

ATTENTION!

TO: All Loyola EMS Providers

FROM: Loyola EMS System Office

RE: Induction of Hypothermia for ROSC

Please note that Loyola EMS Providers are not following the Induction of Hypothermia for ROSC SOP at this time. We ask that the focus be on aggressive resuscitation of the cardiac arrest patient. We anticipate future use of this SOP as receiving hospitals become better equipped to handle hypothermia induction from the field.

If you have any questions, please contact your EMS Coordinator/ Educator or the Loyola EMS Office.

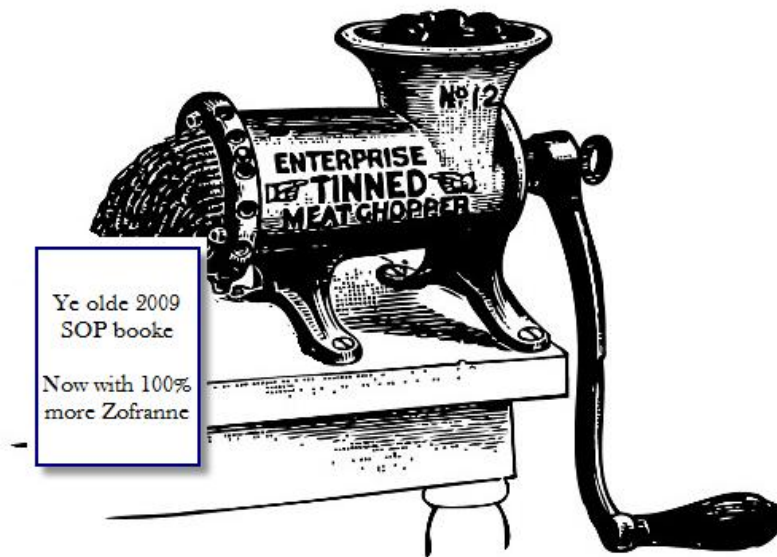
SOP Region VIII

SOP Update - Part I

General Patient Guidelines

Cardiac SOP's

Drug Appendix



Region VIII EMS Systems

Continuing Education

July 2009

Objectives

1. Introduce the SOP revision process
2. Highlight revisions to:
 - General Patient Management Guidelines
 - Cardiac SOPs
 - Drug Appendix

To be covered this month but not included in this packet:

- BLS Skill – AED setup and use
- ALS Skill – Transcutaneous Pacing
- ALS Skill – Calculate dopamine dosages

“Laws are like sausages, it is better not to see them being made” – Otto von Bismark

***“SOPs are like sausages, it is better not to see them being made”
Region VIII Medical Directors***

The Process:

- Initial draft work began 9/2008
- Series of meetings of EMSMDs
- Various distributed drafts
- > 140 comment lines reviewed
- Typos fixed
- EMSC protocols enmeshed
- Drug Appendix rewritten
- Forwarded to IDPH for review 5/2009

Major Changes:

- EMSC guidelines implemented – separate pediatric SOPs for many diseases and situations
- Zofran for nausea
- Simpler dopamine dosing
- CHF SOP now includes CPAP
- Cooling for cardiac arrest with ROSC (return of spontaneous circulation)
- Drug Assisted Intubation – Etomidate only for adults
- Peds age now ≤ 15

Just a small sample of the changes considered and not implemented:

Can we consider giving Etomidate to patients <12 yrs	Etomidate use standardized to age > 15
Can the Etomidate dose be 0.6 mg/kg across the board?	consistent with literature as-is
• Limit ET attempts to ONE or TWO before defaulting to an adjunct airway (CombiTube / King Airway)	No hard limit set per EMSMDs. At discretion of caregivers.
Any chance of adding Atrovent for COPD patients?	No clear EMS clinical benefit
Ketamine for sedation, without respiratory depression or hypotension.	No clear clinical benefit over current sedative meds
Please add Valium back in as a choice for seizure patients	EMSMDs feel that Versed is correct medication
Consider MAD device for nasal Versed in Behavioral Emergencies	Too high risk of being bitten when administering rx
Add vasopressin and Amiodarone for cardiac arrest / Vf	No clear clinical benefit of either medication over what is currently used

There were over 50 suggestions and corrections that were incorporated.

Standard Operating Procedures

These protocols have been developed and approved through a collaborative process involving the Region 8 Resource Hospitals:

Central DuPage, Edward, Good Samaritan, Loyola

THEY SHALL BE UTILIZED:

- ★ as written orders of a physician for treatment guidelines to be administered by authorized members of the Region 8 EMS Systems as circumstances allow for the treatment of the ill or injured patient
- ★ as the prehospital standing medical orders to be initiated by System EMTs or Prehospital RNs until such time that online medical control is established through communications with a base station hospital. In the event that communications cannot be established, prehospital personnel shall continue to provide treatment to the degree authorized by the EMS Medical Directors in these protocols.
- ★ in disaster situations as the basis of patient treatment, given that usual and customary forms of communication are contraindicated, in accordance with the area-wide disaster plans.
- ★ as the standing medical orders to be used by ECRNs when directing prehospital care.

System members are authorized to carry out these protocols to the extent necessitated by the patient's condition. Medical control contact will be established as soon as practical under the circumstances, without endangering the patient.

It is recognized that hospice patients, patients presenting with valid DNR orders, patients who have not responded to ALS procedures, or patients involved in a multiple victim incident (MVI) present unique circumstances that may, in the medical opinion of the physician directing the call, justify deviation from these protocols, including bypassing the nearest hospital.

Standing Orders that are not labeled either PEDIATRIC or ADULT have elements applying to all age groups. Unless otherwise noted, PEDIATRIC patients are those patients 15 years and younger.



