

**Patient Safety
Collaboratives**

The AHSN Network



INNOVATION AGENCY
Academic Health Science Network
for the North West Coast

The National Patient Safety
Collaborative
Sepsis Cluster
Guidance Survey

Full Report

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1. Executive Summary

2. Introduction

There have been a number of different operational definitions for sepsis over the last year (NEWS criteria, SIRS criteria, “Red flag sepsis”, NICE guidance and qSOFA). The unintended consequence of this has been the potential enablement of large scale variation. The survey was conceived to establish the degree of variation in current operational definitions of sepsis across England and to make recommendations to support improvements in practice. The Patient Safety Collaborative Sepsis Cluster undertook this survey to inform policy makers of current front-line sepsis practice and strengthen this critical bidirectional relationship.

The invitation to participate in the survey was sent to all acute trusts and distributed by each Academic Health Science Network (AHSN) and was open between 3rd October 2016 and 5th November 2016. There were 82 responses from over 50 acute trusts, with 44 responses from identified organisational sepsis leads.

3. Summary of Findings

As the majority of responders were clinical leads for sepsis, this survey is likely to reflect practice within acute organisations. The survey describes substantial variation in the criteria used by organisations to recognise and manage patients with sepsis. This includes variation in the use of NEWS, SIRS, qSOFA, NICE/UK Sepsis Trust criteria to recognise sepsis.

1. Just over a quarter of organisations plan to use SIRS criteria in their sepsis pathway.
2. Less than a quarter of organisations also planned to use qSOFA.
3. Just over a quarter of organisations planned to use the UK Sepsis Trust clinical tool kits.
4. 95% of acute organisations use aggregate early warning scores in both diagnosing and tracking sepsis and all cause physical deterioration and the main one being used is the National Early Warning score (NEWS).
5. 75% of organisations do not plan to use the NICE guidelines exactly as published. Most plan to modify the guidelines to either remove moderate risk criteria, amalgamate moderate and high risk criteria or measure lactate earlier.
6. Some responders stated that they felt that the NICE guidance were complex, needing simplification and with better adherence to use of aggregate rather than single “red flag” NEWS scores.

4. Recommendations

The following recommendations reflect the findings of the survey and support working towards a more standardised regional approach to the identification, monitoring and treatment of patients.

1. Due to the current national variation in practice, there should be an initial regional focus on collaboration, monitoring and improvement. The AHSN networks should be used to standardise, share and spread good sepsis strategies in all care settings.
2. The currently available existing sepsis screening tools (based on aggregate NEWS, NICE high/moderate risk, UK Sepsis Trust “Red flags”, qSOFA) should be evaluated to identify the optimal, operational sepsis definition. Analysis of process, balancing and outcomes measures should be used across the whole care pathway as part of this evaluation.
3. A simple, pragmatic and easy to implement operational definition for sepsis is needed. This should not conflict with pre-existing national methods of defining deterioration. This should be actioned by convening a group of expert clinicians.
4. Aggregate National Early warning scores should be part of the deterioration and sepsis pathways in all healthcare settings.
5. Care must be taken with invoking central, national directives on a condition that will be best implemented, monitored and improved in regional collaborative settings.

5. Aim/Purpose

There have been a number of different operational definitions for sepsis over the last year (NEWS criteria, SIRS criteria, “Red flag sepsis”, NICE guidance and qSOFA). The unintended consequence of this has been the potential enablement of large scale variation. The survey was conceived to establish the degree of variation in current operational definitions of sepsis across England and to make recommendations to support improvements in practice.

