

MEDICAL ACTION PLAN

The purpose of a medical action plan is to outline specific details about the organization and delivery of emergency medical care at a mass gathering event. It should be based upon a combination of experience and statistics from previous events of a similar nature and duration coupled with objective evidence about elements known to positively influence the delivery of emergency medical care at mass gathering events. The medical action plan may be regulated or influenced by local, regional or state guidelines concerning such planning activities.

Essential

A basic medical action plan must be created for every mass gathering event. It must be the basis for the contractual agreements between the Event EMS Coordinator, the Event EMS Medical Director and the event sponsors. Authorship of the medical action plan is the responsibility of the Event EMS Coordinator and the Event EMS Medical Director. The medical action plan must meet/exceed local, regional guidelines for mass gathering event EMS planning

Copies of the medical action plan must be forwarded to all local, regional, state and federal officials who hold responsible roles in the mass gathering event. A copy of the medical action plan must be on-site and available to all EMS personnel at the mass gathering event

The medical action plan must be reviewed and approved by the Event EMS Medical Director or the medical director of the EMS agency primarily responsible for delivery of emergency medical care at the mass gathering event

The medical action plan must include/address the following components:

- Physician Medical Oversight
- Medical Reconnaissance
- Negotiations for Event Medical Services
- Level of Care
- Human Resources
- Medical Equipment
- Treatment Facilities
- Transportation Resources
- Public Health Elements
- Access to Care
- Emergency Medical Operations
- Communications
- Command and Control
- Documentation
- Continuous Quality Improvement

Desirable

- The medical action plan should be completed at least 30 days prior to the event
- The medical action plan should be distributed and reviewed with EMS personnel working the event prior to the mass gathering event.

PHYSICIAN MEDICAL OVERSIGHT

The purpose of the medical oversight component of the medical action plan is to define minimum requirements for the position of Event EMS Medical Director and its requisite job requirements. Medical oversight at a mass gathering will generally be provided both directly and indirectly, although the medical director's presence, or that of his/her designee, at the event is preferred for several reasons. First, the on-site physician medical director signifies an organizational commitment to the delivery of appropriate emergency medical care. Second, the emergency medicine literature clearly demonstrates that physicians can positively impact decision-making in the field, especially when it concerns potential non-transports and triage decisions. Third, the on-site physician represents a part of the EMS community and can often function as its spokesperson or champion for the often-unrecognized efforts of the mass gathering medical sector in matters of resource acquisition. Physicians often wield more political clout than their EMS providers. It may be easy to deny an EMS provider a request for additional supplies, but it is much more difficult when a physician defends the request in the name of appropriate patient care.

Physician Medical Oversight Plan

Essential

- A basic plan for the provision of physician medical oversight must exist for every mass gathering event
- Such a plan must address aspects of direct and indirect medical oversight functions applicable to mass gathering events
- Such a plan must ensure that EMS providers have appropriate supervision and/or guidance from a medical command/control authority to safeguard delivery of appropriate emergency medical care

Requirements for the Physician Medical Director

Essential

- A physician medical director must be appointed or confirmed by the event administrator or venue owner, if not already self-designated, for every mass gathering event
- The medical director must possess a valid medical license from the state in which the event is being held
- The medical director must commit to the time required to plan and direct emergency medical care at the event
- The medical director must be knowledgeable and experienced in the out of hospital care of acutely ill and injured patients

Desirable

- The medical director should possess experience as the medical director of an EMS service or agency
- The medical director should be board eligible/board certified in emergency medicine
- The medical director should have previous experience in the oversight of mass gathering medical care
- The medical director should be on-site as much as possible during the mass gathering event

Indirect Medical Oversight

Essential

- The medical director must participate in the design of a medical action plan for every mass gathering event
- The medical director must institute protocols as part of this plan to ensure that uniform and standard emergency medical care is delivered at the mass gathering event
- A mechanism must be in place for the indirect physician supervision of all event medical personnel if the medical director will be off-site or remote from the event
- An organizational chart and reporting structure regarding medical oversight responsibilities must be included in the plan

Desirable

- The organizational chart should include the number, function and reporting pathways for each EMS position which will exist at the event

Direct Medical Oversight

Essential

- The medical director or his/her designee must be continuously available by some form of communication to all EMS personnel for whom he/she is responsible during the course of the mass gathering event
- Any physician designated to fulfill the medical director's role on-site must be knowledgeable of the details regarding administration and planning of medical care for the mass gathering event

Desirable

- The medical director providing direct medical oversight functions should not become personally involved in the care of individual patients unless an extraordinary circumstance exists
- The medical director should be readily and easily identifiable by uniform, command vest or other method (e.g. item of clothing, visible credentials, etc.)

MEDICAL RECONNAISSANCE

The purpose of the medical reconnaissance component of the medical action plan is to present objectives that will aid the Event EMS Coordinator and Event EMS Medical Director in the successful response to medical emergencies at a mass gathering event through careful analysis of elements related to morbidity. Many of these variables are suspected of having a direct or indirect relationship to the number of patients seen at a mass gathering event, although few definitive statements can be made at this time due to the lack of prospective studies to support such predictions. Nonetheless, the importance of proper evaluation and preparedness for a mass gathering event cannot be overemphasized, especially given the number of case reports in the medical literature which appear to identify event characteristics related to illness and injury. Additionally, a thorough inspection of the venue site and an evaluation of the impact of the event on the operations of the local EMS system must be conducted prior to the event. The Event EMS Medical Director must have a sufficient understanding of the EMS system and its capabilities in order to predict where problems might arise and how an additional patient load will affect EMS operations of the event and the surrounding EMS system.

Medical Reconnaissance Plan

Essential

- A basic medical reconnaissance plan must exist for every mass gathering event
- Such a plan must identify key facts about the mass gathering event including, but not limited to, the following:
 - Venue location
 - Venue characteristics
 - Expected attendance
 - Available medical resources
- Such a plan must identify factors likely to adversely affect patient volume including, but not limited to, the following:
 - Crowd demographics
 - Expected weather conditions
 - Risk for violence
 - Alcohol and drug use
 - Availability of food, water and shelter

Medical Reconnaissance Plan (cont)

Desirable

Such a plan should address mitigation strategies to handle increases in patient volume which may be due to one or more of the following factors:

- Crowd composition
- Crowd volume
- Crowd density
- Crowd mood
- Crowd control
- Crowd mobility
- Physical considerations (e.g. barriers to crowd access, aisle space, lighting)
- Time to access victims in different areas of the venue
- Entrance and exit locations for spectators and participants
- Characteristics of event participants
- Location, geography and characteristics of the venue site
- Outdoor versus indoor events
- Nature of the event
- Event duration
- Warm ambient temperature and heat-related illnesses/injuries (outdoor events)
- Cold ambient temperature and cold-related illnesses/injuries (outdoor events)
- Sudden or unexpected changes in temperature (outdoor events)
- Precipitation (outdoor events)
- Threat of thunderstorms with lightning (outdoor events)
- Wet or slippery versus dry ground conditions (outdoor events)
- Availability and/or use of alcohol
- Availability and/or use of illicit drugs
- Availability of water
- Availability of food
- Availability of shelter
- Availability of local emergency medical services
- Ingress and egress routes for emergency vehicles
- Law enforcement and/or venue security presence
- Threats against the event or other security concerns
- VIPs in attendance
- Potential for violent group behavior
- Likelihood for natural or technological disaster occurring during the event (tornado, plane crash, etc.)

Venue and Event Analysis: Information Gathering Prior to the Event

Essential

- The event date, location and duration must be known
- The event site must be visited by the Event EMS Coordinator or his/her designee
- The extent to which emergency medical care can and will be provided must be known
- The responsibility for delivery of emergency medical care to specific groups or subgroups within the overall event population must be agreed upon by all parties concerned
- Operational characteristics and command structure of the jurisdictional 9-1-1 EMS agency must be reviewed
- The distances and predicted transport times to receiving hospitals must be known
- Regional traffic flow patterns and impact upon EMS transport units must be evaluated
- All regulations governing mass gathering medical care, fire codes, safety codes, public health codes and any other applicable local and state regulations must be reviewed prior to the event

Desirable

- The Event EMS Coordinator and/or Event EMS Medical Director should attend similar events prior to the one being planned to evaluate elements contributing to successful or problematic EMS delivery
- The Event EMS Coordinator and/or Event EMS Medical Director should review medical and operational records from previous similar events to evaluate elements contributing to successful or problematic EMS delivery

NEGOTIATIONS FOR EVENT MEDICAL SERVICES

Agreements to provide emergency medical care at the majority of smaller mass gathering events are usually solidified after a single phone call or letter to the local EMS agency. However, a casual approach may ignore certain medicolegal and logistical complications that could impair successful EMS delivery. For large-scale mass gatherings, the planning process may span weeks to months and involve meetings with various event representatives. It is incumbent upon the Event EMS Medical Director and the Event EMS Coordinator to ensure that venue owners and managers understand the complexities of mass gathering medical care delivery. They must fully support the implementation of a plan to provide patients with state-of-the-art care. They must also provide medical personnel with the equipment and logistical support necessary to accomplish this goal.

Liability coverage and compensation for medical personnel are two subjects that should receive special attention. The event managers should take primary responsibility for assurance of appropriate liability coverage for all medical personnel. Liability insurance may be provided by the event organization, through each individual's previously existing plan, or their employer's organizational plan. Reliance on so-called Good Samaritan statutes is risky, especially if medical personnel or the EMS agency receive any form of compensation for their services and when their services were procured with advance notice.

Compensation for services rendered will be monetary or non-monetary. For many smaller events, participation in the event itself and a "free lunch" usually guarantees availability of volunteers. However, it is unlikely that municipal or privately contracted EMS personnel will be interested in providing services free of charge. The costs of participation as well as the delivery of service must be calculated and passed on to the venue management whenever possible. Any added benefits, such as souvenirs or event tickets for family/friends, may also generate enthusiasm among medical personnel.

