

# **West Virginia Office of Emergency Medical Services**



## **State Critical Care Transport (CCT) Guidelines**

**West Virginia Department of Health and Human Resources  
State Trauma and Emergency Care System  
Office of Emergency Medical Services**

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# Contents

Preface  
Acknowledgments  
How To Use The Guidelines

## 1100 Trauma

1101/2101 TAMP - Trauma Assessment and Management Protocol  
1108/2108 Shock

## 1200 Cardiac

1201/2201 MAMP - Medical Assessment and Management Protocol  
1202/2202 Acute Myocardial Infarction  
1203/2203 Hypertensive Emergency  
1213/2213 Atrial Fibrillation with Rapid Ventricular Response

## 1300 Respiratory

1301/2301 Respiratory Distress

## 1400 Pediatrics

## 1500 Environmental

1501/2501 Allergic Reaction/Anaphylaxis  
1506/2506 Burns, Advanced

## 1600 General Medical

1603/2603 Seizures  
1604/2604 Diabetic Emergencies  
1608/2608 Ob Gyn Emergencies  
1609/2609 Sepsis

## 1700 Open

**1800**

**Open**

**1900**

**Special Treatment Guidelines**

1901/2901	Advanced Airway Management (RSI)
1902/2902	Patient Comfort, Advanced
1903/2903	Blood Administration
1904/2904	Sedation and Restraint

## Preface

This set of West Virginia EMS Statewide CCT protocol guidelines is the product of many years of discussion, collaboration, debate, revisions, and hard work on the part of countless dedicated professionals. They reflect the ongoing effort to continually improve trauma and emergency care in West Virginia.

On March 9, 2009 these protocols become available for use by CCT agencies throughout the state. The impact and scope of this event marks the beginning of a new era of care for the patients served by the West Virginia EMS system.

These protocols do not represent the end, but the beginning. The best summary statement concerning these protocols was noted in the preface to the first set of statewide ALS protocols in 2001:

*“In a project of this size and scope, it is impossible to produce a perfect set of protocols. These unified protocols are a dynamic process and will be subject to ongoing review and revisions. The need for additional protocols and modifications is already emerging. EMS personnel who use these protocols on a daily basis are encouraged to provide suggestions for improvement and feedback through their Agency Medical Director to their Regional Medical Director.*

*“By working together in the spirit of cooperation, let these protocols mark a new beginning in our quest to provide the citizens and visitors of the State of West Virginia the finest emergency medical care in the country.”*

William D. Ramsey, M.D  
State EMS Medical Director  
March 2009

## Acknowledgments

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## How to use the West Virginia EMS CCT Guidelines .....


The West Virginia EMS CCT Guidelines are designed to enable EMS personnel to provide a wide variety of treatments to many types of patients. Understanding how they are organized and the terminology used is important.

### Protocol Layout

At the top of each protocol page, the following information is contained in boxes:

West Virginia EMS System Logo  
Type of guideline and guideline number  
Title of the guideline  
Page numbers

Example:

	<b>CCT-RN/Paramedic Treatment Guideline 1202/2202</b>
<b>Acute Myocardial Infarction</b>	<b>Page 1 of 3</b>

### Guideline Numbering System

Each protocol is assigned two four (4) digit numbers separated by a slash ( / ). The first four digit number represents the Class 1 CCT-RN guidelines; the second four digit number represents the Class 2 CCT-Paramedic guidelines. Within each four digit number, the first digit represents the level of care of the CCT team who uses the guideline. See *Classification of Levels of Care* below. The second digit specifies the category of care. See *Category of Care* below. The last two digits are the specific guideline number.

For example: **Acute Myocardial Infarction Guideline 1202/2202**

The 1202 is a CCT-RN Level of care guideline; the 2202 is a CCT-Paramedic Level of care guideline.

Thus, for the 1202:

- 1** Level of care = CCT-RN
- 2** Category of care = Cardiac
- 02** Specific protocol = Acute Myocardial Infarction

### Classification of Levels of Care (first digit)

The Medical Policy and Care Committee developed a numbering system to represent the

levels of care available in the West Virginia EMS System. These numbers run from 1 to 7 and make up the first digit of the protocol number as follows:

- 1000 CCT-RN
- 2000 CCT-Paramedic
- 3000 Class 3 Interfacility Transport Paramedic (C3-IFT)
- 4000 EMT-Paramedic
- 5000 EMT-Intermediate
- 6000 EMT-Basic
- 7000 First Responder
- 8000 Selected Procedure Protocols
- 9000 Special Operational Policies and Protocols

### **Category of Care** (second digit)

The second digit in the protocol number denotes the general category of care being provided within the protocol group. This is a general guideline since some conditions may overlap among categories.

- 4100 Trauma
- 4200 Cardiac
- 4300 Respiratory
- 4400 Pediatrics
- 4500 Environmental
- 4600 General medical
- 4700/4800 Open
- 4900 Special Treatment Protocols

### **Special subdivisions within the CCT guidelines:**

In general, all these 2000 series guidelines apply to a **CCT-Class 2** (Paramedic) level of care; but since a given guideline has two sets of numbers, one for CCT-RN (1000 series guidelines) and one for CCT-Paramedic (2000 series guidelines), special notation is made within the guidelines to designate those areas where **only CCT-Class 1** (RN) level of care is applicable. Thus, unless designated otherwise, these guidelines are **CCT-Class 2** instructions and could be done by **either** a CCT-Paramedic team or a CCT-RN team; however, a **CCT-Class 1** section (designated with this heading and a solid bar) can **only** be done by an RN-equipped team. A **CCT-Class 1 \*** section (marked additionally with a star) **may only be done specifically by the RN.**

### **General Assessment and Management Procedures**

Since the initial procedures needed to assess and manage patients are similar within certain categories, two (2) general guidelines have been developed to streamline the process of outlining the treatment within specific protocols. These two (2) general protocols are designated as follows:

- TAMP (1101/2101)** Trauma Assessment and Management Procedures
- MAMP (1201/2201)** Medical Assessment and Management Procedures

When directed within a guideline to **perform** one of the above (i.e.; "**Follow TAMP**" or "**Follow MAMP**"), then that guideline should be performed in conjunction with the remaining procedures outlined in each individual treatment guideline.

### **Special Shading and Icons**

The following shaded boxes with icons indicate that specific contact is required with **Medical Command** (red telephone) or the **Medical Command Physician** (physician in



surgical mask) in order to perform the treatments.



Means the treatment requires **consultation with Medical Command**.



Means the treatment requires either **consultation with MCP** or **direct contact with MCP**. (\*See special note below regarding interfacility transport).

**\*Medical Command Physician vs. Sending/Receiving Physician:** On all field/911 (out-of-hospital) responses, this physician icon and shaded box indicates that the treatment requires consultation with MCP or orders by the MCP. However, there will be times during interfacility transports when the sending and/or receiving physician will be better suited to give specific orders if they are aware of the patient, know the capabilities of the CCT provider, and are readily accessible for direct consultation with the CCT crew. In such cases, it is acceptable to follow orders from those sending and/or receiving physicians but such orders and consultations must be clearly documented such as “...*In consultation with Dr. X, the receiving cardiologist, orders for Heparin 5000 Units bolus and 1000 Units/hour was initiated . . .*”

See specific details in **Communication Protocol 9106**.

**Note:** The shading and icons are not utilized in the 9000 series special operational policies and procedures

## **CCT Practice in the Field / 911 Arena**

CCT Class 1 and Class 2 personnel may perform those areas of their scope of practice approved for use in the Field / 911 arena. Those medications and procedures approved for use in the field/911 are marked with an “F” on the *Classification of Medications and Procedures* chart.

The following guidelines must be followed relating to the practice of CCT skills in the field / 911 arena:

1. CCT Class 1 and Class 2 personnel may **only** perform their scope of practice when functioning on a legally licensed Class 1 or Class 2 vehicle, as part of the two person Class 1 or Class 2 team, and while operating for a licensed Class 1 or Class 2 EMS agency.
2. The licensed CCT agency must provide to the State EMS Medical Director a written letter signed by the agency CCT medical director specifying that the agency will be providing CCT care in the field / 911 setting. The letter must also attest that the agency CCT medical director will establish a mechanism to assure that 100% of all CCT field / 911

calls will undergo medical review under the direct guidance of the CCT medical director. This letter must also be accompanied by a signed letter of approval from the State CCT medical director.

