2006 Paramedic Interfacility Transport Program

Student Manual

2006 PIFT Program
Maine EMS
January 20, 2007

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GOVERNOR

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January 23, 2007

Dear Colleague:

I am proud to be able to write this introduction to the Maine EMS 2006 Paramedic Interfacility Transfer Program, or PIFT. The revisions to this program that have occurred represent a dramatic step forward in paramedic practice in Maine. The Medical Directions and Practice Board (MDPB) has entrusted us as prehospital professionals with the responsibility to step forward and fill a needed niche in the transport environment. With this ability to utilize additional skills and knowledge comes a professional responsibility to continue learning outside of the classroom. The move away from a medication formulary that delineates specific agents to a list of drug categories will require most of us to invest time in study of new materials that may not have been covered in depth, or at all, in our initial training programs. Every paramedic who completes transfers under this new PIFT curriculum will need a renewed commitment to lifelong learning as we increase our own knowledgebase and skills for the benefit of our patients.

The PIFT program serves as the base of standardized knowledge for paramedics across our state when performing interfacility transports. Individual services and providers must tailor the program to the specific equipment they utilize and the patient population they serve. This program sets the minimums- individual service medical directors and training officers may include additional information they feel is relevant to their unique circumstances. Further, the MEMS Education Committee and MDPB recognize that future developments in the transport arena may require refinements to this program. In the end, patient safety and the responsibility for successful completion of the PIFT transport will rest with one individual- the paramedic providing direct care. Paramedics in Maine are an exceptional group of providers who are more than up to the task of embracing this challenging new program and implementing it successfully.

Should you have any questions or suggestions for improvements in this program, please feel free to contact me at (207) 626-3860 or scott.a.smith@maine.gov.

Sincerely,

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Education & Training Coordinator

Section 1- PIFT Overview

- **P**aramedic **I**nter-**F**acility **T**ransfer (PIFT)

  •**Interfacility transfer** *means "Any transfer, after initial assessment and stabilization, from and to a health care facility." [NHTSA. (2006). Guide for Interfacility Patient Transfer]*

  - *Interfacility transfers are done every day within the normal scope of practice as defined by Maine EMS rules*
    - If the normal scope of practice is not exceeded, then no further assistance or special circumstance is needed
    - **Examples:**
      - *EMT-B transfers a patient with a saline lock*
      - *EMT-P transfers a patient on a Fentanyl drip*
      - **As long as the patient is otherwise stable**

  - *Occasionally, the needs of the patient exceed the capabilities and scope of practice of the EMS provider*
    - *Examples:*
      - *A stable patient on an Amiodarone drip*
      - *A 26 week pregnant female in active labor*
    - Under normal circumstances these patients would require hospital staff to accompany the crew in transport
      - The RN would be part of the team, but hold ultimate responsibility for administering and monitoring the "non-EMS" medications, devices, and treatments.

PIFT Program

- Developed in 1990's to address concerns of hospitals having to send staff on interfacility transfers with stable patients who had medications running that were outside the normal standard of care (i.e., potassium).

- MDPB determined that there are many situations where properly trained paramedics can safely transport patients who are receiving medications that are outside the identified paramedic standard of care.

PIFT Training

- Expanded the paramedic standard of care in the interfacility setting only.
- Allowed paramedics in specific circumstances to control and administer a new list of medications and monitor and troubleshoot a variety of patient care devices.

- The sticking point has always been patient stability.

Current PIFT Parameters

- Paramedics who have completed the 2006 PIFT program may (in an interfacility transfer setting) while working for a PIFT approved service:
  - *Transport medications established by the normal standard of care*
  - *And transport the following additional classifications of medications:*

PIFT Medication Classifications

- Anticoagulants
- Anticonvulsants
- Antidiabetics
- Antidysrhythmics
- Antihypertensives (including ACE inhibitors, Calcium Channel Blockers, Diuretics, Alpha Blockers, and Beta Blockers)
- Anti-infectives
- Antipsychotics
- Cardiac Glycosides
- Corticosteroids
- Gastrointestinal Agents (including H2 Blockers, PPI's, antiemetics, and Somatostatin or its analogues)
- IV Fluids, Electrolytes (including Dextran, Albumin, and Hetastarch)
- Drotrecogin
- Narcotics (including all routes **except epidural**)
- Parenteral Nutrition and Vitamins
- OTC Medications
- Platelet Aggregation Inhibitors (including IIb/IIIa Inhibitors)
- Respiratory Medications (Beta Agonists, Anticholinergics, Mucolytics, and Steroids)
- Sedatives (Benzodiazepines, Barbiturates)
- Vasoactive Agents (Antihypertensives, Pressors/sympathomimetics)

PIFT Limitations

- PIFT Transfers are limited to PIFT trained ***paramedics***
  - *In order to be eligible to participate in a PIFT transfer, the provider must be a paramedic who has attended a new, updated 2006 PIFT training.*
- Expanded protocols are limited to the "interfacility transfer setting"
  - Interfacility transfer setting *means the transfer of a patient from one health care facility to another.*

- *PIFT trained paramedics are not allowed to use expanded protocols in any setting other than a PIFT transfer*.

Stability

- To be eligible for a PIFT transfer, a patient must be "stable."
  - A patient is considered "stable" when there is no foreseeable likelihood of material deterioration in the condition of the patient because of or during the transport.
  - *Assessment of stability will require:*
    - *Hemodynamic and neurologic signs which have demonstrated no deterioration from the acute presentation of the patient, or are within acceptable limits of variation on existing therapy and may be reasonably predicted to remain so during the transport without the need for further adjustments to such therapy; and*
    - *The pathophysiology of the patient's acute condition is known to favorably respond to the therapeutic interventions which have been undertaken at the sending hospital*
  - *Patient reports and detailed physician orders are critical components of a stability decision*
  - *The paramedic must have a detailed understanding of the patient history as it relates to this current treatment plan as well as additional relevant patient history and physician instructions for managing patient change during transport*.
  - **The final decision on whether the patient can be transported under the PIFT program will be made by the transporting paramedic**

Non-PIFT Situations

- There are many interfacility transfers that will not be eligible for PIFT and therefore must utilize hospital staff
  - Patients who are not stable according to the definition listed previously.
  - Patients who are on medications or equipment that is not included in the PIFT program.
  - Situations where the paramedic is not comfortable transporting without additional hospital personnel

Bottom Line

A safe and effective interfacility transport requires the use of adequately trained personnel who are utilizing appropriate equipment, knowledge, and skill to provide optimal management of the patient!

Pre-Trip Check

- Transferring paramedic receives a report on patient conditions, medications running, and required equipment prior to leaving to pick up patient
- Paramedic conducts an inventory to ensure that they have the appropriate equipment, gas levels, and resources for the requested transport.
- Paramedic reviews any required equipment to ensure proper familiarity with its operation.

Patient Deterioration

- Patient must be regularly re-assessed in order to identify changes in patient condition as soon as possible.
- Paramedics must be acutely aware of specific physician orders regarding this patient and the medications that are being administered so that alterations may be made as ordered to accommodate patient condition.
- If the changes in the patient are dramatic, the paramedic should attempt to contact medical control at the sending (1st choice) or receiving (2nd choice) facility for direction.
- In extreme circumstances, the paramedic ***may consider*** discontinuing the medication and utilize existing MEMS protocols to manage the patient.
- The transporting crew should also consider diverting to the closest hospital with an emergency department for assistance.

Report to Receiving Facility

- The Paramedic is a key part of the patient care team and must take responsibility for continuing the communication link that passes critical patient information between caregivers.
- *Information that should be passed along to the receiving facility include:*
  - *History received from the sending facility*
  - *Assessment findings during transport*
  - *Patient general condition*
  - *Treatments administered and/or altered during transport*
  - *Patient response to treatments or changes.*

Summary

- PIFT enables paramedics to broaden their scope of practice during interfacility transfers
- Not all interfacility transfers will qualify for PIFT
- PIFT has rigid parameters including a stability assessment
- Appropriate transport decisions must be made
- Good judgment is an ongoing requirement

Medical/Legal Aspects of Inter Facility Transfer

Overriding Principals

- *The law requires that patients who are being transferred from one facility to another facility for a higher level of care continue to receive appropriate medical care during transport.*
- The sending facility is legally responsible for ensuring that the mode of transport and personnel accompanying the patient during the transport are appropriate for this particular patient at this particular time.

Emergency Medical Treatment and Active Labor Act (EMTALA)

- Originally passed in 1985 as part of The Consolidated Omnibus Budget Reconciliation Act (COBRA)
- Sometimes referred to as the Anti-Dumping law since it was passed to prevent hospitals from refusing to treat indigent persons or transferring them inappropriately to other facilities.

Principals of EMTALA

- Requires hospitals to provide a medical screening examination for all patients seeking medical attention in order to determine if a emergency medical situation exists.
- A patient may not be transferred to another facility if they are at risk to deteriorate from or during transfer unless the current hospital cannot meet the needs of the patient.
- The patient may not be transferred if they are unstable and remain at risk of deterioration unless the sending physician certifies in writing that the benefits to be obtained at the receiving hospital justify the risks of transfer.
- The patient must be accepted by the receiving hospital prior to transfer; the receiving hospital must accept the patient if it has the space and the skills necessary to care for the patient.
- The patient or a legally responsible person must request the transfer after being advised of the risks and benefits of transfer.
- The sending hospital must provide whatever treatment is within its capabilities to ensure that the patient is stabilized before transfer.
- The sending hospital is required to make appropriate arrangements for transfer that include the following:
  - *Appropriate personnel and equipment must be provided; in certain cases it might be necessary for a physician or other healthcare specialist to accompany the patient*
  - *All relevant medical records must be sent with the patient*

Scope of EMTALA

- An ambulance service may not be charged with an EMTALA violation unless it is a hospital-owned service.
- ***BUT…***
- *An ambulance service may still be sued by either the sending hospital or the patient for negligence or misrepresentation if it fails to provide the appropriate personnel and equipment requested by the sending facility.*
- Example
    - A sending facility requests an ALS equipped ambulance staffed by an ACLS certified paramedic to transfer a cardiac patient to another hospital.
    - The service provides only a BLS ambulance with an EMT and fails to advise the sending facility that it is not providing the equipment and personnel that were requested.
    - If the patient requires ALS treatment during transport and suffers damages, the EMS service may be liable.

