



HM Fire Service Inspectorate

**Integrity, Objectivity,
and Fairness.**

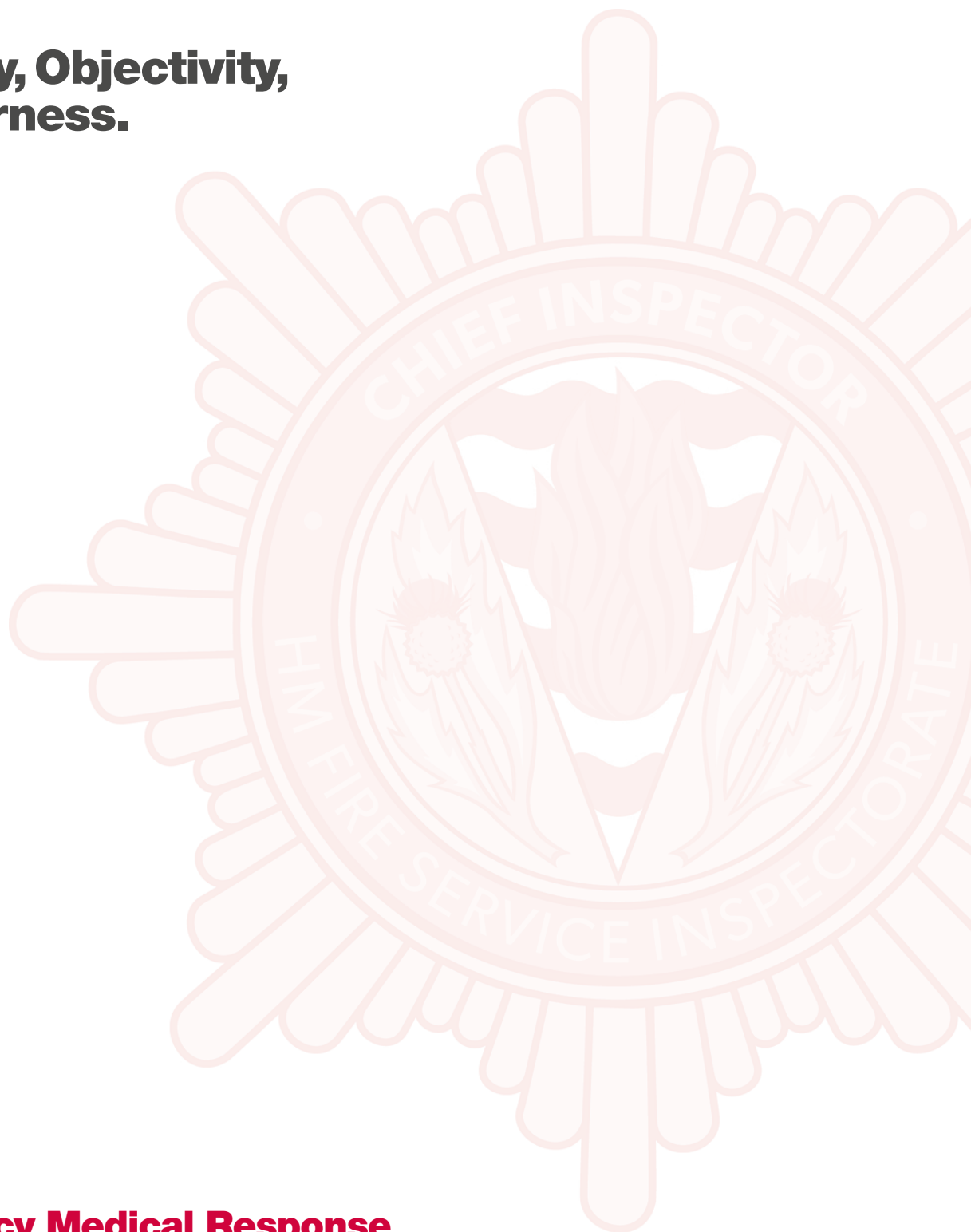


Emergency Medical Response and the Scottish Fire and Rescue Service

Arrangements for Scottish Fire and Rescue Service involvement with medical emergencies and partnership working with the Scottish Ambulance Service.

HM Fire Service Inspectorate

**Integrity, Objectivity,
and Fairness.**



Emergency Medical Response and the Scottish Fire and Rescue Service

Arrangements for Scottish Fire and Rescue Service involvement with medical emergencies and partnership working with the Scottish Ambulance Service.

Acknowledgements

We are grateful to the SFRS Strategic Leadership Team and those members of staff who provided us with information, helped us to organise visits, hosted us and contributed constructively to interviews.

The Inspection team members were:

Steven Torrie QFSM
Paul Considine
Brian McKenzie

Professor Andy Newton QAM provided the team with advice and acted as a critical friend.