3. All field / 911 calls will be forwarded for review to the State CCT medical director if requested.

### **Special Pediatric Notes**

For the purpose of these protocols, any patient under 12 years of age will be considered a pediatric patient. Certain patients who are larger or smaller than the norms for their age may require modification of this convention. Providers should consult with Medical Command as needed to assist in making this determination.



# CCT-RN/Paramedic Treatment Guideline 1101/2101

## Trauma Assessment and Management Procedures (TAMP)

Page 1 of 2

Follow **TAMP Protocol 4101**, as applicable, with the following modifications:

### A. Patient Assessment.

#### 1. Airway:

a. If external airway is in place prior to arrival, confirm proper placement and secure device prior to transport.

b. If patient's airway is not secure and needs secured, establish patent airway using **Airway Management Protocol 4901** and/or **Advanced Airway Management (RSI) Guideline 1901/2901**.

#### 2. Breathing:

a. If **no** respiratory distress, apply oxygen at 10-15 LPM via non-rebreather mask. If patient cannot tolerate mask, apply oxygen at 6 LPM by nasal cannula. Attempt to maintain oxygen saturations >94%.

b. If respiratory distress or cannot maintain oxygen saturations >90% with supplemental oxygen assist ventilations with 100% oxygen and consider securing airway with endotracheal tube using **Airway Management Protocol 4901** and/or **Advanced Airway Management (RSI) Guideline 1901/2901**.

c. Correct any tension pneumothorax by needle decompression per **Chest Trauma Protocol 4104**, or by pneumothorax catheter (Cook, Wayne, or similar) insertion.

For interfacility aeromedical transport, **Consult MCP** to consider pneumothorax catheter insertion prior to transport for *any significant simple pneumothorax (>10%)*, **per direct order of MCP**.



d. If patient is on a ventilator prior to arrival, assess adequacy of current settings and document. Suggest changes in ventilator settings if needed to maintain oxygen saturations >94%.

#### 3. Circulation:

a. Initiate or continue at least (2) large bore IV sites using 0.9% normal saline. If patient is in hemorrhagic shock, follow **Shock Guideline 1108/2108 A: (Hypovolemic Shock)**, including IV fluid boluses and/or blood.



# CCT-RN/Paramedic Treatment Guideline 1101/2101

**Trauma Assessment and Management  
Procedures (TAMP)**

**Page 2 of 2**

b. If patient is in neurogenic shock secondary to a spinal cord injury, follow **Shock Guideline 1108/2108 B: (Neurogenic Shock)**, including IV fluid boluses, blood, and/or possible vasopressor agent.

## B. Treatment.

1. Monitor ECG, pulse oximeter, end tidal CO<sub>2</sub>, vital signs at least every 15 minutes, and document.
2. If patient is intubated or comatose, consider nasogastric or orogastric tube. Do **not** use nasogastric tube if suspected head/facial injuries.
3. If interfacility transport and prolonged transport time is contemplated, Consider urinary catheter insertion.
4. If treatment or prevention of nausea/vomiting is needed, or if pain management is needed, refer to **Patient Comfort Advanced Guideline 1902/2902**.
5. If interfacility transport, ensure that any available medical records, x-rays, recent labs are transported with the patient.
6. If interfacility transport, provide a short update/visit with family at sending facility, if time and condition allows, to alleviate anxiety of patient and family.

C. **Contact Medical Command** enroute with patient report and ETA.





# CCT-RN/Paramedic Treatment Guideline 1108/2108

**Shock**

**Page 1 of 4**

Evaluation of a patient in shock should include an assessment of the etiology of the shock. All trauma patients should be presumed to be in hypovolemic shock unless other clinical information becomes available.

## A. Hypovolemic Shock.

### 1. Initiate **Hypoperfusion (Shock) Protocol 4108**.

2. Assess circulatory status and correct hypotension and/or hypoperfusion, if necessary, using 20 ml/kg IV fluid boluses of 0.9% normal saline. May repeat as necessary up to 40 ml/kg if persistent hemodynamic instability, unless contraindicated. Monitor breath sounds frequently and if pulmonary edema develops stop IV fluid boluses.

**Hemorrhagic Shock:** Hemorrhagic shock is a subcategory of hypovolemic shock, for treatment of patients that are bleeding extensively, or suspected to be bleeding extensively based upon their mechanism of injury. Treatment is the same, except for addition of blood products (see Step A.3. below) *after* appropriate IV fluids have been given.

### **CCT Class 1:**

3. If patient is in hemorrhagic shock and the shock is not corrected with IV fluids as above and especially if obvious major external hemorrhage or signs of internal hemorrhage (intra-abdominal injury, pelvic fractures, etc.), consider starting 2 Units of Packed RBCs wide open, if available, per **Blood Transfusion Guideline 1903/2903**. An additional 1 – 2 Units of Packed RBCs may be administered if hypotension persists and an additional 20 ml/kg of IV fluids has been given. Note: Blood is *not* compatible with Lactated Ringers solution and must be administered with 0.9% normal saline only.

4. **Contact Medical Command** enroute with patient update on all patients needing blood products.



## B. Neurogenic Shock.

### 1. Initiate **Hypoperfusion (Shock) Protocol 4108**.



# CCT-RN/Paramedic Treatment Guideline 1108/2108

Shock

Page 2 of 4

2. Assess circulatory status and correct hypotension and/or hypoperfusion, if necessary, using 0.9% normal saline 20 ml/kg IV fluid boluses. May repeat as necessary up to 40 ml/kg if persistent hemodynamic instability, unless contraindicated. Monitor breath sounds frequently and if pulmonary edema develops stop IV fluid boluses.

## **CCT Class 1:**

3. If multisystem trauma with hemorrhagic shock suspected (*in addition to a spinal cord injury*) and hypotension is not corrected with IV fluids as above, consider blood as in Step A.3. above. However, *if isolated spinal trauma with neurogenic shock strongly suspected*, consider withholding blood administration and skip to Step B.4. below.

4. If hypotension persists and patient has obvious symptoms of neurogenic shock (shock with accompanying symptoms of a spinal cord injury such as bilateral leg paralysis, saddle anesthesia, priapism),

**CCT Class 1\*:** Contact MCP for possible orders for vasopressor such as phenylephrine, (See Table A below).

**CCT Class 2:** Contact MCP for possible orders for dopamine (See Table A below).



## C. Septic Shock.

1. Initiate **Hypoperfusion (Shock) Protocol 4108** and **Sepsis Guideline 1609/2609**.

2. Assess circulatory status and correct hypotension and/or hypoperfusion, if necessary, using 0.9% normal saline 20 ml/kg IV fluid boluses. May repeat as necessary up to 40 ml/kg if persistent hemodynamic instability, unless contraindicated. Monitor breath sounds frequently and if pulmonary edema develops stop IV fluid boluses.



# CCT-RN/Paramedic Treatment Guideline 1108/2108

Shock

Page 3 of 4

3. If hypotension is not corrected with the above IV fluids:

**CCT Class 1\***: Contact MCP for possible orders for vasopressor such as phenylephrine, (See Table A below).

**CCT Class 2**: Contact MCP for possible orders for dopamine (See Table A below).



## D. Anaphylactic Shock.

1. Initiate **Allergic Reaction/Anaphylaxis Guideline 1501/2501**.

2. Assess circulatory status and attempt to correct hypotension and/or hypoperfusion, using 0.9% normal saline 20 ml/kg IV fluid boluses. May repeat as necessary up to 40 ml/kg if persistent hemodynamic instability, unless contraindicated. Monitor breath sounds frequently and if pulmonary edema develops stop IV fluid boluses.

If patient is in severe anaphylaxis (severe hypotension, impending airway compromise, etc.), then do not wait for the intravenous fluids to reverse the situation, but instead, start IV fluids wide open and go on to Step D.3. below.

