LRI Emergency Department and Children's Hospital

Paediatric Observation Priority Score (POPS) and Paediatric Early Warning Score (PEWS) UHL Children's SOP

Staff relevant to:	ED and Children's Hospital Medical & Nursing staff
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Use of the Paediatric Observation Priority Score (POPS) and PEWS in the Children's Emergency Department. This SOP does not provide advice on the clinical management of children.

1. Introduction and who guideline applies to

The Paediatric Observation Priority Score (POPS) has been used in the Leicester Royal Infirmary since 2012 to aid initial and ongoing assessment of children. This SOP describes its background, use and role within the Department and relevant dependencies with PEWS, the in-patient scoring system.

POPS is a set of observations that are to be used on all patients who present to the children's Emergency Department and have ongoing observations with it except for the patients on the Children's Short Stay Unit who will receive a Children's Hospital PEWS (Paediatric Early Warning Score):

POPS may be undertaken by nursing staff and health care assistants who have been deemed competent to assess children.

Paediatric Observation Priority Score (POPS) Chart

This chart is not a substitute for good clinical judgement and any concerns about the condition of a child should be brought to the attention of a senior nurse or doctor

Age	Score	2	1	0	1	2
Any	Sats	<90%	90-94%	>95%	90-94%	<90%
Any	Breathing	Stridor	Audible grunt or wheeze	No distress	Mild or Moderate Recession	Severe Recession
Any	AVPU	Pain	Voice	Alert	Voice	Pain
Any	Gut Feeling	High level concern	Low level concern	Well	Low level concern	Child looks unwell
Any	Other	Oncology Patient	Significant PMH*		Significant PMH*	Congenital heart disease
0-1	Pulse	<90	90 - 109	110 - 160	161 - 180	180+
	RR	<25	25 - 29	30 - 40	41 - 50	50+
	Temp	<35°	35 – 35.9°	36 - 37.5°	37.6 - 39°	39°+
1-2	Pulse	<90	90 - 99	100 - 150	151 - 170	170+
	RR	<20	20 - 24	25 - 35	36 - 50	50+
	Temp	<35°	35 - 35.9°	36 – 37.9°	38.0 - 40°	40°+
2-4	Pulse	<80	80 - 94	95 – 140	141 - 160	160+
	RR	<20	20 - 24	25 – 30	31 - 40	40+
	Temp	<35°	35 - 35.9°	36 - 37.9°	38.0 - 40°	40°+
5-12	Pulse	<70	70 - 79	80 - 110	111 - 150	150+
	RR	<15	15 - 19	20 - 25	26 - 40	40+
	Temp	<35°	35 - 35.9°	36 - 37.9°	38.0 - 40°	40°+
13-16	Pulse	<50	50 - 59	60 – 100	101 - 110	110+
	RR	<12	12 - 14	15 – 20	21 - 25	25+
	Temp	<35°	35 - 35.9°	36 - 37.9°	38.0 - 40°	40°+

Total Score	Priority
0-1	
2-3	
4-7	
8+	Immediate review

Any child scoring above **8** should be considered for transfer to resus

***Significant PMH includes:**

- Ex-premature
- Syndromic conditions
- Cardiac problems
- Asthma
- Diabetes
- Long term steroids
- All other chronic conditions

This is version 1.3 August 2016

POPS is made up of 8 domains

Four are objective vital signs: Heart Rate {pulse}, Respiratory Rate {RR}. Temperature, {Temp}, Oxygen Saturations {Sats} are collected measured according to UHL Policy on observations.

Four are subjective and relate to: the child's work and effort of Breathing {Breathing}, an AVPU score {AVPU}, a measure of health care professional concern {gut feeling} and whether there is any relevant past medical history {other} are measured according to the healthcare professionals best judgement and relevant training.

The following process applied to inputting details into e-Observation devices or paper charts.

All patients in the ED or CSSU who have an illness should have a POPS (Hourly for Majors Patients and more frequently at the discretion of staff)

POPS is specifically designed for Emergency Department use and has a large range of scores 0-16 to accommodate the diversity of patients seen and account for the large turnover of patients presenting with initially deranged observations which return to normal values in 1-2 hours

The standard of care in the Children's Emergency Department is that children and young people in the majors (cubicles or waiting room) have hourly observations. POPS may be taken more frequently at the discretion of the member of staff looking after the child or the nurse-in-charge. Ideally patients in the primary care waiting room receive repeat observations as well, and certainly if a greater than 2 hour wait to be seen.

There is no standard escalation procedure for POPS apart from that any child with a POPS of 8 and above (less than 1% of children presenting) should be reviewed immediately by the doctor and nurse in charge of the Children's Emergency Department and considered for transfer for an emergency room cubicle.

The default option is for POPS to be inputted onto the Nervecentre e-observation system but during periods of downtime paper assessment charts can be used as well.

At the occasional discretion of Nurse or Doctor in charge the PEWS module can be activated and PEWS undertaken

The Emergency Room;

Children presenting to the Emergency Room will be initial placed on POPS. At the request of the treating clinician a PEWS score can be derived. This can be used to compare acuity against other patients that they may be currently managing around the hospital or make decisions based on trajectory of illness.