Essential

- The Event EMS Coordinator must meet with the venue managers/owners prior to the event
- A contractual agreement must be in place that delegates responsibility for the delivery of emergency medical care to the appropriate agency or authority
- Scope and responsibility for emergency medical care must be clarified
- Issues regarding licensing and authority to practice for medical personnel must be clarified
- Liability insurance coverage for the physician medical director and all EMS personnel must be addressed
- Compensation status for all medical personnel must be addressed
- The number and type of medical personnel necessary and desirable for event coverage must be agreed upon prior to the event
- Responsibility for financing and procurement of medical resources must be addressed
- Command and control issues and reporting relationships for medical personnel must be addressed

NEGOTIATIONS FOR EVENT MEDICAL SERVICES (Cont)

Desirable

- The Event EMS Medical Director should either meet with or talk to venue owners/event managers both as a courtesy and to demonstrate commitment to the delivery of emergency medical services
- The Event EMS Coordinator should coordinate and critique all aspects of emergency medical care with the event planning committee and event director both before and after the event
- Human resource logistics issues, such as provision of meals, parking and lodging, should be discussed and arranged with venue managers/owners prior to the event
- Media coverage for EMS sponsoring organizations should be clarified with venue owners/managers prior to the event

- **LEVEL OF CARE**

The level of care component of the medical action plan defines minimum standards for emergency medical capability at a mass gathering event and preferred sophistication of the medical sector. EMT-Basic, which includes the ability to deliver early defibrillation, is the minimal acceptable level of care at a mass gathering event.

Level of Care Plan

Essential

- A basic level of care plan must exist for every mass gathering event
- Such a plan must address the sophistication and capabilities of the medical sector
- Such a plan must explicitly state whether or not advanced life support care is required at the event
- Such a plan must state whether the minimum level of care to be provided includes advanced life support (e.g. EMT-I or EMT-P)
- Such a plan must specifically address how early defibrillation capability will be designed to meet a collapse-to-shock goal of 3-5 minutes or less
- Such a plan must address the need for education/training of EMS providers regarding unusual medical protocols or procedures prior to the actual event
- Such a plan must be reviewed and approved by the Event EMS Medical Director prior to the event
- A detailed map of the event or venue site must be created to show where both basic and advanced life support capability is located

Desirable

- The level of care available at a mass gathering should reflect that which is available in the community
- Availability of advanced life support and the capability to deliver ACLS is always preferred at any mass gathering event
- When limited advanced life support resources are available at an event, they should be located in a fixed position rather than remaining mobile

LEVEL OF CARE (Cont)

Emergency Medical Capabilities

Essential

Emergency medical providers delivering both basic and advanced life support at a mass gathering event must be capable of recognition of abnormal signs and symptoms, preliminary assessment (if possible) and initiation of treatment for the following conditions:

- Abdominal pain/problems
- Airway obstruction
- Allergic reaction
- Altered mental status
- Animal bites
- Back pain (traumatic and non-traumatic)
- Burns
- Cardiac/Respiratory arrest
- Cerebrovascular accident (CVA)
- Chest pain and cardiac symptoms
- Diabetic emergencies
- Electrocutation
- Environmental emergencies
- Hazardous materials incidents with patient complaints
- Headache
- Hemorrhage (internal and external)
- Near-drowning and water-related trauma
- Ophthalmologic illness and injury
- Overdose/poisoning
- Pregnancy problems/labor and delivery
- Psychiatric emergencies
- Respiratory distress
- Seizures
- Syncope
- Traumatic injuries

LEVEL OF CARE (Cont)

Development of Protocols and Standard Operating Procedures

Essential

- The Event EMS Medical Director must ensure that all non-physicians deliver medical care according to an accepted set of protocols and standard operating procedures
- Such policies must be approved prior to the event by the Event EMS Medical Director
- Patients whom are treated and released must be cleared either by a physician or an individual delegated by the Event EMS Medical Director to make such a decision
- The Event EMS Medical Director and the Event EMS Coordinator must ensure that a policy is in place regarding the care of minors who present to the medical sector for evaluation and/or treatment without a parent or legal guardian as well as the release of minor patients
- All medical personnel must be educated about event protocols and policies prior to the beginning of event coverage

Desirable

- Protocols and standard operating procedures should adhere to local or regional practice if event-specific policies have not been developed

Early Defibrillation Capability

Essential

- The Event EMS Coordinator and the Event EMS Medical Director must evaluate the capability of EMS personnel to respond to cases of sudden cardiac death in order to maximize the chances of survival
- Such evaluation must be based on the following factors:
 - Predicted incidence of cardiac arrest
 - Predicted delays in activation of the EMS system
 - Predicted frequency of bystander CPR
 - Availability of AEDs for use by lay persons or bystanders
 - Predicted delays in arrival of personnel trained in early defibrillation
 - Availability of early advanced life support
 - Predicted transport times to definitive care
 - Every effort must be made to deliver early defibrillation to victims of sudden cardiac death within 3-5 minutes from the time of collapse
 - Such efforts will likely involve analysis and involvement of multiple EMS system elements, which should be based upon published studies regarding cardiac arrest and prehospital response

HUMAN RESOURCES

The exact numbers of emergency medical personnel necessary to deliver appropriate care at fixed treatment facilities and to provide roving coverage that will guarantee rapid response for life-threatening medical emergencies will differ for every mass gathering event. Thus, it is impossible to present a mathematical formula that will accurately predict staffing requirements. More importantly, staffing goals for mass gathering events should include as many personnel as possible both to avoid burdening the local EMS system and to be prepared for mass casualty incidents.

The purpose of the human resource component of a medical action plan is to define roles and responsibilities of medical personnel and logistical issues surrounding their deployment. A comprehensive human resource plan will address numbers and types of medical personnel necessary to provide acceptable emergency medical care relative to the specific event. It will also detail how the personal needs and compensation of these personnel will be handled.

Human Resource Plan

Essential

- A basic human resource plan must exist for every mass gathering event
- The human resource plan must clearly indicate a chain of command
- The human resource plan must clearly delineate the medical care responsibilities for all personnel who may participate in such care
- The human resource plan must clearly indicate roles and responsibilities for personnel with advanced medical training (including physicians, nurses and other health care professionals)
- The human resource plan for large scale events must clearly indicate how personnel management issues will be addressed, including, but not limited to, the following:
 - Work cycles (shift rotation)
 - Credentialing procedures
 - Checking in and out procedures
 - Hydration and alimentation
 - Rest and/or sleep
 - Back-up scheduling
- A map of the venue site with locations of all stationary and deployed BLS and ALS medical personnel must be created and stored at the command post

Desirable

- Copies of this map should be distributed to all medical personnel
- Consideration should be given to designation of a personnel manager for large scale events

LEVEL OF TRAINING

Physician

Essential

- Physicians charged with direct patient care responsibilities must be currently licensed in the state in which the mass gathering event is being held
- Physicians charged with direct patient care responsibilities must be recognized by the Event EMS Medical Director to provide care
- Physicians charged with direct patient care responsibilities must be certified in CPR and ACLS or demonstrate that they have the requisite knowledge to handle emergencies that are covered within these training courses
- Physicians charged with direct patient care responsibilities must be experienced in the care of patients with life and limb-threatening illnesses and injuries in the out of hospital setting
- The on-site physician must be immediately available when requested to assist in patient care or evaluation

Desirable

- Use of on-site physicians is strongly encouraged in the following circumstances:
- Sophisticated medical care facilities on-site (radiography, EKG, etc.)
- Limited transportation resources
- Large numbers of spectators and/or participants (potential for large patient volume with broad variety of medical problems)
- Significant risk for the development of life and/or limb-threatening illness or injury (auto racing, equestrian events, boxing, etc.)
- Long transport times to definitive care facilities
- if physician care is available on-site, medical personnel should be aware whether their primary responsibility is direct patient care or consultation
- The on-site physician should be present within the designated treatment area as much as possible during the event
- One or more physicians trained, board-certified, or practicing in emergency medicine should be on-site if physician level care is provided at an event
- Physicians charged with direct patient care responsibilities should be currently certified in PALS, ACLS and ATLS or demonstrate that they have the requisite knowledge to handle emergencies that are covered within these training courses
- Physicians charged with direct patient care responsibilities should be familiar with the incident command system and mass casualty incident response

LEVEL OF TRAINING (Cont)

Physician Extenders (PA, CNP)

Essential

- The role of the physician extender at a mass gathering event is primarily treatment of ambulatory patients with non-critical complaints
- Physician extenders must be directly supervised by an appropriately licensed and qualified physician
- Physician extenders charged with direct patient care responsibilities must be currently licensed in the state in which the mass gathering event is being held
- Physician extenders charged with direct patient care responsibilities must be recognized by the Event EMS Medical Director to provide care
- Physician extenders charged with direct patient care responsibilities must be currently certified in CPR and ACLS

Desirable

- Use of on-site physician extenders may be appropriate in the following circumstances:
- Sophisticated medical care facilities on-site (radiography, EKG, etc.)
- Limited transportation resources
- Large numbers of spectators and/or participants (potential for large patient volume with broad variety of medical problems)
- Long transport times to definitive care facilities
- Physician extenders should primarily be utilized within fixed treatment facilities
- Physician extenders charged with direct patient care responsibilities should be experienced in the evaluation and treatment of patients with acute medical complaints
- Physician extenders charged with direct patient care responsibilities should be currently certified in a trauma life support course, such as BTLS, PHTLS or ATLS
- Physician extenders charged with direct patient care responsibilities should be familiar with the incident command system and mass casualty incident response

Nurse (RN, MICN)

Essential

- The role of the nurse at a mass gathering event is primarily assistance in the treatment of acutely ill and/or injured patients
- Nurses must be supervised by an appropriately licensed and qualified physician
- Nurses charged with direct patient care responsibilities must be currently licensed in the state in which the mass gathering event is being held
- Nurses charged with direct patient care responsibilities must be currently certified in CPR and ACLS