3. If severe anaphylaxis, **Contact MCP for orders** for possible IV epinephrine (see Table A. No. 5 below).



## E. Cardiogenic Shock

1. Follow **Hypoperfusion (Shock) Protocol 4108, Part E Cardiogenic Shock**, with the following modification.
  - a. If there is no rhythm disturbance and patient remains poorly perfused after initial 250 ml fluid bolus, then consider dopamine infusion at 2 – 5 mcg/kg/minute. Titrate dopamine drip at 5 – 20 mcg/kg/minute in an effort to improve perfusion.



# CCT-RN/Paramedic Treatment Guideline 1108/2108

Shock

Page 4 of 4

## Table A. Common Vasopressors and Dosages.

- 1.) Dopamine drip. Usual starting dose is 5 mcg/kg/min on pump, titrate to effect to up to max. dose of 20 mcg/kg/min, **or as directed by MCP.**
- 2.) Dobutamine drip. Usual starting dose is 2 - 5 mcg/kg/min on pump, titrate to effect up to max. dose of 20 mcg/kg/min, **or as directed by MCP.**
- 3.) Norepinephrine drip. Usual starting dose is 0.5 – 1.0 mcg/min on pump, titrate to effect up to max. dose of 30 mcg/min, **or as directed by MCP.**
- 4.) Epinephrine drip. Usual starting doses:  
Adult: 1 – 4 mcg/minute, on pump, titrate to effect, **or as directed by MCP.**  
Pediatric: 0.1 – 1.0 mcg/kg/minute, on pump, titrate to effect, **or as directed by MCP.**
- 5.) Epinephrine (1:10,000) IV:  
Adult dose: 0.5 – 1.0 mg slow IV over 2 minutes **per direct order of MCP.**  
Pediatric dose: 0.01 mg/kg slow IV over 2 minutes. (Max. dose 1 mg) **per direct order of MCP.**
- 6.) Phenylephrine (Neo-Synephrine) drip. Usual starting doses:  
Adult dose: 100 mcg/min, titrate to effect, **or as directed by MCP.**  
Pediatric dose: 0.1 – 0.5 mcg/kg/min, titrate to effect, **or as directed by MCP.**
- 7.) Vasopressin drip. Usual starting doses: 0.01 – 0.04 units/min I V, **or as directed by MCP.**





# CCT-RN/Paramedic Treatment Guideline 1201/2201

## Medical Assessment and Management Procedures (MAMP)

Page 1 of 2

Follow **MAMP Protocol 4201**, as applicable, with the following modifications:

A. Patient Assessment.

1. Airway and Oxygenation Management:

a. If external airway is in place prior to arrival, confirm proper placement and secure device prior to transport.

b. If patient's airway is not secure and needs secured, establish patent airway using **Airway Management Protocol 4901** and/or **Advanced Airway Management (RSI) Guideline 1901/2901**.

2. Breathing:

a. If the patient is in respiratory distress and cannot maintain oxygen saturations >90% by utilizing **MAMP Protocol 4201**, consider securing airway with endotracheal tube using **Airway Management Protocol 4901** and/or **Advanced Airway Management (RSI) Guideline 1901/2901**.

b. Assess and document any ventilator settings if applicable.

3. Circulation:

a. Assess vital signs, skin color, temperature, cap refill, vital signs and document.

4. Neuro

a. Assess level of consciousness, GCS

b. Assess for any focal neurological deficits.

B. Treatment.

1. Initiate or continue at least one (preferably two) IVs of 0.9% normal saline.

2. If interfacility transport, assess and document any continuous IV infusions and their rates. Assess to ensure enough meds to complete the transport.

3. Monitor ECG, pulse oximeter, end tidal CO<sub>2</sub>, vital signs at least every 15 minutes, and document.

4. If interfacility transport, ensure that any available medical records, x-rays, recent labs are transported with the patient.



# CCT-RN/Paramedic Treatment Guideline 1201/2201

**Medical Assessment and Management  
Procedures (MAMP)**

**Page 2 of 2**

5. If interfacility transport and prolonged transport time is contemplated, consider urinary catheter insertion.

6. If interfacility transport, provide a short update/visit with family at sending facility if time and condition allows, to alleviate anxiety of patient and family.

**C. Contact Medical Command** enroute with patient report and ETA.





# CCT-RN/Paramedic Treatment Guideline 1202/2202

**Acute Myocardial Infarction**

**Page 1 of 3**

Follow **Chest Pain (ACS) Protocol 4202** and **MAMP Protocol 1201/2201**, as applicable, with the following modifications:

A. Patient Assessment.

1. If field/911 response, obtain 12 lead ECG and transmit to accepting facility and/or Medical Command, if possible;  
If interfacility transfer, obtain copy of 12 lead ECG and consult with sending personnel regarding type of myocardial infarction.

2. If findings of Inferior Wall infarct (ST elevations in leads II, III, aVf), perform right sided ECG looking for ST elevation in V4R. *ST elevations in V4R would suggest Right Ventricular (RV) infarct. **Do not give nitroglycerin to patients with RV infarct since they need preload.***

B. Treatment for Acute ST-Elevated Myocardial Infarction (STEMI) –[**not Inferior Wall MI with RV infarct**].

1. Ensure that ASA 325 mg PO has been given per **Chest Pain (ACS) Protocol 4202** unless contraindicated.

2. Clopidogrel (*Plavix*) 300 mg PO unless contraindicated.\*

\*Contraindications include age  $\geq 75$ , recent or ongoing bleeding, or if interfacility transport for the purpose of emergency coronary artery bypass graft (CABG).

3. If chest pain persists and BP  $>90$  systolic, ensure that nitroglycerin 0.4 mg SL has been given and may repeat every 5 minutes up to 3 doses, per **Chest Pain (ACS) Protocol 4202** unless contraindicated. ***Withhold nitroglycerin if Inferior Wall MI with RV infarct unless directed by MCP.***

4. If chest pain persists and BP  $>100$  systolic, consider morphine 2 mg slow IVP. May repeat every 5 minutes (up to 10 mg total), if chest pain persists and BP  $>100$  systolic.

**CCT Class 1\*:**

5. If chest pain persists and BP  $>100$  systolic, consider nitroglycerin infusion, starting at 5 mcg/min via IV pump. May titrate up by 5 mcg/min every 5 minutes, if needed as long as BP  $>90$  systolic. Max dose: 40 mcg/min. ***Withhold nitroglycerin if Inferior Wall MI with RV infarct.***



# CCT-RN/Paramedic Treatment Guideline 1202/2202

Acute Myocardial Infarction

Page 2 of 3

## (For Interfacility Transfer Only)

6. In consultation with sending and/or receiving physicians, RN may initiate thrombolytic and/or heparin therapy **as directed by physicians**.

Standard heparin dosing is as follows:

Heparin bolus: 60 Units/kg IVP, not to exceed 5000 Units

Heparin drip: 12 Units/kg/hour, not to exceed 1000 Units/hour

7. If heparin, thrombolytics, or other IV drip meds have already been started by sending facility, maintain infusion rate as set by sending facility unless changed by MCP or receiving physician.

8. If not already given, *for patients who are hypertensive (BP >140/80) and do not have any of the contraindications below*, consider metoprolol (*Lopressor*).

Metoprolol 5 mg slow IV push every 5 minutes, up to total of 15 mg, as long as patient remains hemodynamically stable and none of the following contraindications are present. [**Contraindications include signs of heart failure; heart rate <60; BP <120 systolic; signs of CHF including rales/crackles; 1<sup>st</sup>, 2<sup>nd</sup>, or 3<sup>rd</sup> degree heart block; active asthma, or reactive airway disease; or increased risk for cardiogenic shock including age >70.**]

C. Treatment for Acute Inferior Wall MI with Right Ventricular Infarct.

1. Perform those steps in B. above **except** for administration of nitroglycerin.

2. If hypotension, consider volume loading with IV 0.9% normal saline boluses of 250 ml each, may repeat up to 1 - 2 liters total, as long as lungs remain clear. Titrate IV fluids to maintain BP >90 systolic.

3. If persistent hypotension not corrected by IV fluids, **Consult MCP** for consideration of vasopressors such as:

**CCT Class 1\***: dobutamine (*Dobutrex*) 2 mcg/kg/min, titrate up for BP >90 systolic (max. 20 mcg/kg/min), **per direct order by MCP**,  
**OR**

**CCT Class 2**: dopamine 5 mcg/kg/min, titrate up for BP >90 systolic (max. 20 mcg/kg/min), **per direct order by MCP**.





