

# INTERFACILITY TRANSFER PROTOCOL

## Table of Contents

- I. Policies and Procedures
  - a. Introduction
  - b. Documentation
  - c. Transport Crew Levels
  - d. Contacting Medical Control
  - e. Transferring Patients with Drugs and Devices
  - f. Requesting Additional Personnel
  
- II. Drugs
  - a. Cardiovascular Drugs
    - a.i. Antiarrhythmic Agents
      - a.i.1. Flecainide (Tambocor)
      - a.i.2. Ibutilide (Corvert)
      - a.i.3. Magnesium Sulfate
      - a.i.4. Propafenone (Rhythmol)
    - a.ii. Beta blockers
      - a.ii.1. Atenolol (Tenormin)
      - a.ii.2. Esmolol (Brevibloc)
      - a.ii.3. Labetalol (Normodyne)
      - a.ii.4. Metoprolol (Lopressor)
      - a.ii.5. Sotalol (Betapace)
    - a.iii. Blood Pressure Lowering Drugs (Other)
      - a.iii.1. Hydralazine
      - a.iii.2. Nicardipene (Cardene)
      - a.iii.3. Nitroprusside (Nipride)
      - a.iii.4. Nesiritide (Natrekor)
    - a.iv. Calcium Channel Blockers
      - a.iv.1. Diltiazem Drip (Cardizem)
      - a.iv.2. Nicardipene Drip
    - a.v. Glycoprotein IIb/IIIa Inhibitors
      - a.v.1. Abciximab (Reopro)
      - a.v.2. Tirofiban (Aggrastat)
      - a.v.3. Eptifibatid (Integrilin)
    - a.vi. Heparin Drip
  
    - a.vii. Inotropes
      - a.vii.1. Inamirone (Inacor)
      - a.vii.2. Milrinone (Primacor)
      - a.vii.3. Dobutamine
      - a.vii.4. Dopamine
      - a.vii.5. Epinephrine
      - a.vii.6. Norepinephrine (Levophed)
    - a.viii. Nitroglycerine Drip

- a.ix. Thrombolytic Therapy
  - a.ix.1. Streptokinase
  - a.ix.2. APSAC
  - a.ix.3. TPA
  - a.ix.4. TNK
  - a.ix.5. Retavase
- b. Sedation and Paralytic Agents
  - b.i. Benzodiazepine Drips
    - b.i.1. Lorazepam (Ativan)
    - b.i.2. Midazolam (Versed)
  - b.ii. Moderate Sedation Agents
    - b.ii.1. Propofol
    - b.ii.2. Barbiturates
    - b.ii.3. Ketamine
  - b.iii. Opioid Drips
    - b.iii.1. Morphine
    - b.iii.2. Fentanyl
  - b.iv. Paralytic Agents
    - b.iv.1. Pancuronium
    - b.iv.2. Vecuronium
    - b.iv.3. Rocuronium
- c. CNS Drugs
  - c.i. Anticonvulsants
    - c.i.1. Phenytoin
    - c.i.2. Fosphenytoin (Cerebyx)
    - c.i.3. Valproic Acid
  - c.ii. Mannitol
  - c.iii. Steroids
    - c.iii.1. Methylprednisalone- High Dose
    - c.iii.2. Dexamethasone (Decadron)
- d. HAL/TPN, Insulin and Electrolytes
  - d.i. Hyperalimentation/TPN
  - d.ii. Insulin Drips
  - d.iii. Potassium Chloride
- e. Obstetric Drugs
  - e.i. Magnesium Sulfate
  - e.ii. Oxytocin (Pitocin)
- f. Anti-Infective Therapy
  - f.i. Antibiotics and Antivirals
  - f.ii. Antifungal
- g. Pain Control
  - g.i. Opioid Drips
    - g.i.1. Morphine
    - g.i.2. Fentanyl
    - g.i.3. Hydromorphone (Dilaudid)
  - g.ii. PCA pumps and Subcutaneous pumps

- g.iii. Anesthetic Sprays or Topical Gels
- h. Antidotes
  - h.i. N-Acetyl Cysteine/NAC (Mucomist)
  - h.ii. Cyanide Antidote Kit
  - h.iii. Thiamine
  - h.iv. Bicarbonate Drip
  - h.v. Pyridoxine
  - h.vi. Atropine/2PAM
- i. GI Drugs
  - i.i. Antiemetics
    - i.i.1. Metoclopramide (Reglan)
    - i.i.2. Prochlorperazine (Compazine)
    - i.i.3. Promethazine (Promethazine)
    - i.i.4. Ondansetron (Zofran) and related
  - i.ii. Acid Reduction
    - i.ii.1. Pantoprazole (Protonix)
    - i.ii.2. Lansoprazole (Prevacid)
    - i.ii.3. Ranitidine (Zantac)
  - i.iii. GI Bleed related medications

### III. Devices

- a. Temporary Cardiac Pacing
- b. Chest Tubes
- c. Ventricular Assist Devices
- d. Tracheostomy Care
- e. BiPaP Machines
- f. Invasive Cardiovascular monitoring
  - f.i. Arterial Pressure Monitor lines
  - f.ii. Swann-Ganz catheters
- g. Intracranial Pressure (ICP) monitors
- h. Insulin Pump
- i. Central Vascular Access
  - i.i. Triple lumen CVLs
  - i.ii. Indwelling Catheters
    - i.ii.1. External
    - i.ii.2. Implanted
  - i.iii. Shiley
  - i.iv. PICC lines

### IV. Pediatric Transfer Protocol

- a. Anticonvulsants
- b. Continuous Albuterol Nebulization
- c. Insulin Drip
- d. IV Antibiotics

- V. Special Situations
  - a. The Hospice Patient
  - b. The Pediatric patient and Consent Issues
  - c. The Psychiatric Patient
  - d. The Therapeutically Cooled Patient

VI. Glossary

VII. Interfacility Transfer Checklist Document

VIII. Interfacility Crew Capabilities

# I. ***Procedures and Policies***

- a. *Introduction*
- b. *Documentation*
- c. *Transport Crew Levels*
- d. *Contacting Medical Control*
- e. *Transferring Patients with Drugs and Devices*
- f. *Requesting Additional Personnel*

## a. Introduction

The decision to transfer a patient rests with the transferring physician (or other care provider, such as a physician assistant). This physician bears responsibility for the transfer decisions. It is the transferring physician who must:

- 1) Determine whether the benefits of transfer outweigh the risks.
- 2) Ensure that the patient is properly stabilized prior to departure.
- 3) Be responsible for complying with currently accepted community standards of practice regarding interfacility transfer.

The Paramedics/CCs and Medical Control Physician (MC) assume responsibility for management of the patient, given the circumstances of the patient's condition, while en route between facilities.

This protocol recognizes there will be situations where potentially unstable patients will require transfer to another facility to obtain a higher level of care.

**It should be noted that the Interfacility Transfer Protocol is a supplement to the Regional 911 Protocols and requires additional training. In this light, patient care during transport can be defaulted to that delineated by the Regional 911 Protocols.**

## b. Documentation

It is the responsibility of the transferring hospital/physician to provide appropriate documentation which includes a transfer form or other documentation indicating compliance with current statutes or laws regarding patient transfers. Included should be patient

identifying information (name, address, date of birth, etc.), treatments, test results, preliminary diagnosis, reason for transfer, names of transferring/accepting physicians/institutions, pertinent medical records and orders.

## c. Transport Crew Levels

The following is a description of which levels of care may transport what drugs and devices.

**EMT** Saline lock  
Patients with PCA pumps with settings unchanged for > 6 hours  
Stable patient with no anticipation of further interventions en route

**EMT-I** Above listed plus:  
Peripheral IV lines with no added drugs  
Stable, intubated patients with no anticipation of further interventions en

route

**EMT-CC** Above listed plus:  
Peripheral IV lines  
Indwelling Lines /PICC lines that are already accessed and running  
Central venous lines that are running  
Cardiac monitor/defibrillator  
Intubated patients with stable ventilator settings  
Up to 3 IV drips and drugs except for those excluded from the list  
Only may transport patients on drugs SPECIFICALLY listed in the

protocol

**EMT-P** Above listed plus:  
All Intubated patients  
Arterial and Swann-Ganz lines- not to be used for monitoring by

paramedic

The medical director of the transporting service shall insure that all transporting providers are credentialed and trained for interfacility transfer and may transport drugs in the so-named categories at their discretion.

#### **d. Contacting Medical Control by Paramedics/CCs**

Medical Control **MUST** be contacted in the following circumstances:

1. Ongoing administration of blood products or resuscitative medications
2. Intubated patients
3. Patients with chest tubes
4. Patients with temporary pacemakers
5. Changes in symptoms/ signs/ conditions potentially indicating deterioration
6. Unstable vital signs
7. Medications not specifically listed in the protocol

Patients with the first four listed items should be contacted before arrival, and preferably before the patient leaves the sending facility. Patients with the 5<sup>th</sup> and 6<sup>th</sup> listed items should have MC called en route as these occur.

Patients on medications not specifically listed in the protocol may be transported by **EMT-Ps ONLY**. These medications will need to be reviewed by MC and must fall into a similar category as other drugs **ALREADY LISTED** in the protocol. A patient receiving a completely new category of drug **may not be transported without further personnel** trained in the use of that drug.

**Medical Control (MC) may be defined as either the transporting service agency Medical Director, the transferring or receiving MD and as a last resort the ED physician of the transferring or receiving hospital.**

**The Medical Director of the transporting service may set additional standards regarding contacting MC.**

**e. Transferring Patients with Drugs and Devices**

During interhospital transfer crew members shall follow all regionally approved BLS/ALS protocols. In addition, the patients on the stated drugs and devices may only be transported **if the respective drugs have been initiated at the transferring hospital by the transferring physician/care provider.** None of these may be initiated en route. At the discretion of MC, the drug rates/doses may be altered or discontinued depending on the patient's clinical condition. Where indicated, EMT-Ps may titrate a drug up or down once depending on parameters delineated in the specific protocol.

The following precautions should be kept in mind by transferring providers:

1. All medications have potential to cause allergic reactions.
2. Some medications cause local irritation around the IV site. Several may even cause tissue necrosis if there is infiltration. If there is infiltration of any line, the IV should be immediately discontinued.
3. Many of the listed drugs are incompatible with other medications. Therefore, additional medication should be given through a separate IV line, or, if one is not established, the infusion should be stopped and the line flushed before administering a second medication. This should only be done under direct MC guidance.
4. Most require infusion pumps and/or cardiac monitoring.
5. MC should be contacted if there is any change in patient condition or if any medication needs to be emergently discontinued during transport.
6. If the need arises for emergency medications to be given, infusions may need to be discontinued; contact MC.
7. The MC physician may determine that the number or types of drugs/devices may require the presence of additional personnel (such as a second paramedic, nurse or physician).
8. Transfer of patients with ongoing infusion of medication outside the scope of practice and training of the transporting crew (either because of lack of credentialing or medication not listed in the protocol) can not be accomplished without additional personnel who possess a higher level of training.