Desirable

- Nurses should not independently evaluate and treat patients unless they have recognized prehospital credentials, such as a flight nurse or prehospital nurse
- Nurses should primarily be utilized within fixed treatment facilities
- Nurses charged with direct patient care responsibilities should be experienced in the evaluation and treatment of patients with acute medical complaints
- Nurses charged with direct patient care responsibilities should be certified in a trauma life support course, such as BTLIS, PHTLS or TNCC
- Nurses charged with direct patient care responsibilities should be knowledgeable in mass gathering medical care
- Nurses charged with direct patient care responsibilities should be familiar with the incident command system and mass casualty incident response
- Nurses should be charged with medication dispensation and tracking, if available

EMT-Intermediate and EMT-ParamedicEssential

- The role of the EMT-Intermediate and EMT-Paramedic at a mass gathering event is primarily evaluation and treatment of acutely ill and/or injured patients who require advanced life support work-up or invasive medical therapy
- EMT-Intermediates and EMT-Paramedics charged with direct patient care responsibilities must be currently certified or licensed in the state in which the mass gathering event is being held

Desirable

- Use of EMT-Intermediates and EMT-Paramedics is strongly encouraged in the following circumstances:
 - Limited transportation resources
 - Large numbers of spectators and/or participants (potential for large patient volume with broad variety of medical problems)
 - Significant risk for the development of life and/or limb-threatening illness or injury (auto racing, equestrian events, boxing, etc.)
 - Long transport times to definitive care facilities
- EMT-Intermediates and EMT-Paramedics should be utilized both within fixed treatment facilities and as mobile emergency responders
- EMT-Intermediates and EMT-Paramedics should be knowledgeable in mass gathering medical care
- EMT-Intermediates and EMT-Paramedics should be familiar with the incident command system and mass casualty incident response

EMT-BasicEssential

- The role of the EMT-Basic at a mass gathering event is primarily evaluation and treatment of acutely ill and/or injured patients who require only minor or uncomplicated treatment, unless

there is no advanced life support capability available

- EMT-Basics charged with direct patient care responsibilities must be currently certified or licensed in the state in which the mass gathering event is being held

Desirable

- EMT-Basics can be utilized within fixed treatment facilities, but they should be utilized primarily as mobile emergency responders when ALS capability is available within fixed treatment facilities
- EMT-Basics charged with direct patient care responsibilities should be knowledgeable in mass gathering medical care
- EMT-Basics charged with direct patient care responsibilities should be familiar with the incident command system and mass casualty incident response

Volunteers and Ancillary Medical Personnel (not trained to the EMT-B level)

Essential

- Volunteers and ancillary medical personnel must know how to summon or alert properly trained emergency medical care providers

Desirable

- Volunteers and ancillary medical personnel should serve as scribes, spotters or in other positions which do not require direct patient care responsibility
- Volunteers and ancillary medical personnel should be trained in CPR and basic first-aid if patient contact is anticipated

Number of Personnel

Essential

- A minimum number of emergency medical personnel must be on-site to treat the volume of patients expected according to medical reconnaissance, statistical estimates and experience from previous events
- Sufficient numbers of appropriately trained personnel must be on-site to deliver emergency cardiac care to anyone suffering sudden cardiac death within the geographic boundaries in which care is to be provided and within 3-5 minutes from the time the first call for assistance is placed

Desirable

- Sufficient numbers of appropriately trained personnel should be present within fixed
- treatment facilities to fulfill the following functions (one person may occupy more
- than one role):
 - Triage
 - Evaluation and treatment
 - Medical record keeping
 - Communications
 - Logistics

Credentialing

Essential

- All medical personnel must be appropriately certified/licensed to practice their medical specialty in the jurisdiction at which the mass gathering event is being held
- All medical personnel must be appropriately credentialed to practice their medical specialty at the mass gathering event
- All local, regional and state regulations regarding prehospital care must be followed
- All medical personnel must have some form of identification (preferably photo I.D.) attached to their uniform or person

Desirable

- Verification of medical credentials should be performed prior to the day of the mass gathering event

Compensation

Essential

- Medical personnel must never withhold emergency medical care to persons at a mass gathering event due to the inability of the patient to pay for services
- Medical personnel must never request payment on-site for the delivery of emergency medical care

Desirable

- Medical personnel should receive some form of compensation for their services
- This compensation should be distributed equitably

Deployment Scheme

Essential

- Emergency medical personnel must be deployed in such a way that guarantees arrival of basic life support personnel with defibrillation capability at a patient's side within 3-5 minutes of a request for aid 90% of the time
- Medical personnel deployed in the field must maintain constant radio or visual contact with their supervisors or the command post
- Advanced life support personnel are best utilized within fixed treatment facilities unless there are ample providers available to permit roving advanced life support teams without compromise of fixed treatment facility capabilities
- Deployment of emergency medical personnel must occur before the event begins; the exact time should be determined by the Event EMS Coordinator in conjunction with the venue administrators
- Dismissal of emergency medical personnel must not occur before the event ends; the exact time at which personnel may be demobilized should be determined by the Event EMS Coordinator in conjunction with the venue administrators

Desirable

- Roving teams of emergency medical personnel should be deployed proactively to monitor for emergency medical incidents during events in which there is significant crowd density or other factors which may limit response times or access to patients
- Emergency medical personnel should be specifically assigned to care for either the spectators or the participants at events in which there is a likelihood that participants will become ill and/or injured in order to avoid compromising medical coverage for one group or the other

LogisticsEssential

- The Event EMS Coordinator must determine whether a designated medical sector logistician(s) is necessary to distribute and monitor supplies
- The Event EMS Coordinator or the medical sector logistician must ensure that the necessary quantity and type of supplies have been procured prior to the event
- The Event EMS Coordinator or the medical sector logistician must ensure that there is continuous availability of critical medical supplies during the event
- The Event EMS Coordinator or the medical sector logistician must ensure that distribution of supplies occurs in a timely and efficient manner

Desirable

- One or more designated logisticians should be assigned to the medical sector at large scale events to handle the following tasks:
 - Procurement and distribution of all supplies and pharmaceuticals
 - Tracking of inventory and maintenance of appropriate levels of supplies
 - Collection and return of unused supplies
 - Collection of patient care reports (PCRs)
- Transportation routes for delivery of supplies should be planned ahead of time and should take into account the access and egress routes, density, mobility and location of the crowd and the terrain to be traversed

TrainingEssential

- The Event EMS Coordinator and the Event EMS Medical Director must determine whether emergency medical personnel will require specialized training for the mass gathering event
- If specialized training is required, it must be accomplished prior to the event

Desirable

- The Event EMS Coordinator should review the mass casualty plans with all emergency medical personnel prior to the event

MEDICAL EQUIPMENT

The medical equipment component of the medical action plan defines the minimum necessary medical equipment and suggestions for its deployment. It is impossible to suggest minimum quantities for the recommended items since this will differ for every event. Note that the majority of basic and advanced equipment corresponds to what is typically carried on a basic life support ambulance and advanced life support ambulance, respectively.

The pharmaceutical list is a difficult one to design due in part to the fact that every state has different regulations regarding the administration of medications by paramedical personnel. Clearly, advanced life support providers should be prepared to utilize their entire armamentarium if needed at a mass gathering event. Under no circumstances should they dispense or administer medications that they are neither familiar with nor trained and certified to deliver. Additionally, the use of analgesics, antiemetics and airway management drugs must be closely monitored either directly or indirectly (medical command contact) by the Event EMS Medical Director, since patients who require these agents may be critically ill.

The use of “emergency department” equipment and pharmaceuticals is rare at mass gathering events and likely limited to those extremely large and well-funded events at which a constant physician presence is guaranteed. The items listed below are meant only to serve as a guide for those medical directors and EMS coordinators unsure how to approach delivery of medical care at a mass gathering event. They are not meant to replace equipment and pharmaceutical lists at well-planned annual events that have unusually sophisticated medical care delivery systems. Since fixed treatment facilities may span a spectrum of complexity from simple tents under which paramedics deliver standard EMS care to specially built mini-hospitals, there are no essential items listed under “Fixed Treatment Facility Medical Equipment” and “Fixed Treatment Facility Pharmaceuticals.”

Medical equipment cache design, prioritization and management are important to the overall functioning of the medical sector. Large or prolonged events may dictate that someone be assigned as logistician to effectively manage equipment stocking and deployment issues. This person is best designated prior to the event so that he/she may become familiar with the equipment and plans for its deployment.

Medical Equipment Plan

Essential

A basic medical equipment plan must exist for every mass gathering event

- Such a plan must make reference to the highest level of care that is anticipated to be delivered at the mass gathering event, the amount and type of equipment that will enable this goal to be met and a deployment scheme for such equipment
- Such a plan must include a point-of-contact and/or phone number to request additional supplies and equipment
- Ability to deliver medical care at the EMT-Basic level to all spectators and participants, including early defibrillation, is the minimum acceptable standard for a mass gathering event

- All local, regional and state regulations must be met or exceeded when developing a plan for use of medical equipment at a mass gathering event

Desirable

- Stockpiling of additional supplies and equipment is strongly encouraged at every mass gathering event
- The Event EMS Medical Director should dictate to mobile EMS crews and responders what pieces of equipment and/or medical devices will be carried on field responses

Medical Equipment-Basic

Essential

- Basic diagnostic and therapeutic equipment must be immediately available for both adult and pediatric patients
- The following items are considered essential elements of this equipment cache:
 - Airway adjuncts
 - Nasopharyngeal (adult and pediatric sizes)
 - Oropharyngeal (adult and pediatric sizes)
 - Alcohol swabs
 - Bag-valve masks (adult and pediatric sizes)
 - Backboards, rigid
 - Bandages, elastic
 - Bandages, triangular
 - Band-aids®
 - Cervical collars, rigid (adult and pediatric sizes)
 - Cold packs, disposable
 - Defibrillator, automated
 - Gauze pads (multiple sizes)
 - Gloves, latex, nonsterile (multiple sizes)
 - Gloves, not latex, nonsterile (multiple sizes)
 - Hot packs, disposable (seasonal)
 - Kling® (multiple sizes)
 - Obstetric pack
 - Oxygen delivery devices (nasal cannula, nonrebreather mask)
 - Oxygen tanks and regulators
 - Restraints, soft
 - Shears, trauma-style
 - Sling and swath
 - Splints (finger, wrist, forearm, lower extremity, traction)
 - Stethoscope
 - Sphygmomanometer
 - Suction device, portable (with charger, if necessary)
 - Suction supplies (catheters, disposable bags, etc.)
 - Tape, adhesive (multiple sizes)
 - Tongue blades