# CCT-RN/Paramedic Treatment Guideline 1202/2202

**Acute Myocardial Infarction**

**Page 3 of 3**

D. Treatment for Acute Coronary Syndrome (ACS or Non ST-Elevated MI).

1. For interfacility transport, continue any medications that were started by the sending physician, as appropriate.

2. **CCT Class 1:** If not already established, **Consult with MCP** regarding GIIb/IIIa inhibitor:

eptifibatide (*Integrilin*) 180 mcg/kg bolus over 2 minutes, then  
2 mcg/kg/min,

**OR**

tirofiban (*Aggrastat*) 0.4 mcg/kg/min for 30 minutes, then 0.1 mcg/kg/min





# CCT-RN/Paramedic Treatment Guideline 1203/2203

Hypertensive Emergency

Page 1 of 2

An elevated blood pressure reading is not uncommon in emergency patients and usually is not, by itself, an emergency. Only with extremely high BP along with signs of end organ damage (altered mental status, chest pain, CHF, acute aortic dissection, stroke, etc.) does the blood pressure need treated.

The goal of managing hypertensive emergency is to reduce the blood pressure smoothly and gradually without worsening the patient's condition by causing hypotension or hypoperfusion. The MCP may specify a specific end point or target BP; however, reducing the **diastolic BP to 100** is often a reasonable end-point for adults.

Follow **MAMP Protocol 1201/2201**, and the **Severe Hypertension Protocol 4203 Steps A thru E**, as applicable. This includes IV, oxygen, ECG monitoring, and an assessment for the possible cause of the hypertension. If aortic aneurysm dissection\* or ischemic stroke,\*\* see special circumstances in Section B below. If emergency blood pressure control is needed:

A. Contact MCP regarding possible treatment options, considering **one or more** of the following **based upon direct order of MCP and CCT Class**:



1. Labetalol (*Trandate*): 5 – 10 mg slow IVP. May repeat every 5–20 min, if ordered. *[Note: Labetalol is a potent alpha and beta-blocker that may cause prominent orthostatic hypotension; be prepared to get the patient supine. Use with caution in asthmatics and patients with heart block/bradycardia/CHF].*

2. Lopressor (*Metoprolol*): 5 mg slow IV push. May repeat every 5 minutes up to 3 doses if ordered. ***[Used in Acute MI to decrease heart rate and BP].***

### **CCT Class 1\*:**

3. Esmolol (*Brevibloc*): 500 mcg/kg IV over 1 - 3 minutes, then esmolol drip on pump at 50 – 150 mcg/kg/min.

4. Nitroglycerin drip: Typically start at 5 mcg/min on pump, titrate upward by 5 mcg/min every 5 minutes until BP is lowered.

***[Note: Drug of choice for chest pain/unstable angina/pulmonary edema].***



# CCT-RN/Paramedic Treatment Guideline 1203/2203

Hypertensive Emergency

Page 2 of 2

5. Nitroprusside (*Nipride/Nitropress*) drip: Typically start at 0.5 mcg/kg/min on pump, titrate upward every 5 minutes until end point achieved, typically in dose range of 0.5 – 10 mcg/kg/min. [Note: Typical mix is 50mg in 500ml of D5W (100mcg/ml)]. BP checks must be done every 2-3 minutes during titration and then every 5 minutes thereafter, once the BP has stabilized.

**[Note: this is the drug of choice for intracranial hemorrhage].**

6. Nicardipine (*Cardene*) drip: Typically start at 5 mg/hour on pump, titrate upward by 2.5 mg/hour every 5 min to max. dose of 15 mg/hour.

**[Note: special use in stroke. See Section B. 2. below].\*\***

## B. Special circumstances.

1. \*Aortic dissection: **With appropriate MCP order**, drugs of choice for aortic dissection are to **first use** a beta-blocker such as labetalol or esmolol as in Step 1 or 3 above, and **then start** the nitroprusside drip as in Step 5 above.

2. \*\*Ischemic stroke: Because TPA will be withheld from eligible acute stroke patients if systolic BP >185 or diastolic BP >110, the goal of treatment is to get the BP below these parameters without causing an acute drop in BP. **With appropriate MCP order**, consider:

a. labetalol (*Trandate*) 10 mg IV over 2 minutes. May repeat once if needed. **Then if BP remains high, consider:**

### CCT Class 1\*:

b. nitroprusside (*Nipride*) 0.5 mcg/kg/min IV on pump, titrate upward as in Step A.5 above

**OR**

nicardipine (*Cardene*) 5 mg/hour IV on pump, titrate upward by 2.5 mg/hour every 5 minutes to max. dose of 15 mg/hour.

C. **Contact Medical Command** enroute with patient report and ETA.





# CCT-RN/Paramedic Treatment Guideline 1213/2213

## Atrial Fibrillation with Rapid Ventricular Response

Page 1 of 2

The goal of therapy in atrial fibrillation with rapid ventricular response is to achieve hemodynamic stability through heart rate control. ***It is imperative to use extreme caution when administering medications to a patient that has been in atrial fibrillation for an unknown amount of time due to risk of conversion to sinus rhythm with release of micro emboli. The risk is considered to be small in patients who have been in atrial fibrillation for < 48 hours.***

Follow **MAMP Protocol 1201/2201, Chest Pain (ACS) Protocol 4202, and/or Acute MI Guideline 1202/2202**, as applicable, including IV, oxygen, pulse oximeter, and ECG, with the following modifications:

Atrial fibrillation with rapid ventricular response in an asymptomatic patient would normally not require immediate treatment; however, if the patient is symptomatic (i.e. chest pain, short of breath, near syncope, etc.) and has a rapid heart rate, then treatment would proceed as follows:

### A. Hemodynamically Stable Patient (SBP >90 and normal mentation)

**Contact MCP** to consider diltiazem bolus and drip as follows:

1. Diltiazem (*Cardizem*): 0.25 mg/kg (actual body weight--not to exceed max. dose of 20 mg) slow IVP over 2 minutes. After 15 minutes, if rate still uncontrolled, consider a second dose of 0.35mg/kg (not to exceed 25 mg) slow IV push over 2 minutes.

2. Diltiazem drip: 5-15 mg/hr on pump (use lower end dose with elderly).

3. If patient develops refractory hypotension after diltiazem administration, stop diltiazem infusion and consider calcium gluconate 1 gm slow IV push as reversal agent.



### B. Hemodynamically unstable (SBP <90 **and** altered mentation)

1. Prepare for cardioversion by considering sedation (if hemodynamics and time allow--*use with caution*) as follows:

- a. Sedation: etomidate (*Amidate*) 0.15 mg/kg IV **OR**  
diazepam (*Valium*) 5 mg IV





# CCT-RN/Paramedic Treatment Guideline 1213/2213

**Atrial Fibrillation with Rapid Ventricular  
Response**

**Page 2 of 2**

2. Synchronized cardioversion at 120 joules biphasic.

**C. Contact Medical Command** enroute with patient report and ETA.





# CCT-RN/Paramedic Treatment Guideline 1301/2301

Respiratory Distress

Page 1 of 2

Perform **MAMP Protocol 4201** and after obtaining background history, examining the patient, and reviewing vital signs including oxygen saturations and/or any blood gas results, consider the following guidelines based upon the etiology of the respiratory distress, as follows:

- A. Bronchospasm (as in COPD or asthma).
1. For acute bronchospasm in adults, follow **Bronchospasm Protocol 4302** **except** may administer the following medications without MCP order if needed:
    - a. Albuterol nebulizer 5.0 mg in 2.5 ml of normal saline with oxygen at 8 - 10 LPM, and may repeat this dose every 10-15 minutes, up to 3 doses, if needed to relieve the respiratory distress, unless contraindicated.
    - b. May include in the first respiratory nebulizer treatment: ipratropium bromide (*Atrovent*) 500 mcg.
    - c. Methylprednisolone (*Solu-Medrol*) 125 mg IV.
    - d. If not already performed as part of **MAMP Protocol 4201**, consider CPAP trial per **CPAP Protocol 8301** if patient meets criteria and does not show improvement with the above treatment.
    - e. Intubation per **Airway Management Protocol 4901** or **Advanced Airway Management (RSI) Guideline 1901/2901**, especially if oxygen saturations < 90% and inadequate response to above treatment, or if patient is exhibiting signs of mental confusion, respiratory fatigue, etc.