A Quality Assurance Panel helped us by challenging a draft of the report. The team was:

Peter Holland CBE, Chief Fire and Rescue Adviser for England
Lee Howell QFSM, Fire and Rescue Adviser to the Welsh Government
Christina Yule, Lead Inspector, HMIC Scotland

All the members of the inspection team contributed to the development of this report and the quality assurance panel provided a professional challenge to the contents, assumptions and conclusions made. However, the Chief Inspector takes sole responsibility for the report, its contents and conclusions.

Laid before the Scottish Parliament by HM Chief Inspector of the Scottish Fire and Rescue Service under section 43C(5) of the Fire (Scotland) Act 2005 October 2014 SG/2014/178

To Contact Us

Telephone +44 (0) 131 244 3275
Email HMFSI@scotland.gsi.gov.uk
Website www.scotland.gov.uk/fireinspectorate

Contents

1_ Introduction	02
2_ About the inspection	05
3_ Our findings	07
3.1_ The inherited position	07
3.2_ Experience elsewhere in the UK and overseas	10
3.3_ An opportunity for Scotland	13
4_ Issues for the SFRS to consider	16
Glossary and abbreviations	17

1 Introduction

‘Over 1,500 Scots died from an out of hospital cardiac arrest last year. Currently, only 5% of people who have a cardiac arrest in the community survive and every minute that they wait for a ‘shock’ cuts their chances.’

Source: Scottish Ambulance Service website, April 2014

The above quote from the Scottish Ambulance Service website¹ highlights a fact well-known to practitioners of emergency medicine – that people who have a cardiac arrest away from a hospital environment have only a few minutes in the absence of life support before their chance of survival reduces dramatically.

Not everyone who suffers a cardiac arrest is saveable. But a proportion of cardiac arrest patients initially have what is called a ‘shockable rhythm’ – if they receive medical assistance by way of electric shock from a defibrillator, a normal heart rhythm can be restored.

But every minute that passes, counts. Doctors recognise the importance of what is known as the ‘chain of survival’ in cases of cardiac arrest. Someone needs to recognise that the patient has had a cardiac arrest, and call for help. CPR (chest compressions and rescue breaths) need to start as soon as possible. A defibrillator needs to be used as soon as possible. And advanced life saving drugs need to be administered by a health professional, and the patient transported to hospital, in the shortest possible time.

All of this presents a great challenge to emergency medical services, particularly ambulance services, because the time involved is just a few minutes. The ambulance service in Scotland responds as quickly as possible to medical emergencies, including cardiac arrests. And the Scottish Fire and Rescue Service (SFRS) recognises the importance of having a defibrillator immediately available if a cardiac arrest occurs – more than half of Scotland’s fire appliances are equipped with defibrillators, which were acquired for use in the event that a firefighter has a cardiac arrest while on duty (a recognised hazard for firefighters). In addition, many of Scotland’s firefighters are trained in enhanced first aid and are experienced in applying those skills in emergency situations.

But with only a very few exceptions, SFRS personnel do not respond routinely to calls for help to members of the public who have had medical emergencies. Elsewhere in the UK and overseas, some fire services have become involved in responding to time-critical medical emergencies – supporting and enhancing the work of their ambulance service colleagues: a number of fire and rescue services in England and Wales do so, and major metropolitan fire brigades such as Toronto and Melbourne provide emergency medical response. There is good evidence of the benefit joint working can bring.

It is an ambition of the Scottish Government that public services should work effectively together:

‘The Scottish Government is pursuing a comprehensive and transformative programme of reform to protect and improve public services. Services must be consistently well designed, based on the best evidence and delivered by the right people to the right people at the right time. Continuous improvement of the national outcomes can be achieved when public sector organisations work effectively in partnership with each other to design and deliver excellent public services which meet the needs of local people.

¹ <http://www.scottishambulance.com/NewsDesk/NewsItem.aspx?NewsID=88> retrieved 26 Aug 2014

Supporting people and communities to build and use their own assets, including their skills and networks, can also help to deliver improved outcomes.’

Scottish Government Public Bodies and Public Services Reform Division

We decided to look at the approach the SFRS is taking to medical response in light of the Scottish Government’s ambitions, existing capability within the SFRS, the experience from overseas, the renewed interest in fire and ambulance joint working in England and Wales, and the overarching life-saving potential. A significant investment has already been made in equipment and training to allow firefighters to carry out defibrillation and advanced first aid in appropriate cases. We wished to explore whether there is capacity that could be used for the public benefit and what the benefits and costs of doing so may be.