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 EMS Medical Director
 Central DuPage EMS System



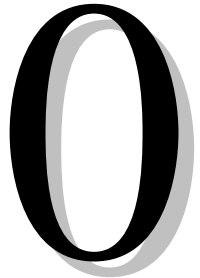
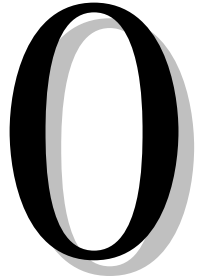
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 Standard Operating Procedures

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Standard Operating Procedures**

The Standard Operating Procedures assume that certain tasks will be done simultaneously by the EMS Personnel. The order in which the tasks appear is not necessarily in order of need or importance.

OUTLINE FOR RADIO REPORT

TRANSMIT THE FOLLOWING, BEING AS CONCISE AS POSSIBLE:

1. Name and vehicle number of provider, desired destination, and ETA. Indicate if desired destination is the nearest by travel time, and any reasons for desiring to transport to other than the nearest hospital.
2. Patient age, sex, and approximate weight.
3. Level of consciousness and orientation.
4. Chief complaint and paramedic impression, including severity:
 - symptoms, degree of distress, severity of pain on a scale of 0-10
 - mechanism of trauma/pertinent scene information
 - pertinent negatives/associated complaints
5. Vital signs
 - Pulse - rate, quality, regularity
 - Blood Pressure - auscultated or palpated
 - Respirations - rate, pattern, depth
 - Skin - color, temperature, moisture, turgor
6. History
 - Signs and Symptoms**
 - Allergies**
 - Medications: time and last dosage taken (bring all Rx to ED)**
 - Past history of pertinent illness / injury**
 - Last oral intake (food or fluid) if known, Last Menstrual Period**
 - Events surrounding event**
7. Clinical findings
 - assessment findings from review of systems - pertinent (+) and (-) findings
 - interpretation of ECG and vital signs q 15 minutes and after each ALS intervention: q 5 minutes if unstable
 - GCS and blood glucose for patients with altered mental status
 - trauma score parameters if appropriate

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GENERAL PATIENT ASSESSMENT

BLS / ALS

1. Assess and secure scene safety
2. Use BSI (Body Substance Isolation) precautions on all patients

ADULT

3. Adult Initial Assessment

- a. Airway – establish and maintain an airway. Utilize cervical spine precautions when indicated
- b. Breathing – assess; assist or provide ventilations as indicated
- c. Circulation – check pulse and control hemorrhage
- d. Disability – neurologic
 - A – Alert
 - V – responds to Verbal stimuli
 - P – responds to Painful stimuli
 - U – Unresponsive
- e. Expose and examine as indicated
- f. Identify priority transports

4. Focused History and Physical Exam

- a. **Signs & Symptoms**, Systematic head-to-toe assessment including GCS
- b. **Allergies**
- c. **Medications**
- d. **Pertinent Medical History**
- e. **Last oral intake, Last Menstrual Period**
- f. **Events leading to present condition**
- g. Initial set of Vital Signs
- h. Rate pain 0-10 scale

5. Detailed Physical Exam (patient and injury specific when appropriate)

6. Ongoing Assessment

- a. Reassess ABCD's

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**CONSIDERATION FOR PATIENTS WITH SPECIAL
HEALTHCARE NEEDS**

- ◆ **Adults and Children** with Special Healthcare Needs in your service community and become familiar with both the patient as well as their anticipated emergency care needs.
- ◆ Refer to patient's emergency care plan formulated by their medical providers, if available. Understanding the patient's baseline will assist in determining the significance of altered physical findings. Parents or caregivers are the best source of information on: medications, baseline vitals, functional level / normal mentation, likely medical complication, equipment operation and troubleshooting, emergency procedures.
- ◆ Regardless of underlying conditions, assess in a systematic and thorough manner. Use parents/caregivers/home health nurses as medical resources.
- ◆ Be prepared for differences in airway anatomy, physical development, cognitive development, and possible existing surgical alterations or mechanical adjuncts. Common home therapies include: respiratory support (oxygen, apnea monitors, pulse oximeters, tracheostomies, and mechanical ventilators), cardiac devices (LVADs, continuous infusions), nutrition therapy (nasogastric or gastrostomy feeding tubes), intravenous therapy (central venous catheters), urinary catheterization or dialysis (continuous ambulatory peritoneal dialysis), biotelemetry, ostomy care, orthotic devices, communication or mobility devices or hospice care.
- ◆ Communicate with the patient in an age appropriate manner. Maintain communication with and remain sensitive to the parents/caregivers and the patient.
- ◆ The most common emergency encountered with pediatric patients is respiratory related and so familiarity with respiratory emergency interventions / adjuncts / treatment is appropriate.

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ADULT INITIAL MEDICAL CARE

BLS/ALS

1. Loosen tight clothing and reassure patient
2. Place patient in semi-Fowler's position or position of comfort unless contraindicated.
3. Enhance airway patency by suctioning and/or insertion of an oropharyngeal or nasopharyngeal airway as needed
4. Administer supplemental **OXYGEN AT LOW FiO₂** (4-6 LPM nasal cannula).
 - If unstable, increase **OXYGEN TO HIGH FiO₂** (12-15 LPM non-rebreather mask)
 - If hypoventilating or apneic, **VENTILATE WITH HIGH FiO₂** (BVM with ≥ 15 LPM oxygen supply)

