



PHILADELPHIA REGIONAL EMERGENCY MEDICAL SERVICES

**REGIONAL EMS PROCEDURE #04
APRIL, 2002**

SUBJECT: ALS INTERFACILITY TRANSPORT PROTOCOLS

1. PURPOSE

To establish procedures regarding the transport of patients by Non-Municipal ALS services in the City of Philadelphia.

The Philadelphia Regional ALS Interfacility Protocols, under separate cover and referred to within this Regional EMS Procedure, recognize the independent nature of medical practice and that a request for ambulance transport made by a physician is an independent medical act. While the Philadelphia Fire Department (PFD) remains solely responsible for 9-1-1 requests for prehospital emergency care and transport, these protocols govern transport by a Non-Municipal service when the request for transport is made by a physician.

2. DEFINITIONS

2.1 NON-MUNICIPAL ALS SERVICE

A Non-Municipal ALS services is any Philadelphia licensed ALS ambulance company which is not the Philadelphia Fire Department (PFD).

2.2 INTERHOSPITAL TRANSPORT

Interhospital transport is the transport of a patient who has been assessed and stabilized by hospital personnel from a transferring hospital to a receiving hospital.

2.3 PREHOSPITAL SCENE

A Prehospital scene is any non-hospital location including private dwellings, public spaces, nursing homes and free-standing physician offices, medical clinics, dialysis centers, etc.

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2.4 PREHOSPITAL TRANSPORT

Prehospital transport: The transport of a patient who has been assessed and stabilized by EMS personnel from a prehospital scene to a receiving hospital.

3. RESPONSIBILITY

It is the responsibility of each ALS Non-Municipal service licensed in Philadelphia to adhere to The Philadelphia Regional ALS Interfacility Policies.

4. PROCEDURE

The ALS Interfacility Transport Protocols are appended to Philadelphia Regional EMS Procedure #04. Each protocol is sequentially numbered within this document.

5. GENERAL INFORMATION

5.1 APPROVAL PROCESS

- a. Reviewed and forwarded by the ALS Interfacility Medical Directors' Board.
- b. Reviewed and forwarded by the Commissioner's Medical Advisory Board.
- c. Reviewed and approved by the Philadelphia EMS Advisory Council.

5.2 DISTRIBUTION

Philadelphia Regional EMS Staff
Philadelphia Regional EMS Medical Director
Philadelphia ALS Non-Municipal Ambulance Companies
Philadelphia ALS Non-Municipal Ambulance Companies' Medical Directors

6. FORM(S) REQUIRED

N/A

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SUBJECT: ALS INTERFACILITY TRANSPORT PROTOCOLS - INDEX

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PHILADELPHIA REGIONAL EMERGENCY MEDICAL SERVICES

**REGIONAL EMS PROCEDURE #4.1
APRIL, 2002**

**ESTABLISHING THE OVERSIGHT OF ALS CARE
BY NON-MUNICIPAL ALS SERVICES**

I. ALS Interfacility Transport Subcommittee

The ALS Interhospital Transport Task Force of the Commissioner's Medical Advisory Board (CMAB) was created in October of 1990. The Task Force was originally charged with the development of policies to address the sharing of personnel information among ALS service Medical Directors, the reporting of quality assurance activities to the Regional Medical Director and the use of interhospital treatment protocols.

In August of 1991 the Task Force began to function as a standing subcommittee of the CMAB and changed its name to the ALS Interfacility Transport Subcommittee. Interhospital and non-municipal service issues are delegated to the Subcommittee by the CMAB and the Regional Medical Director for examination and discussion. The Subcommittee serves in an advisory role and makes recommendations to the CMAB and the Regional Medical Director. The Subcommittee is comprised of the Medical Directors of each non-municipal ALS service operating in Philadelphia.

To date the ALS Interfacility Transport Subcommittee has developed and revised the following policies. These policies have been approved by the CMAB.

1. Provision of ALS Care
2. Direction of ALS Care
3. Quality Improvement Activities
4. Sharing of ALS Provider Personnel Information

II. Definitions

Non-municipal ALS service: Any licensed ALS ambulance company which is not the Philadelphia Fire Department (PFD).

Interhospital transport: The transport of a patient who has been assessed and stabilized by hospital personnel from a transferring hospital to a receiving hospital.

Prehospital scene: Any non-hospital location including private dwellings, public spaces, nursing homes and free-standing physician offices, medical clinics and dialysis centers.

