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Module 7: Emergency Response to Traffic Crashes

Purpose:

To focus on principles and philosophy of emergency response to traffic crashes in order to improve response and reduce crash related deaths.

Learning Outcomes:

Upon completion of the module the participant will be able to:

- Describe the philosophy of emergency response to collisions
- Describe the three principles of emergency response
- List the three critical medical timelines in emergency response
- Describe at least three basic principles of emergency scene management
- Describe three minimum first aid learning outcomes for police
- Describe the emergency response role of Police, Fire, Ambulance and citizen in the developed Nations

Contents:

- A. Emergency response to traffic collisions
- B. Principles of emergency response
- C. First Aid
- D. Principles of medical emergency scene management
- E. Minimum First Aid learning standards for police.
- F. Role of emergency services in developed Nations
- G. Typical rescue equipment carried by Fire Department

Format:

Overhead Presentation

- General information on emergency response and first aid

1. Emergency Response to Traffic Collisions

All of the following is taken from the common practices of the developed Nations. The foundational philosophies of emergency response are as follows:

- The philosophy that life has value, that it is worth making extraordinary efforts to prevent loss of life;
- The philosophy that reducing pain and injury is a worthwhile human endeavour; and
- The philosophy that prompt assistance to injured persons will improve chances of full recovery from injury and thus reduce the long-term social and economic impact from loss of the injured person's productivity.

(An incidental benefit to the MPS traffic police image is that those persons who help the injured are universally seen as good people, persons to be respected like doctors and nurses).

2. Principles of Emergency Response

2.1 First Principle of Emergency Response

The first principle of emergency response is that the first person called to the scene be trained, qualified and equipped to provide basic First aid, that is medical assistance, to injured persons until medical specialists arrive to stabilize, prepare and transport the injured.

This first person may be police, fire, ambulance or other official person. Whatever their speciality, they should have the basic training to preserve life until the arrival of more qualified persons, or, until delivery of the injured person to hospital care. This person should be trained to assess first any potential ongoing risk to himself, then the risk to others, and any continuing risk to the casualty.

In traffic collisions the ongoing risk is most often other moving traffic or vehicles. Lesser hazards at collision scenes include risk from fire, electrocution, hazardous materials such as chemicals and petroleum.

A motor vehicle itself also poses risks the rescuer must be aware of. These include:

- Risk from sharp objects, torn metal, sharp edges, broken glass
- Risk from vehicle fluids – battery acid, gasoline
- Risk from compressed bumpers (modern European/North American vehicles have bumpers which can compress under pressure and may suddenly release)

- Risk from air bags (see explanatory note) modern European/North American vehicle are equipped with exploding airbags. These deploy at 300kmh and have been known to kill children and small adults and injure emergency personnel

2.2 The Second Principle of Emergency Response

The second principle emphasizes self-preservation, the preservation of others. An injured officer is a liability and can help no one. Officers must know how to take steps to avoid being injured and take steps to avoid someone else becoming injured.

2.3 The Third Principle of Emergency Response

The third principle emphasizes urgency from a medical perspective. In this context, there are three critical timelines to be aware of:

i) **BREATHING - OXYGEN SUPPLY**

A person deprived of oxygen, who cannot breathe, will suffer permanent brain damage in 3 to 4 minutes and will die in 4 to 5 minutes.

ii) **BLEEDING - ARTERIAL BLEEDING**

A person suffering arterial bleeding can exhaust their blood supply in as little as 6 to 8 minutes and may die in less than 12 minutes.

iii) **THE GOLDEN HOUR**

Having survived the first two challenges listed above there is generally an hour, often called the “golden hour” during which specialized professional medical attention will often preserve the life of a critically injured person. Supplying this medical attention within one hour:

- Reduces the impact of shock to the body
- Improves the casualties life expectancy
- Improves his or her chances of making a complete recovery. This is particularly true for those persons suffering severe brain injury or internal trauma to the organs in the trunk of the body.

These three important timelines are the issues driving the need for immediate, urgent and appropriate medical attention to injured persons.

3. First Aid

3.1 First Aid Defined

First aid is the emergency help given to an injured or suddenly ill person using readily available materials. This requires some specialized training.

The objectives of first aid are to: (Overhead)

- Preserve life;
- Prevent the injury or illness from becoming worse; and
- Promote recovery.

