National Quality Improvement Project 2018/2019
Vital Signs in Adult
Information Pack

Introduction

The Vital Signs standards were originally developed and published in 2010 through a partnership between the Royal College of Emergency Medicine, the Royal College of Nursing, the Faculty of Emergency Nursing and the Emergency Nurse Consultants Association. This is the second time this audit has been conducted against the standards.

The reception of patients and the initial encounter with clinical staff is where the patient journey begins. The clinical priority is determined by the presenting symptoms and the recording of vital signs, and this is a foundation of clinical quality. Historically much communication has been verbal, and there has not been a standard practice for recording the patient action plan which is required by these standards.

The previous audit, conducted in 2010/11 found Pulse (97%), BP (97%), O_2 saturation (96%) and respiratory rate (92%) were well recorded. Temperature (88%) and GCS or AVPU (77%) were less well recorded. When the patient is alert and talking GCS/AVPU is not routinely recorded in all departments.

The proportion of departments measuring the six vital signs within 20mins was is in the region of 50% - 60%. One in 10 EDs met the standard in less than 33% of cases for pulse, 32% for BP, oxygen saturation and respiratory rate, 31% for temperature and 18% for GCS (or AVPU). The percentage of audited notes where abnormal vital signs were observed varied greatly between EDs (from 8% to 98%) which suggests considerable variation in patient acuity. The national mean value was 41%.

The repeated measurement of vital signs within 60min standard was met for pulse in 25% of cases, BP and O_2 saturation 23%, respiratory rate 22%, GCS (or AVPU) in 17% and temperature in 16% of cases. One in 10 EDs met the standard in less than 5% of cases for oxygen saturation, 4% for pulse and respiratory rate, 3% for BP and not at all for temperature and GCS (or AVPU). Patients may have left the ED before vital signs could be repeated.

Nationally there was evidence in the notes that in 47% of relevant cases showing abnormal vital signs appropriate action had been taken.

Methodology

Inclusion criteria
Patients must meet the following criteria for inclusion:

- Adults **18 years of age and over**
- Presenting to an ED
- Triaged to the majors area of the ED

Exclusion criteria
Do **not** include:

- Children or adolescents under the age of 18
- Patients presenting to minors or resus

For further information about using ECDS or your ED's electronic patient record to identify relevant cases, and to extract data from your system, please see the appendix 1 and 2.

Flow of data searches to identify audit cases
Using codes in the appendix first identify all patients attending your ED between the relevant dates, then by age at time of attendance, then through the other relevant criteria.

If your ED is reliably using the Emergency Care Data Set (ECDS), then your IT department should be able to a) pull off a list of eligible cases for you, and b) extract some or all of the data you need to enter. Please see appendix 1 and 2 for the list of codes they will need to identify eligible cases or extract the data.

Data Entry Information

Sample size and data frequency

The RCEM clinical audits have had a major upgrade, providing you with a range of new features and quality improvement tools. These include a live data dashboard, tracking how your data changes weekly on run charts, and the ability to have your own PDSA cycles added to your charts.

Recommended: To maximise the benefit of the new run charts and features RCEM recommends entering **5 consecutive cases per week**. This will allow you to see your ED's performance on key measures changing week by week.

Alternative: If your ED will find weekly data entry too difficult to manage, you may wish to enter data monthly instead. The system will ask you for each patient's arrival date and automatically split your data into weekly arrivals, so you can get the benefit of seeing weekly variation.

Expected patient numbers	Recommended sample size	Recommended data entry frequency
<5 a week	All patients	Weekly
>5 a week	5 consecutive patients	Weekly
Expected patient numbers	**Alternative sample size**	**Alternative data entry frequency**
<5 a week	All patients	Monthly
>5 a week	20 consecutive patients	Monthly

Data collection period

Data should be collected on patients attending from 1 August 2018 – 31 January 2019.

