

# Neonatal Lumbar Puncture in Sepsis: Describing variation in practice around the region, comparison of practice against NICE guidelines, and a survey of clinician's decision-making process.

PenTRAIN: Peninsula Paediatric Trainee Research Audit & Innovation Network

**Background** Lumbar puncture (LP) is a common procedure in neonates to investigate for meningitis. NICE guidance for performing neonatal septic screens has low thresholds. As trainees rotating around the region we have observed variation in practices and aimed to describe these differences, and to explore senior clinician approach to decision- making

**Method** We looked at all neonates who had a LP from 1st August to 30th September 2018 across the peninsula region using BadgerNet coding and microbiology records. Following data collection, we surveyed senior clinicians to explore their CRP threshold for LPs.

**Results** 66 patients were included. 37 Clinicians responded to the Survey. All LPs were performed after antibiotics were given, despite 77% of patients having strong clinical suspicion of infection, and average age at LP was 49.5 hours. Survey data showed median CRP threshold of 20 with average CRP of 43.7 at time of LP. There was statistically significant difference between sites for CRP thresholds, but no difference in actual CRP values. Only 78.8% were consented and only 21.5% of LPs were documented sufficiently with variation across sites.

**Discussion** All units deviated from NICE guidelines with LP routinely performed after antibiotics. This may be appropriate due to clinical instability, lack of skilled persons to perform in a timely manner or the view that NICE guidelines are too cautious. Documentation of consent of the procedure could be improved in the majority of sites. Introduction of a NatSSIPs style proforma may aid this. Limitations of this project are the small sample size which limits data analysis and general applicability/error margin of findings, especially between larger and smaller centres, and between clinician groups.

# Across the Peninsula region:

• **CRP thresholds for performing neonatal LP vary in theory, but no variation exists in practice**

• **Neonatal LP is routinely performed after antibiotics with sub-optimal documentation and consent**

	Number of patients	Average age hours (IQR) at time of LP	Average CRP at LP (SD)
Site 1	5	40 (26.5)	49.6 (18.9)
Site 2	6	73 (43)	70.4 (45.7)
Site 3	16	39.5 (29.5)	29.8 (24.73)
Site 4	22	61 (98.88)	36.4 (29.81)
Site 5	17	34 (30)	32.5 (22.44)
<b>Total</b>	<b>66</b>		
<b>Average</b>		<b>49.5</b>	<b>43.74</b>
<b>Significance</b>		<b>p=0.046*</b>	<b>p = 0.115</b>

\*Significant difference (non-parametric tests) between average age but no significant difference between average CRP prior to performing LP across sites

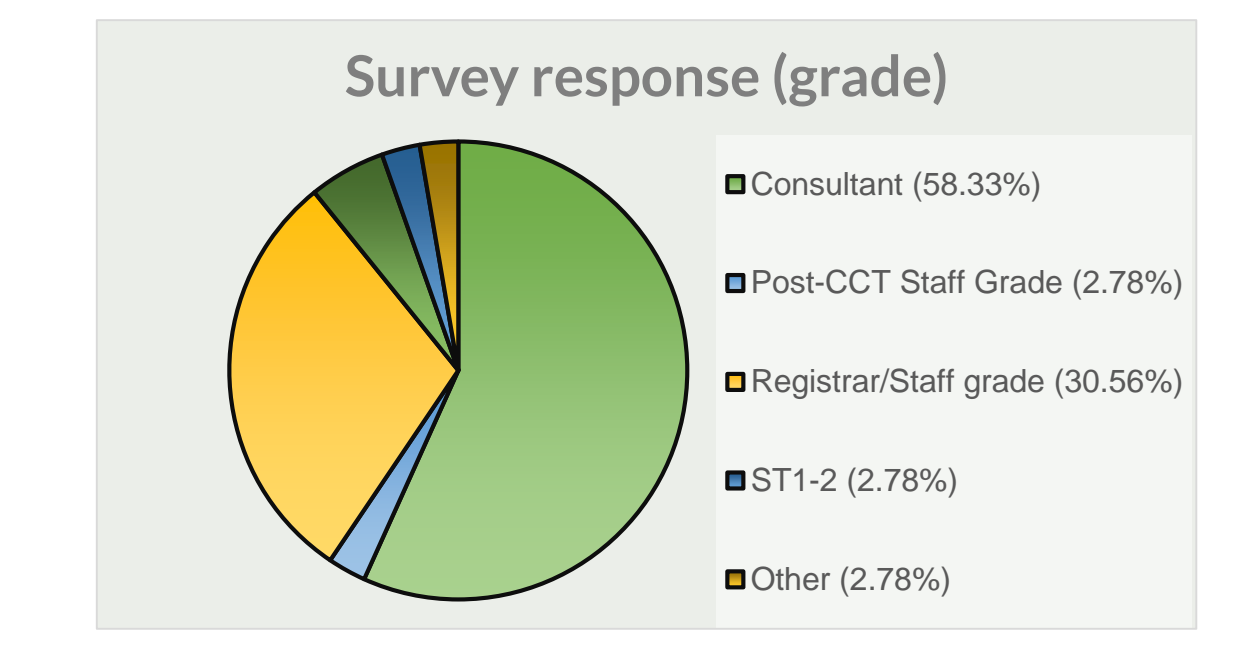
All sites	LP documented	LP not documented	Documented sufficiently*	Not documented sufficiently	Consent taken**	Consent not taken**
Number	61	5	14	51	52	14
Percent (%)	92.42	7.58	21.54	78.46	78.79	21.21

\*Sufficient documentation Pre-LP blood glucose (if CSF glucose required), analgesia, asepsis, number of passes, appearance of CSF, tolerability, tests requested  
\*\*Consent Documented discussion of purpose, risks and benefits

All sites	Abnormal microscopy	Normal microscopy	Strong suspicion of infection: LP before antibiotics	Strong suspicion of infection - LP after antibiotics	No strong suspicion of infection
Number	4	61	0	51	15
Percent (%)	6.15	93.85	0	77.27	22.73

	Response rate	CRP threshold	Average CRP at LP
Site 1	8 (21.6%)	21.9	49.6
Site 2	10 (27%)	18.3	70.4
Site 3	5 (13.5%)	16.7	29.8
Site 4	7 (18.9%)	24.3	36.4
Site 5	7 (18.9%)	12.8	32.5
<b>Total</b>	<b>37</b>		
<b>Average</b>		<b>20 (median)</b>	<b>43.74 (mean)</b>
<b>Significance</b>		<b>p=0.014*</b>	<b>p = 0.115</b>

\*Significant difference (non-parametric tests) between CRP thresholds at different sites



Grade	CRP threshold
Consultant	20.6
Post-CCT Staff grade	10
Registrar/Staff grade	19.1
ANNP	18.5
ST1-2	10
Other	10

Clinical trigger for LP	Total	Percentage
Abnormal neurology	34	97.14
Positive blood culture	33	94.29
Raised CRP without other focus	30	85.71
Not responding to antibiotics	27	77.14
Late onset sepsis	1	2.85
Symptomatic/unwell	3	8.57
Fever	2	5.7

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