A person, who is a first aider, is a qualified person who takes charge of an emergency scene and applies first aid to casualties.

Medical aid (as distinct from First aid) is the treatment given by a medical doctor at an emergency scene, or whilst transporting an injured or ill person, or at a medical facility.

3.2 Casualty Defined

A casualty is a person who is injured or who suddenly becomes ill.

3.3 Universal Precautions in First Aid

Use of the following precautions will minimise risk of infection or injury to the First aider:

- Wash your hands with soap and water immediately after ANY contact with a casualty.
- Wear vinyl or latex gloves whenever you may be in contact with a casualty's blood, body fluid, open wounds or sores. (Many police in the developed nations carry latex gloves in a small pouch, and or wear thin leather gloves).
- Handle sharp objects with care.
- Dispose of used gloves carefully and do not re-use.
- Minimise mouth-to-mouth contact during artificial respiration by using a mask or face shield designed to prevent transmission of disease.

3.4 Culture and History of First Aid; Order of St. John

Almost one thousand years of history make the Order of St. John (now know as St. John's Ambulance society) the oldest charitable organization in the world. With its first headquarters and hospital in Jerusalem, the Order has had many homes over the centuries including *Acre, Cyprus, Rhodes, Malta, and Rome in the Mediterranean area.*

Travelers came from all over Europe to visit Holy places in Jerusalem, sometimes they arrived sick from the long trip, or injured from being attacked during their journey.

Around 600 AD Pope Gregory arranged for a safe place to house pilgrims. A modest hostel was built where pilgrims could stop for shelter and receive help for injuries inflicted by pirates, robbers, or persecutors of Christians.

The facility was burned down around 1000AD and then rebuilt as a hospital and library by Italian merchants. It was staffed by monks. In 1095 the order decided to raise an army to fight pirates, robbers and other attackers and to keep travelers safe. This tradition of fighting criminals and taking care of the sick was continued. The organisation took the name of St. John the Baptist from property acquired in Jerusalem. It was officially recognised by the Pope as the order of hospitallers in 1113AD. From 1119 they were a military order and fought pirates in the Mediterranean until defeated by Napoleon in 1798.

There is a similarity between their role and that of modern police, with the added dimension that they were known for their hospitals.

It is in these traditions that the modern order of St. John was revived in 1831 and in 1877 it took on its' modern role of providing First Aid and Ambulance training for home and work. The modern order no longer has a military or police function but it's representatives can be found today throughout the world serving in places of crisis or emergency, or, supplying basic medical services at public events attended by thousands of people, such as sporting events, air shows, motor racing etc.

In addition to the Order of St. John there are a number of other organizations that provide medical aid in a crisis. The Order of the Red Crescent in Islamic Nations for example. There are also private organizations, charities and foundations that provide similar service around the world.

3.5 Police Culture of First Aid in Developed Nations

In the English speaking and European police world it has long been recognized that police are frequently first on scene where someone is injured or may be dying as a result of injury. This may be true of other cultures as well. As a result emphasis is placed on all police recruits obtaining basic training to enable them to preserve life until specialized medical attention is available. After basic training the most common practice is to ensure that Police Officers get refresher training about every 2 to 3 years. This occurs despite the fact that in most motorized culture ambulances or other medical transport are quickly available. This culture of First Aid universally recognises that the first few minutes after a traumatic injury, are crucial to saving that persons life.

In most urban and suburban areas of the developed world an ambulance will be on the scene typically within 10 minutes and a Hospital is usually less than 20 to 30 minutes away.

4. Principles of Medical Emergency Scene Management

Emergency scene management is the sequence of actions followed at the scene of a medical emergency to ensure that safe and appropriate first aid is given.

The order of steps in emergency scene management may change depending on the circumstances. There are six steps:

1. Scene Survey
2. Communicate Promptly
3. Primary Survey
4. Secondary Survey
5. Triage
6. Ongoing Casualty Care Until Handover

4.1 Scene Survey (Overhead)

- **Danger**

The first priority is to make sure the officer does not get injured and that no additional persons are injured. This is crucial when there is high-speed traffic such as on an expressway.