- The Event EMS Medical Director must decide whether or not EMT-assisted medications and any other specialized medical equipment will be included in the cache for use at the mass gathering event

Desirable

- Patient comfort items should be available and may include urinals, bedpans, facial tissues, feminine hygiene products, sunscreen, lip balm, and other similar products

Medical Equipment-Advanced

Essential

- If advanced life support level of care is available, appropriate diagnostic and therapeutic equipment must be immediately available for both adult and pediatric patients
- The following items are considered essential elements of this equipment cache:
 - Alternative advanced airway devices (Combitube®, lighted stylet, etc.) Blood glucose test strips and meter
 - Broselow tape
 - Cardiac monitor with manual defibrillator and external pacemaker
 - Devices to confirm intubation (CO₂ detector and/or esophageal detector device)
 - Endotracheal tubes of assorted sizes
 - Intravenous access devices and tubing
 - Laryngoscope with assorted blades and Magill forceps
 - Needle cricothyrotomy kit or supplies (may depend on local protocol)
 - Needle thoracostomy kit or supplies (may depend on local protocol)
 - Pulse oximeter
 - Razors
- Medical equipment not commonly used within local EMS practice must be approved by the Event EMS Medical Director prior to the event

Desirable

- Whenever possible, duplicate sets of ALS equipment should be available
- The following items are considered desirable elements of this equipment cache:
 - 12-lead EKG capability
 - Automated blood pressure monitor
 - Automated ventilators for prehospital use
 - End tidal CO₂ monitor
 - Intravenous fluid infuser (disposable or automated)

Pharmaceuticals

Essential

- If advanced life support level of care is available, a standard ALS pharmaceutical regimen must be immediately available
- Such a regimen shall include the following commonly used prehospital medications:
ACLS medications

- Adenosine
- Atropine
- Bretylium (may be deleted in favor of Amiodarone)
- Calcium chloride
- Calcium channel blocker (if approved by local protocol)
- Dopamine (pre-mixed bag preferred)
- Epinephrine 1:10000 concentration
- Lidocaine
- Sodium bicarbonate
- Analgesics
- Aspirin (use for ischemic chest pain may be allowed by local protocol)
- Narcotic for parenteral administration
- Anaphylaxis medications
- Antihistamine for parenteral administration
- Epinephrine, 1:1000 concentration
- Antiepileptics
- Benzodiazepine for parenteral administration
- Asthma medications
- Beta agonist for nebulization
- Steroid preparation (parenteral agent preferred; use may be allowed by local protocol)
- Cardiac medications
- Nitroglycerin, sublingual (tablets or spray)
- Loop diuretic for parenteral administration
- Diabetic medications
- Dextrose, 50%
- Glucagon
- Intravenous solutions
- Crystalloid solutions
- Pharmaceuticals not commonly used within local EMS practice must be approved ahead of time by the Event EMS Medical Director

Desirable

- Pre-filled syringes for commonly used pediatric medications should be available

Non-medical Equipment

Essential

- Hospital-type exam tables, beds and/or stretchers/cots
- Sheets
- Blankets
- Dedicated and properly marked hazardous waste receptacles
- Non-hazardous waste receptacles
- Spare batteries for battery-powered devices
- Pens
- Paper

Patient care forms

Desirable

- Chairs for medical personnel
- Bathroom with sink and toilet dedicated to the medical sector and/or treatment facility
- Linen disposal or recycle bin
- Pillows
- Towels
- Diapers
- Patient identification bracelets
- Safety pins
- Refrigerator (essential item if refrigerated pharmaceuticals are being used)

Fixed Treatment Facility Medical Equipment (assumes physician-level care)

Desirable

The following items are considered desirable elements of this equipment cache:

- Benzoin
- Betadine®
- Burn dressings
- Cotton applicators and balls
- Dermabond® or equivalent
- Eye examination equipment
- Eye patches
- Chest tubes, chest tube trays and chest tube drainage devices
- IV poles
- IV pumps
- Nasogastric tubes
- Ophthalmoscope
- Otoscope
- Prescription pads
- Ring cutters
- Splinting supplies
- Steri-strips®
- Suture kits and suture material
- Thermometers
- Vaseline® gauze
- Woods lamp

Fixed Treatment Facility Pharmaceuticals (assumes physician-level care)

Desirable

The following items are considered desirable elements of this pharmaceutical cache:

- Analgesics

- Anesthetics, local
- Antacids
- Antibiotics
- Intravenous agents
- Ointment
- Oral agents
- Antidiarrheal agents
- Antiemetic (parenteral and/or suppositories)
- Antiepileptics
- Airway management agents
- Induction agents
- Paralytic agents
- Asthma medications
- Steroid preparation (parenteral agent preferred; EMS use may be allowed by local protocol)
- Burn medications
- Silver sulfadiazine cream
- Xeroform® gauze
- Cardiac medications
- Beta blockers (parenteral)
- Calcium channel blockers (parenteral)
- Digoxin (oral or parenteral)
- Diabetic medications
- Insulin, regular
- Intravenous solutions
- D₅W/0.9NS
- D₅W/0.45NS
- Ophthalmic agents
- Anesthetic
- Antibiotic ointment
- Fluorescein strips
- Irrigating solution
- Mydriatic agent
- Poisonings
- Activated charcoal (EMS use may be allowed by local protocol)

Staging and Deployment of Equipment

Essential

A plan for the staging and deployment of medical equipment must be created and reviewed prior to the event

- All equipment and pharmaceuticals must be prepositioned at the beginning of the event
- All equipment and pharmaceuticals must be known to key personnel and tested by the Event EMS Medical Director and/or a dedicated medical logistician prior to the beginning of the

event

- The mechanisms to deliver and replenish equipment and pharmaceuticals must be known to necessary personnel
- Only properly credentialed individuals can be allowed to access and deliver prescription pharmaceuticals
- Cold chain storage of pharmaceuticals must be preserved

Desirable

- Medical personnel should be dedicated to logistics and resupply for high-volume events in which this function is not handled by venue personnel

TREATMENT FACILITIES

The purpose of the treatment facility component of the medical action plan is twofold. First, there must be a clearly defined plan to deliver critically ill and/or injured patients to definitive care. Second, establishment of on-site treatment facilities must be guided by criteria that ensure a safely constructed environment that is efficient for medical personnel and maximally therapeutic for patients.

On-site treatment facilities are generally needed only for large mass gathering events, those that are planned for a lengthy period of time, those in which it is predicted that patient volume will be high and those in which an excessive transport time to off-site treatment facilities exists. On-site treatment facilities can be as simple as a tent in which basic care is offered and there is a place for patients to lie down or as comprehensive as a freestanding emergency department. The exact configuration will depend on the predicted needs of the event patient population and available human and financial resources. Important elements to consider when designing on-site treatment facilities include safe construction of the entity, communications requirements, medical and non-medical equipment needs, barrier-free access.

Off-site treatment facilities are usually the primary destination for persons who require definitive care at a mass gathering event. Hospitals and other acute care facilities, which may be transport destinations should be evaluated for their ability to handle specialty situations.

Treatment Facility Plan

Essential

- A basic treatment facility plan must exist for all mass gathering events
- Such a plan must address both on-site and off-site treatment facilities
- Such a plan must address the physical characteristics and logistics of any on-site treatment facilities which are planned for the event
- Such a plan must address the capability of off-site treatment facilities to handle the expected patient load, including specialty patients, such as critical trauma and hazardous materials patients

Desirable

- On-site treatment facilities should be established whenever analysis of variables related to patient generation and care indicate that a significant patient load is possible
- Off-site treatment facilities should include regional referral centers, as well as local acute care facilities

On Site Treatment Facilities

Physical Characteristics (Construction)

Essential

- On-site treatment facilities must be constructed to withstand predictable weather conditions

during the event

- On-site treatment facilities must protect the occupants from possible adverse weather conditions, including extremes of heat and cold
- On-site treatment facilities must be constructed to minimize exposure of patients to extremes in temperatures

Desirable

- On-site treatment facilities should offer privacy for at least one patient at a time

Communications

Essential

- On-site treatment facilities must have two-way communications capability with the Command Post

Desirable

- Redundant communications modes, such as radio and telephone, should be available to medical personnel within on-site treatment facilities
- On-site treatment facilities should have two-way communications capability with EMS field providers at the mass gathering event
- On-site treatment facilities should have two-way communications capability with receiving facilities

Medical Equipment and Pharmaceuticals

Essential

- On-site treatment facilities must have sufficient medical equipment to begin the initial treatment of all common medical emergencies listed under *Level of Care*
- On-site treatment facilities must have medical equipment of a quality consistent with the highest standards offered in the surrounding community for the same level of care
- On-site treatment facility personnel must ensure the safety, sanitation and readiness of their medical equipment and pharmaceuticals

Desirable

- On-site treatment facilities should have their own cache of medical supplies, although they may be stocked with equipment from an ambulance
- The operations of on-site treatment facilities should not depend on key pieces of equipment from an ambulance that may leave the venue with a patient

Non-medical equipment

Essential

- A sufficient number of cots and chairs must be available for the anticipated patient volume
- Medical waste must be disposed of properly

Desirable

- A sufficient number of chairs should be available to medical personnel to rest
- One or more tables should be available for writing and storing supplies

Level of CareEssential

- On-site treatment facilities must offer a level of care at least equivalent to basic life support

Desirable

- Advanced life support care should be available at every on-site treatment facility, if possible

Staffing (Human Resources)Essential

- At least one medical provider qualified to deliver the highest level of care capable at the on-site treatment facility must be present at all times during the operating hours of that facility
- A predetermined chain of command and responsibility must be instituted in each on-site treatment facility
- Adequate medical personnel must be assigned to each on-site treatment facility based on predicted patient volume

Desirable

- Advanced life support providers assigned to on-site treatment facilities should not leave these facilities to retrieve patients; patients should be brought to the facilities by personnel trained at least to the EMT-Basic level

Patient AccessEssential

- On-site treatment facilities must be clearly marked so that the average patron recognizes them as medical aid stations
- The average patient must have easy access to the on-site treatment facility
- On-site treatment facilities must have a clearly marked entrance(s) and exit(s) consistent with jurisdictional fire codes

Desirable

- The location of on-site treatment facilities and/or the procedure to access emergency medical care should be announced or displayed on a regular basis so that patrons are aware of this information

Logistics (Location, Hours of Operation, Security etc.)

