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How consistent are Pre-alert Guidelines? Review of UK ambulance service guidelines.

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Aims: Ambulance pre-alerts are used to inform receiving emergency departments (EDs) of the arrival of critically unwell or rapidly deteriorating patients who need time-critical assessment or treatment immediately upon arrival. Inappropriate use of pre-alerts can lead to EDs diverting resources from other critically ill patients. However, there is limited guidance about how pre-alerts should be undertaken, delivered or communicated. We aimed to map existing pre-alert guidance from UK NHS ambulance services to explore consistency and accessibility of existing guidance.

Methods: We contacted all UK ambulance services to request documentation containing guidance about pre-alerts. We reviewed and mapped all guidance to understand which conditions were recommended for a pre-alert and alignment with AACE/RCEM pre-alert guidance (2020). We reviewed the language and accessibility of guidance using the Agree II Tool

Results: We received responses from 15/19 UK Ambulance Services. Five had no specific pre-alert guidance. We identified noticeable variations in conditions declared suitable for pre-alerts in each service with a lack of consistency within each ambulance service's own guidance, and alignment with the AACE/RCEM pre-alert guidance. Services listed between 4–45 different conditions suitable for pre-alert. There were differences in physiological thresholds and terminology, even for conditions with established care pathways (e.g. hyperacute stroke, STEMI).

Pre-alert criteria were typically a short section in lengthy handover procedure policy documents. Documents appraised were of poor quality with low scores below 35% for applicability and overall.

Implications:

There is a clear need for ambulance services to have both policies and tools that complement each other and incorporate the same list of pre-alertable conditions. Clinicians need a single, easily accessible document to refer to in a time critical situation to prevent confusion and reduce risk to clinicians making an incorrect pre-alert decision by not using the policy, tool and guidance.

Introduction

Ambulance clinicians can use pre-alerts calls to alert receiving Emergency Departments (ED's) and other hospital departments of the imminent arrival of a patient who will require immediate senior clinical review. The use of pre-alerts can help EDs to prepare for the arrival of the patient and can lead to improved time-critical treatment for certain patient groups (Sheppard et al, 2015, Ahmed et al, 2019, Hunter et al, 2019)). However, over- or inappropriate use of pre-alerts can cause incivility and tension between ambulance and ED staff and may lead to pre-alerts not being responded to appropriately (Carberry & Harden, 2016). The Association of Ambulance Chief Executives (AACE) and Royal College of Emergency Medicine (RCEM) (2020) collaborated to produce clinical guidelines that would help to bridge uncertainty in pre-alert practice. As part of this process, the leaders noted a lack of consistency between existing guidance and the views of ambulance and ED professionals involved in developing the guidance.

As part of a wider study designed to understand the impact of pre-alerts on Ambulance Service and ED staff and patients, we undertook an appraisal of the existing ambulance service guidance on pre-alerts to identify areas of uncertainty or conflict and explore how the guidance differed between different services and from the AACE/RCEM guidelines.

Methods

This study is a part of a wider mixed methods research study. We wrote to Research Leads, Medical Directors and Heads of Education in all 19 UK ambulance services (those covered by AACE guidelines) to ask for their latest pre-alert guidance documents. We summarised the clinical conditions recommended for each ambulance service and described the guidance in terms of areas of uncertainty, accessibility, clarity and focus.

We assessed guidance quality using the AGREE2 Reporting Checklist (AGREE Next Steps Consortium, 2017) for clinical guidelines. The checklist uses 6 domains, incorporating 23 questions: 1- Scope and Purpose, 2- Stakeholder Involvement, 3- Rigour of Development, 4- Clarity of Presentation, 5- Applicability and 6- Editorial Independence. Two appraisers assessed all of the guidelines, in a variety of formats including policies, SOP's and clinical alerts. Any element that was omitted from the document was given the minimum score of 1 in the appraisal domain. There are no appraisal tool that appraise different types of documents.

Results

We received responses from 15/19 Ambulance Services; we did not receive responses from Gibraltar, Guernsey, Jersey or Northern Ireland. Two Ambulance Services said they had no specific pre-alert guidance; Scottish, and Republic of Ireland. Two ambulance services reported they thought there was specific guidance in their trust, but were unable to locate it East Midlands and North East. The Isle of Man strictly only uses AACE/RCEM guidance. South East Coast did send information pertaining to the process of prealerts, but nothing regarding pre-alertable conditions.

Clinical conditions recommended for pre-alert.