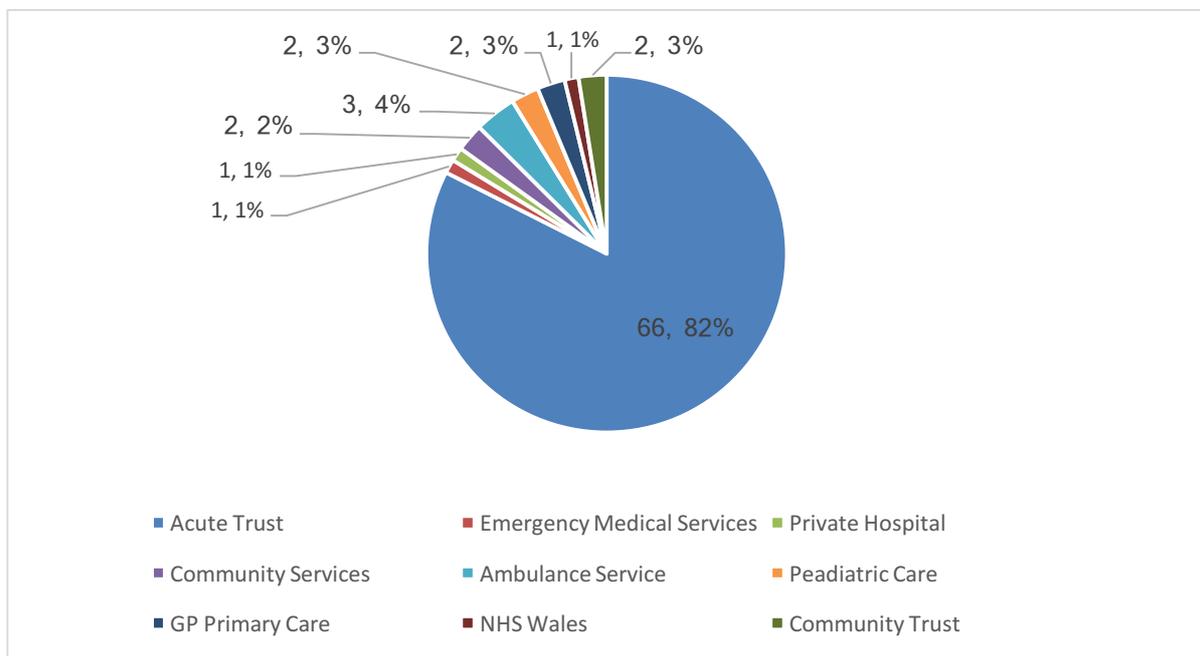
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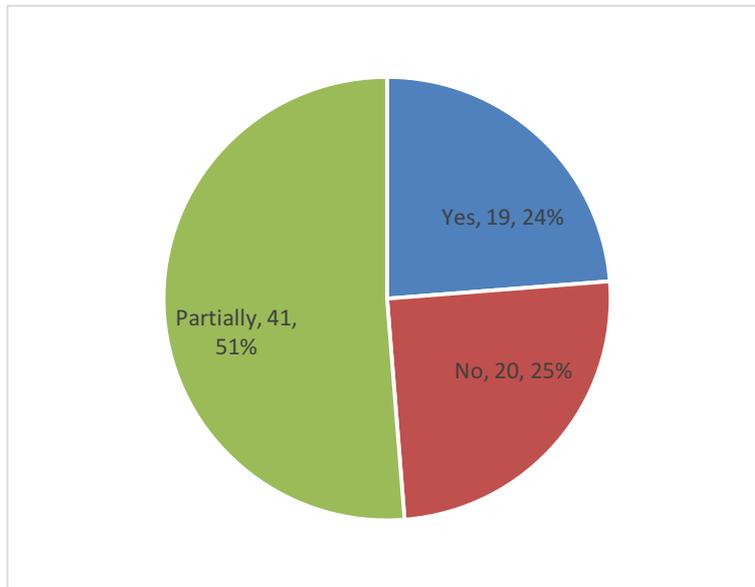
6. Breakdown of Respondents

Respondents were requested to identify in which health sector they are involved. The majority of respondents identified they worked in Acute Trusts (66) from over 50 separate institutions, with Ambulance Service (3), Community Services (2), Paediatric Care (2), GP Primary Care (2), Community Trust (2), Emergency Medical Services (1), Private Hospital (1) and NHS Wales (1) making up the remainder.

Of the 80 responses 44 stated they were the sepsis lead.



3. Will you be implementing the Sepsis NICE Guidelines exactly as they are written for the Adult Sepsis Pathway?



In response to the first question, $\frac{3}{4}$ of the responses stated they would not be implementing the NICE Guidelines as they are written for the adult Sepsis Pathway.