**f. Requesting Additional Personnel**

When the EMS provider anticipates that they will require more assistance to appropriately care for the patient during transfer, they shall request the transferring

physician/health care provider to provide appropriately trained hospital staff to accompany the patient and assist.

The EMS provider must contact MC for medical direction in all situations where they are not comfortable with the circumstances of the transfer. **The transfer will not occur unless the EMS provider and MC are confident the personnel and equipment are appropriate for transfer.**



- II. **Drugs**
  - a. **Cardiovascular Drugs**
  - b. **Sedation and Paralytic Agents**
  - c. **CNS Drugs**
  - d. **HAL/TPN, Insulin and Electrolytes**
  - e. **Obstetric Drugs**
  - f. **Anti-infective Therapy**
  - g. **Pain Control**
  - h. **Antidotes**
  - i. **GI Drugs**

*a. Cardiovascular Drugs*

- i. Antiarrhythmic Drugs*
- ii. Beta Blockers*
- iii. Blood Pressure Lowering Drugs*
- iv. Calcium Channel Blockers*
- v. Glycoprotein Iib/IIIa Inhibitors*
- vi. Heparin Drip*
- vii. Inotropes*
- viii. Nitroglycerine Drip*
- ix. Thrombolytic Therapy*

## *Cardiovascular Drugs*

# **Antiarrhythmics**

**Use:** Treatment and cardioversion of Atrial Fibrillation or Atrial Flutter  
Treatment and prophylaxis of refractory Ventricular Tachycardia

### **Adverse Effects:**

Hypotension,  
QT prolongation, Torsades, Ventricular Tachycardia  
AV Block

### **Dosing:**

#### **Flecainide (Tambocor)**

Infuse: 2 mg/kg over 20 minutes

#### **Ibutilide (Corvert)**

Infuse: 1 mg IV over 10 minutes

#### **Magnesium Sulfate**

Bolus: 1-2 grams over 5 minutes

Infusion: 6-12 grams over 24 hours

#### **Propafenone (Rhythmol)**

Bolus: 2 mg/kg in 15-20 minutes; followed by

Infusion: 0.0067 - 0.0078 mg/kg/minute

### **Special Considerations:**

Use infusion pump for drips

May not be compatible with heparin, lidocaine, amiodarone or bicarb

Frequent BP checks for hypotension

Increased risk for ventricular dysrhythmias if on certain antihistamines or anti-nausea medications

**Transport by EMT-Ps only**

**(with exception of Magnesium Sulfate: may be transported by EMT-CC)**

## Cardiovascular Drugs

# Beta- Blockers

**Uses:** Slow ventricular response in SVT, Atrial Fibrillation and Atrial Flutter  
Slow sinus node rate

**Adverse Effects:**

Hypotension, bradycardia  
Hypoglycemia (diabetics on medications); usual signs and symptoms are masked  
Bronchospasm  
Sinus node arrest

**Dosing:**

**Atenolol (Tenormin)**

Infuse: 5 mg over 5 minutes  
May be repeated in 10 minutes

**Esmolol (Brevibloc)**

Bolus: 500 mcg/kg (0.5 mg/kg) over one minute  
Infusion: 50 mcg/kg/minute for 4 minutes

If inadequate response, repeat bolus and  
increase drip rate by 50 mcg/kg/minute up to 3 times  
**(total dose of 2000 mcg bolus and in fusion @ 200  
mcg/kg/minute)**

Drug comes in a 100 mg (10 mg/ml) vial or  
2500 mg ampule into 250 ml (10 mg/ml) or 500 ml (5 mg/ml) NS or D5W

**Labetalol (Normodyne)**

Infusion: 2 mg/minute (concentration 1mg/ml; 2ml/min)  
duration from 25 minutes to 2.5 hours

**Metoprolol (Lopressor)**

Inject: 2.5 mg IV slow push over 2 minutes  
May repeat dose up to 5 times every 5 minutes  
for a **total dose of 15 mg**

**Sotalol (Betapace)**

Bolus: 1-1.5 mg/kg; followed by  
Infusion: 0.008 mg/kg/minute = 8 mcg/kg/min

**Special Considerations:**

Use infusion pump  
Check BP frequently; monitor heart rate  
Carefully monitor for hypotension, excessive bradycardia or new AV blocks  
Patient with DIABETES may have symptoms of hypoglycemia masked; watch  
carefully

for mental status changes  
Contact MC if develop adverse reaction

### Cardiovascular Drugs

## Blood Pressure Lowering Agents

**Uses:** Short term parenteral treatment when oral treatment is not feasible  
Nitroprusside may be used in CHF to reduce both preload and afterload (reduces work of the heart)

#### Adverse Effects:

Hypotension, bradycardia, dysrhythmias  
Palpitations, flushing, angina  
Headache, restlessness, drowsiness, confusion or slurred speech

**Dosing:**                      **Hydralazine**                      5-40 mg IV push over 1-2 minutes  
min    Usually given as repeat bolus doses every 20-30  
Rarely given as drip: 1-10 mg/hour

#### **Nicardipene(Cardene)**

Dilute to:                      0.1 mg/ml  
Infusion:                      Start @ 50 ml/hr (5 mg/hr)  
May increase rate by 2.5 mg/hr every 15 minutes until  
desired  
BP is reached for a **maximum dose of 15 mg/hr**

**Nitroprusside**                      Infusion:                      Continuous to maintain BP  
**See dosage chart below; amount listed is in mL/hr**

**Nesiritide(Natrecor)**                      2 mcg/kg IV push over 60 seconds  
0.01 mcg/kg/min maintenance infusion

#### Special Considerations:

Use infusion pump  
Dedicated IV line- should not administer in same IV line as other meds  
Nicardipene:  
If hypotensive (BP<60) or tachycardic (HR>140), discontinue drip.  
May resume when stable @ 3-5 mg/hr  
Infusion site must be changed after 12 hours  
Use with caution in patients with liver failure, since it is metabolized in the liver.  
May be contraindicated in severe Aortic Stenosis as may decrease preload.  
Nitroprusside:  
Small boluses or slight increases in infusion rate may produce profound hypotension  
Solution must be wrapped in foil to protect it from light

Do not mix other medications in the same line

Check BP and heart rate every 5 minutes

Hypotension can be alleviated by decreasing the infusion rate

Nesiritide:

Caution in pregnant or lactating patients

Contact MC for worsening signs/symptoms, significant BP change or if BP<90

**NITROPRUSSIDE DOSING CHART**

**CONCENTRATION 200MCG/ML**

100MG/500ML

50MG/250ML

Pat Wt in Kg	MCG/KG/MINUTE															
	0.5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
35	5	11	21	32	42	53	63	74	84	95	105	116	126	137	147	158
40	6	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180
45	7	14	27	41	54	68	81	95	108	122	135	149	162	176	189	203
50	8	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225
55	8	17	33	50	66	83	99	116	132	149	165	182	198	215	231	248
60	9	18	36	54	72	90	108	126	144	162	180	198	216	234	252	270
65	10	20	39	59	78	98	117	137	156	176	195	215	234	254	273	293
70	11	21	42	63	84	105	126	147	168	189	210	231	252	273	294	315
75	11	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338
80	12	24	48	72	96	120	144	168	192	216	240	264	288	315	336	360
85	13	26	51	77	102	128	153	179	204	230	255	281	306	332	357	383
90	14	27	54	81	108	135	162	189	216	243	270	297	324	351	378	405
95	14	29	57	86	114	143	171	200	228	257	285	314	342	371	399	428
100	15	30	60	90	120	150	180	210	240	270	300	330	360	390	420	450
105	16	32	63	95	156	158	189	221	252	284	315	347	378	410	441	473
110	17	33	66	99	132	168	198	231	264	297	330	363	396	429	462	495
115	17	35	69	104	138	173	207	242	276	311	345	380	414	449	483	518
120	18	36	72	108	144	180	216	252	288	324	360	396	432	468	504	540

**Blood Pressure Lowering Drugs should be transported by EMT-Ps only.**

*Cardiovascular Drugs*

## **Calcium Channel Blockers**

**Uses:** Ventricular Rate Control in A Fib, Atrial Flutter, MAT or SVT

**Adverse Effects:**

May cause Atrial Flutter, AV Block, Bradycardia, Chest Pain, CHF,  
Ventricular Arrhythmias , nausea/vomiting, dyspnea or hypotension

**Dosing:**

**Diltiazem (Cardizem)**

Bolus: 0.25 mg/kg over 2 minutes (20 mg for average patient)  
If needed may repeat bolus in 15 minutes @ 0.35 mg/kg  
(25 mg in the average patient) over 2 – 5 minutes

Infusion: Dilute 125 mg (25ml) in 100 ml NS/D5W  
Drip @ 5 – 15 mg/hour titrated to heart rate

**Nicardipene(Cardene)**

Dilute to: 0.1 mg/ml  
Infusion: Start @ 50 ml/hr (5 mg/hr)  
May increase rate by 2.5 mg/hr every 15 minutes until

desired

BP is reached for a **maximum dose of 15 mg/hr**

**Special Considerations:**

Carefully monitor for hypotension/excessive bradycardia/ new A/V block  
PVC's can occur with conversion to NSR  
Don't use in the presence of a WIDE COMPLEX TACHYCARDIA

**Nicardipene:**

If hypotensive or tachycardic, discontinue drip.

May resume when stable @ 3-5 mg/hr

Infusion site must be changed after 12 hours

Use with caution in patients with liver failure, since it is metabolized in

the liver.

May be contraindicated in severe Aortic Stenosis as may decrease preload.  
Should not be infused in same IV with other drugs

*Cardiovascular Drugs*

## **Glycoprotein IIb/IIIa Inhibitors**

**Use:** Unstable Angina  
Non Q-wave MI  
Percutaneous Coronary Intervention

**Adverse Effects:**  
Bleeding (usually at cath sites)  
Possible allergic reactions to ReoPro

**Dosing:** **Abciximab (ReoPro)**  
Loading bolus: 0.25 mg/kg over 10-60 minutes  
Maintenance infusion: 0.125 mcg/kg/min for 12 hours following PCI  
or 18-24 hours for unstable angina

Should be administered through a 0.2 or 0.22 micron filter  
Drip rates will vary depending on concentration that was mixed. Verify drip rates/dosage calculations with the transferring facility staff prior to transport.

