



CITY OF HAMILTON
COMMUNITY AND EMERGENCY SERVICES DEPARTMENT
Hamilton Fire Department

PUBLIC HEALTH SERVICES
Office of the Medical Officer of Health

TO:	Mayor and Members Board of Health
COMMITTEE DATE:	May 16, 2016
SUBJECT/REPORT NO:	Epinephrine Auto Injectors (EAI) on Hamilton Fire Apparatus (CES16019/BOH16029) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Randy Moss (905) 546-2424 Ext. 3376 Russell Crocker (905) 546-2424 Ext. 7739
SUBMITTED BY:	Dave Cunliffe Acting Fire Chief Hamilton Fire Department Community & Emergency Services Department Dr. Ninh Tran, MD, MSc, CCFP, FRCPC Associate Medical Officer of Health Public Health Services
SIGNATURE:	

RECOMMENDATION

- (a) That the Hamilton Fire Department put Epinephrine Auto Injectors (EAI) on all front line fire trucks that have the potential to be dispatched to medical calls, and that firefighters be trained to administer the EAI to patients with a known history of acute allergic reaction or anaphylaxis, a history of having an EAI prescribed by their physician, a suspected history of exposure to a probable allergen, and demonstrating signs and symptoms of a severe, life-threatening reaction;
- (b) That the approximate cost of \$25,500.00 to implement recommendation (a) be absorbed in the approved 2016 Fire operating budget; and,
- (c) That the implementation be completed by December 31, 2016.

EXECUTIVE SUMMARY

Hamilton Fire Department (HFD) responds to medical emergencies in Hamilton based on certain criteria. Alerting of the Fire Department when the dispatch criteria are met is

performed by the Ministry of Health Central Ambulance Communications Centre. Hamilton firefighters are trained in CPR, first aid and the use of Automated External Defibrillators (AEDs) to manage medical emergencies prior to paramedic arrival. The focus of these advanced first aid skills is to:

- Provide basic airway management
- Provide artificial respiration for a person not breathing
- Provide supplemental oxygen to increase oxygen saturation in the organs
- Control bleeding
- Provide cardiopulmonary resuscitation (CPR) when there is no pulse
- Utilize an AED in the event of sudden cardiac arrest.

During the past six months (August 2015 – January 2016), Hamilton Paramedic Service responded to 99 suspected anaphylaxis incidents within the City of Hamilton. Response times for these 99 events included the following observations: (Hamilton Paramedic Service, Interdev ePCR Analytics, 2016¹)

1. Paramedic Service average response time was 7.8 minutes.
2. Hamilton Fire Department arrived on scene prior to Hamilton Paramedic Service on about one of five occasions (18 out of 99 events, or 17.8%).
3. Where fire arrived on scene ahead of paramedics the average time was 5.3 minutes.

The Hamilton Fire Department currently operates AEDs under the medical oversight of the Medical Director. The oversight of the Medical Director can be utilized to include EAls.

In consulting with the Medical Director, he expressed the following opinions regarding the use of EAls by Fire Department personnel:

1. *“I am of the opinion that it is now time to ensure that the residents of this city have safe access to this potential lifesaving intervention at point of care. Firefighters are exceptionally well poised to provide this care.”*
2. *“A minimum of two adult devices and two pediatric devices must be maintained on each vehicle for affective use. These will need to be replaced when utilized, and when they reach expiry.”*

The Ontario Base Hospital Group (OBHG), representing physicians responsible for certification and quality assurance of paramedics, recently advised the Director of the Emergency Health Services Branch of the Ministry of Health and Long-Term Care (MOHLTC) that use of EAls by trained firefighters on patients with a pre-existing diagnosis of anaphylaxis, and exhibiting signs of an anaphylactic reaction, may be

¹ Hamilton Paramedic Service. (2016, March 1). Anaphylaxis Report - 6 Month Review. Hamilton, Ontario, Canada.

potentially lifesaving. Through evidence based research and professional insight, they concluded the following:

“...the important role of firefighter first responders is seen in communities that have included first responders as part of a tiered response program. These communities have uniformly demonstrated improved survival for victims of out of hospital cardiac arrest through early defibrillation with automatic external defibrillators (AEDs) and early high quality CPR.” (OBHG, p. 2)

In addition to this, OBHG comments on the following of EAI use by fire departments:

“In our opinion, first responders should be included as part of tiered response where there is a suspected life threat. In addition to defibrillation, we feel the use of epinephrine auto injectors for patients with pre-existing diagnosis of anaphylaxis meets this threshold. Application of these skills is time dependent and potentially life-saving.” (Lewell, 2015²)

Alternatives for Consideration – Not Applicable

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial: Start-up costs would be approximately \$25,500. This would include: training of in-house instructors who would train the firefighters, the purchase of the EAI devices, and used sharp containers for the Fire vehicles. This cost can be absorbed in the 2016 Fire operating budget.

In addition, a cost of approximately \$23,000.00 (plus applicable cost increases from the vendor) would be required to sustain the program every other year for the replacement of the EAls due to their 18-month expiry. This future cost will be included in the Fire Department capital equipment replacement program.

Staffing: In order implement the recommendation all Fire Department front line staff will need to be provided with the applicable training approved by the Medical Director. This specific training program would be delivered through an in house training program once instructors have been identified and trained. It is anticipated that this instructor component could be completed by the end of June. With July and August being the peak vacation months, staff training will commence in September and will be completed prior to the end of the year.