Section 2- Medical Direction and QI

PIFT Service Eligibility

- In addition to provider PIFT eligibility requirements, there are service level requirements
  - Licensed as an approved PIFT service by MEMS
  - Medical Director
  - Satisfactory participation in service, hospital, regional and state QI programs to include completion of PIFT QA Form for all calls
  - 100% review of all PIFT transfers *by service medical director within 1 month of call*

Medical Oversight

Prospective	Off-line	Indirect	E.g., protocol development
Concurrent	On-line/On-scene	Direct	E.g., giving orders via radio
Retrospective	Off-line	Indirect	E.g., quality management

Service Medical Director

- Minimum requirements include knowledge of EMS prehospital and PIFT protocols
- The medical director is further encouraged to be an ambassador to local hospitals, acute and chronic care facilities, and medical staffs to help support and clarify the role of paramedics in these types of transfers.
- Transport decisions are ultimately left to the discretion of the paramedic providing the PIFT level transfer.
- The medical director is expected to be able to offer support to the paramedic and provide educational or system support if issues of competency arise.
- The service medical director will review 100% of PIFT transfers.
- Discussions of "borderline" transfers may require the medical director to speak with the authorizing physician, and this is an expectation that should be offered willingly and easily.

Quality Improvement

- Prospective evaluation is a key component of the PIFT program.
- To continue to be eligible to conduct PIFT transfers, a service must comply with hospital, regional and state QI programs
- PIFT services must have an active in-house QI program able to review 100% of PIFT transfers
- A MEMS PIFT quality improvement form must be filled out for each PIFT transfer (see Appendix A)
- The MEMS QI form will delineate the definitions of stability:
  - *A stable "Low Risk" Patient: A patient who has hemodynamic and neurological stability with no foreseeable deterioration. This is the patient who is not suffering from an acute illness, but has medications or interventions being administered which are outside of the scope of the Paramedic without PIFT training.*
  - *A stable "Moderate Risk" Patient: A Stable patient is one who has hemodynamic and neurologic stability from therapies initiated. Therapies initiated must be expected to maintain patient stability during the transport. This patient is typically going via emergent transfer to a tertiary facility for services not readily available at a local facility. Variation on existing therapy has demonstrated no deterioration and may be reasonably predicted to remain without change during the transport without the need for further adjustments to such therapy.*
  - *An unstable "High Risk" patient and those receiving interventions outside the scope of the PIFT module will require the sending facility to provide other appropriate staff to assure appropriate clinical care during transport. Vital signs and interventions will be recorded, and any variance requiring contact of OLMC will be recorded. This must be kept for 3 years, and should be made available to regional or state QI staff when requested.*

Emergency Room Physicians

- An emergency department physician can provide guidance to any crew when patient safety is ever an issue.
  - Sending facility
  - Receiving facility
  - Closest facility in an emergent situation
- Communication will be critical
  - *Sending physician instructions and overall patient report will enable an ED physician to assist you*
- ***ED physicians should be considered a consulting resource in any case.***

PIFT RESOURCES

PIFT related print resources currently recognized by the MDPB include, but are not limited to the following:

Statutory and Regulatory

- Maine EMS Prehospital Treatment Protocols (July 1, 2005)
- Title 32 Chapter 2B Maine EMS Act 1982 (August 4, 2004)
- Maine EMS Rules effective July 1, 2003
- EMTALA Statute- Emergency Medical Treatment and Active Labor Law - www.dol.gov
- COBRA Statute-Consolidated Omnibus Budget Reconciliation Act – www.cms.hhs.gov
- HIPAA – Portability of Health Coverage – www.cms.hhs.gov

Interfacility Drugs-Text

- Shannon, Wilson, Stang. Health Professionals Drug Guide. Prentice Hall, 2006
- Springhouse. Nursing IV Drug Handbook. Lippincott, 9e
- Bledsoe, Clayden. Prehospital Emergency Pharmacology. Brady, 2005, 6e.
- Paramedic Emergency Care-Text
- Bledsoe, Benner. Critical Care Paramedic. Brady, 2006.
- Bledsoe, Porter, Cherry. Essentials of Paramedic Care. Brady, 2006, 2e.

PIFT related electronic resources currently recognized by the MDPB include, but are not limited to the following:

- Epocrates – PDA products - www.epocrates.com
- Lexidrugs – PDA pproducts – www.lexidrugs.com
- PEPID – PDA products – www.PEPID.com

PIFT Allowable Medication Classification Handout

Paramedics who have completed the 2006 PIFT program may transport patients who, in the sending physicians (and paramedics) opinion, are hemodynamically stable and have one or more of the following classifications of medications running:

1. Anticoagulants
2. Anticonvulsants
3. Antidiabetics
4. Antidysrhythmics
5. Antihypertensives (including ACE inhibitors, Calcium Channel Blockers, Diuretics, Alpha Blockers and Beta Blockers)
6. Anti-infectives
7. Antipsychotics
8. Cardiac Glycosides
9. Corticosteroids
10. Gastrointestinal Agents (including H2 Blockers, PPI's, antiemetics, and Somatostatin or its analogues)
11. IV Fluids, Electrolytes (including Dextran, Albumin, and Hetastarch)
12. Drotrecogin
13. Narcotics (including all routes **except epidural**)
14. Parenteral Nutrition and Vitamins
15. OTC Medications
16. Platelet Aggregation Inhibitors (including IIb/IIIa Inhibitors)
17. Respiratory Medications (Beta Agonists, Anticholinergics, Mucolytics and Steroids)
18. Sedatives (Benzodiazepines, Barbiturates)
19. Vasoactive Agents (Antihypertensives, Pressors/sympathomimetics)

In addition, the PIFT paramedic may administer the patient's regularly scheduled medications by other approved routes (oral, SC, etc.) if ordered and supplied by the sending facility.

The PIFT paramedic may also transport the following patient care devices:

- IV pumps
- Central Lines
- Chest Tubes (to water seal or Heimlich valve)
- Transvenous Pacers
- Urinary Drainage devices and CBI
    - OG/NG tubes (clamped or to suction)

Section 3- MEDICATION CLASSIFICATIONS

GENERAL CONCEPTS

- Check transfer order carefully to be sure that all medications ordered are permitted under the PIFT program.
- Be sure that order specifies:
  - *Dosage*
  - *Times of administration where applicable*
  - *Eg.: Nitroglycerin dosage is often altered based on pain and/or BP.*
- Ask the physician or RN to review medication with you if you are not familiar with it.
- Discuss potential adverse reactions and how to deal with them.
- Determine how long it will take to reach receiving facility and calculate the amount of the drug you will need to reach your destination.
  - *Allow for unforeseen delays.*
- Check to be sure that you have the right drug and the right concentration.
- Check expiration dates of all medications.
- Be sure that you thoroughly understand how to use the infusion pump being supplied by the hospital
  - *Are you able to troubleshoot potential problems?*
- Check IV site for patency, redness, etc.
- Be sure to have a drug reference book available in your ambulance
  - *Review drug reference for detailed information about the drug.*
  - *It will provide information about side effects, adverse reactions, dosing, interactions, etc.*
- Contact medical control if it becomes necessary to administer another drug to ascertain possible interaction problems

ALLERGIC REACTIONS

- All medications have the potential to create an allergic reaction
- Be vigilant for signs of allergic reactions or anaphylaxis
- Treat according to MEMS protocol

ANTICOAGULANTS

- Used to prevent extension of existing clot or formation of new blood clots
- Does not dissolve existing clots
- Patients may be on these drugs for extended periods of time
- PATIENTS ON ANTICOAGULANTS
  - *MI or suspected MI patients*
  - *DVT—deep vein thrombosis*
  - *pulmonary embolism*
  - *DIC—disseminated intravascular coagulation*
  - *Other clotting-related disorders*
- Most commonly used anticoagulants:
  - Heparin
  - Lovenox (enoxaparin)
- What to watch for:
  - Signs of bleeding, either internally or externally
  - Monitor vitals frequently
  - Signs and symptoms of shock
  - Altered level of consciousness
- Potential interventions in case of adverse reaction:
  - Consider discontinuing drug
  - Control any external bleeding
  - Treat for shock
  - Consider contacting medical control
- Paramedics are not permitted to transport patients with thrombolytic drugs running
  - BUT…..
  - Paramedics may transport patients shortly after completion of thrombolytic therapy.
  - These patients may present in several different ways…
    - Patients may have received thrombolytics for either an acute MI or non-hemorrhagic CVA
    - Patients have reperfused and have improved OR…
    - Failed perfusion and continue to show symptoms
- What to watch for during transport:
  - *Signs of bleeding*
    - *Particularly intracranial or GI bleeding*
  - *Signs of shock*
  - *Altered level of consciousness*
  - *Hypotension*
  - *Dysrhythmias*
- Potential interventions for adverse reactions:
  - *Treat dysrhythmias as per Maine EMS protocols*
  - *General supportive measures*
  - *Consider fluids for hypotension*
  - *Contact OLMC for options including diversion*

ANTICONVULSANTS

- Used primarily to prevent or treat seizures
- Seizures are often associated with epilepsy, head injury, fever, infection or unknown etiology
- Anticonvulsants consist of three types of drugs:
    - *Benzodiazepines*
    - *Barbiturates*
    - *Dilantin or Cerebyx*
- BENZODIAZEPINES:
    - *Lorazepam (Ativan)*
    - *Midazolam (Versed)*
    - *Diazepam (Valium)*
- May be administered IV, IM, PO or rectally in infants
- Usually administered by IV infusion pump during interfacility transport
- Barbiturate of choice for many years has been PHENOBARBITAL
- DILANTIN (phenytoin) and CEREBYX (fosphenytoin) are also frequently used to suppress and/or control seizure activity
- It is not uncommon to see 2 or more different anticonvulsants used in combination during interfacility transport
- Doses may have to be altered during transport due to increased seizure activity
- What to watch for:
    - Hypotension
    - Respiratory depression
    - Vomiting
    - Bradycardia and other dysrhythmias
    - Increased seizure activity
- Potential interventions in case of adverse reaction:
    - Consider discontinuing drug or drugs
    - Consider fluids for hypotension
    - Support ventilations as necessary
    - Treat dysrhythmias per Maine EMS protocols
    - If increased seizure activity occurs, consider increasing dosage if permitted by transfer order or contact OLMC