**Tirofiban (Aggrastat)**  
Loading infusion: 0.4 mcg/kg/min for 30 minutes  
Maintenance infusion: 0.1 mcg/kg/min

Rate will be halved for patients with renal insufficiency  
Dosing table for Tirofiban HCl (concentration 50 mcg/ml)

<b>Patient Weight</b>		<b>30 Minute Loading</b>			
<b>Maintenance Infusion</b>					
<i>(lb)</i>	<i>(kg)</i>	<i>rate (ml/hr)</i>	<i>volume (30 min)</i>	<i>rate (ml/hr)</i>	
66-82	30-37	16 ml/hr	8 ml	4ml/hr	
83-100	38-45	20 ml/hr	10 ml	5 ml/hr	
101-119	46-54	24 ml/hr	12 ml	6 ml/hr	
120-137	55-62	28 ml/hr	14 ml	7 ml/hr	
138-155	63-70	32 ml/hr	16 ml	8 ml/hr	
156-174	71-79	36 ml/hr	18 ml	9 ml/hr	
175-192	80-87	40 ml/hr	20 ml	10 ml/hr	



193-210	88-95	44 ml/hr	22 ml	11 ml/hr
211-229	96-104	48 ml/hr	24 ml	12 ml/hr
230-247	105-112	52 ml/hr	26 ml	13 ml/hr
248-265	113-120	56 ml/hr	28 ml	14 ml/hr
266-283	121-128	60 ml/hr	30 ml	15 ml/hr
284-302	129-137	64 ml/hr	32 ml	16 ml/hr
303-319	138-145	68 ml/hr	34 ml	17 ml/hr
320-337	146-153	72 ml/hr	36 ml	18 ml/hr

**Eptifibatide (Integrilin)**

Loading bolus: 180 mcg/kg over 1-2 minutes

Maintenance infusion: 2 mcg/kg/min up to 72 hours

Dosing table for Eptifibatide

Bolus drawn directly from “**bolus-vial**” (2 mg/ml)

Maintenance given directly from “**infusion vial**” (0.75 mcg/ml)

<b>Patient Weight (kg)</b>	<b>Bolus Volume (mL)</b>	<b>Infusion Rate (mL/hr)</b>
37-41	3.4 ml	6 ml/hr
42-46	4.0 ml	7 ml/hr
47-53	4.5 ml	8 ml/hr
54-59	5.0 ml	9 ml/hr
60-65	5.6 ml	10 ml/hr
66-71	6.2 ml	11 ml/hr
72-78	6.8 ml	12 ml/hr
79-84	7.3 ml	13 ml/hr
85-90	7.9 ml	14 ml/hr
91-96	8.5 ml	15 ml/hr
97-103	9.0 ml	16 ml/hr
104-109	9.5 ml	17 ml/hr
110-115	10.2 ml	18 ml/hr
116-121	10.7 ml	19 ml/hr
>121	11.3 ml	20 ml/hr

**Special Considerations:**

Use infusion pump

Should always be given WITH heparin; if bleeding occurs, need to turn off heparin as

well as the GPIIb/IIIa drug

Eptifibatide dose will be decreased in patients with impaired renal function;

settings to

be determined by the patient’s ordering physician

*Cardiovascular Drugs*

## **Heparin Drip**

**Uses:** Prevents blood clotting, especially in the following situations:  
Acute MI, Pulmonary Embolus, Deep Vein Thrombosis

**Adverse Effects:**  
Hemorrhage from various sites including needle sticks, GI tract, CNS bleeds

**Dosing:** Bolus: 15-18mg/kg  
Infusion: 800-1600 mg/hour  
Infusion rates may be outside this range and should not require adjustment during transport

**Special Considerations:**  
Use infusion pump  
D/C immediately for onset of major bleeding or acute mental status change  
Contact MC for any bleeding such as IV sites or gums

*Cardiovascular Drugs*

## Inotropes

**Uses:** Short term intravenous treatment of patients with acute decompensated heart failure

Severe CHF/Cardiogenic Shock

To increase cardiac output by increasing myocardial contractility and stroke volume

Hemodynamically significant hypotension not resulting from hypovolemia

**Adverse Effects:**

May develop hypokalemia resulting from increased cardiac output and/or diuresis

May have tachycardia, ventricular dysrhythmias or ectopy, hypertension, angina

or

ischemic chest pain

Dobutamine may also cause hypotension

Dopamine may cause nervousness, headache, palpitations, dyspnea, nausea or

vomiting

**Dosing:** **Inamrinone (Inacor):** Loading dose over 2-3 minutes: 0.75 mcg/kg  
Maintenance infusion: 5-10 mcg/kg/min

**Milrinone (Primacor):** Loading dose over 10 minutes: 50 mcg/kg

<b>Patient Weight (kg)</b>	<b>30</b>	<b>40</b>	<b>50</b>	<b>60</b>	<b>70</b>	<b>80</b>	<b>90</b>	<b>100</b>	<b>110</b>	<b>120</b>	
<b>(max)</b>											
Loading Dose (mg)	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	
Maintenance dose (mL/hr)	200 mcg/mL concentration										
mcg/kg/min	<b>0.375</b>	3.4	4.5	5.6	6.8	7.9	9.0	10.1	11.3	13.5	
	<b>0.50</b>	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0	16.5	
18.0	<b>0.75</b>	6.8	9.0	11.3	13.5	15.8	18.0	20.3	22.5	24.8	27.0

**Dobutamine:** 2.5 – 20 mcg/kg/min continuous infusion;  
onset may be 10 minutes

**See dosing chart below for different concentration solutions**

**DOBUTAMINE DOSING CHART  
CONCENTRATION 2MG/ML**

1G/500ML OR 100MG/50ML  
500MG/250ML

PAT WT IN KG	MCG/KG/MINUTE																																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	25	30	35	40																
35	1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	26	32	37	42																
40	1	2	4	5	6	7	8	10	11	12	13	14	16	17	18	19	20	22	23	24	30	36	42	48																
45	1	3	4	5	7	8	9	11	12	14	15	16	18	19	20	22	23	24	26	27	34	41	47	54																
50	2	3	5	6	8	9	11	12	14	15	17	18	20	21	23	24	26	27	29	30	38	45	53	60																
55	2	3	5	7	8	10	12	13	15	17	18	20	21	23	25	26	28	30	31	33	41	50	58	66																
60	2	4	5	7	9	11	13	14	16	18	20	22	23	25	27	29	31	32	34	36	45	54	63	72																
65	2	4	6	8	10	12	14	16	18	20	21	23	25	27	29	31	33	35	37	39	49	59	68	78																
70	2	4	6	8	11	13	15	17	19	21	23	25	27	29	32	34	36	38	40	42	53	63	74	84																
75	2	5	7	9	11	14	16	18	20	23	25	27	29	32	34	36	38	41	43	45	56	68	79	90																
80	2	5	7	10	12	14	17	19	22	24	26	29	31	34	36	38	41	43	46	48	60	72	84	96																
85	3	5	8	10	13	15	18	20	23	26	28	31	33	36	38	41	43	46	48	51	64	77	89	102																
90	3	5	8	11	14	16	19	22	24	27	30	32	35	38	41	43	46	49	51	54	68	81	95	108																
95	3	6	9	11	14	17	20	23	26	29	31	34	37	40	43	46	48	51	54	57	71	86	100	114																
100	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	75	90	105	120																
105	3	6	9	13	16	19	22	25	28	32	35	38	41	44	47	50	54	57	60	63	79	95	110	126																
110	3	7	10	13	17	20	23	26	30	33	36	40	43	46	50	53	56	59	63	66	83	99	116	132																
115	3	7	10	14	17	21	24	28	31	35	38	41	45	48	52	55	59	62	66	69	86	104	121	138																
120	4	7	11	14	18	22	25	29	32	36	40	43	47	50	54	58	61	65	68	72	90	108	126	144																

ml / hr or drops/min. using minidrip tubing = 60 drops / ml

**DOUBLE CONCENTRATION**

**DOBUTAMINE DOSING CHART  
CONCENTRATION 4MG/ML**

**1000MG/250ML  
500MG/125ML**

PAT WT IN KG	MCG/KG/MINUTE																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	25	30	35	40
35	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	11	13	16	18	21
40	1	1	2	2	3	4	4	5	5	6	7	7	8	8	9	10	10	11	11	12	15	18	21	24
45	1	1	2	3	3	4	5	5	6	7	7	8	9	9	10	11	11	12	13	14	17	20	24	27
50	1	2	2	3	4	5	5	6	7	8	8	9	10	11	11	12	13	14	14	15	19	23	26	30
55	1	2	2	3	4	5	6	7	7	8	9	10	11	12	12	13	14	15	16	17	21	25	29	33
60	1	2	3	4	4	5	6	7	8	9	10	11	12	13	14	14	15	16	17	18	23	27	32	36
65	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	24	29	34	39
70	1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	26	32	37	42
75	1	2	3	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	23	28	34	39	45
80	1	2	4	5	6	7	8	10	11	12	13	14	16	17	18	19	20	22	23	24	30	36	42	48
85	1	3	4	5	6	8	9	10	11	13	14	15	17	18	19	20	22	23	24	26	32	38	45	51
90	1	3	4	5	7	8	9	11	12	14	15	16	18	19	20	22	23	24	26	27	34	41	47	54
95	1	3	4	6	7	9	10	11	13	14	16	17	19	20	21	23	24	26	27	29	36	43	50	57
100	2	3	5	6	8	9	11	12	14	15	17	18	20	21	23	24	26	27	29	30	38	45	53	60
105	2	3	5	6	8	9	11	13	14	16	17	19	20	22	24	25	27	28	30	32	39	47	55	63
110	2	3	5	7	8	10	12	13	15	17	18	20	21	23	25	26	28	30	31	33	41	50	58	66
115	2	3	5	7	9	10	12	14	16	17	19	21	22	24	26	28	29	31	33	35	43	52	60	69
120	2	4	5	7	9	10	13	14	16	18	20	20	23	25	27	29	31	32	34	36	45	54	63	72

ml/hr or drops/min. using minidrip tubing = 60 drops/ml

**Dopamine:** 1-20 mcg/kg/min continuous infusion  
Onset may be 10 minutes

**See dosing chart below for different concentration solutions**

**Dopamine Dosing Chart**  
**Single Concentration 1.6 mg / ml**  
 800 mg / 500 ml  
 400 mg / 250 ml  
 mcg /kg /minute