ALS

- Oxygen saturation if pulse oximetry available.
 - If intubated, use end tidal CO₂ detector and/or esophageal intubation detection device per System-specific policy.
 - If unable to intubate, consider use of **Alternative Airway (CombiTube, King Airway)**.
5. If altered mental status
 - Place patient on side (vomiting precautions), unless contraindicated
 - Check glucose level. If glucose < 60, treat per Diabetes / Glucose Emergencies SOP.
 6. Evaluate cardiac rhythm if indicated. All ALS patients do not necessarily require continuous ECG monitoring or transmission of a strip to the telemetry base station.
 - Consider 12-lead ECG on all patients with cardiac-related complaint, dysrhythmias or syncope
 7. Establish venous access via **IV of NORMAL SALINE (NS) at 20-30 mL/hr** with regular drip tubing or consider **SALINE LOCK** as indicated by patient condition. Attempt x 2 unless requested to continue or situation indicates.
 - Continuing use of central venous access devices is acceptable for transport if initiated by RN or physician. Document the name of the on-scene healthcare provider or trained caregiver, i.e. parent. Contact Medical Control prior to administration of any medications.
 - If patient encountered with continuous infusion devices or home medication devices, transport unaltered and contact Medical Control.
 - Per System-specific policy, **INTRAOSSUEOUS ACCESS** may be used in patients for whom vascular access is urgently needed.

BLS/ALS

8. **Pain management** should be considered in the care of all patients. Ask patient to rate pain on a scale of 0-10.
9. **ALS:** If patient experiencing nausea, consider **ZOFRAN ODT 4 mg tab placed sublingually x 1 dose only**.
10. Attempt to contact Medical Control as soon as care is completed or patient's condition is stabilized. Transmit assessment and treatment information and

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await orders.

11. **Recheck and record VS** and patient condition **at least every 15 minutes** as able and after each ALS intervention. **For unstable patients more frequent re-assessment may be needed.** Note the times obtained.
12. Transport to the closest appropriate hospital. **Note: By law, a physician must certify that the benefits outweigh the risks of transport to a facility other than the closest appropriate hospital. Establish Medical Control contact before initiating transport. ECRN must contact and obtain the availability of the intended receiving hospital before authorizing the bypass.**
13. Pursuant to Illinois Vehicle Code Section 625 ILCS 5/11-1421, the use of visual and audible warning devices from the scene to the hospital is authorized by the EMS Medical Director when deemed necessary by the healthcare provider(s) caring for the patient (refer to system-specific policy).

Certain situations may require that treatment, which would normally be administered on the scene, be attempted en route to the hospital. The patient's condition or behavior which necessitated abbreviated scene time should be thoroughly documented.

20 mL
x 10 drops / mL
200 drops over 1 hour

3.3333 drops / minute

30 mL
x 10 drops / mL
300 drops over 1 hour

5 drops / minute

**OUTLINE FOR STREAMLINED COMMUNICATION
FOR BLS CALLS ONLY**

1. Name and vehicle number of provider
2. Patient age and gender
3. Chief complaint / Mechanism of Injury
4. SOP being followed
5. Any deviation from SOP / unusual circumstances
6. ETA

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INITIATION OF ALS CARE

ALS should be initiated according to the following guidelines:

1. Patient with abnormal vital signs - regardless of complaints. The following are guidelines for adults:
 - a. Pulse < 60 or > 130; or irregularity
 - b. Respiration < 10 or > 28; or irregularity
 - c. Systolic Blood Pressure < 90 or > 200
2. Any patient with a potential life-threatening condition which exists or might develop during transport. Examples of situations in which ALS care is usually indicated include, but are not limited to:
 - a. Altered Mental Status and/or Unconsciousness
 - b. Chest Pain
 - c. Palpitations
 - d. Seizures
 - e. Neurologic Deficit / Stroke
 - f. Syncope or Near Syncope
 - g. Abdominal Pain
 - h. Shortness of Breath / Difficulty Breathing
 - i. Vaginal Bleeding
 - j. Complication of Pregnancy or Emergency Childbirth
 - k. GI Bleeding
 - l. Trauma
 - m. Overdose / Poisoning
3. In an uncooperative patient, the requirements to initiate assessment and full ALS service may be waived in favor of assuring that the patient is transported to an appropriate medical facility.

Document clearly the reasons ALS care was aborted.

4. Never discontinue ALS once initiated unless prior approval by Medical Control.
5. WHEN IN DOUBT, CONSULT WITH MEDICAL CONTROL.
6. **Drug Administration Guidelines for Pediatric Patients:** When calculating drug dosages for pediatric patients, the maximum individual doses and maximum total dose should not exceed the recommended adult dose and maximum. This does not apply to IV fluid challenges, where the pediatric bolus may exceed the 200 mL adult bolus.

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LOAD-AND-GO SITUATIONS

This SOP applies if circumstances demand hospital care for patient stability. In certain circumstances, a patient's condition may require prehospital providers to omit or abbreviate certain procedures described in these SOPs. The decision to deviate from Standard Operating Procedures must be documented thoroughly. This Standard Operating Procedure does not imply that the rate of speed of transport is accelerated, but rather, there is emphasis on rapid patient packaging and limited on-scene time (barring prolonged extrication). ***Any deviation from Standard Operating Procedures must be based on the medical judgment of the pre-hospital provider treating the patient.***

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WITHHOLDING OR WITHDRAWING OF RESUSCITATIVE EFFORTS

BLS/ALS

1. If at any time you are not certain which of these policies apply, begin treatment and contact Medical Control for orders.
2. Emotional support should be provided to significant others.
3. Disposition of the patient will be handled according to local and county requirements
4. **Use of SOP must be guided by a physician.** Contact should be established via telemetry radio or cellular phone. Note: **MERCI radio or private phone may be used in extenuating circumstances.**
5. Patients may be pronounced dead by an ED physician. The time of pronouncement should be documented on the patient care report (PCR).