Prehospital transport: The transport of a patient who has been assessed and stabilized by EMS personnel from a prehospital scene to a receiving hospital.

III. Policy Comments

A. Policy for the Provision of ALS Care

The policy recognizes the independent nature of medical practice and that a request for ambulance transport made by a physician is an independent medical act. While the PFD remains

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solely responsible for 9-1-1 requests for prehospital emergency care and transport, the policy authorizes prehospital transport by a non-municipal service when the request for transport is made by a physician.

B. Policy for the Direction of ALS Care

The policy acknowledges the inherent differences between prehospital and interhospital transports. While a prehospital transport is directed by protocol and on-line medical command, the direction of an interhospital transport rests primarily with the transferring physician. In addition, the patient care required during an interhospital transport often requires skills beyond the scope of paramedic practice.

The policy also recognizes that paramedics may provide care in more than one EMS region, but they should not be expected to know multiple sets of prehospital and interhospital protocols. Similarly, medical command physicians should be familiar with the protocols used by ALS providers.

C. Policy for Quality Improvement Activities

The policy assumes that each service conducts its own quality improvement activities. The policy requires a quarterly summary of these more detailed activities.

D. Policy for Sharing of ALS Provider Personnel Information

The policy recognizes that ALS providers may be employed by more than one ambulance service and that a procedure is required for reporting extraordinary actions (e.g. investigations, suspensions, dismissals) which may potentially affect another service.

**REGIONAL EMS PROCEDURE #4.2
APRIL, 2002**

PROVISION OF ALS CARE BY NON-MUNICIPAL ALS SERVICES

The Philadelphia Fire Department (PFD) is solely responsible for 911 requests for emergency care and transport. Non-municipal ALS services who are not included in the Philadelphia Regional Emergency Response System, but who operate in the Philadelphia EMS Region may, however, provide ALS care and transport in the following situations:

1. When providing interhospital transport for patients who have already been assessed and stabilized by hospital personnel.
2. When providing prehospital care and transport at the request of a physician or personnel acting under standing orders from a physician.
3. When providing care at a special event, in accordance with a special event EMS plan filed with the Philadelphia Regional EMS Office, where the non-municipal ALS service is the contracted provider of Emergency Medical Services.
4. During a mass casualty event, if mutual aid is requested by the Philadelphia Regional Emergency Response System.
5. When a non-municipal ALS ambulance unexpectedly encounters a prehospital emergency.

Excepting #2 and #4 above, a non-municipal ALS ambulance may not be dispatched to a prehospital scene with the intent to provide emergency care unless it is dispatched at the time the call is referred to 911 for response by the PFD.

If the non-municipal ALS ambulance arrives at the prehospital scene prior to the PFD, the non-municipal ALS ambulance should initiate patient care. PFD first responders should not delay patient transport by the non-municipal ambulance when the PFD paramedic unit is not on location. If the PFD paramedic unit arrives prior to transport, the PFD paramedic will assess the patient and contact a medical command physician to obtain authorization for non-transport by the PFD and authorization of patient transport by the non-municipal ALS ambulance.

If the PFD paramedic unit arrives at the prehospital scene prior to the non-municipal ALS ambulance, the PFD paramedic will contact a medical command physician to obtain authorization for non-transport by the PFD and authorization of patient transport by the non-municipal ALS ambulance.

Control of emergency response scenes in Philadelphia is the responsibility of the PFD. Control of patient management at emergency response scenes is the responsibility of the individual in attendance who has the highest level of EMS certification/recognition.

**REGIONAL EMS PROCEDURE #4.3
APRIL, 2002**

DIRECTION OF ALS CARE BY NON-MUNICIPAL ALS SERVICES

I. Prehospital

Each service must obtain on-line medical command (OLMC) from a medical command physician who is familiar with the prehospital protocols used by that service. Each service will provide prehospital care in Philadelphia in accordance with the Philadelphia Medical Intervention Procedures unless the service is licensed through another EMS region, conducts a majority of its patient transports outside of Philadelphia or obtains on-line medical command from medical command facilities outside of Philadelphia.

If a service intends to provide prehospital care in Philadelphia in accordance with protocols approved by another EMS region, the service must notify the Regional Medical Director in writing.