Pt wt in Kg		1	2	3	4	5	10	15	20
	35	1	3	4	5	7	13	20	26
40	2	3	5	6	8	15	23	30	
45	2	3	5	7	8	17	25	34	
50	2	4	6	8	9	19	28	38	
55	2	4	6	8	10	21	31	41	
60	2	5	7	9	11	23	34	45	
65	2	5	7	10	12	24	37	49	
70	3	5	8	11	13	26	39	53	
75	3	6	8	11	14	28	42	56	
80	3	6	9	12	15	30	45	60	
85	3	6	10	13	16	32	48	64	
90	3	7	10	14	17	34	51	68	
95	4	7	11	14	18	36	53	71	
100	4	8	11	15	19	38	56	75	
105	4	8	12	16	20	39	59	79	
110	4	8	12	17	21	41	62	83	
115	4	9	13	17	22	43	65	86	
120	5	9	14	18	23	45	68	90	

ml/hr or drops/min. using minidrip tubing = 60 drops/ml  
**Dopamine (Single) Dosing Chart**

**Dopamine Dosing Chart**  
**Double Concentration 3.2 mg/ml**  
 800 mg/250 ml  
 mcg/kg/minute

Pt wt in Kg		1	2	3	4	5	10	15	20
	35	1	1	2	3	3	7	10	13
40	1	2	2	3	3	7	11	15	
45	1	2	3	3	4	8	13	17	
50	1	2	3	4	5	9	14	19	
55	1	2	3	4	5	10	15	21	
60	1	2	3	5	6	11	17	23	
65	1	2	4	5	6	12	18	24	
70	1	3	4	6	7	13	20	26	
75	1	3	4	6	7	14	21	28	
80	2	3	5	6	8	15	23	30	
85	2	3	5	7	8	16	24	32	
90	2	3	5	7	8	17	25	34	
95	2	4	5	8	9	18	27	36	
100	2	4	6	8	9	19	28	38	
105	2	4	6	8	10	20	30	39	
110	2	4	6	9	10	21	31	41	
115	2	4	6	9	11	22	32	43	
120	2	5	7	9	11	23	34	45	

ml/hr or drops/min. using minidrip tubing = 60 drops/ml  
**Dopamine (Double) Dosing Chart**

**Epinephrine:** 1-10 mcg/min titrated to desired effect

**Norepinephrine:** 0.5-1.0 mcg/min

**(Levophed)**

Titrated up to 30 mcg/min to desired hemodynamic effect

**Special Considerations:**

Use infusion pump

For Inamrinone/Milrinone:

do not mix with Lasix or dextrose-containing solutions

**should be transported by EMT-Ps only**

Monitor for cardiac dysrhythmias; these may be caused by hypokalemia, pre-existing

arrhythmias, abnormal drug levels, catheter placement, etc.

Check blood pressure and heart rate frequently. Discontinue briefly if develop hypotension secondary to vasodilatation

EMT-Ps may titrate up/down one increment without calling MC

Contact MC for any adverse affects

*Cardiovascular Drugs*

**Nitroglycerine Drip**

**Uses:** Acute Coronary Syndrome, CHF, Hypertension  
Decreases preload, and to a lesser extent, afterload

**Adverse Effects:**  
Excessive hypotension which can provoke angina, headache, restlessness, palpitations, tachycardia or dizziness

**Dosing:** Continuous infusion titrated to maintain therapeutic effect while avoiding hypotension.  
Usual range 10-200 mcg/min. May be higher in treatment of pulmonary edema.

**NITROGLYCERIN DOSING CHART  
CONCENTRATION 200MCG/ML  
100 MG/500 ML  
50 MG/250 ML**

**DOUBLE CONCENTRATION  
NITROGLYCERIN DOSING CHART  
CONCENTRATION 400MCG/ML  
100 MG/250 ML**

MCG/MIN	PUMP SETTING	MCG/MIN	PUMP SETTING	MCG/MIN	PUMP SETTING	MCG/MIN	PUMP SETTING
10	3	160	48	10	2	160	24
20	6	170	51	20	3	170	26
30	9	180	54	30	5	180	27
40	12	190	57	40	6	190	29
50	15	200	60	50	8	200	30
60	18	210	63	60	9	210	32
70	21	220	66	70	11	220	33
80	24	230	69	80	12	230	35
90	27	240	72	90	14	240	36
100	30	250	75	100	15	250	38
120	36	260	78	120	18	260	39
130	39	270	81	130	20	270	41
140	42	280	84	140	21	280	42
150	45			150	23		

**Special Considerations:** Use Infusion pump  
Monitor heart rhythm  
Check BP and HR frequently (every 5 minutes);  
may decrease to every 10 minutes if at the same rate for >1 hour  
Do not mix other medications in the same line  
Hypotension can be alleviated by decreasing the rate of infusion  
D/C infusion if BP systolic is <60mm Hg and contact MC  
Contact MC for worsening or persisting adverse signs/symptoms

or for

persisting BP < 90 mmHg

***EMT-CCs* may transport patients with a **MAXIMUM** rate of 100 mcg/min  
*EMT-Ps* may perform one titration of 10 mcg for escalating chest pain without contacting MC**



*Cardiovascular Drugs*

## **Thrombolytic Therapy**

**Uses:** Dissolves clots in blood vessels  
Generally used in the setting of Acute MI or CVA; occasionally used Pulmonary Embolus

**Adverse Effects:**

Minor hemorrhages from IV sites and gums  
Major hemorrhage from GI and intracranial or spinal sites  
Reperfusion dysrhythmias often occur about 30-60 minutes after starting infusion  
Allergic reactions including anaphylaxis may occur with Streptokinase or APSAC

**Dosing:**

**Streptokinase, APSAC or TPA:**

Dose to be determined by transferring physician  
(determined by patient weight and indication for therapy)  
Rate should not require adjusting en route

**Tenecteplase (TNK):** weight-based one time dose, administered over 5 seconds

Pt weight:	<60 kg	Dose:	30 mg
	≥60 - <70 kg		35 mg
	≥70 - <80		40 mg
	≥80 - <90		45 mg
	≥90		50 mg

Occasionally used as continuous infusion for peripheral arterial thrombus  
0.25-0.5 mg/hour up to 48 hours

**Retevase:** Given in 2 doses of 10 mg each, 30 minutes apart  
Given as a 2 minute IV push

**Special Considerations:**

Use infusion pump  
Monitor heart rhythm  
Check BP and HR frequently  
Do not mix with other medications in the same line  
D/C infusion immediately if there is cardiac arrest, major

hemorrhage,

anaphylaxis or change in mental status **AND call MC.**

## *b. Sedation and Paralytic Agents*

*i. Benzodiazepine Drips*

*ii. Moderate Sedation Agents*

*iii. Opioid Drips*

*iv. Paralytic Agents*

*Sedation and Paralytic Agents*

## **Benzodiazepine Drips**

**Uses:** Sedation for patients who are intubated (and often concurrently on a paralytic drip)

May be used to treat Status Epilepticus

**Adverse Effects:**

May be more prone to hypotension if used with an opioid drug

Can cause paradoxical agitation, hypertension or tachycardia

**Dosing:** **Lorazepam (Ativan):** Loading dose: 0.5- 4.0 mg IV bolus; may be repeated in 10 min

Infusion: 0.02- 0.1 mg/kg/hour

**Midazolam (Versed):** Loading dose: 0.01- 0.1 mg/kg IV bolus

Infusion 0.02-0.1 mg/kg/hour

**Special Considerations:**

Only to be used in intubated patients

## *Sedation and Paralytic Agents*

# **Moderate Sedation Agents**

**Uses:** Sedation for patients who are intubated (and often concurrently on a paralytic drip)

May also be used for refractory seizures or therapeutic coma

**Adverse Effects:**

May be more prone to hypotension if used with an opioid drug  
Can cause paradoxical agitation, hypertension or tachycardia

**Dosing:**

**Propofol:** Loading dose: 0.5-5 mg/kg  
Maintenance infusion: 2-10 mg/kg/hour

**Barbiturates:** *Pentobarbital* is most commonly used  
Loading dose: 10 mg/kg; infuse up to 25 mg/min  
Maintenance: 1-2 mg/kg/hour

**Ketamine:** Loading dose: 1-5 mg/kg  
Maintenance infusion: 0.01-0.05 mg/kg/hour

**Special Considerations:**

Only to be used in intubated patients

## *Sedation and Paralytic Agents*

# **Opioid Drugs/Drips**

**Uses:** Typically **part of a sedation combination** for patients who are intubated  
Occasionally for pain control

### **Adverse Effects:**

May cause hypotension, especially in volume depleted patients or those with  
right-sided  
heart failure

### **Dosing:**

until

**Morphine:** Loading dose: 2 mg increments given every 5-10 minutes

adequate pain control; typically max dose is 10 mg- may be higher

in

patients on chronic pain therapy

Infusion: 1-10 mg/hour

**Fentanyl:** Loading dose: 1-5 mcg/kg given IV push

Infusion: 1-5 mcg/kg/hour

### **Special Considerations:**

Not advisable to give patients on narcotic drips Naloxone, as this may precipitate  
acute

withdrawal

Antihistamines (both H1 and H2) may counteract hypotension; this is an MCO

## *Sedation and Paralytic Agents*

# Paralytic Agents

- Uses:** Total muscular paralysis when patient movement may:
1. Compromise airway control (e.g. causing unwanted extubation)
  2. Exacerbate a real or potential illness or injury (e.g. spinal cord injury from a spine fracture)
  3. Endanger the patient, EMS care provider or others

**Adverse Effects:**

Bronchospasm, flushing, hypotension and tachycardia have been rarely reported

**Dosing:**

**Pancuronium:**

Loading dose: 10 mg/kg

May repeat dose every 1-2 hours as needed

**Vecuronium:**

Initial dose 10 mg IV push

Repeat dose of 10 mg IV push every 20-40 minutes as

needed

Maintenance infusion may be an alternative:

1.1 mg/kg/min

**Rocuronium:**

Loading dose 0.6 mg/kg

May rebolus 0.2 mg/kg every 30-45 minutes

Maintenance infusion may be an alternative:

1.1 – 0.15 mg/kg/min

**Special Considerations:**

Produces COMPLETE APNEA; therefore an intact airway (e.g. endotracheal intubation),

and adequate ventilation/oxygenation **MUST BE ESTABLISHED PRIOR TO ADMINISTRATION**. Likewise, personnel and equipment with the ability to restore an airway, ventilation and oxygenation must be available during transport.

