SUBJECT: Standardization of Paramedic and Firefighter Defibrillators (HES08013) (City Wide)

RECOMMENDATION:

(a) That the Chief/General Manager of Hamilton Emergency Services, or his designee, be authorized and directed to purchase paramedic and firefighter electrocardiogram monitor defibrillators from Zoll Medical Corporation for 2008 through 2012.

(b) That the Chief/General Manager of Hamilton Emergency Services, or his designee, be authorized and directed to purchase the City-wide public access defibrillators from Zoll Medical Corporation for 2008 through 2012.

(c) That staff be directed and authorized to negotiate a “house account” for the supply of any replacement parts of the standardized electrocardiogram monitor defibrillators and public access defibrillators, as well as any maintenance contracts, as required, with the manufacturer; Zoll Medical Corporation.

(d) That staff be directed to investigate, prior to the end of 2012, the capabilities of other electrocardiogram monitor defibrillator and public access defibrillator manufacturers to determine if a competitive process would be appropriate, at that time.

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Jim Kay
General Manager / Chief
Hamilton Emergency Services
EXECUTIVE SUMMARY:

Hamilton Emergency Services (HES) is required to replace its current supply of cardiac monitor defibrillators, which are carried in paramedic service vehicles, and semi-automated defibrillators, which are carried on Fire vehicles, as they are at the end of their projected five (5) year life cycle. HES is experiencing increasing incidents where these units need service, which limits the number of units available for use at any given time; subsequently, increasing the risk of a failure of life saving equipment when treating a patient.

In reviewing the available requisite features that are necessary for HES, based on the input from our Emergency Medical Services (EMS) Medical Advisor, Dr. Michael Shuster, and other operational needs it has been determined that only one manufacturer can meet all the current HES requirements.

It is recommended that the Purchasing Section and HES be authorized to negotiate, with Zoll Medical Corporation, to acquire the cardiac monitor and defibrillation devices for paramedic and firefighter use.

Worthy of note, as of the week of May 1, 2008, one of the three manufacturers that may have been able to provide units to Hamilton was ordered by the United States Food and Drug Administration (FDA) to cease selling their electrocardiogram (ECG) defibrillation products and this order will stand for an undetermined period of time.

If the standardization of cardiac monitor defibrillators, to the Zoll product is approved, standardizing the City-wide public access defibrillators (PADs) to the Zoll Medical Corporation is also recommended, as it supports an integrated seamless approach to patient care, quality assurance, and data transfer. The seamless approach is not only realized within the City’s departments, it is also consistent with the products currently in use in the four (4) local hospitals and by Kitchener-Waterloo Region, Peel Region, Oxford County, Brant County, Halton and Toronto ambulance services.

No additional funding would be required to support these recommendations, as the existing capital budget for Fire and EMS could adequately finance these projects.

BACKGROUND:

HES-Fire and HES-EMS use cardiac monitor defibrillators to provide care to emergency patients in the City, and HES-EMS has distributed public access defibrillators across 51 City facilities. These devices are used to deliver a shock to defibrillate a heart that is not beating, and, in the EMS setting, to act as an external mechanical pacemaker when a heart is beating too slowly. The basic monitor function of the electrocardiogram (ECG) unit is used to view, measure and record the electrical conduction of the heart. This information is valuable in determining appropriate treatment for patients and provides a record for hospital staff to identify changes in the patient’s condition. On July 11, 2007,
Council approved Item 7 of the Committee of the Whole Report 07-023 (Report HES06005(a) - Resource and Deployment Review of Emergency Medical Services). As part of the approved resolution, Hamilton EMS was directed to enhance the (ECG) function with 12 lead ECG capabilities. The acquisition of these replacement and new defibrillators will fulfill these equipment requirements.

In addition, HES needs to replace all of the existing monitors and defibrillators, as they have reached the end of their five (5) year life cycle, and both services are experiencing an increase in repairs of this life saving device. Adding to this pressure to purchase the units forthwith, the maintenance contract for the majority of the Department’s inventory has expired and needs to be renewed. In the past five (5) years the annual maintenance contract with the manufacturer has been $19,000 per year. Now that the devices are five (5) years old, the cost of an additional year of maintenance contract from the manufacturer is $98,000 per year. The increase in cost of maintenance is indicative of the expected need for service. The nature of the use of these devices is such that any malfunction could result in a negative outcome for a patient suffering a medical emergency.