2. **Contact Medical Command** enroute with patient report, update of all treatments instituted, and ETA.



- B. Acute Pulmonary Edema.
1. For acute pulmonary edema, may administer nitroglycerin sublingual, furosemide (*Lasix*), and morphine sulfate as per **Pulmonary Edema Protocol 4303**, and may administer albuterol nebulized (as in A.1. above), all without MCP order, if needed.



# CCT-RN/Paramedic Treatment Guideline 1301/2301

Respiratory Distress

Page 2 of 2

2. If not already performed as part of **MAMP Protocol 4201**, consider CPAP trial per **CPAP Protocol 8301** if patient meets criteria and does not show improvement with the above treatment.

3. Consider intubation per **Airway Management Protocol 4901** or **Advanced Airway Management (RSI) Guideline 1901/2901**, especially if oxygen saturations < 90% and inadequate response to above treatment, or if patient is exhibiting signs of mental confusion, respiratory fatigue, etc.

4. Contact Medical Command enroute with patient report, update of all treatments instituted, and ETA.



## C. Pediatric Respiratory Distress (non-cardiac etiology).

1. For acute bronchospasm in children, follow **Bronchospasm Protocol 4302** **except** may administer the following without MCP order if needed:

a. Albuterol 2.5 mg in 2.5 ml normal saline with oxygen at 8-10 LPM via nebulizer as in **Bronchospasm Protocol 4302**, and may repeat this dose every 10-15 minutes, up to 3 doses, if needed to relieve the respiratory distress, unless contraindicated.

b. Methylprednisolone (*Solu-Medrol*) 2 mg/kg IV.

c. If stridor, racemic epinephrine 0.25 mg in 3 ml normal saline via nebulizer.

2. If epiglottitis, airway should be secured by endotracheal tube by the most experienced health care provider available (**usually by the sending facility and their physicians, in the O.R.**) prior to transport.

3. **Contact Medical Command** enroute with patient report, update of all treatments instituted, and ETA.





# CCT-RN/Paramedic Treatment Guideline 1501/2501

Allergic Reaction/Anaphylaxis

Page 1 of 2

Perform **MAMP Protocol 1201/2201**, then follow **Allergic Reaction/Anaphylaxis Protocol 4501**, as applicable, with the following modifications:

A. Mild Reaction with itching or hives. No respiratory distress or hypotension.

1. Diphenhydramine (*Benadryl*):

- a. Adults: 50 mg IM or slow IV push
- b. Pediatrics: 1 mg/kg IM or slow IV push (max. dose 25 mg)

2. Contact Medical Command enroute with patient report and ETA.



B. Moderate Reaction. Moderate respiratory distress (wheezing), but no hypotension.

1. Immediately administer epinephrine 1:1000.

- a. Adults: 0.3 mg SQ [Note: 0.3 mg = 0.3 ml]
- b. Pediatrics: 0.01 mg/kg SQ (max. dose 0.3 mg)

2. Administer diphenhydramine (*Benadryl*) as in Step A.1. above.

3. Establish and maintain IV KVO. Closely monitor lung sounds and pulse oximeter for effectiveness of treatment.

4. Albuterol nebulized if wheezing.

- a. Adults: 5 mg via nebulizer
- b. Pediatrics: 2.5 mg via nebulizer

**OR**

Racemic epinephrine 0.5 ml via nebulizer for stridor.

5. Methylprednisolone (*Solu-Medrol*):

- a. Adults: 125 mg IV push
- b. Pediatrics: 2 mg/kg IV push



# CCT-RN/Paramedic Treatment Guideline 1501/2501

Allergic Reaction/Anaphylaxis

Page 2 of 2

6. Consider histamine blockade with:
  - a. famotidine (*Pepcid*):  
Adult dose: 20 mg IV  
Pediatric dose: 0.5 mg/kg IV OR
  - b. cimetidine (*Tagamet*):  
Adult dose: 300 mg IV  
Pediatric dose: 5 mg/kg IV OR
  - c. ranitidine (*Zantac*):  
Adult dose: 50 mg IV  
Pediatric dose: 1 mg/kg IV
  
7. Expedite transport and reassess for improvement or worsening of reaction.

8. **Contact Medical Command** enroute with patient report and ETA.



C. Severe Reaction. Respiratory distress and signs of shock.

1. Perform all the above steps as listed under Moderate Reaction Part B. above, **plus:**
2. Treat the anaphylactic shock with IV epinephrine and IV fluid boluses per **Shock Guideline 1108/2108 – Part D (Anaphylactic Shock)**, if needed.
3. Consider glucagon if patient is on a beta blocker and epinephrine proves ineffective.  
Adults dose: 1 mg IV push or IM  
Pediatric dose: 0.1 mg/kg IV or IM (max. dose 1 mg)

4. **Contact Medical Command** enroute with patient report and ETA.





# CCT-RN/Paramedic Treatment Guideline 1506/2506

**Burns, Advanced**

**Page 1 of 1**

Evaluate patient as per **Burns-Thermal Protocol 4506**, with the following modifications:

**A. Airway.**

1. Follow **Airway Management Protocol 4901**. In cases of severe inhalational injury or potential for impending airway compromise, consider **Advanced Airway Management (RSI) Guideline 1901/2901** as needed.

**B. Pain Management.**

1. Consider analgesics using **Patient Comfort, Advanced Guideline 1902/2902**, if needed.

**C. Fluid Management if major burn.**

1. Use the Parkland Burn Formula\* as a guide for the rate of administration of lactated ringer's (LR) as follows:

**[Total first 24 hour fluids = 4 ml X %Burn X Weight in kg]**, with the First ½ of this fluid over first eight hours *from the time of injury*, and the Second ½ of this fluid over the remaining 16 hours.

\*Note: Some burn centers use **2 ml X %Burn X Weight in kg**, which is half of the above amount, due to concerns of over hydration with the Parkland Formula. Follow receiving facility's or MCP's recommendation and closely monitor urine output as in Step E. below.

**D. If patient has circumferential burns of the chest with respiratory compromise or circumferential burns of the extremities with vascular compromise, consider escharotomy (chest or extremity) if trained to do so and if ordered by MCP.**



**E. If extended transport time is contemplated, insert foley catheter in order to monitor urine output unless genital area is involved with the burn. Monitor urine output since it is a more reliable indicator of hydration than just using the Parkland formula for fluid input determinations. The goal is to establish a urine output of 30 ml/hour in adults and 1 ml/kg/hour in children.**

**F. Consult with MCP regarding direct aeromedical transport to a Burn Center if patient has a major burn.**





# CCT-RN/Paramedic Treatment Guideline 1603/2603

**Seizures**

**Page 1 of 2**

Evaluate patient as per **Seizure Protocol 4603**. However, prolonged or recurrent seizures or those that interfere with airway management should be treated:

A. Assess ABC's and vital signs per **MAMP Protocol 1201/2201**.

1. Ensure airway patency.

- a. Provide supplemental oxygen
- b. Suction airway as needed
- c. Consider nasopharyngeal airway
- d. Consider endotracheal intubation if patient does not respond to the treatment below and airway patency continues to be a problem; however, **DO NOT ADMINISTER LONG-TERM PARALYTICS (Vecuronium, Rocuronium) which may limit the ability to recognize continuing seizures.**

2. Establish IV access with 0.9% normal saline KVO.

3. Consider hypoglycemia.

- a. Check finger stick glucose. If glucose < 80, give dextrose per **Diabetic Emergencies Protocol 4604**.

B. Anticonvulsant Therapy.

1. Consider lorazepam (*Ativan*): **(Note: This is the drug of choice)**

Adult dose: 2 mg IV push. May repeat in 5 minutes if needed.

Pediatric dose: 0.1 mg/kg IV push (max. dose 2 mg). May repeat in 5 minutes if needed,

**OR**

2. Consider diazepam (*Valium*)

Adult dose: 5 mg IV push, or rectal diazepam (*Valium*) 10 mg PR

Pediatric dose: 0.2 mg/kg IV push, or rectal diazepam (*Valium*) 0.5 mg/kg PR (max. dose 10 mg).