A summary of our findings

- **Discussions are under way to improve co-operation and joint working between the Scottish Fire and Rescue Service and the Scottish Ambulance Service (SAS). We think that this is very important but we believe that the benefits which could be achieved and the lives which could be saved will not happen unless there is a major change in the way the two Services work together.**
- There is strong UK and international evidence to show that the introduction of formal emergency medical response schemes where fire and rescue services respond with emergency ambulance services to time-critical medical emergencies improves patient outcomes in the case of cardiac arrest.
- We are aware that the themes of this report potentially tie in with broader strategic thinking about resuscitation capability in the community. We believe that a new and close working relationship between the SFRS and the SAS could offer a key component of that capability and is a fundamentally sensible thing to do in any case.
- SFRS recognises the value of defibrillators. It owns about 380 defibrillators, around 350 of which are on fire appliances and 30 of which are at stations or are held as spares. However, at the time these were acquired, they were intended primarily for use on FRS staff if required – not the public.
- There are very few instances where SFRS personnel are turned out *as a matter of routine and as part of a formal arrangement* to medical emergencies in their area. The only examples we are aware of are schemes inherited from the former Grampian Fire and Rescue Service at Braemar and Maud – and the Braemar unit has had limited utilisation recently.
- The memorandum of understanding between Grampian Fire and Rescue Service and the SAS was designed to allow for the addition of further co-responder schemes but there was no expansion beyond the inception of the first two schemes in 2007. Every indication is that the scheme in Maud is of great benefit to the local community – which raises the question as to why this partnership has never progressed beyond the two original sites.
- On an *ad hoc* basis, SFRS assets are sent to medical emergencies at the request of ambulance control, to provide emergency first aid until an ambulance is able to attend. This occurred around 130 times in 2013-14. There is very little formal underpinning of this activity and an absence of standard operating procedures, memoranda of understanding or clinical protocols. If SFRS is going to respond to medical calls, formal structures and procedures (including procedures for crew safety and welfare) ought to be in place.
- About a third of the 46 fire and rescue services in England and Wales operate co-responder schemes. The arrangements vary rather than being uniform, with marked differences in the equipment which is carried and the range of calls which might be attended. However, where these schemes are in existence, they might well be described as operating a long way beyond anything which is currently happening in Scotland.
- While arguably the highest profile benefit of a fire and rescue service emergency medical response scheme is the opportunity to save lives in cases of out-of-hospital cardiac arrest (OHCA), beyond that, there is anecdotal evidence that co-responder crews are valued by the community simply for the reassurance their early attendance offers.

2 About the inspection

Her Majesty's Fire Service Inspectorate in Scotland (HMFSI) is a body that operates within, but independently of, the Scottish Government. Inspectors have the scrutiny powers specified in section 43B of the 2005 Act. These include inquiring into the state and efficiency of SFRS, its compliance with Best Value, and the manner in which it is carrying out its functions.

The purpose of this inspection is:

To consider the extent to which the SFRS is maximising opportunities to contribute to community safety by its acquisition and use of defibrillators and other medical equipment and by collaborating with the Scottish Ambulance Service in providing support to emergency medical response.

An inquiry by the Inspectorate can be self-directed or can be subject to direction by Scottish Ministers. This inquiry into the SFRS is self-directed by the Chief Inspector. The decision to carry out this inspection was influenced by recent reports and debate in England over greater collaboration between blue-light services, ongoing initiatives in emergency medical provision within Scotland, and the potential for improved survival.

The Fire and Rescue Framework for Scotland 2013 sets out a number of things which support the subject of this report:

- The purpose of the SFRS, defined in the Framework is 'to work in partnership with communities and with others in the public, private and third sectors, on prevention, protection and response, to improve the safety and wellbeing of people throughout Scotland'.
- The Framework identifies a subset of the National Outcomes which are particularly important to the shared aspirations of the Scottish Government and the Scottish Fire and Rescue Service. Outcome 6 being: '**we live longer and healthier lives**' and outcome 15 '**our public services are high quality, continually improving, efficient and responsive to local people's needs**'.
- Paragraph 15 of the Framework includes this statement: '*The new SFRS must not work alone. It should build on the existing partnership work with the other emergency services and category one responders to enhance Scotland's resilience. It should build on existing partnerships with a range of local organisations to drive down risks in the community, and continue to build on its partnerships with a range of other justice sector bodies in its focus on the vulnerable and most at risk.*' This principle of partnership working is defined as a strategic priority for the SFRS.

The Fire (Scotland) Act 2005 sets out a number of powers for the SFRS. One of those is to:

'... take ... action ... in response to an event or situation that is ... likely to cause a person to die ... or become ill ...'

Taking all of this together, and in the context of this report, it is our view that closer working between the SFRS and the SAS, to the benefit of the public in Scotland, is clearly within the expectation of the Scottish Government.

Methodology

This inspection has largely been carried out on the basis of a desk top data review, complemented by field visits to the two co-responder schemes currently operated by the SFRS, and a number of face-to-face discussions with stakeholders in Government, the SAS, and elsewhere.

As well as visiting the two Scottish co-responder schemes, we travelled to Lincolnshire to find out about the well-established co-responder arrangements in place in that Fire and Rescue Service, and to speak to staff involved in delivering the service there. We also spoke to people from Hampshire Fire and Rescue Service to develop an understanding of arrangements in its area.

We reviewed national and international literature on OHCA events, with a view to better understanding the evidence for rapid intervention in OHCA cases, and the effect that the introduction of fire-based emergency medical response schemes can have both on the rapidity with which patient care can commence, and survival rates of OHCA patients.