- The officer will determine if there is other traffic? The most common means of making traffic safe is to position a well lit, marked police vehicle in a way that prevents moving traffic from running into the casualty, a damaged vehicle, or the officer.
- In the motorized nations the officer will wear a highly reflective orange or yellow traffic vest, visible under all lighting conditions.

- **Gloves**

The officer will put on fine latex rubber gloves to protect himself from blood borne diseases.

- **Don't Move**

It is generally unwise to move injured persons until they have been properly assessed for the nature and scope of their injuries.

- **How many were injured**

Even trained responders can stall and spend too much time helping one injured person. It is crucial for accurate information to be relayed for professional medical assistance that the correct number of injured is identified.

- **Responsiveness**

The trained first aid person will establish which injured persons are able to respond and communicate and which are not. Unconscious persons that are unresponsive are usually the most serious injured. The trained First aider will also assess the level of responsiveness, as injured persons can fade in or out of consciousness.

- **Consent**

This is a legal issue in developed Nations. No one can apply First aid to a conscious injured person without his or her consent. This is also a matter of courtesy. The trained First Aid person will say, "I am trained in medical aid, do you want me to assist you?" For example it may cause grievous offence in many cultures for a male police officer to feel the limbs of an injured female looking for broken bones. Even though this is the best thing to do for the injured person. Part of the process is an inspection, which involved the First Aid person in running their hands over the entire victim's body looking for unusual bumps, protrusions or imbedded objects.

- **Medical Help**

The officer will ensure that professional medical help is obtained from ambulance, hospital or medical clinic.

- The officer will quickly determine the number of casualties, get a quick visual overview of how many vehicles, how many injured, immediate hazards such as fire, fuel spill.
- The officer will take charge of the situation. If he is in plainclothes or off duty he will advise people, including the victim, that he is qualified in First Aid and is in charge.
- The officer may ask for help from bystanders
- The officer will assess hazards at the scene with a view to making the area safe for himself and others. This includes assessing traffic conditions, hazardous materials, such as fuel spills, damaged power lines. (Generally the greatest hazard in developed countries is the traffic).

4.2 Now Communicate Promptly

The officer will send for or obtain professional assistance (Ambulance, Fire, Doctor) by the fastest reliable means. This is usually radio or telephone.

- In the absence of either radio or telephone the officer will use a messenger, (a responsible educated citizen selected for that purpose). If he must use a messenger he will where possible use two separately for reliability. The messenger/runner must be able to state where the emergency is located, the type of emergency i.e.

traffic crash) and be able to communicate the location and number of injured by nearest telephone. The officer will pick a messenger who is educated, fit, mobile and responsible.

Typical city or urban western police radio communication:

Officer: "Dispatch Delta 4"

Radio Dispatch: "Dispatch"

Officer: "On view two car injury collision 82nd Ave & Scott Rd. looks like two possibly three injuries. Checking".

Radio Dispatch: "10-4" (acknowledged – dispatch calls Fire Dept.,)

Officer: "Confirmed three injuries one life threatening"

Dispatch: "10-4" (acknowledged – dispatch calls for two ambulances)

....Pause.....

Radio Dispatch: "Delta 4, Fire & Ambulance enroute"

These broadcasts are brief, cryptic, cover all the basic information required to ensure that appropriate emergency assistance is on the way. With this information the dispatcher automatically knows that the Fire Dept. has to be called, and the ambulance can only transport two injured so two ambulances are required.

In some countries police officers are required to take special training to qualify as a radio operator and how to communicate effectively. In many countries civilian radio and telephone dispatchers are required to take special training, anywhere from 3 weeks to 3 months.

In a rural area the following may hamper communications:

- Cell phone does not work
- Radio does not work
- This is where use of a reliable messenger e.g. the driver of next vehicle to arrive, may be of assistance.

4.3 Primary Survey

(Overhead)

Recalling the three critical timelines expressed earlier the first priority is:

- **Airway** – Is the victims throat clear and unobstructed
- **Breathing** – Can the victim breath properly and clearly
- **Circulation**
 - Is there severe bleeding?

- Is there a radial pulse present?
- What are the victims skin temperature and condition?
- Rapid body survey.

This is a technique taught to first aid personnel to rapidly survey the victim's body, using the hands and eyes, to check for broken bones, bleeding and all types of external injuries.