Data submission period

Data can be submitted online at the link below from 1 August 2018 – 31 January 2019. You can find the link to log into the data entry site at www.rcem.ac.uk/audits

Data Sources

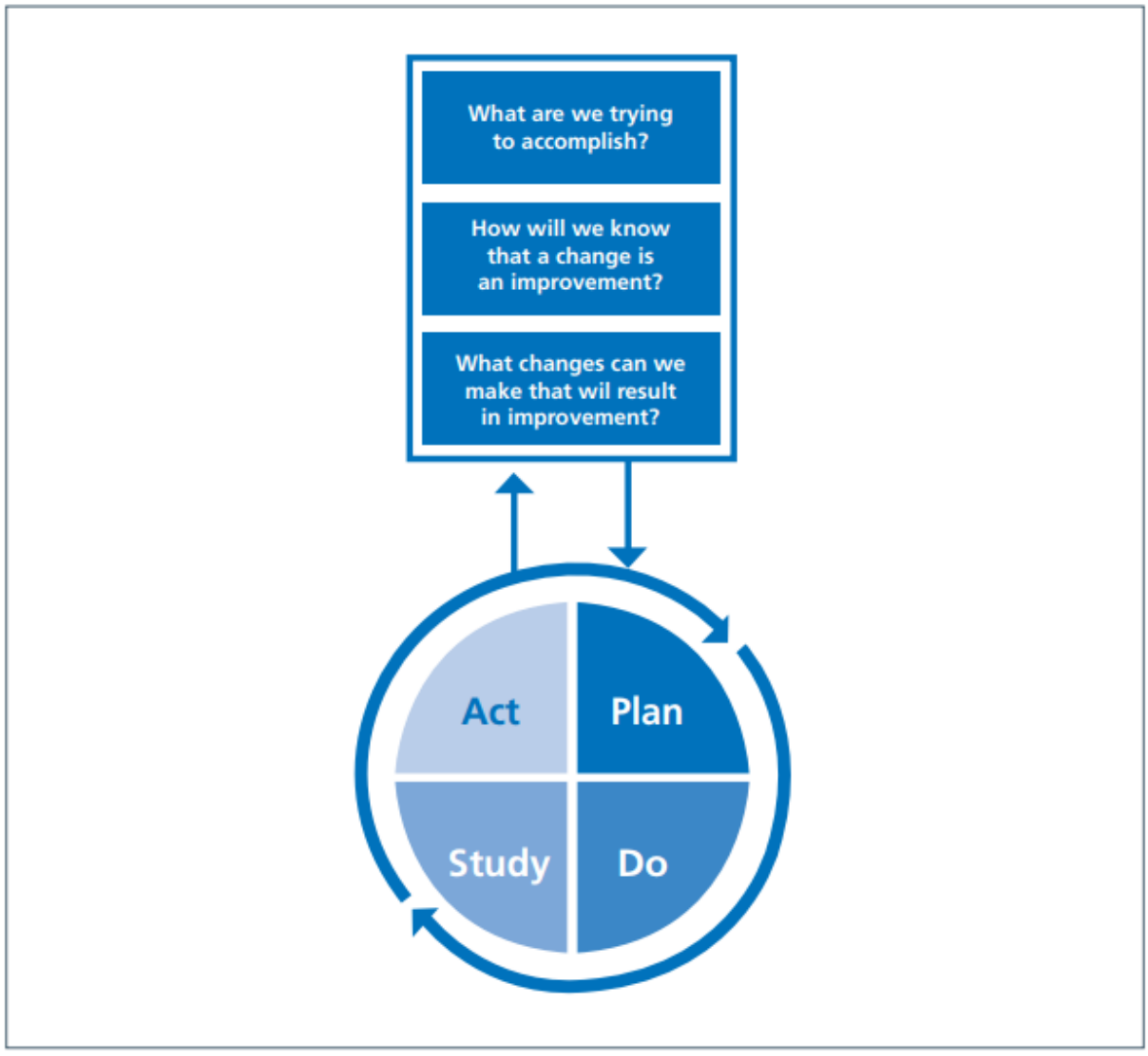
ED patient records (paper, electronic or both).

