

The Canadian Neonatal NetworkTM
Le Réseau Néonatal CanadienTM
Annual Report 2010 Rapport Annuel

Acknowledgements

This report is based upon data collected from 27 individual hospitals from across Canada that were members of the Canadian Neonatal Network™ during the year 2010. In addition to all investigators and the funding agency, we would like to recognize the invaluable support of the Neonatal Intensive Care Units (NICUs) that contributed to this information, the support of all of the participating hospitals and most importantly, the dedication and hard work of the Site Investigators and Data Abstractors.

Structure of the CNN

The Canadian Neonatal Network™ (CNN) is a group of Canadian researchers who collaborate on research issues relating to neonatal care. The Network was founded in 1995 by Dr. Shoo Lee. The Network maintains a standardized NICU database and provides a unique opportunity for researchers to participate in collaborative projects on a national and an international scale. Health care professionals, health services researchers, and health care administrators participate actively in clinical, epidemiologic, outcomes, health services, health policy and informatics research aimed at improving effectiveness and efficiency of neonatal care. Research results are published in Network reports and in peer-reviewed journals.

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Table of contents

	Page
<u>A. Executive Summary</u>	1
<u>B. Background & Objectives</u>	3
<u>C. Information Systems</u>	5
<u>D. Descriptive Analyses</u>	6
<u>D.1. Analyses based on number of admissions to participating Canadian NICUs</u>	
Presentation #1 <u>Admissions to Canadian Neonatal Network participating hospitals</u>	9
Presentation #2 <u>Admission illness severity scores (SNAPII and SNAPIPE) by hospital</u>	11
<u>D.2. Analyses based on number of neonates admitted to participating Canadian NICUs</u>	
Presentation #3 <u>Gestational age at birth</u>	14
Presentation #4 <u>Gestational age at birth and survival to NICU discharge</u>	16
Presentation #5 <u>Birth weight</u>	17
Presentation #6 <u>Birth weight and survival to NICU discharge</u>	18
Presentation #7 <u>Maternal characteristics</u>	19
Presentation #8 <u>Resuscitation (GA < 31 weeks and GA > 31 weeks)</u>	21
Presentation #9 <u>Early onset sepsis (by GA)</u>	23
Presentation #10 <u>Late onset sepsis (by GA)</u>	24
Presentation #11 <u>Late onset sepsis (by BW)</u>	25
Presentation #12 <u>Other diagnoses / interventions / procedures by GA groups</u>	26
<u>D.3. Analyses based on number of very preterm (<33 weeks GA) or VLBW (<1500g) neonates</u>	
Presentation #13 <u>Treatment of patent ductus arteriosus (by GA)</u>	29
Presentation #14 <u>Treatment of patent ductus arteriosus (by BW)</u>	30
Presentation #15 <u>Neuroimaging findings (by GA)</u>	31
Presentation #16 <u>Neuroimaging findings (by BW)</u>	33
Presentation #17 <u>Necrotizing enterocolitis and treatment modalities received (by GA)</u>	35
Presentation #18 <u>Necrotizing enterocolitis and treatment modalities received (by BW)</u>	36
Presentation #19a <u>Oxygen dependency (by GA) among neonates with GA <33 weeks</u>	37
Presentation #19b <u>Any respiratory support (by GA) among neonates with GA <33 weeks</u>	38
Presentation #20a <u>Oxygen dependency (by BW) among neonates with BW < 1500g</u>	39
Presentation #20b <u>Any respiratory support (by BW) among neonates with BW < 1500g</u>	40
Presentation #21 <u>Retinopathy of prematurity (by GA)</u>	41
Presentation #22 <u>Retinopathy of prematurity (by BW)</u>	42
Presentation #23 <u>Laser/Anti-VEGF therapy for neonates with retinopathy of prematurity (by GA)</u>	43
Presentation #24 <u>Laser/Anti-VEGF therapy for neonates with retinopathy of prematurity (by BW)</u>	44
Presentation #25a <u>GA specific mortality or significant morbidity (6 morbidities)</u>	45
Presentation #25b <u>GA specific mortality or significant morbidity (3 morbidities)</u>	46
<u>E. Site Comparisons</u>	
<u>E.1. Site Comparisons - Population</u>	
Presentation #26 <u>Site-specific GA categories of neonates</u>	49
Presentation #27 <u>Site-specific BW categories of neonates</u>	50

E.2. Site Comparisons – Survival / Mortality

Presentation #28	Site-specific survival rates by GA	52
Presentation #29	Site-specific survival rates by BW	53
Presentation #30	Site comparison of mortality	54
Presentation #31	SNAP-II PE adjusted site mortality rates	55

E.3. Site Comparisons – Morbidities & Risks Adjusted Analyses

Presentation #32	Late onset sepsis for neonates with GA < 33 weeks (site rates)	58
Presentation #33	Late onset sepsis among neonates with GA < 33 weeks (site comparison)	59
Presentation #34	Late onset sepsis per 1000 patient days for neonates with GA < 33 weeks	60
Presentation #35	Late onset sepsis per 1000 central catheter days among neonates with GA < 33 weeks	61
Presentation #36	Treatment of PDA for neonates with GA < 33 weeks	62
Presentation #37	Surgical ligation of PDA for neonates with GA < 33 weeks	63
Presentation #38	Neuroimaging abnormalities among neonates <33 weeks GA	64
Presentation #39	Neuroimaging abnormality (VE or PEC) among neonates <33 weeks GA	66
Presentation #40	Necrotizing enterocolitis (>stage 2) for neonates with GA < 33 weeks (site rates)	67
Presentation #41	Necrotizing enterocolitis (>stage 2) among neonates with GA <33 weeks (site comparison)	69
Presentation #42	Oxygen dependency at 28 days in neonates with GA <33 weeks at birth	70
Presentation #43	Oxygen dependency at 36 weeks in neonates with GA <33 weeks at birth	71
Presentation #44	Oxygen dependency at 28 days or death in neonates with GA <33 weeks at birth	72
Presentation #45	Oxygen dependency at 36 weeks or death in neonates with GA <33 weeks at birth	73
Presentation #46a	Oxygen dependency at 36 weeks post-menstrual age (site comparison)	74
Presentation #46b	Oxygen dependency at 28 days after birth (site comparison)	75
Presentation #47a	Oxygen dependency at 36 weeks post-menstrual age or death at any time	76
Presentation #47b	Oxygen dependency at 28 days after birth or death at any time	77
Presentation #48	Postnatal use of steroids for any indication among neonates with GA <33 weeks	78
Presentation #48a	Postnatal use of steroids for treatment of BPD among neonates with GA <33 weeks	79
Presentation #48b	Postnatal use of systemic steroids for hypotension among neonates with GA <33 weeks	80
Presentation #49a	Retinopathy of prematurity among neonates with BW <1000g & survival beyond 6 weeks	81
Presentation #49b	Retinopathy of prematurity among neonates with BW <1500g and who had eye exams	82
Presentation #50	Treatment for retinopathy of prematurity among neonates with BW <1000g	83
Presentation #51	Retinopathy of prematurity stage 3 and higher	84
Presentation #52	Laser/Anti-VEGF therapy for retinopathy of prematurity	85
Presentation #53a	Benchmarking for sites which contributed all eligible admission with GA < 33 weeks	86
Presentation #53b	Benchmarking for sites which contributed all eligible admission with GA <29 weeks	87

F. Discharge Disposition & Status

Presentation #54	Discharge destination	89
Presentation #55	Support at discharge	90

G. Duration of Support & Length of Stay

Presentation #56	Duration of invasive mechanical ventilation for neonates with GA < 33 and discharged home from network hospitals	92
Presentation #57	Duration of invasive mechanical ventilation for neonates with GA < 29	93
Presentation #58	Duration of CPAP for neonates with GA < 33 and discharged home from network hospitals	94
Presentation #59	Duration of any respiratory support for neonates with GA < 33 and discharged home from network hospitals	95
Presentation #60	Duration of oxygen support for neonates with GA < 33 and discharged home from network hospitals	96

Presentation #61	<u>Duration of TPN for neonates with GA < 33 and discharged home from network hospitals</u>	97
Presentation #62	<u>Duration of TPN for neonates with GA < 29</u>	98
Presentation #63	<u>Duration of UV catheter use for neonates with GA < 33 and discharged home from network hospitals</u>	99
Presentation #64	<u>Duration of UV catheter use for neonates with GA < 29</u>	100
Presentation #65	<u>Duration of IV catheter use for neonates with GA < 33 and discharged home from network hospitals</u>	101
Presentation #66	<u>Length of stay for neonates with GA < 33 and discharged home from network hospitals</u>	102

H. Hypoxic Ischemic Encephalopathy

Presentation #67	<u>Hypoxic Ischemic Encephalopathy</u>	104
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<u>I. Trend Analyses over last 3 years</u>		107
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<u>J. Conclusions</u>		117
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<u>K. Future Plans</u>		118
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A. Executive Summary

This report from the Canadian Neonatal Network™ (CNN) is based on data from 27 tertiary NICUs, which contributed data in the year 2010. The CNN is funded through the Canadian Institutes of Health Research (CIHR) and the coordinating center at the Maternal-Infant Care Research Center is supported by the Ministry of Health and Long-Term Care, Ontario. The individual centers contribute financially by providing funding for data abstraction. The purposes of the Network are to:

- ❖ Maintain a national neonatal-perinatal database and provide the infrastructure to facilitate collaborative research
- ❖ Provide benchmarking information for Canadian NICUs
- ❖ Maintain a national network of multidisciplinary researchers interested in neonatal-perinatal research
- ❖ Longitudinally study outcomes and variations in medical care and
- ❖ Examine the impact of resource utilization and practice patterns on patient outcomes and costs of care

Summary of Results/Methodology

Canadian Neonatal Network™ Database: Admissions between January 1, 2010 and December 31, 2010 who were discharged by March 31, 2011 are included.

Total number of eligible admissions to participating Canadian NICUs (See section D.1 for analyses)	14 005
Total number of eligible individual neonates (See section D.2. for analyses)	13 151
Total number of eligible very preterm (<33 weeks GA) neonates (See section D.3. for analyses)	4 173
Total number of very low BW (VLBW) neonates (See section D.3. for analyses)	2 890
Total number of small for GA neonates	2 247

Gestational age (GA) in weeks in this document refers to completed weeks (i.e. 32 weeks include neonates of 32 weeks and 0 days to 32 weeks and 6 days of gestation). Neonates who were transferred to a “normal newborn care area” (level I nursery) or discharged home within 24 hours of their admission to the NICU were excluded. Data on patient demographics, components of care and outcome until discharge from the participating hospital were entered into a computer and transferred electronically to the Coordinating Centre, at the Maternal-Infant Care Research Centre (MiCare), where the data were verified and analyzed.

Results presented in this report are comprised of:

- Section D: Descriptive Analyses
- Section E: Site Comparisons
- Section F: Discharge Disposition and Status
- Section G: Duration of Support and Length of Stay
- Section H: Hypoxic Ischemic Encephalopathy
- Section I: Trend Analyses over last 3 years

Some sites are limited by funding and therefore are only able to contribute data from a subset of the eligible neonates admitted to their NICU. Characteristics of participating CNN sites are highlighted at the outset of the presentations to provide basic information regarding network hospitals. The ‘missing’ data on outcome variables vary for each presentation and caution should be used in interpreting the information.

B. Background and Objectives

Neonatal Intensive Care Units (NICUs) utilize the combined abilities of health care team members in expanding knowledge and advancing the technology to provide effective care of neonates. To support continuous improvement in newborn outcomes of Canadian NICUs, the CNN database provides ordinal and categorical data to identify variations in mortality, morbidity, and resource utilization. The first CNN report saw the validation of a newborn severity score [Score for Acute Neonatal Physiology (SNAPII)¹], a severity of illness scale [Neonatal Therapeutic Intervention Scoring System (NTISS)²], and an instrument for assessing neonatal transport outcomes [Transport Risk Index of Physiologic Stability (TRIPS)³]. The use of these three scores permitted benchmarking of risk-adjusted variations in mortality and morbidity among Canadian NICUs. This demonstrated variations in outcomes and practices among Canadian NICUs, and indicated that different hospitals had different strengths as well as areas requiring improvement. The results suggested that practice and outcome variations are associated, and led to the inception of an additional research project investigating the targeting of specific practices for change in order to improve outcomes in NICUs across Canada.

The Evidence-based Practice for Improving Quality (EPIQ1) project explored new methodologies for identifying care practices associated with good or poor outcomes, and provided an evidence-based approach to improving quality of care. Building upon traditional continuous quality improvement techniques, EPIQ1 used multidisciplinary teams at CNN sites, who worked collaboratively to implement best practice changes. Results of this study were recently published.¹ The second version of this project, EPIQ2, is currently ongoing in NICUs across Canada.

Research using the data was overseen by a Steering Committee, which was elected by members of the Canadian Neonatal NetworkTM. Separate ethics approvals were obtained from the participating institutions for specific projects. Studies conducted by the CNN researchers are supported by the Neonatal-Perinatal Interdisciplinary Capacity Enhancement (NICE) Team, comprising leading researchers from across Canada.

Background information regarding participating CNN sites is reported in the following page.

¹ Shoo K. Lee et al. **Improving the quality of care for neonates: a cluster randomized controlled trial.** Can. Med. Assoc. J., Oct 2009; 181: 469 - 476

CNN Site Characteristics

Site	Level II / step-down nursery?	Level II data included in CNN?	CNN data collection			Pediatric surgeries other than ROP/PDA?	ROP surgery?	PDA surgery?
			All GA/BW?	Specific GA	Specific BW			
BCCH	Yes	Yes	Yes			Yes	Yes	Yes
CHUQ	Yes	No	No	<29 weeks		Yes	Yes	Yes
ECH	Yes	Yes	Yes			No	No	No
EDM	Yes	Yes	No	<33 weeks		Yes	Yes	Yes
FMC	Yes	Yes	Yes			No	Yes	No
GVS	Yes	Yes	Yes			Yes	Yes	Yes
HHSC	Yes	No	Yes			Yes	Yes	Yes
HSC	No	No	Yes			Yes	Yes	Yes
HSCC	Yes	Yes	Yes			Yes	Yes	Yes
HSJ	Yes	Yes	Yes			Yes	Yes	Yes
IWK	Yes	Yes	Yes			Yes	Yes	Yes
JCHC	Yes	Yes	Yes			Yes	Yes	Yes
JGH	Yes	Yes	Yes			No	No	No
KGH	Yes	Yes	Yes			Yes	No	Yes
LHSC	Yes	Yes	Yes			Yes	Yes	Yes
MCH	No	No	No	<29 weeks		Yes	Yes	Yes
MSH	Yes	Yes	Yes			No	No	No
OTTA	Yes	Yes	No	<33 weeks		Yes	Yes	Yes
RCH	Yes	Yes	Yes			Yes	No	Yes
RQHR	Yes	Yes	Yes			No	No	Yes
RUH	Yes	Yes	Yes			Yes	Yes	Yes
RVH	Yes	Yes	Yes			No	No	Yes
SBGH	No	No	Yes			Yes	Yes	Yes
SEHC	No	No	Yes			No	No	No
SJRH	No	No	Yes			No	No	No
SUNY	No	No	Yes			No	No	No
SMH	Yes	Yes	No			Yes	No	No

C. Information Systems

Neonates included in this report are those who were admitted to a CNN participating site between January 1, 2010 and December 31, 2010, and were discharged by March 31, 2011. The neonates must have had a length of stay in the NICU of one of the CNN participating sites for greater than or equal to 24 hours, or died or were transferred to another level 2 or 3 facility within 24 hours. A total of 13 151 patients accounted for 14 005 admissions as some neonates were admitted on more than one occasions.

Patient information was retrospectively abstracted from patient charts by trained personnel using standard definitions and protocols contained in a standard manual of operations. Data were usually entered into a laptop computer using a customized data entry program with built-in error checking and subsequently sent electronically to the Canadian Neonatal Network™ Coordinating Centre, located at the Maternal-Infant Care Research Centre (MiCare) in Toronto, Ontario. Patient data at each participating NICU are available to the respective site investigator and data abstractor only. Patient identifiers were stripped prior to data transfer to the Coordinating Centre. Patient confidentiality was strictly observed. Individual-level data are used for analyses, but only aggregate data are reported. The results presented in this report will not identify participating NICUs by name; each site is anonymous using a randomly assigned number. Wherever a small cell size (≤ 5) was observed in the data output, the data were often grouped to maintain anonymity.

At each participating NICU, data are stored in a secured database in the NICU or in an alternate secured site used by the NICU to store patient information (e.g. health records department, computer services department). At the Coordinating Centre, the central database is stored in a secured computer database located on a server and off site back up that is maintained and secured by the Mount Sinai Hospital Information Technology Department. At the Coordinating Centre, information was verified for completeness and was reviewed for accuracy by looking for “unusual” and missing values on individual data items and by comparison with other information that might be related (e.g. GA and birth weight [BW]). However, the principal accuracy rests upon the diligence and capabilities of the individual sites. Each site had one or occasionally two dedicated person(s) responsible for data acquisition and transmission.

At the Coordinating Centre, analyses were conducted using univariate, bivariate, and multivariate analyses for the total cohort, and for individual sites. Multivariable regression analysis was used to identify risk factors associated with mortality and major morbidities. Grouped data enabled development of outcome graphs by GA and BW for mortality and selected major morbidities. Similar systems have been used to guide stratification in randomization trials, assist in quality assurance, and predict resource utilization.

D. Descriptive Analyses

This section is divided into three sub-sections.

Section D.1. Analyses based on number of eligible admissions to participating NICUs

These include data from 14 005 eligible admissions (including readmissions) to 27 NICUs. Of these 23 hospitals submitted complete data (n=13 223) on all admissions and four hospitals submitted data on a selected admission cohort (n=782).

