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EMS Systems

Advanced Care Paramedicine

Module: 01

Section: 03a

EMS Systems

- Comprehensive network of personnel, equipment, and resources established to deliver aid and emergency medical care to the community.

Out-Of-Hospital Components

- Members of the community
- Communications system
- EMS providers
- Public utilities
- Poison control centres
- Fire rescue, hazmat

In-Hospital Components

- Emergency nurses
- Emergency and specialty physicians
- Ancillary services
- Rehabilitation services

Basic Life Support

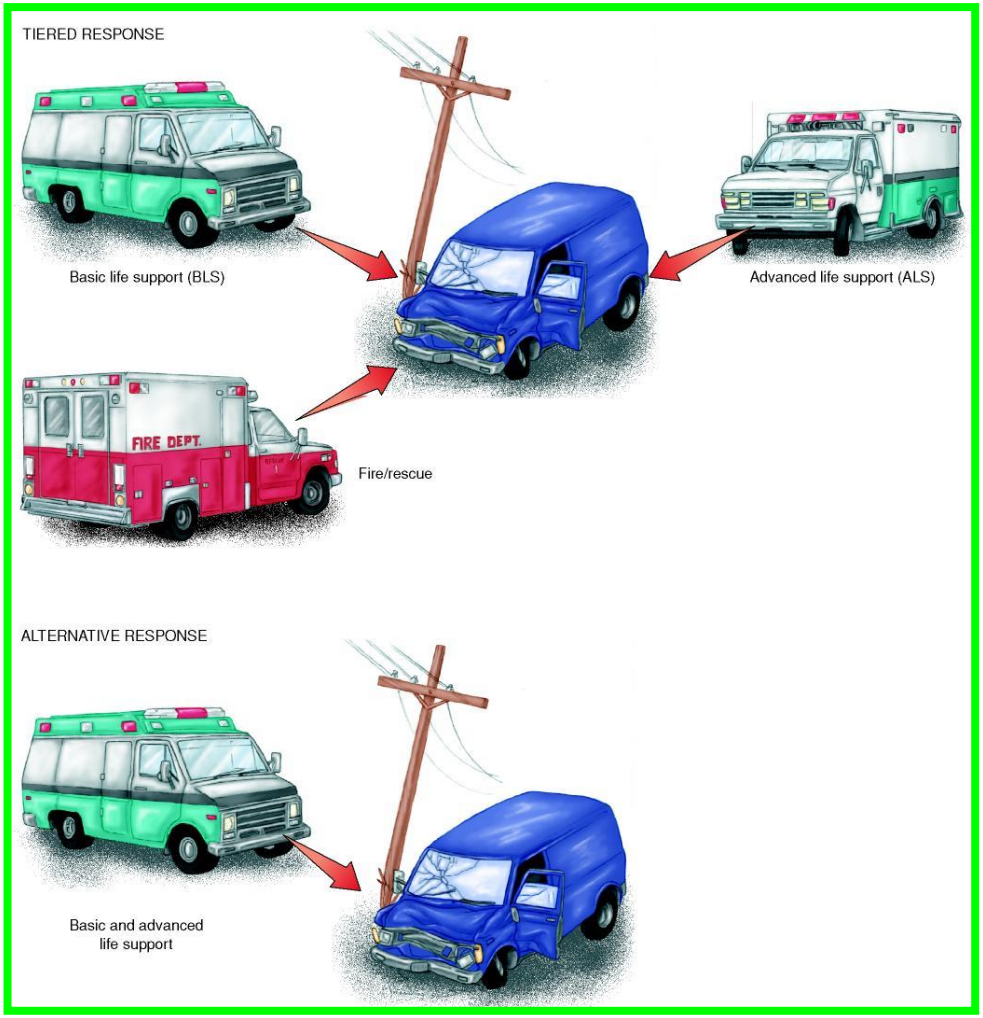
- Basic Life Support
- Refers to the basic life-saving procedures such as artificial ventilation and cardiopulmonary resuscitation.

Advanced Life Support

- Advanced Life Support
- Refers to advanced life-saving procedures such as intravenous therapy, drug therapy, intubation, and defibrillation.

Tiered Response

- Some Systems Are Tiered in which BLS arrives first and then, If required, ALS arrives Later.