Quality improvement information

The purpose of clinical audit is to quality assure and quality improve your service where it is not meeting standards. The new RCEM system allows your team to record details of quality improvement projects (QIP) and see on your dashboard how each initiative affects your data on key measures.

We encourage you to use this new feature to try out QIPs in your department. If you are new to QIPs, we recommend you follow a Plan Do Study Act (PDSA) methodology. The Institute for Healthcare Improvement (IHI) provides a useful worksheet which will help you to think about the changes you want to make and how to implement them.

The model for improvement, IHI



Standards

STANDARD	GRADE
1. Patients triaged to the majors or resuscitation areas of the ED should have the following measured and recorded in the notes within 15 minutes of arrival or triage, whichever is the earliest: • respiratory rate • oxygen saturation • pulse • blood pressure • GCS or AVPU score • temperature	F
2. Patients with abnormal vital signs, should have their vital signs repeated and recorded in the notes within 60 minutes of the first set of observations	D
3. There should be explicit evidence in the ED record that the clinician recognised the abnormal vital signs (if present).	D
4. There should be documented evidence that the abnormal vital signs (if present) were acted upon in all cases.	F

Grade definition

F - Fundamental: need to be applied by all those who work and serve in the healthcare system. Behaviour at all levels and service provision need to be in accordance with at least these fundamental standards. No provider should provide any service that does not comply with these fundamental standards, in relation to which there should be zero tolerance of breaches.

D - Developmental: set requirements over and above the fundamental standards.

A - Aspirational: setting longer term goals.

Standards definitions

Standard	Term	Definition
2	Abnormal vital signs	The following criteria may be used to define abnormal vital signs in adults which should be acted on (if you have locally defined abnormal vital signs you may use those instead): a) Respiratory rate < 10 **or** > 20 per min b) Oxygen saturation < 92% c) Pulse < 60 **or** > 100 d) Systolic blood pressure < 100 **or** > 180 e) GCS < 15 or less than Alert on AVPU f) Temperature < 35 **or** > 38 g) MEWS score ≥2 = "abnormal parameters"

Audit questions

Case mix

1.1	Reference (do not enter patient identifiable data)	
1.2	Date and time of arrival or triage – whichever is earlier	dd/mm/yyyy HH:MM

Vital signs

2.1	Were the following vital signs measured and recorded?			
	Tick all applicable:	*Time (leave blank if unknown)*	*Date (for use if different to date of admission)*	*No (select option where applicable)*
	a) Respiratory rate	HH:MM	dd/mm/yyyy	• No – but the reason was recorded • Not recorded
	b) Oxygen saturation	HH:MM	dd/mm/yyyy	• No – but the reason was recorded • Not recorded
	c) Pulse	HH:MM	dd/mm/yyyy	• No – but the reason was recorded • Not recorded
	d) Systolic blood pressure	HH:MM	dd/mm/yyyy	• No – but the reason was recorded • Not recorded
	e) GCS score (or AVPU)	HH:MM	dd/mm/yyyy	• No – but the reason was recorded • Not recorded
	f) Temperature	HH:MM	dd/mm/yyyy	• No – but the reason was recorded • Not recorded
2.2	Were the vital signs recorded as a part of a formalised scoring system?			• Yes (please specify: _____) • No

Abnormal vital signs

3.1	Were any of the recorded vital signs abnormal (as defined in the audit standards)?	• Yes • No
3.1a	➔ If 3.1 = yes: Is there specific evidence in the ED record that the clinician recognised the abnormal vital signs?	• Yes • No
3.1b	➔ If 3.1 = yes: Is there evidence in the ED record that the abnormal vital signs were acted upon?	• Yes • No

Repeat vital sign recording

4.1	Was a repeat set of vital signs recorded in the ED record?		
	Tick all applicable:	*Time (leave blank if unknown)*	*Date (for use if different to date of admission)*
	• Respiratory rate	HH:MM	dd/mm/yyyy
	• Oxygen saturation	HH:MM	dd/mm/yyyy
	• Pulse	HH:MM	dd/mm/yyyy
	• Systolic blood pressure	HH:MM	dd/mm/yyyy
	• GCS score (or AVPU)	HH:MM	dd/mm/yyyy
	• Temperature	HH:MM	dd/mm/yyyy
4.2	(Only answer if YES to 4.1) Were any of the recorded repeat vital signs abnormal (as defined in the audit standards)?	• Yes • No	