4.4 Secondary Survey

(Overhead)

Some of the following applies to general First Aid but may not be directly relevant to traffic crash victims.

- **History** – What are the symptoms i.e. Chest pain, short of breath
- **Allergies** – Is this person allergic to something i.e. Bee stings, certain foods or plants
- **Medications** – Is the victim on any type of medication?
- **Past Medical History** – i.e. has the victim been suffering previously from a known disease, sickness or injury i.e. diabetes.
- **Last Meal** – When did they last eat? The recent meal could have caused food poisoning, or, could complicate an injury by causing vomiting or unexpected blockage of an airway.
- **Events leading to Incident** – i.e. Collision with another vehicle. Driver not wearing belt collides with steering wheel – chest injury suspected.

Determine the full scope of injury to each victim.

If head/spinal injuries are suspected do not move the casualty.

4.5 Triage

This is a process of casualty assessment for multiple victims that requires special training. The procedure involves the officer in identifying who is the most severely injured and in need of immediate attention. This is a fairly sophisticated process which requires special training and a cool head. Someone screaming loudly can obviously breathe and probably has at least four minutes to live.

A person quietly suffocating, or, someone with blood spurting from a damaged artery requires immediate attention.

Upon arrival of advanced medical assistance the officer should know enough through his survey to direct the medical resources to those persons most likely to die.

The transportation priorities in multiple casualty situations are as follows:

a) PRIORITY 1

1. Airway obstruction
2. Penetrating chest injury
3. Major bleeding with shock

b) PRIORITY 2

1. Flail chest (ribs caved in - typical of impact with steering wheel by person not wearing safety belt)
2. Penetrating injury to head, neck, abdomen, or groin
3. Two or more long bone fractures
4. Spinal cord injury
5. Burns to more than 15% of body surface area
6. Severe head injury
7. Amputation of extremity

c) PRIORITY 3

1. Moderate burns
2. Spinal injury without evidence of spinal cord injury
3. Open fractures
4. Eye injuries
5. Mild head injury

d) PRIORITY

1. Soft tissue injury
2. Sprains
3. Closed fractures
4. Other minor injuries

4.6 Ongoing Care Until Transport

- **Reassure the casualty** – It is important for recovery that they not lose hope
- **Loosen tight clothing** – This assists breathing and improves blood flow
- **Preserve Body Heat** – This reduces shock and stress on the heart and body
- **Protect Personal belongings** – this reduces stress to the victim
- **Re-Check ABC's** - **Airway**, **Breathing**, and **Circulation**. The ABC's are an elementary approach following the first three letters of the European alphabet.

- **Report to Ambulance** – A trained person will give the ambulance or Doctor an accurate report of their
 - Observations of the victim
 - Medical aid rendered
 - History of the victim
 - History of the injury

This requires a comprehensive training programme. A minimal approach is 2 days training per year, with bi-annual certification. The minimal approach to training is recommended only for those areas where ambulance or other medical services are readily available.

A proper training programme requires one week.

4.7 A Word About Blood Borne Diseases

The role of the emergency responder has taken on a new danger in recent years with the growing threat of blood borne pathogens. Blood borne pathogens are microorganisms in human blood that cause disease in humans. Both HIV, the human immunodeficiency virus that causes AIDS and the hepatitis B virus, are blood borne pathogens. Exposure to the blood or body fluids of a person carrying blood borne pathogens can be fatal. The varieties of hepatitis are extremely virulent blood borne diseases and much easier to catch than HIV.

Unfortunately, in an emergency situation, there is no way that an emergency responder can identify whether a victim is a carrier of disease. For this reason, all victims and all blood must be treated as if infected.

There is no end in sight to the spiralling problem of blood borne diseases, but with proper training and scrupulous attention to universal precautions, the emergency responder will be able to self protect against the growing threat of these diseases.

A training programme is required that provides information to help police, emergency room, emergency room personnel, Emergency medical technicians, fire fighters and paramedics protect themselves against exposure to blood borne pathogens. In accordance with occupational health and safety guidelines. This training should explain in detail universal precautions recommended by the Occupational Health and Safety Association, stressing, stressing that hand scrubbing and good personal hygiene are the best defence against the spread of the disease.