Note: Do not repeat rectal dose.



# CCT-RN/Paramedic Treatment Guideline 1603/2603

Seizures

Page 2 of 2

## CCT Class 1:

3. If continued or recurrent seizures after initial anticonvulsant above has been given, and patient is not already on phenytoin (*Dilantin*), consider:  
fosphenytoin (*Cerebyx*): Adult/Pediatric dose: 15 – 20 mgPhenytoinEquivalents/kg IV at a rate no greater than 150 mgPE/minute (max. dose 1000 mgPE).

4. If continued or recurrent seizures after *Cerebyx* loading, consider:  
phenobarbital: Adult/Pediatric dose: 10 – 15 mg/kg slow IV, max. rate of 50 mg/min.  
Note: High incidence of respiratory depression with phenobarbital in addition to all the above meds. **Be prepared to intubate the patient.**

C. Observe and Reassess status:

Observe closely for respiratory depression and/or respiratory arrest, especially as multiple anticonvulsants are given. **Be prepared to intubate the patient.**

D. **Contact Medical Command** enroute with patient report, update of all treatments instituted, and ETA.







# CCT-RN/Paramedic Treatment Guideline 1604/2604

Diabetic Emergencies

Page 1 of 2

First follow **MAMP Protocol 1201/2201**, as applicable, including IV, oxygen, ECG monitor, and pulse oximeter, as well as assessment of fingerstick glucose, then:

A. Hypoglycemia.

1. Treat hypoglycemia per **Diabetic Emergencies Protocol 4604**.

B. Hyperglycemia [*not Diabetic Ketoacidosis (DKA) nor Hyperglycemic Hyperosmolar Non-ketotic Syndrome (HHNS)*]:

**CCT Class 1:** Consider sliding scale SQ Insulin. **Consult MCP for dose.**



C. DKA and HHNS: As a general rule, DKA is treated with generous IV fluids *plus* an insulin drip; HHNS is also treated with IV fluids initially, and sometimes with an insulin drip. However, prior to getting orders for an insulin drip, one must be very aware of the potassium (K<sup>+</sup>) level, since the potassium will drop once an insulin drip is initiated. ***If the potassium is already abnormally low (K<sup>+</sup> < 3.5), withhold starting an insulin drip until the potassium level is brought up to within a normal range of 3.5 to 5.0.***

1. DKA. Assess the current glucose level, potassium level, and what IV fluids have been already given. If the glucose is high (>400) and an inadequate amount of fluids has been given at the referring facility:
  - a. Consider IV fluids, 0.9% normal saline 20 ml/kg bolus, then 250-500 ml/hr (adult) or 1.5 times maintenance in a child.

b. **CCT Class 1:** Have glucose, potassium, serum acetone, and ABG results if available, in addition to what has already been done, then **contact MCP** to consider:  
Insulin drip 0.1 Units/kg/hour **per direct order of MCP**. *Note: standard insulin drip is 100 units regular insulin in 100 ml normal saline (1 unit per 1 ml) on a pump.*





# CCT-RN/Paramedic Treatment Guideline 1604/2604

**Diabetic Emergencies**

**Page 2 of 2**

- c. Monitor finger stick glucose every 30 minutes. If glucose drops below 250, change IV to D5 ½Normal Saline and cut insulin drip to half previous dose. Stop insulin drip completely if glucose drops below 120.
2. Hyperglycemic hyperosmolar non-ketotic syndrome (HHNS):
    - a. Consider IV fluids, 0.9% normal saline 20 ml/kg bolus, then 500 ml/hr (adult). Adequate volume replacement *must occur before* initiation of any insulin drip.

b. Have glucose, potassium, serum acetone, and ABG results if available, in addition to what has already been done, then **contact MCP** to discuss treatment options to possibly include insulin drip as in Step C.1.b. above.





# CCT-RN/Paramedic Treatment Guideline 1608/2608

Ob Emergencies

Page 1 of 4

Follow **Obstetrical and Gynecologic Emergencies Protocol 4608** and **MAMP Protocol 1201/2201**, as applicable, with the following additions:

A. Preterm Labor.

1. General Supportive Measures

- a. Transport patient on left side.
- b. Monitor vital signs every 15 minutes
- c. Verify and record fetal heart rate every 15 minutes.
- d. Frequently assess labor pattern (intensity, duration, and frequency of contractions).
- e. Ask physician to assess cervical status prior to departure from referring facility to verify safety of transfer. *Patients in active labor who are dilated > 5 cm are generally not candidates for air medical transfer.*
- f. Assess for vaginal discharge (bloody show, amniotic fluid, meconium).

2. Medical Treatment. Treatment of a patient in *active, pre-term labor with contractions* is based upon what has already been done at the sending facility. If treatment has not been started, consider the following:

- a. Hydrate with 500 ml bolus of 0.9% normal saline, then maintain IV at 125 ml/hour. If tocolytic is needed, proceed as follows.
- b. Terbutaline (*Brethine*) 0.25 mg SQ and every 2 hours as needed. (Terbutaline may be used in addition to magnesium sulfate.)

c. **CCT Class 1:**

If still contracting, consider magnesium sulfate load and drip. *Note: If already on magnesium sulfate drip, skip to [Step 2.d.] below.* Magnesium sulfate loading dose is typically 4 gm IV over 10-15 min; then, magnesium sulfate drip of 2 gm/hour, increase by 0.5 gm/hour every 15 – 30 min if contractions persist. Stop increases in infusion rate if significant side effects develop, \* loss of deep tendon reflexes (DTRs), if contractions stop, or when max dose of 4 gm/hour is reached.

*\*Note: If patient develops magnesium sulfate toxicity [decreased mental status or respiratory depression], stop magnesium sulfate drip and consider calcium gluconate 10% 1 gm IVP slowly over 3-5 minutes until depressive effects are reversed.*

- d. If already on magnesium sulfate infusion, continue infusion per Step 2.c. above. Titrate as in Step 2.c. above if needed.



# CCT-RN/Paramedic Treatment Guideline 1608/2608

**Ob Emergencies**

**Page 2 of 4**

**B. Premature Rupture of Membranes.**

**1. General Supportive Measures.**

Perform the General Supportive Measures as in Step A.1. above.

**2. Medical Treatment**

a. IV 0.9% normal saline at 125 ml/hour via large bore IV

b. Consider the need for tocolysis if contractions are present (see Preterm Labor Guideline above).

**C. Pre-Eclampsia.**

**1. General Supportive Measures**

a. Transport patient on her left side.

b. Monitor vital signs and DTRs every 15 minutes.

c. Monitor ECG

d. Verify and record fetal heart rate every 15 minutes

e. Assess patient for level of consciousness, visual disturbances, nausea, headache, pupillary reaction, edema, pulmonary status, peripheral perfusion, and recent urinary output.

f. Assess patient for labor.

g. Protect patient from excessive stimuli, like from sirens (or rotor noise in aeromedical environment) using headphones, eye shields if available).

**2. Medical Treatment**

General principles:

a. Elevated blood pressure should not be treated unless diastolic > 110, and ideally treatment should not drop diastolic <90.

b. Only 5% of pre-eclamptics develop eclampsia, but all should have magnesium sulfate therapy initiated as seizure prophylaxis.

c. Transport patient with 2 IV's, large bore, with total fluids at 100 ml/hour using normal saline.

**CCT Class 1:**

d. If **not** already on magnesium sulfate, consider magnesium sulfate loading dose of 4 gm slow IV push over 10-15 minutes, using 20% solution. Assess vital signs, DTRs, and patient response every 5 minutes during IV push. After load is given, then consider magnesium sulfate drip at 2 gm/hour on pump.



# CCT-RN/Paramedic Treatment Guideline 1608/2608

**Ob Emergencies**

**Page 3 of 4**

e. If diastolic blood pressure > 110, consider Hydralazine (*Apresoline*) 5 mg slow IV push. May repeat every 15 minutes if needed to maintain diastolic BP at approximately 90-100.

f. If eclampsia develops, implement **Eclampsia Guideline** below.