We discussed with the SFRS the rationale behind the original acquisition of defibrillators by the predecessor fire and rescue services, the costs involved in that acquisition and staff training, and the financial implications for the Service in the event that it provided an increased level of emergency medical response.

During the course of our work we had helpful assistance from Professor Andy Newton QAM, Consultant Paramedic and Clinical Operations Director at South East Coast Foundation Ambulance NHS Trust, as a critical friend to inform the direction of our work and to point us in the direction of relevant, peer-reviewed scientific research.

The conclusions of this report remain the sole responsibility of HM Chief Inspector of the SFRS.

3 Our findings

In this, the main section of our report, we start by looking at things which the Service has inherited from its predecessor organisations (for example, defibrillators, co-responder schemes and partnership working). We then reflect on these things in the context of what has been happening in the UK and abroad and in the light of research and data.

3.1 The inherited position

Equipment held by SFRS

The SFRS already has a substantial amount of medical equipment, including defibrillators and oxygen administration packs, both on its appliances and at SFRS premises across Scotland.

The provision of defibrillators has arisen primarily through considerations of firefighter safety – and the way that this has evolved has not in our view been unreasonable. It has been recognised for some time now in the international literature² that firefighting carries with it an elevated risk of cardiac arrest, particularly in the highly physical and stressful environment of an emergency scene. For this reason, fire and rescue services in Scotland (with the exception of the former Highlands and Islands Fire and Rescue Service) acquired defibrillators for deployment on front-line appliances and in some fixed locations.

At the latest count, over 330 SFRS vehicles carry defibrillators on a routine basis and their distribution across the emergency vehicle fleet varies. To date, no appliances in the former Highlands and Islands FRS area have defibrillators as that service did not acquire them. Despite the inevitable investment that will be required in acquisition of these units and training staff in their use, we do not think that this position is equitable in a single national service and steps should be considered to standardise distribution across Scotland.

When defibrillators were issued by the predecessor fire and rescue services, instructions outlining their use were provided. These instructions made it clear that the reason for issuing defibrillators was for increased firefighter safety, not to provide a capability to respond to 999 calls for medical emergencies. They could, however, be used where firefighters encountered someone in need of assistance whilst they were at an incident, or whilst they were travelling in a fire appliance. Those instructions were reasonable, in the context of the acquisition of this equipment for firefighter safety rather than as part of a formal emergency medical response scheme.

We have encountered in the course of our inspection anecdotal suggestions that some firefighters may believe that they are not permitted to use the defibrillators they carry on members of the public. We have no evidence that this has ever had any adverse effect on the availability of defibrillators to members of the public in appropriate circumstances. We consider, however, that the SFRS should put the matter beyond doubt by issuing a national standard operating procedure for use of this equipment, to include advice that it may be used on a member of the public in the same way as other first aid equipment carried on fire appliances.

² For example *NIOSH Alert: Preventing Firefighter Fatalities Due to Heart Attacks and Other Sudden Cardiovascular Events* US Department of Health and Human Services, 2007

We also note that the SAS does not have information on where SFRS defibrillators are located, and the numbers of SFRS staff trained in defibrillator use and cardio-pulmonary resuscitation (CPR). Provision of this information would be a starting point for discussions between the SFRS and SAS to identify the locations in which SFRS assets could potentially be used as part of a joint strategy and we suggest that the SFRS makes this information available to the SAS.

Existing medical response schemes

The SFRS inherited a programme from the former Grampian Fire and Rescue Service (GFRS), in which members of the Maud and Braemar fire stations will respond to medical calls in their station area. These are the only two instances in Scotland where a formal memorandum of understanding exists between the fire and ambulance services allowing for the routine dispatch of fire service resources to medical emergencies.


A dedicated vehicle at Maud was provided by GFRS and a vehicle at Braemar by the SAS. Initial training was provided by SAS and costs for staff attendance were covered by GFRS. GFRS also covered annual revenue costs. This ongoing cost, which averages just over £5000 per year, has been inherited by the SFRS.

In the course of our inspection we visited the crews at Maud and Braemar to gather information about their experience of these schemes. Recently, the level of activity in Braemar has been very low. In contrast, over the last three years, Maud responded on average to over 50 calls to medical emergencies each year – around half their total number of calls. There are currently five members of staff who provide an on-call rota and this is managed together with the fire and rescue part of their responsibilities.

The pilot scheme at these locations has been successful in demonstrating the ability of SFRS resources to respond to medical emergencies without compromising fire cover in their area, or overburdening retained duty system staff who deal with these calls. Outcomes for the communities served by these fire stations have also been positive in terms of enhancing community safety. While complex issues, including compatibility of ICT systems, exist around the exchange of information and management of knowledge sharing between the SFRS and SAS, the Maud and Braemar schemes have demonstrated that it is possible to overcome these issues.