Essential

- On-site treatment facilities must be located in an area that is secure and easily accessible by the public
- The Event EMS Coordinator must ensure the ongoing security of on-site treatment facilities for equipment, staff and patients
- On-site treatment facilities must be operational for the duration of the mass gathering event, unless the Event EMS Coordinator redeploys staff and equipment

Desirable

- The location of on-site treatment facilities should be decided prior to the mass gathering event
- Medical personnel working at on-site treatment facilities should be aware of the location of the closest security or law enforcement personnel
- On-site treatment facilities should be prepared to receive patients one-half hour prior to the beginning of the event and one-half hour after the conclusion of the event

Off-Site Treatment Facilities

Receiving Hospitals

Essential

- One or more receiving hospitals must be designated to receive potential patients from the mass gathering event
- Potential receiving hospitals must be notified of the event prior to its occurrence
- The Event EMS Coordinator must ensure that event EMS personnel familiar with local hospital capabilities assigns transportation destinations to departing ambulances

Desirable

- All attempts should be made to appropriately and efficiently distribute casualties to multiple hospitals in order to prevent “overload” of any single facility
- Distribution of casualties is most effective when planned by the Event EMS Coordinator in conjunction with local emergency department directors prior to the event

Hospital Capabilities

Essential

- The Event EMS Coordinator must be aware of receiving hospital capabilities and the availability of specialty services
- The closest trauma center to the event location must be identified and its capabilities categorized prior to the mass gathering event
- A mechanism must be in place to alert the Event EMS Coordinator and/or the Command Post of changes in hospital closure and diversion status

Desirable

- Designated pediatric, obstetrical and psychiatric referral hospitals should be identified prior to the mass gathering event
- A designated receiving hospital for contaminated patients from a hazardous materials or WMD incident should be identified prior to the mass gathering event

TRANSPORTATION RESOURCES

The transportation component of a mass gathering medical action plan defines how emergency and non-emergency transportation resources will be deployed and utilized during a mass gathering event. Ground transportation resources are used to deliver EMS personnel and supplies to the scene of a medical incident and to transport acutely ill and injured patients to on-site and off-site treatment facilities. Air medical transportation resources can be used for a variety of purposes: to transport acutely ill and injured patients to off-site acute care facilities; to deliver additional personnel and/or equipment to remote venue sites; and to deliver additional personnel and/or equipment during a mass casualty or disaster incident. Non-emergency transportation resources can be used to transport patients with minor injuries and/or illnesses to on-site and off-site treatment facilities and to deliver EMS personnel and supplies to locations within the mass gathering venue. There are many theories governing the staging of transportation resources. However these resources are positioned, the following objectives should be met: response time to medical emergencies should be minimized; access to patient loading areas should be unimpeded (relatively) and safe; and egress pathways to a treatment facility should be unimpeded (relatively) and safe.

Transportation Plan

Essential

- A basic transportation plan must exist for every mass gathering event
- Such a plan must contain at a minimum the number and medical capability (BLS vs ALS) of ambulances deployed, type and number of non-emergency transport vehicles, and staging locations for all transportation resources
- Such a plan must address how and where additional transportation resources will be obtained if needed (mutual aid)

Desirable

- The transportation plan should predict utilization of transportation resources based on previous event statistics, if available, and analysis of elements related to patient generation
- Non-emergency transportation resources should be utilized for patients with non-life and non-limb threatening illness and/or injuries
- The number of transportation resources available for event deployment should be greater than the predicted utilization
- The number of on-site ground transportation resources should be maintained at a constant level
- Staging of vehicles should also address refueling and restocking
- Dedicated transportation resources should not leave the venue to answer jurisdictional emergency calls unrelated to the mass gathering event

Emergency Transportation - Ground

Traditional (Ambulance)

Essential

- Traditional ground transportation resources must be readily available to respond to medical incidents at a mass gathering event
- Traditional ground transportation resources must be clearly marked and highly visible
- Traditional ground transportation resources should meet all state regulations and licensure standards

Desirable

- Traditional ground transportation resources should be dedicated to the mass gathering event
- Traditional ground transportation resources should be on-site at the mass gathering event

Non-traditional (Modified go cart, boat or other unusual emergency vehicle)Essential

- Protocols for the appropriate utilization of non-traditional ground transportation resources, when applicable, must be formulated prior to the mass gathering event

Desirable

- Non-traditional transportation resources are usually smaller than traditional vehicles and should be utilized whenever possible due to their ability to penetrate crowds
- Non-traditional transportation resources should be dedicated to the medical sector for the duration of the mass gathering event, if possible
- Non-traditional transportation resources should be clearly marked and highly visible
- Non-traditional transportation resources should be staffed by at least one person with medical training, preferably to a minimum of the EMT-B level

Emergency Transportation—Air medicalEssential

- Protocols for the appropriate utilization of air medical resources must be formulated prior to the mass gathering event
- A dedicated landing zone must be established and secured if air medical resources are used during a mass gathering event

Desirable

- Guidelines for use of air medical resources should be disseminated to EMS personnel prior to the mass gathering event
- Local SOP should be followed concerning fire suppression capability at the landing zone
- Local SOP should be followed concerning security at the landing zone

Non-emergency TransportationEssential

- Protocols for the appropriate utilization of non-emergency transportation resources must be

formulated prior to the mass gathering event

Desirable

- Non-emergency transportation resources are highly desirable to reduce utilization of emergency transportation resources, especially if these are in short supply
- Non-emergency transportation resources should be dedicated to the medical sector for the duration of the mass gathering event, if possible
- Non-emergency transportation resources should be clearly marked and highly visible
- Non-emergency transportation resources should be staffed by at least one person with medical training, preferably to a minimum of the EMT-B level

Staging Placement of Transportation Resources

Essential

- Transportation resources must be geographically staged for a mass gathering event so that predicted transport times from on-site medical incidents is minimized

Desirable

- Emergency transportation resources should be staged on site at a mass gathering event whenever possible
- Designated reserved parking areas should be established for emergency vehicles
- Provisions should be made for refueling and restocking of transportation vehicles

PUBLIC HEALTH ELEMENTS

The purpose of the public health component of the medical action plan is to protect the health and well-being of participants and spectators at a mass gathering event from infections and unintentional injuries related to improper food, water, waste, land and/or road/traffic management. Event EMS personnel must determine if the jurisdictional public health department and other regulatory authorities will be responsible for oversight of public health concerns at a mass gathering event. While event EMS personnel may not be directly responsible for any of these areas, a working knowledge of factors contributing to the development of diseases and injuries related to improper management of these areas may help reduce the number of medical incidents during the event.

Definitions for each category are listed below:

- Food management includes, but is not limited to, food storage, food handling, food preparation and the cleanliness, actions and activities of food service personnel.
- Water management includes, but is not limited to, resources, supply, distribution, storage, handling, contents and the devices used to deliver water to the public.
- Waste management includes, but is not limited to, water and non-water carried sewage and their respective disposal facilities, solid, liquid and gaseous wastes, refuse storage, and refuse disposal.
- Land management includes, but is not limited to, flora control, fauna control, necessary and proper illumination, and appropriate maintenance of terrain integrity.
- Road management includes, but is not limited to, maintenance of the following components: primary and secondary roadways, improved and unimproved surfaces, necessary and proper illumination, necessary and proper signage, and appropriate ingress and egress routes for pedestrian and vehicle traffic.

Public Health Element Plan

Essential

- A basic plan that addresses the preceding public health elements and the potential for development of illness and/or injuries due to unforeseen circumstances at mass gatherings must exist
- If the event medical sector has responsibility for one or more of these categories, the public health component of the medical action plan must include at least a brief description of the protocols governing these responsibilities and strategies targeted to handle possible threats

Desirable

- A designated medical sector representative should work together with jurisdictional public health personnel prior to the event to identify potential problems and formulate potential solutions
- A point-of-contact should be identified at the appropriate jurisdictional public health department prior to the mass gathering event if a public health presence will not be on-site

Food Management

Essential

- Event EMS planners must acquire a basic working knowledge of anticipated food service operations and food management concerns prior to the event
- Event EMS planners must determine prior to the event whether responsibility for food management and safety has been delegated to the medical sector
- if oversight of food management and safety is delegated to the medical sector, the Event EMS Coordinator should seek consultation from the appropriate jurisdictional health department concerning basic responsibilities and statutory regulations

Desirable

- EMS supervisory personnel should develop a basic understanding of the epidemiology of food-borne illness
- EMS supervisory personnel should understand the principles of preventing food-borne illness
- EMS personnel should be proactive in the prevention of food-borne illness by observing appropriate food handling practices at mass gathering events

Water Management

Essential

- Event EMS planners must acquire a basic working knowledge of the venue's potable and non-potable water supply and the associated health concerns
- Event EMS planners must determine prior to the event whether water-borne health incidents will be the responsibility of the medical sector
- If oversight of water management and/or water supply is delegated to the medical sector, the Event EMS Coordinator should seek consultation from the appropriate jurisdictional water authority and health department concerning relevant statutory regulations

Desirable

- EMS supervisory personnel should understand the epidemiology of water-borne illness
- EMS supervisory personnel should understand the principles of preventing water-borne illness
- EMS personnel should be proactive in the prevention of water-borne illness by observing appropriate water management and water supply practices at mass gathering events