We have summarised the recommended thresholds for pre-alert for a subset of conditions, which were listed most frequently in ambulance service pre-alert guidelines in Table 1. All services that had a documented list of pre-alert conditions were included..The table illustrates significant inconsistencies in the criteria for pre-alerts and the language and terminology used, even for time critical conditions with known care pathways, such as STEMI (National Institute for Health and Care Excellence, 2014)) or Stroke (National Institute for Health and Care Excellence, 2022). Criteria such as 'altered physiology' which have objective cut offs, have different thresholds for pre-alerting across the country. Respiratory rates with a lower thresholds varied between 8 and 10, with upper thresholds ranging from ≥25 to >30. No two ambulance services had the same threshold for pre-alerting GCS, with 9 different ways of describing a reduced GCS being reported. Some were very vague – using the ACVPU scale, whilst others used more specific scores including a GCS motor score of <4, or a fall of >2 since initiating patient contact.

Few conditions were recommended for pre-alerts by multiple services with most conditions not listed as pre-alert-able by any more than three services. Conditions that were frequently reported as pre-alert-able included airway compromise, respiratory arrest, cardiac arrest, STEMI, lowered GCS, FAST positive, uncontrolled seizure/currently fitting and obstetric emergencies. Clinician concern was listed as criteria for pre-alert from every ambulance service. There were considerable differences in guideline specificity, with some services listing no specific conditions, and other listing as many as 45 separate conditions.

Whilst all the services did indicate that the AACE/RCEM guidelines should also be consulted, there was often an overlap in the trust specific guidelines. Conditions such as cardiac arrest, or strokes were usually mentioned in the trust's own guidelines, however a considerable number of conditions were omitted from trust guidelines.

Table 1: Recommended thresholds for pre-alert

	AACE/JRCalc	**East of England**	**London**	**North West**	**South Central**	**South Western**	**West Midlands**	**Yorkshire**	**Welsh**	**Isle of Wight**
Matched with RCEM/AACE Guidelines	-	3/23	4/23	6/23	10/23	7/23	19/23	10/23	10/23	4/23
Respiratory Rate	-			RR <10 or >30 for adults	Abnormal Breathing Rate, or Irregular breathing pattern (e.g. Cheyne Stokes Breathing)	RR<10 or >29 (for adults)	RR ≤8 or ≥25	RR ≤8 or ≥25		NEWS >7
Chest pains	ST elevation MI Complete heart block or broad complex tachycardia with adverse features (shock, syncope, heart failure, myocardial ischaemia)		Current Cardiac chest Pain, with abnormal ECG (e.g. heart block, BBB)	STEMI, or Cardiac Chest pain where cardiac cause is suspected	STEMI, or patients with signs of cardiogenic shock	STEMI, or circulatory compromise	STEMI, or incomplete heart block	STEMI	ST Elevation indicative of an MI for early thrombolysis, or haemodynamically unstable with signs and symptoms of shock.	
GCS	Unconscious with a GCS motor score of less than 4		Reduced ACVPU	GCS <8	P/U on ACVPU scale, or injured with GCS Motor Score <4	GCS <14	Unconscious with GCS Motor Score <4		Trauma patients with GCS <9 or fall of >2 since patient contact. Medical patients – Unconscious	

Stroke	FAST-positive stroke within timeframe for thrombolysis	Use BE-FAST Standardised frame work	Any new limb weakness, speech impairment, sudden change in behaviour, FAST +ve	New Stroke with symptom onset of no more than4hours	Acute Stroke (FAST positive) being transported directly to a Hyper-acute Stroke Unit (HASU) Clinical suspicion of intracranial bleed e.g. sub-arachnoid haemorrhage	FAST positive stroke	FAST Positive and within time frame for thrombolysis	FAST Positive		

There was no specific pre-alert guidance available for EMAS, NEAS, SECAMB, Republic of Ireland or Scottish Ambulance Service.

Isle of Man had no conditions consistent with RCEM/AACE guidance, so has been omitted from this table.

Table 2: Accessibility of pre-alert guidance

	LAS		NWAS	SCAS		WMAS	SWAST	SECAmb
Name of Document	Managing the conveyance of Patients Policy and Procedure	Requesting Clinical Support and Advice	Hospital Standby/Pre-alert Information	Emergency Department Pre-Arrival alert criteria for SCAS Personnel	SCAS ED Pre-arrival alert Criteria	Pre-alerting of Patients	ATMIST Early and Pre-alerts	Clinical Handover and Transfer of Care Procedure
Date of issue	May 2019	August 2021	April 2015	February 2019	January 2019	October 2020	February 2018	November 2019
Type of document	Policy	Clinical update	Clinical update	Clinical update	Reference table	Clinical update	Clinical update	Policy
Mnemonics used	CASMEET	SBAR	ASCHICE	Avoid SBAR, Re-introducing ATMIST		ATMIST	ATMIST	ASCHICE
Who makes the pre-alert	Conflicting information. Clinician calls EOC – passes pre-alert onto receiving ED. Also states clinician pre-alert receiving unit directly	Clinician on scene	Inform EOC or Trauma Cell – does not define who will pass on the message	SCAS Staff (presumed on scene clinician)		Specifically notes EOC do NOT pass pre-alerts on from ambulance clinician. Medical – Ambulance clinician; Trauma – ATMIST to RTD	Lead Ambulance Clinician	Most Senior Clinician