This raises the question what has been done to build on these pilot schemes and to expand the number of locations from which the SFRS provides emergency medical response. Although we have seen some limited documentation around post-implementation review of the Maud and Braemar schemes, so far as we know there has been no detailed evaluation of their effectiveness. Given that the SFRS provides emergency response from more than 350 fire stations across Scotland, many of which are in areas demographically similar to Maud that could be expected to generate a similar number of calls for emergency medical assistance, we think that a formal evaluation of this initiative is overdue. In January 2009, the Westminster government published a review of co-responder work in England³. Amongst other things, the report asked why the existing schemes in England had not been rolled out across the country as a whole.

³ *Current Practice and Prospects for FRS Co-responding. Fire Research Series 14/2008 CLG, 2009*



It is not the role of the Fire Service Inspectorate to decide whether the SFRS should provide emergency medical response services or not – we recognise that is a matter for government policy. We do, however, consider that there is an obligation on the SFRS to use the information gathered from these pilot schemes to inform strategic thinking about future service provision, and we wish to encourage the Service to see that is done.

SFRS ad hoc response to medical calls

We requested information from the SFRS about the number of times, apart from the schemes at Maud and Braemar discussed above, that a fire appliance is responded to a medical emergency to provide medical treatment pending the arrival of an ambulance. This is to be distinguished from the relatively common situation in which fire and rescue service resources are mobilised to assist with the movement of a patient.

We were told that for a number of years, some fire and rescue services in Scotland (and since April 2013, the SFRS) have received calls from the SAS requesting their attendance to provide first aid to a critically ill patient. This has usually been where all ambulance service resources in the area have already been committed to other calls. We understand that occasionally, a fire appliance with a defibrillator has been dispatched to provide emergency first aid until an ambulance can attend. Unlike the formal schemes at Maud and Braemar, this is arranged on a case-by-case basis.

This kind of *ad hoc* mobilisation is unusual – there are approximately 130 recorded instances in the financial year 2013-14 across Scotland (SFRS responds to nearly 90,000 emergency calls each year, while the SAS responds to 600,000 emergency calls). As will be clear from this report, we think that joint working of this kind has the potential to significantly improve outcomes for some patients, and we do not want to discourage initiatives of this kind. We do, however, have some concerns about the nature of these arrangements as they have operated in the past.

Attendance at a medical emergency involves considerations for which specific training is desirable, over and above the simple mechanics of operating a defibrillator. Also, it is important that both fire and ambulance control rooms understand when it is, and is not, appropriate for a fire appliance to be sent to a medical emergency. We have been advised that an interim memorandum of understanding between the SFRS and SAS is being developed to govern the circumstances in which a fire appliance can be requested to respond to a medical call outwith the formal co-responder schemes in place. In our view, there should be an accompanying analysis of the training that is required for responding fire crews to operate safely and effectively at the scene of a medical emergency, and provision of that training to SFRS crews who might respond to these calls.

3.2 Experience elsewhere in the UK and overseas

Elsewhere in the UK and worldwide, the idea of fire services providing emergency medical response to the communities they serve is widespread. It is notable, however, that there is no single consistent model applied internationally, and in many cases, the evolution of fire-based emergency medical services has occurred for historical reasons of local relevance.

Broadly speaking, it is possible to describe two types of fire-based emergency medical response model. The first of these is the co-responder model, in which fire services are responded, always at the same time as an ambulance, to certain types of medical call.

There are variations on this model: in one, the fire service may co-respond to a wide range of medical emergencies where ambulance response times are likely to be extended. This is often associated with rural areas where there may be no ambulance stationed nearby, but in some locations, particularly in the United States and Canada, fire services in urban areas provide a comprehensive co-response service accounting for up to 80% of their emergency calls.

In another approach to co-responding, fire services respond to life-threatening medical emergencies on the basis that, no matter how comprehensive ambulance coverage may be, a fire appliance can still be expected to arrive on scene before (perhaps only a minute or two before) an ambulance on a significant number of occasions. In emergencies such as cardiac arrest, that small time advantage may make a difference to patient survival rates. The Emergency Medical Response (EMR) programme in metropolitan Melbourne, Australia is an example of that approach.

The second model of fire service medical response is where the fire service is itself responsible for managing ambulance and paramedic provision in a location. The cities of New York and Washington DC in the United States are examples of this model, as are Dublin in Ireland and Berlin in Germany. The fire service will dispatch a unit to a medical emergency, and that is the only response provided – there is no separate ambulance service. This model is as much an organisational one as an operational one.

Of 46 fire and rescue services in England and Wales, there are currently at least 18 who currently provide some sort of medical response⁴. The criteria and operating procedures differ from service to service, and so it could fairly be said that the approach varies rather than being uniform. There are, however, a good number of examples of partnership working between fire and ambulance services which go a long way beyond anything that can be found in Scotland.

At least one service in England, Lincolnshire, has obtained funding to acquire ambulances to allow it to expand its long-standing medical response arrangements, by offering urgent care patient transportation in appropriate circumstances. We visited Lincolnshire to discuss the medical response scheme with senior officers and front-line crews, and it was apparent to us that medical response was seen as an important and integral part of the Service's operations in rural areas and is valued by the ambulance service. Although the crews involved still saw themselves very much as firefighters who went to medical calls, of the 21 stations in Lincolnshire that provide emergency medical response services, all but two attend more medical emergencies than fire calls.