Legal: Authority to authorize firefighters to utilize EAls would be under the medical oversight of HFDs Medical Director.

² Lewell, M. (2015, July 8). Prehospital Medicine. Retrieved April 18, 2016, from http://www.prehospitalmedicine.ca/wp-content/uploads/announcement/OBHG_2015Jul08_MAC_OPFFA_Letter.pdf

HISTORICAL BACKGROUND

Hamilton Fire Department responds to medical emergencies in Hamilton based on certain criteria. Alerting of the Fire Department when the dispatch criteria are met is performed by the Ministry of Health Central Ambulance Communications Centre. Hamilton firefighters are trained in CPR, first aid and the use of Automated External Defibrillators (AEDs) to manage medical emergencies prior to paramedic arrival. The focus of these advanced first aid skills is to:

- Provide basic airway management
- Provide artificial respiration for a person not breathing
- Provide supplemental oxygen to increase oxygen saturation in the organs
- Control bleeding
- Provide cardiopulmonary resuscitation (CPR) when there is no pulse
- Utilize an AED in the event of sudden cardiac arrest.

In determining whether it is appropriate to have Hamilton Fire Department carry EAls for the treatment of anaphylaxis, an environmental scan indicates that some other municipalities have already initiated this. These include: (OPFFA, 2015³)

- | | |
|-----------------|-------------------|
| • Brampton | • Pearson Airport |
| • Niagara Falls | • Ottawa Airport |
| • Pembroke | • Deep River |
| • Mississauga | • Chalk River |
| • Clarington | • Barrie |
| • Caledon | • Toronto |
| • Richmond Hill | |

During the past six months (August 2015 – January 2016), Hamilton Paramedic Service responded to 99 suspected anaphylaxis incidents within the City of Hamilton. Response times for these 99 events included the following observations: (Hamilton Paramedic Service, Interdev ePCR Analytics, 2016)

1. Paramedic Service average response time was 7.8 minutes.
2. Hamilton Fire Department arrived on scene prior to Hamilton Paramedic Service on about one of five occasions (18 out of 99 events, or 17.8%).
3. Where fire arrived on scene ahead of paramedics the average time was 5.3 minutes.

In addition to this, clinical data noted the following:

1. 32 patients administered their personal EAls prior to first responder arrival.

³ OPFFA. (2015). Assess the Impact and Outcomes of Fire Firghter Symptom Relief Training and Intervention in Ontario. Intrepid, 18-20.

2. 48 patients received epinephrine administration by paramedics. This may indicate the following:
 - a. First time event for the patient
 - b. Personal EAI not accessible to patient (expired, lost, etc.)
 - c. The reaction was significant and required additional epinephrine treatment
 - d. The patient was not able to recognize their symptom(s)
 - e. The patient was unsure how to utilize their prescribed EAI
3. There were no adverse patient outcomes in any of the patients irrespective of the response times or which agency arrived first.

The Hamilton Fire Department currently operates Automated External Defibrillators (AEDs) which are also legislated the same as EAls, under the medical oversight of the Medical Director. The oversight of the Medical Director can be utilized to include EAls.

Epinephrine is considered the therapy of choice for any anaphylactic reaction, but as with any medication, there can be adverse side effects on patients. There have been case reports of complications resulting from epinephrine administration which include:

- Fatal heart rhythms
- Heart attacks
- Neurologic complications.

It should be noted that these complications tended to be in older adults and mostly occurred as a result of administering the medication intravenously (IV). As the route for administration with an EAI involves intramuscular (IM) injections only, there is a low risk of complication. In a Prehospital Emergency Care article regarding the use of epinephrine in out-of-hospital treatment is stated the following in regards to safety of epinephrine:

“It is important to remember that these (referring to complications) are generally case reportable incidents, and epinephrine has generally been deemed safe for administration for the treatment of anaphylaxis, especially the SQ/IM route” (Ryan C. Jacobsen, 2011⁴)

RELEVANT CONSULTATION

Consultation has taken place with the following:

- Hamilton Paramedic Service
- Public Health Services – Associate Medical Officer of Health
- Risk Management
- Hamilton Fire Department oversight Medical Director

⁴ Ryan C. Jacobsen, M. E.-P. (2011, December 1). The Use of Epinephrine for Out-Of-Hospital Treatment of Anaphylaxis: Resource Document for the National Association of EMS Physicians Position Statement, p. 7.

ALTERNATIVES FOR CONSIDERATION

None.

ALIGNMENT TO THE 2012 – 2015 STRATEGIC PLAN

Strategic Priority #1

A Prosperous & Healthy Community

WE enhance our image, economy and well-being by demonstrating that Hamilton is a great place to live, work, play and learn.

Strategic Objective

- 1.5 Support the development and implementation of neighbourhood and City wide strategies that will improve the health and well-being of residents.

Strategic Priority #2

Valued & Sustainable Services

WE deliver high quality services that meet citizen needs and expectations, in a cost effective and responsible manner.

Strategic Objective

- 2.1 Implement processes to improve services, leverage technology and validate cost effectiveness and efficiencies across the Corporation.

APPENDICES AND SCHEDULES ATTACHED

None