The training program should also explain the benefits of protective clothing and equipment, demonstrating how to safely put on and remove gloves, goggles, and masks in emergency situations. It should advocate the use of disposable plastic masks for medical personnel rather than traditional surgeon's masks. It should also teach how to handle

contaminated clothing and equipment, and provide instructions on how to safely clean and decontaminate surfaces that may have become infected.

Needle stick wounds are a workplace hazard for emergency responders including police in the developed nations. These can have serious consequences; the training programme should explain how to avoid these injuries and tells what to do if such an injury does occur. It should also train proper procedures for mouth-to-mouth resuscitation, although no cases exist of exposure through this method, the training program suggests ways to avoid contamination during this procedure.

5. Minimum First Aid Learning Outcomes for Police

Once again we take the best practices of the developed world.

5.1 Urban and Suburban Areas

In urban areas, those areas with quick access to medical services, police officers at collision scenes will be trained and should know how to:

- i) Identify breathing difficulty in casualties, remove blockages, restore breathing and oxygen supply.
- ii) Identify arterial bleeding, and apply pressure to reduce or prevent it.
- iii) Identify heart stoppage; apply cardio pulmonary resuscitation and artificial respiration to unconscious casualties.
- iv) Identify casualties whose injuries place them in the rapid transport category and prioritize their transport to medical facility.
- v) Not to move persons with suspected head, neck or spinal injuries until arrival of qualified medical personnel.

5.2 Rural and Remote Areas

In rural areas, or areas with slow access to medical services, police officers should know all of the above, plus the following:

- i) Apply dressings, and bandages to reduce bleeding.
- ii) Apply splints and bandages to persons with broken bones
- iii) Stabilize injured persons with suspected head, neck or spinal injury.
- iv) Facilitate breathing where possible by moving unconscious persons into the “three quarter prone” position.

NB: Sometimes this conflicts with the “DO NOT MOVE” rule, but a person who cannot breathe will die in four minutes.

It should be stressed that in terms of best practices these are basic minimum standards.

5.3 First Aid Training Requirements

EMERGENCY FIRST AID – SAFETY ORIENTED (Overhead)

General and specific training requirements for First Aid are as follows:

- Emergency Scene Management
- Shock, Unconsciousness & fainting]
- Artificial Respiration
- Choking
- Severe bleeding
- Cardio-Pulmonary Resuscitation (C P R)
- Wound Care & Minor Wound treatment
- Eye Injuries
- Burns

These training courses for police vary from a minimum of two days (a refresher course), one week (basic training), three weeks (Instructor). The instructor however requires three years as a practitioner before qualifying as an instructor.

5.4 Communications

Having established the basic requirement for urgency, effective and speedy communications are a foundational tool to ensure prompt response to emergencies.

The positive trend in developed countries is to centralize the citizen report functions on a city or countywide basis. This trend is apparently also occurring in China on a City-to-City basis and is to be encouraged. Citizens should have only one telephone number to remember in any Emergency. North American practice is to dial 911; United Kingdom Practice is to dial 999. This number enlists immediate access to a 7 day, 24-hour telephone switchboard where a trained operator may ask “Fire, Police or Ambulance” and ask for the City location. The call may then be transferred to the appropriate emergency response centre.

The most sophisticated modern centres route emergency calls to amalgamated centres that dispatch all three services by radio. These sophisticated centres have the following common features:

- Employ the most sophisticated electronic equipment
- Are commonly supervised by police
- Have radio contact with Police, Fire, Ambulance, Coast Guard, Naval or maritime rescue, Independent rescue units
- May have radio contact with military units
- Use tracking equipment for untraced cellular calls
- Use tracking automatic tracking equipment for landline calls
- Have a sophisticated computerized database to track items such as dangerous goods, poisons, contaminants, explosives and access to solutions to these problems

In addition some centres have cameras that can view traffic conditions, weather conditions, crime conditions, and monitor special locations such as major bridges, public buildings and embassies.