ANTIDIABETICS

- In the context of interfacility transport, it is not uncommon to encounter patients that require treatment with antidiabetic agents
- In most cases, the medication that you will be monitoring or administering will be INSULIN.
- Patients will generally have a diagnosis of:
    - *Hyperglycemia*
    - *Hyperglycemic coma*

- *Hyperosmolar hyperglycemic nonketotic coma*

- INSULIN comes in many forms. They are generally either rapid, intermediate or long acting preparations.
  - Common names include the following:
    - Humulin, Novolin, NPH, Iletin, Lantus
- Administration will generally be by IV infusion in the interfacility mode but…
  - *In some long distance transfers it may be necessary to administer the patient's routine dose of insulin by subcutaneous injection*
- Blood glucose monitoring may be necessary depending on the patient's condition and the length of the transfer
- What to watch for during transport:
  - Seizures
  - Alterations in blood glucose
  - Signs and symptoms of hypoglycemia (*Nausea, anxiety, altered level of consciousness, tachycardia, diaphoresis)*
- Potential interventions:
  - Treat hypoglycemia or seizures as per Maine EMS protocols
  - Consider discontinuing or altering the infusion rate of insulin as per OLMC
  - Provide general supportive measures

ANTIDYSRHYTHMICS

- *This is the largest classification of medication in the PIFT program as it contains several sub-classifications*
- Contained within this section are the following sub-classes of medications:
  - *Beta Blockers*
  - *Calcium Channel Blockers*
  - *Cardiac Glycosides*
  - *Miscellaneous Antidysrhythmics such as:*
    - Amiodarone (Cordarone)
    - Magnesium sulfate
    - Procainamide (Pronestyl)
    - Phenytoin (Dilantin)
    - Lidocaine
- Certain medications will appear in several different classifications during this program as some of them are used for other medical conditions.
  - Ex. Beta blockers and calcium channel blockers appear in this section as antidysrhythmic agents but will also be seen in the section on Antihypertensives
- What kinds of patients will we see on antidysrhythmic medications?
  - CARDIAC PATIENTS
    - Confirmed or suspected MIs
    - Angina
    - Tachydysrhythmias
    - Bradydysrhythmias with or without heart blocks
    - Atrial fibrillation and flutter

- PVCs and other ectopic conditions

- BETA BLOCKERS
  - Metoprolol (Lopressor)
  - Propranolol (Inderal)
  - Atenolol (Tenormin)
  - Esmolol (Brevibloc)
  - *During transport primarily used to treat various tachydysrhythmias, atrial fibrillation and atrial flutter*
  - *Used to treat MIs but generally given in hospital prior to transfer*
- CALCIUM CHANNEL BLOCKERS
  - Diltiazem (Cardizem)
  - Verapamil (Calan)
  - Nifedipine (Procardia)
- CARDIAC GLYCOSIDES
  - Digoxin (Lanoxin)
  - *Treatment of tachydysrhythmias, particularly to control ventricular rate in atrial fibrillation or flutter; PSVT*
- AMIODARONE
  - *Generally used to treat atrial and ventricular tachydysrhythmias during interfacility transport*
- LIDOCAINE
  - *Used to treat wide complex tachycardia and ventricular ectopy*
- ROUTES OF ADMINISTRATION
  - *Antidysrythymics will almost always be administered IV by infusion pump*
- WHAT TO WATCH FOR DURING TRANSPORT:
  - *Dysrhythmias*
  - *Altered levels of consciousness*
  - *Hypotension/changes in vital signs*
  - *Seizures*
- Potential interventions in case of adverse or allergic reaction:
  - *Treat dysrhythmias and seizures per Maine EMS protocols*
  - *Consider fluids for hypotension if not contraindicated by patient's condition*
  - *OLMC for option of discontinuing drug, adjusting dosage or diversion*
  - *General supportive measures*
- KEEP IN MIND THAT ALL PATIENTS ON CARDIAC MEDICATIONS SHOULD BE TRANSPORTED ON A CARDIAC MONITOR
- RECORD ANY CHANGES IN RHYTHM
- TAKE FREQUENT VITALS
- REMEMBER THAT CARDIAC PATIENTS CAN DETERIORATE QUICKLY AND YOU MUST BE PREPARED FOR A CODE OR OTHER SERIOUS EVENT AT ALL TIMES

ANTIHYPERTENSIVES

- These medications are essentially used to control hypertensive crisis of various etiologies
- Included within the classification of antihypertensives are several other classes of medications that have antihypertensive action
- Other classifications and sub classifications of antihypertensives include:
  - ACE Inhibitors
  - Beta Blockers
  - Alpha Blockers
  - Calcium Channel Blockers
  - Diuretics
  - Vasodilators
- COMMONLY USED ANTIHYPERTENSIVES
  - ACE Inhibitors
  - Benazepril (Lotensin)
  - Enalapril (Vasotec)
  - Iisinopril (Zestril)
  - Captopril (Capoten)
- Alpha Blockers
  - *Doxazosin (Cardura)*
  - *Prazosin (Minipress)*
  - *Terazosin (Hytrin)*
- Beta Blockers
  - *Atenolol (Tenormin)*
  - *Propranolol (Inderal)*
  - *Metoprolol (Lopressor)*
  - *Labetalol (Normodyne)*
- Calcium Channel Blockers
  - *Diltiazem (Cardizem)*
  - *Verapamil (Calan)*
  - *Nifedipine (Procardia)*
  - *Amlodipine (Norvasc)*
- Diuretics
  - *Furosemide (Lasix)*
  - *Bumetadine (Bumex)*
  - *Torsemide (Demadex)*
- Vasodilators

- *Hydralazine (Apresoline)*
- *Minoxidil (Loniten)*
- *Nitroglycerin*

- Routes of Administration…….
  - Generally IV but may be given PO in certain cases on long transfers
- What to watch for during transport…..
  - *Severe hypotension*
  - *Nausea/vomiting*
  - *Symptomatic bradycardia*
  - *Other dysrhythmias*
- Possible interventions when adverse reactions occur during transport:
  - Treat bradycardia and other dysrhythmias as per Maine EMS protocols
  - Consider fluids for hypotension if not contraindicated by patient condition
  - Consider promethazine (Phenergan) for nausea
  - Contact OLMC for options of discontinuing medication, altering dosage or diversion
- *All patients on antihypertensive medications should be transferred on a cardiac monitor*
- *Take frequent vitals*

ANTI-INFECTIVES

- Includes the following:
  - Antibiotics
  - Antivirals
  - Antifungal agents

- What types of patients can we expect to see on anti-infectives?
  - *Pneumonia/respiratory infections*
  - *Meningitis*
  - *Sepsis*
  - *Cellulitis*
  - *UTI*
  - *Various infectious diseases*
- Most common medications used in transport:
  - Vancomycin
  - Rocephin
  - Penicillin
  - Cefazolin (Ancef)
  - Gentamicin
- Almost always administered IV
- What to look for:

- Signs and symptoms of allergic reaction
- Induration or redness at the IV site
- Altered level of consciousness
- Nausea/vomiting

- Note: Antibiotics have a greater potential for allergic reactions than any other drugs

ANTIPSYCHOTICS

- The number of psychiatric transfers has increased dramatically in recent years
- A many patients are transferred with chemical restraints and sometimes need to be given additional medication during transport
- Medication is administered to control psychotic behavior that is otherwise difficult to manage in an ambulance
- Patients will have a number of different diagnoses including agitation, schizophrenia, depression, delusional disorders, etc.
- *A number of different medications are used to provide chemical restraint*
- Common Chemical Restraint Medications:
  Haloperidol (Haldol)
  Chlorpromazine (Thorazine)
  Risperidone (Risperdal)
  Benzodiazepines (Diazepam, Lorazepam, Midazolam)
- These drugs may be given alone or in combination with other antipsychotic drugs
- May also be administered in combination with other medications such as diphenhydramine (Benadryl) for added sedative effect
- Routes of administration
  - *Generally given IV but may be given IM or PO in some cases*
  - *For IV medication, the patient should leave the hospital with a saline lock in place if possible*
- *Considerations…*
  - *Discuss all medication issues with the sending physician before leaving the hospital*
  - *If the patient is sedated upon your arrival, ask if the drug will last long enough for you to reach your destination*
    - Transfers of more than 2 hours are not uncommon
  - *If medication will be needed during transport, do not wait until the patient becomes disruptive and combative*
  - *Make sure that any patient who is medicated or may require medication during transport is "Blue papered "*
- What to watch for during transport:
  - *Respiratory depression*
  - *Hypotension*
  - *Seizures*
  - *Extrapyramidal reactions*
    - Agitation, muscle tremor, drooling, tremors, facial rigidity, etc.
- Potential interventions in cases of adverse or allergic reactions:

- *Treat allergic reactions and seizures as per Maine EMS protocols*
- *Support ventilations as necessary and be prepared to intubate*
- *Consider fluids for hypotension*
- *Diphenhydramine for extrapyramidal reactions*
- *OLMC for other options including diversion*

CARDIAC GLYCOSIDES

- These are essentially digitalis preparations
  - *The most commonly used drug is digoxin (Lanoxin)*
  - *Generally used to treat atrial fibrillation, atrial flutter or atrial tachycardias*
  - *Sometimes used to treat CHF*
- Route of Administration
  - Generally IV infusion but can be po for maintenance
- What to watch for during transport:
  - Dysrhythmias including heart blocks
  - Cardiac arrest
  - Nausea/vomiting
  - Digitalis toxicity- S+S include dysrhythmias, heart blocks, head ache, nausea, photophobia, blue-green halos around lights, etc.
- Potential interventions for adverse reactions:
  - *Treat all dysrhythmias per Maine EMS protocols*
  - *Consider promethazine for nausea/vomiting*
  - *Contact OLMC for options of discontinuing drug, altering dose or diversion*
- All patients on cardiac glycosides must be transported on a cardiac monitor and watched carefully for developing adverse reactions

