

Maternal and Early Neonatal Sepsis Audit: How Useful Is Temperature as a Trigger for the Sepsis Pathway?

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Introduction

- * Final year medical student at Cardiff University
- * Year 4 SSC Project
- * Delivery Suite, University Hospital of Wales
- * With thanks to Dr Rachel Collis and Mr Lutfi Shamsuddin



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University Health Board

Background

- * CMACE Executive Summary recognises sepsis as a primary cause of maternal mortality ¹
- * Of the 8.5 per 100,000 maternal deaths during 2012-2014, those caused either directly, or indirectly by sepsis (influenza; pneumonial/others) were 0.29, 0.04 and 0.60 respectively ²
- * Need for clear warning systems but no unanimous consensus on its design.

¹ Centre for Maternal and Child Enquiries (CMACE). Saving Mothers' Lives: reviewing maternal deaths to make motherhood safer: 2006–08. The Eighth Report on Confidential Enquiries into Maternal Deaths in the United Kingdom (2011)

² Maternal mortality in the UK: an update (2017)

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- * SIRS criteria no longer considered gold standard although still in clinical use; to be replaced with qSOFA
- * qSOFA --> Quick Sequential [Sepsis-related] Organ Failure Assessment score
- * Also compared against Modified Early Obstetric Warning Score due to its widespread use

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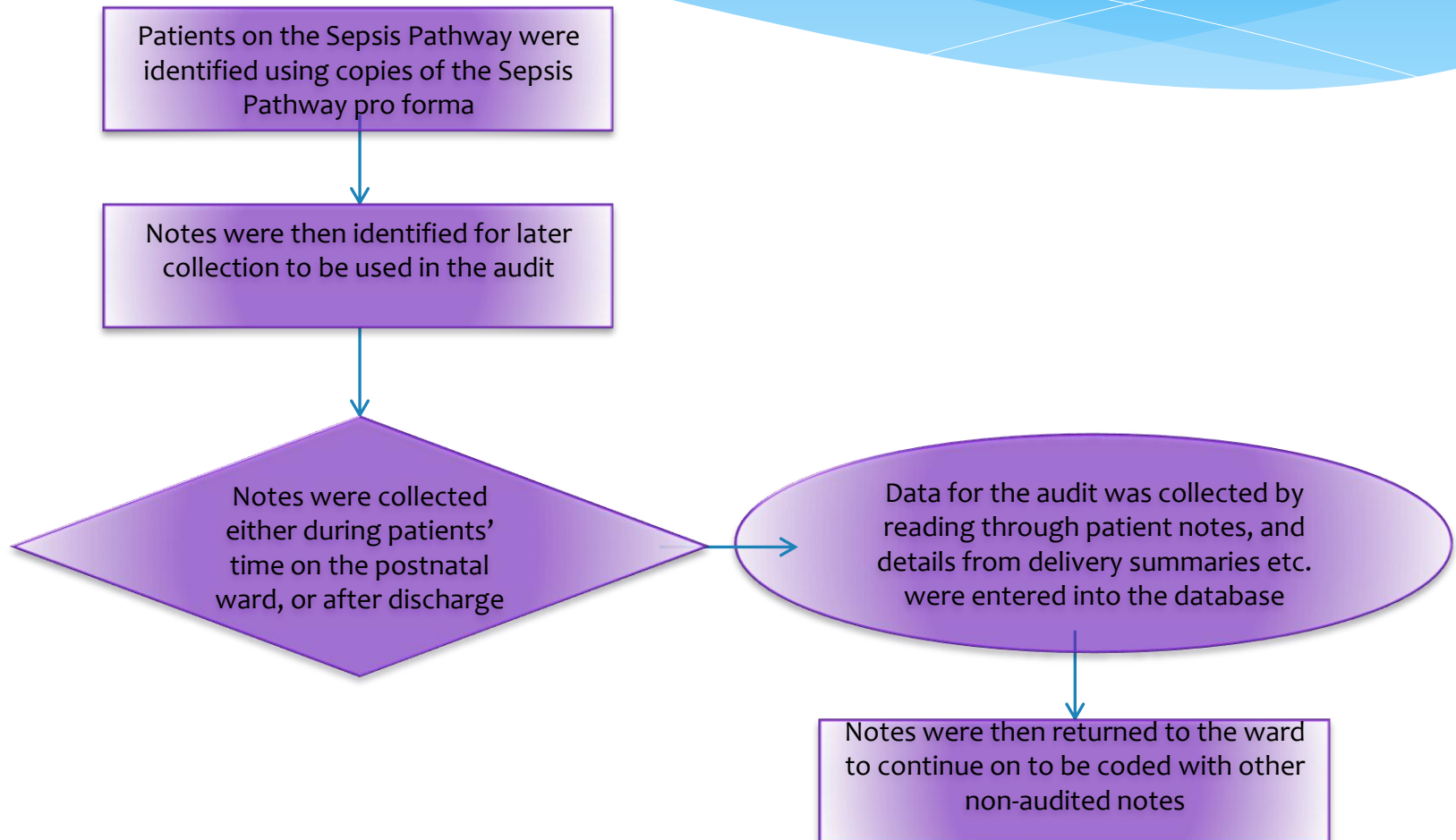
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	Temperature	Respiratory Rate	Heart Rate	Systolic Blood Pressure	Looks Unwell	Altered Mentation
Obstetric Sepsis Care Pathway (UHW)	<35.5 or >37.5 °C	✓	✓	✓	✓	
SIRS	<36°C or >38.3°C	<36°C	>100bpm	-	-	-
MEOWS	<36°C or >38.0 °C	≥21	<50bpm or >100bpm	-	-	-
qSOFA	-	≥22	-	<100	-	YES