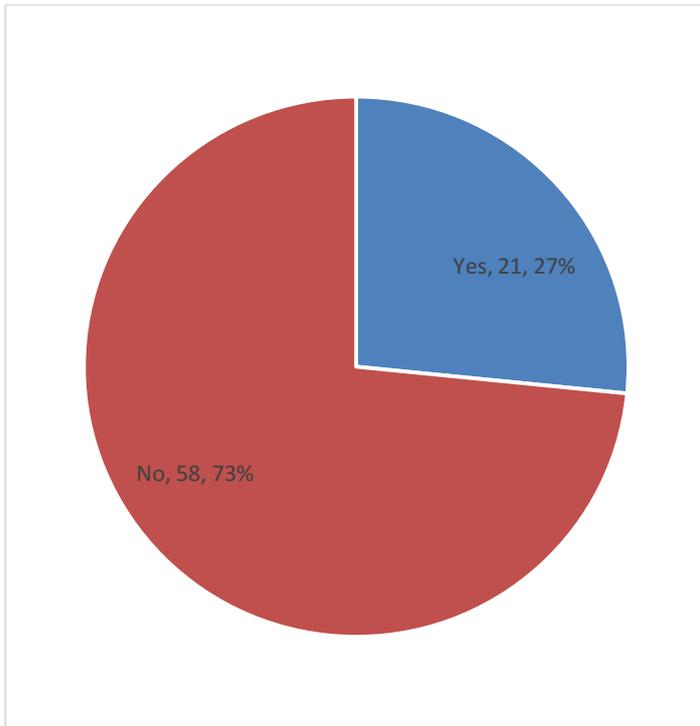
For those whose response was partially the following reasons were given for not implementing the guidelines completely:

- One group of responders stated that across all sectors stated they would be using a modified/less complicated version of the tool, particularly around amber flags. One felt the complication would lead to the triage nurse not diagnosing Sepsis, delaying the prescribing of antibiotics.
- Some responders had incorporated the red flags and were working towards integrating the amber flags, either by modifying existing tools, incorporating areas which are missing from local tools, or working in tandem with NEWS or qSOFA scores.
- Some respondents were altering specific criteria, such as including lactate, “inclusion of neutropaenia in the 'high risk' group”, “Ashen/mottled skin/cyanosis will not be included”
- Two acute trusts welcomed the raising of awareness of Sepsis.
- Respondents stated they will continue using UK Sepsis Trust toolkits as these have been specifically compiled using prehospital expertise. “The NICE approach to stratification is flawed and not evidence based so we are taking a different approach (based on use of the National Early Warning Score).”
- One acute trust stated they felt “the moderate/high risk criteria especially in adults is too inclusive and will include most patients and will lead to over diagnosing and treating sepsis and possibly the development of adverse events such as antimicrobial resistance and C diff infection.”
- One acute trust raised concern with the practicality of seeing all patients within the recommended timeframes with current staffing levels.
- One respondent stated: “Need a system which facilitates the delivery of Sepsis 6 within 60 minutes. Hourly urine output does not. The Intermediate risk is not simple and looks a bit like SIRS. Altered mental appears to be an criteria for both

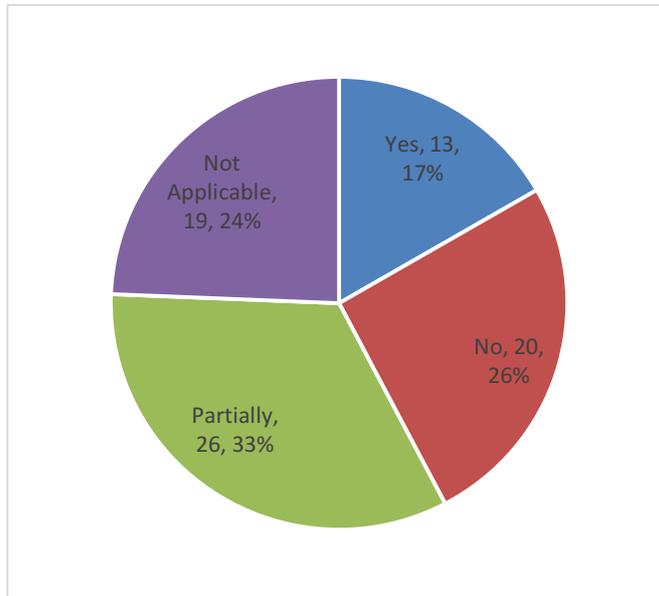
high and intermediate risk patients. We are replacing intermediate risk with concern.”