⁴ Communication from Chief Fire and Rescue Adviser, Department for Communities and Local Government, September 2014

Case study – Hampshire FRS

Hampshire Fire and Rescue Service has operated a co-responder scheme since 2004 and is recognised as delivering a well organised and mature partnership. The scheme operates out of 21 fire stations and the Service is planning to increase this to 22. Staff take on this additional role on a voluntary basis. Volunteers are trained by the Ambulance Service.

Hampshire FRS has been responding to the most urgent ‘Category A’ calls but discussions are taking place with the Ambulance Service for the FRS to take on less urgent calls (and thereby free up Ambulance Service assets to deal with more urgent ones). The original intention was to use FRS mobilisation in areas where the Ambulance Service was having difficulty in meeting its attendance targets (and therefore, amongst other things, reducing the likelihood of people surviving an OHCA).

Dedicated vehicles are used by the FRS for responding to emergency medical calls. These vehicles are deployed directly by Ambulance control. South Central Ambulance Service provides about £500k funding each year to cover the cost of RDS mobilising fees.

The FRS co-responders in Hampshire achieve target attendance times on about 80% of occasions and fire stations average around 500 emergency medical calls per year. Across Hampshire, the FRS attends approximately 10,000 calls annually and contributes to 5% of the Ambulance Service’s overall performance in attending the most urgent category of calls.

Benefits and costs of co-responding

The science around the ‘chain of survival’ and the importance of providing early defibrillation in OHCA cases is well-understood. The Resuscitation Council (UK) advises that for every minute of delay, the chances of successful defibrillation decrease by about 10%⁵ and ‘...recommends strongly a policy of attempting defibrillation with the minimum of delay in victims of VF/VT cardiac arrest.’⁶

A significant amount of research has taken place to establish the benefits of medical intervention in OHCA cases, and to examine the contribution that fire service intervention can make.

Peer-reviewed research was published into the impact of the EMR programme in Melbourne – an urban and suburban environment in which the ambulance service was already using mobile paramedics in fast response vehicles to minimise attendance times. In a study of the first seven years of the Melbourne EMR project, significantly shorter response times at the 50th and 90th percentiles were identified for fire service response, with a fire response being on average some three minutes quicker than the ambulance response⁷. Whether similar results would be replicated elsewhere would depend on the distribution of fire stations, availability of crews to respond, and duty system in operation: but in principle it can be demonstrated that a fire service response can significantly improve average response times to cases of OHCA.

⁵ Resuscitation Council (UK), *National Resuscitation Guidelines 2010*

⁶ *ibid.*

⁷ Boyle et al, *The first seven years of the metropolitan fire brigade emergency responder program – an overview of incidents attended*, Open Access Emergency Medicine, 2010

Provision of continuous, good quality chest compressions is important to maximise the chances of a positive outcome for OHCA patients⁸, and that poses a significant challenge to paramedics who may be working singly or in pairs when they have other tasks to attend to such as defibrillation, establishing and maintaining an airway and administering life-saving drugs. Providing chest compressions is also physically demanding, with fatigue rapidly degrading the quality of compressions by a single rescuer over time⁹, and the assistance of firefighters may maximise the chances of good quality, continuous compressions being provided in tandem with other interventions.

In our discussions with fire and rescue service staff who respond to medical incidents both in Scotland and elsewhere, it was apparent that the benefits of fire service response may sometimes be intangible: for example, the additional reassurance and first aid that can be given to a patient in advance of an ambulance arriving, even if their condition is not life-threatening. Communities can be made to feel safer in the knowledge that trained medical assistance is available from their local fire station regardless of the availability of an ambulance.

It is beyond the scope of this report to place a financial value on the potential benefits to the community of establishing an emergency medical response capability in the SFRS. There are a number of variables that would have to be taken into account. For example, a scheme might not extend to all fire stations in Scotland (only rural, or only urban stations, or only stations where there are identified issues with ambulance response times, might be selected). The benefits of a scheme are closely tied to the number of time-critical medical incidents that occur in the area affected.

What we can say, however, is that there are facts that weigh strongly in favour of at least considering the provision of fire-based emergency medical services in both urban and rural communities:

- For some categories of medical call there is a direct correlation between time taken for initial medical interventions, and patient survivability.
- No matter how comprehensive ambulance cover is in an area, there will always be circumstances in which ambulances and paramedics are occupied elsewhere and are therefore unavailable to respond immediately.
- It is not just the time taken by initial responders, but the total number of trained responders at a scene, that is relevant to successful outcomes in cases of OHCA.
- In many communities, there is a fire station with firefighters trained in emergency response who could provide initial first aid until an ambulance or paramedic can arrive, and could then provide assistance to the paramedic team as required.
- The fire and rescue service provides an existing cohort of disciplined people, trained in emergency response, and a management and supervision structure to allow their activities to be monitored and supported.