**ANALYSIS/RATIONALE:**

There are currently three (3) manufacturers of cardiac monitor/defibrillators suitable for the Department’s use in this setting. (Several other municipalities have undertaken the RFP and tender process for monitor/defibrillators in the past months and years. Only these three [3] vendors have responded with proposals that involve a suitable product). They are Medtronic Physio Control, Laerdal Philips, and Zoll Medical. In reviewing the features, functions and options of these devices, there are several significant differences, including:

- **12 Lead ECG Interpretation Software** – Two (2) of the manufacturers incorporate software to interpret the 12 lead ECG that was developed by General Electric, known as Marquette software. This software has been studied and proven to be accurate to an acceptable limit. Laerdal Phillips uses its own proprietary software, which has never been independently studied and the accuracy of that software is unknown. HES-EMS Medical Advisor, Dr. Michael Shuster, has advised that our monitors should utilize the Marquette software so that we have the opportunity to compare our device’s accuracy to those in other systems.

- **CPR Feedback** – It is believed that the quality of CPR performed on a cardiac arrest victim can have a significant impact on whether that patient survives. The Heart and Stroke Foundation of Canada along with the American Heart Association recently changed their standards to put more emphasis on the performance of CPR, and international research is ongoing to determine the magnitude of impact. Two (2) of the manufacturers, Laerdal Phillips and Zoll have incorporated the ability into their monitors to assist rescuers by measuring the speed and depth of CPR and coaching the rescuer where required. Dr. Shuster has recommended that HES include this function in the next cardiac monitors and defibrillators. Medtronic Physio Control does not offer this function.
• Integrated AC / DC Adaptor – Council has been made aware of the increasing challenge of hospital off-load delays, in which Hamilton EMS paramedics must care for patients for extended periods of time in the hospital, sometimes involving several hours. Cardiac monitor/defibrillators, used by EMS, are battery operated with a range of two (2) to five (5) hours of operation on fully charged batteries.

The prolonged use of the EMS ECG units is significantly challenging for EMS to have sufficiently charged batteries available to use during the shift so that the paramedic can maintain adequate patient care. To mitigate this concern, Hamilton EMS needs cardiac monitors that have an integrated AC adaptor so that the monitors could be plugged into a wall outlet, when required, at any location where AC power is available.

Medtronic Physio Control does offer an AC adaptor for their defibrillators, but the addition of the device increases the weight of their devices to beyond the weight limit that the Ministry of Labour dictates is an appropriate weight for paramedics to carry. Laerdal Phillips also offers an optional AC adaptor, but the use of this adaptor reduces the number of batteries carried in the device from two (2) to one (1) reducing the effective battery capacity for emergency calls by half. Zoll offers an integrated AC adaptor in their device that does not add additional weight or reduce battery capacity.

• Data Transfer Ability – The information captured and stored by the monitor defibrillator can be valuable in the care of a patient and an important part of the record of care. These records are currently transferred from the device to the patient’s charts by printing onto paper. Council has approved Hamilton EMS to move to an electronic patient record system that will require the transfer of electronic data from the monitor into these records. The current Medtronic Physio Control system of data transfer involves the use of a patch cord to a computer, and the data transfer can take from several up to 45 minutes to complete. The experience of Hamilton Fire is that this transfer of data is unreliable and difficult to manage and reconcile. The Zoll and Phillips monitors utilize data cards, which can transfer the data in seconds.

• Standardization of Patient Equipment in Hamilton – Currently all of the hospitals in the Hamilton area use Zoll Medical monitor defibrillators. The use of Zoll monitor defibrillators by the City of Hamilton would allow the efficient transfer of patients with the hospital without the need to remove and replace proprietary patient care supplies, such as defibrillation and pacing pads. On a similar note, the City-wide PAD Program, managed by HES-EMS, currently uses Zoll defibrillators. Not only will standardization to the use of Zoll monitor defibrillators by City of Hamilton allow for a seamless transfer of this information and equipment with the hospital, it will also integrate the quality assurance software of the devices and the patient care data transfer software.
Given the above, it would be disingenuous for HES to undertake a tender process as the Zoll Medical monitor defibrillator is the only device that meets all of the Department’s needs.

In addition, in May 2008, Medtronic Physio Control (one of the three (3) manufacturers as described above) was ordered by the US Food and Drug Administration to cease selling their ECG defibrillation products. This ban will continue for an undetermined period of time. Not only is HES unable to purchase units from this vendor, but given the extent of the order, it is also expected to create pressure on availability of units to be purchased by the other manufacturers. This has heightened the importance of purchasing units now while they are available.