Waste Management

Essential

- Event EMS planners must acquire a basic working knowledge of waste management operations and concerns prior to the event
- Event EMS planners must determine prior to the event whether waste-borne health incidents will be the responsibility of the medical sector
- if oversight of waste management is delegated to the medical sector, the Event EMS Coordinator should seek consultation from the appropriate jurisdictional health department concerning relevant statutory regulations

Desirable

- EMS supervisory personnel should understand the epidemiology of infectious illness related to improper handling of garbage
- EMS supervisory personnel should understand the principles of preventing waste-borne illnesses
- EMS personnel should be proactive in the prevention of illness related to improper handling of garbage by observing appropriate waste management practices at a mass gathering event

Land Management

Essential

- Event EMS planners must acquire a basic working knowledge of land management operations and concerns prior to the event
- Event EMS planners must determine prior to the event whether land management and related public health issues are the responsibility of the medical sector
- if oversight of land management is delegated to the medical sector, the Event EMS Coordinator should seek consultation from the appropriate jurisdictional health department concerning relevant statutory regulations

Desirable

- EMS supervisory personnel should understand the epidemiology of flora- and fauna-related injury
- EMS supervisory personnel should understand the principles of preventing flora- and fauna-related injuries
- EMS personnel should be proactive in the prevention of illness and injuries related to poor groundskeeping by observing appropriate land management practices at a mass gathering event, if possible

Road/Traffic Management

Essential

- Event EMS planners must acquire a basic working knowledge of anticipated road/traffic management operations and concerns prior to the event
- Event EMS planners must determine whether road management and related public health issues are the responsibility of the medical sector prior to the event
- if oversight of road/traffic management is delegated to the medical sector, the Event EMS Coordinator should seek consultation from the appropriate jurisdictional highway and traffic agencies concerning relevant statutory regulations

Desirable

- EMS supervisory personnel should understand the epidemiology of traffic-related injuries
- EMS supervisory personnel should understand the principles of preventing traffic injuries
- EMS personnel should be proactive in the prevention of traffic-related injuries by observing appropriate road/traffic management practices

ACCESS TO CARE

All spectators and participants at a mass gathering event must be able to access emergency medical care in a timely fashion. The burden of responsibility falls on the event emergency medical sector to minimize the time interval for victims to correctly identify the location of medical personnel and/or activate the event EMS system. The purpose of the access to care component of the medical action plan is to define methods that patients may use to access emergency medical care at mass gathering events and to minimize barriers to access for all persons.

Access to Care Plan

Essential

- A basic access to care plan must exist for every mass gathering event
- Such a plan must address how the venue administration and the medical sector will inform the public of the location(s) and easiest access to medical care through use of audio and/or visual aides
- Such a plan must ensure compliance with all Americans with Disability Act (ADA) statutes and with pertinent local, regional and state guidelines
- Such a plan must address the strategic location of EMS resources to minimize the distance and time interval necessary for the patient to reach medical care or vice versa

Desirable

- Such a plan should acknowledge the potential barriers to access which cannot be overcome during the mass gathering event
- Such a plan should examine potential barriers to resources which may indirectly lead someone to become a patient, including but not limited to, water, food, bathrooms and shelter

Access to Care: Public Education

Essential

- All spectators and participants at a mass gathering event must be informed about accessibility to emergency medical care
- The special needs of physically and mentally disabled persons must be included in plans to access emergency medical care
- All emergency medical providers and treatment facilities must be easily identifiable
- EMS personnel must wear elements of a uniform identifying themselves as medical providers or a highly visible cap or command-style vest which is recognizable to the public-at-large
- EMS treatment facilities must be identified by visual aids, such as signs, flags or posters
- Brochures distributed by the venue sponsor should highlight how the public can access emergency medical care

Desirable

- Public address systems should be utilized to announce instructions to spectators about accessing emergency medical care both at the beginning of the event and at regular and reasonable intervals
- Venue administrators should ensure that event participants are aware of emergency medical care presence and location
- Children under the age of 8 years should be provided identification bracelets upon entry to the event

EMERGENCY MEDICAL OPERATIONS

The emergency medical operations component of the medical action plan addresses key operational details central to successful delivery of emergency medical care not otherwise covered in the document. Although emergency medical operations are detail-oriented by nature, many of the items listed here are essential to a well-planned event.

The Event EMS Coordinator is responsible for the creation and the execution of the operations plan. He/she must ensure that the overall emergency medical operation has a defined mission and objectives. The mission, its charter, scope, and duration should be written on official venue stationary (or an equivalent) and be presented to event administration/sponsors well ahead of the event. This includes procurement of necessary resources to accomplish tasks listed in the document. The medical sector must also establish a relationship and lines of communication with major factions at the mass gathering event, including other public safety services.

Finally, the Event EMS Coordinator must be prepared for the possibility of unusual circumstances, such as care of the VIP patient, standard mass casualty incidents and a multitude of disaster scenarios, which now include the real possibility of terrorism and nuclear/biological chemical [WMD] attack. There are no expectations that a complex terrorism response plan will be created for every event solely by the medical sector. However, it remains the responsibility of the Event EMS Coordinator to participate in multi-agency planning for such scenarios and to educate all EMS personnel about the risks and initial response to these occurrences.

Emergency Medical Operations Plan

Essential

- A basic emergency medical operations plan must exist for every mass gathering event
- Such a plan must address elements of responsibility for medical care, including but not limited to, contractual relationships, scope of medical care to be provided, anticipated duration of medical operations and geographic limits of medical coverage (See Negotiations for Event Medical Services)
- Such a plan must address procurement of necessary human and materials resources for emergency medical operations (See Human Resources and Medical Equipment)
- Such a plan must address the relationship of the medical sector to other functional areas, including but not limited to, fire suppression, security, venue administration, and venue logistics (See Communications, Command and Control and Public Health)
- Such a plan must address financial issues, including but not limited to, overall budget, procurement, and human resource compensation
- Such a plan must address how medical care for celebrities, VIPs and/or high-ranking government figures will be handled
- Such a plan must address existing mutual aid plans and the procedure for activation of this system
- Such a plan must address mass casualty incident and disaster planning
- Such a plan must address an initial response to an act of terrorism, including the use of weapons of mass destruction or other hazardous materials

Desirable

- The Event EMS Coordinator should craft a mission statement and main objectives for the delivery of emergency medical care at the mass gathering event, including nontraditional elements, such as public health, if applicable
- EMS personnel should be familiar with this mission statement and should strive to uphold it
- Such a plan should address the relationship of the medical sector to other functional areas, including but not limited to, non-medical transportation, event sponsors, public relations, and non-medical human resources

Operational Details of Medical CareEssential

- The Event EMS Coordinator must have clear authority via a contractual relationship to supervise the delivery of emergency medical care at the mass gathering event
- If more than one agency is involved in the delivery of emergency medical care, a chain of command and responsibility must be established prior to the mass gathering event
- The scope of emergency medical care to be delivered must be clearly defined and agreed upon by event administration and the Event EMS Coordinator prior to the mass gathering event
- The duration of delivery of emergency medical care must be clearly defined and agreed upon by event administration and the Event EMS Coordinator prior to the mass gathering event
- The geographic coverage area for emergency medical care must be clearly defined and agreed upon by event administration and the Event EMS Coordinator prior to the mass gathering event

Desirable

- The scope of emergency medical care to be provided depends not only on what is considered the standard, but also the reality of what resources are available
- EMS personnel should not be responsible for responding to emergency calls outside the defined event coverage area, but should notify the appropriate jurisdictional EMS provider
- EMS personnel should generally be on-site at a mass gathering event one hour prior to the start of the event and one hour after the event concludes

Relationship to Other Venue Disciplines

Essential

- The Event EMS Coordinator must establish a working relationship with venue owners and event administration
- The Event EMS Coordinator must establish a working relationship with venue logistics
- The Event EMS Coordinator must establish a working relationship with security and law enforcement officials
- The Event EMS Coordinator must establish a working relationship with fire suppression and other public safety services
- The Event EMS Coordinator must establish a working relationship with the jurisdictional public health director
- The Event EMS Coordinator must establish a working relationship with local emergency management planners

Desirable

- The Event EMS Coordinator should establish a working relationship with public relations
- The Event EMS Coordinator should establish a working relationship with non-medical transportation and non-medical human resources
- The Event EMS Coordinator should establish a working relationship with event sponsors
- The Event EMS Coordinator should assist and promote the establishment of a working relationship between law enforcement security agencies and the jurisdictional public health director
- The Event EMS Coordinator should attempt to establish a relationship with medical equipment manufacturers, including those that supply prehospital equipment, for the purposes of securing donations or loans of equipment

Financial Issues

Essential

- The Event EMS Coordinator and the event director (administrator) must jointly calculate an overall budget for the delivery of emergency medical care at a mass gathering event
- Such a budget must include costs related to the procurement and deployment of medical supplies and equipment, transportation resources, human resources and on-site treatment facilities, if applicable
- The Event EMS Coordinator must address the issue of human resource compensation, including, but not limited to, legal ramifications, ethical ramifications, source of payment and monetary versus non-monetary compensation

Desirable

- Event sponsors should be responsible for as much of the reasonable costs related to delivery of emergency medical care as possible
- EMS personnel should receive some form of compensation for their work
- The Event EMS Coordinator should seek donations to help offset the costs of delivery of emergency medical care if this care is being delivered by volunteers and/or nonprofit organizations

VIP Care and Dignitary Protection

Essential

- The Event EMS Coordinator must ascertain whether there is a reasonable possibility that any VIP, celebrity, dignitary or high-ranking government official will attend the mass gathering event
- The Event EMS Coordinator must work jointly with event administration, law enforcement and other security and venue personnel to develop contingency plans for VIPs and dignitaries who may become ill or injured at the mass gathering event
- The Event EMS Coordinator must work jointly with event administration, law enforcement and other security and venue personnel to ensure that operational details and VIP/dignitary security concerns do not adversely impact the health of the general public at a mass gathering event