II. Interhospital

Each service must obtain OLMC from a medical command physician who is familiar with the interhospital protocols. Interhospital transport protocols must be consistent with prehospital protocols and must be approved by the EMS region which approved the prehospital protocols.

The transferring physician or physician designee may direct patient care by accompanying the patient to the receiving hospital. An accompanying physician is responsible for all aspects of patient care during transport and may supersede protocol. An accompanying physician may not order a paramedic to provide care beyond the scope of paramedic practice.

An accompanying nurse may participate in patient care in accordance with the written or verbal orders of the transferring physician. A nurse cannot assume control of patient care during transport; paramedics may not take orders from a nurse. Clear delineation of responsibilities during transport is desirable.

The transferring hospital must provide qualified personnel to accompany the patient when the patient requires care beyond the scope of paramedic practice. Patient care beyond the scope of paramedic practice includes the monitoring of medications, IV infusion pumps and other devices which are not approved for paramedic use by the ALS service Medical Director.

**REGIONAL EMS PROCEDURE #4.4
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**POLICY FOR QUALITY IMPROVEMENT ACTIVITIES
BY NON-MUNICIPAL ALS SERVICES**

Each service which provides prehospital and/or interhospital care in Philadelphia must provide the Regional Medical Director with the following information on a quarterly basis:

1. The number of interhospital ALS transports.
2. The number of prehospital ALS transports.
3. The number of prehospital requests referred to 911.
4. The number and outcome of cardiopulmonary arrests during interhospital or prehospital ALS transports.
5. The number and outcome of deliveries during interhospital ALS transports.
6. The volume and outcome of quality activities conducted during the quarter (e.g. incidents investigated, audits performed and quality improvement projects).

**REGIONAL EMS PROCEDURE #4.5
APRIL, 2002**

**POLICY FOR SHARING OF ALS PROVIDER PERSONNEL INFORMATION
BY NON-MUNICIPAL ALS SERVICES**

Each service which provides prehospital and/or interhospital care in Philadelphia must provide the Regional Medical Director with the names of paramedics and health professionals who have medical command authorization on a quarterly basis.

Each service must promptly notify the Regional Medical Director if a paramedic or health professional temporarily or permanently loses medical command authorization or if the provider is convicted of a felony or convicted for driving under the influence of alcohol or drugs. If the involved paramedic or health professional provides ALS care for another ALS service in Philadelphia, the Regional Medical Director will notify the ALS service Medical Director.

An ALS service Medical Director may gather personnel information through formal or informal mechanisms. The Medical Director may request written information from a provider's previous or current Medical Director.

**Philadelphia Regional Emergency Medical Services
Inter-Facility Transport Protocol for Intravenous Infusions**

Scope

Advanced Life Support ambulances operating in the City of Philadelphia as interfacility transport units are often required to transport patients being treated with a variety of intravenous drug infusions. These include, but are not limited to, heparin, nitroglycerin, dopamine, dobutamine, lidocaine, diltiazem, and esmolol. Medications not on the state-approved list require the presence of a nurse or physician to manage them, whereas approved drugs may be managed by paramedics. The following protocol is the guideline for intravenous drug infusion management during interfacility transport in the Philadelphia EMS Region.

General Guidelines

1. Paramedics will manage and monitor intravenous infusions in accordance with this protocol during interfacility transports when the patient requires the medication, and the transferring hospital does not intend to provide a nurse or physician to accompany the patient.
2. When a nurse or physician accompanies the patient, this individual maintains responsibility for the management of intravenous infusion in accordance with written, verbal, or standing orders from the transferring physician.
3. All patients should be monitored during transport with appropriate devices, including cardiac monitoring and pulse oximetry when indicated.
4. Oxygen should be provided when indicated.
5. Paramedics will insure that the patient has at least one additional intravenous access site than is otherwise needed to accommodate their current therapy.
6. Infusions for interfacility transports may only be administered via service-approved infusion pumps.
7. It is the responsibility of the service medical director to ensure that paramedics have been properly trained and in-serviced in the management of the approved medication infusions.