Canadian EMS

- Remains a provincial/territorial responsibility
- Each developed their own systems and educational programs
- Most have a mix of basic and advanced life support programs
- There are still large differences in the quality of prehospital care across Canada

American Model

- NHTSA established elements necessary to all EMS systems

- Not formally adopted by Canadian EMS systems but often referred to

NHTSA System Requirements

- Regulation and Policy
- Resources management
- Human resources and training
- Transport
- Facilities
- Communications
- Trauma systems
- Public information and education
- Medical direction
- Evaluation and quality improvement

Today's EMS Systems

- There is no one model for the provision of prehospital care in Canada

- Varies from province to province and even city to city

Types of EMS Services

- Provincial or Territorial Service
- Municipal, Upper Tier and Regional Municipality Service
- Fire-Based Service
- Hospital-Based Service
- Private Operator
- Volunteer Service

System Status Planning

- Major goal to locate and implement plans for quick and reliable response coverage
- Continuous coverage of response areas
- Reevaluated on a consistent basis

EMS Systems

- Made up of a series of systems within a system

- Integration and cooperation of all participants help ensure the best quality of emergency care

EMS Systems

- Medical direction
- Public information and education
- Communications
- Education and certification
- Patient transport
- Receiving facilities
- Mutual aid and mass casualty preparation
- Quality improvement and quality assurance
- Research
- System financing
- Certification and licensing of personnel

Medical Direction

- EMS systems must retain a medical director
- A physician who is legally responsible for all clinical and patient care aspects of the system
- Medical care provided by paramedics is considered an extension of the medical director’s license

Role of the Medical Director

- Educate and train personnel
- Participate in personnel and equipment selection
- Develop clinical protocols in cooperation with expert EMS personnel
- Participate in quality improvement and problem resolution
- Provide direct input into patient care
- Interface between the EMS system and other health care agencies
- Advocate within the community
- Serve as the medical conscience of the EMS system including advocating for patient care

Online Medical Direction

- When a qualified physician gives direct orders to a prehospital care provider

Offline Medical Direction

- Refers to medical policies, procedures, and practices that the medical director has set up in advance of the call
- Includes both prospective and retrospective elements

Protocols are the policies and procedures for all elements of an EMS system.

The Four "T's"

- Protocols are designed around the four "T's" of emergency care.
  - Triage
  - Treatment
  - Transport
  - Transfer

Public Education

- An essential and often overlooked component of EMS is the public.
- EMS systems should develop plans to educate the public on recognizing an emergency.
  - accessing the system.
  - initiating BLS procedures.

Communications

- A coordinated, flexible communications plan should include:
- Citizen Access
- Single Control Centre
- Operation Communication Capabilities
- Medical Communication Capabilities
- Communications Hardware
- Communications Software

Single Control Centre

FIGURE 1-3 The ideal communications centre can communicate with and control the movement of all emergency units within an EMS system.

Emergency Medical Dispatcher (EMD)

- The activities of an EMD are crucial to the efficient operation of EMS.
- EMDs not only send ambulances to scenes, they also make sure that system resources are in constant readiness.
- EMDs must be medically and technically trained.

Education and Certification

- Two kinds of EMS education are:
  - Initial education
    - The original training course for prehospital providers.
  - Continuing education
    - Programs include refresher courses for recertification and periodic in-service training sessions.

Once the initial education is completed, the paramedic will become either certified or licensed.

Definitions

- Certification
  - The process by which an agency or association grants recognition to an individual who has met its qualifications.
- Licensure
  - A process of occupational regulation.
- Reciprocity
  - The process by which an agency grants certification or licensure to an individual of comparable certification, licensure or registration from another agency

Registration

- A requirement in many provinces to practice
- Requirements
  - Successful completion of a course of education for the level of registration
  - Completion of a regulatory exam

Levels of Pre-hospital Care

- Described in the NOCP as:
  - Emergency Medical Responder (EMR)
  - Primary Care Paramedic (PCP)
  - Advanced Care Paramedic (ACP)
  - Critical Care Paramedic (CCP)

Emergency Medical Responder (EMR)

- Generally a first responder or entry level position
- Primary assessments, BLS interventions
- Occasionally provide transport
- Do not perform delegated acts

Primary Care Paramedic (PCP)

- Largest group of paramedic practitioners in Canada
- Perform patient assessment, treatment and provide select delegated medical acts
- Expectations
  - To build a sound knowledge of anatomy, physiology and pathophysiology
  - Demonstrate excellent problem solving and decision-making skills

Advanced Care Paramedic (ACP)

- Enhanced care utilizing ALS procedures and protocols
- Competencies include:
  - Build on PCP foundation to provide more advanced assessment and treatment
  - Advanced techniques, invasive procedures, pharmacologic interventions and delegated acts

Critical Care Paramedic (CCP)

- Highest level described by the NOCP
- Competencies include:
  - Patient assessment and interpretation of lab and radiological data
  - Advanced decision making and differential discrimination skills
  - Manage patients autonomously and with consultation
  - Wide range of controlled and delegated acts including invasive hemodynamic monitoring

Paramedic Association of Canada

- Formed in 1988
- Canada's only national EMS organization representing prehospital practitioners
- Currently represents over 14 000 members

Regulation of Practice

- Regulation and delivery of EMS services are governed by provincial and territorial bodies
- Exception is the Canadian Armed Forces which is federal
- NOCP provides governing bodies a way to compare programs from different jurisdictions

Accreditation

- Voluntary accreditation program established by the Canadian Medical Association (CMA)
- Uses the NOCP to establish levels of accreditation
  - NOCP also identifies the performance environment in which competencies should be evaluated at each level (clinical, field, etc.)