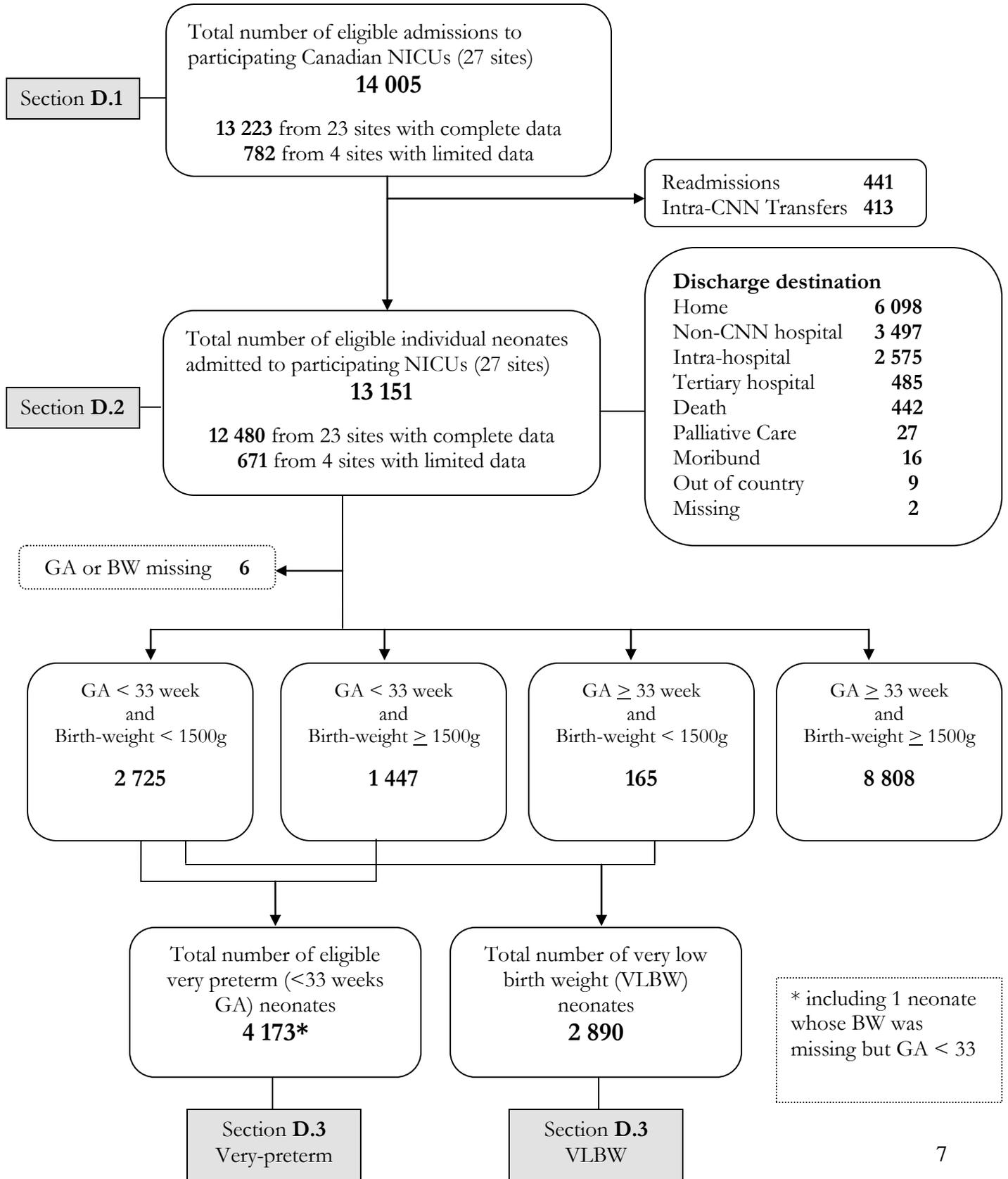
Section D.2. Analyses based on number of eligible neonates admitted to participating NICUs

These include data from 13 151 eligible neonates admitted to 27 NICUs. Of these, 23 hospitals submitted complete data (n=12 480) on all eligible admitted neonates and four hospitals submitted data on selected eligible admitted neonates (n=671).

Section D.3. Analyses based on number of eligible very preterm (< 33 weeks GA) or very low BW (<1500g BW) neonates

These include data from 4 173 eligible very preterm neonates and 2 890 eligible VLBW neonates.

Canadian Neonatal Network™ Database: Admissions between January 1, 2010 and December 31, 2010 who were discharged by March 31, 2011. Readmissions from 2009 and delivery room deaths were excluded.

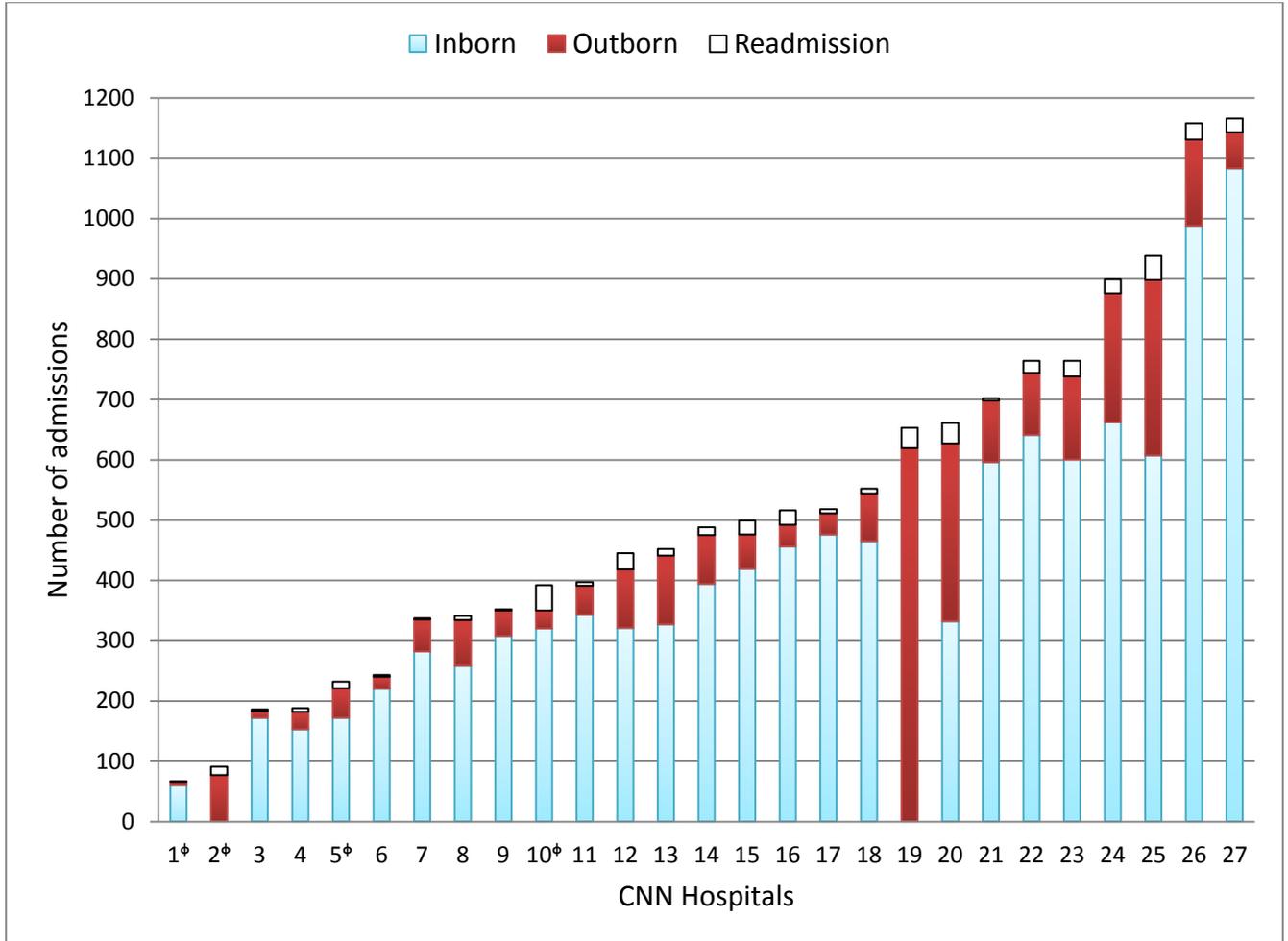


Section D.1

Analyses based on number of eligible admissions to participating NICUs

These include data from 14 005 eligible admissions (including readmissions) to 27 NICUs. Of these 23 hospitals submitted complete data (n=13 223) on all admissions and four hospitals submitted data on a selected admission cohort (n=782).

Presentation #1
Admissions to Canadian Neonatal Network participating hospitals



Presentation #1 (continued)
Admissions to Canadian Neonatal Network participating hospitals

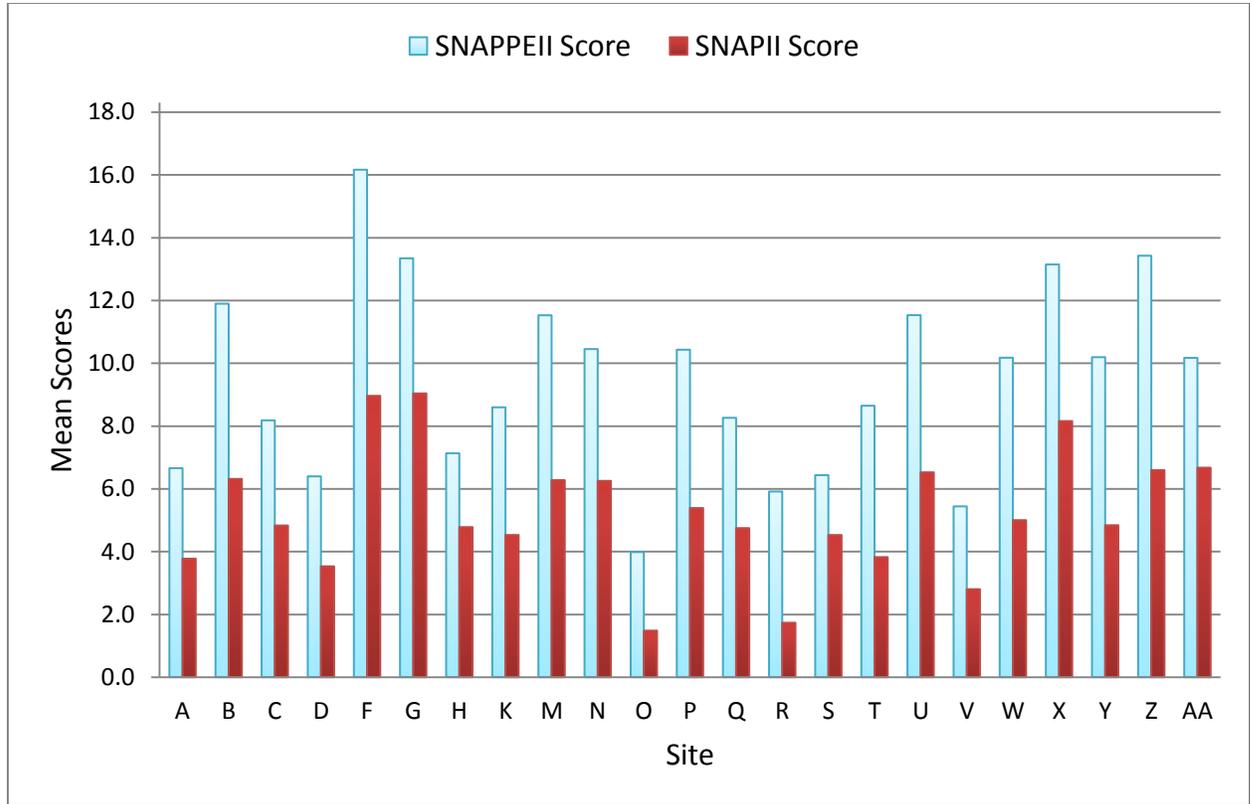
Hospitals		Admission Status			Total	Hospitals		Admission status			Total
		Inborn	Outborn	Readmission				Inborn	Outborn	Readmission	
1 ^φ	Count	60	6	1	67	14	Count	394	81	13	488
	%	89.55	8.96	1.49	(100.0)		%	80.74	16.6	2.66	(100.0)
2 ^φ	Count	0	77	14	91	15	Count	419	57	23	499
	%	0	84.62	15.38	(100.0)		%	83.97	11.42	4.61	(100.0)
3	Count	172	11	3	186	16	Count	456	36	24	516
	%	92.47	5.91	1.61	(100.0)		%	88.37	6.98	4.65	(100.0)
4	Count	153	29	6	188	17	Count	476	35	7	518
	%	81.38	15.43	3.19	(100.0)		%	91.89	6.76	1.35	(100.0)
5 ^φ	Count	172	49	11	232	18	Count	465	79	8	552
	%	74.14	21.12	4.74	(100.0)		%	84.24	14.31	1.45	(100.0)
6	Count	220	20	3	243	19	Count	0	619	34	653
	%	90.53	8.23	1.23	(100.0)		%	0	94.79	5.21	(100.0)
7	Count	282	53	2	337	20	Count	332	295	34	661
	%	83.68	15.73	0.59	(100.0)		%	50.23	44.63	5.14	(100.0)
8	Count	258	76	7	341	21	Count	596	102	4	702
	%	75.66	22.29	2.05	(100.0)		%	84.9	14.53	0.57	(100.0)
9	Count	308	42	2	352	22	Count	641	103	20	764
	%	87.5	11.93	0.57	(100.0)		%	83.9	13.48	2.62	(100.0)
10 ^φ	Count	320	30	42	392	23	Count	600	138	26	764
	%	81.63	7.65	10.71	(100.0)		%	78.53	18.06	3.4	(100.0)
11	Count	343	48	6	397	24	Count	662	214	23	899
	%	86.4	12.09	1.51	(100.0)		%	73.64	23.8	2.56	(100.0)
12	Count	321	97	27	445	25	Count	607	291	40	938
	%	72.13	21.8	6.07	(100.0)		%	64.71	31.02	4.26	(100.0)
13	Count	327	114	11	452	26	Count	988	143	27	1158
	%	72.35	25.22	2.43	(100.0)		%	85.32	12.35	2.33	(100.0)
	Count					27	Count	1083	60	23	1166
	%						%	92.88	5.15	1.97	(100.0)

Total number of admissions: 14 005
 Inborn: 10 655 (76.1%)
 Outborn: 2 905 (20.7%)
 Readmission: 441 (3.2%)
 Missing data on admission status: 4 (0.03%)

COMMENTS: These analyses include 14 005 admissions to participating NICUs across Canada during the period of January 1, 2010 to December 31, 2010. Adjusting for readmission, these represent 13 151 Neonates. **Twenty-three hospitals collected data on all eligible admissions whereas four hospitals (marked by ^φ) collected data on selected cohort of eligible admissions only.**

Presentation #2

Admission illness severity scores (SNAPII and SNAPIIPE) by hospital
(for hospitals that contributed data on all eligible admissions)
(n=23 hospitals, 13 223 admissions, 355 missing data)



Presentation #2 (continued)

Admission illness severity scores (SNAPII and SNAPIIPE) by hospital

Site		SNAPIIPE	SNAPII	Site		SNAPIIPE	SNAPII
A	Mean	6.7	3.8	N	Mean	10.4	6.3
	SEM	0.5	0.3		SEM	0.5	0.3
B	Mean	11.9	6.3	O	Mean	4.0	1.5
	SEM	0.6	0.4		SEM	0.7	0.4
C	Mean	8.2	4.8	P	Mean	10.4	5.4
	SEM	0.6	0.4		SEM	0.6	0.4
D	Mean	6.4	3.5	Q	Mean	8.3	4.7
	SEM	0.6	0.4		SEM	0.6	0.4
E^φ	Mean	28.9	11.4	R	Mean	5.9	1.7
	SEM	1.9	1.5		SEM	0.4	0.2
F	Mean	16.2	9.0	S	Mean	6.4	4.5
	SEM	0.8	0.5		SEM	0.7	0.5
G	Mean	13.3	9.0	T	Mean	8.6	3.8
	SEM	0.5	0.3		SEM	1.0	0.6
H	Mean	7.1	4.8	U	Mean	11.5	6.5
	SEM	0.7	0.5		SEM	0.6	0.4
I^φ	Mean	21.8	13.7	V	Mean	5.4	2.8
	SEM	1.5	1.0		SEM	0.5	0.3
J^φ	Mean	40.2	22.3	W	Mean	10.2	5.0
	SEM	2.9	1.7		SEM	0.8	0.5
K	Mean	8.6	4.5	X	Mean	13.1	8.2
	SEM	0.6	0.4		SEM	0.5	0.3
L^φ	Mean	20.4	9.7	Y	Mean	10.2	4.8
	SEM	1.1	0.6		SEM	0.6	0.3
M	Mean	11.5	6.3	Z	Mean	13.4	6.6
	SEM	0.8	0.5		SEM	0.7	0.5
				AA	Mean	10.2	6.7
					SEM	0.7	0.5

Overall Mean (SEM): SNAPIIPE 10.9 (0.1)

SNAPII 6.1 (0.1)

COMMENTS: These analyses include 14 005 admissions (366 missing data) to participating NICUs across Canada during the period of January 1, 2010 to December 31, 2010. Adjusting for readmission, these analysis represents 13 151 Neonates. **Twenty-three hospitals collected data on all eligible admissions whereas four hospitals (marked by ^φ) collected data on a selected cohort of eligible admissions only.**

^φ Please note that the criteria for entering neonates in the CNN dataset are not the same for these four hospitals and thus, the scores are not comparable with each other or with centers contributing complete data. These four hospitals included neonates at lower GAs and/or lower BWs; thus, their severity of illness scores may be higher than the remaining hospitals.

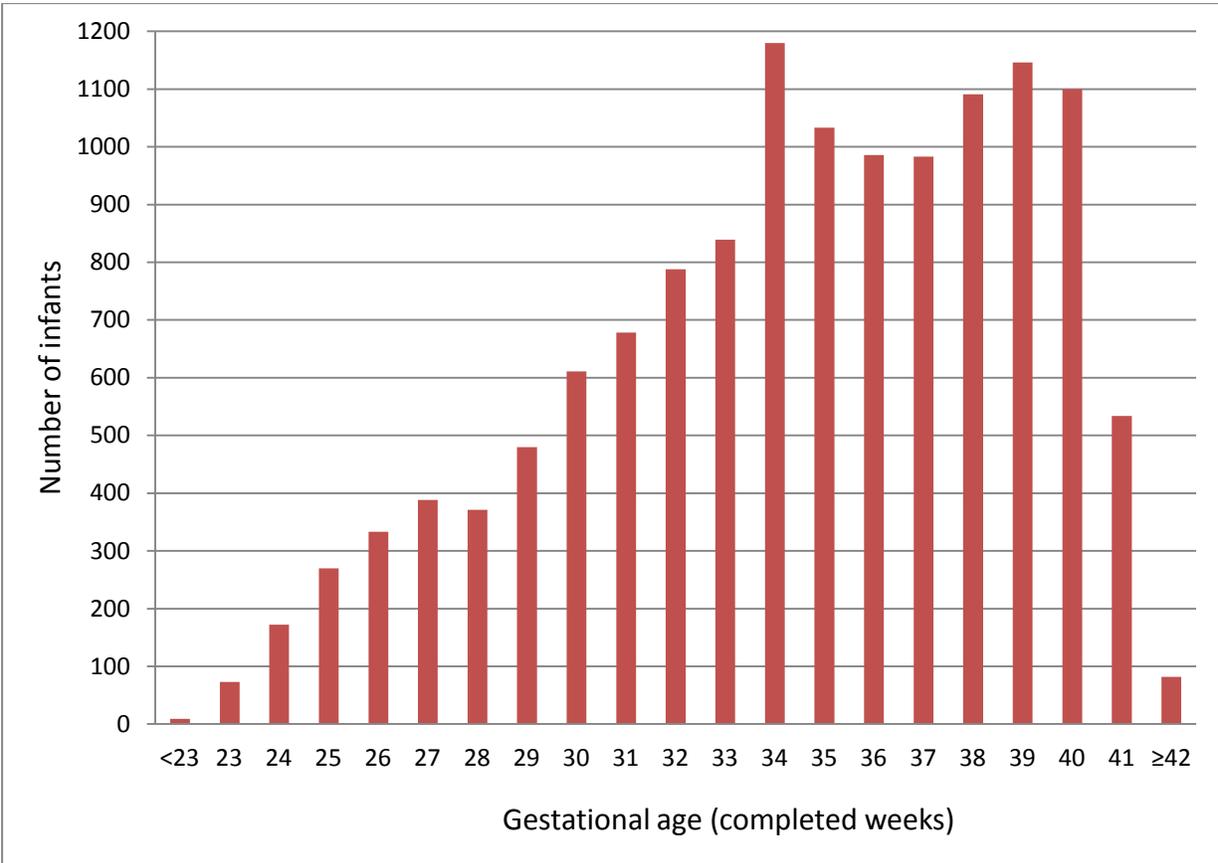
Section D.2

Analyses based on number of eligible neonates admitted to participating NICUs

These include data from 13 151 eligible neonates admitted to 27 NICUs. Of these, 23 hospitals submitted complete data (n=12 480) on all eligible admitted neonates and four hospitals submitted data on a selected cohort of eligible admitted neonates (n=671).