- Paediatric services would not be using the Adult Sepsis Pathway.

7. Will you be using SIRS criteria for the Adult Sepsis Pathway



8. Will you be Implementing the Sepsis NICE Guidelines exactly as they are written for the Paediatric Pathways?

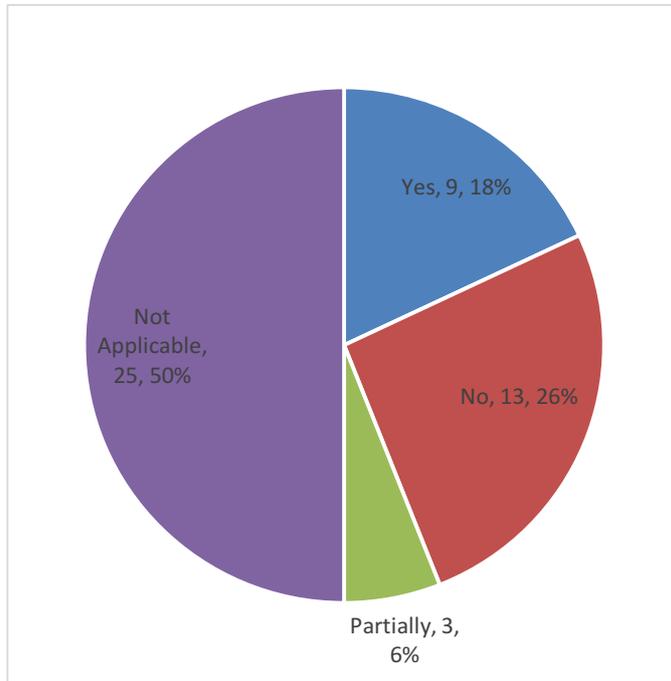


A lot of comments mirrored the changes occurring with the adult pathways, with services still deciding what to use, using the UK Sepsis Trust guidelines, looking to simplify the guidance, concerns around amber flags or using tools developed in house.

This is a summary of the comments from respondents:

- Some acute trusts supported the division for children into age ranges, although others stated that it would be confusing for junior colleagues.
- Respondents also raised concern regarding paediatric conditions and the over referral of children to secondary care. "There are lots of paediatric conditions which will mimic sepsis which will not be helped by aggressive fluid resuscitation and antibiotics e.g. bronchiolitis. SpO2 not specific/useful as conditions such as bronchiolitis and asthma with have low SpO2 and these conditions will not be helped by antibiotics."
- "There is considerable concern that use of sepsis tools in primary care will over trigger and result in a deluge of children in secondary care. It must be remembered that for every minute spent trying to avoid missing sepsis, there will be less time for avoiding other problems, such as child protection/acute abdomen etc."
- Two respondents stated they are concentrating on the adult sepsis pathway before implementing the paediatric pathway. One is also developing an electronic safety net system.
- Two respondents stated they were considering including ST4 and above and as adequate for performing a senior review.

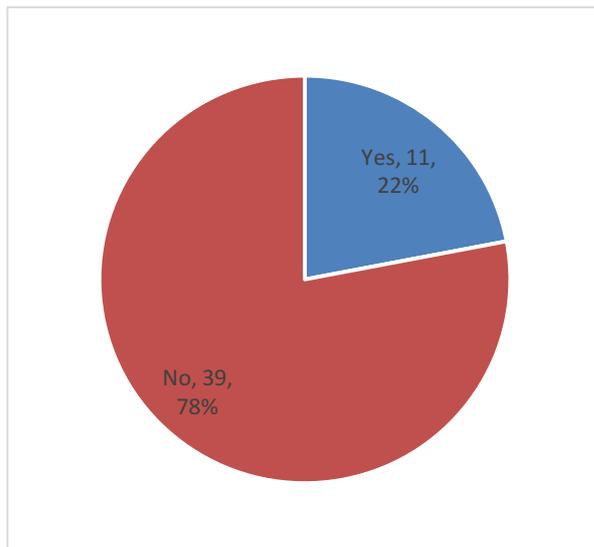
9. Will you be implementing the Sepsis NICE guidance exactly as written for the Obstetric pathway?