8. For every intravenous drug to be infused, the paramedic should obtain the following information prior to transporting the patient:
 - a. Patient history and assessment
 - b. Indications for the intravenous infusion to be administered
 - c. Concentration of the drug solution
 - d. Infusion rate of the drug solution
 - e. Duration of the drug infusion
 - f. Recent dosing changes in the infusion
 - g. Recent changes in the patient's condition or any complications
 - h. Other information specific to the drug infusion protocol in question
9. Paramedics will review the above information to ensure that the drug infusion parameters fall within the guidelines set forth by these protocols. In the event that they do not, the paramedic has several recourses:
 - a. Request that the transporting hospital adjust the drug infusion to fit within these guidelines, such as adjusting the concentration, etc.
 - b. Request that the transporting hospital provide a nurse or physician to accompany the patient and manage the infusion.
 - c. Contact medical command for permission to transport with specific orders pertaining to the particular drug infusion parameters.
 - d. Contact medical command to permit refusal of transport without a nurse or physician to manage the infusions which fall out of the scope of these protocols.
10. During transport, the paramedic will be responsible for the following:
 - a. Reassess patient frequently for complications related to the medications being infused.
 - b. Examine the intravenous access sites for infiltration and document findings every 15 minutes.
 - c. Document vital signs every 15 minutes (heart rate, respiratory rate, blood pressure).
 - d. Re-establish intravenous access in the event of loss or infiltration of existing intravenous sites and resume the infusion at the pre-existing rate.

- e. Call medical command if any significant complication should arise related to the infusion, including loss of intravenous access, or as directed by the individual infusion protocol.
- f. Call medical command if the patient's symptoms recur or worsen, or if the patient's condition deteriorates in any way.
- g. Call medical command if the paramedic feels there is a reason to do so.
- h. Document any changes in patient symptoms or condition, or changes in the infusion rate of any medication which occurred for any reason.

Specific Drug Infusion Protocols

1. Amiodarone
2. Diltiazem
3. Dobutamine
4. Dopamine
5. Glycoprotein IIb/IIIa inhibitors
6. Heparin
7. Lidocaine
8. Magnesium Sulfate
9. Nitroglycerin

**Amiodarone
(Intravenous Infusion)**

Background

1. Amiodarone is an antiarrhythmic with primarily Class III effects although it has properties of Class I, II and IV antiarrhythmics.
2. Amiodarone is indicated for the treatment of ventricular arrhythmias including ventricular fibrillation and ventricular tachycardia.
3. It is also used as an adjunct in the treatment of supraventricular tachycardia including refractory multifocal atrial tachycardia and atrial fibrillation.
4. Major complications include vasodilation, hypotension, prolonged QT intervals, bradycardia and AV nodal blockade.

General

1. Paramedics will monitor an intravenous infusion of amiodarone in accordance with this protocol during interfacility transports when:
 - a. The patient is already receiving intravenous amiodarone
 - b. The transferring hospital does not provide a nurse or physician to monitor the infusion
2. Intravenous amiodarone is permitted during pre-hospital transports, and it may be initiated during interfacility transports when indicated for appropriate patients based on regional protocols (i.e. 300 mg IV bolus for ventricular fibrillation / pulseless ventricular tachycardia).
3. In addition to the usual assessments, the paramedic will determine and record the loading dose that was given to the patient.
4. The concentration of amiodarone which is permitted to be managed and monitored by paramedics is 1.5mg/ml (150 mg in 100 ml D₅W) for an initial infusion or 1.8 mg/ml (900 mg in 500 ml D₅W) for maintenance infusions.

5. Doses provided by this concentration are:
 - a. Initial infusion (1.5 mg/ml): 1.5 mg/min: 60 ml/hr
 - b. Maintenance infusions (1.8 mg/ml): 1.0 mg/min: 33.3 ml/hr
0.5 mg/min: 16.6 ml/hr

Maintenance infusions rates are typically 1.0 mg/min for first 6 hours followed by 0.5 mg/min for next 18 hours.

Interventions

1. The paramedic will assess the patient and gather information required in the general guidelines of this protocol to ensure compliance with interfacility guidelines.
2. Monitor patient during transport in accordance with the general guidelines.
3. If increased ventricular ectopy should occur, the paramedic will contact medical command for instructions on dose adjustment, providing the physician with:
 - a. The original indication for the infusion
 - b. The loading dose if given
 - c. The current infusion dose
4. If other complications occur, the paramedic will immediately stop the infusion and call medical command.
5. Treat hypotension by stopping the infusion and following the regional hypotension protocol.
6. Treat bradycardia by stopping the infusion and following the regional bradycardia protocol.