Discharge

5.1	Was the patient discharged home?	• Yes • No
5.1a	(Only answer if YES to Q5.1) When the patient was discharged home, were their vital signs normal?	• Yes • No • Not recorded
5.1b	(Only answer if YES to Q5.1) Is there documented evidence of review by a senior doctor (ST4 or above in emergency medicine or equivalent non-training doctor)?	• Yes • No

Notes
(Optional space to record any additional notes for local use)

Question and answer definitions

Term	Definition
Discharged home	Home or their normal place of residence
Abnormal vital signs	The following criteria may be used to define abnormal vital signs in adults which should be acted on (if you have locally defined abnormal vital signs you may use those instead): h) Respiratory rate < 10 **or** > 20 per min i) Oxygen saturation < 92% j) Pulse < 60 **or** > 100 k) Systolic blood pressure < 100 **or** > 180 l) GCS < 15 or less than Alert on AVPU m) Temperature < 35 **or** > 38 n) MEWS score ≥2 = "abnormal parameters"

Evidence base for standards

The audit standards have been checked for alignment with National Institute for Health and Care Excellence

STANDARD	EVIDENCE
1. Patients triaged to the majors or resuscitation areas of the ED should have the following measured and recorded in the notes within 15 minutes of arrival or triage, whichever is the earliest: • respiratory rate • oxygen saturation • pulse • blood pressure • GCS or AVPU score temperature	
2. Patients with abnormal vital signs, should have their vital signs repeated and recorded in the notes within 60 minutes of the first set of observations	
3. There should be explicit evidence in the ED record that the clinician recognised the abnormal vital signs (if present).	
4. There should be documented evidence that the abnormal vital signs (if present) were acted upon in all cases.	

Appendix 1: ECDS Search terms to support case identification

These codes will help you and your IT team to identify cases that may be eligible for the audit. This is not an exhaustive list and other search terms can be used. All potential patients should then be reviewed to check they meet the definitions & selection criteria before inclusion in the audit.

Inclusion criteria	ECDS data group	ECDS data item	M/R /O	Format	Start value	Finish value	DM&D Code	DM&D Description	SNOMED code	SNOMED description
Start of data capture period	EC attendance activity characteristics	EMERGENCY CARE ARRIVAL DATE	M	an10 CCYY-MM-DD	2018-08-01	2019-01-31	-	-	-	-
	EC attendance activity characteristics	EMERGENCY CARE ARRIVAL TIME	M	an8 HH:MM:SS	00:00:01	23:59:59	-	-	-	-
Adults 18 years of age or over	Patient Identity	PERSON BIRTH DATE	R	an10 CCYY-MM-DD	2000-08-01	2001-01-31	-	-	-	-
		AGE AT CDS ACTIVITY DATE	M	max an3	18 +		-	-	-	-
Presenting to ED	EC Attendance Location	EMCARE DEPARTMENT TYPE	M	an2	-	-	01	Type 1 : General Emergency Department (24 hour)	-	-
Triaged to majors	EC Attendance Characteristics	Acuity	R	SNOMED-CT	-	-	-	-	1064911000000105	Very urgent level emergency care (regime/therapy)
									1064901000000108	Urgent level emergency care (regime/therapy)

Exclusion: Triaged to resus or majors	EC Attendance Characteristics	Acuity	R	SNOMED-CT	-	-	-	-	1064891000000107	Immediate resuscitation level emergency care (regime/therapy)
									1077241000000103	Standard level emergency care (regime/therapy)
									1077251000000100	Non-urgent level emergency care (regime/therapy)

Appendix 2: ECDS codes to support data extraction

These codes will help you and your IT team to extract audit data from your electronic patient records. This is not an exhaustive list and other search terms can be used. All data should be reviewed to ensure it is accurate.