Desirable

- A separate treatment area should be designated for VIPs and dignitaries both to protect their privacy and to avoid crowd hysteria and interference with patient care
- The Event EMS Coordinator should attempt to secure pertinent background medical information on any VIPs and/or dignitaries who may be in attendance at the mass gathering event
- The Event EMS Coordinator should designate a treatment team for VIPs and/or dignitaries composed of the minimum number of personnel properly trained and equipped to handle both routine and life-threatening emergencies

Mutual Aid

Essential

- The Event EMS Coordinator must collaborate with the jurisdictional EMS providers to ensure that a realistic mutual aid plan exists for the mass gathering event

Desirable

- Mutual aid units should be aware of the mass gathering event and the possibility that their services may be requested
- Mutual aid units should receive maps of the venue site indicating access routes and locations of on-site treatment facilities
- Mutual aid units should be informed of communications infrastructure in place and frequencies in use at the mass gathering event
- Mutual aid units should be aware of the command and control structure and reporting relationships enacted at a mass gathering event

Mass Casualty Incident (MCI) and Disaster Planning

Essential

- The Event EMS Coordinator must plan for the possibility of an MCI or disaster event during the mass gathering
- Such planning should specifically address the two most likely types of disasters at mass gatherings, environmental (weather) disasters and technological disasters
- EMS personnel must be aware of SOPs regarding disaster operations, including medical protocols and other operational guidelines
- Medical personnel must be assigned MCI roles prior to the beginning of the event
- MCI roles should be based upon the local MCI plan or an accepted incident management system

Desirable

- An MCI/disaster trailer should be on-site or immediately available for large scale mass gathering events and those in which it is predicted that patient volume will be excessive
- Triage tags should be uniform in design and centrally located at the venue site if not already carried by all field EMS personnel

Hazardous Materials and Weapons of Mass Destruction Response

Essential

- The Event EMS Coordinator must have completed a Hazardous Materials Awareness course within the last three years
- EMS personnel must be briefed about potential hazardous materials that exist at or near the venue site
- The Event EMS Coordinator must maintain close contact with security officials so that he/she may be alerted to any possibility or threat of terrorism as early as possible

Desirable

- The Event EMS Coordinator should have additional hazardous materials experience or training to the Hazardous Materials Operations level
- The Event EMS Coordinator should have completed a course in medical aspects of terrorism within the last three years
- Hazardous Materials mitigation capability should be on-site or immediately available for high profile mass gathering events and those in which threats have been received
- The Event EMS Coordinator should give serious consideration to distribution of gas masks and Mark I kits to all EMS personnel at major mass gathering events, especially those in large cities, those that draw VIPs and government officials, and those that law enforcement experts consider to be at high risk for terrorist attack

COMMUNICATIONS

Efficient information flow is vital to the successful delivery of emergency medical care at a mass gathering event. Information flow relies on a communications system utilizing communications hardware and protocols to link patients with patient care providers through a centralized hub, or command post. (For a discussion of command post issues, see the Command and Control section.) The communications component of a medical action plan defines how information pertinent to medical care and medical issues is managed and disseminated during the event and how the communications system is designed and operated. Since a functioning communications system is necessary for the delivery of emergency medical care, the Event EMS Coordinator must participate in the design and testing of the system to ensure its effectiveness and reliability.

Communications hardware may include a base station and portable radios, scanners, repeaters and transmission equipment. The exact configuration of the system, including type and number of radios needed, will be unique to each event and may largely depend on how the local public safety system is currently functioning. Vendors may need to be contacted to supply additional radios or to lease frequencies for larger events and/or those in which there is inadequate communications coverage.

A variety of communication links must be established during a mass gathering event. Event organizers may need to communicate important and time-sensitive information to medical personnel and vice versa. Such links are necessary between the command post and EMS personnel, transportation vehicles, acute care facilities and the local public safety answering point (PSAP).

Communications Plan

Essential

- A basic medical communications plan must exist for every mass gathering event
- Such a plan must address number, type and sophistication of equipment necessary and available
- Such a plan must include the designated radio frequencies and phone numbers of supervisory medical personnel
- Such a plan must be reviewed and approved by local officials to ensure that it does not interfere with communications protocols of local emergency services
- Such a plan must identify the command post by an acronym (i.e. “Medical Command”) and authorize its function as the lead communications entity for the mass gathering event
- Such a plan must include an established communications process for direct medical oversight (on-line medical control) if necessary
- A system of communications must be designed to ensure that non-medical personnel, such as ushers, can alert medical personnel to the presence of a medical emergency
- Communications protocols must be designed for use by all personnel equipped with radios
- All communications protocols should include rules of etiquette which maximize efficiency and minimize interference of vital transmissions
- Communications protocols must be reviewed with all medical personnel prior to the event

Desirable

- Radio designations should be allocated to EMS command personnel and transportation resources to enable easy identification
- Redundant communications technology should be utilized to avoid system failure

EquipmentEssential

- A dedicated medical communications system must exist for the mass gathering event
- Sufficient support equipment must be available to prevent communications failures

Desirable

- EMS personnel should be involved in the design of a medical communications system and acquisition of necessary communications equipment
- Communications equipment should be tested prior to the mass gathering event to ensure effectiveness
- Speaker microphones should be available for EMS personnel roaming on foot or in crowds
- Headsets should be available for EMS personnel who are operating in loud environments

PersonnelEssential

- The Event EMS Coordinator must designate a communications manager for the event
- The Event EMS Coordinator or a designated communications manager must ensure that the following actions are accomplished prior to the event:
 - Procure, test and distribute all radio equipment
 - Procure, test and maintain radio and/or battery chargers
 - Construct, test and maintain on-site landline and/or cellular phone connections
 - Ensure functional communication links (see below)

Communications Links

Essential

The command post (“Medical Command”) must be able to communicate with the following resources and medical personnel by radio, cellular phone or landline:

- Event administrators (Security, Maintenance, public address announcer)
- All EMS command personnel
- Intravenue EMS personnel (roving)
- Intravenue EMS personnel at fixed medical facilities
- Transportation resources, including ambulances dedicated to the event
- Non-medical personnel assisting with medical reconnaissance (“spotters”)
- Public safety answering point (PSAP) and emergency operations center (EOC) for the jurisdiction in which the event is being held
- Director of the multiple casualty incident (MCI) plan for the jurisdiction
- Director of public health for the jurisdiction
- Acute care facilities and emergency departments to which patients are likely to be transported (includes ED Directors)
- Medical direction resources

Desirable

- Communications capability should exist between EMS providers and EMS transportation resources at the venue
- Communications capability to transportation resources should not be compromised when they are off-site (relative to effectiveness of radio transmission)

COMMAND AND CONTROL

The purpose of the command and control component of a medical action plan is to formulate an organizational structure that guides the provision of emergency medical care at a mass gathering event. This section of the plan must show clear lines of authority and responsibility for each medical position. It must also delineate the integration of medical oversight into the overall administrative structure of the event. It is suggested that the Incident Command System be utilized for this purpose.

At the heart of every mass gathering command and control plan is the command post, which functions as a centralized hub for command and control, communications and dissemination of information. It can be as simple as an individual sitting at a table or as sophisticated as a dedicated custom-built emergency vehicle. Regardless of the physical make-up, the command post must serve as the lead medical command and communications entity and the focal point for information relay.

Every mass gathering event must have a functional Coordinator of EMS Operations. With the exception of the Event EMS Medical Director, who must be appointed for every event, the exact number and type of other EMS administrative and operational positions will largely depend on local preference and needs. It is highly desirable that any individuals involved in planning for this type of event medical coverage have experience and/or formal training in the process.

Command and Control Plan

Essential

- A basic command and control plan must exist for every mass gathering event
- The command and control plan must designate essential EMS administrative personnel for the event
- The command and control plan must designate essential EMS operations personnel for the event
- The command and control plan must include an organizational chart with a list of job assignments/tasks for each position, the number of personnel filling each position and a reporting structure
- The command and control plan must outline a system of medical oversight

Desirable

- Command and control assignments and structure should follow the Incident Command System
- When the mass gathering event involves multiple public safety services or EMS systems, the unified command model should be invoked

Command Post

Essential

- The location of the command post and its contact telephone number(s) and/or radio identifier(s) must be clearly and rapidly identifiable to all EMS personnel
- The command post must be staffed continuously from a predesignated time prior to the event to a predesignated time following the event
- The command post must be staffed by at least one individual at all times
- The administrative and medical functions within the command post must be separate from other operations if a unified command post concept is in place

Desirable

- The command post should be clearly marked and highly visible
- The command post should remain in a fixed location, if possible
- The command post should be a physical entity, rather than an individual, if possible
- The command post should be located in proximity to that of the following services:
 - Event administration
 - Security
 - Venue maintenance
 - Public affairs and public address announcer
 - Other public safety functions

The Command Post should maintain and update important information, such as acute care facility closure and diversion status, during events that are capable of generating large volumes of patients

EMS Administrative Positions

Essential

- An Event EMS Coordinator must be appointed for every mass gathering event
- The Event EMS Coordinator must be a certified/licensed EMS provider in the state in which the event is being held

Desirable

- The Event EMS Coordinator should have previous mass gathering medical care experience
- Other EMS administrative positions may need to be designated based on event characteristics or local EMS practices

EMS Operations Positions

Essential

- A designated EMS supervisor must be appointed for every mass gathering event
- A designated EMS supervisor must be on-site for every mass gathering event

Desirable

- The Event EMS Coordinator or his/her designee should be on-site for every mass gathering event
- Other EMS Operations positions may need to be designated based on the event or local EMS practices

DOCUMENTATION

The purpose of the medical documentation component of the medical action plan is to ensure uniform record keeping. The patient care record is a legal as well as a medical document. Medical record keeping at many mass gathering events is less than satisfactory for a variety of reasons, including overwhelmed medical staff and lack of a clear strategy for medical documentation. Medical record keeping may be disorganized and nonstandard at many mass gathering events. Thus, various medical providers may record chief complaints and diagnoses differently, or not at all. This is a dangerous practice from a legal standpoint. It also precludes proper evaluation and interpretation of statistics that may help to drive a more objective approach to planning for medical needs at future mass gathering events of similar nature.