CORTICOSTEROIDS

- Medications in this class are primarily used to treat the following:
  - *Cerebral edema associated with head injury*
  - *Status asthmaticus*
  - *To suppress the immune system in cases of severe allergic reactions/anaphylactic shock*
  - *Chronic inflammatory conditions*
- Routes of administration……
  - *IV infusion in most cases*
  - *Also used in inhaled form for certain respiratory conditions*
- Commonly used medications in this class
  - *Betamethasone (Celestone)*
  - *Dexamethasone (Decadron)*
  - *Methylprednisolone (Solu-Medrol)*
  - *Hydrocortisone (Solu-Cortef)*

- Also in inhaled form…
  - *Beclomethasone (Beconase, Beclovent)*
  - *Triamcinolone (Azmacort, Kenalog)*
  - *Flunisolide (Aerobid)*
- What to watch for during transport:
  - *Hypertension*
  - *Nausea/vomiting*
  - *CHF*
- Potential interventions in case of adverse reactions:
  - *Follow Maine EMS protocols for allergic reactions, CHF or nausea/vomiting*
  - *Contact OLMC for options of discontinuing drug*

DROTRECOGIN (Xigris)

- An Antisepsis agent
- Used to treat severe sepsis or septic shock
- Administered by IV infusion only
- What to watch for during transport:
  - *Be alert for signs of internal bleeding*
  - *Shock symptoms*
- Potential interventions during transport in cases of adverse reactions:
  - *Treat for shock*
  - *Contact OLMC for option of discontinuing drug*

GASTROINTESTINAL AGENTS

- Used to treat a variety of GI disorders
- Several different sub-classifications of GI medications:
  - *Protein pump Inhibitors*
  - *antiemetics*
  - *Somatostatin Analogues*
  - *H2 Blockers*
- Protein Pump Inhibitors
  - Commonly used drugs:
    - Protonix
    - Prevacid
- Somatostatin Analogues
  - Commonly used drug:
    - *Sandostatin*
- H2 Blockers
  - Commonly used drug:
  - *Famotidine (Pepcid)*

- *Cimetidine (Tagamet)*
- Anti-emetics
  - *metoclopramide (Reglan)*
  - *ondansetron (Zofran)*
  - *prochlorperazine (Compazine)*

- What kind of patients will we see being transported on these medications?
  - Active duodenal or gastric ulcers
  - GERD—gastric esophageal reflux disease
  - Upper GI bleed
  - Esophageal varices
- Routes of Administration
  - *IV infusion*
  - *PO*
- What to watch for during transport:
  - *Adverse reactions are rare but may consist of dysrhythmias*
  - *Hypoglycemia is possible but will probably only be seen on longer transfers*
- Potential interventions for adverse or allergic reactions:
  - *Treat dysrhythmias and hypoglycemia per Maine EMS protocols*
  - *Consider termination of drug*
  - *OLMC for further options*

IV FLUIDS, Electrolytes

- Consists of a wide variety of fluids including the following:
  - Normal saline, ½ NS
  - Lactated Ringers
  - D5W and D10W
  - Dextran, Plasmanate
  - Hetastarch, albumin
- Why do we give IV fluids during transport?
  - Increase or maintain blood volume and blood pressure
  - Maintain hydration
  - Access for medication
  - Treat hypoglycemia (D10W)
- What to watch for during transport:
  - *Signs of fluid overload*
  - *Edema*
  - *Pulmonary edema*
  - *Take vitals often to monitor BP*
- Potential interventions in cases of adverse reactions:
  - *Consider discontinuing or reducing rate of infusion*
  - *Treat CHF per Maine EMS protocols*
- Electrolytes consist of the following:
  - *Potassium*

- *Calcium*
- *Sodium chloride*
- *Sodium bicarbonate (alkalizing agent)*

- What type of patients will we see who require electrolyte therapy?
  - Patients requiring potassium supplementation due to deficiency diseases when oral replacement is not feasible
  - Those who have lost potassium due to severe vomiting or diarrhea
- What type of patients will we see who require electrolyte therapy?
  - Patients with severe hypocalcemia
  - Sodium depletion
  - Patients requiring sodium bicarbonate to treat hyperacidity or metabolic acidosis due to shock or dehydration

- Route of administration

  Primarily IV infusion
- What to watch for during transport:
  - *Dysrhythmias*
  - *Seizures*
  - *Signs and symptoms of allergic reactions (rare)*
- Potential interventions in cases of adverse reactions:
  - *Treat seizures and dysrhythmias per Maine EMS protocols*
  - *Consider option of discontinuing drug or modifying dose as per OLMC or transfer orders*

NARCOTICS

- Used to control moderate to severe pain
- May be administered by IV infusion pump but may also be given by IV or IM injection as per transfer order
  - ***Epidural infusions are not included in PIFT when they are used in the acute setting***
- Commonly used narcotics:
  - Fentanyl
  - Morphine
  - Hydromorphone (Dilaudid)
  - Meperidine (Demerol)
  - *Pentazocine (Talwin)*
- *Difference is in potency- review any standard equianalagesic dosing chart*
- *What to watch for during transport:*
  - *Respiratory depression*
  - *Hypotension*
  - *Nausea/vomiting*
  - *Bradycardia*
- Potential interventions in cases of adverse reactions:
  - *Consider discontinuing medication*
  - *Treat dysrhythmias per Maine EMS protocols*

- *Consider Naloxone*
- *Assist ventilations as necessary and be prepared to intubate*

Parenteral Nutrition and Vitamins

- Nutritional supplements are used to treat the following:
  - Patients requiring nutrition who are unable to take food and/or fluids by mouth
  - Patients requiring vitamin supplements to prevent or treat vitamin deficiency conditions
- Common forms include the following:
  - Vitamin solutions
  - TPN (Total Parenteral Nutrition)
    - *An individualized solution designed to meet the needs of the patient*
- What to watch for during transport:
  - *Adverse or allergic reactions are rare but have been seen*
  - *Hypoglycemia*
    - *Can occur since most TPN preparations contain Insulin*
- Potential interventions in case of adverse reactions:
  - *Treat hypoglycemia as per Maine EMS protocols*
  - *Consider discontinuing drug*

Platelet Aggregation Inhibitors (including IIb/IIIa inhibitors)

- What are these drugs all about?
  - *They are potent agents that inhibit platelets from aggregating or clumping together in the context of coronary artery disease.*
  - *Frequently used in combination with Heparin*
- Patients being transported on these drugs
  - Acute MI
  - Unstable angina
  - Acute coronary syndrome
  - Many of these patients are being transported to the cath lab for diagnostic and/or interventional catheterization---angioplasty
- Route of Administration
  - *IV infusion only*
- What to watch for during transport:
  - *Any signs of bleeding*
  - *Signs and symptoms of shock*
  - *Changes in level of consciousness*
- Potential interventions in cases of adverse or allergic reactions:
  - *Control any external bleeding*
  - *Treat for shock as needed*
  - *Contact OLMC for options of discontinuing drug, altering dose or diversion*

- *In cases of suspected bleeding, the provider may also have to D/C heparin if it is also being administered*
- *Treat dysrhythmias and allergic reactions as per Maine EMS protocols*

RESPIRATORY MEDICATIONS

- Within this classification are several sub classifications of drugs that are used in treating patients with respiratory conditions
  - Beta agonists
  - Anticholinergics
  - Steroids
  - Mucolytics
  - Miscellaneous

•BETA AGONISTS
- Albuterol (Proventil)
- Terbutaline
- Metaproterenol (Alupent)
- Piruterol (Maxair)
- These drugs provide relief through bronchodilation

•ANTICHOLINERGICS
- Ipratropium (Atrovent)
- These drugs provide long term maintenance of bronchodilation

•STEROIDS
- Beclomethasone (Beclovent)
- Flunisolide (AeroBid)
- Fluticasone (Flovent)
- Triamcinolone (Azmacort)
- These drugs provide relief by reducing inflammation

•MISCELLANEOUS
- Aminophylline
- Montelukast (Singulair)

- What kinds of patients will you be transporting on respiratory medications?
  - The respiratory problem may be primary or secondary
  - Acute or chronic
    - *Asthma*
    - *COPD, Emphysema*
    - *Certain cases of allergic reaction*
- Routes of administration:
  - *Most of these drugs will be administered by inhaler or nebulized*
    - *Aminophylline is given by IV infusion*
    - *Terbutaline may be IV or by inhalation*
    - *Is epinephrine a respiratory medication?*

- Transport respiratory medication patients on cardiac monitor, pulse ox
- What to watch for during transport:
  - *Dysrhythmias*
    - *Beta agonists such as Albuterol can cause tachydysrhythmias*
  - *Palpitations, chest pain*
- Potential interventions in case of adverse reaction:
  - *Treat dysrhythmias and chest pain per Maine EMS protocols*

SEDATIVES

- Sedatives consist of a variety of medications from several different classifications *(Some that we have already reviewed)*
  - Narcotics
  - Benzodiazepines
  - Antipsychotics
  - Barbiturates and anesthetics
- Narcotics
  - *Fentanyl, morphine, Dilaudid, meperidine, etc.*
- Benzodiazepines
  - *Diazepam, lorazepam, midazolam*
- Antipsychotics
  - *Haloperidol, risperidone, chlorpromazine, etc.*
- Barbiturates
  - *Phenobarbital, thiopental, amobarbital*
- Anesthetics
  - *Etomidate, propofol*
  - ***NOTE: Paramedics will not transport patients on anesthetics unless accompanied by an RN***
  - Most patients on anesthetics are intubated
- Types of patients on sedatives…
  - Agitation and combativeness associated with head injury, psychosis, etc.
  - Control of seizure activity
  - Any condition where it is necessary to provide sedation
- What to watch for during transport:
  - Respiratory depression
  - Hypotension
  - Bradycardia
- Potential interventions in cases of adverse reactions:
  - *Oxygen, Support ventilations as necessary and be prepared to intubate*
  - *Treat bradycardia per Maine EMS protocols*
  - *Consider fluids for hypotension*
  - *OLMC for other options*
- Take vitals often
- Transport on cardiac monitor, pulse oximeter, and possibly $EtCO_2$ monitor