For those who answered partially, the following comments were received:

- For respondents with Obstetrics, similar to above, some have already developed their own pathways based on the UKST Maternal guidelines, more simple, or are similar to the NICE guidance.
- Some acute trusts have altered the criteria “with the addition of lactate > 2 to high risk criteria “ and “Systolic BP <90 or 20% less than their normal; (qSOFA < 100 systolic); Respiratory Rate > 22bpm (qSOFA >22); Altered Mental State / V, P or U on AVPU Score (qSOFA); O2 saturation of <95; Increased O2 requirements to maintain O2 levels; Oliguria / anuria or AKI/ NPU 12 - 18hrs (0.5mls/kg/hr); Coagulopathy / purpuric rash / mottled / ashen / cyanotic; Heart rate > 130bpm Ø Lactate of ≥4 indicates septic shock; If any of these are present or any 2 of the qSOFA the patient has Sepsis: Start the Sepsis 6 immediately.”
- One ambulance service stated “Very minor differences between adult and obstetric pathway - will complicate and confuse frontline clinicians.”
- One acute trust stated “I'm not aware of NICE guidance on sepsis in obstetrics”

10. Will you be using qSOFA scores exactly as they are written?



Respondents varied from not using qSOFA for screening, to using it as an additional monitoring tool or using qSOFA alongside red flags or using qSOFA instead of SIRS. All comments came from the Acute Trusts.

These are examples of comments from

respondents:

- One respondent commented: “Far too complex and unrealistic to translate into daily clinical practice. It seems like they have tried to cover every aspect of sepsis but the result is an unwieldy guideline rather than a workable patient pathway. The risk assessment and identification of sepsis (high/medium/low) are far too complicated, qSOFA is ICU focused and the HAT(hypotension/altered mental state and high RR) are now risk assessments and predictor of death/long ICU stay which is interesting but not helpful when the pt. arrives in ED – basically the simplification which I think/hope we have gone for is suspicion of infection and triggers (which include the HAT criteria) as a tool to start treatment for sepsis not a predictor of death.” Another stated it was “too complicated without electronic patient records integrating lab results with physiology”
- One acute trust stated “This is not a helpful tool for any prehospital care” and “this relates to outcomes and not identification of sepsis
- One stated: “Not using in wake of Churpek paper. Neither we nor WHO will be recommending.”
- One felt “the strength of the NICE guidance/Red Flags is that there are two steps: firstly, is the patient sick? Secondly, why are they sick. qSOFA will result in a disconnect between Sepsis and other causes of deterioration.”
- One was adding lactate.
- One using NEWS stated the qSOFA criteria is incorporated within NEWS.

11. If you are modifying the Sepsis NICE guidelines what do you propose to change?

For this question respondents were invited to choose one of 3 set examples and they could write their own. More than one option could be selected. 23 respondents did not state what they were going to change. 14 respondents chose two of the stated option, with 7 of these also adding another comment. None of the responders chose all three responses from the given list.