ALS

6. Document thoroughly all circumstances surrounding the use of this procedure.
7. Attach a copy of the EKG rhythm strip to the provider copy of the PCR. If someone represents themselves as having Power of Attorney to direct medical care of a patient and/or a document referred to as a Living Will is present, follow these guidelines:

Power of Attorney for Healthcare

8. DNR requests can only be honored by EMS personnel if a **written DNR Order**, signed by the patient's physician, is presented.
9. Healthcare decisions other than DNR may be made by the Power of Attorney for Healthcare, if the document provides for this. If in doubt, begin treatment and contact Medical Control.
10. Bring any documents presented to the hospital.

Living Will/Surrogates

8. DNR requests can only be honored by EMS personnel if a **written DNR Order**, signed by the patient's physician, is present.
9. Living Wills **may not** be honored by field personnel. Begin or continue treatment. Contact Medical Control, explain the situation, and follow any orders received.
10. There are **no** situations in which a surrogate can directly give instructions to field personnel. Begin or continue treatment. Contact Medical Control, explain the situation and follow any orders received.

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WITHHOLDING OR WITHDRAWING OF RESUSCITATIVE EFFORTS

BLS/ALS

DNR Orders / Withholding Treatment

8. Confirm the validity of the DNR order according to System Policy. Components of a valid DNR order:
 - Must be a written document that has not been revoked. It must contain all of the following:
 - Name of patient
 - Name and signature of physician
 - Effective date
 - The words “Do Not Resuscitate”, “Withhold Treatment” or the equivalent
 - Evidence of consent – any of the following;
 - ◆ Signature of the patient, or
 - ◆ Signature of Legal Guardian, or
 - ◆ Signature of Durable Power of Attorney for Health Care Agent, or
 - ◆ Signature of surrogate decision maker under the Illinois Health Care Surrogate Act.
9. If the DNR order is valid, resuscitative efforts will be withheld. Follow any specific orders found on the DNR order.
10. In the event the patient has a valid DNR order but IS NOT in cardiac or respiratory arrest with a decompensating condition, begin IMC; if you are considering intubation **contact Medical Control**. If unable to contact Medical Control, follow appropriate SOP.
11. If resuscitative efforts were begun prior to the DNR form being present, efforts may be withdrawn once the validity of the order is confirmed. Contact Medical Control and explain the situation. Follow any orders received.

BLS/ALS

Obviously Dead Patients: “Triple Zero”

8. Obviously dead patients are those found to be non-breathing, pulseless, asystolic, and have one or more of the following long-term indications of death. No resuscitative efforts are to be initiated for the patients listed below:
 - ◆ Decapitation
 - ◆ Rigor Mortis without hypothermia
 - ◆ Profound dependent lividity
 - ◆ Decomposition
 - ◆ Mummification / putrification
 - ◆ Incineration
 - ◆ Frozen state
9. For patients appearing to be obviously dead but not listed above, contact Medical Control and explain the situation. Indicate that you have a “Triple Zero”. Follow any orders received.
10. Document pronouncement time and physician name.

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WITHHOLDING OR WITHDRAWING OF RESUSCITATIVE EFFORTS

BLS/ALS

Hospice Patients Not in Arrest

8. If patients are registered in a hospice program, initiate BLS care and immediately contact Medical Control for orders on treatment and disposition. Inform Medical Control of the presence of written treatment orders and/or valid DNR orders

ALS

Patients in persistent Asystole / PEA who do not respond to treatment:

Note: An order from a physician is required before stopping treatment under this SOP

8. Provide patient care, per SOP, based on the patient's condition
9. Contact Medical Control and explain the events of the call. Report treatments administered and any patient responses.
 - a. Confirm all of the following:
 - The patient is an adult, is normothermic, and experienced an arrest unwitnessed by EMS
 - The patient remains in Asystole / PEA
 - ET and **VASCULAR ACCESS** are confirmed as patent
 - Drug therapy, defibrillation, and CPR attempts have been carried out according to SOP
 - b. If the physician determines it is appropriate, s/he may give the order to discontinue medical treatment. It is not necessary that all four above criteria be met.
 - c. **Only an ED physician may make the determination to withdraw resuscitative efforts.**
 - d. Consult with Medical Control for disposition of patient. Record time of pronouncement and physician name.
10. If the physician gives the order to continue resuscitative efforts until you reach the hospital, treatment per appropriate SOP is to be carried out.
11. If unable to establish communications with Medical Control, resuscitative efforts should continue until the patient reaches the hospital.

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ADULT SUSPECTED CARDIAC PATIENT WITH CHEST PAIN

STABLE: alert, normotensive

BLS / ALS

1. **Initial Medical Care:**
2. Inquire about the patient's use of Viagra (sildenafil), Levitra (vardenafil), Cialis (tadalafil), or Revatio (sildenafil citrate) within 36 hours
3. **Baby Aspirin 324 mg** (4 x 81 mg tablets) chewed and swallowed
 - unless contraindicated
 - may omit if patient has taken aspirin within 8 hours

BLS

4. If patient has physician prescribed NTG and has not taken a maximum dose, and if SBP > 100 mmHg, administer **1 tablet or spray of NTG SL**
5. **Obtain 12-lead ECG** if able
 - Notify Medical Control of 12-lead ST elevation (STEMI) if noted
 - **Transport to the closest appropriate facility**

ALS

4. SBP > 100 mmHg and symptomatic: **NTG 0.4 mg SL**; may repeat NTG x 1 in 5 minutes if SBP > 100 mmHg and IV established
 - NOTE: Initial NTG may be given prior to IV start
5. **Obtain 12-lead ECG**
 - Notify Medical Control of 12-lead ST elevation (STEMI) if noted
 - **Transport to the closest appropriate facility**
6. If SBP > 100 mmHg and pain unrelieved by NTG, **MORPHINE SULFATE 2 mg IV increments up to 10 mg q 5 minutes prn**

Special considerations:

- avoid more than two IV attempts if patient is a candidate for thrombolytic therapy