VASOACTIVE AGENTS

- These are medications that have an effect on the tone and caliber or diameter of blood vessels
  - Vasopressors and sympathomimetic drugs cause constriction of blood vessels…….
  - Nitrates, vasodilators, Calcium Channel Blockers and ACE Inhibitors cause relaxation and dilation of vessels, thereby reducing BP
- What kinds of patients will we see on Vasopressors and Sympathomimetics?
  - Patients on these drugs are generally being treated for hypotension and certain types of shock
- Commonly used vasopressors and sympathomimetics:
  - Vasopressin (Pitressin)
  - Metaraminol (Aramine)
  - Dopamine (Intropin)
  - Dobutamine (Dobutrex)
  - Epinephrine and norepinephrine
  - Isoproterenol (Isuprel)

•Nitrates

- Patients taking nitrates are generally being treated for ischemic chest pain or hypertensive crisis
- Commonly used nitrates include:
  - Nitroglycerin
  - Nitroprusside (Nipride)

•Vasodilators

- Used primarily for treatment of hypertensive crisis and management of CHF

- Calcium Channel Blockers and ACE Inhibitors are primarily used to treat hypertension as we saw in the section on Antihypertensives
- Routes of administration:
  - *IV infusion*
    - *Usually by infusion pump*
- What to watch for during transport:
  - *Severe hypotension or hypertension*
  - *Dysrhythmias*
  - *Dyspnea*
  - *Altered level of consciousness*
  - *Nausea/vomiting*
- Potential interventions in case of adverse or allergic reactions:
  - *Treat dysrhythmias as per Maine EMS protocols*
  - *Consider fluids for hypotension*
  - *Consider discontinuing drug or modifying dose as per OLMC or transfer order*
  - *Diversion*

- NOTE……
  - These patients must be transported on a cardiac monitor
  - Monitor vitals frequently

OTC MEDICATIONS

- During the course of a transport, particularly a long distance transfer, it may be necessary to administer certain commonly used OTC medications
- May include medications for the following:
  - *Pain (ibuprofen, acetaminophen, etc.)*
  - *Motion sickness (Dramamine)*
  - *Antacids*
  - *Antihistamines*
- Guidelines for administration:
  - Written order by physician that includes name of drug, route of administration, indication, dose and time of initial and repeat dosing
  - Drug must be supplied by the sending facility
  - Drug must have been used previously by patient without adverse reactions
- *Administration must be documented as with all other medications*
- *Remember that even OTC drugs can result in adverse or allergic reactions so watch for any such reactions following administration*

PRESCRIPTION DRUGS

- During longer transports you may need to administer one or more of the patient's regular prescription drugs
- The drug must be included in one of the classifications that are part of the PIFT module
- Must follow guidelines listed above in OTC medications for administration

MEDICATION CLASSIFICATION CONCLUSIONS

- *Be constantly alert—patients can change in seconds*
- *Know your drugs---use resources*
- *Remember that every drug, even OTC drugs, have the potential to result in a serious adverse reaction*
- *Never leave the sending facility unless you feel thoroughly comfortable with your patient and with the medications you are being asked to administer or monitor*
- *Make sure that you are thoroughly prepared for any complication*
- *Know where possible diversion hospitals are located*
- *Use OLMC whenever necessary*

Section 4- Device Module

- What to remember about devices in the PIFT setting
  - *An once of prior planning at the bedside can prevent untold misery on the trip*
  - *It is your responsibility as the PIFT paramedic to be thoroughly familiar with the devices used at your service*
  - *At least annual competency-based skills checks on the new devices included in the 2006 PIFT course are strongly recommended by Maine EMS*

- Infusion Pumps
  - *Broad category that can include IV pumps, feeding pumps, and pain pumps*
  - *3 areas to look at*
    - Describe the basic mechanical principles of infusion pumps including syringe pumps.
    - Demonstrate infusion pump operation to include: tubing set up, on, and off controls, and rate adjustment of a common (typical) infusion pump.
    - Diagnosis and correct common infusion pump problems to include blockages or power failure.

- Infusion Pumps- Why
  - *Accurate delivery of critical care medications often requires precise dosing over time*
  - *While the paramedic is able to calculate drip rates using a microdrop set (60 gtt/ml), this is often inaccurate in the prehospital setting*
  - *The use of electronic IV infusion pumps builds in a safety factor and allows for precise calculation of drug dosages over time*

- Several different types of infusion pumps exist
  - *Piston Pumps*
    - *Work when a piston moves back, allowing fluid into a chamber through a one-way valve. When the piston moves forward, fluid is pushed out of the chamber and into the IV line.*
  - *Peristaltic pumps*
    - *Have a rotating head that pushes fluid along in a tube. Because the turning is continuous, fluid can't go backwards. The rate of administration is controlled by the speed of rotation.*
  - *Diaphragm Pumps*
    - *Have a thin spring-loaded diagram that moves up and down. The pressure changes cause fluid to rush into the negative space created by the diaphragm (just like the thoracic cavity)*
  - *Syringe Pumps*
    - *Have a turning shaft that causes the syringe cylinder to move in as the shaft is turning*

- Goal of PIFT is a general awareness of pump types and common problems

- Specific training on the pumps you will use is expected to be conducted at the service level

- General Pump Principles
  - *Power functions*
  - *Lock functions*
  - *Alarm silence/reset*
  - *Programming*
  - *Run time*
  - *Low Battery Warning*

- Power for On-Board Devices
  - *Know what you have on your vehicle*
  - *Some inverters best left off until needed for AC conversion so they don't burn up*
  - *How many plugs do you need vs. the number of "live" plugs in truck*
  - *Do you need to carry a power strip?*

- Lock Functions
  - *IV Pumps may have lock to stop patient or family from changing settings- Ask staff about this if you are not familiar with pump*
  - *PCA/pain pumps have lock to prevent access to the narcotics- do you need a key or a code?*

- Programming
  - *Very Pump Specific*
  - *Pumps now becoming very complex*
  - *JCAHO "smart pumps"*
  - *Still need to know what's being infused and check the math, rates, etc.*
  - *2 user levels*
    - *"I can get by!"*
    - *"Super-user"*

- Basic Things you should know how to set each of the following on your pumps
  - Volume to be infused
  - Rate in ml/hr
  - Silence and clear any alarms
  - Get readings of volumes infused in transit

- Pump Power
  - *The internal battery in infusion pumps is just like our EMS gear*
  - *Expect it to die at the least opportune time*
  - *Ask how long they typically last and plan on half that time on battery power*
  - *Any time you can, plug it in*
  - *Know how to verify it's charging*
- Is there a low battery warning or does it just die?

- Pump Tubing
  - *Know what the pumps take and get extra tubing in case something happens enroute*
  - *Know how to prime tubing so you don't get air bubbles*
  - *Is tubing from your pump compatible with sending facilities stuff?*

- Hints for PIFT Transfers
  - *Build a PIFT Tool Kit- Clave connectors, dead end caps, alcohol wipes, prn adapters, three-way stopcocks, 18 Gauge IM needles, tape, Sharpie, tape, flushes, pump tubing, Buretrols*
  - *Double check all lines for labeled and secure*
  - *Understand what is plumbed to what*
    - *Will increasing a rate cause a change in the delivery rate of another medication in the same line?*
    - *Are they compatible?*
  - *Always have an open line for code meds*
  - *Make sure pumps are set right*
  - *If it starts beeping when you push start, there's a clamp closed somewhere*

- Common Audible Alarms
  - *A "down pressure" sensor will detect when the patient's vein is blocked, or the line to the patient is kinked.*
    - *Small lumen central lines/PICs often need to have pressure settings in pump reset*
    - *Same if an in-line filter is being used (Dilantin, Mannitol, etc.)*
  - *An "air-in-line" detector. A typical detector will use an ultrasonic transmitter and receiver to detect when air is introduced to the closed system. Some pumps actually measure the volume, and may even have configurable volumes, from 0.1 to 2 ml of air. None of these amounts can cause harm, but sometimes the air can interfere with the infusion of a low-dose medicine.*
  - *An "up pressure" sensor can detect when the bag or syringe is empty, or even if the bag or syringe is being squeezed.*

- Urinary Drainage Systems
  - a.k.a. Foley Catheters
- The indications of a Foley catheter insertion include:
  - management of chronic incontinence
  - monitor of fluid balance status (i.e. monitor output carefully- 1ml/kg/hr is the minimum expected volume for kids, 30 ml/hr for adults)
  - allow for bladder irrigation or drainage post operatively
  - resolve obstruction (i.e. prostate)
- Indwelling Foley catheters consist of a drainage tube, with an inflatable balloon to prevent inadvertent removal. Balloons are inflated with sterile water only, as saline causes the balloon to deteriorate.
- Continuous Bladder Irrigation (CBI)

- Continuous bladder irrigation is utilized to keep the bladder free of clots and to maintain the patency of the urethra in patients with complications of infection or postoperatively.
- CBI can be either open or closed. In an open system, the bladder is drained using a 60 ml syringe. In a closed system, the bladder drains directly into a Foley bag.
- CBI involves instilling sterile irrigation solution into the bladder, then allowing that fluid to drain out. Failure to recognize that the fluid isn't draining can result in severe bladder injury, as large volumes of irrigation solution are typically instilled.
- Typically, triple lumen catheters are used. One port is to fill the balloon so the catheter stays in place, one is used to infuse fluid, and the last is used to drain fluid.