5.5 Police Supervision

There are several good reasons for police supervision of emergency response command and control centres:

- Police are trained in communications
- Police have wider coverage through regular police patrols
- Police have many more calls for police service than ambulance and fire have for their services
- Police are trained to remain calm and think clearly in any emergency

6. Emergency Services Roles (In Developed Nations)

Practices vary around the world, but the following topics are a summary of best practices in emergency response to traffic collisions around the developed nations:

6.1 Role of Police

Unlike Fire & Ambulance Services, Police perform a patrol function and are scattered throughout the City or District. They are often the first to arrive at any emergency. Like police everywhere they are tasked as follows in order of priority:

- i) Preserve Life;**
- ii) Preserve Safety;**
- iii) Keep the Peace (prevent crime or re-occurrence);**

- iv) **Arrest the lawless;**
- v) **Investigate incidents – gather evidence.**

These priorities of course apply to the scene of a traffic collision. The officer's first priority is to preserve Lifeuntil the arrival of persons specially trained and equipped to take over that function. When the experts arrive the officer then assumes the next priority on the above list.

6.2 Role of Fire Department (In traffic collisions)

6.2.1 Introduction

In the developed Nations there are many more Fire Stations than Police Stations. This is because the Fire Dept. must have equipment strategically located near to residential, business and commercial areas in order to suppress Fires as quickly as possible. In a wood frame building typical of Western residential techniques a fire doubles in size every 60 seconds. In major cities there are 5 to 7 Fire Stations for every Police Station. In a suburban area Fire Stations are located to be at most four minutes away from a Fire or emergency call. In a City area the goal is to locate them at most two minutes away from an emergency call.

The Fire Dept. is therefore strategically located closer to traffic collision sites than the police station. In addition Firefighters have always had a role in resuscitating persons rendered unconscious by smoke. Further there are many more Fire Stations than ambulances or hospitals.

There are other dynamics at work. Firefighters work very hard when fighting fires, but often have free time when they are required to stay at the Fire Station waiting for a call. This creates ample opportunity for training. As a result of these influences Firefighters in virtually all developed Nations have developed highly sophisticated responses to all types of medical emergency including traffic collisions.

Further to this the Fire Dept. carries equipment to fight fires, which has uses in terms of rescuing persons trapped in automobiles.

Here is a list of major influences on the Fire Dept. role at traffic collisions:

- Strategically located Fire Stations
- Ample time for sophisticated training
- Mobility is by trucks which can carry extra equipment
- Multi role function enhanced by a team of five officers
- An existing need for resuscitation equipment
- Fire fighting equipment has some commonality with vehicle rescue requirements.

In contrast none of the influences listed above works well for the police.

As a result, Fire Departments have major roles in assisting at the scenes of traffic collisions. It is standard practice in many jurisdictions to call the Fire Dept., to all collision involving anything more than minor damage or minor injury.

6.2.2 Fire Functions at Collision Scene

Fire fighters immediately take over First Aid functions from Police upon arrival. (In the absence of ambulance personnel) They are better trained and equipped for the task than police.

Fire fighters also take responsibility from police for rescuing casualties trapped in a vehicle. They are better equipped for this.

In the absence of an ambulance, Fire Fighters take responsibility for preparing casualties for transport to hospital. This includes stopping bleeding and immobilizing broken limbs.

Fire fighters have responsibility for dealing with all hazardous conditions (fuel spill, fire, hazardous materials, dangerous goods) with the exception of traffic control.

Fire fighters also share responsibility for cleaning up any hazardous debris (fuel, oil, gas leaks, blood, body parts). They are so good at this the police sometimes call them the evidence eradication team (an attempt at humour).

Upon arrival of firefighters police can revert to basic police functions:

- Traffic control
- Gathering evidence
- Interviewing witnesses
- Taking enforcement action against the guilty party

In conclusion the Fire Department has a major role to play in emergency response to serious traffic collisions.

6.2.3 Additional Fire Department Roles

Attendance at medical emergencies is a primary function of firefighters in motorized Nations. This function is not limited to traffic casualties. In many major Western Cities Fire Departments operate an ambulance service right from the Fire Station. They utilise highly trained staff called paramedics who can perform some functions of a doctor by administering drugs or plasma.

City Police call Fire Department paramedics first to attend for the following:

- Drug overdose
- Heart attack
- Unconscious person

- Casualty from poisoning
- Casualty from electrical burns

In city, urban and suburban areas, where rapid and reliable COMMUNICATIONS exist, the Fire Departments response time of two to four minutes may be just sufficient to restore oxygen supply to the brain of a person with severe or disabled breathing ability. Generally speaking no other emergency service can perform to these expectations as consistently and reliably.