UNSTABLE: altered mental status or signs of hypoperfusion

BLS

1. **Initial Medical Care**
2. Initiate **Expeditious Transport**. Notify Medical Control enroute

ALS

3. If P < 60, treat per **BRADYCARDIA SOP**
4. If P ≥ 60, treat per **CARDIOGENIC SHOCK SOP**
5. Treat dysrhythmias per appropriate SOP

Note:

Oral medications for erectile dysfunction (Viagra®, Levitra®, Cialis®, etc.) or pulmonary hypertension (Revatio™), may potentiate the effect of nitrates. Consult Medical Control prior to administering NTG in these situations

**Illinois Region 8 Emergency Medical Services
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ADULT BRADYDYSRHYTHMIAS

ALS

STABLE: alert, oriented, normotensive

1. **Initial Medical Care**
 - **Anticipate the need for transcutaneous pacing**
2. **Transport**

UNSTABLE: altered mental status, signs of hypoperfusion

1. **Initial Medical Care**

Supraventricular Bradycardia, Second Degree Type-I AV blocks

2. **ATROPINE 0.5 mg rapid IV/IO or 1 mg ET; may repeat ATROPINE q 3-5 minutes up to 3 mg until pacing available.**
3. If patient remains hypotensive and pulse < 60: initiate **TRANSCUTANEOUS PACING (TCP)** at an initial rate of 70 bpm per System procedure. Consider sedation with **VERSED in 2 mg increments IV/IO** to a maximum of 10 mg.
4. If patient remains symptomatic, **DOPAMINE 5 – 10 mcg/kg/min IVPB**

IVR, Second Degree Type II or Third Degree AV block

2. Initiate **TRANSCUTANEOUS PACING (TCP)** at an initial rate of 70 bpm per system procedure. Consider sedation with **VERSED in 2 mg increments IV/IO** to a maximum of 10 mg.
3. If patient remains symptomatic, **DOPAMINE 5 – 10 mcg/kg/min IVPB**

Note:

- If patient symptomatic, **do not delay pacing** while awaiting IV access or **Atropine** to take effect
- **Do not give Lidocaine** to patients in AV blocks or IVR

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**ADULT SUPRAVENTRICULAR TACHYCARDIA
(NARROW COMPLEX TACHYCARDIA RATE > 150)**

ALS

1. Search for treatable contributing causes:

Possible Cause	Field Treatment
Cardiogenic Shock	Cardiogenic Shock SOP
Heart Failure	Pulmonary Edema SOP
Hypovolemia	IV fluid challenge(s)
Hypoxemia	Ventilations with high FiO ₂ , verify ET tube placement
Hypoglycemia	Diabetic / Glucose Emergencies SOP
Hypothermia	Cold Emergencies SOP
Side effects of medications or overdose	
Tamponade (cardiac)	IV fluid challenge(s) to optimize preload
Tension Pneumothorax	Pleural decompression to affected side

STABLE: alert, normotensive

2. **Initial Medical Care** - start IV in proximal vein
3. **Valsalva maneuver** while preparing medication
4. If no response, **ADENOCARD 6 mg rapid IV** with 10 mL NS flush
5. If no response, **ADENOCARD 12 mg rapid IV** with 10 mL NS flush
6. If no response, **ADENOCARD 12 mg rapid IV** with 10 mL NS flush

UNSTABLE: heart rate > 150 with altered mental status and/or signs of hypoperfusion

2. **Initial Medical Care**
3. Consider sedation with **VERSED 2 mg increments** q 2 minutes to a maximum of 10 mg
4. **SYNCHRONIZED CARDIOVERSION @ 100 J** (monophasic or biphasic)
5. **If no response, repeat SYNCHRONIZED CARDIOVERSION** at recommended energy. Check rhythm and pulse between shocks.
6. If no response, consider Cardiogenic Shock SOP or contact medical control

ADENOCARD Notes:

- **ADENOCARD** should not be given to irregular rapid rhythms
- Follow **ADENOCARD** doses with rapid 10 mL NS flush

Defibrillator	Waveform	Adult Defib J	Adult Sync J
Monophasic		200-300-360	100-150-200-300-360
Medtronic ADAPTIV™	N/A	200-300-360	100-150-200-300-360
Philips SMART™	BTE	150	100-150-200
Welch-Allyn	BTE	200-300-360	100-150-200-300-360
Zoll	RB	120-150-200	100-120-150-200

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**ADULT VENTRICULAR TACHYCARDIA WITH PULSE
(WIDE COMPLEX TACHYCARDIA)**

ALS

STABLE: Alert and oriented, normotensive

1. **Initial Medical Care with HIGH FiO₂ OXYGEN**
2. **LIDOCAINE 1 mg/kg IV/IO (maximum dose 100 mg)**
 - a. If VT persists or PVCs present, rebolus with **LIDOCAINE 0.5 mg/kg IV /IO (max dose 50 mg) every 3 minutes up to 3 mg/kg**
 - b. If VT eliminated, rebolus with **LIDOCAINE 0.5 mg/kg IV/IO (max dose 50 mg)** 10 minutes after initial bolus
3. If no response, call Medical Control to consider **ADENOCARD**

UNSTABLE: Altered mental status. Signs of hypoperfusion, rate > 150

1. **Initial Medical Care with HIGH FiO₂ OXYGEN or VENTILATION**
2. Consider sedation with **VERSED in 2 mg increments** q 2 minutes to a maximum of 10 mg
3. **SYNCHRONIZED CARDIOVERSION at 100 J and LIDOCAINE 1 mg/kg IV/IO (max dose 100 mg).** Do not delay cardioversion attempts for IV start.
 - Assess pulse and rhythm after each cardioversion
 - Consider cardioversion if rhythm persists
 - If rhythm converts, follow appropriate SOP
 - Anytime VT converts to a supraventricular rhythm, give **LIDOCAINE 1 mg/kg IV/IO (max dose 100 mg)**. Rebolus in 10 minutes with **LIDOCAINE 0.5 mg/kg IV/IO (max dose 50 mg)**.
4. **If no response, repeat SYNCHRONIZED CARDIOVERSION** at recommended energy. Check rhythm and pulse between shocks.
5. Repeat **LIDOCAINE 0.5 mg/kg IV/IO (max dose 50 mg) every 3 minutes up to 3 mg/kg** if VT persists.
6. Repeat **SYNCHRONIZED CARDIOVERSION at recommended energy** after each **Lidocaine** bolus.