Audit questions			Able to capture directly via EDIS (ECDS)?	ECDS data item and codes			ECDS proxy measure		
				ECDS data item	SNOMED / D&DM code	SNOMED / D&DM description	ECDS data item	SNOMED / D&DM code	SNOMED / D&DM description
Case mix									
1.1	Reference (do not enter patient identifiable data)		NO	-	-	-	-	-	-
1.2	Date and time of arrival or triage – whichever is earlier		YES	EMERGENCY CARE ARRIVAL DATE	-	-	-	-	-
				EMERGENCY CARE ARRIVAL TIME	-	-	-	-	-
				EMERGENCY CARE INITIAL ASSESSMENT DATE	-	-	-	-	-
				EMERGENCY CARE INITIAL ASSESSMENT TIME	-	-	-	-	-
Vital signs									
2.1	Were the following vital signs measured and recorded?	Respiratory rate	NO	-	-	-	-	-	-
		Oxygen saturation	NO	-	-	-	-	-	-
		Pulse	NO	-	-	-	-	-	-
		Systolic blood pressure / capillary refill	NO	-	-	-	-	-	-
		GCS score (or AVPU)	NO	-	-	-	-	-	-
		Temperature	NO	-	-	-	-	-	-
2.2	Were the vital signs recorded as a part of a	Yes	YES	ACUITY score in ECDS	1064891000000107	1 - Immediate care level emergency care	-	-	-

Audit questions			Able to capture directly via EDIS (ECDS)?	ECDS data item and codes			ECDS proxy measure		
				ECDS data item	SNOMED / D&DM code	SNOMED / D&DM description	ECDS data item	SNOMED / D&DM code	SNOMED / D&DM description
	formalised scoring system?				1064911000000105	2 - Very urgent level emergency care	-	-	-
					1064901000000108	3- Urgent level emergency care	-	-	-
					1077241000000103	4 - Standard level emergency care	-	-	-
					1077251000000100	5 - Low acuity level emergency care	-	-	-
		No	NO	-	-	-	-	-	-
Abnormal vital signs									
3.1	Were any of the recorded vital signs abnormal (as defined in the audit standards)?	Yes	NO	-	-	-	-	-	-
		No	NO	-	-	-	-	-	-
			NO	-	-	-	-	-	-
3.1a	Is there specific evidence in the ED record that the clinician recognised the abnormal vital signs?	YES	NO	-	-	-	-	-	-
		NO	NO	-	-	-	-	-	-
3.1b	Is there evidence in the ED record that the abnormal vital signs were acted upon?	Yes	NO	-	-	-	EC treatment code	88140007	Cardiac monitor surveillance (regime/therapy)
		NO	NO	-	-	-	-	-	-
Repeat vital sign recording									

Audit questions			Able to capture directly via EDIS (ECDS)?	ECDS data item and codes			ECDS proxy measure		
				ECDS data item	SNOMED / D&DM code	SNOMED / D&DM description	ECDS data item	SNOMED / D&DM code	SNOMED / D&DM description
4.1	Was a repeat set of vital signs recorded in the ED record?	Respiratory rate	NO	-	-	-	-	-	-
		Oxygen saturation	NO	-	-	-	-	-	-
		Pulse	NO	-	-	-	-	-	-
		Systolic blood pressure / capillary refill	NO	-	-	-	-	-	-
		GCS score (or AVPU)	NO	-	-	-	-	-	-
		Temperature	NO	-	-	-	-	-	-
4.2	(Only answer if YES to 4.1) Were any of the recorded repeat vital signs abnormal (as defined in the audit standards)?	YES	NO	-	-	-	-	-	-
		NO	NO	-	-	-	-	-	-
Discharge									
5.1	Was the patient discharged home	YES	YES	EC discharge destination	306689006	Discharge to home (procedure)	-	-	-
					306691003	Discharge to residential home (procedure)	-	-	-
					306694006	Discharge to nursing home (procedure)	-	-	-
					306705005	Discharge to police custody (procedure)	-	-	-
					50861005	Patient discharge, to legal custody (procedure)	-	-	-