Ward Transfer;

Children waiting for transfer to the Ward will remain on POPS until they have left the emergency department. At the discretion of the Nurse looking after the patient, or the Nurse in Charge, the PEWS module can be activated and PEWS undertaken

3. Education and Training

There is a training package on POPS available and recent published evidence has demonstrated that variation is minimal between staff members even without prior training [1]. Where errors are made these are universally in over-scoring observations which reduces the risk of harm to patients.
All staff should have accessed the POPS training prior to commencing the assessment of training. In situations where this has not been possible the nurse in charge of the department has the discretion to allow individuals to make independent assessments but these should be reviewed by senior staff for the first couple of assessments.

4. Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting Arrangements
Proportion of complete observations per clinical area	Electronic Reporting	Dr. Roland	Six monthly	tbc

5. Supporting Information

When considering scoring systems in Paediatric Emergency Departments there is a simultaneous challenge to identify the most ill children while also aiding decisions on which patients are safe to discharge. There needs to be recognition that patients receiving urgent and emergency care are a different cohort of patient than those on the ward or in intensive care.
Escalation of patients who do not need urgent attention draws resources away from patients who do need intervention. POPS is designed to promote critical thinking, reduce cognitive overload, as opposed to being a decision making aid via the following:

Reduce Knowledge Deficit**:** Most tools define an acceptable reference range for each physiological variable commonly measured. This assists junior staff, particularly if inexperienced with children

Decrease cognitive load**:** Graphical or numerical display of physiological observations, whether at the triage stage or repeatedly over time, allows clear identification of sick children.

Escalate seniority of review**:** All early activation of senior clinician involvement

Identify both tails of the distribution curve: Ability to identify potentially critically unwell children as well as those fit for discharge without hospital admission, is the fundamental purpose of an ED

Improve Communication**:** Many tools are now integral to the process of patient handover and triage. Handover is well known to be a high-risk transition for patients, and objectivity and alerts are possible using scoring systems.

6. Supporting References

Langton L, Bonfield A, Roland D. Inter-rater reliability in the Paediatric Observation Priority Score (POPS). Archives of Disease in Childhood 2018;103:458-462.

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6. Key Words

Children's Emergency Department, Paediatric, Observation, Priority, Score, Nursing Assessments, Observations

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The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs.
As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.

Directorate	**Emergency Department & Women's and Children's CMG**
Department and Sub Department	**Children's Emergency Department & The Children's Hospital**
Clinical Medical Lead	**D Roland – Professor in Paediatric Emergency Medicine**
Executive Lead	**Chief Medical Officer**

Document and Change History

Related documents:

Critical Care Pathway For Children And Young People UHL Childrens Guideline
Basic Life Support or Choking UHL Childrens Hospital Guideline

Change History:

Version	Date Issued	Brief Summary of Change	Author
6.0	Jan 2020	Added reference to CSSU	D Roland
6.1	June 2021	Altered to keep default of POPS throughout department	D Roland
6.2	August 2022	Formatting changes	D Roland
7.0	January 2023	Amended statement regarding short stay patients to now advise - **All patients in the ED or CSSU who have an illness should have a POPS.** At the occasional discretion of Nurse or Doctor in charge the PEWS module can be activated and PEWS undertaken. Removed statement - Once a patient has been in the department for more than 4 hours they will automatically be placed on the PEWS. Return to the Emergency Room (for example if the child deteriorates) will activate POPS or PEWS dependant on the length of stay in the department at the time of transfer to the Emergency Room.	D Roland

Appendix

Early Warning Scores were developed following retrospective reviews of care preceding unplanned admission to intensive care units, where a recurrent theme was that of well documented physiological deterioration over many hours that was either not recognised or not acted upon[2]. Similarly, the 2006 CEMACH report "Why children die" identified failure to recognise severity of illness in children as a significant remediable factor in paediatric deaths and recommended "*a standardised and rational monitoring system with imbedded early identification systems for children developing critical illness – an Early Warning Score*"[3].
There is, as yet, no universal Early Warning Score (EWS) for children, and although multiple versions have been developed at local levels[4,5] direct evidence of their benefit is lacking for their utility[6]

A £1.8 million National Institute of Health Research grant is currently reviewing the evidence and undertaking a validation of a potential system.

Despite the lack of evidence it has been assumed that a PEWS system would translate well into Emergency Department practice. There is so far no evidence of this being the case. In fact because the large majority of patients presenting to Emergency Departments have previously been un-treated so they present with fever and distress a significant proportion unnecessarily trigger warning systems. This poor specificity (i.e. many false positives) has been demonstrated to result in inappropriate use of resources[7].

A review of Early Warning Score use in Children's Emergency Departments demonstrated effectiveness in recognising the very sick child[8] but much poorer performance on identifying need for admission. The tools were not particularly discriminatory meaning children with high scores were often admitted but so were children with low scores as well.

The initial POPS study demonstrated an increased relative risk of admission with a POPS >1[9], and demonstrated the utility of its novel nurse gut feeling component. Further data on over 20000 patients has demonstrated a relationship between length of stay and increasing POPS[10]. From these 20000 patients only 11 children discharged with POPS 0 returned to be admitted and required further definitive management

Paediatric practice in emergency medicine aims to identify sick children and avoid unnecessary admission. It is clearly not a reasonable proposition to admit every child who may be unwell as this would overload services and create further errors later in the system. Safely identifying the child suitable for discharge after a small period of observation is core skill of emergency care practitioners who deal with children. The POPS systems has been specifically designed to solve this problem and now has a considerable evidence base to support its use[11,12].

There is minimal evidence to support the use of PEWS in Children's Emergency Departments as an specific and sensitive scoring system.

References for Appendix

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