## D. Eclampsia (Pre-eclampsia with seizure).

### 1. General Supportive Measures

- a. Monitor vital signs every 15 minutes
- b. Monitor ECG
- c. Place patient on left side if possible to prevent aspiration, and enhance uterine blood flow.
- d. Protect patient from excessive stimulation (use headphones if available).
- e. Assess mental status, pulmonary status, and peripheral perfusion.
- f. Maintain airway: Consider oral airway. Consider intubation if seizing continuously, or at risk for aspiration, or hypoxic, or if respiratory depression. Use 100% oxygen.
- g. Prevent patient from self-injury during seizure.
- h. Verify and record fetal heart rate every 15 minutes.

### 2. Medical Treatment

a. IV normal saline via 2 large bore IV's, KVO.

b. Eclamptic seizure (tonic-clonic):

#### **CCT Class 1:**

If not already on magnesium, consider magnesium sulfate loading dose of 4 gm slow IV push at rate not to exceed 1 gm/min., using 20% solution, then magnesium sulfate drip at 2 gm/hour on pump. If seizure continues after above, or reoccurs, consider additional magnesium sulfate 2 gm slow IV push at rate not to exceed 1 gm/min and if reflexes still brisk, increase magnesium sulfate drip to 3 gm/hour.

c. If seizure continues, give diazepam (*Valium*) 5 mg IV push.

d. Observe closely for drop in BP and hypoventilation. Be prepared to intubate and/or fluid resuscitate.



# CCT-RN/Paramedic Treatment Guideline 1608/2608

**Ob Emergencies**

**Page 4 of 4**

E. Emergency Delivery. Follow **Ob/Gyn Emergencies Protocol 4608** with the following addition:

1. Post partum hemorrhage. If postpartum hemorrhage occurs
  - a. Massage uterus bimanually.

**CCT Class 1:**

- b. Consider oxytocin (*Pitocin*) 20-40 units in 1000 ml of normal saline, wide open.

- c. Assess uterine tone and massage as needed to maintain a firm fundus.



# CCT-RN/Paramedic Treatment Guideline 1609/2609

**Sepsis**

**Page 1 of 1**

## A. Initial Assessment.

1. Utilize appropriate isolation precautions if the patient has a contagious disease.
2. Follow **MAMP Protocol 1201/2201** in evaluating the patient, including:
  - a. Place the patient on a cardiac monitor, pulse oximeter, and End Tidal CO2 monitor if intubated.
  - b. If patient is in respiratory distress or cannot maintain oxygen saturations >90% with supplemental oxygen, assist ventilations with 100% oxygen and consider securing airway with endotracheal tube using **Airway Management Protocol 4901** and/or **Advanced Airway Management (RSI) Guideline 1901/2901**.
  - c. Assess and document any ventilator settings if applicable.
  - d. Monitor and treat hypoglycemia if necessary.

## B. Circulation/Perfusion.

1. If patient is hypotensive, follow **Shock Guideline 1108/2108 C** using IV fluid boluses in initial management, then a vasopressor agent if needed.

## C. Antibiotics.

### **CCT Class 1:**

1. Review patient's allergies. If the patient is septic and has not been given antibiotics at the referring facility, **Contact MCP for orders** for a possible antibiotic that is available and could be started at the referring facility prior to transport.





# CCT-RN/Paramedic Treatment Guideline 1901/2901

Advanced Airway Management (RSI)

Page 1 of 3

Rapid Sequence Intubation (RSI) should only be performed if a rapid airway is indicated, and benefits outweigh potential risks. This guideline is for patients that require intubation but are awake, continue to have respiratory effort, and intact cough/gag reflex. Whenever possible, RSI should be performed prior to transport. This guideline is not intended for patients in cardiac arrest because they should be intubated without drugs per **Airway Management Protocol 4901**.

***The EMS provider must have a backup/rescue airway plan (LMA, Combitube, cric, etc.) in mind and immediately accessible for all patients under consideration for RSI prior to proceeding:***

A. General Information.

1. Patient should be on a cardiac monitor and pulse oximeter. Maintain patient on high flow supplemental oxygen either by mask or bag-valve-mask. Confirm or initiate two IVs if possible, preferably large bore. Have suction hooked up and on. Have bag-valve-mask hooked to oxygen and immediately available.

2. Pre-oxygenate the patient using 100% oxygen. Assure that you can assist ventilations with a bag-valve-mask prior to proceeding. **DO NOT BAG VENTILATE the patient unless necessary**—this only causes increased gastric distention and the increased risk of aspiration.

B. RSI Procedure.

1. If suspected closed head injury or other reason for high ICP, give lidocaine 1.0 – 1.5 mg/kg IV push at least 3 minutes prior to intubation if possible.

2. Defasciculating agent if time permits. May skip if etomidate is used in Step 5.

a. vecuronium (*Norcuron*): 0.01 mg/kg IV push (max. dose 1 mg; usual dose in adult is 1 mg); **OR**

b. rocuronium (*Zemuron*): 0.06 mg/kg IV push

3. Consider fentanyl (*Sublimaze*): 1 – 3 mcg/kg IV slow push. Withhold if hypotensive or if rapid airway management is mandatory.

4. Apply cricoid pressure (Sellick's Maneuver).





# CCT-RN/Paramedic Treatment Guideline 1901/2901

Advanced Airway Management (RSI)

Page 2 of 3

5. Sedative agent:

- a. etomidate\* (*Amidate*): 0.3 mg/kg (use 0.2 mg/kg if hypotensive) **OR**
- b. midazolam (*Versed*): 2 – 10 mg IV push (max. dose 0.1 mg/kg).

**Do not use midazolam in hypotensive patients.**

\*Note: Etomidate is the preferred sedative, especially in patients with possible hemodynamic compromise. If etomidate is used, succinylcholine should already be drawn up and ***immediately*** follow the etomidate administration.

6. Pre-treat (prophylactically against bradycardia) children < 5 years old prior to administration of succinylcholine.

- a. atropine 0.02 mg/kg IV (minimum dose 0.1 mg; max. dose 1 mg)

7. If not contraindicated,\*\* consider succinylcholine (*Anectine*): 1.5 – 2.0 mg/kg IV push. When paralysis is achieved (in about 30 – 45 seconds), orally intubate patient, inflate cuff, and confirm tube placement (bilateral breath sounds, tube fogging, good oxygen saturations, appropriate End Tidal CO<sub>2</sub> readings, etc.).

\*\*Note: Contraindications include high intraocular pressure, high potassium (K>5.5), burns and spinal cord injuries > 24 hours old, pseudocholinesterase deficiency.

8. If unable to intubate, consider suctioning, jaw thrust, changing operators, using a different blade, etc.; monitor oxygen saturations and use bag-valve-mask to ventilate between attempts if needed.

9. Use rescue airway plan (LMA, Combitube, King, cricothyrotomy, etc.) and/or bag-valve-mask if unable to intubate after 3 attempts.

10. Once intubation is confirmed, if patient requires continued sedation, long term paralytics\*\*\*, or analgesics, consider the following drugs and repeat as necessary based upon patient response and drug duration of action:

a. Sedation:

1. midazolam (*Versed*): 0.1 mg/kg IV push (if not hypotensive) **OR**
2. lorazepam (*Ativan*): 1 - 2 mg IV push, **OR**
3. diazepam (*Valium*): 5 mg slow IV push over 2 minutes



# CCT-RN/Paramedic Treatment Guideline 1901/2901

Advanced Airway Management (RSI)

Page 3 of 3

b. Analgesia:

1. fentanyl (*Sublimaze*): 1 - 3 mcg/kg slow IV push, **OR**
2. morphine sulfate: 2 - 4 mg slow IV push

c. Long-term paralytics:\*\*\*

1. vecuronium (*Norcuron*): 0.1 mg/kg IV push, **OR**
2. rocuronium (*Zemuron*): 1 mg/kg IV push

**\*\*\*Note: an agent for long term paralyzation must never be given until endotracheal tube placement is fully confirmed.**

11. All patients given a long-term paralytic agent *must* also periodically be given sedation while they remain paralyzed.