The cornerstone of a documentation plan is the patient care report. Such a report is essential to record patient complaint and treatments rendered. Exactly who is a patient must be determined prior to the event. The style and complexity of mass gathering medical care documentation is highly variable around the country but must conform both to local/state regulations and to general medicolegal principles. All patient contacts must be documented in some form, preferably one that is consistent throughout the venue. Special circumstances, such as the unaccompanied minor, the patient with minor complaints or needs and the patient who refuses care or leaves the medical sector prior to the completion of treatment, must be addressed from a documentation standpoint as well as a medicolegal one.

Documentation Plan

Essential

- A basic medical documentation plan must exist for every mass gathering event
- Such a plan must address how patient contacts will be recorded
- Such a plan must address the type, complexity and methodology of patient care documentation
- Such a plan must address how patient care documentation will be collected and stored following the conclusion of the mass gathering event
- All local, regional and state regulations regarding medical documentation must be followed

Desirable

- A unique event patient care form should be developed prior to the event
- if a unique event patient care form is not developed, the local EMS patient care record should be utilized for every patient contact
- Accurate records should be kept concerning response times for patient retrieval, transport times to definitive care, supplies utilized, major decision-making and its outcome, and any problems encountered
- A uniform approach to the categorization and documentation of patient complaints should be designed prior to the event
- EMS personnel should be educated prior to the event regarding the preferred method of documentation and standardization of patient records
- Consider delegating the duties of scribe to personnel assigned to on-site treatment facilities

Patient Care Documentation

Essential

- All patient contacts must be documented
- Minimal essential elements for patient documentation include basic demographic information, location of incident, chief complaint, focused history and physical exam, treatment and final disposition
- Documentation must be recorded for all patients who refuse treatment or leave prior to completion of treatment, often referred to as Refusal of Medical Aid (RMA) or Against Medical Advice (AMA)

Desirable

- A “patient contact” should be defined prior to the mass gathering event
- Any person who receives medical care, advice or supplies from a medical professional at a mass gathering event should be considered a patient
- Notation should be made about whether or not parents should be contacted whenever minors present as patients
- Notation should be made for patients who present more than once for emergency medical treatment, especially for similar complaints
- Receiving hospitals should be provided with a copy of the patient care documentation, if possible
- Patients who refuse care or sign out of the medical sector against medical advice should be informed of the risks of doing so and should sign a statement attesting to their actions
- When treatment facilities become overwhelmed by patients, a request for assistance with documentation should be placed to the Command Post

CONTINUOUS QUALITY IMPROVEMENT

The purpose of the continuous quality improvement component of the medical action plan is to ensure that the delivery of mass gathering medical care is constantly improving through analysis of medical sector performance. This can be accomplished in several ways, including patient care report review, structured critique of the incident and review of notes and other data relating to EMS system performance at the mass gathering event. A proactive medical CQI plan is an important element of risk management for the event administration and venue owner.

Continuous Quality Improvement Plan

Essential

- A basic CQI plan must exist for every mass gathering event
- Such a plan must address how information on the delivery of mass gathering medical care at this event will be used to improve medical care and planning for future events of a similar nature
- Such a plan must address how event data will be collected
- Such a plan must delineate who is responsible for “real time” event data collection
- The definition of a patient encounter for paperwork purposes must be made prior to the event

Desirable

- An event debriefing should be held within a reasonable timeframe after the conclusion of the mass gathering event
- Such a debriefing should be structured in a positive fashion so that it emphasizes education and improvement
- A list of recommendations and conclusions regarding mass gathering medical care should be generated and distributed to all parties concerned within a reasonable timeframe after the conclusion of the mass gathering event

Event Data Collection and Analysis

Essential

- The Event EMS Coordinator must ensure that basic facts and figures concerning the
- delivery of medical care and patient volume at the event are recorded and/or obtained
- for appropriate analysis
- A medical record form must be generated for every patient encounter
- A confidential medical record form designed and approved under the guidance of the
- Event EMS Coordinator and Event EMS Medical Director must include the following items:
 - Encounter date
 - Encounter time
 - Patient name
 - Patient sex
 - Patient age
 - Chief complaint
 - Pertinent medical history, including medications
 - Drug allergies
 - Pertinent physical exam findings
 - Diagnostic impression
 - Treatment
 - Disposition

Desirable

- Event data analysis should be undertaken by the Event EMS Coordinator or his/her designee within a reasonable timeframe after the conclusion of the mass gathering event
- Selected patient care reports including incidents of critical illness and non-transport should be reviewed by the Event EMS Coordinator or his/her designee within a reasonable timeframe after the conclusion of the mass gathering event
- EMS supervisory personnel on-site should be encouraged to record ongoing notes concerning medical sector performance
- Venue administration should be encouraged to supply necessary information/statistics

ADDITIONAL READINGS

- Baker WM, et al: Special Event Medical Care: The 1984 Los Angeles Summer Olympic Experience. *Ann Emerg Med* 1986; 15(2): 185-190.
- Binder LS, Willoughby P1, Matkaitis L: Development of a Unique Decentralized Rapid-Response Capability and Contingency Mass-Casualty Field Hospital for the 1996 Democratic National Convention. *Prehospital Emerg Care* 1997; 1(4): 238-245.
- Boyle MF, De Lorenzo RA, Garrison R. Physician Integration into Mass Gathering Medical Care. *Prehosp Dis Med.* 1993; 8:165-168.
- Brunko M: Emergency Physicians and Special Events. *J Emerg Med* 1989; 7: 405-406.
- Chapman KR, Carmichael FI, Goode JE: Medical Services for Outdoor Rock Music Festivals. *CMA I* 1982; 126: 935-938.
- DeAngeles D, et al: Traumatic Asphyxia Following Stadium Crowd Surge: Stadium Factors Affecting Outcome. *WMJ* 1998; Oct: 42-45.
- DeLorenzo RA: Mass Gathering Medicine: A Review. *Prehospital Disaster Med* 1997; 12(1): 68-72.
- De Lorenzo RA, et al: Effect of Crowd Size on Patient Volume at a Large, Multipurpose, Indoor Stadium. *J Emerg Med* 1989; 7: 379-384.
- Federman JH, Giordano LM: How to Cope With a Visit From the Pope. *Prehospital Disaster Med* 1997; 12(2): 86-91.
- Friedman U, et al: Medical Care at the California AIDS Ride 3: Experiences in Event Medicine. *Ann Emerg Med* 1998; 31(2): 219-223.
- Grange JT, Green SM, Downs W: Concert Medicine: Spectrum of Medical Problems Encountered at 405 Major Concerts. *Academic Emerg Med* 1999; 6(2): 202-207.
- Health and Safety Commission/Home Office The Scottish Office: Guide to Health, Safety and Welfare at Pop Concerts and Similar Events. Crown Publishing 1993; London: HMSO: ISBN 0 11 341072 7.
- Hewitt 5, Jarrett L, Winter B: Emergency Medicine at a Large Rock Festival. *J Accid Emerg Med* 1996; 13: 26-27.
- Hnatow DA, Gordon DJ. Medical Planning for Mass Gatherings: A Retrospective Review of the San Antonio Papal Mass. *Prehosp Dis Med.* 1991; 6:443-450.
- Hodgetts Ti, Cooke MW: The Largest Mass Gathering: Medical Coverage for Millennium Celebrations Needs Careful Planning. *BMJ* 1999; 318: 957-958.
- Jaslow D, Drake M, Lewis 1. Characteristics of State Legislation Governing Mass Gathering Medical Care. *Prehosp Emerg Care.* 1999; 3(3): 3 16-320.
- Kassanoff I, et al: Stadium Coronary Care: A Concept in Emergency Health Care Delivery. *JAMA* 1972; 221(4): 397-399.
- Leonard, RB: Medical Support for Mass Gatherings. *Emerg Med Clin North Am* 1996; 14(2).

- Michael IA, Barbera JA: Mass Gathering Medical Care: a Twenty-Five Year Review. *Prehospital Disaster Med* 1997; 12(4): 305-312.
- Nardi R, et al: Emergency Medical Services in Mass Gatherings: The Experience of the Formula 1 Grand Prix 'San Marino' in Imola. *European J Emer Med* 1997; 4(4): 217-223.
- Ounaman LL, Salinas C, Shear CL: Medical Care at the 1982 US Festival. *Ann Emerg Med* 1986; 15(5): 520-527.
- Parrillo S: EMS and Mass Gatherings. *e medicine* website Aug 1998; (emedicine.com/emerg/topic812.html).
- Parrillo S: Medical Care at Mass Gatherings: Considerations for Physician Involvement. *Prehospital Disaster Med* 1995; 10(4): 273-275.
- Pons PT, et al: An Advanced Emergency Medical Care System at National Football League Games. *Ann Emerg Med* 1980; 9(4): 203-206.
- Sanders AB, et al: An Analysis of Medical Care at Mass Gatherings. *Ann Emerg Med* 1986; 15(5):5 15-5 19.
- Schulte D, Meade DM: The Papal Chase. The Pope's Visit: A "Mass" Gathering. *Emerg Med Serv* 1993; 22(11): 46-49,65-75,79.
- Sexton PA, Bums RS, Lerner SE: Sunshine '75: Rock Medicine Inside Diamond Head. *Hawaii Med J* 1975; 34(8): 271-275.
- Spaite DW, Criss EA, Valenzuela TD, et al: A New Model for Providing Prehospital Medical Care in Large Stadiums. *Ann Emerg Med* 1988; 17: 825.
- Thompson JM, et al: Level of Medical Care Required for Mass Gatherings: The XV Winter Olympic Games in Calgary, Canada. *Ann Emerg Med* 1991; 20(4): 385-390.
- Whipkey RR, Paris PM, Stewart RD: Emergency Care for Mass Gatherings: Proper Planning to Improve Outcome. *Postgrad Med* 1984; 76(2): 44,46-48,51,54.