Overview

Our new clinical response model (introduced in November 2016) was developed following the most extensive clinically-evidenced review of its type ever undertaken in the UK.

It focuses on improving patient survival and treatment rather than simply measuring the time it takes to respond.

The previous system, introduced over 40 years ago as a one-size-fits-all solution for the whole of the UK and not updated since, was outdated, inefficient and was potentially diverting life-saving resources away from patients in greater need of assistance.

Our new model is based on the very latest available clinical evidence and has informed by patient and staff feedback. England and Wales have already moved to similar models, Wales being first, closely followed by England.

Under the new system, patients with immediately life-threatening conditions, such as cardiac arrest, or who have been involved in serious road traffic incidents, are prioritised and receive the fastest response.

In less urgent cases, call handlers may spend more time with patients to better understand their health needs and ensure they send the most appropriate resource for their condition, first time – not necessarily the nearest or quickest response. This approach takes into account the advances we have seen in clinical expertise in recent years and focuses on patient outcomes. An example would be that under the previous system, the nearest single paramedic in a car or a motorbike may have been sent to a patient with a standard injury (non-life threatening). When the paramedic arrived, the would find that the patient actually needed to be taken to hospital. An ambulance would therefore have to be sent out to take the patient to hospital. In this example, you'd have two resources tied up with one patient – one of which could potentially have been sent to a more critically ill patient in need.

Under the new system, by spending a little bit more time on the phone identifying the condition of the patient in non-immediately life threatening cases, our call handlers can ensure that the right response is sent to the patient, first time, not just the nearest. It also means that we can ensure that if the patient needs to be taken to a specialist facility, for example a stroke or heart condition, then the patient can be taken to this facility rather than just the nearest hospital.

Executive Summary

New Response Model Aims

The 'New Clinical Response Model' (NCRM) aims to;

- Save more lives
- Provide a safer, more efficient and more effective response model by better matching responses to identified patient need based on clinical evidence.
- Improve patient and staff experience

Overview of Response Categories and Results

Purple Response Category

Key Points

The intention was to more accurately identify patients with an immediate need for resuscitation. This meant an expectation of a significant increase in volume in the category. This has been observed as predicted.

Inclusion criteria: include cardiac arrest rate over 10%.

Response: Two closet emergency resources with a minimum of three clinicians attending

Results:

- 43% increase in 30-day survival (23.9% - 34.1%) for all patients in the Purple Category (1182 people). This is based on analysing linked 30 day survival data.
- The cardiac arrest rate in the purple basket was 52% in the first year of the pilot, indicating that we are more accurately identifying patients likely to go into cardiac arrest and ensuring they get our fastest response.
- 21% increase in patients in Cardiac Arrest achieving Return of Spontaneous Circulation (i.e patients who have a pulse when they arrive at hospital after suffering a cardiac arrest)
- 100% increase in double responding to these codes in first year of NCRM (i.e attempting to ensure two separate crews are on scene in cardiac arrest cases as evidence shows this increases the chances of survival).
- Median and 90th percentile response time maintained following NCRM introduction – this is despite a significant increase in call volume in this category

Red Response Category

Key Points

Modelling demonstrated that patients had a defined need for specific clinical assessment and care on scene.

Based on clinical need some codes were re-triaged to other response categories after more detailed questioning by call handlers about the patient's condition. The expectation therefore was that there would be a significant reduction in red call volume compared with the previous Cat A cohort. This has been observed as predicted.

Inclusion criteria: include cardiac arrest rate between 1% and 10%.(Actual figure is 1.5%)

Response: Immediate dispatch of nearest SAS resource and if this is not a conveying or paramedic resource, appropriate automatic back up is allocated.

Results:

- No observed change in 24 hour or 30 day survival.
- Median and 90th percentile response times maintained following NCRM introduction.
- Clinical interventions identified were as predicted by the pre NCRM modelling.

Amber Response Category

Key Points

The modelling demonstrated a cohort of patients who had a high requirement for diagnosis and conveyance to definitive care but a low requirement for immediate resuscitation. This included many patients with chest pain and suspected stroke. The expectation was that there would be a significant increase in call volume in this category. This has been observed as predicted.

Inclusion criteria: cardiac arrest rate under 1% (actual figure 0.3%) but high likelihood of need for conveyance to definitive care.