- Catheter Care For the Paramedic
  - When caring for a catheter that is already in place, the major tasks include:
    - Assuring adequate urine output, without obstruction.
    - Assuring the system remains closed to prevent infection.
    - Keeping the Foley bag below the level of the bladder, to prevent urine from the bag from flowing back into the bladder.
    - Assessing the bladder to make sure there is no pain or distention.
    - Preventing accidental dislodgment by assuring that the Foley balloon is inflated, and the bag is appropriately secured.
    - Preventing infection by using strict aseptic technique.

- Normal expectations for Foley care
  - Pain free
  - Free flow drainage of clear or amber urine of at least 30 ml/hr
  - CBI Care Issues
  - Monitoring the color and type of drainage. Postoperatively, clots and small volumes of blood are expected. Bright red blood, or large volumes of drainage may indicate active bleeding.
  - Maintaining close input and output balance. All instilled fluid should be measured. Output is also measured. (fluid out minus fluid in = patient losses)
  - Maintaining catheter patency, and delivering instilled fluid at the ordered rate.

- Normal Expectations for CBI
    - Cloud, tea colored, or bloody urine
    - Free flow of catheter, with occasional clots
    - Free of bright red, or high volumes of bleeding or drainage
    - Frequent bladder spasms and cramps, which may be reduced with pre-medication. Increases in spasm may indicate outlet obstruction.
- Logistical Issues for Transport
    - What do I do with the CBI drainage?
    - Do I have additional irrigation solution?
    - How do I secure the irrigation solution?

- Issues with Flushing the Catheter
  - Requires sterile technique
  - Need sterile supplies
    - Irrigation tray with cath tip syringe or
    - 60 ml cath tip syringe and NS/SW
  - Must maintain sterility of system if possible???
  - Sets patient up for infection

Troubleshooting Urinary Drainage Systems

Complication	Action	Notes
Catheter draining little or no urine despite adequate fluid intake	Consider level of drainage bag Consider flushing catheter	Bag should always be lower than level of the bladder to prevent black flow of urine
Unexpected removal	Do not reinsert tube.	Retained catheter fragments are usually the result of balloon rupture (catheter disruption, in this case) and can potentiate many complications. The Catheter must be inspected to determine potential of catheter fragments in the bladder.
Infection	None during transport	After 48 hours of catheterization, most catheters are colonized with bacteria, thus leading to possible bacteruria and its complications. Catheters can also cause renal inflammation, nephro-cysto-lithiasis, and pyelonephritis if left in for prolonged periods.
Bleeding into or around the catheter	Control bleeding if external	Monitor for cessation of flow; consider flushing catheter
Urethral swelling around the catheter	None during transport	Contact OLMC for consultation with significant swelling
Leakage of large amounts of	None during transport	Contact OLMC for

urine around the catheter		consultation to consider flushing the catheter

- Central Lines
  - *This review of central venous devices is to refresh the paramedic on central venous devices that are already accessed*
  - *It is not a substitute for the MEMS Central Venous Access Program*
  - *Paramedics wishing to access central lines in the field must still complete the Central Venous Access Program*

- Central Line Facts
  - *Central venous lines typically are inserted in the internal jugular or subclavian veins. The catheter tip enters directly into these large veins. Central lines are utilized in patients requiring long term IV therapy, in patients who had poor peripheral IV access, or in clients requiring large volumes of fluid. Various types and manufacturers of Central Lines exist.*
  - *Dual lumen, triple lumen, and quad lumen lines are used, allowing for administration of various medications simultaneously, without the risk of in line medication compatibility issues.*
  - *Some central lines are peripherally inserted (PICC lines).*
  - *See the MEMS Central Venous Access document for additional information regarding central lines. (Available on MEMS website)*

- Care of Central Lines
  - *When accessing central lines to give medications or connect to a fluid source, it is critical to maintain sterile technique. Nosocomial infections from central lines are one of the major contributors to patient death. Sterile gloves and mask are typically worn when changing dressings or cleaning the site.*
  - *Before departure, determine which lines are being utilized, which medications are going to which line tale. Flush each line before departure following the manufacturer's recommendations. Cover the site with an occlusive dressing and avoid touching the site during transport.*
  - *Assess the insertion site frequently for bleeding, infiltration, or signs of infection. Monitor IV fluid administration closely, as large volumes can be infused over a short period of time. Be sure all ports are secure and all clamps are closed. Loss of a clamp can result in rapid bleeding, due to the large vessels that are cannulated.*

- Central Line Flushing
  - Need adequate volume to flush lumen (usually 5-10 ml between meds) with 10 ml syringe
  - SASH
    - Saline

- Administer Med
- Saline
- Heparin (if not going to keep it accessed, heparin flush 100 Units/mL must be obtained from sending facility)

- Use push-pause method to flush blood out
- Need specific syringes at times
  - Never use smaller syringes (< 5 mL) with PIC lines as increased pressure can lead to line rupture

Complications of Central Lines

Complication	Action	Notes
Unexpected removal	Treat as open wound with occlusive dressing and direct pressure.	Contact OLMC for consultation
Shortness of breath	Observe patient for s/sx of tension pneumothorax	Monitor for pneumothorax with any subclavian or internal jugular vein cannulation

- Transvenous Pacers
  - *Transvenous pacemakers are inserted into the right ventricle, where the pacemaker lead contacts the endocardium near the ventricular septum. The lead is then connected to a small pulse generator.*
  - *Transvenous pacemakers deliver electrical currents that stimulate cardiac depolarization. They are used to treat symptomatic bradycardia, heart blocks, or sick sinus syndromes. They may also be used to override symptomatic tachycardias.*
  - *Transvenous pacemakers can be permanent or temporary, depending o the clinical situation.*
  - *Newer pacemakers typically are dual chambers, where both the atria and the ventricles are stimulated.*

- **Pacemakers are set for rate and mode.**
  - *Demand mode indicates the pacemaker will only generate an impulse if preset parameters are met (i.e. HR falls below 60).*
  - **Asynchronous pacers pace the heart at a set rate regardless of the patient's own electrical or physical activity.**
- The electrical output is how much energy in milliamperes (mA) is needed to generate an impulse that results in depolarization (capture).
- Pacer rhythms are fairly distinctive and therefore easy to identify on a rhythm.
  - Myth- Newer pacemakers may be hard to see in traditional lead II monitoring
  - Nursing should be consulted to identify what capture looks like in this specific patient
    - *Get a strip before transport*

- *Things to Know If Transporting a Transvenous Pacer*
    - **When and why was it inserted?**
    - **What was the underlying rhythm?**
    - **Is the patient hemodynamically dependent on the pacer? (Stability??)**
    - **What are the settings?**
- *mA (output)- energy needed to get electrical & mechanical capture of myocardium*
- *Rate- number of paced impulses per minute*
- *Sensitivity- threshold measure to detect patient's own electrical activity*
- Mode- Typically DDD or VVI
- Pacer Modes
    - First letter standards for chambered sensed (D=dual, A=atrial, V=Ventricle)
    - 2nd letter is chamber paced (D, A, V)
    - 3rd letter is what pacer does in response to sensing a patient's own "native" beat (impulse)
    - Triggered (T)- sensing patient electrical activity causes pacer to fire
    - Inhibited (I)- sensing patient's electrical activity causes pacer to standby
    - Dual (D)- Triggered or Inhibited
    - Asynchronous (O)- pacemaker disregards the patient's inherent activity and paces asynchronously
        - Use on if patient's underlying rhythm is asystole
- Most emergency pacing concerned with pacing the ventricles and minimizing risk of R on T phenomenon
    - DDD, VVI, VVO usually safe modes
- Demand pacing typically see pacer rate 10 beats below patient's native rate so it will pace as need but is sensing all the time
- Fixed, asynchronous pacing should be avoided unless patient is in asystole as the pacer will fire without regard for the patient's native electrical activity, possibly leading to R on T and VF

- Pacer Emergencies
    - Failure to Capture- See spike with no QRS after; reposition first, then increase mA as ordered;
    - Failure to Sense- May see many or no spikes
    - Oversensing- Thinks patient's rate faster than it is so pacer does not fire. Correct by decreasing sensitivity (turn towards zero).
    - Undersensing- pacer thinks rate too slow so fires too much and competes with native beats (risk of R on T). Correct by increasing sensitivity.
    - Lead wire fracture- Common cause of problems with sensing and capture- try to correct by repositioning patient on left side or placing arm above head

- Tips for a Safe Pacer Transport
  - Tape all wire connections
  - Make sure there is a fresh battery in unit and you have a spare
  - If you don't have to change pacer boxes, don't
  - If you do, set your box up to mimic their settings
  - Connect lead extension wire to box
  - Rapidly disconnect patient leads from their box and connect to your box
  - Assess for capture
  - Conduct trial on new pacer

- ***Never change a pacer box out if the patient***
  - ***Has an underlying rhythm of asystole***
  - ***Is hypothermic***
  - ***Is acidotic***
  - ***Capture was hard to achieve***

- ***Epicardial pacing wires (s/p CABG) are not a PIFT approved device- you must take a nurse***

- Always place your transcutaneous pacing pads and leads as a backup before transport
- Complications of emergency transvenous cardiac pacing are numerous and are similar to those related to central venous catheterization, right heart catheterization (dysrhythmias with PVC's), and transvenous pacing.