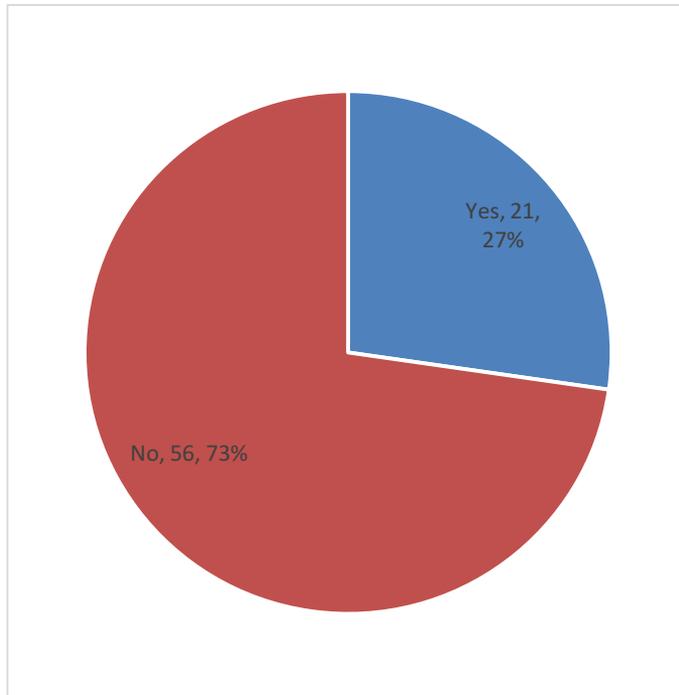
Removal of moderate risk criteria	16
Amalgamation of moderate risk criteria with high risk	18
Moving lactate measurement earlier in the pathway	18

These are examples of other responses:

- Several stated the modification of moderate risk criteria
- We have already adopted a moderate risk criteria in adults and <5 years/5-12 years/>12 years in children.
- We are saying that a qSOFA score of two or more - operationalized as NEWS 5 or more - plus infection is very likely sepsis and needs a bundle of investigations, treatments and reassessments (reasonably similar to the Sepsis Six) at designated time points.
- We are amalgamating the moderate to severe high risk to make sure we do not miss patients with sepsis and the management starts there. We have incorporated the qSOFA as reinforcement of prompts for sepsis which are part of NEWS. This will allow us to do some prospective validation too.
- All our ED patients have a venous gas run through the gas machine in the ED and so we get a lactate on almost every patient on admission. It makes sense for us to include it earlier.
- We do not use NEWS so it is being adapted to cover our track and trigger charts. Instead of a NEWS score patients are screened if the score 2 or more Ambers
- Likely removal of moderate risk criteria or separating Observations from clinical risk factors
- The UK Sepsis Trust tools may well be aligned with NICE shortly, but do these have the degree of specificity and sensitivity that we require without sending everyone into the EDs
- Simplified. We looked at getting POC lactate to measure earlier in pathway but was too expensive and too much training.

- We are undecided yet as to how we will implement the guidance, but our biggest challenge will be around the Amber moderate risk category and how we will "safety net" such patients.
- Bring AKI into Red flags. Make lactate mandatory Amber flags can be replaced by "seek senior review if ongoing concerns"
- Altering the look of the pathway to make it easier to use and adding fluid resuscitation (Ambulance Service comment)
- We have implemented a protocol based upon the Sepsis 3.0 work, utilising a NEWS screening, and a qSOFA stratification, as proposed by the SSC. This protocol is under constant review in light of ongoing research.
- We'll be using standard NEWS scores to identify at risk patients. The moderate criteria are nonsensical. E.g. triggering the pathway if the temperature is <36 or the urine output is 0.5-1 ml/kg/hr or the HR is >90. Half the hospital population will fall into these categories. The NICE systematic review on lactate studies stated the Guidelines Group had no confidence in lactate levels at any particular threshold yet this is what they offered. The current guideline mandates treatment only if lactate is >2 yet 25% of patients with sepsis and a normal lactate die so many patients at high risk will be missed if doctors are only looking at lactate. Also the NICE algorithm doesn't make sense - antibiotics are recommended within 1 hour (again, with an evidence base that's lacking by their own admission) but no other treatment is suggested until the lactate is done. That's not sensible!
- In all patients in our ED with SIRS; or high NEWS; or suspected infection and/or organ dysfunction we do at least VBG lactate (POCT) regardless guidelines, because VBG provides us if immediate information about infection - Leucocytes and organ dysfunction - lactate (perfusion/microcirculation) and Creatinine (AKI). Both are necessary for diagnosis of sepsis.
- We will be adding an aggregate NEWS of 5 or more as a high-risk criterion. We will be insisting on a NEWS of 3 or more as being the entry point for sepsis screening. The moderate criteria are confused, they include historical, physical examination and physiological elements all together. They are not usable. The whole pathway needs to be much more simplified. The recommended use of red observations above aggregate NEWS scores seems to be non-evidence based. The guidelines need to be heavily modified for actual front line use.