Note:

If VT becomes pulseless or deteriorates to V-fib, defibrillate immediately per V-fib SOP

Defibrillator	Waveform	Adult Defib J	Adult Sync J
Monophasic		200-300-360	100-150-200-300-360
Medtronic ADAPTIV™	N/A	200-300-360	100-150-200-300-360
Philips SMART™	BTE	150	100-150-200
Welch-Allyn	BTE	200-300-360	100-150-200-300-360
Zoll	RB	120-150-200	100-120-150-200

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**ADULT VENTRICULAR FIBRILLATION
PULSELESS VENTRICULAR TACHYCARDIA**

ALS

1. Verify pulselessness
2. **Precordial thump** if arrest is witnessed and defibrillator is not immediately available
3. **CPR** until defibrillator available
 - **While patient is pulseless, CPR should only be interrupted for ventilation (until intubated), rhythm check or shock delivery.** Rhythm checks should be brief and pulse checks only if an organized rhythm is observed
4. **DEFIBRILLATE** at recommended initial energy.
5. **Resume CPR immediately following defibrillation. After 2 minutes, pause CPR and check rhythm and pulse**
 - If VF / pulseless VT, **resume CPR** and **DEFIBRILLATE** at second recommended energy as soon as defibrillator charged
 - If rhythm converted after defibrillation, treat per appropriate SOP
6. **If pulseless, resume CPR. INTUBATE. IV / IO ACCESS** as able
7. **EPINEPHRINE 1:10,000 1 mg IV/IO or 1:1000 2 mg ET.** After 2 minutes of **CPR, DEFIBRILLATE** at maximum energy
8. **LIDOCAINE 1 mg/kg IV/IO (max dose 100 mg) or 2 mg/kg ET (max dose 200 mg).** After 2 minutes of **CPR, DEFIBRILLATE** at maximum energy
9. Repeat **EPINEPHRINE / CPR / DEFIBRILLATION** sequence q 2-3 minutes as long as pulseless rhythm persists
10. Repeat **LIDOCAINE / CPR / DEFIBRILLATION** sequence q 2-3 minutes up to 3 mg/kg.
11. Continue **CPR, EPINEPHRINE and SHOCK** sequence q 2-3 minutes.

Note:

- For any patient who experiences persistent return of spontaneous circulation, refer to **INDUCTION OF HYPOTHERMIA FOR ROSC SOP**
- **EPINEPHRINE 1:10,000 2 mg ET also acceptable, but 1:1000 preferred**
- If **EPINEPHRINE 1:1000** given ET, dilute with NS to a total of 10 mL
- **Flush all IV/IO push meds with the 20 mL IV fluid bolus**
- If V-fib converts to a supraventricular rhythm, bolus **Lidocaine 1 mg/kg IV/IO (max dose 100 mg)**, and rebolus **Lidocaine 0.5 mg/kg (max dose 50 mg)** after 10 minutes if not contraindicated to a maximum dose of 3 mg/kg
- **Defibrillation sequence is CPR – Rhythm Check – CPR (defibrillator charging or medication administration) - Shock**

Defibrillator	Waveform	Adult Defib J	Adult Sync J
Monophasic		200-300-360	100-150-200-300-360
Medtronic ADAPTIV™	N/A	200-300-360	100-150-200-300-360
Philips SMART™	BTE	150	100-150-200
Welch-Allyn	BTE	200-300-360	100-150-200-300-360
Zoll	RB	120-150-200	100-120-150-200

**Illinois Region 8 Emergency Medical Services
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ADULT ASYSTOLE / PULSELESS ELECTRICAL ACTIVITY

ALS

1. **CPR** until defibrillator available to check rhythm
 - **While patient is pulseless, CPR should only be interrupted for ventilation (until intubated), rhythm check or shock delivery.** Rhythm checks should be brief and pulse checks only if an organized rhythm is observed.
 - **After ET placed, give continuous CPR without pause for ventilation**
 - Search for possible treatable contributing causes:

Possible Cause	Field Treatment
Hypovolemia	IV fluid wide open
Hypoxemia	High FiO₂ ventilations , assure ET placement
Hypoglycemia	Check blood sugar and treat per Diabetic SOP
Hypothermia	Active rewarming if hypothermic
Tamponade (cardiac)	IV fluid wide open to maximize preload
Tension Pneumothorax	Pleural decompression to affected side

2. **EPINEPHRINE 1:10,000 1 mg IV/IO or 1:1000 2 mg ET**
 - Repeat q 3 minutes while pulseless
3. If asystole or bradycardia, **ATROPINE 1 mg rapid IV/IO or 2 mg ET**
 - Repeat q 3 minutes to a maximum of 3 mg IV/IO or 6 mg ET
4. If pulse returns, refer to appropriate SOP
5. If patient remains in persistent asystole, consider withdrawal of resuscitation SOP

Notes:

- For any patient who experiences persistent return of spontaneous circulation, refer to **INDUCTION OF HYPOTHERMIA FOR ROSC SOP**
- **EPINEPHRINE 1:10,000 2 mg ET also acceptable, but 1:1000 preferred**
- If **EPINEPHRINE 1:1000** given ET, dilute with NS to a total of 10 mL
- **All IV/IO push meds should be flushed with 20 mL IV/IO fluid bolus**

