.	Observe respiratory status after administration.

Drug Reference

Drug	Indication	Dosing	Cautions	Comments
Midazolam	Behavioral emergency	Initial - 5mg IM *or* 1-3mg IV in 1mg increments May repeat to a max of 5mg For excited delirium Initial – 10mg IM May repeat to a max of 10mg For patients ≥ 12 years of age only. Refer to pediatric dosing guide	Use caution in patients over 60 years of age.	Observe respiratory status after administration. For pediatric patients, repeat administration require Base Hospital orders.
	Sedation for pacing or cardioversion	1mg IV/IO Titrate in 1-2mg increments to a max of 5mg Refer to pediatric dosing guide		
	Sedation of patient with an advanced airway	2-5mg IV/IO May repeat to a max of 5mg Refer to pediatric dosing guide		
Naloxone	Respiratory depression or apnea	2-4mg IN or 1-2mg IV/IM Refer to pediatric dosing guide	Abrupt withdrawal symptoms and combative behavior may occur.	IN administration preferred unless patient is in shock or has copious secretions/blood in nares. Shorter duration of action than that of narcotics. Titrate to effect of normal respirations; it is not necessary to fully wake the patient.
Naloxone E	Overdose	1 preload syringe	See Naloxone	See Naloxone

Drug Reference

Drug	Indication	Dosing	Cautions	Comments
Nitroglycerin	Chest pain	0.4mg SL May repeat to a max of 3 doses	Can cause hypotension and headache. Do not administer if systolic BP < 90mmHg. Do not administer if patient has taken Viagra, Levitra, within past 24 hours or Cialis if taken within 36 past hours. Use caution and consider base contact if HR >120.	Perform 12-Lead ECG prior to administration.
	Pulmonary edema	0.4mg SL if systolic BP > 90mmHg 0.8mg SL if systolic BP > 150mmHg May repeat appropriate dose every 5 minutes		
Ondansetron	Vomiting or severe nausea	4mg IV/IO/IM/ODT May repeat after 15 minutes Refer to pediatric dosing guide	Administer IV/IO dose over 1 minute as rapid administration may cause syncope.	None
Sodium Bicarbonate	Tricyclic antidepressant overdose	1mEq/kg IV/IO	Can precipitate with or inactivate other drugs.	Use only if life-threatening or in the presence of hemodynamically significant dysrhythmias. Administer 20ml flush IV/IO when delivering in conjunction Calcium Chloride.
	Crush injury			
	Hyperkalemia	50mEq IV/IO		
Tranexamic Acid (TXA)	Blunt or penetrating injury within 3 hours, **OR** Postpartum hemorrhage with > 500 ml blood loss, **AND** SBP < 90 due to uncontrolled hemorrhage	**1gm in 100ml IV/IO over 10 minutes**	Do not administer to: • Patient < 15 years old • Isolated head injury • Cervical cord injury with motor deficit • Traumatic arrest > 5 min, CPR without ROSC • Isolated drowning • Hanging victims	Do not delay transport to administer TXA.