Presentation #3

Gestational age at birth

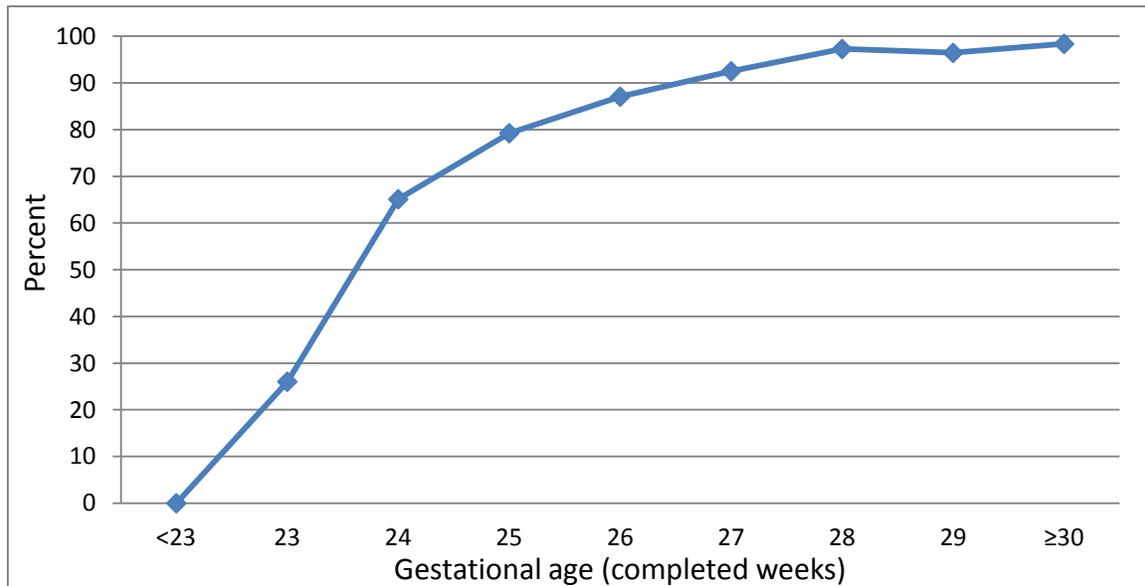


Presentation #3 (continued)
Gestational age at birth

GA in completed weeks at birth	Frequency	Percent	Cumulative percent
<23	9	0.1	0.1
23	73	0.6	0.6
24	172	1.3	1.9
25	270	2.1	4.0
26	333	2.5	6.5
27	388	3.0	9.5
28	371	2.8	12.3
29	480	3.7	15.9
30	611	4.7	20.6
31	678	5.2	25.8
32	788	6.0	31.7
33	839	6.4	38.1
34	1180	9.0	47.1
35	1033	7.9	55.0
36	986	7.5	62.5
37	983	7.5	69.9
38	1091	8.3	78.2
39	1146	8.7	87.0
40	1100	8.4	95.3
41	534	4.1	99.4
≥42	82	0.6	100.0
Total included	13 147	100.0	
Total # of missing (GA)	4		
Total # of infants	13 151		

COMMENTS: The GA distribution of neonates is shown here. Term babies (≥ 37 weeks) represent approximately 37% of the total neonates. Twenty-three hospitals collected data on all eligible admissions whereas four hospitals collected data on a selected cohort of eligible admissions.

Presentation #4
Gestational age at birth and survival to discharge from participating NICUs



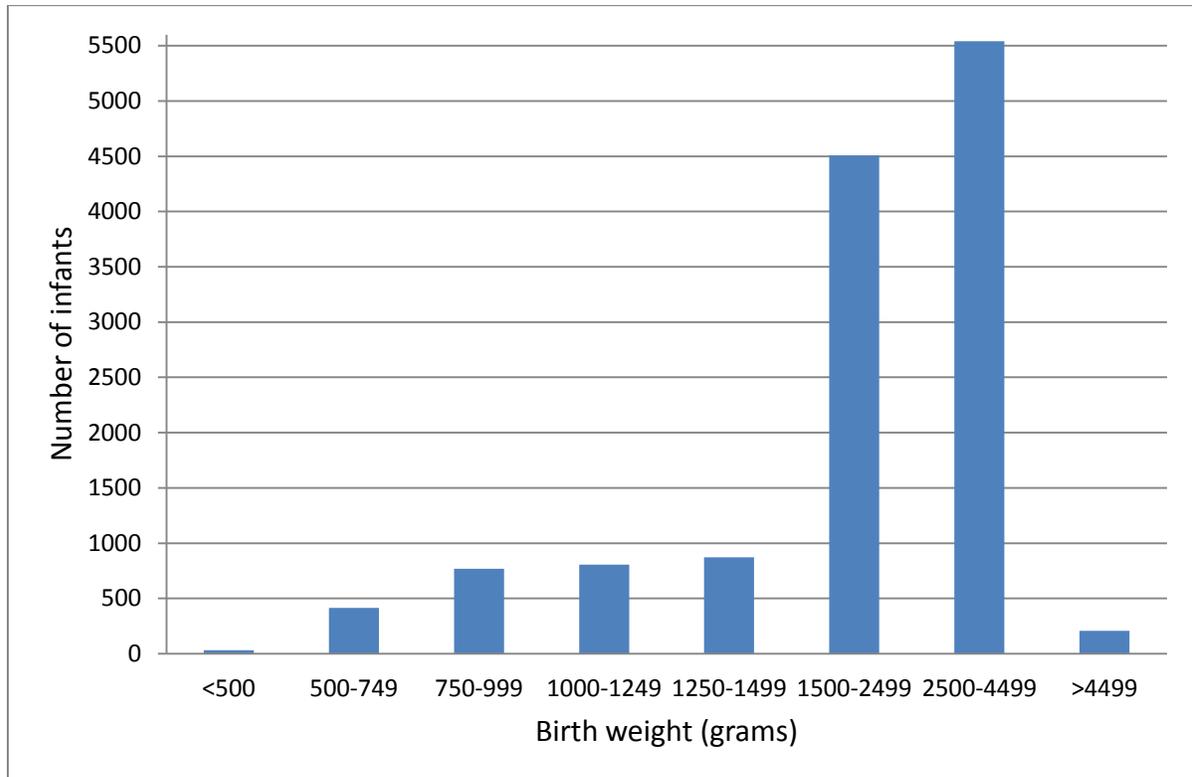
CNN Admissions					Delivery room deaths*		Total CNN admissions + Delivery room deaths*			
GA (completed weeks)	Number of infants	Number of survivors	% survival among CNN admissions	Number of infants who received palliative care	Palliative care	Active care	Total	Number of infants who received palliative care	Number of infants who received active care	Percentage survival among those who received active care
<23	9	0	0	5	12	5	26	17	9	0
23	73	19	26	5	15	7	95	20	75	25
24	172	112	65	6	2	4	178	8	170	66
25	270	214	79	3	2	1	273	5	268	80
26	333	290	87	1	1	1	335	2	333	87
27	388	359	93	0	1	1	390	1	389	93
28	371	361	97	1	1	0	372	2	370	97
29	480	463	96	1	0	0	480	1	479	96
≥30	11 051	10 873	98	10	7	2	11 060	17	11 043	98
Total included	13 147	12 691	97	32	42	21	13 210	74	13 136	97
Total # of missing (GA)	4				1	0	5	1	4	
Total # of infants	13 151				43	21	13 215	75	13 140	

*Please note that these numbers are not included in any other analyses

Note: The survival rates refer only to neonates admitted to the NICUs and should be used cautiously for antenatal counseling. The survival rates are based upon the final discharge from the participating neonatal site. Note that these rates include only neonates admitted to NICUs or died in delivery room of participating sites and thus, are not reflective of the entire Canadian population. Capturing data for DR deaths is an ongoing process and not all sites contributed delivery room deaths data.

Presentation #5

Birth weight

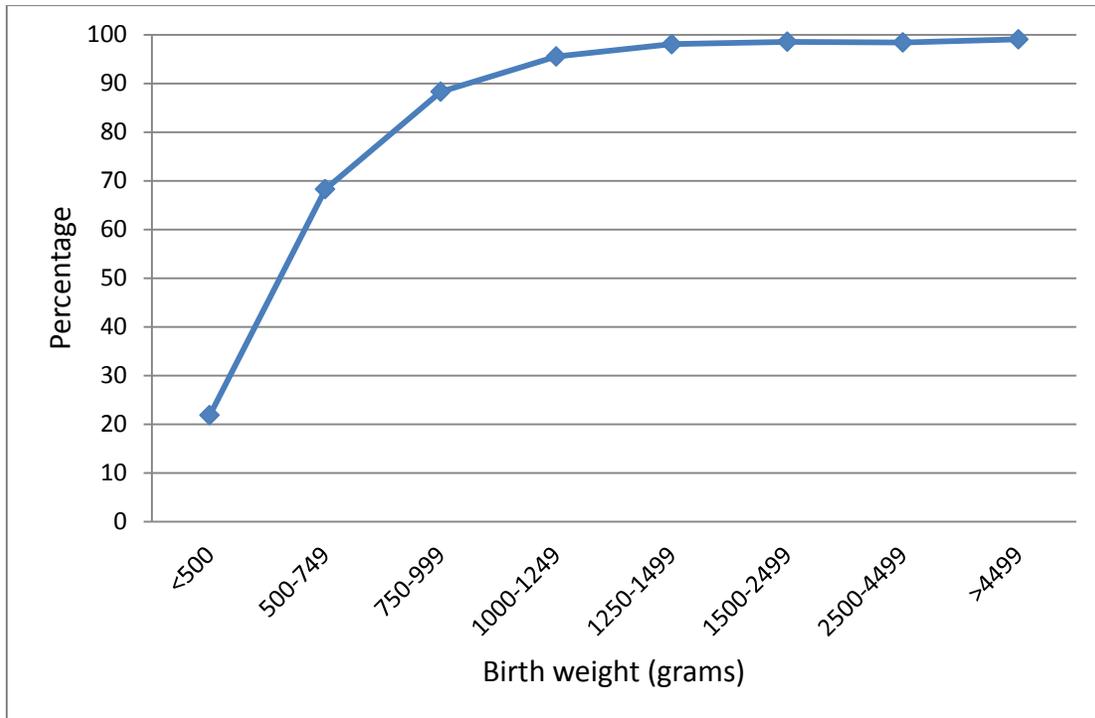


BW (grams)	Frequency	Percent from total number of neonates	Cumulative percent
<500	32	0.2	0.2
500-749	413	3.1	3.4
750-999	769	5.9	9.2
1000-1249	805	6.1	15.4
1250-1499	871	6.6	22.0
1500-2499	4 507	34.3	56.3
2500-4499	5 542	42.2	98.4
>4499	208	1.6	100.0
Total included	13 147	100.0	
Missing (BW)	4		
Total # of neonates	13 151		

COMMENTS: The BW distribution of neonates admitted to NICUs. Seventy-eight percent weighed over 1 500g at birth and 43.7% weighed over 2 500g. Twenty-three hospitals collected data on all admissions whereas four hospitals collected data on a selected cohort of eligible admissions only.

Presentation #6

Birth weight and survival to discharge from participating NICUs



BW (grams)	Number of neonates	Number of survivors	% survival
<500	32	7	22
500-749	413	282	68
750-999	769	679	88
1000-1249	805	769	96
1250-1499	871	854	98
1500-2499	4 507	4 442	99
2500-4499	5 542	5 454	98
>4499	208	206	99
Total included	13 147	12 693	97
Missing (BW)	4		
Total # of neonates	13 151		

Note: The survival rates refer only to neonates admitted to the NICUs, and should be used cautiously for antenatal counseling.

COMMENTS: The survival rates are defined as survival to final discharge from the participating neonatal site. Note that these rates include only neonates admitted to NICUs and thus, are not reflective of the Canadian population. Numbers and rates do not represent neonates (especially those at very low GAs) who died prior to admission to participating NICUs.

Presentation #7

Maternal characteristics

Characteristics		Missing	Unknown		GA at birth (completed weeks)						Total
					≤25	26 - 28	29 - 30	31 - 32	33 - 36	≥37	
Total		4			524	721	1462	2305	3199	4936	13151
No prenatal care		18	993	N	13	28	18	20	53	65	197
				%	2.7	2.8	1.8	1.5	1.4	1.4	1.6
Illicit drug use		8		N	24	48	53	60	218	341	744
				%	4.6	4.4	4.9	4.1	5.4	6.9	5.7
Smoking		8		N	71	181	174	224	572	751	1973
				%	13.6	16.6	16.0	15.3	14.2	15.2	15.0
Maternal hypertension		17	337	N	48	198	235	316	776	458	2031
				%	9.7	18.8	22.2	22.0	19.6	9.5	15.9
Maternal diabetes		16	413	N	25	97	132	170	558	576	1558
				%	5.1	9.4	12.6	11.9	14.2	12.0	12.2
Assisted pregnancy		16	551	N	57	103	147	213	439	156	1115
				%	11.5	10.0	14.2	15.0	11.3	3.3	8.9
Multiples		4		N	126	287	359	551	1185	166	2674
				%	24.1	26.3	32.9	37.6	29.4	3.4	20.3
MgSO ₄ during labour		18	862	N	63	184	146	197	239	47	876
				%	13.0	18.1	14.6	14.2	6.3	1.0	7.1
Prenatal steroids	None	527		N	101	112	106	215	2511	4603	7648
				%	20.0	10.6	10.1	15.1	65.1	97.3	60.6
	Complete in last week			N	204	401	348	479	418	19	1869
				%	40.4	38.0	33.3	33.6	10.8	0.4	14.8
	Complete before last week			N	73	270	327	405	608	101	1784
				%	14.5	25.6	31.3	28.4	15.8	2.1	14.1
	Complete (timing unknown)			N	17	39	32	41	73	1	203
				%	3.4	3.7	3.1	2.9	1.9	0.0	0.7
	Partial <24h			N	99	207	187	242	204	4	943
				%	19.6	19.6	17.9	17.0	5.3	0.1	7.5
	Partial >24h			N	10	21	29	31	31	3	125
				%	2.0	2.0	2.8	2.2	0.8	0.1	1.0
	Partial (timing unknown)			N	1	6	16	14	13	2	52
				%	0.2	0.6	1.5	1.0	0.3	0.0	0.4

Presentation #7 (continued)

Maternal characteristics

Characteristics		Missing	Unknown		GA at birth (completed weeks)						Total
					≤25	26 - 28	29 - 30	31 - 32	33 - 36	≥37	
Total		4			524	721	1462	2305	3199	4936	13151
Mode of birth	Vaginal	15	45	N	282	436	413	591	2026	2957	6705
				%	54.0	40.1	37.9	40.5	50.4	60.2	51.2
	C/S			N	240	651	676	869	1998	1952	6386
				%	46.0	59.9	62.1	59.5	49.7	39.8	48.8
Presentation	Vertex	15	942	N	248	643	680	943	3009	4197	9720
				%	52.4	63.4	67.8	69.7	79.6	91.9	79.7
	Breech			N	198	314	277	348	661	283	2081
				%	41.9	30.9	27.6	25.7	17.5	6.2	17.1
	Other			N	27	58	46	63	110	89	393
				%	5.7	5.7	4.6	4.7	2.9	2.0	3.2
Rupture of membranes	<24 h	16	793	N	377	830	810	1089	3333	4296	10735
				%	77.4	80.0	79.1	80.7	87.2	93.0	87.0
	24h to 1wk			N	67	137	110	163	368	316	1161
				%	13.8	13.2	10.7	12.1	9.6	6.8	9.4
	>1 wk			N	43	71	104	97	121	10	446
				%	8.8	6.8	10.2	7.2	3.2	0.2	3.6
Chorioamnionitis*		3 941		N	127	211	129	118	152	229	966
				%	33.1	25.1	16.0	10.5	5.4	7.1	10.5
Antenatal interventions**		17	485	N	11	26	16	28	67	39	187
				%	2.2	2.5	1.6	2.0	1.7	0.8	1.5

*Chorioamnionitis is defined as documented “suspected or confirmed chorioamnionitis” in maternal chart or presence of maternal fever and *either* leukocytosis *or* uterine tenderness

** Antenatal interventions include Fetal transfusion, Fetal reduction, Laser ablation, Amnioreduction, Shunt placement etc.

Presentation #8

Resuscitation (GA < 31 weeks)

Characteristics		GA at birth (completed weeks)								Total	
		≤23	24	25	26	27	28	29	30		
Total			82	172	270	333	388	371	480	611	2707
No resuscitation needed	N	3	1	3	4	6	12	30	72	131	
	%	3.7	0.6	1.1	1.2	1.6	3.2	6.3	11.8	4.8	
CPAP only	N	0	8	14	16	36	40	41	65	220	
	%	0.0	4.7	5.2	4.8	9.3	10.8	8.5	10.6	8.1	
PPV via mask	N	55	130	190	252	293	275	340	389	1924	
	%	67.1	75.6	70.4	75.7	75.5	74.1	70.8	63.7	71.1	
PPV via ETT	N	66	139	210	250	244	168	196	178	1451	
	%	80.5	80.8	77.8	75.1	62.9	45.3	40.8	29.1	53.6	
Chest compression	N	10	24	26	26	19	13	26	18	162	
	%	12.2	14.0	9.6	7.8	4.9	3.5	5.4	3.0	6.0	
Epinephrine	N	4	11	10	8	5	3	10	8	59	
	%	4.9	6.4	3.7	2.4	1.3	0.8	2.1	1.3	2.2	
Palliative	N	10	6	3	1	0	1	1	1	23	
	%	12.2	3.5	1.1	0.3	0.0	0.3	0.2	0.2	0.8	
Unknown	N	0	2	5	6	8	8	9	12	50	
	%	0.0	1.2	1.9	1.8	2.1	2.2	1.9	2.0	1.8	
Any resuscitation provided*	N	69	161	256	316	367	330	407	463	2369	
	%	84.2	93.6	94.8	94.9	94.6	89.0	84.8	75.8	87.5	
Initial gas (N=1943)	Air	N	10	23	36	61	67	85	81	101	464
		%	17.9	17.7	18.0	24.1	22.3	30.7	24.5	25.6	23.9
	Suppl. O ₂	N	6	39	77	90	132	125	142	184	795
		%	10.7	30.0	38.5	35.6	43.9	45.1	42.9	46.6	40.9
	100% O ₂	N	40	68	87	102	102	67	108	110	684
		%	71.4	52.3	43.5	40.3	33.9	24.2	32.6	27.9	35.2
Maximum O ₂ conc. during resus (N=1766)	21%	N	1	1	5	2	12	6	13	20	60
		%	1.9	0.8	2.5	0.9	4.3	2.5	4.3	5.8	3.4
	22-40%	N	1	6	39	37	60	55	83	107	388
		%	1.9	4.9	19.6	16.4	21.7	23.2	27.2	31.0	22.0
	41-70%	N	1	12	22	30	38	42	45	44	234
		%	1.9	9.8	11.1	13.3	13.7	17.7	14.8	12.8	13.3
	>70%	N	51	104	133	157	167	134	164	174	1084
		%	94.4	84.6	66.8	69.5	60.3	56.5	53.8	50.4	61.4

* Number of neonates who received any resuscitation includes those who received CPAP, PPV, Chest compression or epinephrine

NOTE: Please note that some of the definitions for items on this data collection were evolving during this first year of this data collection. Please use caution while interpreting these data.