Belonging to a Professional Organization is a good way to keep informed about the latest technology.

Canadian EMS Organizations

- Ambulance Paramedics of British Columbia
- Alberta College of Paramedics
- Saskatchewan Paramedic Association
- Paramedic Association of Manitoba Inc.
- Paramedic Professional Association of Quebec/Association Professionelle des Paramedics du Quebec
- Nova Scotia College of Paramedics
- Paramedic Association of New Brunswick
- Paramedic Association of Prince Edward Island
- Paramedic Association of the Yukon

American EMS Organizations

- National Association of EMTs (NAEMT)
- National Association of Search and Rescue (NASAR)
- National Association of State EMS Directors (NASEMSD)
- National Association of EMS Physicians (NAEMSP)
- National Flight Paramedics Association (NFPA)
- National Council of State EMS Training Coordinators (NCSEMSTC)

A variety of journals are available to keep the paramedic aware of the latest changes in this ever-changing industry.

Professional Journals

- Annals of Emergency Medicine
- EAU FAU Magazine
- Emergency Medical Services
- Canadian Emergency News
- Emergency
- Journal of Emergency Medical Services
- Journal of Emergency Medicine
- Prehospital Emergency Care

Patient Transportation

- Patients should be taken to the nearest facility whenever possible.
- Medical direction and patient condition should designate the facility.
- Patients may be transported by ground or air.

Types of Ambulances

- Type I
  - Conventional cab and chassis on which a module body is mounted
  - No passageway between driver and patient compartments
- Type II
  - Standard van, body and cab form an integral unit
  - Most have a raised roof
- Type III
  - Specialty van with forward cab, integral body and passageway between driver and patient compartment

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A Type-I Ambulance

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A Type II Ambulance

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A Type III Ambulance

The helicopter has become an integral part of prehospital care.

Military helicopters frequently assist civilian EMS systems.

Hospitals

- Not all receiving facilities are equal in emergency and support service capabilities. Local systems and regions categorize hospitals based on capabilities.

Trauma Centre Designation

- Tertiary Trauma Centre
  - Regional referral centre for critically injured patients
  - 24 hour trauma response team
- District Trauma Centre
  - May function as a trauma centre in smaller communities or support a tertiary centre
  - 24 hour response to provide prompt resuscitation and care for trauma patients
- Primary Trauma Centre
  - Usually a smaller rural medical centre or nursing station
  - Provides initial triage but refers all but most minor cases

Mutual Aid and Mass-Casualty Preparation

- A formalized mutual aid agreement ensures that help is available when needed.
- Agreements should be between neighbouring departments, municipalities, systems, or provinces/territories
- Each system should also put a disaster plan in place for catastrophes that can overwhelm available resources.

Key Point

- An EMS system should have a disaster plan in place that is practiced frequently.

Quality Improvement

- Leadership
- Information and analysis
- Strategic quality planning
- Human resources development and management
- EMS process management
- EMS system results
- Satisfaction of patients and stakeholders

QA and CQI

- Quality Assurance (QA)
  - Designed to maintain continuous monitoring and measurement of the quality of clinical care.
- Continuous Quality Improvement (CQI)
  - Designed to refine and improve an EMS system, emphasizing customer satisfaction.

EMS Systems

- An EMS system must be designed to meet the needs of the patient.
- Therefore, the only acceptable quality of an EMS system is EXCELLENCE!

Take-It-For-Granted Quality

- People must be able to take for granted that:
  - EMS will respond quickly
  - Act at the highest level of professionalism
  - Provide safe and appropriate care

Take-It-For-Granted Quality

- New medications, processes or procedures introduced based on the rules of evidence
  - There must be theoretical basis for change.
  - There must be ample research.
  - It must be clinically important.
  - It must be practical, affordable, and teachable.

Take-It-For-Granted Quality

- Also accomplished by the ongoing training of personnel
- Peer review
  - The process of EMS personnel reviewing each other's actions and interactions with patients.

Take-It-For-Granted Quality

- Ethics
  - The standards that govern the conducts of a group or profession.
- All levels of practitioner have an ethical responsibility to their patients and the public

Service Quality

Customer satisfaction can be created or destroyed with a simple word or deed.

Research

- Research programs are essential for moral, educational, medical, financial, and practical reasons.
- Future EMS research must address the following issues:
  - Which interventions actually reduce morbidity and mortality?
  - Are the benefits of a procedure worth the risk?
  - What is the cost-benefit ratio?

Research

- Components of a research program
  - Identify a problem.
  - Identify the body of knowledge on the subject.
  - Select the best design for the study.
  - Begin the study and collect raw data.
  - Analyze the data.
  - Assess and evaluate the results.
  - Write a concise, comprehensive description of the study for publication in a medical journal.

System Funding

- Wide variety of system designs
- Funding may come from many sources but is typically a provincially funded insurance system