Audit Design



Results

- * 96 patients (March-June 2017)
- * 92 patients included a temperature trigger ($>37.5^{\circ}\text{C}$)
- * 1 excluded
 - one data point recorded as “ $>38^{\circ}\text{C}$ ”
- * Some patients documented as triggering the pathway at a temperature of 37.5°C
- * Temperature range: 37.6°C - 40.2°C

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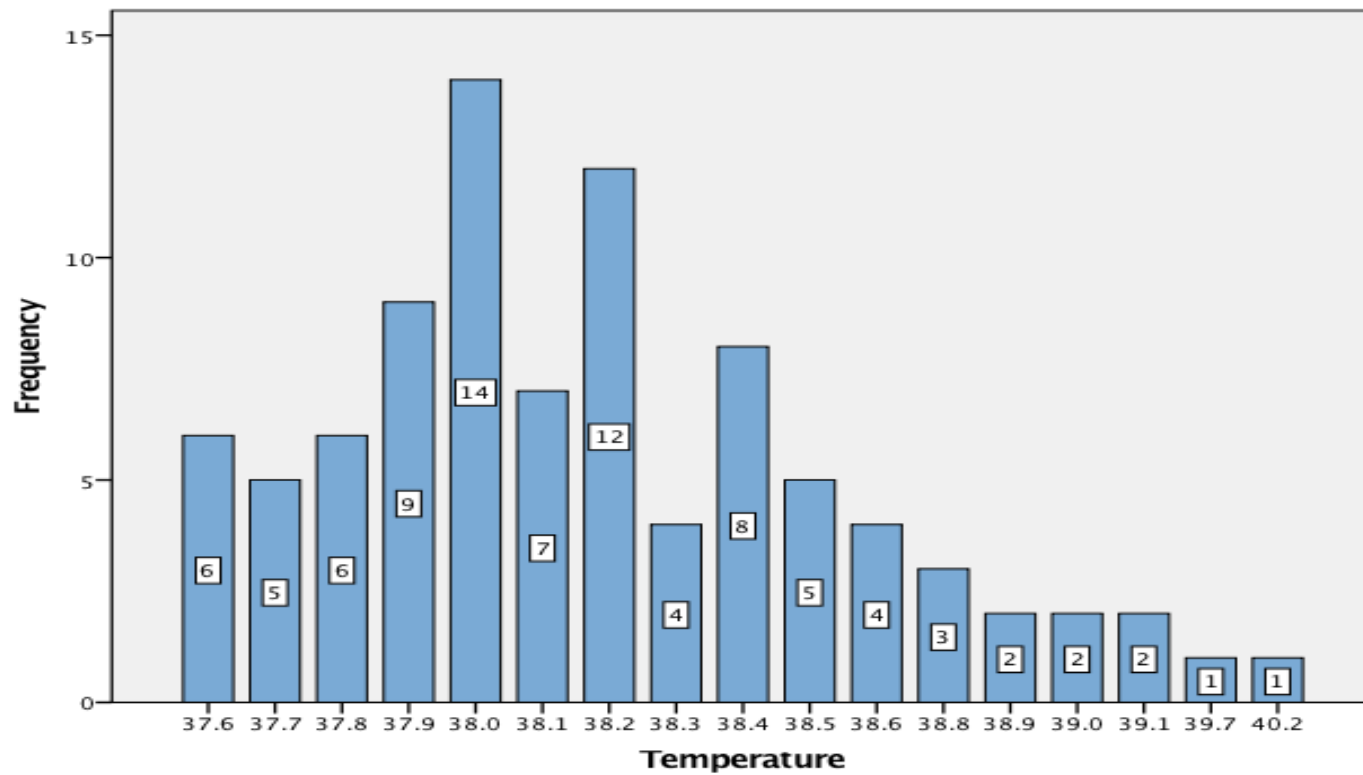
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Frequency of Temperatures Triggered



Statistics

Temperature

N	Valid	91
	Missing	0
Mean		38.205
Median		38.100
Mode		38.0



Temperature

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 37.6	6	6.6	6.6	6.6
37.7	5	5.5	5.5	12.1
37.8	6	6.6	6.6	18.7
37.9	9	9.9	9.9	28.6
38.0	14	15.4	15.4	44.0
38.1	7	7.7	7.7	51.6
38.2	12	13.2	13.2	64.8
38.3	4	4.4	4.4	69.2
38.4	8	8.8	8.8	78.0
38.5	5	5.5	5.5	83.5
38.6	4	4.4	4.4	87.9
38.8	3	3.3	3.3	91.2
38.9	2	2.2	2.2	93.4
39.0	2	2.2	2.2	95.6
39.1	2	2.2	2.2	97.8
39.7	1	1.1	1.1	98.9
40.2	1	1.1	1.1	100.0
Total	91	100.0	100.0	

* Mean: 38.205

* Median: 38.100

* Mode: 38.0

Temperature - Blood Culture Growth

- * Of the 91 patients that included a trigger for temperature:
 - 5 did not have blood cultures sent off
 - 79 had negative blood culture results
 - 7 had positive blood culture results

Results

- * $p = 0.768$
- * *Must accept null hypothesis*
- * No association between temperature and positive blood culture growth

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	25.890 ^a	32	.768
Likelihood Ratio	22.982	32	.879
Linear-by-Linear Association	1.193	1	.275
N of Valid Cases	91		

a. 44 cells (86.3%) have expected count less than 5. The minimum expected count is .05.

Conclusions

- * Accept the Null Hypothesis:
Temperature is unrelated to the incidence of positive blood culture growth
- * Degree of hyperthermia unrelated to microbiological confirmation of septicaemia.
- * Greater consideration of risk-benefit analysis of inappropriate triggering of the sepsis pathway- whilst balancing risks of under-treatment

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[illegible]