Presentation #8 (continued)

Resuscitation (GA \geq 31 weeks)

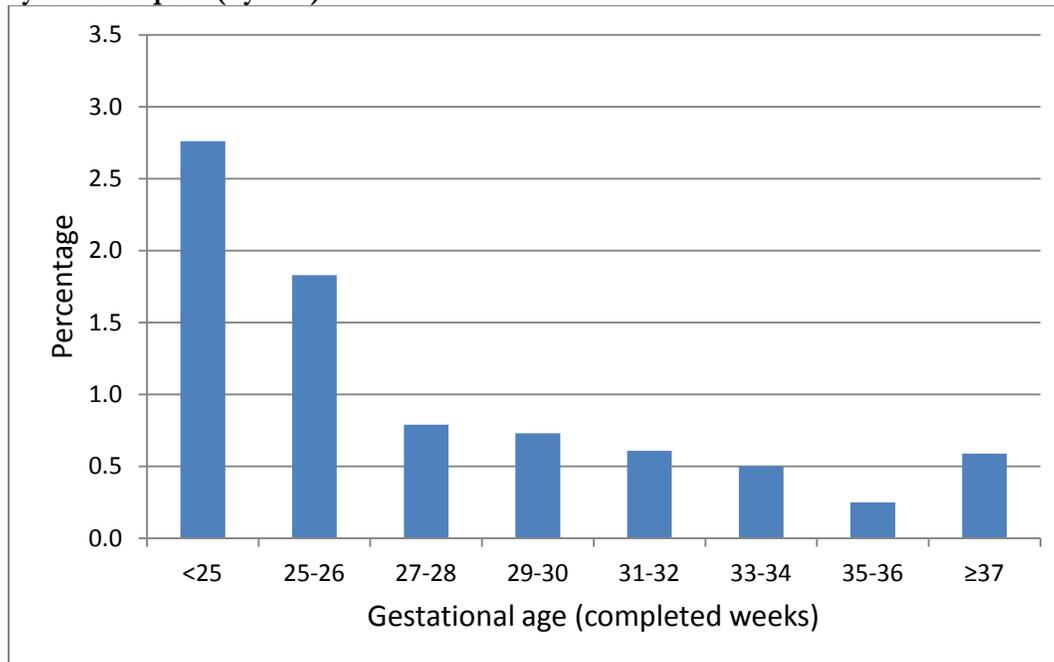
Characteristics			GA at birth (completed weeks)						Total	
			31	32	33	34	35	36		≥ 37
Total			678	788	839	1180	1033	986	4936	10440
No resuscitation needed	N		102	172	248	452	389	368	1877	3608
	%		15.0	21.8	29.6	38.3	37.7	37.3	38.0	34.6
CPAP only	N		77	65	37	53	46	24	102	404
	%		11.4	8.3	4.4	4.5	4.5	2.4	2.1	3.9
PPV via mask	N		360	359	315	329	288	300	1475	3426
	%		53.1	45.6	37.5	27.9	27.9	30.4	29.9	32.8
PPV via ETT	N		131	100	68	59	48	79	560	1045
	%		19.3	12.7	8.1	5.0	4.7	8.0	11.4	10.0
Chest compression	N		12	17	10	8	9	18	146	220
	%		1.8	2.2	1.2	0.7	0.9	1.8	3.0	2.1
Epinephrine	N		6	7	4	2	3	11	55	88
	%		0.9	0.9	0.5	0.2	0.3	1.1	1.1	0.8
Palliative	N		0	0	0	2	1	1	5	9
	%		0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.1
Unknown	N		18	22	17	24	19	41	198	339
	%		2.7	2.8	2.0	2.0	1.8	4.2	4.0	3.2
Any resuscitation provided*		N	441	429	364	391	334	337	1717	4013
		%	65.0	54.4	43.4	33.1	32.3	34.2	34.8	38.4
Initial gas (N=4236)	Air	N	139	152	153	167	145	130	578	1464
		%	33.3	36.2	40.5	37.0	36.6	33.9	32.3	34.6
	Suppl. O ₂	N	169	159	130	148	146	135	589	1476
		%	40.5	37.9	34.4	32.8	36.9	35.3	32.9	34.8
	100% O ₂	N	109	109	95	136	105	118	624	1296
		%	26.1	26.0	25.1	30.2	26.5	30.8	34.8	30.6
Maximum O ₂ conc. during resus (N=3424)	21%	N	30	38	49	57	55	42	171	442
		%	8.4	11.2	16.0	16.1	17.7	13.8	11.8	12.9
	22-40%	N	107	117	88	87	77	67	295	838
		%	30.1	34.5	28.7	24.5	24.8	22.0	20.3	24.5
	41-70%	N	48	29	34	37	34	29	123	334
		%	13.5	8.6	11.1	10.4	11.0	9.5	8.5	9.8
	>70%	N	171	155	136	174	144	166	864	1810
		%	48.0	45.7	44.3	49.0	46.5	54.6	59.5	52.9

* Number of neonates who received any resuscitation includes those who received CPAP, PPV, Chest compression or epinephrine

NOTE: Please note that some of the definitions for items on this data collection were evolving during this first year of this data collection. Please use caution while interpreting these data.

Presentation #9

Early onset sepsis (by GA)

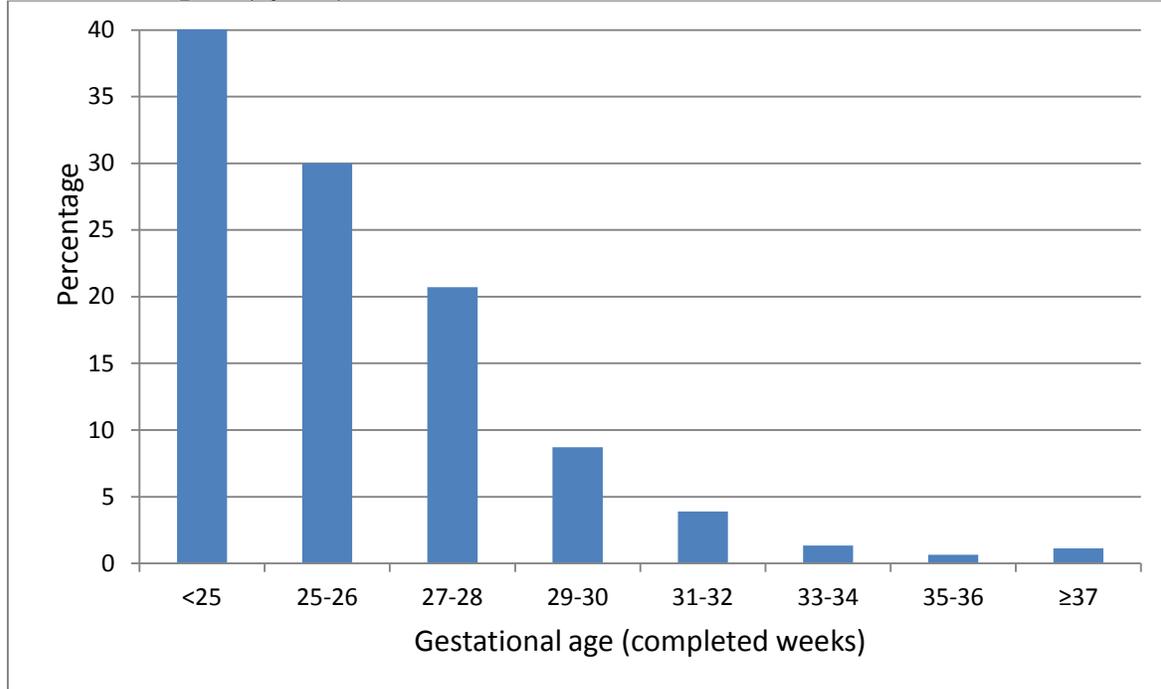


GA at birth (completed weeks)	Total number of neonates	No. of neonates with infection	% of neonates with infection	Total number of organisms	Organism			
					GBS	E. Coli	CONS	Others
<25	254	7	2.8	7	2	2	2	1
25-26	602	11	1.8	12	4	3	1	4
27-28	758	6	0.8	6	1	3	1	1
29-30	1 091	8	0.7	8	1	3	2	2
31-32	1 466	9	0.6	9	2	5	2	0
33-34	2 018	10	0.5	10	2	3	2	3
35-36	2 019	5	0.3	5	1	0	4	0
≥37	4 935	29	0.6	29	12	4	7	6
Total included	13 147	85	0.6	86	25	23	21	17
Missing (GA)	4							
Total # of neonates	13 151							

COMMENTS: Early onset sepsis is indicated by positive bacterial or fungal culture in blood and/or cerebrospinal fluid, in the first two days after birth. One neonate had two organisms isolated.

Presentation #10

Late onset sepsis (by GA)

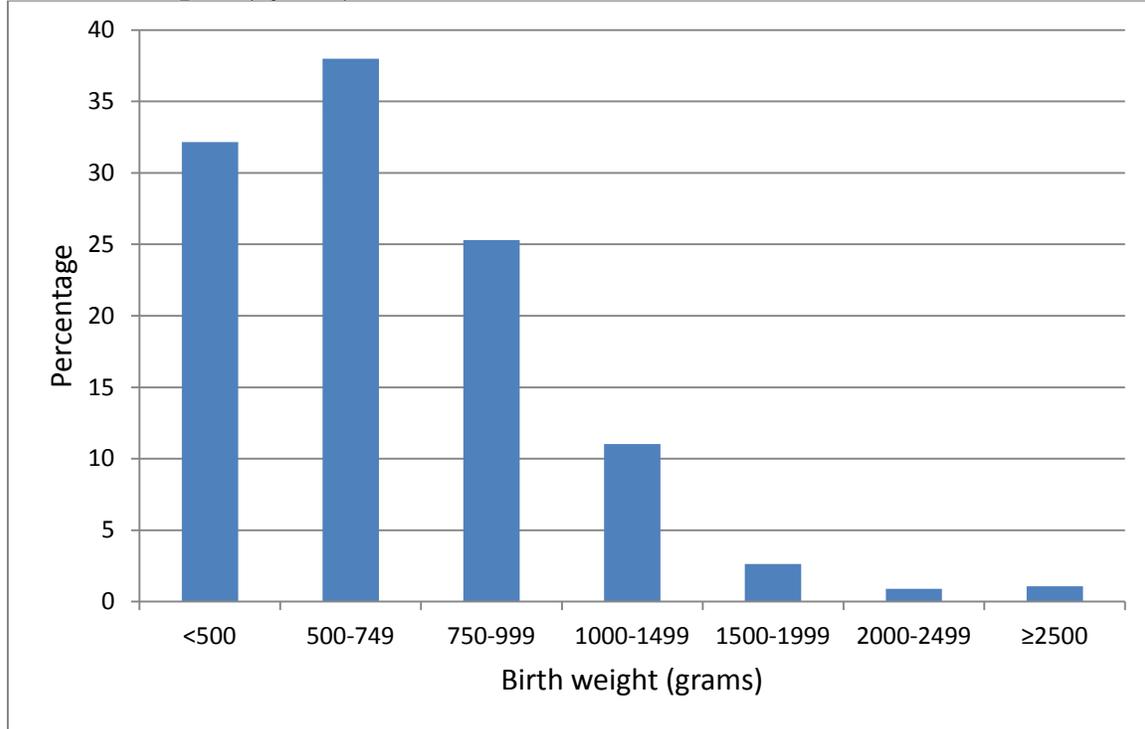


GA at birth (completed weeks)	Total number of neonates	Number of deaths in the first 2 days after birth	Number of neonates survived beyond day 2 after birth	Number of neonates with at least one infection	Number of infants with more than one infection	Percent of infants who survived day 2 with at least one infection	Total number of organism	Organisms			
								CONS	E. Coli	Staph Aureus Coag +	Other
<25	254	30	224	90	20	40	122	66	12	8	36
25-26	603	16	587	176	42	30	244	143	18	11	72
27-28	759	6	753	156	33	21	212	147	9	8	48
29-30	1 091	11	1 080	94	10	9	113	74	7	9	23
31-32	1 466	3	1 463	57	8	4	68	46	5	3	14
33-34	2 019	6	2 013	27	2	1	30	13	5	4	8
35-36	2 019	6	2 013	13	3	1	17	9	2	1	5
≥37	4 936	28	4 908	55	8	1	66	31	10	0	25
Total included	13 147	106	13 041	668	126	5	872	529	68	44	231
Missing (GA)	4										
Total # of neonates	13 151										

COMMENTS: Late onset sepsis is indicated by any positive blood and/or cerebrospinal fluid culture for bacteria or fungi after 2 days of age (analysis is neonate-based). The numbers are adjusted for readmission.

Presentation #11

Late onset sepsis (by BW)



BW (grams)	Total number of neonates	Number of deaths in the first 2 days after birth	Number of neonates survived beyond day 2 after birth	Number of infants with at least one infection	Number of infants with more than one infection	Percent of infants who survived day 2 with at least one infection)	Total number of organism	Organism			
								CON S	E. Coli	Staph Aureus Coag +	Other s
<500	32	4	28	9	2	32	11	6	2	0	3
500-749	413	34	379	144	33	38	199	114	13	10	62
750-999	769	14	755	191	43	25	264	165	16	14	69
1000-1499	1 676	9	1 667	184	29	11	229	159	11	14	45
1500-1999	2 170	7	2 163	57	8	3	71	36	11	3	21
2000-2499	2 337	5	2 332	21	4	1	26	15	4	2	5
≥2500	5 750	32	5 718	62	7	1	72	34	11	1	26
Total included	13 147	105	13 042	668	126	5	872	529	68	44	231
Missing (GA)	4										
Total # of neonates	13 151										

COMMENTS: Late onset sepsis is indicated by any positive blood and/or cerebrospinal fluid culture for bacteria or fungi after 2 days of age (analysis is neonate-based). The numbers are adjusted for readmission and transfer.

Presentation #12

Other diagnoses / interventions / procedures by GA groups

Characteristics				GA at birth (completed weeks)						Total
				≤25	26 - 28	29 - 30	31 - 32	33 - 36	≥37	
Total		missing		524	721	1462	2305	3199	4936	13151
Prophylactic	Indomethacin	14	N	35	17	5	0	0	2	59
			%	6.8	1.6	0.5	0.0	0.0	0.0	0.4
	HFV	14	N	25	25	7	3	10	12	82
			%	4.9	2.3	0.6	0.2	0.3	0.2	0.6
	Vitamin A	14	N	8	2	3	0	0	0	13
			%	1.6	0.2	0.3	0.0	0.0	0.0	0.1
	Probiotics	14	N	1	11	8	15	1	0	36
			%	0.2	1.0	0.7	1.0	0.0	0.0	0.3
	Phototherapy	14	N	78	125	77	88	78	62	508
			%	15.2	11.5	7.1	6.0	1.9	1.3	3.9
	L-Arginine	14	N	19	38	1	0	0	1	59
			%	3.7	3.5	0.1	0.0	0.0	0.0	0.4
	Surfactant*		N	223	328	151	48	18	6	774
			%	42.6	30.0	13.8	3.3	0.5	0.1	5.9
RDS	Unknown	17	N	9	4	2	3	8	9	35
			%	1.8	0.4	0.2	0.2	0.2	0.2	0.3
	Uncertain		N	9	29	39	41	51	49	218
			%	1.8	2.7	3.6	2.8	1.3	1.0	1.7
	None		N	31	186	404	900	3359	4604	9484
			%	6.0	17.1	37.2	61.4	83.2	93.3	72.2
	Definite		N	465	872	641	522	620	273	3393
			%	90.5	79.9	59.0	35.6	15.4	5.5	25.8
Pneumothorax	Observation	14	N	13	13	5	11	46	197	285
			%	2.5	1.2	0.5	0.8	1.1	4.0	2.2
	Needle drainage	14	N	15	12	8	6	18	30	89
			%	2.9	1.1	0.7	0.4	0.5	0.6	0.7
	Chest tube	14	N	22	16	17	19	49	82	205
			%	4.3	1.5	1.6	1.3	1.2	1.7	1.6
	100% O ₂	14	N	12	7	3	7	14	53	96
			%	2.3	0.6	0.3	0.5	0.4	1.1	0.7
Seizures	Definite /suspected	14	N	47	34	21	16	65	301	484
			%	9.1	3.1	1.9	1.1	1.6	6.1	3.7

*Surfactant given within 30 minutes of birth

Presentation #12 (continued)
Other diagnoses / interventions / procedures by GA groups