Response: identification and dispatch of nearest conveying resource with the preferred clinical skill set available

Results;

- No increase in cardiac arrest rate for patients moved from Cat A to Amber response category.
- Dispatch of best and most appropriate resource increased from 77.3% to 86.4% following NCRM introduction.
- No observed changes in 24 hour or 30 day survival data
- Increase in number of STEMI cases identified and taken directly to a specialist facility for treatment (i.e we were able to better identify heart attack patients and then take them to a specialist unit for further care, rather than just the nearest hospital).

Yellow Response Category

Key Points

This cohort of patients presented with a low need for immediate resuscitation and a variety of clinical responses that required a face to face consultation and assessment with onward care options including on scene definitive care or referral to the nearest Emergency Department. A range of responses had been defined and ongoing testing of appropriate response is progressing. There was an expectation that volumes of calls in this category would remain broadly similar. This has been observed as predicted.

Inclusion criteria: cardiac arrest rate under 1% (actual figure 0.1%) and no clinical need for definitive care pathway (e.g a specialist facility like a PCI or stroke unit)

Response: identification and dispatch of the nearest appropriate resource. The type of resource and skill set are determined by the individual code and resource availability.

Results

- Low rates of deterioration and stable mortality rates.
- Optimal dispatch of most appropriate resource for the patient's condition increased from 85.8% to 93.1% post NCRM launch.
- Significant reduction in 'stand down' (where a crew is already on their way to the patients address, and subsequently instructed to stand down) post launch of Dispatch on Disposition

Conclusions

Changing the triage system for emergency care within the Scottish Ambulance Service has been a complex and complicated process. The new system of care required redesign across the service from patient call to definitive care to achieve the aim of responding based on clinical need and in doing so improve outcomes.

The systematic review of the data provided a clear evidence base for change. Implementing the changes required staff support and the new system was co-designed with frontline staff with the recognition that improvement was required to be more efficient and effective as a service. Several highlights from the data demonstrate the following improvements

- The model is working well and as planned, particularly in relation to the identification response and improved outcomes for our most seriously unwell patients.

- The modelling predictions carried out pre-launch and post new clinical response have been realised. This has been validated by the data captured since NCRM launch, supporting the validity of the response category descriptors.

- The purple response category shows an improvement in 30 day survival rates from 23.9% pre NCRM to 34.1% post NCRM, an increase of 43%. The survival data shows that this equates to 1182 people.

- Response times are stable across the system for our most acutely unwell patients (purple and red categories).

- During the pilot year, the Amber median and 90th percentile response times have shown improvement. Median response has reduced from 11.02 minutes to 10.43. 90th percentile has reduced from 23.87 minutes to 20.95. (Distribution Graph 5)

- In the Amber category, there has been a welcome increase in the number of patients with chest pain overall and the sub set of patients presenting with STEMI conveyed to a specialist facility for treatment – Percutaneous Coronary Intervention (PCI) centres, rather than the nearest hospital. The model has demonstrated it has effectively dealt with this increase and this volume will be continually reviewed

- There has been an increase in response times to patients in the yellow codes as expected. However, linked mortality data appears to be stable for this category of patients who are at lower clinical risk. We recognise, however, that there is more improvement work to do for this category of patients and

are implementing new approaches to improve our response. (Distribution Graph 8 and Table 16).

- With the use of median and 90th percentile response data, this has improved SAS ability to understand and manage demand for all of patients and presents a much improved measurement framework than the previous 75% in 8 minute target for only 32% of our patients.

- There have been no Serious Adverse Events reported related to the new response re-triage and clinical hierarchy.

- There is evidence of improved efficiency and more accurate allocation of resources since NCRM implementation. There has been an increase in allocation of the right resource first time, with a reduction in inappropriate double resourcing to amber and yellow calls (Run chart 5).

11   Recommendations

- Implement the system and process changes developed within the pilot period of NCRM to business as usual within SAS.

- As with services in England and Wales, replace the 8 minute response target with agreed median and 90th percentile measures for patients in the defined categories to allow a more accurate and meaningful analysis of performance.

- Create additional quality indicator measures that focus on patient and staff outcomes, continually developing how this data for improvement is actively shared with clinicians.

- Continue to work to improve the experience of patients within the yellow category who are waiting longer.

- Further focus on how SAS can deliver effective care to patients in the yellow response category, developing access to alternative care pathways from face to face or additional telephone triage in line with the Service's 2020 Strategy.

- Continue to review demand and capacity and implement models that ensure a better match of resourcing to demand.

- Continue to invest in the additional workforce requirements determined by the independent demand and capacity modelling review (May 2018).

- Continue to showcase our work in SAS as a key part of Scotland Health and Care system, nationally and internationally.