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**INDUCTION OF HYPOTHERMIA FOR ROSC
For Adult Patients with Return Of Spontaneous Circulation (ROSC)**

Patient Selection:

- Adult unresponsive after out of hospital cardiac arrest with
 - **Return Of Spontaneous Circulation** greater than 5 minutes
 - Able to maintain systolic BP > 90 with or without vasopressors
 - Intubated

Relative Exclusions:

- Major head trauma or traumatic cardiac arrest.
- Recent major surgery within 14 days.
- Systemic infection.
- Coma from other causes such as drug induced or overdose
- Active bleeding
- Hypothermia is not recommended for isolated respiratory arrest.
- Frank pulmonary edema
- Suspected hypothermia already present 34°C / 93.2°F.

Pre-hospital Induction of Hypothermia:

1. If patient meets the inclusion criteria with no relative exclusions, consider inducing pre-hospital hypothermia
2. Obtain and record baseline tympanic temp; repeat temp every 30 minutes to insure patient temperature is > 34°C / 93.2°F
3. Place ice packs around axilla, neck and groin
4. Rapid infusion of up to 2 liters of 4°C / 40°F normal saline IV/IO
5. **VERSED 2mg IV/IO** for shivers en route if patients BP>100 systolic.
6. Transport to facility using hypothermia for post cardiac arrest patients
 - **CONTACT RECEIVING HOSPITAL**, advise them that "Hypothermia Induction has been initiated."
 - If the receiving hospital cannot accept patient for continuation of Hypothermia Induction SOP, the receiving hospital must direct bypass to a facility that can provide appropriate therapy.
7. Pre chilled saline can be kept in coolers in ambulances.

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**ADULT PULMONARY EDEMA
(DUE TO HEART FAILURE)**

BLS/ALS

STABLE: Alert, normotensive or hypertensive

1. Initial Medical Care

- Place patient in high Fowlers position, if SBP > 100 mmHg
- Consider administration of CPAP as primary oxygen delivery if indicated

2. If SBP > 100 mmHg , **NTG 0.4 mg SL**

ALS

STABLE: Alert, normotensive or hypertensive

3. Administer CPAP, if available, per System-specific Procedure. If patient becomes unstable, remove CPAP and treat per appropriate SOP

4. If SBP > 100 mmHg, **LASIX 1 mg/kg IV** (100 mg maximum total dose)

5. If SBP > 100 mmHg, repeat **NTG 0.4 mg SL**; may repeat q five minutes if SBP > 100 mmHg

UNSTABLE: Altered Mental Status or signs of hypoperfusion

1. Initial Medical Care. HIGH FiO₂ OXYGEN or VENTILATION

2. Pulse < 60: treat per Bradycardia SOP
Pulse ≥ 60: treat per Cardiogenic Shock SOP

Note:

Oral medications for erectile dysfunction (Viagra®, Levitra®, Cialis®, etc.) or pulmonary hypertension (Revatio™), may potentiate the effect of nitrates. Consult Medical Control prior to administering NTG in these situations.

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ADULT CARADIOGENIC SHOCK

ALS

1. Initial Medical Care with HIGH FiO₂ OXYGEN or VENTILATION

- If hypovolemic and/or dehydrated and lungs are clear:
IV FLUID CHALLENGE IN 200 mL INCREMENTS x 2
- Reassess breath sounds after each 200 mL increment

2. Treat underlying dysrhythmias per appropriate SOP

3. DOPAMINE DRIP, dose dependent on clinical condition

- If P > 60, begin at 5 mcg/kg/min and increase q 3 min to achieve SBP ≥ 90 mmHg to a maximum of 20 mcg/kg/min

Calculation Chart

Body Weight		mcg / kg / min			
		5	10	15	20
Pounds	Kilograms	mcgtts/min ↓	mcgtts/min ↓	mcgtts/min ↓	mcgtts/min ↓
80	36	7	14	20	27
100	45	9	17	26	34
120	55	10	20	31	41
140	64	12	24	36	48
160	73	14	27	41	55
180	82	15	31	46	61
200	91	17	34	51	68
220	100	19	38	56	75
240	109	20	41	61	82
260	118	22	44	66	89
280	127	24	48	72	95
300	136	26	51	77	102

Individual dosage requirements may vary widely. The above drip rates cover a dosage range of 5 – 20 mcg/kg/min. This chart applies to a concentration of 1600 mcg/mL (typically 800 mg / 500 mL or 400 mg / 250 mL D₅W)

Q & A:

Q - Regarding STEMI (or Stroke, for that matter), what is “Closest Appropriate Facility”?

A – This topic is still being discussed at the Region Medical Directors / Advisory Board level. Further guidance is forthcoming.

The AHA has something to say on the topic, and what they say is usually embraced as the standard of care. From the **2005 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care:**

- *“It may be appropriate for the EMS medical director to institute a policy of out-of-hospital bypass of hospitals that provide medical therapy only, particularly for patients who require interventional therapy.”*
- *“In summary, at this time (2005) there is inadequate evidence to recommend out-of-hospital triage to bypass non-PCI-capable hospitals to bring patients to a PCI center (Class Indeterminate). Local protocols for EMS providers are appropriate to guide the destination of patients with suspected or confirmed STEMI.”*

Remember, that position was from 2005 and there have been many studies on the topic published since then.

Q – What happened to Etomidate with 13-15 year olds?

A – With the EMSC recommendation that pediatric protocols cover up to and include age 15, the Medical Directors decided to simplify the Drug Assisted Intubation to accommodate that age cutoff. There were very few, if any, documented DAI on that age group, or in peds at any age.