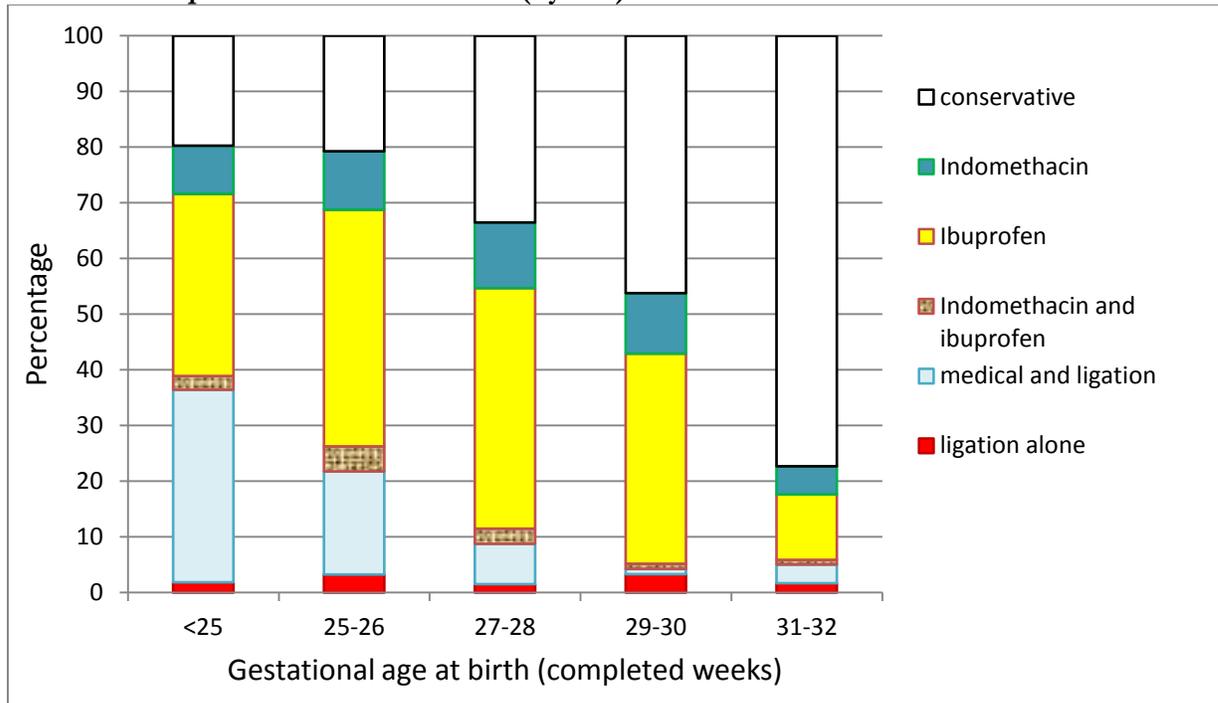
Characteristics				GA at birth (completed weeks)						Total
				≤25	26 - 28	29 - 30	31 - 32	33 - 36	≥37	
Total		missing		524	721	1462	2305	3199	4936	13151
Operations	Laparotomy	14	N	35	46	15	21	97	160	374
			%	6.8	4.2	1.4	1.4	2.4	3.2	2.8
	Thoracotomy	14	N	25	8	5	1	11	29	79
			%	4.9	0.7	0.5	0.1	0.3	0.6	0.6
	VP shunt	14	N	10	6	3	4	4	10	37
			%	2.0	0.6	0.3	0.3	0.1	0.2	0.3
Gastro-intestinal perforation	Spontaneous	74	N	27	14	7	6	9	10	73
			%	5.3	1.3	0.7	0.4	0.2	0.2	0.6
	NEC related		N	18	23	7	10	4	8	70
			%	3.5	2.1	0.7	0.7	0.1	0.2	0.5
Acquired stricture		14	N	7	17	2	1	1	2	30
			%	1.4	1.6	0.2	0.1	0.0	0.0	0.2
Acute bilirubin encephalopathy		14	N	0	0	2	0	5	4	11
			%	0.0	0.0	0.2	0.0	0.1	0.1	0.1
Exchange transfusion		14	N	0	2	3	5	15	21	46
			%	0.0	0.2	0.3	0.3	0.4	0.4	0.4
Congenital anomaly	None		N	395	881	915	1247	3385	3684	10507
			%	75.4	80.7	83.9	85.1	83.8	74.6	79.9
	Minor		N	102	164	133	147	347	571	1464
			%	19.5	15.0	12.2	10.0	8.6	11.6	11.1
	Major		N	27	47	43	72	306	681	1176
			%	5.2	4.3	3.9	4.9	7.6	13.8	8.9

Section D.3

Analyses based on number of eligible very preterm (< 33 weeks GA) or very low BW neonates (<1 500g BW) neonates

These include data from 4 173 eligible very preterm neonates and 2 890 eligible VLBW neonates.

Presentation #13
Treatment of patent ductus arteriosus (by GA)

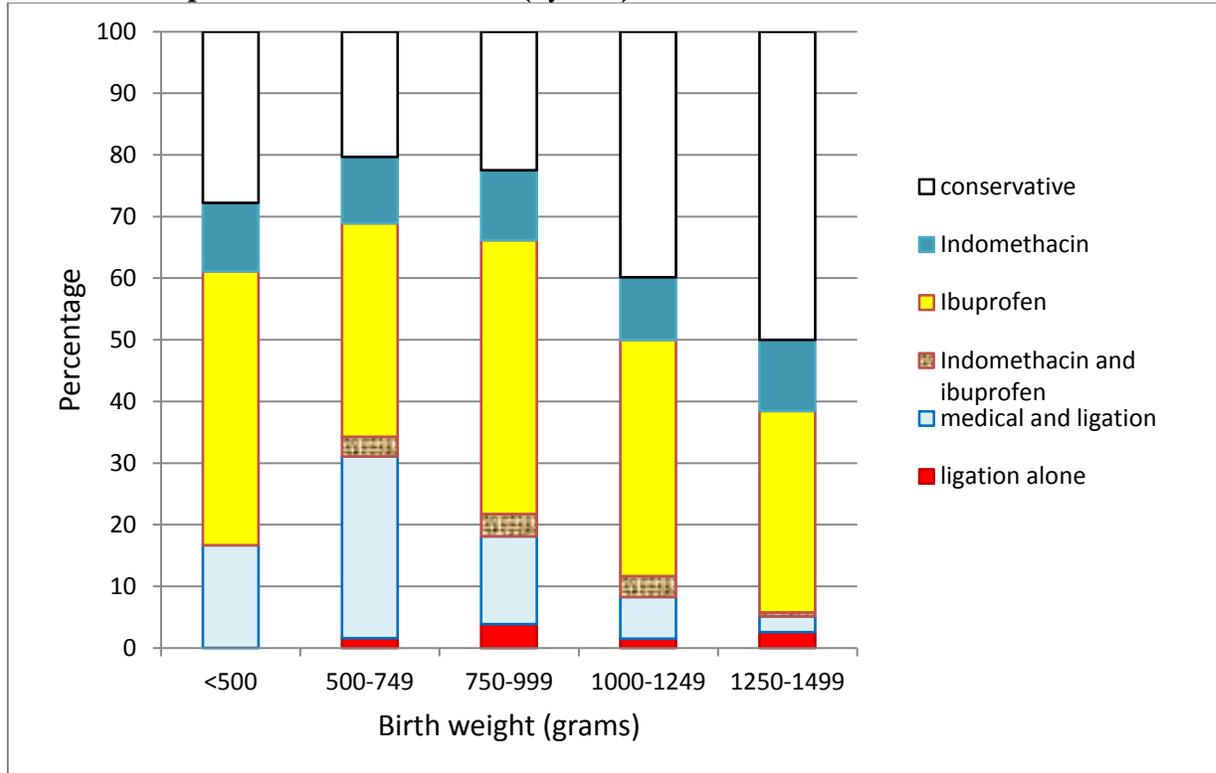


Birth GA (completed weeks)	Total	Missing data on PDA	PDA information unknown	No PDA	Neonates with PDA	Treatment*					
						Conser vative	Indome thacin	Ibuprofen	Indometh acin and Ibuprofen	Medical and ligation#	Ligation alone
<25	N 254 %	8	12	72	162	32 20%	14 9%	53 33%	4 2%	56 35%	3 2%
25-26	N 603 %	2	8	193	400	83 21%	42 11%	170 43%	18 5%	74 19%	13 3%
27-28	N 759 %	0	1	427	331	111 34%	39 12%	143 43%	9 3%	24 7%	5 2%
29-30	N 1 091 %	3	5	871	212	98 46%	23 11%	80 38%	2 1%	2 1%	7 3%
31-32	N 1 466 %	0	9	1 338	119	92 77%	6 5%	14 12%	1 1%	4 3%	2 2%
Total included	N 4 173 %	13	35	2 901	1 224	416 34%	124 10%	460 38%	34 3%	160 13%	30 2%

*The percentages of treatment of patent ductus arteriosus are calculated out of number of neonates with diagnosed PDA. # Medical and ligation = Ligation + at least one of (Indomethacin or Ibuprofen)

COMMENTS: Specific reasons for treatment with indomethacin and frequency of repeat course of indomethacin were not recorded. Excludes indomethacin prophylaxis started on the first day of age. Neonates were identified as without PDA if there was no clinical suspicion of PDA.

Presentation #14
Treatment of patent ductus arteriosus (by BW)



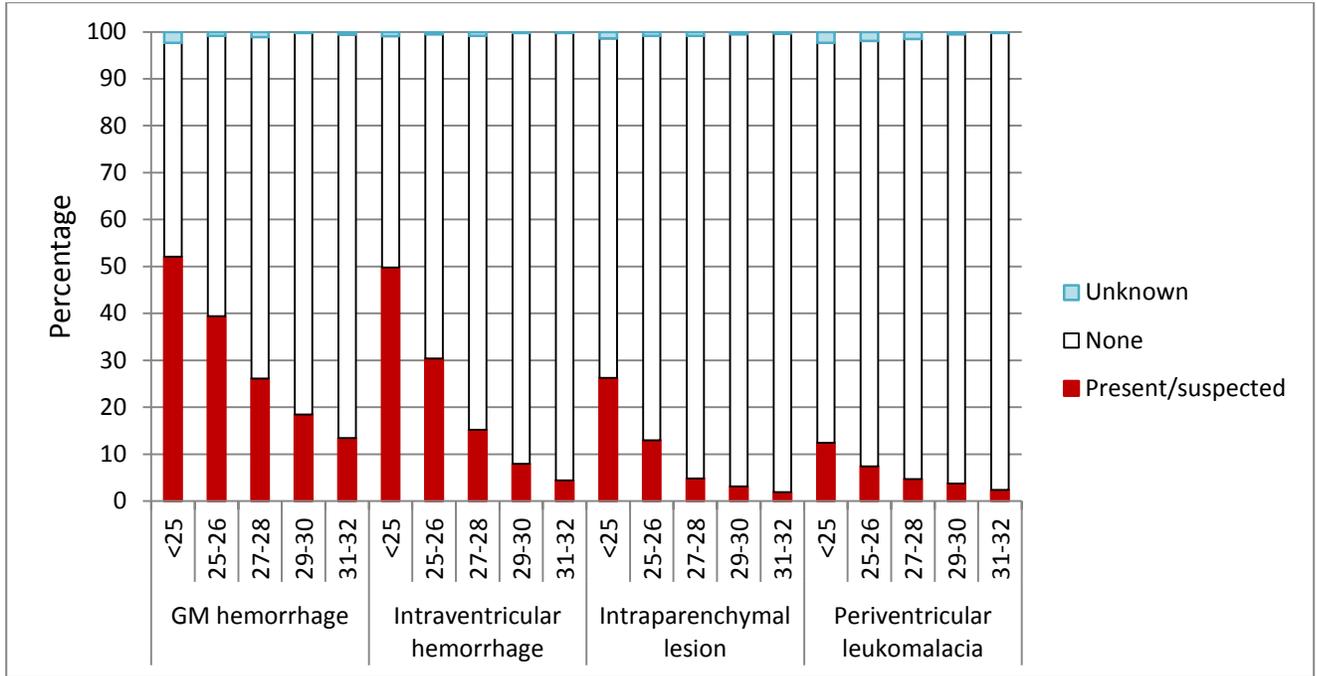
BW (grams)		Total	Missing data on PDA	PDA information unknown	No PDA	Neonates with PDA	Treatment*					
							Conservative	Indomethacin	Ibuprofen	Indomethacin and Ibuprofen	Medical and ligation [#]	Ligation alone
<500	N %	32	6	1	7	18	5 28	2 11	8 44	0 0	3 17	0 0
500-749	N %	413	3	15	144	251	51 20	27 11	87 35	8 3	74 29	4 2
750-999	N %	769	2	6	347	414	93 22	47 11	184 44	15 4	59 14	16 4
1000-1249	N %	805	1	4	534	266	106 40	27 10	102 38	9 3	18 7	4 2
1250-1499	N %	871	0	5	710	156	78 50	18 12	51 33	1 1	4 3	4 3
Total included	N %	2 890	12	31	1 742	1 105	333 30	121 11	432 39	33 3	158 14	28 3

*The percentages of treatment of patent ductus arteriosus are calculated out of number of neonates with diagnosed PDA. [#]Medical and ligation = Ligation + at least one of (Indomethacin or Ibuprofen)

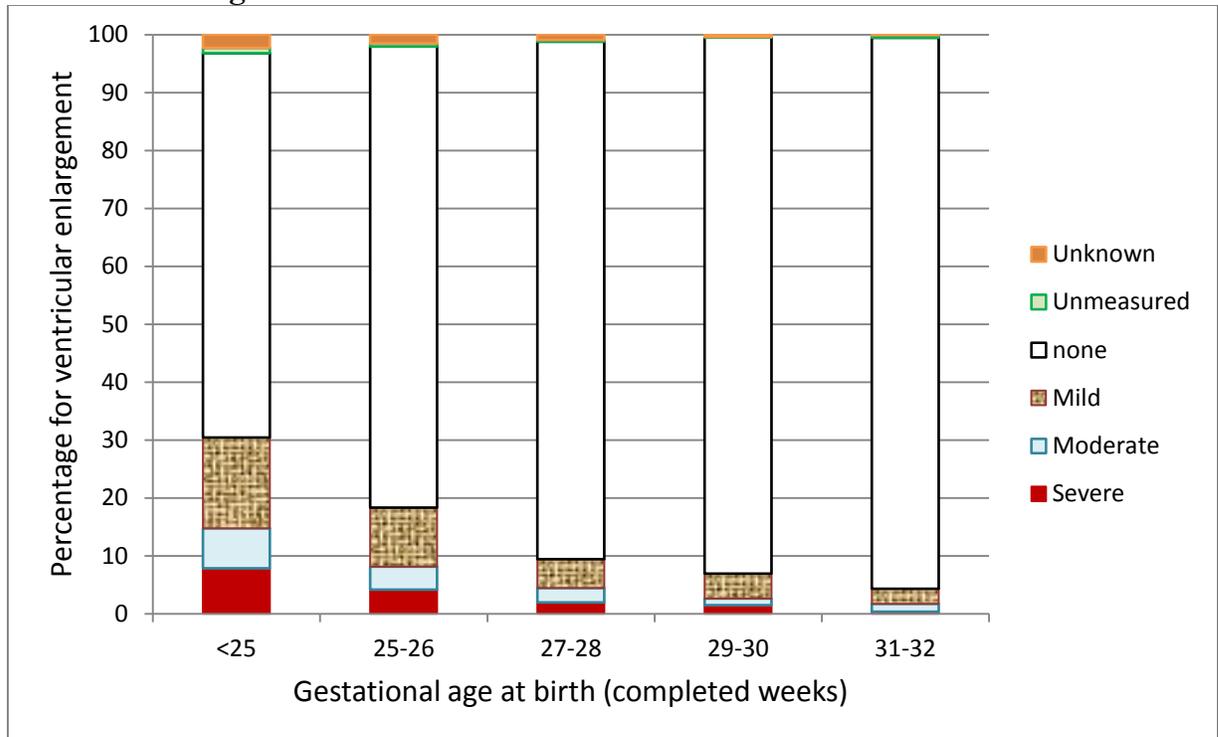
COMMENTS: Specific reasons for treatment with indomethacin and frequency of a repeat course of indomethacin were not recorded. Excludes indomethacin prophylaxis started on the first day of age. Neonates were identified as without PDA if there was no clinical suspicion of PDA.

Presentation #15

Neuroimaging findings (by GA)



Ventricular enlargement

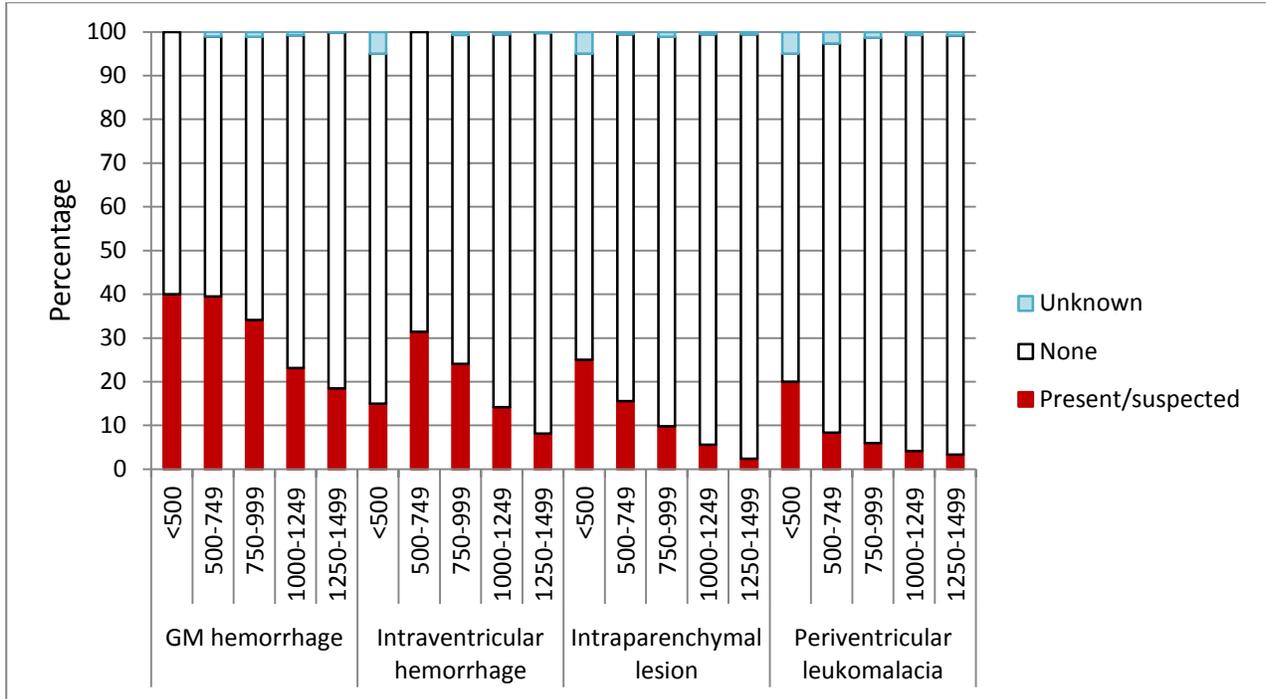


Presentation #15 (continued)