12. Will you be using the Sepsis Trust Clinical toolkit- Red, Amber flag criteria exactly as written?



If no can you please explain why not?

Three quarters of respondents indicated that they will not be using the Sepsis Trust Clinical Toolkit. Some indicated that they would modify the amber flags - by adding, merging or removing the flags, or removing amber flags which are included in red flags in order to reduce confusion. Some respondents planned to use the NICE guideline high/medium risk terminology rather than calling them flags.

- These are examples of responses from respondents:
- Some respondents, particularly those who were identified as not

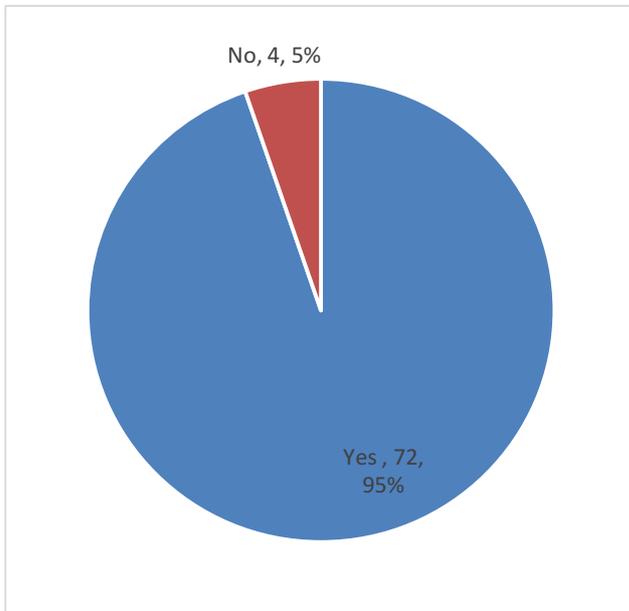
working in an acute trusts liked the simplicity of the red flags.

- Some respondents are using their own pathways / toolkits which are similar
- One respondent considered the flags were not specific enough. "SpO2 is too unspecific as the bronchiolitis and asthmatics need to be considered due to variation in clinical indications. Urine Output parameter has been reduced from 18 hours to 12hours."
- There was a concern Sepsis may be missed. "May not be able to trigger a Red Alert until NEWS is 12!!!", "They are too complex and a bit confused as well. They are seeking to follow NICE guidance and as a result will not be implementable in healthcare settings. The ignorance of aggregate NEWS means that there are very sick, septic patients who will be missed." And "We are saying that a qSOFA score of two or more - operationalized as NEWS 5 or more - plus infection is very likely sepsis and needs a bundle of investigations, treatments and reassessments (reasonably similar to the Sepsis Six) at designated time points. The Red flag approach may well miss very sick patients."
- One GP Practice stated: "The BMJ infographic with its summary is much easier for reference"
- One will be using a NEWS score greater than 5 or 3 in 1 parameter, one would be adding lactate to high risk
- One stated: "There is concern about the ongoing need to deliver antibiotics within the hour (in an unevidenced way) to large groups of patients, many of whom may

not have sepsis. In recent years, these concerns have led many to disregard the UKST red flag guidance, and apathy in relation to sepsis care has been noted amongst groups of Clinicians of all grades. There have also been concerns raised about early antibiotic delivery pressures distracting from other front-door priority treatments.

- A couple of respondents stated: “We merged Red and Amber together. Because daily practice in DGH especially during out of hours and mainly for inpatients showed that doctor does not usually have chance to review requested blood results or images within an appropriate timeframe to initiate Sepsis Six if those indicate sepsis, which is mandatory for amber pathway. Therefore, we prefer to give first dose of antibiotics immediately for Red and Amber pathway and before the second or third dose of antibiotics there should be enough time review those results and if sepsis not confirmed than de-escalate/stop antibiotic treatment.”
- Finally, one stated “We use the Red Flag Sepsis criteria (one needed) and SIRS (Two needed). If either met, then patients get same investigations and treatment”

13. Do you use aggregate (total) NEWS, PEWS and MEOWS 'scores' (or equivalents) to monitor and track deterioration in your workplace?