When		When requested, or when additional clinical support required		ASAP with follow up call 10 minutes prior to arrival		ASAP	ASAP (even if not yet mobile – just state you are not yet mobile)	
Reference to JRCalc?	No	Yes – use checklist (Could be for cardiac arrest, or SBAR – no specific criteria listed)	No	No	No	YES	NO – states it replaces JRCalc Guidelines (others are usually in conjunction with)	No

Table 2 cont.	YAS		Welsh	Isle of Man	Isle of Wight	SMTN	RCEM
Name of Document	Assessment, Conveyance and Referral of Patients (Emergency Operations)	Pre-alert and Handover Guidance	Hospital pre-alert and Patient handover	Conveyance and referral policy	Ambulance Pre-alert process Clinical Number 27	UK NHS Ambulance Services pre-alert guideline for the deteriorating adult patient	UK NHS Ambulance Services pre-alert guideline for the deteriorating adult patient
Date of issue	March 2017	September 2019	May 2010	April 2021	July 2020	September 2020	September 2020
Type of document	Policy	Policy	SOP	Policy	Instructions & Procedures	?	Guideline
Mnemonics used	MTCTC ATMIST SBAR NEWS	MTCTC SBAR ATMIST NEWS2	ATMIST SBAR ASCHICE		ATMIS ASSET	ATMIST SBAR	ATMIST SBAR ED
Who makes the pre-alert	By Clinician. Must also pre-alert MTCTC for Major Trauma	By Clinician. Must also pre-alert MTCTC for Major Trauma	Crew to EMS Control – EMS Control to Receiving hospital department	Ambulance crew	Operational/Tactical Commander > Attending Clinician > emergency Vehicle Operator	Ambulance clinician	Ambulance Clinician
When	10 minutes before reaching the receiving hospital	10 minutes before reaching the receiving hospital					

Reference JRCalc	No.	No	Yes			This is the JRCalc Guidelines	N/A

Services that sent no guidelines have been excluded.

Clinical Update * - Or equivalent. A short email memo, usually sent via bulk email to clinicians.

Acronyms

- Halo - Hospital Ambulance Liaison Officer
- AOC - Ambulance Operations Centre
- SitRep - Situational Report
- TOC - Tactical Operations Commander
- DTC - Duty Tactical Commander
- NHSE/I - NHS England and NHS Improvement
- ED – Emergency Department

ASCHICE – Age, Sex, History, Injuries/Illness, Condition, ETA

- CASMEET – Callsign, Age, Sex, Mechanism of Injury/Mode of Illness, Examination, ETA, Treatments already provided
- ATMIST – Age (name and DOB), Time of Onset, Mechanism of Injury/Medical Complaint, Injuries, Signs, Treatment given
- RTD - Red Trauma Desk
- SBAR – Situation, Background, Assessment, Recommendations
- ABCDEF - Airway, Breathing, Circulation, Disability Environment, F
- ASSET - Age, Signs Symptoms, ETA, Treatment

Accessibility of pre-alert guidance

We identified significant variation in format and accessibility of pre-alert guidance. Only one service had a policy specifically for pre-alerts, with other services including the pre-alerts guidance within wider policies on patient care processes and ambulance personnel responsibilities during the patient journey. Policy documents focussed principally on process issues around how the pre-alert should be undertaken (e.g. pressing the correct buttons on vehicle MDT systems, at hospital and, collecting hospital staff handover pins in a timely manner) to enable accurate documentation of hospital handover and ambulance turnaround times, rather than the clinical conditions that required a pre-alert. Many policies also documented in detail how handovers should be escalated should they be breaching the set 15-minute target, and some services had separate policies dedicated to this.

The information specific to pre-alerts was usually a small section, buried in a lengthy policy which is inaccessible to a clinician in a time critical scenario. Very few services replicated this information in a 'Tool' that would be easy to use whilst treating a patient. The services that did have a tool, did not refer to this in their policies or add the tool as an appendix.

When requesting information, staff contacted, including Medical Directors, Research Teams and Head of Education were sometimes unable to locate the pre-alert guidance, not knowing how or where to locate it, or whether guidance existed. If clinicians are unable to easily locate policies they are supposed to use, they will not be able to use them, and are at risk of being disciplined should they deviate from the policy. In addition, some policies defined additional, non-clinical conditions for which a pre-alert was required, for example, when attending hospital with multiple patients from one incident, child safeguarding concerns, patients attending with police, or in one service any patient that requires a bed requires a pre-alert.