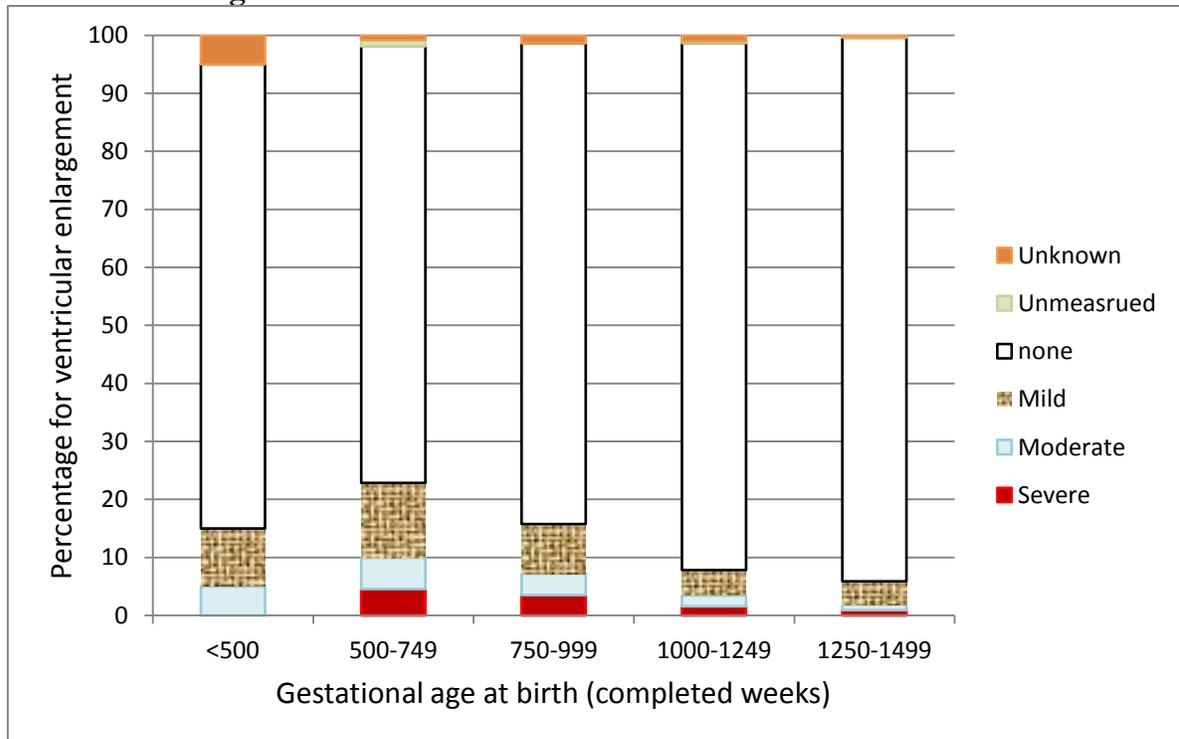
Neuroimaging findings (by GA)

GA at birth (completed weeks)		Total number	Neuro-imaging available	Neuroimaging findings																	
				GM hemorrhage			Intraventricular hemorrhage			Ventricular enlargement						Intraparenchymal lesion			Periventricular leukomalacia		
				Present/suspected	None	Unknown	Present/suspected	None	Unknown	Mild	Moderate	Severe	None	Unmeasured	Unknown	Present/suspected	None	Unknown	Present/suspected	None	Unknown
<25	N %	254	217	113 52%	99 46%	5 2%	108 50%	107 49%	2 1%	34 16%	15 7%	17 8%	144 66%	2 1%	5 2%	57 26%	157 72%	3 1%	27 12%	185 85%	5 2%
25-26	N %	603	579	228 39%	346 60%	5 1%	176 30%	400 69%	3 1%	59 10%	23 4%	24 4%	461 80%	3 1%	9 2%	75 13%	499 86%	5 1%	43 7%	525 91%	11 2%
27-28	N %	759	723	189 26%	526 73%	8 1%	110 15%	607 84%	6 1%	36 5%	18 2%	14 2%	646 89%	2 0%	7 1%	35 5%	682 94%	6 1%	34 5%	678 94%	11 2%
29-30	N %	1091	955	176 18%	777 81%	2 0%	76 8%	877 92%	2 0%	41 4%	11 1%	14 1%	884 93%	1 0%	4 0%	30 3%	920 96%	5 1%	36 4%	914 96%	5 1%
31-32	N %	1466	885	119 13%	761 86%	5 1%	39 4%	844 95%	2 0%	23 3%	12 1%	3 0%	842 95%	4 0%	1 0%	17 2%	865 98%	3 0%	21 2%	862 97%	2 0%
Total included	N	4173	3359	825	2509	25	509	2835	15	193	79	72	2977	12	26	214	3123	22	161	3164	34
	%			25%	75%	1%	15%	84%	0%	6%	2%	2%	89%	0%	1%	6%	93%	1%	5%	94%	1%

Presentation #16
Neuroimaging findings (by BW)



Ventricular enlargement



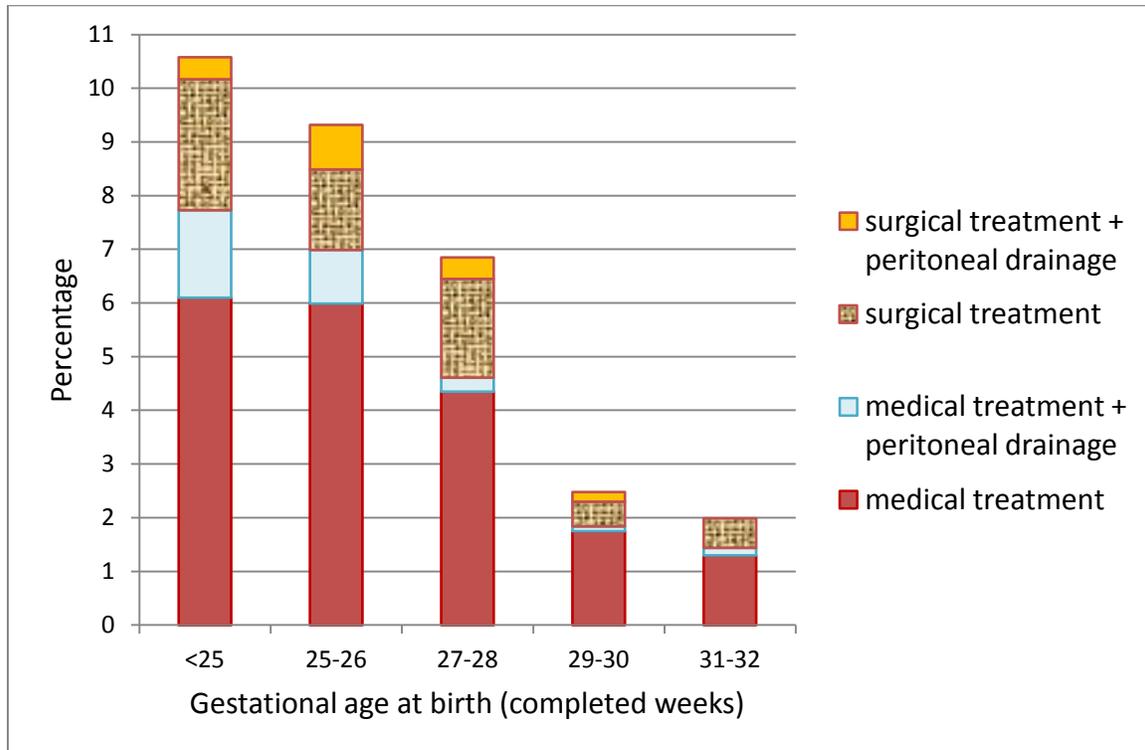
Presentation #16 (continued)

Neuroimaging findings (by BW)

BW (grams)		Total number	Neuroimaging available	Neuroimaging findings																	
				GM hemorrhage			Intraventricular hemorrhage			Ventricular enlargement						Intraparenchymal lesion			Periventricular leukomalacia		
				Present/suspected	None	Unknown	Present/suspected	None	Unknown	Mild	Moderate	Severe	None	Unmeasured	Unknown	Present/suspected	None	Unknown	Present/suspected	None	Unknown
<500	N %	32	20	8 40%	12 60%	0 0%	3 15%	16 80%	1 5%	2 10%	1 5%	0 0%	16 80%	0 0%	1 5%	5 25%	14 70%	1 5%	4 20%	15 75%	1 5%
500-749	N %	413	372	147 40%	221 59%	4 1%	117 31%	255 69%	0 0%	48 13%	20 5%	17 5%	280 75%	4 1%	3 1%	58 16%	312 84%	2 1%	31 8%	331 89%	10 3%
750-999	N %	769	736	251 34%	477 65%	8 1%	177 24%	554 75%	5 1%	63 9%	27 4%	26 4%	610 83%	0 0%	10 1%	72 10%	656 89%	8 1%	44 6%	682 93%	10 1%
1000-1249	N %	805	753	174 23%	573 76%	6 1%	107 14%	642 85%	4 1%	33 4%	14 2%	12 2%	684 91%	2 0%	8 1%	42 6%	707 94%	4 1%	31 4%	717 95%	5 1%
1250-1499		871	748	138 18%	609 81%	1 0%	61 8%	685 92%	2 0%	30 4%	7 1%	7 1%	701 94%	1 0%	2 0%	18 2%	726 97%	4 1%	25 3%	717 96%	6 1%
Total included	N	2 890	2 629	718	1892	19	465	2152	12	176	69	62	2291	7	24	195	2415	19	135	2462	32
	%			27%	72%	1%	18%	82%	0%	7%	3%	2%	87%	0%	1%	7%	92%	1%	5%	94%	1%

Presentation #17

Necrotizing enterocolitis and treatment modalities received (by GA)



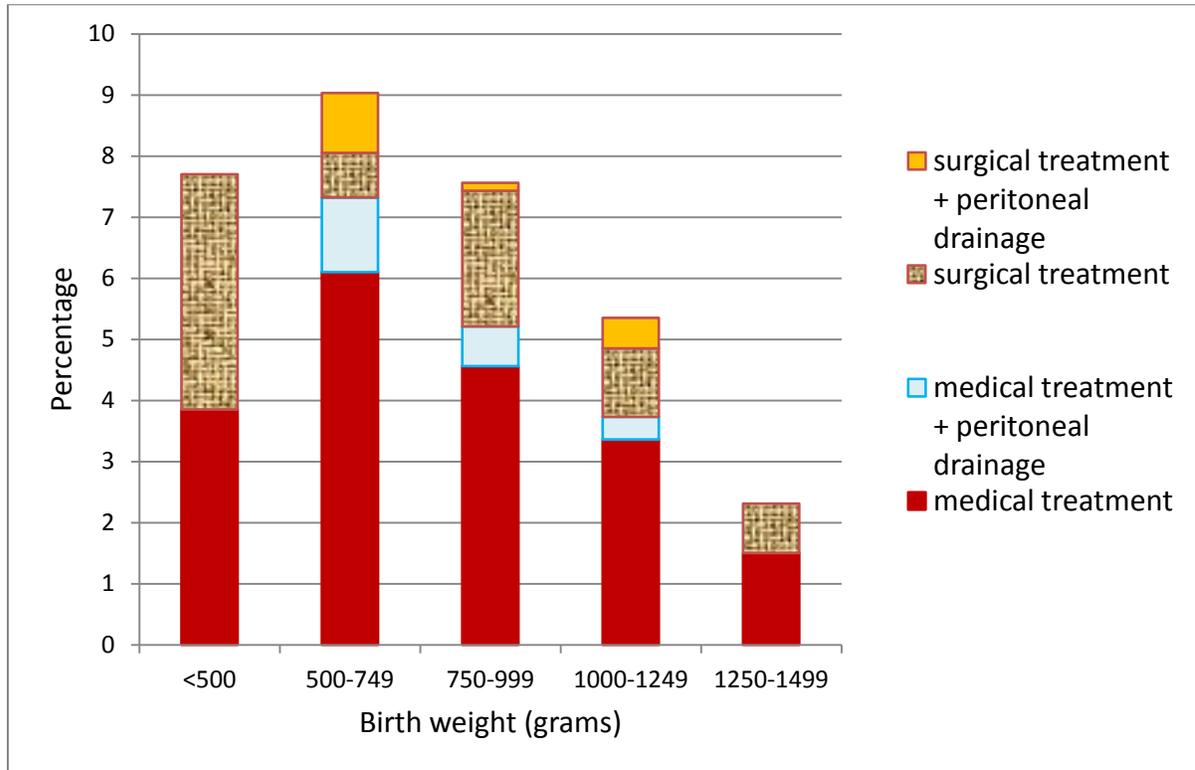
GA at birth (completed weeks)	Total number of neonates	Missing data on NEC	No NEC	Neonates with necrotizing enterocolitis*			
				Medical treatment only	Medical + peritoneal drainage	Surgical treatment	Surgical + peritoneal drainage
<25	N 254	8	220 (89.4%)	15 (6.1%)	4 (1.6%)	6 (2.4%)	1 (0.4%)
25-26	N 603	2	545 (90.7%)	36 (6.0%)	6 (1.0%)	9 (1.5%)	5 (0.8%)
27-28	N 759	0	707 (93.2%)	33 (4.4%)	2 (0.3%)	14 (1.8%)	3 (0.4%)
29-30	N 1 091	5	1 059 (97.5%)	19 (1.8%)	1 (0.1%)	5 (0.5%)	2 (0.2%)
31-32	N 1 466	0	1 437 (98.0%)	19 (1.3%)	2 (0.1%)	8 (0.6%)	0 (0.0%)
Total	N 4 173	15	3 968 (95.4%)	122 (2.9%)	15 (0.4%)	42 (1.0%)	11 (0.3%)

*The percentages of necrotizing enterocolitis are calculated out of number of neonates with data available on NEC.

COMMENTS: Necrotizing enterocolitis is scored according to the following criteria: a) definite pneumatosis (air within the bowel wall) or portal/hepatic air as diagnosed by x-ray, or b) if there is a surgical or autopsy diagnosis of NEC. Diagnoses of ‘suspected NEC’ or x-rays showing free air without pneumatosis are not classified as NEC.

Presentation #18

Necrotizing enterocolitis and treatment modalities received (by BW)

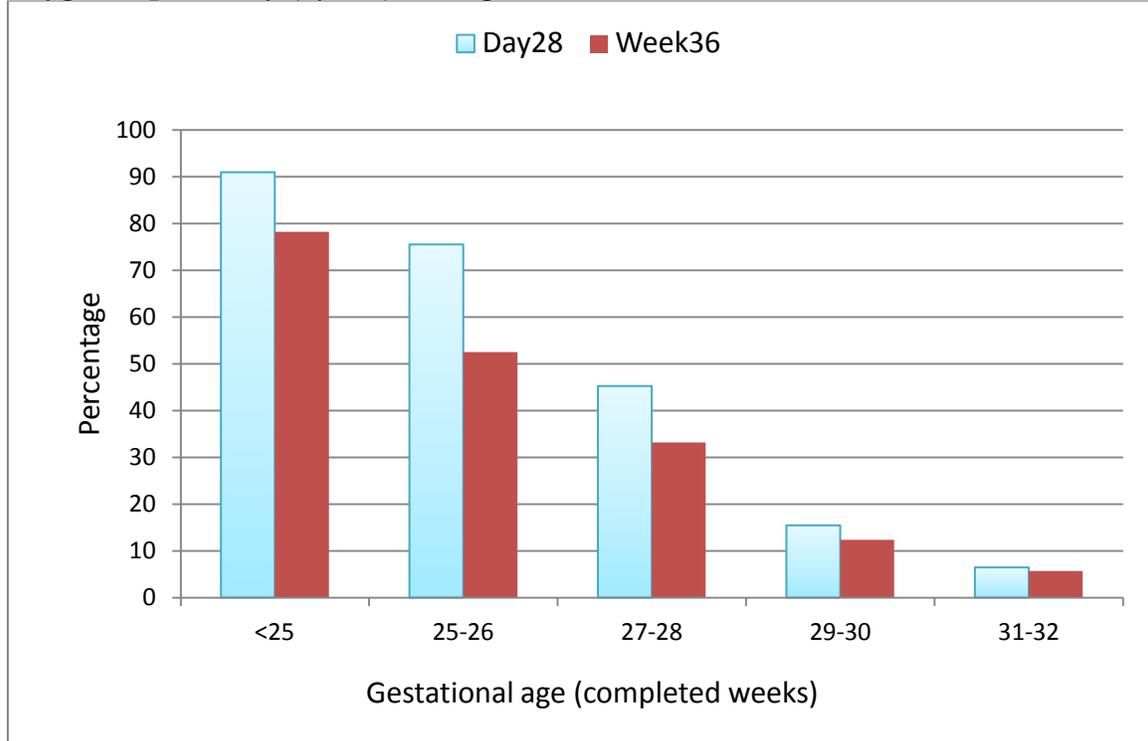


Birth weight (grams)	Total number of neonates	Missing data on NEC	No NEC	Neonates with necrotizing enterocolitis*			
				Medical treatment only	Medical + peritoneal drainage	Surgical treatment	surgical + peritoneal drainage
<500	N 32	6	24	1	0	1	0
	%		92.3%	3.9%	0.0%	3.9%	0.0%
500-749	N 413	3	373	25	5	3	4
	%		91.0%	6.1%	1.2%	0.7%	1.0%
750-999	N 769	2	709	35	5	17	1
	%		92.4%	4.6%	0.7%	2.2%	0.1%
1000-1249	N 805	1	761	27	3	9	4
	%		94.7%	3.4%	0.4%	1.1%	0.5%
1250-1499	N 871	2	849	13	0	7	0
	%		97.7%	1.5%	0.0%	0.8%	0.0%
Total	N 2 890	14	2 716	101	13	37	9
	%		94.4%	3.5%	0.5%	1.3%	0.3%

*The percentages of necrotizing enterocolitis are calculated out of number of neonates with data available on NEC.

COMMENTS: Necrotizing enterocolitis is scored according to the following criteria: a) definite pneumatosis (air within the bowel wall) or portal/hepatic air as diagnosed by x-ray, or b) if there is a surgical or autopsy diagnosis of NEC. Diagnoses of ‘suspected NEC’ or x-rays showing free air without pneumatosis are not classified as NEC.

Presentation #19a
Oxygen dependency (by GA) among neonates with GA <33 weeks



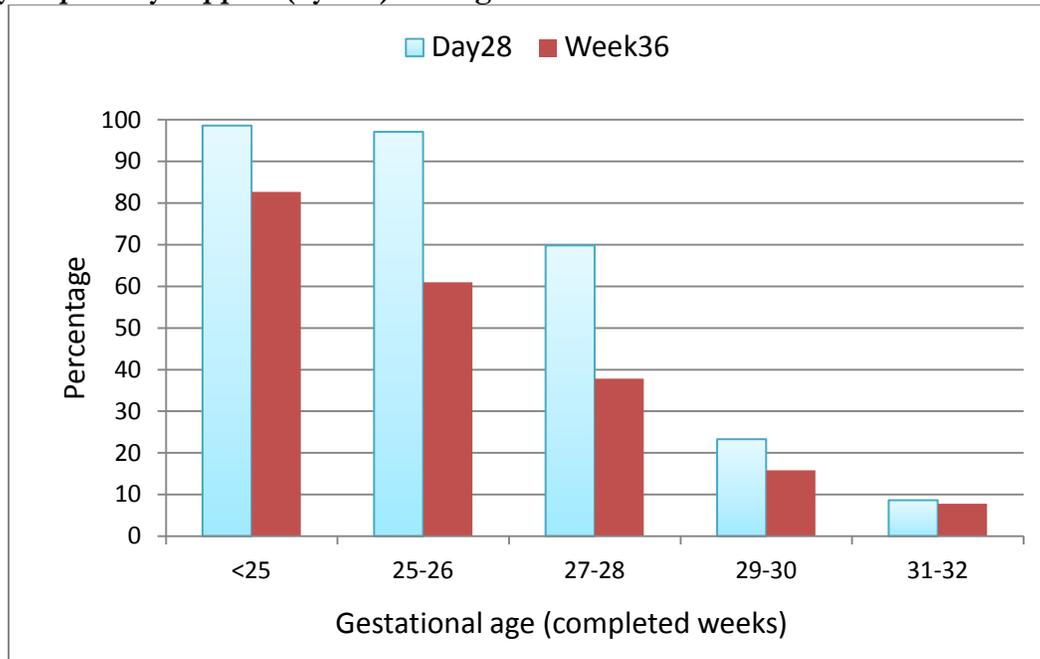
GA	Total number of neonates	Day 28				Week 36			
		Number of neonates whose oxygen dependency is unknown*	Number of neonates with known results	Number of neonates with oxygen dependency	% of neonates with oxygen dependency among neonates with known results	Number of neonates whose oxygen dependency is unknown**	Number of neonates with known results	Number of neonates with oxygen dependency	% of neonates with oxygen dependency among neonates with known results
<25	254	110	144	131	91	121	133	104	78
25-26	603	84	519	392	76	98	505	265	52
27-28	759	43	716	324	45	45	714	237	33
29-30	1 091	43	1 048	162	15	41	1 050	130	12
31-32	1 466	41	1 425	92	6	43	1 423	81	6
Total	4 173	321	3 852	1 101	29	348	3 825	817	21

COMMENTS: This presentation includes neonates who received supplemental oxygen on day 28 of age or week 36 postmenstrual age (PMA), and neonates who were discharged prior to day 28 of age or week 36 PMA and receiving supplemental oxygen at discharge. There were no requirements for chest radiographs at the time of diagnosis.