⁸ Edelson, Abella, Kramer-Johansen et al *Effects of compression depth and pre-shock pauses predict defibrillation failure during cardiac arrest* Resuscitation 2006 71:137-45

⁹ Hightower, Thomas, Stone, Dunn and March, *Decay in quality of closed-chest compressions over time*, AnnEmergMed 1995 26, 300-3

- In terms of the volume of fire calls attended, SFRS has, generally speaking, the capacity to undertake additional medical response work.
- The SFRS might also be able to use its 350-plus fire stations around the country, and qualified staff from its training department, to offer training to community members in CPR and first aid techniques.

Costs

Co-responding comes with attendant costs, both one-off and ongoing. It is important, when considering the implementation of a scheme, that these costs are understood and consideration given to what can be absorbed within existing budgets, and what may require additional funding. Costs include:

- Training and skills maintenance of responders.
- Acquisition and maintenance of defibrillators, oxygen packs and enhanced first aid kits.
- Coordination of dispatch systems to allow simultaneous dispatch of fire and ambulance resources.
- Marginal costs of response, for example staff costs to cover mobilisation payments, fuel, wear and tear on vehicles – for the year 2013-14, the average incident cost for the Maud co-responder scheme was in the order of £120 per call.
- Provision of vehicles and personal protective equipment, where this is considered necessary in addition to existing fire service resources.
- Addressing the administrative requirements of clinical and cross-organisational governance.

Although the costs of a fire-based emergency medical response scheme are relatively small, they should not be ignored – particularly when fire and rescue services are being urged to reduce their budgets. If the fire service is to be asked to support medical response activities, appropriate resourcing would need to be identified to allow this to be implemented properly and supported effectively by managers.

3.3 An opportunity for Scotland

The creation of the single Scottish Fire and Rescue Service has provided a key opportunity for the Service to take stock of the steps that have been taken towards providing medical response using fire and rescue service assets.

Notably, defibrillators have been widely acquired across the predecessor services (with the exception of the former Highlands and Islands Fire and Rescue Service) and so firefighters are knowledgeable about this equipment and how to use it.

Two medical response schemes have been operating in the former Grampian Fire and Rescue Service locations of Maud and Braemar. There is some evidence to suggest that these schemes have added value to their local communities, yet there has been no detailed review or evaluation of their effectiveness and no consideration of expanding the number of stations providing medical response.

The SFRS has more than 350 fire stations across Scotland, many of which are located in rural or remote communities where ambulance or paramedic attendance may be delayed. Equally, numbers of SFRS fire stations with 24 hour staffing are located in urban centres, and may be available to provide an emergency response at times when ambulances in the area are busy on other calls.

We think that the SFRS should now consider in detail whether it could establish partnership working with the SAS so as to provide an emergency medical response from some or all of these locations, and increase the benefit that the SFRS provides to the community.

We have commented elsewhere¹⁰ on the challenges facing the retained duty system (RDS) and volunteer units in Scotland. Occasionally, the required minimum of four crew are not available to attend a retained or volunteer fire station to go to a fire or other emergency – in which case an appliance from a nearby station will go instead. It has been put to us in the course of this inspection that this might act as a barrier to providing emergency medical response from RDS and volunteer stations. In relation to this point we think that the following factors are relevant:

- Typically only two crew are needed to mount an effective medical response – meaning that this service may be available even when the more traditional fire engine response is not.
- Failure by the SFRS to make crews available to respond to a known medical emergency call and deliver potentially life-saving assistance, in case a more traditional fire and rescue call came in, would not in our view be acceptable to the public. In our visits to Maud and Braemar we found no evidence that conflict between medical calls and traditional fire calls is an issue in practice.
- The experience in England has been that the introduction of emergency medical response increases (sometimes, significantly increases) the number of calls being attended by a station. This can have the effect of increasing the availability of a station – because staff are more prepared to make themselves available for emergency calls if there is a greater chance of them dealing with emergency work.
- Even if a crew is not available 100% of the time it would still be providing a life-saving service for the times that it was available.

Existing first responder provision

We are aware of the existing community first responder schemes administered by the SAS in many areas of Scotland and we are also aware of the British Association for Immediate Care (BASICS) scheme which trains and equips local doctors to undertake emergency pre-hospital work. Where an existing community scheme is operating effectively and providing initial medical response to its community, we would not see an imperative for the SFRS to consider basing a parallel scheme in a local fire station. In other words, this report does not suggest that the SFRS is uniquely well-placed to provide these services. We do however offer the following observations based on evidence gathered in the course of our inspection:

- An SFRS-based response could complement (not replace) existing community schemes, securing the attendance of additional personnel to assist in the critical early stages of an emergency.