C. **Contact Medical Command** enroute with patient update for all patients requiring intubation.





# CCT-RN/Paramedic Treatment Guideline 1902/2902

**Patient Comfort, Advanced**

**Page 1 of 2**

Following general guidelines/precautions of the **Patient Comfort Protocol 4902**, assess the patient's need for advanced comfort measures (treatment of severe pain, nausea, vomiting) using the guidelines below:

- A. Pain Management. This pain management guideline is intended for patients with severe pain due to isolated trauma, not the multisystem trauma patient. This is also **not** intended for treatment of abdominal pain. For chest pain in cardiac patients, refer to **Chest Pain (ACS) Protocol 4202**.

1. Review patient's allergies, if possible.

2. Ensure patent IV. Check vital signs and ensure that patient is not hypotensive per **MAMP Protocol 1201/2201**.

3. Fentanyl (*Sublimaze*): **[drug of 1<sup>st</sup> choice due to less nausea/vomiting, hypotension]**

a. Adult dose: 1.0 – 1.5 mcg/kg slow IV push (max. dose 150 mcg). May be repeated in 50 mcg dose increments as needed.

b. Pediatric dose: 1.0 – 1.5 mcg/kg slow IV push. May be repeated in 1 mcg/kg dose increments as needed up to a max. total dosage of 3 mcg/kg.

**OR**

4. Morphine sulfate:

a. Adult dose: 5 mg IV; may repeat in 5 – 10 minutes if no relief.

b. Pediatric dose: 0.1 mg/kg IV; may repeat 0.05 mg/kg in 5 – 10 minutes if no relief. (Max. dose not to exceed adult dose).

- B. Nausea/Vomiting Management.

1. Ondansetron (*Zofran*): **(This is the drug of 1<sup>st</sup> Choice)**

Adult dose: 4 mg IV push. May repeat in 10 minutes if needed.

Pediatric dose: 0.15 mg/kg IV push (max. dose 4 mg). May repeat in 10 minutes if needed.

**OR**

2. Promethazine (*Phenergan*):

Adult dose: 12.5 mg IV push (6.25 mg IV in elderly). Not to be repeated.

Pediatric dose (over 2 year old): 0.25 – 1.0 mg/kg IV push (max. dose 12.5 mg). Not to be repeated.



# CCT-RN/Paramedic Treatment Guideline 1902/2902

**Patient Comfort, Advanced**

**Page 2 of 2**

C. After giving any of the above medications, **Contact Medical Command** enroute with updated patient report.





# CCT-RN/Paramedic Treatment Guideline 1903/2903

## Blood Administration

Page 1 of 3

Blood/blood products may be administered during transport in accordance with the following guideline:

- A. Indications for transfusion.
1. Prior to blood administration in patients with hypovolemic shock, conventional IV fluid therapy for volume replacement should be initiated.
  2. Patients with ongoing, or suspected ongoing, major hemorrhage based on their presenting injury or diagnosis, and with the clinical signs of shock (tachycardia, delayed capillary refill, hypotension, or mental status changes) should be given blood (if available) when the normal IV fluid volume replacement has not corrected the problem. Blood transfusion should also be considered in patients with known Hemoglobin less than 8.
  3. Baseline vital signs should be obtained prior to blood administration, with continuous monitoring throughout the transfusion.
  4. Blood Type: Blood for transfusion should be used, if available, in the following order of availability:
    - a. 1<sup>st</sup> choice: fully cross-matched
    - b. 2<sup>nd</sup> choice: type specific [appropriate for life threatening hemorrhage only]
    - c. 3<sup>rd</sup> choice: type O Rh negative [universal donor blood]
    - d. 4<sup>th</sup> choice: type O Rh positive [use as last resort in females of childbearing age]

### CCT Class 1:

#### 5. Dosage:

Adults: 2 – 4 Units Packed Red Blood Cells (PRBCs)

Pediatrics: 10 ml/kg PBRCs. May repeat this amount if needed.

### CCT Class 2:

6. Blood administration is normally a CCT Class 1 procedure. However, for a patient receiving blood, a CCT Class 2 team, so as to not delay transport, may be given extra units of blood by a sending hospital to take with them for administration while enroute but only under the following circumstances:

- a. All blood compatibility cross-checks and patient identification must be signed off by the two required hospital personnel **before** leaving the sending facility **AND**,



# CCT-RN/Paramedic Treatment Guideline 1903/2903

**Blood Administration**

**Page 2 of 3**

b. The CCT team must recheck and verify the patient's armband identification that each unit of blood is for the correct patient before administration, **AND,**

c. The CCT team must receive a **direct order from the sending physician or MCP** as to the number of units of blood to be given enroute.



7. Contact Medical Command enroute with updated report on any patient needing emergency transfusion.



## B. General Guidelines.

1. All blood not currently being administered should be transported in a cooler if possible.
2. If a squad obtains blood from a hospital, that hospital's blood bank procedures should be followed for obtaining blood.
3. Prior to administration, transport personnel must check and verify blood type, Rh factor, unit numbers, and expiration date.
4. Signatures are required on blood label by both transport medical personnel after checking above information.
5. In adults, blood should be administered through a large bore (at least 18 gauge) peripheral IV, central line, or intraosseous needle. Smaller bore is acceptable in children.
6. Blood should be administered through standard blood tubing with filter, and with 0.9% normal saline.



# CCT-RN/Paramedic Treatment Guideline 1903/2903

**Blood Administration**

**Page 3 of 3**

7. After transfusion is complete, amount transfused and patient's response should be documented.

8. All unused blood products and empty blood product bags should be handled according to your institutional policy.

**C. Transfusion Reaction.**

1. If signs of a transfusion reaction develop [fever, chills, hypotension, dyspnea, tachycardia, pain at the transfusion site, hives, etc.], stop the transfusion immediately.

2. The unit of blood, the IV bags, and all tubing must be discontinued and sent to the blood bank upon arrival at the receiving hospital.

3. Notify Medical Command immediately of all possible transfusion reactions and to obtain orders for treatment of transfusion reaction if necessary.





# CCT-RN/Paramedic Treatment Guideline 1904/2904

**Sedation and Restraint**

**Page 1 of 2**

Safety of both the Critical Care Transport team and patient is paramount. This safety should not be compromised by the transport of a combative patient. Neither should the patient be allowed to put himself/herself into a situation that could potentially cause further self harm. This guideline is intended to ensure the safety of all involved, yet not infringe upon the rights of an awake, alert, competent patient.

A. Physical Restraint. All medical patients must be evaluated per **MAMP Protocol 1201/2201**. All trauma patients must be evaluated per **TAMP Protocol 1101/2101**.

1. Any patient needing restraints must be evaluated for toxic ingestion, multi-system trauma, or head injury. If patient has multi-system trauma or severe head injury causing combative behavior, follow **TAMP Protocol 1101/2101** and/or **Advanced Airway Management (RSI) Guideline 1901/2901**, if applicable for their medical management, rather than this guideline. However, no patient should ever be RSI intubated simply as a “retribution for being unruly.”

2. Soft restraints may be applied to any patient who, at the discretion of the CCT crew, must be restrained to prevent potential injury to the patient or the crew. This includes patients that consent to restraint, and patients who in the opinion of the CCT crew lack the ability to make that decision. Awake, alert, competent adults may refuse restraint and may even refuse transport.

3. If restraints are applied, four or five point restraint is desirable. Check for adequate perfusion in each restrained extremity every 15 minutes.

B. Chemical Restraint (Sedation).

1. Transport of a combative patient is inappropriate, especially during aeromedical transport. Patients that are combative and present a danger to themselves or the CCT crew may also need to be chemically restrained, in addition to physically restrained.

2. If chemical restraint (sedation) is necessary, follow the guidelines below:

a. Consider lorazepam (*Ativan*):

Adult dose: 1 – 2 mg slow IV push.

Pediatric dose: 0.05 mg/kg slow IV push (max. dose 2 mg).

**OR**





# CCT-RN/Paramedic Treatment Guideline 1904/2904

**Sedation and Restraint**

**Page 2 of 2**

b. Consider midazolam (*Versed*): [Do not use if hemodynamically unstable]

Adult dose: 1 – 2 mg slow IV push

Pediatric dose: 0.1 mg/kg slow IV push

3. Repeat doses of either of the above meds may be given if necessary.

C. For any patient requiring physical restraint **and** chemical restraint (sedation), **Contact Medical Command** enroute with updated patient report.