**Diltiazem
(Intravenous Infusion)**

Background

1. Diltiazem is a calcium channel blocker that is used to slow the heart rate in patients experiencing rapid atrial fibrillation or flutter, paroxysmal supraventricular tachycardia or other narrow complex re-entrant rhythms. It has primarily Class IV effects.
2. Major complications include hypotension, bradycardia, and AV nodal blockade.

General

1. Paramedics will monitor an intravenous infusion of diltiazem in accordance with this protocol during inter-facility transports when:
 - a. The patient is already receiving intravenous diltiazem
 - b. The transferring hospital does not provide a nurse or physician to monitor the infusion
2. Intravenous diltiazem is permitted during pre-hospital transports, and it may be initiated during interfacility transports when indicated for appropriate patients based on regional protocols
3. The infusion concentration of diltiazem ranges from 0.4 mg/ml to 1 mg/ml depending on how the medication is mixed with diluent (NS or D₅W). Typical concentration is 1 mg/ml (125 mg in 125 ml NS or D₅W)
4. Intravenous bolus dosing is usually 0.25 mg/kg over 2 minutes and repeated at 0.35 mg/kg over 2 minutes if no response to first dose within 15 minutes.
5. Typical infusion dosages range from 5 mg/hr to 15 mg/hr.
6. In addition to the usual assessments, the paramedic will establish a minimum systolic blood pressure which is to be determined by the transferring physician. This represents the pressure below which the infusion rate should be decreased or stopped.
7. In addition to the usual assessments, the paramedic will determine, as accurately as possible, the weight of the patient in kilograms to be used for dose calculations.

Interventions

1. The paramedic will assess the patient and gather information required in the general guidelines of this protocol to ensure compliance with interfacility guidelines.
2. If bradycardia or hypotension should occur, the paramedic will contact medical command for instructions on dose adjustment, providing the physician with:
 - a. The original indication for the infusion
 - b. The loading dose if given
 - c. The current infusion dose
3. Treat severe hypotension by stopping the infusion and following the regional hypotension protocol or as otherwise directed by medical command.
4. Treat bradycardia by stopping the infusion and following the regional bradycardia protocol or as otherwise directed by medical command.
5. If other complications occur, the paramedic will immediately stop the infusion and call medical command.

Dobutamine (Intravenous Infusion)

Background

1. Dobutamine is a potent inotropic agent useful in the treatment of congestive heart failure and for improving cardiac function.
2. The effects of dobutamine are dose dependant.
3. The dose range is 2-20 $\mu\text{g}/\text{kg}/\text{minute}$ and is adjusted based on patient response.
4. The major complications of dobutamine therapy are hypertension, tachycardia, and increased myocardial oxygen demand.

General

1. Paramedics will monitor an intravenous infusion of dobutamine in accordance with this protocol during inter-facility transports when:
 - a. The patient is already receiving intravenous dobutamine
 - b. The transferring hospital does not provide a nurse or physician to monitor the infusion
2. Intravenous dobutamine is not permitted during pre-hospital transports, and it may not be initiated during interfacility transports.
3. The concentration of dobutamine which is permitted to be managed and monitored by paramedics is 1000 $\mu\text{g}/\text{ml}$ (250 mg in 250 ml D₅W).
4. In addition to the usual assessments, the paramedic will establish a threshold systolic blood pressure (ThSBP) which is to be determined by the transferring physician. If the pressure drops below the ThSBP, the paramedic will reassess vital signs within 2-3 minutes. If the blood pressure is still below the ThSBP, the infusion rate should be increased 2.5 $\mu\text{g}/\text{kg}/\text{minute}$ and the paramedic will contact medical command.
5. In addition to the usual assessments, the paramedic will determine, as accurately as possible, the weight of the patient in kilograms to be used for dose calculations.

6. The paramedic will contact medical command prior to accepting responsibility for the patient when the patient has a systolic blood pressure less than 90 mmHg despite dobutamine and/or dopamine therapy, or if the patient appears to be imminently unstable.

Interventions

1. The paramedic will assess the patient and gather information required in the general guidelines of this protocol to ensure compliance with inter-facility guidelines.
2. If the systolic blood pressure falls below the ThSBP **AND** the paramedic is unable to contact medical command promptly, the paramedic will increase the infusion rate by 2.5 µg/Kg/minute and reassess vital signs. Additional 2.5 µg/Kg/minute increases are permitted every 5 minutes TO A MAXIMUM OF 20 µg/Kg/minute if the systolic blood pressure remains below the ThSBP.
3. If the patient develops SEVERE hypotension (systolic blood pressure <80 mmHg), the paramedic will contact medical command and initiate the regional hypotension protocol.
4. The paramedic will contact medical command during transport if:
 - a. The patient develops a dysrhythmia, chest pain, dyspnea, or the patient's condition otherwise deteriorates.
 - b. The systolic blood pressure increases or decreases by >10 mmHg on two consecutive measurements 2-5 minutes apart.