Troubleshooting Transvenous Pacemakers

Complication	Action	Notes
Failure to capture	Adjust current to the minimum current necessary to obtain capture	
Undersensing	Increase sensitivity number on generator	Note- this is most dangerous from risk of R-on-T
Oversensing	Decrease sensitivity number on generator	Leads to slower rate than pacer is set at since it is sensing artifact inappropriately
Equipment failure	New battery prior to transport	Additional backup battery for transport
Displacement, fracture of the catheter, loose leads	Contact OLMC for consultation	Suspect with intermittent or complete loss of capture after other causes have been considered

- Chest Drainage Systems
  - A tube inserted into the pleural space that drains air, blood, or other fluid, allowing apposition of the visceral and parietal pleura, thus sealing any visceral pleural holes and enabling full expansion of the lungs.
- Indications
  - Tension pneumothorax
  - Spontaneous or iatrogenic pneumothorax (particularly if the pneumothorax is large, progressive, or if the patient is symptomatic or has underlying lung disease)
  - Pneumothorax of any size in a patient receiving mechanical ventilation
  - Penetrating chest trauma
  - Hemothorax
  - In a trauma situation, if >1500 cc fluid obtained immediately, or >200 cc/hr for 4 hrs, then OR for evacuation and necessary repairs.
- Contraindications
- Absolute: None.
- Potential Complications
  - Chest tube malposition is by far the most common complication Clotting, kinking, or dislodgement of the chest tube are all common.
  - Other possibilities, albeit rare, include empyema, diaphragmatic perforation, perforation of the right ventricle, right atrium, and abdominal organs (spleen, liver, stomach, colon).
  - Cardiogenic shock from chest tube compression of the right ventricle, mediastinal perforation with contralateral hemothorax and pneumothorax, bleeding from intercostal artery injury, and infection at the chest tube site have all been reported.
  - Re-expansion pulmonary edema – potentially life-threatening –usually occurs following rapid re-expansion of a collapsed lung, evacuation of large volumes of pleural fluid (>1.0 to 1.5 liters) or after the removal of an obstructing tumor. (Tx: supportive w/ O2 +/- mechanical ventilation prn).

- The chest tube connects to a Pleuravac® (which is simply a fancy name for a three-chambered box).
- Choosing the Tube
  - *Type: Silastic chest tubes should be used preferentially over rubber tubes, as they contain more drainage holes, produce less pleural inflammation, and they contain a radio-opaque strip with a gap that serves to mark the most proximal drainage hole.*
  - *Size: Sizes range from 10 to 40 Fr, and the size required depends on the indication for the chest tube. In general, tube sizes can roughly follow the algorithm:*
  - *pneumothorax<pleural effusion<empyema<hemothorax*
  - *Length: There are two standard lengths, and either is appropriate for use in the adult, while the shorter is more appropriate in pediatric patients.*

- Normal negative pressure in the pleural space is maintained, allowing for improved ventilation and oxygenation.
- Water seal systems are used to maintain negative pressures. Typically, chest drainage units are connected to continuous suction to allow for drainage from the thoracic cavity.
- Chest tubes are sutured in place, however care should be taken to prevent accidental removal.
- Equipment needed during transport includes a functioning suction unit, tape, occlusive dressing, and Pleuravac or Heimlich valve.
- Pleuravac should be secured to prevent spilling of fluids and inadvertent introduction of air into the pleural cavity. Continuous or intermittent negative pressure should be maintained, as ordered.
- Heimlich valves are one way valves that prevent air from entering the pleural space through the chest tube, but permit air to drain out. They may be preferred for simple pneumothrorax during transport because they don't require water filled containers.
- It is important to verify tube placement before departure, and after each transfer. Record where the tube is taped in cm, and assure that the tube is properly secured. Retape all connections as needed.
- A normally functioning chest tube with Pleuravac should have air bubbling in the water seal chamber that fluctuates during inspiration and expiration (tidaling).
- Monitor drainage carefully. Bright red drainage indicates active bleeding.
- Avoid "milking" or clamping the tube.
- Assess frequently for placement, crepitus at the insertion site, leakage, and monitor connections carefully.
- Assure that the water seal chambers are filled appropriately.

- Troubleshooting Chest Drainage Systems.
    - Recognize and troubleshoot common problems such as disconnection or blockage and leakage.
    - The most common complications of chest tube insertions include infections, laceration of an intercostal vessel, laceration of the lung, and intra-abdominal or solid organ placement of the chest tube.

- Immediately after insertion and q 4 hours while chest tube is in place assess:
    - *Breath sounds, heart rate, blood pressure, temperature, respiratory rate, and O2 saturation*
    - *Tidaling*
    - *Air leaks*
    - *Appropriate suction*
    - *Amount, color and consistency of drainage (it may be helpful to mark the volume of drainage, as well as the date, time, and one's initials directly on the Pleuravac®)*
    - *Dressing for occlusiveness and drainage from insertion site*

- *Chest wall at insertion site for subcutaneous emphysema ("Rice Krispies")*

- Key Points in Chest Drainage Management
  - *Always position the Pleuravac® in an upright position, below the level of the heart.*
  - *Always keep emergency equipment in patient's room (NS, 4 x 4, Vaseline gauze, tape & non-toothed padded clamps).*
  - *Frequent deep breathing, coughing, and repositioning of the patient is necessary to help re-expand the lung, assist with drainage, and prevent normal fluids from collecting in the lungs.*
  - *Dressing changes as appropriate, or immediately if they become soiled, saturated, or loose.*
  - ***Never** clamp a chest tube, except momentarily, when*
    - ***Changing the chest tube system***
    - ***Running the system***
    - ***Assessing patient's tolerance of chest tube removal***

- "Tidaling"
  - With the drainage unit (a.k.a. Pleuravac®) off suction, the fluid within the water seal chamber should move with respiration.
  - If the pleura seals off the chest tube, then the tube cannot suction appropriately, and tiding will not be observed.
- "Running the System"
  - Bubbles passing through water seal fluid while on suction = large air leak.
  - If suction is off, bubbles observed when patient coughs = small air leak.
  - Running the system determines whether the air leak (i.e. bubbles seen in the water seal chamber) is from the patient or from the tubing.
  - **Momentarily** occlude the chest tube. If the air leak is still present (i.e. bubbles are still seen), then the leak is from the tubing or tubing connections, and not from the patient.

- Intervention Required
  - If a new air leak develops that is attributable to the patient.
  - Migration of the tube:
    - If it pulls out so slightly that no holes are yet visible, secure tube in place and perform STAT CXR to confirm location of tube – opacity must be in the pleural space.
    - If a hole is visible in the tube, then immediate removal of tube with covering of incision site, until proper re-insertion can take place.
    - Under **no circumstance** should the tube be re-advanced, for this could introduce infection.
    - If the tube becomes clogged or if the drainage drops expeditiously, then suction with a sterile suction catheter.

Troubleshooting Chest Drainage Units

Complication	Actions	Notes
Recurrent pneumothoraces with chest tube failure	Observe patient for s/sx of tension pneumothorax	
Mechanical failure to drain air or fluid	Ensure that drainage collection is secure and below the level of the tube insertion	
Tube obstruction: Blood clots, kinks	Place and tape tubing to prevent kinks. Obstruction for by any other means, contact OLMC for consultation	
Unexpected removal	Treat as open chest wound. Immediately apply sterile occlusive dressing: Do not reinsert tube.	Remember to ventilate occlusive dressing to relieve tension pneumothorax. May need to divert to acute care facility to stabilize patient and replace chest tube.
Increased bleeding from chest tube	Do not clamp chest tube	Contact OLMC for consultation
Chest tube disconnects from drain unit	Keep bottle of sterile saline or water with patient, if chest tube disconnects from drain unit, submerge end in the water This is done instead of clamping to prevent another pneumothorax. Air is still allowed to escape.	
Infection of the entry site or pleural fluid	None	Prophylactic antibiotics are controversial
Bleeding at site	Control bleeding with direct pressure	

- Gastric Drainage Principles
- Nasogastric and orogastric tubes are inserted to empty abdominal contents, to promote release of air, to prevent gastric distention, to provide a route to administer medications and feedings, and in cases of GI bleed or abdominal surgery, to drain blood or perform gastric lavage.
- The nasogastric tube is measured from the edge of the nose, to the angle of the jaw, and down to the xiphoid process. The orogastric tube is measured from the corner of the mouth instead of the nose. They may connected to intermittent or continuous suction, may be clamped, or may be open to the air.
- Levin tubes are single lumen, with holes near the tip of the tube. Salem Sump tubes have two lumens; one is for gastric contents removal, the other is for air venting.
- An anti-reflux valve (e.g. Lopez valve) is often used when the tube is not connected to the suction unit.
- A 60 cc syringe with a catheter tip is used to verify position and to aspirate contents.
- Recognize and troubleshoot common problems such as extubation or blockage.

- The main complications of NG tube insertion include aspiration and tissue trauma. Additional complications are at time of placement. Placement of the catheter can induce gagging or vomiting, therefore suction should always be ready to use in the case of this happening.

Troubleshooting Gastric Drainage Devices

Complication	Action	Notes
Unexpected removal *note severe vomiting could dislodge tube from stomach, but not from nose.	Do not reinsert tube.	Anticipate need for suction Anticipate vomiting
Sinusitis	None during transport	
Aspiration	Place head of be at 30 degrees	
Nasal Hemorrhage	Place head of bed at 30 degrees	
Passage of the tube into the trachea	Confirm by placing external end of tube into bottle of saline and observing bubbles	Contact OLMC for option of tube removal
Perforation of the esophagus	None during transport	
Gastrointestinal bleeding	None during transport	
Coiling of the tube in the posterior pharynx	Place head of bed at 30 degrees	Monitor for aspiration

- Patient Centric Devices
  - *MDPB recognizes that these usually would require no intervention from the paramedic*
  - *OK for transport*
  - *Get education from the sending facility about the device*
- Wound vacs very common now
- Continuous Negative Pressure Devices
- Standard gravity or suction drains
  - *T tubes*
  - *Penrose Drains*
  - *Hemovacs*
  - *Jackson-Pratt*
- Feeding Pump
  - OK for transport as nutritional agent
  - Review operation with hospital staff
- Other Devices
- MDPB has developed a new special device protocol that will be included in next protocol revision
- If it's not covered here, it does not fall in the realm of PIFT so you must take staff

- Special Cases
  - IV pumps and non-medicated IVF
  - PCA pumps (peripheral or central line)
  - G tubes, J tubes, PEG tubes
  - Epidural or intrathecal pumps
- PCA Pumps
  - Patient controlled
  - Narcotics mainly
  - Ok under all circumstances for EMT-B with IV maintenance or above
    - If it has continuous infusion, that is a PIFT transfer
  - Route is central or peripheral
- Things Not in PIFT
  - Epidural or intrathecal infusion pumps for acute patients
  - **Acutely placed epidural anesthesia not in PIFT**
  - Implanted epidural and intrathecal pain pumps exist for chronic pain patients
    - These ok for all levels (i.e. they are a patient-centric home care device)
- How Not to Get Caught In a Quandary
  - Assess the patient
  - If they have a catheter taped to their back connected to a pump, it's probably an epidural or intrathecal device (pain meds, steroids, chemo, etc.) and you can't transport it under PIFT

Documentation of PIFT Transports

Two different procedures will be used for PIFT documentation. Services utilizing the electronic MEMSRR System will be receiving updated information via the MEMSRR website on how to utilize the new features related to PIFT. For services utilizing the paper MEMS run forms, a supplemental code list for drug categories will be posted on the Maine EMS website prior to the "go live" date. The new PIFT codes will be 3 digits and are designed to capture more data about the true nature of PIFT transports in Maine. PIFT paramedics are asked to make sure that they now check the PIFT box anytime a PIFT protocol, procedure, or device is used during the transport.