Causes paralysis only; **therefore concomitant use of a sedative/hypnotic is indicated**

Note: Paralysis may alter the clinical exam. For example, motor seizure activity will not

be seen, but the brain will continue to undergo seizure activity, and this must be treated! Also, conditions such as shock, hypoxia, pain, intracranial injury, hypoglycemia, etc. maybe the cause of this unwanted, spontaneous patient movement in the first place. **These conditions must be addressed but may be masked by the paralytic agent!**

### *c. CNS Drugs*

*i. Anticonvulsants*

*ii. Mannitol*

*iii. Steroids*

*CNS Drugs*

## **Anticonvulsants**

**Uses:** Prevention and treatment of seizures

**Adverse Effects:**

If intravenous phenytoin is given too rapidly, may result in:

- 1) Cardiac dysrhythmias including ventricular fibrillation or asystole
- 2) Hypotension

Subcutaneous extravasation of intravenous phenytoin may cause tissue necrosis or pain at the IV site

**Dosing:**                   **Phenytoin:** 100-1200mg IV piggy back in normal saline;  
Rate not to exceed 50 mg/min

**Fosphenytoin:**           *dose expressed in **phenytoin equivalents (PE)***  
15-20 PE/kg ; rate up to 100-150 PE/min

**Valproic Acid:**           40-60 mg/kg  
Rate up to 3 mg/kg/min

**Special Considerations:**

Use infusion pump

Monitor heart rhythm

Check BP frequently; vital sign monitor recommended

D/C infusion and contact MC for any adverse effects



*CNS Drugs*

**Mannitol**

**Uses:** Treatment of increased intracranial pressure or selected fluid overload states

**Adverse Effects:**

Hypernatremia  
Volume Depletion

**Dosing:** 25- 50 grams IV push or bolus infusion (in 50cc D5W over 20 minutes)

**Special Considerations:**

Patients receiving mannitol should have a Foley to monitor fluid status

*CNS Drugs*

## **Steroids**

**Uses:** Spinal cord injury to decrease edema  
Cerebral edema due to injury or CNS mass or lesion

**Adverse Effects:**

GI Bleed  
Electrolyte disturbance and hyperglycemia  
Hypertension or Acute CHF  
Agitation  
Corticosteroid hormonal suppression (hypoglycemia, hypotension, hypothermia)  
Higher risk for infection or masking symptoms of infection

**Dosing:**                      **Methylprednisolone (Solumedrol):** Initial bolus: 30 mg/kg over 15  
minutes  
Start infusion 45 minutes later: 5.4 mg/kg/hour for 23  
hours

**Dexamethasone:** 0.1-0.6 mg/kg day  
**(Decadron)** May be given as IV drip of 2 mg/kg over 2 hours

**Special Considerations:**

Contact MC for question of adverse effects

*d. Hyperalimentation/TPN, Insulin and Electrolytes*

i. *Hyperalimentation/TPN*

ii. *Insulin Drip*

iii. *Potassium Chloride*

*Hyperalimentation/TPN, Insulin, Electrolyte solutions*

## **Hyperalimentation/TPN**

**Uses:** Intravenous nutrition

**Adverse Effects:**

Catheter related sepsis

Air embolism if central venous IV tubing becomes disconnected

Subcutaneous extravasation of solution can cause tissue necrosis

Discontinuation of infusion may cause hypoglycemia

**Dosage:** Continuous infusion usually through central venous catheter but occasionally through a peripheral IV line.

Rate should not require adjustment enroute.

**Special Considerations:**

Use infusion pump.

Do not administer any other medication through the same IV line.

Contact MC for any adverse effects listed above

Consider use of a cardiac monitor

*Hyperalimentation/TPN, Insulin, Electrolyte solutions*

# Insulin

**Uses:** Lowers blood glucose  
Used in diabetics especially with ketoacidosis or hyperosmolar nonketonic coma.

**Adverse Effects:**  
Hypoglycemia related (tachycardia, diaphoresis, mental status changes, and seizures)

**Dosage:** 5-15 units per hour but dosages outside this range may be used.

**Special Considerations:**

Use infusion pump

Do not administer medications in the same IV line except D50.

If symptoms of hypoglycemia develop:

- turn off infusion,
- perform a D-Stick
- administer 25 grams, (one AMP) D50) if glucose <80,
- contact MC.

Monitor blood sugar every 30 minutes during transport

Cardiac monitoring required

**EMT-CCs may manage isolated insulin drip or with one additional drip**

*Hyperalimentation/TPN, Insulin, Electrolyte solutions*

## **Potassium Chloride**

**Uses:** Replacement therapy for hypokalemia

**Adverse Effects:**

Cardiac dysrhythmias (prolonged PR interval; wide QRS complex; depressed ST segment;

tall, peaked T-waves; heart block; cardiac arrest)

Subcutaneous extravasation of solution can cause tissue necrosis

**Dosage:** Usual range is up to 20 mEq / hr., continuous infusion. May be mixed with various IV solutions in various sized bags including “piggy back” solutions. Rate should not require adjustment en route.

**Special Considerations:**

Monitor heart rhythm

Often causes burning during infusion; contact MC if this is problematic

Contact MC for changes in EKG configuration and/or dysrhythmias.

*e. Obstetric Drugs*

*i. Magnesium Sulfate*

*ii. Oxytocin*

*Obstetric Drugs*

## **Magnesium Sulfate**

**Uses:** Treatment of pre-eclampsia and eclamptic seizures  
Premature rupture of membranes

**Adverse Effects:**

Lethargy, nausea, vomiting, hypotonia, respiratory depression, dysrhythmia

**Dosing:**

Loading dose: 2-6 grams IV over 15 minutes  
(may give 2 grams over 5 minutes)  
Followed by either: 5 grams IM in each buttock  
Maintenance infusion: 1-2 grams/hr

**Special Considerations:**

Monitor reflexes  
For symptomatic toxicity: 10 mLs of 10% Calcium Chloride and contact MC  
MC may also request furosemide and/or NS bolus as MCO  
In renal failure, patient may require emergency dialysis



*Obstetric Drugs*

**Oxytocin (Pitocin)**

**Uses:** Stimulates post-partum contraction of the uterus to control bleeding

**Adverse Effects:**

Hypertension, tachycardia, dysrhythmias

**Dosing:** 10-40 units added to 1000 mL IV Fluid to control hemorrhage  
Usual rate is 10-20 milliunits/min

**Special Considerations:**

Use infusion pump

Monitor heart rhythm

Check BP frequently; vital sign monitor recommended

Contact MC for any adverse effects

*f. Anti-Infective Therapy*

- i. Antibiotics*
- ii. Antifungals*

*Anti-Infective Therapy*

## **Antibiotics and Antivirals**

**Uses:** Bacterial or Viral infections (treatment and prophylaxis)

**Adverse Effects:**

Allergic signs and symptoms, including anaphylaxis

**Dosage:**

Vary depending on the antibiotic  
Generally given as a “piggyback” solution  
Rate should not require adjustment en route

**Special Consideration:**

D/C infusions if there are any allergic signs or symptoms, then contact MC.

***Most Commonly used:***

*Acyclovir*  
*Azithromycin (Zithromax)*  
*Cefazolin (Ancef)*  
*Ceftriaxone (Rocephin)*  
*Gentamicin*  
*Levofloxacin (Levaquin)*  
*Metronidazole (Flagyl)*  
*Piperacillin/Tazobactam (Zosyn)*  
*Vancomycin*

*Anti-Infective Therapy*

## **Antifungals**

**Uses:** Fungal infections  
Often in immune-compromised patients, those on chemotherapy or chronic antibiotics

**Adverse Effects:**  
Nausea or diarrhea  
Amphotericin- fever, rigors, chills

**Dosing:** **Amphotericin B, Azoles or “Fungins”:**  
Usually given as bolus dosing once daily to TID  
May be given as continuous bladder irrigation: 50 mg/liter  
Over 24 hours @ 42 ml/hour

**Special Considerations:**  
Drug interactions may occur with statins, coumadin, antivirals, benzodiazepines, oral hypoglycemic drugs and transplant anti-rejections drugs  
Side effects can be pre-treated with Acetaminophen or Diphenhydramine

*g. Pain Control*

- i. Opioid Drips*
- ii. PCA Pumps and Subcutaneous Pumps*
- iii. Anesthetic Sprays or Topical Gels*

*Pain Control*

## **Opioid Drips**

**Uses:** Control of pain

**Adverse Effects:**

May cause hypotension, especially in volume depleted patients or those with right-sided

heart failure

Respiratory Depression

**Dosing:**

until

in

**Morphine:** Loading dose: 2 mg increments given every 5-10 minutes

adequate pain control; typically max dose is 10 mg- may be higher

patients on chronic pain therapy

Infusion: 1-10 mg/hour

**Fentanyl:** Loading dose: 1-5 mcg/kg given IV push

Infusion: 1-5 mcg/kg/hour

**Hydromorphone (Dilaudid):** Loading dose: 0.5-4 mg IV slow

push

Continuous infusion: 1-10 mg/hour

**Special Considerations:**

Avoid Naloxone as this could precipitate acute withdrawal

Pump malfunction could precipitate withdrawal

Antihistamines (both H1 and H2) may counteract hypotension; this is an MC

option

*Pain Control*

## **PCA (Patient Controlled Anesthesia) Pumps and Subcutaneous Pumps**

**Uses:** Treatment for patients with palliative care or chronic pain conditions  
Often PO analgesia is not feasible

**Adverse Effects:**

Hypotension  
Respiratory depression  
Catheter site infection or irritation

**Dosing:**

**PCA (Patient Controlled Analgesia) Pumps**

**Morphine, Fentanyl and Hydromorphone are most commonly used.**

Pre-programmed settings for patient

Patient may require assistance to “self-administer” medication

**Subcutaneous Catheter Pumps**

**Morphine most commonly used.**

Up to 2 mLs volume at a time regardless of concentration

May also give IV fluids at a usual rate of 1-10 mLs/hour; MAX of 25 mLs/hr

**Special Considerations:**

Encourage patient to use medication as needed

Avoid Naloxone as this could precipitate acute withdrawal

Pump malfunction could precipitate withdrawal

Subcutaneous catheter sites need to be changed every 7 days

*Pain Control*

## **Sprays and Gels**

**Uses:** Topical pain control- usually prior to a procedure

**Adverse Effects:**

Allergy to medication  
Depressed gag reflex if used orally

**Dosing:**                   **Sprays:**                    Usually 2-3 sprays to desired area  
**Topical gels:** Enough to thinly cover area

Duration can be minutes to hours

**Special Considerations:**

Some can induce *Methemoglobinemia*. Watch for hypoxia



## *h. Antidotes*

- i. *NAC*
- ii. *Sodium Thiosulfate*
- iii. *Thiamine*
- iv. *Bicarbonate Drip*
- v. *Pyridoxine*
- vi. *Atropine/2-PAM*

*Antidotes*

**N-Acetyl Cysteine or NAC (Acetadote)**

**Uses:** Acetaminophen overdose- toxic quantities

**Adverse Effects:**

Anaphylactoid type reactions (urticaria, flushing, hypotension and bronchospasm)

**Dosing:**

Loading dose: 150 mg/kg over 15-20 minutes  
Maintenance infusion: 50 mg/kg over 4 hours  
then 100 mg/kg over 16 hours