Dopamine (Intravenous Infusion)

Background

1. Dopamine is a potent vasoconstrictor, inotrope, and somewhat chronotropic agent useful in the treatment of hypotension and cardiogenic shock.
2. The effects of dopamine are variable and dose dependant:
 - a. 2-5 µg/kg/minute: increased renal perfusion
 - b. 5-20 µg/kg/minute: mixed alpha and beta adrenergic effects (increased heart rate and blood pressure)
 - c. >20 µg/kg/minute: pure alpha effects (increased blood pressure)
3. The major complications of dopamine therapy are hypertension and tachycardia.
4. Other complications include increased myocardial oxygen demand and decreased end-organ perfusion at high doses.
5. Infiltration causes local tissue necrosis due to vasoconstriction.

General

1. Paramedics will monitor an intravenous infusion of dopamine in accordance with this protocol during inter-facility transports when:
 - a. The patient is already receiving intravenous dopamine
 - b. The transferring hospital does not provide a nurse or physician to monitor the infusion
2. Intravenous dopamine is permitted during pre-hospital transports, and it may be initiated during interfacility transports when indicated for appropriate patients based on regional protocols.
3. The concentration of dopamine which is permitted to be managed and monitored by paramedics is 1600 µg/ml (400 mg in 250 ml NSS).

4. In addition to the usual assessments, the paramedic will establish a threshold systolic blood pressure (ThSBP) which is to be determined by the transferring physician. If the pressure drops below the ThSBP, the paramedic will reassess vital signs within 2-3 minutes. If the blood pressure is still below the ThSBP, the infusion rate should be increased 2.5 µg/kg/minute and the paramedic will contact medical command.
5. In addition to the usual assessments, the paramedic will determine, as accurately as possible, the weight of the patient in kilograms to be used for dose calculations.
6. The paramedic will contact medical command prior to accepting responsibility for the patient when the patient has a systolic blood pressure less than 90 mmHg despite dopamine therapy or if the patient appears to be imminently unstable.

Interventions

1. The paramedic will assess the patient and gather information required in the general guidelines of this protocol to ensure compliance with interfacility guidelines.
2. If the pressure drops below the ThSBP, the paramedic will reassess vital signs within 2-3 minutes. If the blood pressure is still below the ThSBP, the infusion rate should be increased 2.5 µg/kg/minute and the paramedic will contact medical command.
3. If the systolic blood pressure falls below the ThSBP **AND** the paramedic is unable to contact medical command promptly, the paramedic will increase the infusion rate by 2.5 µg/kg/minute and reassess vital signs. Additional 2.5 µg/kg/minute increases are permitted every 5 minutes TO A MAXIMUM OF 20 µg/kg/minute if the systolic blood pressure remains below the ThSBP.
4. If the patient develops SEVERE hypotension (systolic blood pressure <80 mmHg), the paramedic will contact medical command and initiate the regional hypotension protocol.
5. The paramedic will contact medical command during transport if:
 - a. The patient develops a dysrhythmia, chest pain, dyspnea, or the patient's condition otherwise deteriorates.
 - b. The systolic blood pressure increases or decreases by >10 mmHg on two consecutive measurements 2-5 minutes apart.
6. In the event of infiltration at the intravenous access site, the paramedic will stop the infusion and apply warm compresses to the site for maintenance of local tissue perfusion. Medical command will be contacted, and the receiving facility will be made aware of the infiltration immediately upon arrival. The paramedic may resume the infusion at a new site of intravenous access.

**Glycoprotein IIb/IIIa Inhibitors
(Intravenous Infusion)**

Background

1. Glycoprotein IIb/IIIa inhibitors prevent thrombosis (clotting) by inhibiting platelet aggregation.
2. Major uses of glycoprotein IIb/IIIa inhibitors are for patients with acute coronary syndromes, for patients undergoing percutaneous coronary intervention (angioplasty), or for patients with unstable angina not responding to conventional medical therapy when angioplasty is planned within 24 hours.
3. The major complication of glycoprotein IIb/IIIa inhibitor therapy is bleeding.