It is sufficient to say that firefighters are respected members of society in the developed world. Their job is recognised as one, which men perform well, that it requires fit men of sound character. They are generally well-paid, highly trained, professional persons willing to put their life on the line for others. The emphasis on their job description has surrounded their response to traffic collisions. In fact Fire Fighters carry out many more functions including Fire Prevention, general rescue, Disaster response, Fire Bylaw enforcement and arson investigation. On top of this they fight fires.

6.3 Role of Ambulance at Injury Traffic Collisions

The only role of the ambulance staff is to deal solely with injured persons. In the absence of a paramedic, ambulance staff performs the following tasks:

- Intervene to save life, apply First Aid
- Stabilize the casualty, ensure stable life signs
- Prepare the casualty for transport
- Transport to nearest appropriate medical facility

In China in some cities it is apparently practice to send an ambulance from the Hospital with a Doctor on board. It is a rare occurrence for Doctors to attend crashes in developed Nations. This does occur however where injured persons are trapped and will remain trapped for some time whilst being rescued from the vehicle.

Many large Cities in the developed world have a helicopter with special equipment and specially trained staff that can attend the most severe collisions. Generally speaking the response time may be slow i.e. 15 –20 minutes, but the casualty can be transported to the nearest Hospital in 5 or 10 minutes thus saving time. All modern Hospitals are equipped with a helicopter landing pad and procedures for handling helicopter borne patients. These air ambulances however are extremely expensive to operate, probably in the region of \$700 per hour. They are used on a limited basis as a last resort.

6.4 Role of Towing Company – Vehicle Recovery

The primary responsibilities of the Towing Company are vehicle removal and storage.

A specially equipped and designed tow truck handles vehicle removal. Many of these are sophisticated vehicles with well-trained operators, but this is not always the case. Private

commercial companies usually operate these trucks. In some large cities the Tow trucks are owned and operated by the Police, driven by civilian operators under police direction. There are generally no universal training standards in place for tow truck drivers and company operators.

The tow truck prepares the vehicles for safe transport and then removes them to a storage or repair facility. These companies are often under contract to either local police, or to the City Government. There has been historically some fraud and theft associated to the Towing business. As a result the best practices involve closely regulating the industry. These are best regulated by City By-Laws, which are more flexible and can accommodate local conditions. Tow truck operators have the opportunity to steal belongings of injured persons left in a vehicle, or to steal parts of the vehicle such as wheels & tires, stereo equipment etc.

Tow vehicles and operators are not responsible for dealing with the victim. However in the absence of a properly equipped rescue vehicle such as a Fire Truck, tow trucks are equipped with a variety of basic equipment, which can assist in a rescue.

The following equipment on a tow truck is helpful at crash scenes:

- Overhead flashing yellow lights, flashlights (torches), high mounted scene lights;
- Crowbars, pry bars & levers;
- Ropes, chains, pulleys;
- Electric winch with steel cable;
- Fire extinguisher;
- Common mechanics hand tools including a hammer;
- “Slim Jims”, a specially designed tool for opening a locked car door; and
- Basic cutting equipment, such as oxygen/acetylene torch;

Additional equipment is carried to assist in vehicle removal:

- “Dollies” – an extra set of wheels to lift and remove a severely disabled car.
- “Stringers” – an extra set of magnetic taillights connected via wire extension to the rear of the damaged vehicle whilst being towed.
- A broom, shovel and garbage container.

It is common practice where Tow trucks are contracted to the Government to require the tow truck operator to clean up debris on the Highway at the collision scene.

6.5 Role of City, County, Regional Government

Commonly called the “works”, “Highway” or “maintenance” Dept. These are civilian City or Highway maintenance staff. They are mobile, in trucks, equipped at least with yellow flashing lights. Additional equipment onboard includes flashlights, portable barricades, signs (accident ahead,) shovels, brooms, and a garbage container. They carry also a quantity of “absorbo”; a type of vermiculite which when spread on the highway

will absorb such materials as diesel fuel and gasoline. In addition they carry sand and/or grit to provide traction at oil and diesel spills, these conditions being deadly for motorcyclists.

This is considered an entry-level job and these staff may have no special training.