**Special Considerations:**

Ideal time of onset of treatment is within 8-10 hours of ingestion  
Anaphylactoid reactions may be treated with IV diphenhydramine  
Maintenance infusion must be doubled at the 4 hour period

*Antidotes*

## **Cyanide Antidote Kit (Amyl Nitrate, Sodium Nitrate, Sodium Thiosulfate)**

**Uses:** Cyanide poisoning

**Adverse Effects:**

May cause methemoglobinemia

**Dosing:** Dosing as described in kit; weight based for children

**Special Considerations:**

Not to be used with *Carbon Monoxide* poisoning

*Antidotes*

## **Thiamine**

**Uses:** Wernicke's Encephalopathy

**Adverse Effects:**  
Possible anaphylactic reactions

**Dosing:** 100 mg IV over 15-30 minutes

**Special Considerations:**  
Glucose administration in nutritionally depleted patients should be accompanied  
by  
thiamine

*Antidotes*

## **Bicarbonate Drip**

**Uses:** Tricyclic, aspirin or other acidotic overdoses  
Renal protection after IV contrast or with severe muscle breakdown  
(rhabdomyolysis)

**Adverse Effects:**  
Sodium load

**Dosing:** Titrated to urine pH >7 by hospital staff

**Special Considerations:**  
Usually will have a Foley to check urine pH and output  
May be associated with hypokalemia

*Antidotes*

## **Pyridoxine (Vitamin B6)**

**Uses:** Isoniazide (INH) Overdose

**Adverse Effects:**

GI upset

Headache or sleepiness

Tingling or burning of hands/feet

**Dosing:** 5 grams IV over 3 – 5 minutes; repeat every 5-20 minutes until seizures resolve

**Special Considerations:**

Often patient is in status epilepticus; seizures may respond to benzodiazepines



*i. GI Drugs*

*i. Antiemetic Agents*

*ii. Acid Reduction*

*iii. GI Bleed Related Medications*



*GI Drugs*

## **Antiemetic Agents**

**Uses:** For control of severe nausea and vomiting

**Adverse Reactions:**

Drowsiness, dizziness, blurred vision, skin reactions, hypotension  
Extrapyramidal symptoms (EPS) – motor restlessness, dystonic reactions, pseudo-  
parkinsonism, tardive dyskinesia with metaclopramide, prochlorperazine,

or

promethazine

Headache or dizziness may occur with ondansetron

**Dose: Metaclopramide (Reglan)**

10 mg IV over 2 minutes

If needed, dose may be repeated once in 10 minutes

**Prochlorperazine (Compazine)**

5 mg IV over 2 minutes

If needed, dose may be repeated once in 10 minutes

**Promethazine (Phenergan)**

25 mg IV over 2 minutes

If needed, dose may be repeated once in 10 minutes

**Ondansetron (Zofran)**

4 mg slow IV over 2 minutes *or* IM

If needed, dose may be repeated once in 10 minutes

**Special Considerations:**

Extra-pyramidal symptoms may be treated by administering Diphenhydramine  
(Benadryl) 50 mg IV over 2 minutes

Confirm with MD regarding IV administration of Promethazine due to “black box  
warning”

*GI Drugs*

## **Acid Reduction**

**Uses:** Decrease secretion of gastric acid or chronic reflux  
Patients with UGI Bleed

**Adverse Effects:** (all rare)  
Occasional CNS symptoms- more so in the elderly  
Jaundice  
GI upset

<b>Dosing:</b>	<b>Pantoprazole (Protonix)</b>	Bolus:	80 mg over 5 minutes;
		Infusion:	8 mg/hour
	<b>Lansoprazole (Prevacid)</b>	Bolus:	30- 60 mg over 30 minutes
		Infusion:	6 mg/hour
	<b>Ranitidine (Zantac)</b>	Bolus:	50 mg over 20-30 minutes
		Infusion:	150 mg over 24 hours

**Special Considerations:**  
May be used for antihistamine effects

*GI Drugs*

## **GI Bleed Related Medications**

**Uses:** Variceal Upper GI Bleed

**Adverse Effects:**

Gall Bladder sludging or stones  
Diarrhea and GI Upset  
Hypoglycemia

**Dosing:** **Octreotide:** 50 mcg IV bolus, then 50 mcg/hour

**Special Considerations:**

Alters the balance between insulin/glucagon; could result in either hypoglycemia or hyperglycemia

**Vasopressin** is presently rarely used due to its potent vasoconstrictive and catecholamine inducing properties

### ***III. Devices***

- a. Temporary Cardiac Pacing***
- b. Chest Tubes***
- c. VADs***
- d. Trachesotomy Care***
- e. BiPap Machines***
- f. Invasive Cardiovascular Monitoring***
- g. ICP Monitors***
- i. Insulin Pumps***
- j. Central Vascular Access***

*Devices*

## Temporary Cardiac Pacing

**Uses:** To ensure adequate heart rate; Most common use is for symptomatic bradycardia or heart block

**Adverse Effects:**

Problems related to transvenous/trans thoracic insertion: pericardial tamponade, pneumothorax, myocardial perforation, air embolus sepsis and thrombophlebitis

Failure to pace due to: displacement of pacing electrode (most common complication),

loose connection, faulty generator, myocardial ischemia

Failure to sense due to: patient's native beats not sensed by the pacemaker and the output pulse may occur after a spontaneous beat which may induce dysrhythmias

Catheter induced dysrhythmias

**Pacer Box Settings:**

**Rate control:** usually between 60-100 beats/minute

**Output** (electric current used to stimulate myocardium): usually between 5-20 mAmps

**Sensitivity control:** used to sense heart's native electric activity (QRS deflection)

**Special Considerations:**

Monitor heart rhythm. A functioning pacemaker usually reveals a pacer spike followed

by a bundle branch pattern on the monitor strip

Contact MC if develops a bradycardia with no pacer spikes or non capturing of the QRS;

consider initiating transthoracic pacing if patient is unstable

*Devices*

## **Thoracostomy Tubes (Chest Tubes)**

**Uses:** To evacuate an abnormal collection of air (pneumothorax), blood (hemothorax) or fluid (pleural effusion) from the pleural space

**Complications:**

drainage Mechanical problems: tube dislodgement from the wall, air leaks from tubing, site or skin site  
Blocked drainage: kinked tube or clots  
Bleeding: local incision hematoma, artery or vein laceration  
Visceral perforation  
Re-expansion pulmonary edema

**Procedure:** Usually placed in the midaxillary line at the fifth-seventh intercostal space, or in the midclavicular line at the second intercostal space  
Tube is sutured to the chest wall and Vaseline gauze and an adhesive bandage are placed over the site  
The distal part of the chest tube is connected to a chest drainage system (under a water seal) which includes an air seal, a drainage reservoir and suction capability

**Special Considerations:**

Avoid traction on the chest tube; this could dislodge the tube  
The chest tube drainage system should remain below the chest level  
Avoid kinking or clamping the drainage system  
Contact MC if any of the above complications develop, or if the patient develops shortness of breath or change in vital signs

## *Devices*

# Ventricular Assist Devices (VADs)

**Uses:** Implantable external heart pump used to treat patients with debilitating heart failure  
awaiting transplant  
May be used in patients who are not candidates for transplant as well as those awaiting transplant

**FAQs:** There are many types of VAD units;  
some have pulses (usually pulse will not be in sync with the patient's rhythm) and some are continuous flow units resulting in no pulse

### **Complications:**

**VAD Pump Failure:** Need to initiate hand pumping at a rate of 60-90 strokes/min;  
may be a Bi-VAD with two pumps  
Disconnect power source first; prime pump with a purge valve before use

**VAD Working- Blood Flow Low- ECG Abnormal:**  
arrhythmia- Usually with a single VAD device; patient's function is influenced by  
may need to treat the rhythm if patient is symptomatic  
LVAD (Left-sided VAD) patient may require large amounts of IV fluids  
RVAD (Right-sided VAD) patient should not get IV fluids

**VAD Working- Blood Flow Low- ECG Normal:**  
appropriate Hypovolemia; could be internal bleeding. If symptomatic initiate  
therapy to treat cause of hypovolemia

**Procedures:** *If need to transport a STABLE patient...*  
**Heart monitor:** *ECG may not match pulse*  
**Large bore IV should be started**

**Bring companion with patient if available who is able to hand pump the VAD**  
**if needed**  
**Bring backup equipment: Hand pumps, extra batteries, primary and backup**  
**drivers, if**  
**available**

**Special Considerations:**

*Need to ask patient:*

1. Can I perform CPR on you?
2. IF not- is there a hand pump?
3. If the device slows down- will alarms go off for low flow state?
4. How can I speed up the device?
5. Does patient need heparin if the device slows down?
6. Can patient be defibrillated while connected to the device?
7. If can be defibrillated, do I need to disconnect anything first?
8. Does the patient usually have a pulse with the device?
9. What are acceptable vital sign parameters?
10. Can patient be externally paced?

**Contact Patient's Cardiac Care Team ASAP for problems and prior to transfer**

**Unstable VAD patients should be transferred with a higher level of care**

*Devices*

## **Tracheostomy Care**

**Uses:** Inadequate airway  
Respiratory Insufficiency  
Excessive secretions  
Need for prolonged mechanical ventilation

**Adverse Effects:**

Dislodgement of tracheostomy tube  
Obstruction of tube or stoma  
Malfunction of mechanical ventilator or loss of O2 supply

**Procedures: Suctioning:**

Sterile gloves  
Suction with 120-150mmHg (adults); 80-100mm Hg (pediatric)  
Hyperventilate with 100% O2  
Suction up to 10 seconds (adult); up to 3-4 seconds (pediatric)  
If mucus plugs/thick secretions- may instill 3-5cc sterile saline

**Bronchodilator Administration:**

Assemble nebulizer assembly as usual  
Attach trach collar to reservoir tubing  
Connect to oxygen source at a flow rate sufficient to produce misting  
Fit trach collar over stoma and have patient breathe slowly and deeply



**Stoma Intubation:**

uncuffed  
Select largest tube able to fit in stoma without force; cuffed for adult,  
for pediatric  
Sterile gloves  
Hyperventilate with 100% O<sub>2</sub>  
Suction, if necessary.  
Pass the ET tube and inflate the cuff. The tube will protrude several  
inches.  
Hold the tube and watch for chest rise with ventilation; secure the tube.  
Auscultate the lung fields. Check for subcutaneous emphysema.  
Allow no longer than 30 seconds for the procedure.