One acute trust stated they are not using for paediatrics as the tool does not give a numeric score, or the tool is not validated for pre-hospital; care.

One respondent was using a modified local EWS. One respondent mentioned using electronic NEWS.

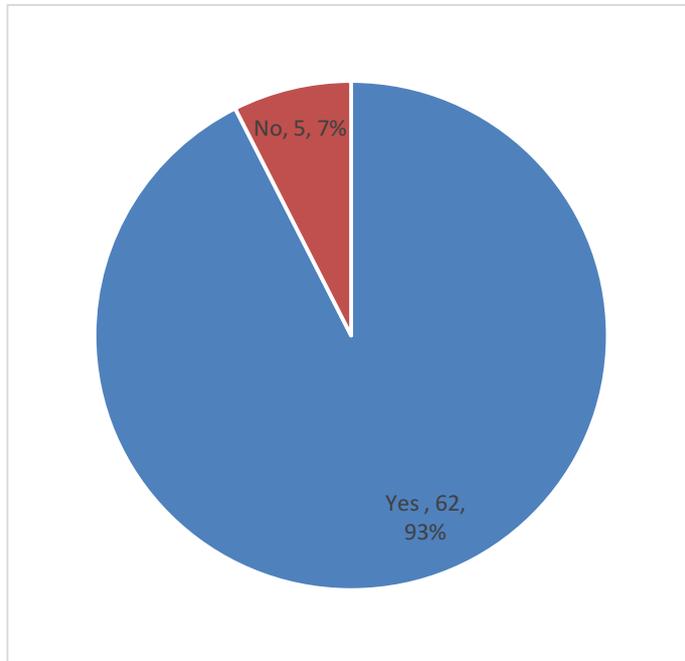
One resuscitation service stated: "We use a graduated response system on our Track & Trigger charts which have Red, amber & green triggers rather than scores"

One stated "This can only be done retrospectively in our trust"

"The NEWS score is used on the wards to monitor patients and as a trigger for screening."

One acute trust identified "5 or above or 3 in one parameter"

14. Will you be using aggregate (total) NEWS, PEWS, MEOWS score (or equivalents) within the sepsis pathway?



Ninety three percent of respondents stated that they will be using aggregate early warning scores within their sepsis pathway.

These are examples of comments from respondents:

- One stated “If we were to follow these NICE guidelines completely I think we would have to redo the existing pathway with a complex additional risk assessment sheet and I don’t think this would overall help – I think what we could add to our sepsis education is raising awareness of the complexity of how sepsis presents, temp/no temp, subtle changes in mentation etc. but not a massive change to the current pathway.”
- Respondents stated they use NEWS-5, NEWS 4 with 2 of 3 qSOFA, PEWS, MatMEWS scores as a trigger for sepsis screening.
- One stated: “It is used on the wards but not in the Emergency Department.”

15. SUMMARY

As the majority of responders were clinical leads for sepsis, this survey is likely to reflect practice within acute organisations. The survey describes substantial variation in the criteria used by organisations to recognise and manage patients with sepsis. This includes variation in the use of NEWS, SIRS, qSOFA, NICE/UK Sepsis Trust criteria to recognise sepsis.

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6. Some responders stated that they felt that the NICE guidance were complex, needing simplification and with better adherence to use of aggregate rather than single “red flag” NEWS scores.

16. GLOSSARY

NEWS = National Early Warning Scores

PEWS= Paediatric Early Warning Scores

MEOWS= Modified Early Obstetric Warning Scores

qSOFA= quick Sepsis related Organ Failure Assessment

SIRS= Systemic Inflammatory Response Syndrome

17. RECOMMENDATIONS

The following recommendations reflect the findings of the survey and support working towards a more standardised regional approach to the identification, monitoring and treatment of patients.

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