*unknown = death before day 28 or first admission after day 28

**unknown = death before week 36 or first admission after week 36

Presentation #19b
Any respiratory support (by GA) among neonates with GA <33 weeks



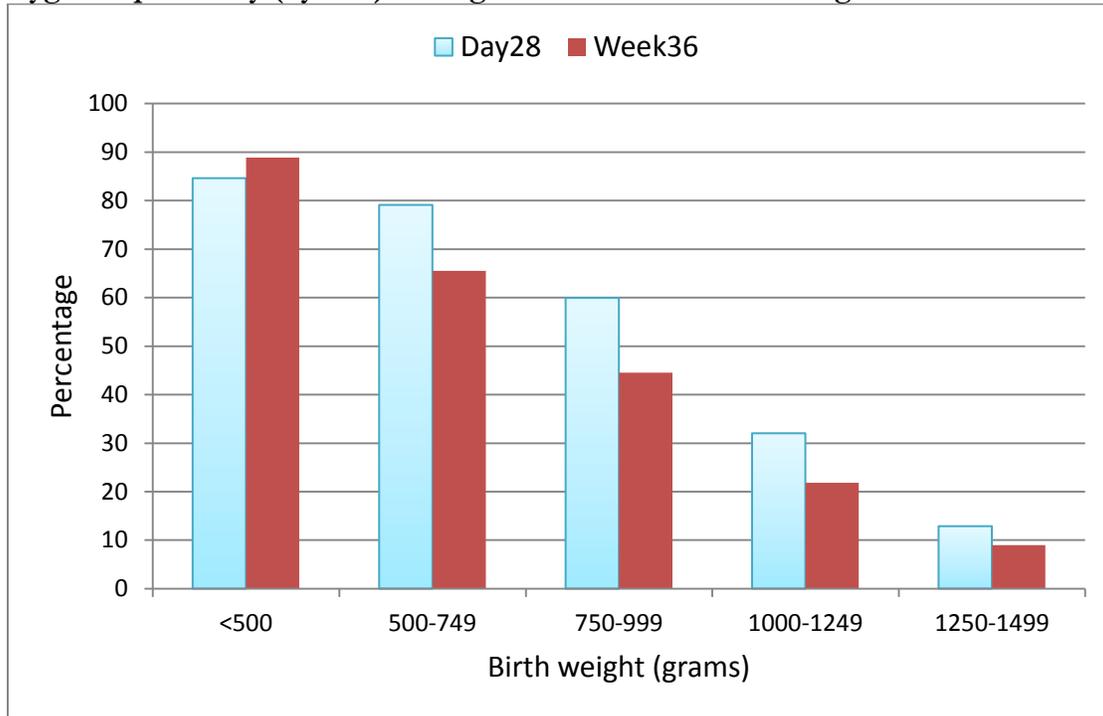
GA	Total number of neonates	Day 28				Week 36			
		Number of neonates whose respiratory support is unknown*	Number of neonates with known results	Number of neonates with any respiratory support	% of neonates with any respiratory support among neonates with known results	Number of neonates whose respiratory support is unknown**	Number of neonates with known results	Number of neonates with any respiratory support	% of neonates with any respiratory support among neonates with known results
<25	254	110	144	142	99	121	133	110	83
25-26	603	84	519	504	97	98	505	308	61
27-28	759	43	716	500	70	45	714	270	38
29-30	1 091	43	1 048	244	23	41	1 050	166	16
31-32	1 466	41	1 425	123	9	43	1 423	111	8
Total	4 173	321	3 852	1 513	39	348	3 825	965	25

COMMENTS: This presentation includes neonates who received supplemental oxygen or any respiratory support on day 28 of age or week 36 postmenstrual age (PMA), and neonates who were discharged prior to day 28 of age or week 36 PMA and receiving supplemental oxygen or any respiratory support at discharge. There were no requirements for chest radiographs at the time of diagnosis.

*unknown = death before day 28 or first admission after day 28

**unknown = death before week 36 or first admission after week 36

Presentation #20a
Oxygen dependency (by BW) among neonates with BW < 1500g



BW (grams)	Total number of neonates	Day 28				Week 36			
		Number of neonates whose oxygen dependency is unknown*	Number of neonates with known results	Number of neonates with oxygen dependency	% of neonates with oxygen dependency among neonates with known results	Number of neonates whose oxygen dependency is unknown**	Number of neonates with known results	Number of neonates with oxygen dependency	% of neonates with oxygen dependency among neonates with known results
<500	32	19	13	11	85	23	9	8	89
500-749	413	121	292	231	79	129	284	186	65
750-999	769	80	689	413	60	91	678	302	45
1000-1249	805	37	768	246	32	41	764	167	22
1250-1499	871	25	846	109	13	23	848	76	9
Total	2 890	282	2 608	1 010	39	307	2 583	739	29

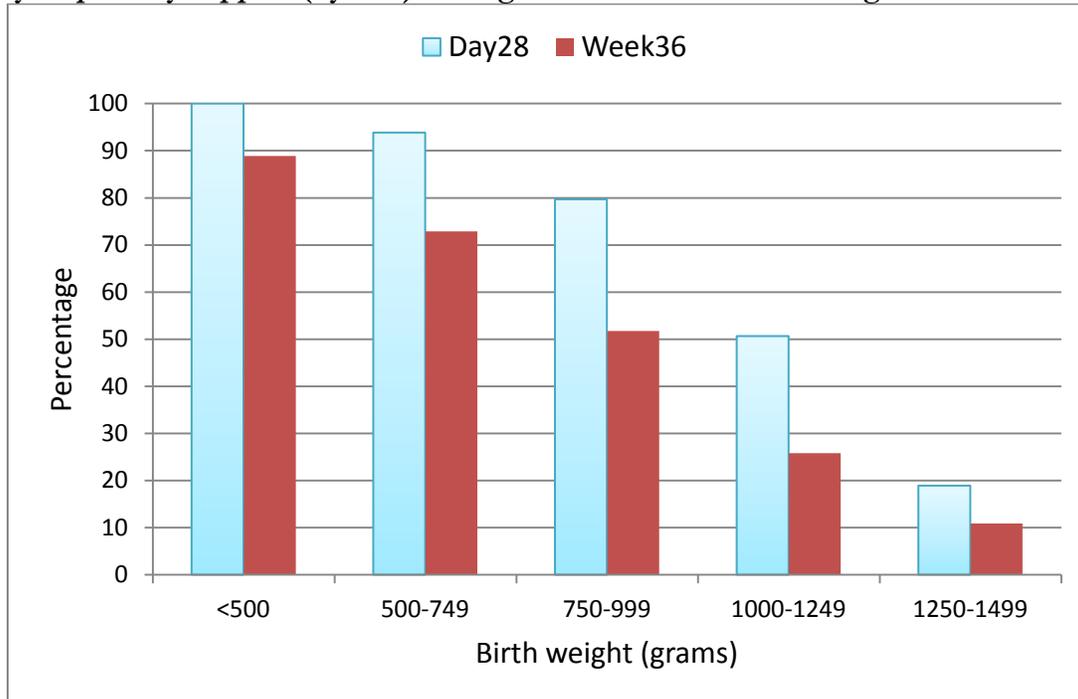
COMMENTS: This presentation includes neonates who received supplemental oxygen on day 28 of age or week 36 postmenstrual age (PMA), and neonates who were discharged prior to day 28 of age or week 36 PMA and receiving supplemental oxygen at discharge. There were no requirements for chest radiographs at the time of diagnosis.

*unknown = death before day 28 or first admission after day 28

**unknown = death before week 36 or first admission after week 36

Presentation #20b

Any respiratory support (by BW) among neonates with BW < 1500g



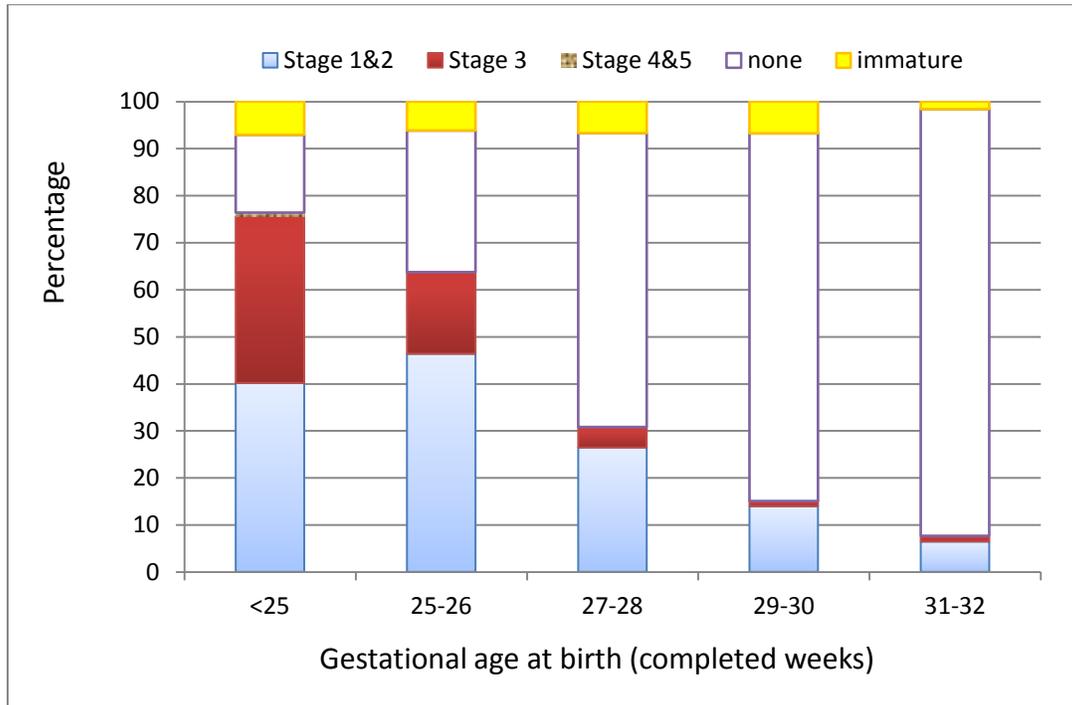
BW (grams)	Total number of neonates	Day 28				Week 36			
		Number of neonates whose respiratory support is unknown*	Number of neonates with known results	Number of neonates with any respiratory support	% of neonates with any respiratory support among neonates with known results	Number of neonates whose respiratory support is unknown**	Number of neonates with known results	Number of neonates with any respiratory support	% of neonates with any respiratory support among neonates with known results
<500	32	19	13	13	100	23	9	8	89
500-749	413	121	292	274	94	129	284	207	73
750-999	769	80	689	549	80	91	678	351	52
1000-1249	805	37	768	389	51	41	764	197	26
1250-1499	871	25	846	160	19	23	848	92	11
Total	2 890	282	2 608	1 385	53	307	2 583	855	33

COMMENTS: This presentation includes neonates who received supplemental oxygen or any respiratory support (CPAP, mechanical ventilation, low flow air/oxygen) on day 28 of age or week 36 postmenstrual age (PMA), and neonates who were discharged prior to day 28 of age or week 36 PMA and receiving supplemental oxygen or any respiratory support at discharge. There were no requirements for chest radiographs at the time of diagnosis.

*unknown = death before day 28 or first admission after day 28

**unknown = death before week 36 or first admission after week 36

Presentation #21
Retinopathy of prematurity (by GA)



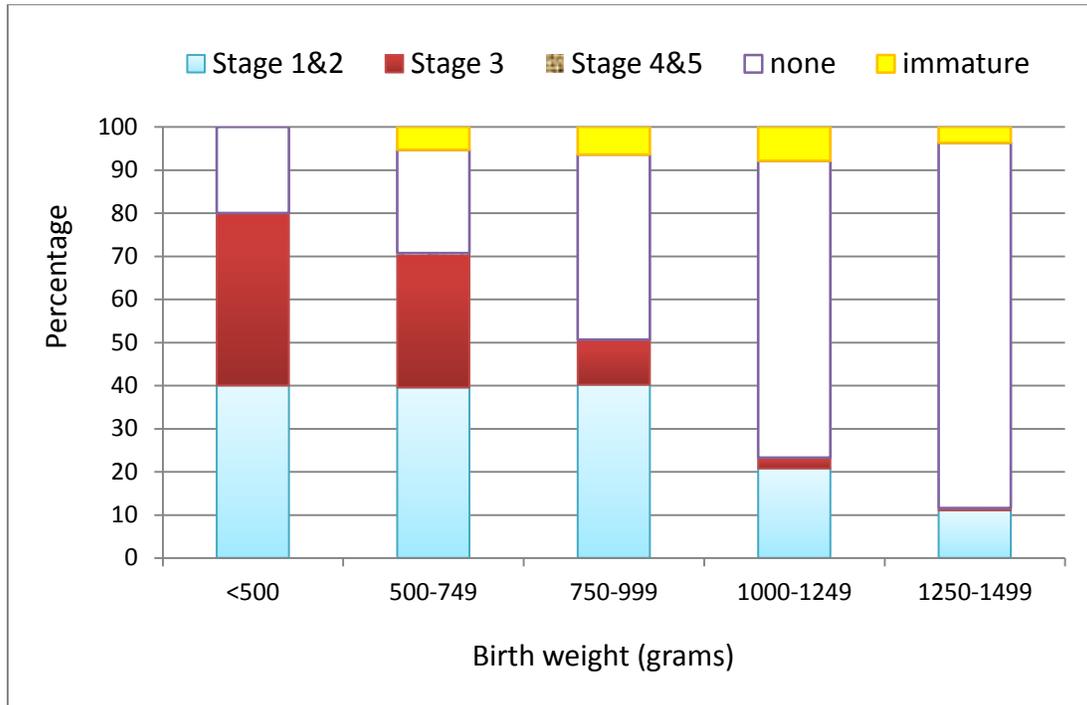
Birth GA (completed weeks)		Total number of neonates	Number of neonates alive at 6 weeks	Number of neonates with known eye examination results	Retinopathy of prematurity*				
					Immature	None	Stages 1 & 2	Stage 3	Stage 4 & 5
<25	N	254	140	127	9	21	51	45	1
	%				7%	17%	40%	35%	1%
25-26	N	603	522	455	28	137	211	79	0
	%				6%	30%	46%	17%	0%
27-28	N	759	727	552	37	345	146	24	0
	%				7%	63%	26%	4%	0%
29-30	N	1 091	1 060	458	31	358	64	5	0
	%				7%	78%	14%	1%	0%
31-32	N	1 466	1 444	248	4	225	16	3	0
	%				2%	91%	6%	1%	0%
Total included	N	4 173	3 893	1 840	109	1 086	488	156	1
	%				6%	59%	27%	8%	0%

*The percentages of various stages of retinopathy of prematurity are calculated out of number of neonates with known eye examination results.

COMMENTS: Retinopathy of prematurity is defined according to the International Classification of Retinopathy of Prematurity (ICROP). More advanced stages may have been detected in neonates transferred from network NICUs to level II hospitals or units. **Caution should be used in interpreting these data.**

Presentation #22

Retinopathy of prematurity (by BW)



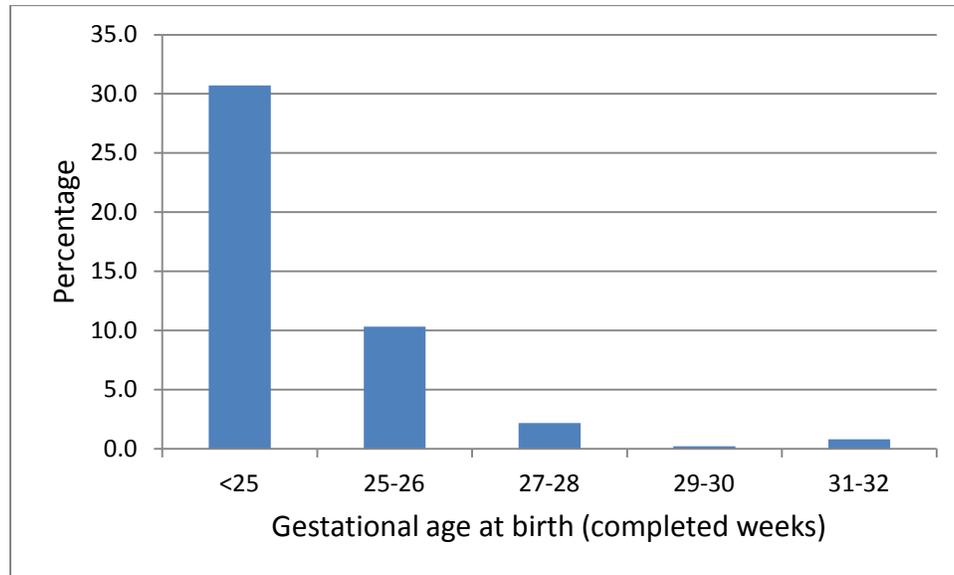
BW (grams)	Total number of neonates	Number of neonates alive at 6 weeks	Number of neonates with known eye examination results	Retinopathy of prematurity*				
				Immature	None	Stages 1 & 2	Stage 3	Stage 4 & 5
<500	N 32 %	10	10	0 0%	2 20%	4 40%	4 40%	0 0%
500-749	N 413 %	293	263	14 5%	63 24%	104 40%	81 31%	1 0.4%
750-999	N 769 %	697	545	35 6%	234 43%	219 40%	57 10%	0 0%
1000-1249	N 805 %	773	520	41 8%	358 69%	108 21%	13 3%	0 0%
1250-1499	N 871 %	857	380	14 4%	322 85%	42 11%	1 0%	1 0.3%
Total included	N 2 890 %	2 630	1 718	104 6%	979 57%	477 28%	156 9%	2 0.1%

*The percentages of various stages of retinopathy of prematurity are calculated out of number of neonates with known eye examination results.