The responsibility of “works” or maintenance staff include the following:

- Assist police with barricades and lights at crash scene;
- Restore traction to slippery road surfaces;
- Remove debris from the roadway;
- Repair or replace damaged signs, signals, barricades or road markings;
- Restore the Highway to its original condition; and
- Occasionally assist with rescue work.

6.6 Role of Citizen

In the English-speaking world there is a historic cultural value that requires citizens to take responsibility for their environment, surroundings and circumstances. Citizens are expected to assist and cooperate in emergencies. Some of them voluntarily train for this responsibility, the earlier example given being First Aid. Some citizens have formed rescue societies, with special training equipment and vehicles to perform rescue efforts in areas not served by City or County Governments.

In addition there are actual legal requirements for citizens to assist police in certain emergencies.

Educated citizens can be used at a traffic collision in the following roles:

- Provide evidence as a witness to the event;
- Can be used as a messenger if electronic communications are unavailable;
- Assist with traffic control;
- Assist with crowd control; and
- Assist with rescue, vehicle recovery, first aid.

In addition motivated citizens are most useful to work with police on road safety programmes in order to prevent crashes in the first instance.

The culture in the developed Nations is infused with benevolent organisations formed to assist and develop the community. These are predominately self funded and do not rely on public tax money. You have already heard about a major world organisation called the Red Cross. Many smaller social organisations have been formed by public-spirited individuals for the public good. There are thousands of them. Some raise funds for ambulances or hospitals, some train and equip for disasters, some form rescue societies like the story you are about to hear. British Columbia has a privately trained and

equipped earthquake rescue team, staffed and funded by volunteers that can be ready to fly to any place on earth in two hours.

7. Sicamous – Case Study

Let me give you an example on a small scale of a local citizen initiative developed to fill a need in a small rural community. In Canada, which is very sparsely populated Fire Dept's are organized on a citywide basis. They are well staffed, well trained, properly equipped. If located in a City or town near an unorganized rural area however they may not be permitted to go beyond the City limits. Leaving the City may expose the City or town to risk from Fire and expose them to civil lawsuit. Canada is thinly populated with large tracts of unoccupied land. In the small village of Sicamous British Columbia, the population is less than 5,000. There is a volunteer citizen Fire Dept., However, Canada's major East West Highway #1 runs through the outskirts of the village. The Fire Dept. is generally restricted to operate close to the village limits. Yet huge tracts of sparsely populated land surround Sicamous. This land includes Highway, farmland and forests and is crossed by hundreds of kilometres of basic rural gravel roads. If someone is involved in a collision and injured or trapped in a vehicle, an ambulance can take up to one hour to arrive, even though there is good telephone service.

The local citizens of Sicamous got together, formed a charitable society, and raised funding for a rescue truck. This vehicle is specially equipped with First aid equipment, ropes, ladders pulleys, and basic fire fighting equipment, wood cutting chainsaws. It also is equipped with hydraulic rescue gear such as Hydraulic cutting Jaws (Jaws of Life), hydraulic rams, special lifting and cutting gear. The citizens spent their own time and money in preparation and training for months.

Within a year of the citizens putting this together, their Unit was called to a mountain forest road where a Jeep with four young people in it had been driven off a cliff. They were instrumental in saving the lives of two of the young people. It took hours to get the young people up the cliff and off the mountain. If this unit had not been formed probably only one of the four youths would have survived.

As a serving police officer for 34 years Sgt. Greenhalgh has attended many serious traffic collisions. On many occasions citizens have assisted him with traffic control, first aid, or helping to control a crowd. In 1992 Sgt. Greenhalgh was operating a police motorcycle when a drunk driver deliberately rammed him. Two citizens immediately came to his aid.

In the undeveloped world only prominent and wealthy citizens can afford to operate personal automobiles. In these nations highway death and injury rates are much higher than in the developed nations. Citizens groups have formed to see what can be done to reduce highway carnage, Sometimes these initiatives are led by member of the medical community.

Responsible citizens should be seen as primary resources to work with police to make the roads safer on a variety of levels.

8. Conclusion

Emergency response is expensive. Having to respond is an admission of failure to prevent the occurrence.

What is the best emergency response to a traffic crash?

To prevent the crash from occurring in the first place – using the right combination of training, education, engineering and enforcement, coupled with proper use of safety devices.