¹⁰ *Equal Access to National Capacity*, HM Fire Service Inspectorate, 2014

- We have been advised of instances where RDS firefighters are reluctant to participate in non-fire-based first responder schemes as this would make them unavailable to crew the local fire appliance. By undertaking emergency medical response within the SFRS, it is possible to manage these potential conflicts.
- The SFRS provides a ready-made management and command structure for its stations across the country, and the SFRS is experienced in the management of a large, on-call emergency services workforce.
- In many cases the SFRS currently has a trained workforce in an area where there is no community first responder scheme, that with little extra expenditure could be used for emergency medical response as well. To develop a parallel community first responder capability in these areas may represent an unnecessary duplication of effort.
- Although it is not a significant issue in many rural areas, fire service personnel are trained in emergency driving and are able to respond to emergencies under 'blue light' conditions, which community volunteers cannot.

The SFRS has already indicated a willingness to make its fire stations available for training sessions for community first responder groups, and this represents another opportunity to promote closer working between the SFRS and SAS that we endorse.

Joint working

We think that it is fundamental to all of this that future developments are considered in the context of joint working between the SFRS and SAS. Fire-based emergency medical response is not a substitute for an ambulance service – rather, it should complement that service and allow for the delivery of better outcomes to the community. In the past, there has been good work done between the fire and ambulance services in Scotland to work co-operatively and pursue joint initiatives.

It is, however, our view that the proper consideration of fire-based emergency medical response in Scotland requires a transformational change in that relationship. Instead of viewing their respective response activities as separate from each other and requiring only to be co-ordinated at the boundaries, we believe that fire and ambulance services should increasingly see themselves as jointly contributing to attending certain emergency incidents to provide the best possible outcomes for the public, regardless of the nature of the incident.

That does not mean merging the services or attempting to train all responders as experts in all types of incident. There needs to be specialist intervention by trained paramedics at a medical incident just as there needs to be specialist intervention by trained firefighters at a fire. But if fire and rescue service personnel, trained in initial emergency interventions, can attend at medical incidents before the ambulance service is able to get there – and save lives by doing so – then in our view the public would not expect traditional views of what a firefighter does to stand in the way of that.

4 Issues for the SFRS to consider

We recognise that how and to what extent the SFRS and the SAS work together is a matter for those organisations and, primarily, for the Scottish Government. Our role is only to look at and make comment on how effectively the SFRS is performing.

Bearing that in mind, we present the following issues for SFRS to consider:

1. We believe that there is strong evidence that close working between fire and rescue services and emergency ambulance services can provide great benefit to the public. We therefore strongly encourage SFRS to consider how its relationship with SAS can become much closer and to engage with the Scottish Government and the SAS to that end.
2. We think that if best advantage is to be delivered through a new working relationship between the two public services (and by that we mean better services to the public) then a transformational change in the relationship between the two organisations needs to take place.
3. A starting point for the SFRS should be to carry out a formal evaluation of the schemes at Maud and Braemar, to quantify the costs of setting up and managing those schemes, and the benefits that the community has obtained from them.
4. The SFRS should form a view, based on the evidence both from its own experience and available elsewhere, as to whether it will or will not expand the provision of emergency medical response by its staff. In doing so, we acknowledge that the SFRS will need to consider how this fits into its broader strategic assessment of how to provide response services to meet identified risks to the community.
5. We suggest that SFRS sets out a national policy for the distribution and use of AEDs, and that a database of the locations of the equipment and numbers of trained personnel is maintained and shared with the SAS.

Glossary and abbreviations

Throughout this report, at the risk of some repetition, we have minimised the use of abbreviations in the interests of readability. There are some exceptions, particularly where an abbreviation is used so widely within or outside the Scottish Fire and Rescue Service that spelling it out on each occasion would look unnatural. An example is ‘SFRS’ for Scottish Fire and Rescue Service. An explanation of abbreviations used can be found below.

AED	Automated External Defibrillator
BASICS	British Association for Immediate Care
Co-responder	We use ‘co-responder’ in this report to mean a formal arrangement whereby a disciplined service (usually the fire and rescue service) will, as a matter of routine, provide a simultaneous response together with the ambulance service to defined classes of medical emergency.
CPR	Cardio-pulmonary resuscitation
EMR	Emergency medical response
First responder	We use ‘first responder’ in this report to refer to community-based schemes where volunteers from the community will respond on receipt of a call for assistance to defined classes of medical emergency, on the basis that they can reach a patient more quickly than the ambulance service and begin to provide emergency care.
FRS	Fire and Rescue Service
GFRS	Grampian Fire and Rescue Service
OHCA	Out-of-hospital cardiac arrest
Predecessor organisations	The eight fire and rescue services in Scotland, and the Scottish Fire Services College, that were combined into SFRS.
RDS	Retained duty system. Firefighters live and work away from their fire station and are alerted to attend emergency calls by means of a pager.
SAS	Scottish Ambulance Service
SFRS	Scottish Fire and Rescue Service
VF/VT	Ventricular fibrillation/ventricular tachycardia; the two heart conditions that may be successfully treated with defibrillation.
2005 Act	The Fire (Scotland) Act 2005



© Crown copyright 2014

ISBN: 978-1-910349-02-1

HM Fire Service Inspectorate
St Andrew's House
Edinburgh
EH1 3DG

APS Group Scotland
DPPAS36085 (09/14)