Completion of the PIFT Course

At the conclusion of this course, your instructor will forward a copy of the signed roster to the Maine EMS Education Coordinator. MEMS will subsequently issue completion certificates back the instructor for distribution to the course participants. Note: it is the course instructor's responsibility to distribute certificates to course participants. If you have not received your certificate within 30 days of course completion, please contact MEMS. In the event a participant requires timely documentation of PIFT course completion (prior to being issued a certificate), a photocopy of a roster signed by the instructor, will serve as satisfactory proof of completion in the eyes of Maine EMS.

PIFT Operations

In order to conduct PIFT transfers, two aspects must be completed. One, providers must complete a current PIFT course and two; a service must complete the PIFT permitting process and be approved by MEMS as a PIFT service (See PIFT Permitting Process). It is important to note to students that BOTH aspects must be complete before conducting PIFT transfers. The presence of one aspect without the other is meaningless.

Appendix A: Maine EMS PIFT QA Form

Maine EMS PIFT Program QA Form		
Service Medical Director Review _____ (sign) on _____ (date)		
Date _____	PCR # _____	Service # _____
Sending Facility _____	Paramedic Name _____	
Receiving Facility _____	Lic # _____	
Do not complete the transfer unless attending physician, on line medical control physician and OLMC contact number provided. Must also complete whether or not communication problems anticipated enroute. Attending physician: _____OLMC: _____ Phone:_____ Communication Problems Anticipated: _____		
Stable _Moderate[1] / Low[2]_ Risk (Circle one) **Unstable On Arrival**[3] Action: _____		
Vitals signs as documented on EMTALA form: Pulse: _____ Respirations: _____ Blood Pressure: _____ SaO_2%: _____		Vital Signs on arrival at facility: Pulse: _____ Respirations: _____ Blood Pressure: _____ SaO_2%: _____
List all medications and their rates/doses being administered during transport:		List any interventions performed or devices used enroute:
□ Heparin	_____	□ IV Start
□Nitroglycerine	_____	□ Intubation
□ Potassium	_____	□ CPR
□ TPN	_____	□ Defibrillation
□ Morphine	_____	□ Cardioversion
□ Other	_____	□ Other Airway Maintenance
□ Other	_____	□ Transvenous Pacing
□ Other	_____	□ Other
□ Other	_____	□ Other
Were there any titrations to medications or unscheduled boluses administered during transport? If so, list medication and dose/change: _____ _____ _____ _____		*Was contact with OLMC necessary during transport?* If so, list what was requested and if received: _____ _____ _____ Name of OLMC:_____
Order sheet for all medications/interventions is completed, signed by Physician/PA/NP or by RN with Verbal Order, and accompanies patient chart.		
The transporting paramedic has the final decision whether or not they are comfortable in transporting the patient without additional hospital staff.		
1) Stable “Moderate Risk” Patient: A Stable patient is one who has hemodynamic and neurologic stability from therapies initiated. Therapies initiated must be expected to maintain patient stability during the transport. This patient is typically going via emergent transfer to a tertiary facility for services not readily available at a local facility. Variation on existing therapy has demonstrated no deterioration and may be reasonably predicted to remain without change during the transport without the need for further adjustments to such therapy.		
2) Stable “Low Risk” Patient: A patient who has hemodynamic and neurological stability with no foreseeable deterioration. This is the patient who is not suffering from an acute illness, but has medications or interventions being administered which are outside of the scope of the Paramedic without PIFT training.		
3) Unstable “High Risk” patients and those receiving interventions outside the scope of the PIFT module will require the sending facility to provide other appropriate staff to assure appropriate clinical care during transport. updated 11/07/06		

Appendix B: Pre-Trip Considerations and Planning

1. Vehicle Considerations

One of the most important things to consider in planning for a PIFT transport is the condition and readiness of the vehicle for transport. Standard EMS operational issues such as having adequate fuel, road conditions, and driver fatigue are all commonly considered on any EMS call. In a PIFT transport, additional electrical demands may be placed on the vehicle's inverter system and electrical system. On-board oxygen and medical air levels must be sufficient for the anticipated duration of the transport, plus a good safety margin. The provider must consider if additional suction regulators are needed to provide suction to the devices the patient may have in place. Finally, other types of specialty equipment may need to be added to the vehicle, with the paramedic remembering the importance of properly securing objects in the patient compartment for safety during transport.

2. Getting the Scoop- What to know before you go and what to ask in report

Careful preparation is an essential key to success in any PIFT transfer. This process begins with the team member who takes to request for the PIFT transfer and must continue through until completion of the trip. Many services find that a standardized report sheet for PIFT transports helps plan crew and vehicle assignments, resource allocation, and allows the crew to prepare before they venture out to pick up the patient. There is nothing more embarrassing or problematic to you as a PIFT paramedic then showing up to pick up a patient and finding that you do not have the required equipment with you. An example of a report sheet is included in the appendix, as is the oxygen conversion table for finding the duration of tank flow.

Some items to ask when taking a PIFT request include all the standard dispatch information, destination, sending facility and MD, and most important, what makes it a PIFT transfer. A list of medication classes and approved PIFT devices is included in the 2006 PIFT Program Student Manual. When the crew arrives at the bedside, they must undertake a review of the patient's chart for at bare minimum, each of the following things:

- Patient Demographics- a copy for you and the receiving facility
- EMTALA/COBRA form- a copy for you and the receiving facility
- Transfer orders- a copy for both you and the receiving facility
- The patient's most recent, relevant lab results:
  - Complete Blood Count (CBC)- Pay attention to the hemoglobin and hematocrit (H & H); the total white blood cell count (WBC) indicates infection and immunity
  - Basic or Complete Metabolic Panel (BMP or CMP)- This is sometimes called the Chem 7 or Chem 20. The things to look at here are serum levels for sodium (Na^+), potassium (K^+), chloride (Cl^-), carbon dioxide (CO_2), blood urea nitrogen (BUN), creatinine (Cr), and serum glucose (Glu). The great thing

about labs is that the reference values for that lab are usually printed on the report sheet next to the actual value. For patients who are diabetic and/or receiving insulin therapy (i.e. receiving TPN), note that the lab glucose value is considered the most accurate and may differ significantly from bedside point-of-care glucose monitoring.
    - In respiratory patients, ABGs
    - For Cardiac Patients, look at the troponin I or T level, LDH, total CPK, CK-MB. Heart failure patients may also have had a BNP test performed, which is a very specific evaluation of heart failure severity.
- Most recent vital signs, ECG rhythm, and trends- if the patient is on vasoactive medications, knowing the highest heart rate and lowest blood pressure may be helpful. In addition, it is important to find out if the sending physician wishes you to treat the patient's systolic BP (SBP) or titrate to Mean Arterial Pressure (MAP), which can be calculated via MAP = (SBP + 2 x DBP) ÷ 3.
- Review the transfer orders with the nurse or physician. Make sure that you have a copy of the signed transfer order for your chart.
- Review any medications that you are not familiar with for action, dose range, side effects, adverse reactions, and special considerations.
- Determine if any periods of instability of occurred recently and what was done to manage them.
- Obtain any scheduled medications as needed from the sending facility. Make sure they are labeled with the patient's name, medication, dose, concentration, and time of administration.
- With the nurse, check any infusions to verify dose and rate.
- Perform a patient assessment and proceed with the transport if you have determined the patient to be stable for a PIFT transport. If not, request staff assistance for transport.
- For patients with special PIFT devices in place, review any operational details with the nursing staff. Important things to know are the size of the Foley catheter, chest tube, or other type of invasive device; condition of line and drain sites (i.e. dressing appearance, subcutaneous air, etc.), input and output, and reasons the devices are in place.

Appendix C: Calculating Oxygen and Medical Gas Consumption

To calculate the duration of flow for an oxygen tank, use the formula below.

$$\frac{(\text{Gauge Pressure in psi} - \text{the safe residual pressure}) \times \text{constant}}{\text{Flow rate in L/min}} = \text{duration of flow in minutes}$$

Safe residual pressure= 200 psi

Cylinder constants

D= 0.16
E= 0.28
M=1.56
H=3.14

Adapted from Pollack, A. N. (ed.). (2005). *Emergency care and transportation of the sick and injured (9th ed.).* Sudbury, MA: Jones & Bartlett Publishers, p. 236.

Appendix D.
MDPB Devices and Appliance Statement
Adopted 12/20/06 by the MDPB

1 (for the brown pages)

It is recognized that many patients will, as part of their totality of care, have devices and appliances (drains, ports, etc.) placed. Many of these are devices with which patients are routinely discharged home and patients (or their care providers) are expected to maintain them on their own. While these devices have some risk associated with them, they are generally considered safe in the home environment. As such, EMS providers are not restricted in the care or transfer of these patients based solely on the presence of these devices or appliances. Unfamiliarity with or any questions concerning these devices should be referred to medical control.

2 (for the PIFT document)

Nothing in the PIFT requirements shall prohibit the transport of patients with surgical or medical appliances that will routinely or prospectively require active management by Maine EMS personnel during the course of transport and whose consequences of unforeseen malfunction would present an immediate threat to the patient. The sending facility is responsible for contemporaneous education and training on the use of these devices prior to Maine EMS providers taking responsibility of the patient. Unfamiliarity with or any questions concerning these devices should be referred to medical control.