Q – What happened to the old protocol of starting transcutaneous pacing at the highest energy for unconscious patients?

A – In accordance with AHA Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care, who no longer differentiate between conscious and unconscious patients who need pacing, it was decided to simplify the pacing protocol (this was actually done in the 2006 revision). The point is, don't dawdle when increasing the energy. Increase the current more slowly (5-10 mA at a time) if the patient is conscious, and more quickly (10 mA at a time) if the patient is unconscious. You should either achieve capture or reach maximum current in approximately 60-90 seconds in the unconscious patient.

Drug of the Month Lidocaine

The use of lidocaine for ventricular arrhythmias was supported by initial studies in animals and extrapolation from the historic use of the drug to suppress premature ventricular contractions and prevent VF after acute myocardial infarction.¹ Lidocaine is an amide local anesthetic and... (an) antiarrhythmic that exerts its effects on nerve axon sodium channels, preventing depolarization.²

The American Heart Association guidelines call for an initial bolus of 1 – 1.5 mg/kg, with a rebolus of 0.5 – 0.75 mg/kg. For ease of calculation, Region VIII has standardized on the low end of those ranges (in 2004).

The issue of lidocaine toxicity, particularly in the population of patients with obesity, has caused the Medical Directors to cap the single dose of lidocaine at 100 mg for the initial bolus (1 mg/kg) and 50 mg for rebolus’.

Pathophysiology of toxicity³

Lidocaine's main effects are due to decreased conductance of sodium channels, antiarrhythmic effect, sedation, and neural blockade.

Lidocaine is hepatically metabolized and renally excreted, with only 10% unmodified.

CNS lidocaine toxicity is biphasic. The earlier manifestations are due to CNS excitation, with problems such as [seizures](#). Subsequent manifestations include CNS depression with a cessation of convulsions and the onset of unconsciousness and respiratory depression or arrest. This biphasic effect occurs because local anesthetics first block inhibitory CNS pathways (resulting in stimulation) and then eventually block both inhibitory and excitatory pathways (resulting in overall CNS inhibition).

Higher serum concentrations of local anesthetics cause cardiovascular effects. Local anesthetics block sodium channels through a fast-in, slow-out mechanism that affects impulse conduction through the heart and nerve tissue. In the heart, this mechanism depresses Vmax (ie, the rate of depolarization during phase 0 of the cardiac action potential) and may lead to reentrant arrhythmias. Additionally, conduction through the sinus and atrioventricular nodes is suppressed. Acceleration of the ventricular rate has been reported in patients with atrial arrhythmias. Lidocaine also may elevate fibrillation thresholds.

The symptoms of lidocaine toxicity tend to follow a predictable progression. The toxicity begins with numbness of the tongue, lightheadedness, and visual disturbances and progresses to muscle twitching, unconsciousness, and seizures, then coma, respiratory arrest, and cardiovascular depression.

¹ Circulation. 2005;112:IV-58-IV-66

² <http://emedicine.medscape.com/article/167309-overview>

³ <http://emedicine.medscape.com/article/167309-overview>

- CNS toxicity: When the lidocaine dose is increased from 1 mg/kg to 1.5 mg/kg, the risk of CNS toxicity increases from 10% to 80%. Symptoms include the following:
 - Lightheadedness, dizziness
 - Visual disturbance
 - [Headache](#)
 - Perioral tingling, numbness or tingling of tongue
 - Sedation
 - Impaired concentration
 - Dysarthria
 - Tinnitus
 - Metallic taste
 - Muscular twitching, tremors
 - With progression of toxicity, the patient may experience tonic-clonic seizures and, eventually, unconsciousness and coma.
- Cardiovascular: Excessive lidocaine concentration can cause cardiovascular toxicity, although this is less common than CNS toxicity. Risk of cardiac toxicity is greatest in those patients with underlying cardiac conduction problems or after myocardial infarction. Potential cardiovascular effects include the following:
 - Negative inotropic effects
 - Effects on vascular tone (with low doses having vasoconstrictive effects and higher doses causing relaxation of vascular smooth muscle)
 - Effects on cardiac conduction (including widened PR interval, widened QRS duration, sinus tachycardia, sinus arrest, and partial or complete atrioventricular dissociation)
 - Cardiac toxicity is potentiated by acidosis, hypercapnia, and hypoxia, which worsen cardiac suppression and increase the chance of arrhythmia. This is important to consider since seizure makes this metabolic picture more likely.
 - When blood levels are high enough to block inhibitory and excitatory pathways, convulsions cease and the patient experiences respiratory depression or arrest and cardiovascular depression.

<p>Lidocaine (Xylocaine[™])</p> <p>Classification: Antiarrhythmic Class 1b</p>	<p>1 mg/kg (max dose 100 mg) up to 3 mg/kg IV/IO or 2 mg/kg (max dose 200 mg) up to 6 mg/kg ET</p> <p>IV/IO rebolus at 0.5 mg/kg (max dose 50 mg) or 1 mg/kg (max dose 100 mg) ET</p>	<p>Same as adult</p>	<p>Exerts antidysrhythmic action by suppressing automaticity in the His-Purkinje system and by elevating electrical stimulation threshold for ventricular dysrhythmias. Used to lower the threshold for electrical conversion.</p>	<p>Pre- and post-defibrillation in ventricular fibrillation and unstable ventricular tachycardia, persistent stable ventricular tachycardia</p>	<p>AV blocks, bleeding, thrombocytopenia, known sensitivity to lidocaine, sulfite or paraben.</p> <p>Use with caution if hx of liver or renal disease, CHF, hypoxia, elderly.</p>	<p>Toxicity (signs may include anxiety, apprehension, euphoria, nervousness, disorientation, dizziness, blurred vision, other CNS changes), seizures without warning, hypotension, pain at injection site.</p>
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