General

1. Paramedics will monitor an intravenous infusion of a glycoprotein IIb/IIIa inhibitor in accordance with this protocol during inter-facility transports when:
 - a. The patient is already receiving an intravenous glycoprotein IIb/IIIa inhibitor.
 - b. The transferring hospital does not provide a nurse or physician to monitor the infusion.
2. Intravenous glycoprotein IIb/IIIa inhibitors are not permitted during pre-hospital transports, and they may not be initiated during interfacility transports.

Interventions

1. The paramedic will assess the patient and gather information required in the general guidelines of this protocol to ensure compliance with interfacility guidelines.
2. Examine all body sites for bleeding. If any bleeding occurs, treat appropriately and report findings to the referring facility and to medical command prior to departure.
3. Monitor patient during transport in accordance with the general guidelines.
4. The paramedic may not make adjustments in the infusion rate.
5. If a complication occurs, the paramedic will immediately stop the infusion and call medical command.
6. Treat bleeding by stopping the infusion and applying pressure as needed.

**Heparin
(Intravenous Infusion)**

Background

1. Heparin prevents recurrence of thrombosis (clotting) after an initial breakdown of the clot has occurred.
2. Heparin maintains the patency of the infarct-related artery.
3. Major complications of heparin therapy are bleeding and hypotension.

General

1. Paramedics will monitor an intravenous infusion of heparin in accordance with this protocol during inter-facility transports when:
 - a. The patient is already receiving intravenous heparin
 - b. The transferring hospital does not provide a nurse or physician to monitor the infusion
2. Intravenous heparin is not permitted during pre-hospital transports, and it may not be initiated during interfacility transports.

Interventions

1. The paramedic will assess the patient and gather information required in the general guidelines of this protocol to ensure compliance with interfacility guidelines.
2. Examine all body sites for bleeding. If any bleeding occurs, treat appropriately and report findings to the referring facility and to medical command prior to departure.
3. Monitor patient during transport in accordance with the general guidelines.
4. The paramedic may not make adjustments in the infusion rate.
5. If a complication occurs, the paramedic will immediately stop the infusion and call medical command.
6. Treat hypotension by stopping the infusion and following the regional hypotension protocol.
7. Treat bleeding by stopping the infusion and applying pressure as needed.

**Lidocaine
(Intravenous Infusion)**

Background

1. Lidocaine is a local anaesthetic, which is used in treating ventricular dysrhythmias.
2. The major complications of lidocaine therapy are seizures, hypotension, central nervous system depression, and heart block.

General

1. Paramedics will monitor an intravenous infusion of lidocaine in accordance with this protocol during inter-facility transports when:
 - a. The patient is already receiving intravenous lidocaine
 - b. The transferring hospital does not provide a nurse or physician to monitor the infusion
2. Intravenous lidocaine is permitted during pre-hospital transports, and it may be initiated during interfacility transports when indicated for appropriate patients based on regional protocols.
3. The concentration of lidocaine which is permitted to be managed and monitored by paramedics is 4 mg/ml (2000 mg in 500 ml D₅W).
4. Doses provided by this concentration are:
 - a. 1 mg/min: 15 ml/hr
 - b. 2 mg/min: 30 ml/hr
 - c. 3 mg/min: 45 ml/hr
 - d. 4 mg/min: 60 ml/hr
5. In addition to the usual assessments, the paramedic will determine and record the loading dose that was given to the patient, if applicable, and the patient's weight.

Interventions

1. The paramedic will assess the patient and gather information required in the general guidelines of this protocol to ensure compliance with interfacility guidelines.
2. Monitor patient during transport in accordance with the general guidelines.
3. If increased ventricular ectopy should occur, the paramedic will contact medical command for instructions on dose adjustment, providing the physician with:
 - a. The original indication for the infusion
 - b. The loading dose (if it was given)
 - c. The patient's weight
 - d. The current infusion dose
4. If other complications occur, the paramedic will immediately stop the infusion and call medical command.
5. Treat hypotension by stopping the infusion and following the regional hypotension protocol.
6. Treat central nervous system depression by stopping the infusion and supporting respirations as needed while monitoring the patient for changes.