Quality of guidance The AGREE-2 checklist is intended to evaluate guidelines rather than evaluate policies or tools but was used to identify areas where future guidance could be improved. Where trusts submitted multiple documents we used the document that listed pre-alert conditions rather than just processes.

Table 3.0 – Mean appraisal scores for each domain for each document. Scores are out of 100

Domain	EEAST	LAS	NWAS	SCAS	SECAMB	SWAST	WMAS	YAS	Welsh	Scottish	IoM	IoW	AACE/ RCEM
1 – Scope and Purpose	**14**	**57**	**39**	**8**	**39**	**81**	**83**	**53**	**72**	**0**	**64**	**47**	**53**
2 - Stakeholder Involvement	**0**	**27**	**8**	**0**	**14**	**11**	**42**	**50**	**14**	**0**	**41**	**8**	**33**
3 – Rigor of Development	**13**	**21**	**2**	**2**	**4**	**4**	**4**	**4**	**6**	**2**	**8**	**2**	**5**
4 – Clarity of Presentation	**11**	**30**	**52**	**63**	**69**	**56**	**58**	**58**	**50**	**11**	**36**	**39**	**78**
5 – Applicability	**0**	**6**	**10**	**16**	**2**	**33**	**44**	**25**	**21**	**8**	**14**	**29**	**18**
6 – Editorial Independence	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Appraiser approved	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**Yes**
All	**6**	**23**	**19**	**15**	**21**	**31**	**38**	**31**	**27**	**4**	**27**	**21**	**31**

Score of <25 is a good score.

EMAS omitted as no guidance or policies sent.

Where trusts submitted multiple documents, the document that detailed specific pre-alert conditions was used.

Assessment of quality identified variation in quality of guidance as assessed by the AGREE2 tool. However, there were clear differences in quality of guidance across wider domains. Guidance could score well across the wider domains but lack usability from an ambulance clinician perspective. For example, one 70 page policy included full details of how the guidance was developed, but lacked accessibility or clarity of criteria for an ambulance clinician to reference on scene. Appraisers were asked if they would use the tool. The tools they reported they would use, had lower overall ratings..

Due to the nature of how policies are written, policies scored better in many domains of the AGREE tool, despite not being as user friendly. Guidance that scored better (25/100 or more) were user-friendly and provided key information in an easy-to-read form at the beginning of the document. Undertaking the quality assessment identified simple ways in which the guidance could be improved. For example, the AACE/RCEM guidance does not provide detail of who needs to undertake the pre-alert, does not state who the guidance is for and loses quality marks as it cross-references other tools (JRCALC) and local policy.

Discussion

We identified significant differences in content, quality and accessibility of guidance across UK ambulance services. Despite the importance of undertaking pre-alerts consistently and appropriately, the criteria for pre-alerts differed considerably between ambulance services, with a wide range of reference values used as well lack of consistency in acronyms. Such differences lead to post code lotteries, with patients needing to be more unwell with worse physiological observations in some areas, than in other areas, in order to hit pre-alert thresholds for immediate intervention upon arrival at hospital. Moreover, the lack of consistency in terminology between ambulance services, leads to breakdowns in communication when pre-alerting hospital staff as the language used is not the same. This will be increasingly likely when receiving units on border receive pre-alerts from multiple ambulance services.

Current pre-alert guidance in some ambulance services focuses largely on the technological processes of pre-alerting and handover (i.e. measurable process issues), rather than patient care. Although timely care is key and government targets are important for measuring service availability, this does not measure the quality of the care provided to the patient during the interaction. The quantity of text focussed on the clinical side of pre-alerts, versus the processes surrounding pre-alerts and handover imply that meeting government targets is of higher importance than providing high quality patient care. Going forward, we need to ensure we create policies and tools that are accessible for a patient facing clinician, and specific to treating the patient.

This research is limited in that the appraisal tool use does not cater to different types of documents and biases ‘policies, over other forms of documents. There is a clear need for ambulance services to have both policies and tools that complement each other and incorporate the same list of pre-alertable conditions. The former is required for documenting the entire process, to understand how the policy was developed and by who, to track changes over time, and to document the correct procedure to staff and the public. Tools are required for quick reference in a time critical situation.

Clinicians should only have one single document to refer to in a time critical situation to prevent confusion and reduce risk to clinicians making an incorrect pre-alert decision by not using the policy, tool and guidance. Individual ambulance services may add region-specific guidance but should not omit conditions from the RCEM list of pre-alert conditions on their own tools. Similarly, any tool should be easy for a clinician to refer to in a time critical situation, and not refer clinicians to another piece of guidance. The tool also needs to use language that is consistent with the terminology used at the receiving hospitals, to prevent confusion and ambiguity.

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