**Special Considerations:**

Avoid oral intubation if possible  
**DO NOT USE DEMAND VALVE WITH BVM!**

*Devices***BiPAP Machines**

**Uses:** Obstructive Apnea  
Respiratory Insufficiency

**Adverse Effects:**

Chance of Pneumothorax  
Mechanical failure  
Disconnected tubing  
Misfit of facial/nasal mask  
Drying of mouth/nasal passages

**Special Considerations:**

Usually will not involve intervention by EMS- should be pre-set  
If fails, may need to switch to CPAP or supplemental O<sub>2</sub>; contact MC

*Devices*

## **Invasive Cardiovascular Monitoring**

**Uses:** Usually used to monitor Cardiac Output  
Used in ICU setting with ICU monitors- not for EMS use

**Complications:**

**Arterial Line Pressure Monitor:**

- Hematomas
- Distal ischemia/ thrombosis
- Disconnection and hemorrhage
- Inadvertent drug injection

**Swan-Ganz catheter:**

- Arrhythmias
- Knotting and displacement
- Cardiac Valve trauma
- Pulmonary Artery Rupture
- Balloon Rupture
- Catheter thrombosis or embolism

**Monitor components:**

**Arterial Line Pressure Monitor:**

Arterial cannula  
Monitoring line  
Transducer  
Monitoring system

**Swan-Ganz catheter:**

heart Balloon tipped catheter through central vein; floated through right side of

into pulmonary artery

Monitoring line  
Transducer  
Monitoring System

**Special Considerations:**

Require prolonged pressure if lines are pulled out

*Devices*

## **Intracranial Pressure (ICP) Monitors**

**Uses:** Measurement of Intracranial Pressure in ICU setting  
May also be used to relieve pressure as well

**Adverse Effects:**  
Infection at skin site into brain  
Dislodgement of catheter

**Special Considerations:**  
If pulls out- apply sterile dressing; may have CSF leaking from site

*Devices*

## **Insulin Pumps**

**Uses:** Computerized device delivering a steady dose of insulin (basal rate) through a flexible subcutaneous catheter

**Adverse Effects:** Hypoglycemia can occur

**Dosing:** Patient has a pre-set basal rate and pre-programmed corrections

**Special Considerations:**  
If hypoglycemic treat as per protocol  
If seemingly in DKA (Diabetic Ketoacidosis), make sure the pump is working or the catheter is intact

SHOULD NOT REQUIRE ANY DIRECT INTERVENTION BY  
TRANSPORTING CREW UNLESS  
PATIENT BECOMES HYPOGLYCEMIC; IN THAT SCENARIO, TURN  
OFF THE PUMP

*Devices*

## Central Vascular Access

**Uses:** Specialty vascular access in patient with problematic access or requiring frequent infusion of medication or parenteral nutrition

**Adverse Effects:**

Line infection can cause bacteremia/sepsis  
Complications can be related to insertion of line such as pneumothorax, hematomas, vascular rupture

**Different Types:**

**Triple Lumen Central Venous Catheter:**

Can be in Femoral, Internal Jugular or Subclavian location  
Usually red hub is for blood draws- it is typically the most certain line of the three ports in emergency situations

**Indwelling Catheter**

**External Access (Broviac, Hickam, Groshung) catheters:**

Usually placed in Subclavian region  
Usually contains heparin; draw 10 mL waste before infusions

**Implanted ports (Part-a-cath, Bard Port):**

Require Huber needle to access

**Shiley:** Usually used for dialysis

Usually contains heparin; draw 10 mL waste before infusions, then flush with saline if needed in emergency situations

**Peripherally Inserted Central Catheter (PICC) line:**

Location usually in the antecubital regions  
Usually contains heparin; draw 10 mL waste before infusions

**Special Considerations:**

STERILE TECHNIQUE is imperative!

Only to be accessed in emergency situations

## ***IV. Pediatric Transfer Protocols***

- a. *Anticonvulsants*
- b. *Continuous Albuterol Nebulization*
- c. *Insulin Drip*
- d. *IV Antibiotics*

### *Pediatric Transfers*

## **Anticonvulsants**

**Uses:** Prevention and treatment of seizures

**Adverse Effects:**

Ventricular dysrhythmias or hypotension if phenytoin given too rapidly  
Respiratory depression, especially with benzodiazepines or phenobarbital  
Subcutaneous extravasation may cause tissue necrosis

**Dosing:**                   **Phenytoin:** 10-20 mg/kg; IV piggy back in NS  
Rate not to exceed 50 mg/min

**Fosphenytoin:** 15-20 PE /kg (phenytoin Equivalents)  
Up to 150 PE/min

**Propofol:** Loading dose: 3 mg/kg  
Maintenance infusion: 50 mcg/kg/min  
May increase up to 250 mcg/kg/min

**Special Considerations:**

Monitor heart rhythm  
Use infusion pump  
Check BP frequently; vital sign monitor if available  
D/C Infusion and contact MC for adverse reactions



*Pediatric Transfers*

## **Continuous Albuterol Nebulization**

**Uses:** Treatment of status asthmaticus

**Adverse Effects:**

Tachycardia  
Nervousness, headache, shakiness  
Nausea/ vomiting  
Hypokalemia

**Dosing:** 0.5 mg/kg/hour or otherwise directed by MC

**Special Considerations:**

Need to use a special large volume nebulizer designed for continuous administration

Cardiac monitor  
Should have IV running concurrently



*Pediatric Transfers*

## **Insulin Drip**

**Uses:** Lower blood glucose and treat diabetic ketoacidosis

**Adverse Effects:**

Hypoglycemia (tachycardia, diaphoresis, mental status change, seizure)

Hypokalemia (occurs as acidosis improves)

**Dosing:** 0.05-0.1 units/kg/hour; may be varied depending on glucose response by patient

**Special Considerations:**

Glucose must be checked every hour

If hypoglycemia occurs, D/C insulin drip and administer D25 (2-4 mL/kg)

*Pediatric Transfers*

## **IV Antibiotics**

**Uses:** Treat infections and prophylaxis

**Adverse Effects:**

Allergic signs and symptoms, including anaphylaxis

**Dosing:**

Varies depending on antibiotic and patient weight/size

Generally given as a piggyback infusion

Rate should not require change en route

**Special Considerations:**

D/C infusion if allergic signs and symptoms

Contact MC

## *V. Special Situations*

- a. *The Hospice Patient*
- b. *The Pediatric Patient and Consent Issues*
- c. *The Psychiatric Patient*
- d. *The Therapeutically Cooled Patient*

## *Special Situations*

# **The Hospice Patient**

### *I. Introduction*

The Hospice patient presents a unique situation in regards to care and transport. These patients have often been deemed to be in the terminal stages of a disease process, for which treatment is no longer effective in reversing or arresting the progress of the disease. Care becomes focused on patient and family comfort, which often flies in the face of usual resuscitative care. What might be considered as an unstable patient might well be in line with the course as planned by the patient's caregivers. Family members are often torn between sticking with the recognized treatment plan versus emotion as they see their loved one approach their end.

It is important to keep in mind that these patients do not have a situation that can be fixed. It is often up to us to gently encourage the family to adhere to the goal of patient comfort. The Hospice patient truly has needs that are not those of the usual prehospital patient and special considerations need to be made in the response of the prehospital provider.

### *II. Assessment*

The assessment of the Hospice patient requires a redefinition of what is considered an "unstable" vital sign requiring action. A terminal patient might have either lower or higher parameters in temperature, heart rate, respiratory rate or blood pressure. The ABC's might also be altered. This is not unexpected.

An important part of the assessment is evaluation of the DNR status. If the patient or family do not have a copy of the DNR or MOLST form, Hospice staff is often able to fax a copy, or at least confirm the existence of the DNR status if necessary.

### *III. Treatment*

In general, the only measures that should be implemented are oxygen or stretcher positioning. Narcotic administration might be in order; however, medical control should be contacted if there are questions regarding administration.

Typically, Hospice patients should not receive an IV or be placed on a cardiac monitor, unless there has been direction by Hospice to do so. Their medications are usually given orally (e.g. Roxanol), transcutaneously (e.g. opioid drug patch) or subcutaneously per Hospice. Morphine may be given as per ALS Pain Protocol if this has been approved in the patient's Hospice care plan.

### *IV. Medical Direction*

The Hospice patient is still under Medical Control by a Base Station medical physician. However, since these patients are in a situation that is more similar to an "Interfacility Transport", input may be made by the Hospice physician. The patient's plan of care may be **confirmed** with them.

### *V. Transport*

If the decision is made for the patient to be transported to the Hospice Inpatient Unit either for an acute intervention or for an inpatient bed, then there are considerations to be made.

The destination of the patient should be as directed by Hospice. This might include direct transport to an inpatient unit at a hospital, bypassing the Emergency Dept.

The medications that the patient is on should accompany the patient to the Hospice Inpatient Unit. However, if the patient is being brought to a Hospice Unit in a hospital, family members should bring the medications (a list is adequate). In keeping with the goal of patient comfort, lights and sirens should not be used during transport. If the patient expires in the ambulance anytime during transport, the patient should be taken to the previously instructed facility. **DO NOT** take the patient back home.

### *Special Situations*

## **The Pediatric Patient and Consent Issues**

### *I. Introduction*

Transport and treatment of a pediatric patient is met with unique issues. The pediatric patient is unable to give consent/refusal as they are a minor. Usually, the patient's parent or guardian will be available to give consent. However, there are times when either the legal guardian is not available or does not have legal ability to consent.

In New York State a pediatric patient is considered a minor until the day that they reach 18 years of age.

The following is a review of situations where consent might be given by someone other than the child's legal guardian.

### *II. The Emancipated Minor*

New York's case law defines the status of an **emancipated minor** as being characterized by renunciation of parental rights.

Also, a minor is considered emancipated if the following events have occurred:

He or she is married.

He or she is in the armed services.

He or she has established a home and is financially independent.

His or her parent has failed to fulfill parental support obligations and the minor seeks emancipation.

### III. *The CPS patient*

Occasionally a child presents with a picture of abuse or negligence, and the suspected perpetrator is the legal guardian. Mandated reporters must make a report to New York State Child Protective Services (CPS). After a preliminary investigation, CPS might decide to take custody of the child. There should be documentation of the CPS custody with the patient's chart. This will allow care of the child to proceed.

### IV. *The Guardian is Unavailable*

In situations where a child's guardian is unable to be reached or are incapacitated, administrative consent might be obtained. This can be confirmed with the transferring facility.

## *Special Situations*

# **The Psychiatric Patient**

### I. *Introduction*

Psychiatric patients often present to facilities where there is no ability to perform a psychiatric assessment or offer treatment for psychiatric illness. In these situations, patients need to be transported to a facility able to offer psychiatric intervention.