Magnesium Sulfate (Intravenous Infusion)

Background

1. Magnesium sulfate can be used to control the ventricular rate in narrow complex tachycardia as well as in ventricular tachycardia and the more familiar polymorphic ventricular tachycardia known as torsades de pointes.
2. Magnesium sulfate is used to control uterine contractions in cases of premature labor and is the first line agent for treatment of seizures due to toxemia of pregnancy (eclampsia). Magnesium sulfate is also utilized to treat pregnancy-induced hypertension and pre-eclampsia.
3. Major complications of magnesium sulfate therapy are respiratory depression, CNS depression, and hypotension. Hyporeflexia is a sign of magnesium sulfate toxicity.

General

1. Paramedics will monitor an intravenous infusion of magnesium sulfate in accordance with this protocol during inter-facility transports when:
 - a. The patient is already receiving intravenous magnesium sulfate.
 - b. The transferring hospital does not provide a nurse or physician to monitor the infusion.
2. Intravenous magnesium sulfate is permitted during pre-hospital transports, and it may be initiated during inter-acility transports when indicated for appropriate patients based on regional protocols.
3. A common concentration for magnesium sulfate is 8 mg/ml (4 g in 500 ml D₅W), but any concentration provided by the transferring facility may be used.

Interventions

1. The paramedic will assess the patient and gather information required in the general guidelines of this protocol to ensure compliance with interfacility guidelines.
2. Monitor patient during transport in accordance with the general guidelines.
3. The paramedic may not make adjustments in the infusion rate.

4. If a complication occurs, the paramedic will immediately stop the infusion and call medical command.
5. Treat severe hypotension (SBP < 90) by stopping the infusion and following the regional hypotension protocol or as otherwise directed by medical command.
6. Treat respiratory depression by stopping the infusion and administering high-flow oxygen. Consider the need for bag-valve-mask ventilatory assist or intubation.

Nitroglycerin (Intravenous Infusion)

Background

1. Nitroglycerin is a potent vasodilator, which is effective in the treatment of myocardial ischemia and congestive heart failure.
2. The major complication of nitroglycerin therapy is hypotension.

General

1. Paramedics will monitor an intravenous infusion of nitroglycerin in accordance with this protocol during interfacility transports when:
 - a. The patient is already receiving intravenous nitroglycerin
 - b. The transferring hospital does not provide a nurse or physician to monitor the infusion
2. Intravenous nitroglycerin is not permitted during pre-hospital transports, and it may not be initiated during interfacility transports.
3. The concentrations of nitroglycerin which are permitted to be managed and monitored by paramedics are 200 µg/ml (100 mg in 500 ml D₅W), or 400 µg/ml (200 mg in 500 ml D₅W).
4. In addition to the usual assessments, the paramedic will establish a threshold systolic blood pressure (ThSBP) which is to be determined by the transferring physician. If the pressure drops below the ThSBP, the paramedic will reassess vital signs within 2-3 minutes. If the blood pressure is still below the ThSBP, the infusion rate should be decreased by 3 ml/hr and the paramedic will contact medical command.
5. The paramedic will contact medical command prior to accepting responsibility for the patient when the patient has a diagnosis of unstable angina or myocardial infarction and complains of on-going chest pain.
6. The drip rate may only be increased by order of the medical command physician.

Interventions

1. The paramedic will assess the patient and gather information required in the general guidelines of this protocol to ensure compliance with interfacility guidelines.
2. If the pressure drops below the ThSBP, the paramedic will reassess vital signs within 2-3 minutes. If the blood pressure is still below the ThSBP, the infusion rate should be decreased by 3ml/hr and the paramedic will contact medical command.
3. If the systolic blood pressure falls below the ThSBP **AND** the paramedic is unable to contact medical command promptly, the paramedic will decrease the infusion rate by 3 ml/hr and reassess vital signs. Additional 3 ml/hr decreases are permitted every 5 minutes if the systolic blood pressure remains below the ThSBP.
4. If the patient develops **SEVERE** hypotension (systolic blood pressure <80 mmHg), the paramedic will stop the nitroglycerin infusion, contact medical command, and initiate the regional hypotension protocol.
5. The paramedic will contact medical command during transport if:
 - a. The patient complains of new or worsening dyspnea or chest pain, or the patient's condition otherwise deteriorates.
 - b. The systolic blood pressure increases or decreases by >10 mmHg on two consecutive measurements 2-5 minutes apart.