Audit questions			Able to capture directly via EDIS (ECDS)?	ECDS data item and codes			ECDS proxy measure		
				ECDS data item	SNOMED / D&DM code	SNOMED / D&DM description	ECDS data item	SNOMED / D&DM code	SNOMED / D&DM description
		NO	YES		1066331000000109	Emergency department discharge to emergency department short stay ward (procedure)	-	-	-
					1066341000000100	Emergency department discharge to ambulatory emergency care service (procedure)	-	-	-
					1066351000000102	Discharge to hospital at home service (procedure)	-	-	-
					306706006	Discharge to ward (procedure)	-	-	-
					1066361000000104	Emergency department discharge to high dependency unit (procedure)	-	-	-
					1066371000000106	Emergency department discharge to coronary care unit (procedure)	-	-	-
					1066381000000108	Emergency department discharge to special care baby unit (procedure)	-	-	-
					1066391000000105	Emergency department discharge to intensive care unit (procedure)	-	-	-
					1066401000000108	Emergency department discharge to neonatal intensive care unit (procedure)	-	-	-
					19712007	Patient transfer, to another health care facility (procedure)	-	-	-
					183919006	Urgent admission to hospice (procedure)	-	-	-
					305398007	Admission to the mortuary (procedure)	-	-	-
5.1a	(Only answer if YES to 5.1)			-	-	-		-	-
		Yes		-	-	-	-	-	-

Audit questions			Able to capture directly via EDIS (ECDS)?	ECDS data item and codes			ECDS proxy measure		
				ECDS data item	SNOMED / D&DM code	SNOMED / D&DM description	ECDS data item	SNOMED / D&DM code	SNOMED / D&DM description
	When the patient was discharged home, were their vital signs normal?		NO						
		No	NO	-	-	-	-	-	-
		Not recorded	NO	-	-	-	-	-	-
5.1b	(Only answer if YES to 5.1)				-	-	-	-	-
	Is there documented evidence of review by a senior doctor (ST4 or above in emergency medicine, or equivalent non-training doctor)?	Yes	NO	-	-	-	Clinician Tier	04	Senior CARE PROFESSIONALS able to supervise an Emergency Care Department alone with remote support. Possess some extended skills. Full scope of practice.
				-	-	-		05	Senior CARE PROFESSIONALS (CONSULTANTS) with accredited advanced qualifications in Emergency Medicine. Full set of extended skills. Full scope of practice.
		No	NO	-	-	-	-	-	-

Appendix 3: analysis plan

This section explains how the RCEM team will be analysing your data. You are welcome to use this analysis plan to conduct local analysis if you wish. Analysis sample tells you which records will be included or excluded from the analysis. The analysis plan tells you how the RCEM team plan to graph the data and which records will meet or fail the standards.

STANDARD	GRADE	Analysis sample	Analysis plan – conditions for the standard to be met
1. Patients triaged to the majors or resuscitation areas of the ED should have the following measured and recorded in the notes within 15 minutes of arrival or triage, whichever is the earliest: • respiratory rate • oxygen saturation • pulse • blood pressure • GCS or AVPU score • temperature	F	All patients	Met: 2.1 within 15 mins of 1.2 Not met: all other cases SPC chart for each of the following: • respiratory rate • oxygen saturation • pulse • blood pressure • GCS or AVPU score • temperature
2. Patients with abnormal vital signs, should have their vital signs repeated and recorded in the notes within 60 minutes of the first set of observations	D	Include: 3.1 = yes	Met: 4.1 within 60 mins of 1.2 Not met: all other cases
3. There should be explicit evidence in the ED record that the clinician recognised the abnormal vital signs (if present).	D	Include: 3.1 = yes	Met: 3.1a = yes Not met: all other cases
4. There should be documented evidence that the abnormal vital signs (if present) were acted upon in all cases.	F	Include: 3.1 = yes	Met: 3.1b = yes Not met: all other cases