Needless to say, these patients are often not desirous of such intervention. New York State Mental Hygiene law makes provision to allow caregivers the ability to hold a patient against their will until they are psychiatrically evaluated or treated and deemed safe for discharge with no lethality or risk of harm to self or others. However, in order to assure that a patient's rights are not violated, there exist various NYS forms which must be filled out by a physician or designated peace officer. The

following is a review of what forms are required for which situation. They are required for a transporting agency to transport a patient against their will.

## II. *Section 9.27*

This form is called the ***Application for Involuntary Admission of Medical Certification***. This form is filled out by a physician who must certify that a patient requires in-patient psychiatric admission. In order for this to be effected, there must be **TWO** physicians in agreement of the need for admission. Thus, there will be two physicians having signed the form accompanying the patient.

## III. *Section 9.37*

This form is titled ***Application for Involuntary Admission on Certificate of a Director of Community Services or Designee***. This form can be filled out when a patient is transferred from a facility with staff able to make an initial psychiatric assessment and deem that the patient requires inpatient psychiatric admission. The originating facility, however, is unable to provide inpatient treatment and has the patient transferred to a facility that is able to provide the inpatient services. This form is completed by the sending facility to apply to send the patient to the inpatient facility.

## IV. *Section 9.55 and 9.57*

This form is for ***Custody/Transport of a Person Alleged to be Mentally Ill to a Hospital Approved to Receive Emergency Admissions***. The 9.55 portion is to be filled out by a psychiatrist directing transport of a patient to a facility able to offer Emergency Psychiatric care. The 9.57 portion is to be filled out by an Emergency physician requesting similarly.

## *Special Situations*

# **The Therapeutically Cooled Patient**

## I. *Introduction*

There has been a recent resurgence of therapeutic cooling used in patient care scenarios. These require maintenance of specific hypothermic target temperature. The current two most likely indications are those of the post cardiac arrest patient, the stroke patient and the traumatic brain or spinal cord injury patient.

The theory behind therapeutic hypothermia is to decrease circulation of ischemic and injury mediators. Further, metabolism is decreased thus preventing further inflammatory response. The balance that must be maintained is to provide adequate



cooling to achieve the above but to avoid acidosis and damage from the hypothermia itself. Patients must be intubated and paralyzed to prevent shivering.

The hypothermia is achieved by surface and internal cooling. Surface cooling is achieved with ice (applied at head, neck, axillae and groin), cooling blankets and/or heat exchange surface cooling devices. Internal cooling is achieved either by cooled fluids or by endovascular heat exchange catheters. These usually involve a femoral line placement.

## II. *Clinical Uses of Therapeutic Hypothermia*

### a. *The Post Cardiac Arrest Patient*

In 2005 the American Heart Association offered guidelines regarding the use of hypothermia in unconscious patients with return of spontaneous circulation after out-of-hospital cardiac arrest. It is recommended that these patients be cooled to 32-34 °C for 12-24 hours. The cooling should occur within 6 hours post cardiac arrest. They should have a systolic blood pressure of >90mm Hg.

### b. *The Acute Stroke Patient*

There is evidence that hypothermia reduces the volume of infarct and may preserve brain tissue. However, a large study has yet to be done showing clear benefit.

### c. *The Traumatic Brain Injury (TBI) Patient*

Mild therapeutic hypothermia has been shown to be effective in TBI with high intracranial pressure. These patients have better outcomes with longer hypothermia (5 days).

### d. *The Traumatic Spinal Cord Injury (SCI) Patient*

There have not been large scale reviews or studies to demonstrate benefit of hypothermia with SCI. However, case reports suggest that there may in fact be some advantage in using hypothermia to treat patients with SCI.

## III. *Transporting the Therapeutically Cooled Patient*

These patients are often critical and may require additional personnel. Not only must the cooling apparatus be kept in attention, but the patient must be carefully watched with frequent vital signs (every 10-15 minutes during transport). Consideration should be given for backup cooling alternatives should there be device failure.

#### IV. ***Glossary and Abbreviations***

**ALS Provider (Advanced Life Support Provider)** Includes EMT-I, EMT-CC and EMT-P

**BiPAP** Bi-phasic Positive Airway Pressure

**BP** Blood Pressure

**BVM** Bag-Valve Mask

**CHF** Congestive Heart Failure

**CNS** Central Nervous System

**COPD** Chronic Obstructive Pulmonary Disease

**CPAP** Continuous Positive Airway Pressure

**D/C** Discontinue

**DKA** Diabetic Ketoacidosis

**DNR** Do Not Resuscitate

**EMT-D (Emergency Medical Technician-Defibrillation)** An individual trained to perform patient assessment, handle emergencies using Basic Life Support equipment, perform CPR, control hemorrhage, provide non-invasive shock treatment, fracture and spinal stabilization, manage environmental emergencies, emergency childbirth and use a defibrillator.

**EMT-I (Emergency Medical Technician-Intermediate)** An individual trained to use all EMT-D skills and utilize Basic Life Support equipment. In addition, may supply Advanced Life Support, using IV therapy and ET or other advanced airway for airway control.

**EMT-CC (Emergency Medical Technician-Critical Care Technician)** An individual trained to perform all EMT-I skills and utilization of equipment. In addition, is trained to supply Advanced Life Support, using the EMT-I skills and equipment, and administer appropriate medications.

**EMT-P (Emergency Medical Technician-Paramedic)** an individual trained to perform all EMT-I skills and utilization of equipment. In addition, is able to perform under Advanced Cardiac Life Support (ACLS) and Advanced Trauma Life Support Standards (ATLS), is knowledgeable and competent in the use of cardiac monitor/defibrillator, IV drugs and fluids. The EMT-P has reached the highest level of pre-hospital certification.

**EPS (Extrapyramidal Symptoms)** A variety of motor and sensory nervous system disorders related to medications or disease processes.

**ETA** Estimated Time of Arrival

**ET tube** Endotracheal tube

**FB** Foreign Body

**GI** Gastrointestinal

**H/O** History of

**HR** Heart rate

**Huber needle** A needle designed to access an indwelling vascular port. It has a ninety-degree bend.

**IM** Intramuscular

**IV** Intravenous

**JVD** Jugular Venous Distention

**KVO** Keep Vein Open; usually indicates an IV rate of 20-60mL/hour

**Large Bore IV** 14 or 16 gauge IV

**Loading dose** Initial amount of medication required to establish a therapeutic effect

**LR** Lactated Ringers Solution

**MC (Medical Control or Medical Command)** 1. A physician (Medical Director or designee) responsible for the care of a patient who is being served by an EMS provider. 2. (aka Medical direction) The process of providing responsibility for the care of a patient who is being served by an EMS provider.

**MCO** Medical Control Option

**Medical Director** The physician who has authority and responsibility over all clinical and patient care aspects of the EMS provider. This includes responsibility for off-line MC

**Methemoglobinemia** a condition where the hemoglobin is altered in a way which decreases its ability to carry and release oxygen to tissues

**mg** milligram

**MI** Myocardial Infarction

**mL** millileter

**NS** Normal Saline; usually refers to 0.9 normal saline

**OD** Overdose

**Off-line Medical Control** Provision of care in accordance with patient care protocols developed and promulgated by physicians. This also includes training, testing, certifications, continuing education, operational policy and procedures development and continuous quality improvement.

**On-line Medical Control** Provision of care via direct voice communication with a physician

**PO** Orally

**PRN** As needed

**PVC** Premature ventricular contraction

**Q** Every

**SL** Sublingual

**SQ** Subcutaneous

**Standing Orders** Treatment algorithms for the ALS provider to follow prior to comatcing  
MC

**Status Epilepticus** Ongoing seizure activity or a series of seizures with separation of less than  
or equal to one hour

**Syst** Systolic

**TID** Three times per day

**VS** Vital signs

**VII.            *Interfacility Transfer Checklist***  
*(May be used as a resource)*





# WESTERN NEW YORK EMERGENCY MEDICAL SERVICES

## INTERFACILITY TRANSFER CHECKLIST

Patient Name: \_\_\_\_\_ Date of Birth \_\_\_/\_\_\_/\_\_\_  
Diagnosis: \_\_\_\_\_

Condition: STABLE / UNSTABLE Weight: \_\_\_kg Date of Transfer \_\_\_/\_\_\_/\_\_\_

Transporting

Agency: \_\_\_\_\_

Hospital Origin: \_\_\_\_\_ Hospital

Destination: \_\_\_\_\_

Receiving physician: \_\_\_\_\_ Bed/Unit location: \_\_\_\_\_

*Check all that apply.*

\_\_\_\_\_ **Intravenous Fluids:** Fluid: \_\_\_\_\_ Infusion Rate: \_\_\_\_\_

### \_\_\_\_\_ Medication- Continuous Infusion

Medication Ordered: \_\_\_\_\_

Infusion Rate: \_\_\_\_\_

Parameters:

Vital Signs: *Maintain:* BP HR

*Above:* \_\_\_\_\_ *and Below:* \_\_\_\_\_

Other: \_\_\_\_\_

### \_\_\_\_\_ Medication- PRN

Medication Ordered: \_\_\_\_\_

Dose: \_\_\_\_\_ Frequency: \_\_\_\_\_

Route: *IV push* *IM* *SQ* *Other:* \_\_\_\_\_

Parameters:

Vital Signs: *Maintain:* BP HR

*Above:* \_\_\_\_\_ *and Below:* \_\_\_\_\_

Other: \_\_\_\_\_

Ordering

Physician: \_\_\_\_\_

PRINT

SIGNATURE

Date: \_\_\_/\_\_\_/\_\_\_

Time: \_\_\_\_\_

EMS

Provider: \_\_\_\_\_

PRINT

SIGNATURE

AEMT#

Date: \_\_\_/\_\_\_/\_\_\_

Time: \_\_\_\_\_

PCR#: \_\_\_\_\_

# VIII. *Interfacility Crew Capabilities*

**EMT** Saline lock  
Patients with PCA pumps with settings unchanged for > 6 hours  
Stable patient with no anticipation of further interventions en route

**EMT-I** *Above listed plus:*  
Peripheral IV lines with no added drugs  
Stable, intubated patients with no anticipation of further interventions en route

**EMT-CC** *Above listed plus:*  
Peripheral IV lines  
Cardiac monitor/defibrillator  
Intubated patients  
Up to 3 IV drips and drugs except for those excluded from the list:  
*Antiarrhythmic agents as listed*  
*Blood Pressure Lowering Drugs*  
*Inamirone and Milranone*  
Specific drug limitations:  
*Nitroglycerine up to MAX rate of 100 mcg/minute*  
*Insulin drip can be accompanied by any only ONE other drip*  
Only may transport patients on drugs SPECIFICALLY listed in the protocol

**EMT-P** *Above listed plus:*  
Central venous lines/PICC lines that are running  
Permanent Lines that are already accessed and running  
Arterial and Swann-Ganz lines- not to be used for monitoring by paramedic