In keeping with the Corporate Purchasing Policy, Section 4.14, Policy for Standardization, it is recommended that the City standardize to the use of Zoll Medical Corporation for all HES monitor defibrillators for the next five (5) years, 2008 to 2012 inclusive, and during the same period for any replacement or new PAD units for the City-wide PAD program. The capabilities of other manufacturers and the factors above should be reconsidered at that time to determine if a competitive process would be appropriate.

**ALTERNATIVES FOR CONSIDERATION:**

The alternative is for HES and the Purchasing Section to begin a Request for Proposal (RFP) process. HES would need to reconsider some or all of the features described above in order to allow other manufacturers to bid competitively. This approach is not recommended due to the negative impact it would have on the integrated, and otherwise seamless, delivery of emergency cardiac care to Hamilton residents, and into the receiving hospitals in our catchment area.

**FINANCIAL/STAFFING/LEGAL IMPLICATIONS:**

**Financial**

The recommendation is to standardize from 2008 to 2012 inclusive, and thereafter re-evaluate the market conditions and the requirements. The relevant comparison factors should be reviewed prior to the end of 2012.

Funding for the purchase of monitor/defibrillators has been planned for and the funds in capital projects will be sufficient to cover the costs. The cost of replacing 42 paramedic ECG monitor defibrillators will be approximately $770,000. EMS will also need to add an additional six (6) units, as part of the increase in services approved by Council in July 2007. The cost of these additions will be approximately $126,060 and this funding is included in EMS capital projects. In total the capital cost for EMS for this project is approximately $896,000 and is based on the actual negotiated cost. There may be up to a 10% variation if the current assumptions and market conditions change in the intervening period.
The cost of replacing Fire Division’s semi-automated defibrillators is expected to be $200,000. The cost of this equipment is available in the HES-Fire capital projects.

A fair purchase price can be determined and assured through the process undertaken by other municipalities. The Region of Peel undertook a competitive purchasing process for cardiac monitor defibrillators in late 2006, and Zoll Medical was the successful bidder. The purchase arrangement in Peel, at that time, allowed other municipalities to purchase the Zoll monitors for the same fair market price arrived at through the competitive process. That option has been exercised by Hamilton EMS for a limited number of devices purchased in 2006 and 2007, as well as by other municipalities. The quoted price from that process is still available to Hamilton. In addition, Lambton County has recently closed a competitive process for the purchase of monitor defibrillators. Zoll Medical has presented a proposal in that process, and the conditions of that process would allow Hamilton EMS to purchase at the same price.

**Staffing**

There are no staffing implications.

**Legal**

There are no legal implications.

**Policies Affecting Proposal:**

The City of Hamilton Purchasing Policy, Section 4.14 - Policy for Standardization applies.

The recommendations contained within this report are keeping to the spirit of this provision.

**Relevant Consultation:**

Corporate Services Department, Financial Services Division, Purchasing Section
Community Services

Purchasing staff has advised to utilize the Council approved Policy for Standardization. Both Finance and Purchasing staff recommend a Council resolution to authorize the General Manager of Emergency Services and the Manager of Purchasing or their designates to negotiate purchases with the suppliers of cardiac monitor defibrillators.

Purchasing Policy Section 4.14, which permits the standardization of purchases where cost savings and operational efficiencies may be realized, supports this type of approach, and requires Council approval.
CITY STRATEGIC COMMITMENT:

By evaluating the “Triple Bottom Line”, (community, environment, and economic implications) we can make choices that create value across all three bottom lines, moving us closer to our vision for a sustainable community, and Provincial interests.

Community Well-Being is enhanced. ☑ Yes ☐ No

Standardizing to the Zoll monitor allows Hamilton EMS to provide better care to the community.

Environmental Well-Being is enhanced. ☑ Yes ☐ No

Enhanced electronic transfer of data reduces or potentially eliminates the need to print patient data from a defibrillator. Standardizing to Zoll products eliminates the need to use multiple sets of disposable defibrillator pads.

Economic Well-Being is enhanced. ☑ Yes ☐ No

Efficiencies can be maximized by standardizing to one defibrillator in the City of Hamilton.

Does the option you are recommending create value across all three bottom lines? ☑ Yes ☐ No

Do the options you are recommending make Hamilton a City of choice for high performance public servants? ☑ Yes ☐ No

The Zoll monitor defibrillator provides high performance caring paramedics with the ability to provide the best care to the patients in Hamilton.