COMMENTS: Retinopathy of prematurity is defined according to the International Classification of Retinopathy of Prematurity (ICROP). More advanced stages may have been detected in neonates transferred from network NICUs to level II hospitals or units. **Caution should be used in interpreting these data.**

Presentation #23

Laser/Anti-VEGF therapy for neonates with retinopathy of prematurity (by GA)



Birth GA (completed weeks)	Total number of neonates	Number of neonates with known eye examination results	Therapy for retinopathy of prematurity *	Therapy for retinopathy of prematurity **		
				Laser	Anti-VEGF	Other
<25	N 254 %	127	39 31%	36	4	0
25-26	N 603 %	455	47 10%	41	6	1
27-28	N 759 %	552	12 2%	12	1	0
29-30	N 1 091 %	458	1 0.2%	1	0	0
31-32	N 1 466 %	248	2 1%	2	0	0
Total included	N 4 173 %	1840	101 6%	92	11	1

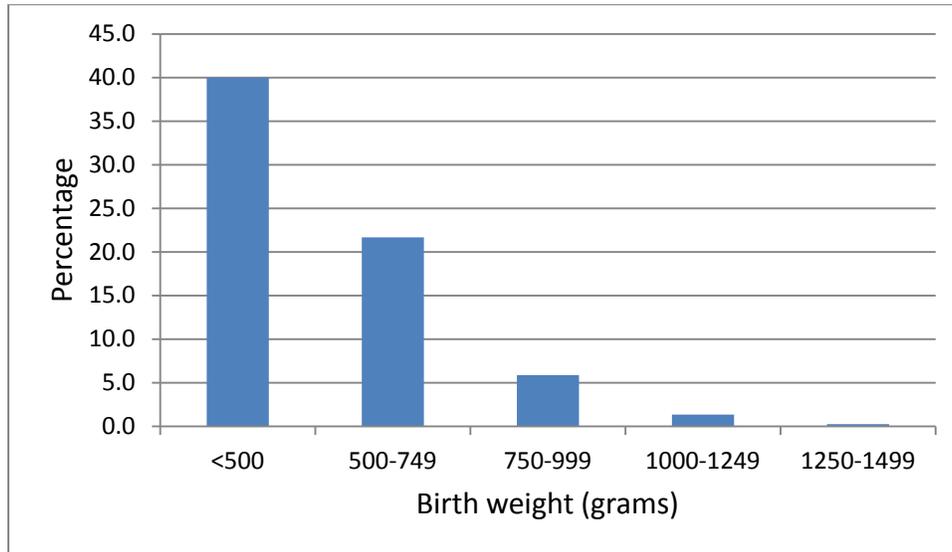
*The percentages of patient who received therapy are calculated out of number of neonates with known eye examination results.

**One neonate can have more than two types of therapies.

COMMENTS: Retinopathy of prematurity is defined according to the International Classification of Retinopathy of Prematurity (ICROP). More advanced stages may have been detected in neonates transferred from network NICUs to level II hospitals or units. **Caution should be used in interpreting these data.**

Presentation #24

Laser/Anti-VEGF therapy for neonates with retinopathy of prematurity (by BW)



BW (grams)		Total number of neonates	Number of neonates with known eye examination results	Therapy for retinopathy of prematurity *	Therapy for retinopathy of prematurity **		
					Laser	Anti-VEGF	Other
<500	N	32	10	4	4	0	0
	%			40%			
500-749	N	413	263	57	53	6	0
	%			22%			
750-999	N	769	545	32	28	4	1
	%			6%			
1000-1249	N	805	520	7	6	1	0
	%			1%			
1250-1499	N	871	380	1	1	0	0
	%			0.3%			
Total included	N	2 890	1718	101	92	11	1
	%			6%			

*The percentages of patient who received therapy are calculated out of number of neonates with known eye examination results.

**One neonate can have more than two types of therapies.

COMMENTS: Retinopathy of prematurity is defined according to the International Classification of Retinopathy of Prematurity (ICROP). More advanced stages may have been detected in neonates transferred from network NICUs to level II hospitals or units. **Caution should be used in interpreting these data.**

Presentation #25a
Gestational age specific mortality or significant morbidity (six morbidities)

GA	Number of neonates	Number survived (%)	Number of neonates discharged home directly from network hospitals	Number (%) with any one morbidity prior to discharge	Number (%) with any two morbidities prior to discharge	Number (%) with any three morbidities prior to discharge	Number (%) with any four morbidities prior to discharge	Number (%) with any five morbidities prior to discharge	Number (%) with all six morbidities prior to discharge	Number (%) without any of the six morbidities
<24	82	19 (23)	7	1 (14)	0	3 (43)	1 (14)	1 (14)	1 (14)	0
24	172	112 (65)	39	7 (18)	11 (28)	8 (21)	10 (26)	1 (3)	0	2 (5)
25	270	214 (79)	104	29 (28)	31 (30)	19 (18)	9 (9)	0	0	16 (15)
26	333	290 (87)	122	46 (38)	25 (20)	11 (9)	5 (4)	2 (2)	0	33 (27)
27	388	359 (93)	139	48 (35)	16 (12)	9 (6)	1 (1)	0	1 (1)	64 (46)
28	371	361 (97)	129	45 (35)	12 (9)	4 (3)	1 (1)	0	0	67 (52)
29	480	463 (96)	134	29 (22)	11 (8)	2 (1)	0	0	0	92 (69)
30	611	595 (97)	218	44 (20)	8 (4)	1 (0)	1 (0)	0	0	164 (75)
31	678	661 (97)	251	41 (16)	5 (2)	0	0	0	0	205 (82)
32	788	778 (99)	287	18 (6)	3 (1)	0	0	0	0	266 (93)
Total	4173	3852 (92)	1430	308 (22)	122 (9)	57 (4)	28 (2)	4 (0)	2 (0)	909 (64)

Inclusion criteria for these analyses:

1. Neonate born at <33 weeks GA
2. Neonate discharged home from participating network hospital

COMMENTS:

Morbidities were counted as score of one for each of the following

- i. Ventricular enlargement or PEC
- ii. Stage 3 or 4 ROP
- iii. Oxygen dependency at 36 weeks or discharge
- iv. Culture proven early onset or late onset sepsis
- v. Stage 2 or 3 NEC
- vi. PDA requiring surgical ligation

Presentation #25b
Gestational age specific mortality or significant morbidity (three morbidities)

GA	Number of neonates	Number survived (%)	Number of neonates discharged home directly from network hospitals	Number (%) with any one morbidity prior to discharge	Number (%) with any two morbidities prior to discharge	Number (%) with all three morbidities prior to discharge	Number (%) without any of the three morbidities
<24	82	19 (23)	7	3 (43)	2 (29)	2 (29)	0
24	172	112 (65)	39	11 (28)	17 (44)	6 (15)	5 (13)
25	270	214 (79)	104	38 (37)	27 (26)	3 (3)	36 (35)
26	333	290 (87)	122	53 (43)	17 (14)	3 (2)	49 (40)
27	388	359 (93)	139	36 (26)	9 (6)	2 (1)	92 (66)
28	371	361 (97)	129	34 (26)	5 (4)	1 (1)	89 (69)
29	480	463 (96)	134	29 (22)	2 (1)	0	103 (77)
30	611	595 (97)	218	34 (16)	1 (0)	0	183 (84)
31	678	661 (97)	251	27 (11)	1 (0)	0	223 (89)
32	788	778 (99)	287	13 (5)	0	0	274 (95)
Total	4173	3852 (92)	1430	278 (19)	81 (6)	17 (1)	1054 (74)

Inclusion criteria for these analyses:

1. Neonate born at <33 weeks GA
2. Neonate discharged home from participating network hospital

COMMENTS:

Morbidities were counted as score of one for each of the following

- i. Ventricular enlargement or PEC
- ii. Stage 3 or 4 ROP
- iii. Oxygen dependency at 36 weeks or discharge home

E. Site Comparisons

E.1. Site Comparisons – Population

Presentation #26

Site-specific GA categories of neonates

		GA (completed weeks)								Total number of neonates	Criteria of data collection
		<25	25-26	27-28	29-30	31-32	33-34	35-36	≥37		
Neonates per site (%)	1	0.3	3.6	3.1	3.4	8.0	16.5	21.9	43.3	388	Complete
	2	2.3	3.9	5.7	9.9	9.2	14.5	18.3	36.3	1133	Complete
	3	1.8	2.6	2.8	4.3	9.3	16.0	15.7	47.4	719	Complete
	4	2.4	5.2	7.2	10.5	9.9	14.2	13.8	36.8	543	Complete
	5	1.2	1.5	1.9	5.6	5.9	22.5	10.8	50.6	324	Complete
	6	2.0	5.4	8.0	8.1	12.7	12.9	10.3	40.5	590	Complete
	7	0.9	4.6	3.7	8.1	14.2	17.1	15.3	36.1	457	Complete
	8	0.6	3.5	2.3	5.8	5.8	15.6	15.6	50.9	173	Complete
	9	0.9	3.3	2.1	9.6	11.0	19.1	21.5	32.5	335	Complete
	10	6.8	16.3	24.0	23.5	29.4	0.0	0.0	0.0	221	Partial
	11	0.0	2.2	2.6	4.2	7.9	17.1	21.2	45.0	698	Complete
	12	2.7	5.9	6.3	6.3	16.8	18.7	13.1	30.1	475	Complete
	13	0.0	2.8	1.7	3.4	11.7	7.3	22.4	50.8	179	Complete
	14	0.1	1.5	3.1	4.6	8.2	14.5	18.3	49.6	732	Complete
	15	12.1	43.9	42.4	1.5	0.0	0.0	0.0	0.0	66	Partial
	16	3.9	4.9	5.9	3.4	13.5	19.9	17.9	30.6	408	Complete
	17	0.6	2.9	2.9	6.1	3.9	18.8	21.4	43.3	510	Complete
	18	4.5	13.6	16.4	27.2	35.1	3.1	0.0	0.0	353	Partial
	19	0.0	12.9	6.5	6.5	6.5	6.5	9.7	51.6	31	Partial
	20	4.1	9.5	15.0	14.8	14.2	16.0	13.1	13.4	487	Complete
	21	2.3	5.6	5.5	8.7	13.7	19.7	11.9	32.8	878	Complete
	22	1.3	1.0	3.1	6.2	8.8	19.7	17.4	42.3	385	Complete
	23	0.0	1.2	1.7	8.6	6.3	14.9	23.2	44.1	349	Complete
	24	1.4	2.7	6.3	6.3	6.5	9.2	10.6	57.1	445	Complete
	25	3.1	5.3	5.3	10.7	11.5	17.1	12.8	34.3	1136	Complete
	26	1.9	3.8	6.4	8.4	11.5	13.6	14.0	40.5	895	Complete
	27	0.8	1.3	1.7	5.1	5.9	11.8	30.4	43.0	237	Complete
Total		1.9	4.6	5.8	8.3	11.2	15.4	15.4	37.5	13147	

Number of neonates with missing GA = 4

COMMENTS: Proportion of the GA categories of neonates varied considerably among sites. Note some centers are only submitting a subset of the eligible population.

Presentation #27

Site-specific BW categories of neonates

		BW (g)						Total number of neonates	Criteria of data collecting	
		<500	500-749	750-999	1000-1249	1250-1499	1500-2499			≥2500
Neonates per site (%)	1	0.0	0.5	4.9	3.9	3.6	32.7	54.4	388	Complete
	2	0.3	3.0	6.0	4.9	7.4	34.4	44.0	1133	Complete
	3	0.1	2.0	3.3	4.0	4.2	31.2	55.2	719	Complete
	4	0.4	2.8	7.4	8.5	7.9	33.0	40.2	543	Complete
	5	0.3	1.5	2.2	2.8	3.1	36.4	53.7	324	Complete
	6	0.3	3.1	6.6	7.6	7.1	31.1	44.1	589	Complete
	7	0.2	2.2	4.6	4.8	7.0	34.6	46.6	457	Complete
	8	0.0	1.7	3.5	4.1	2.9	33.0	54.9	173	Complete
	9	0.0	1.5	4.8	4.8	4.8	40.0	44.2	335	Complete
	10	0.9	12.7	17.2	21.3	19.0	29.0	0.0	221	Partial
	11	0.0	0.7	3.6	3.2	3.4	38.0	51.2	698	Complete
	12	0.6	5.3	5.0	7.1	8.2	41.6	32.1	476	Complete
	13	0.0	0.6	2.2	1.1	7.3	41.9	46.9	179	Complete
	14	0.0	0.3	2.5	3.4	3.7	36.5	53.7	732	Complete
	15	7.6	19.7	43.9	24.2	4.6	0.0	0.0	66	Partial
	16	0.3	4.7	6.1	4.4	4.7	42.4	37.5	408	Complete
	17	0.0	1.6	2.9	3.1	2.8	32.9	56.7	510	Complete
	18	0.0	6.5	18.7	19.3	15.6	39.4	0.6	353	Partial
	19	0.0	6.5	16.1	6.5	3.2	16.1	51.6	31	Partial
	20	0.2	6.6	16.0	10.7	11.5	37.2	17.9	487	Complete
	21	0.2	4.1	5.5	5.7	10.1	35.4	39.0	879	Complete
	22	0.3	1.8	2.1	2.9	4.2	36.4	52.5	385	Complete
	23	0.0	0.0	2.9	2.9	3.2	33.8	57.3	349	Complete
	24	0.0	2.3	3.4	6.5	6.1	21.6	60.2	445	Complete
	25	0.4	5.3	6.6	8.1	8.6	32.8	38.3	1136	Complete
	26	0.2	3.8	5.0	6.5	5.8	31.5	47.2	895	Complete
	27	0.4	0.9	0.4	3.4	3.8	35.2	55.9	236	Complete
Total		0.2	3.1	5.8	6.1	6.6	34.3	43.7	13147	

Number of neonates with missing BW = 4

*Please note that some centers are only submitting a subset of the eligible admissions.

E.2. Site Comparisons – Survival / Mortality

Presentation #28

Site-specific survival rates by GA

Site	Percentage survival for each GA (completed weeks)								Overall survival rate for sites*
	<25	25-26	27-28	29-30	31-32	33-34	35-36	≥37	
A	0.0	90.9	78.3	97.1	98.3	99.1	100.0	98.9	98.1
B	75.0	97.8	98.6	100.0	98.6	98.7	100.0	98.5	97.9
C	69.2	78.9	95.0	96.8	100.0	100.0	99.1	98.8	97.9
D	NA	50.0	100.0	100.0	100.0	100.0	98.8	99.4	98.9
E ^φ	NA	100.0	100.0	50.0	50.0	50.0	33.3	37.5	51.6
F	91.7	84.4	95.7	91.7	97.3	94.7	95.1	95.4	94.6
G	76.9	93.2	96.9	98.2	98.1	98.8	98.6	99.5	98.1
H	75.0	40.0	100.0	94.4	100.0	100.0	100.0	99.4	98.1
I ^φ	40.0	75.0	90.6	96.2	95.4	NA	NA	NA	87.3
J ^φ	37.5	89.7	89.3	100.0	NA	NA	NA	NA	83.3
K	75.0	76.2	94.1	100.0	100.0	100.0	97.1	100.0	98.0
L ^φ	50.0	81.3	98.3	100.0	98.4	100.0	NA	NA	94.3
M	100.0	92.9	100.0	92.3	100.0	98.4	100.0	99.4	99.0
N	70.6	94.1	94.7	98.7	98.1	100.0	99.2	98.9	98.0
O	NA	60.0	100.0	100.0	100.0	100.0	100.0	100.0	98.9
P	38.5	82.1	100.0	96.5	98.1	97.4	98.7	99.0	96.1
Q	66.7	86.7	93.3	96.8	100.0	100.0	100.0	99.5	98.8
R	NA	93.3	94.4	100.0	98.2	99.2	99.3	98.7	98.7
S	0.0	100.0	100.0	91.7	100.0	100.0	100.0	99.0	98.3
T	0.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4
U	40.0	65.3	93.8	96.1	97.5	98.3	96.2	96.2	93.6
V	40.0	100.0	100.0	100.0	97.1	100.0	100.0	100.0	99.0
W	25.0	85.0	87.5	92.9	100.0	100.0	97.3	99.2	94.6
X	22.9	80.0	95.0	92.6	97.7	99.0	97.2	96.9	93.7
Y	69.2	85.7	93.3	96.7	98.8	98.9	100.0	98.6	96.8
Z	16.7	91.7	92.9	100.0	93.1	95.1	91.5	95.7	93.9
AA	33.3	63.6	100.0	96.9	97.3	100.0	100.0	99.1	97.3
Overall survival rate for GA**	51.6	83.6	94.9	97.0	98.2	99.0	98.6	98.3	96.5

These analyses include 13 147 neonates from 27 hospitals (4 neonates had missing data for GA).

Twenty-three hospitals collected data on all eligible admissions whereas four hospitals (marked by^φ) collected data on selected eligible admissions only.

^φ Please note that the criteria for entering neonates in the CNN dataset are not the same for these four hospitals and thus, the rates may not be comparable with other sites.

Overall* = (number of neonates survived by site / total number of neonates for that site)*100

Overall** = (number of neonates survived for GA category / total number of neonates in GA category)*100

NA = no data available, 0 = no neonates survived

Presentation #29

Site-specific survival rates by BW

Site	Percentage survival for each BW (g) category							Overall survival rate for sites*
	<500	500-749	750-999	1000-1249	1250-1499	1500-2499	≥2500	
A	NA	50.0	77.8	88.0	100.0	98.9	99.2	98.1
B	100.0	84.4	98.7	96.2	100.0	98.9	100.0	97.9
C	100.0	57.1	91.7	96.6	100.0	98.7	99.2	97.9
D	NA	NA	80.0	100.0	100.0	99.2	99.5	98.9
E ^φ	NA	50.0	100.0	50.0	0.0	40.0	43.8	51.6
F	0.0	88.9	92.3	97.8	97.6	94.5	95.4	94.7
G	66.7	85.3	97.1	94.6	97.6	98.7	99.2	98.1
H	0.0	40.0	85.7	100.0	100.0	100.0	99.4	98.1
I ^φ	0.0	67.9	76.3	89.4	97.6	96.9	NA	87.3
J ^φ	20.0	76.9	86.2	100.0	100.0	NA	NA	83.3
K	100.0	70.0	81.0	100.0	96.9	99.4	100.0	98.0
L ^φ	NA	65.2	86.4	98.5	98.2	99.3	100.0	94.3
M	NA	50.0	100.0	100.0	100.0	98.4	99.5	99.0
N	0.0	85.3	100.0	94.8	98.1	99.6	98.6	98.0
O	NA	100.0	50.0	100.0	100.0	100.0	100.0	98.9
P	0.0	53.3	87.5	97.8	97.7	98.3	99.1	96.1
Q	NA	87.5	86.7	93.8	100.0	99.4	99.7	98.8
R	NA	100.0	96.0	95.5	100.0	98.5	99.2	98.7
S	0.0	50.0	100.0	100.0	100.0	98.8	100.0	98.7
T	NA	66.7	100.0	100.0	100.0	100.0	100.0	99.4
U	50.0	55.6	66.7	96.0	98.9	97.7	96.2	93.6
V	0.0	85.7	87.5	90.9	100.0	100.0	100.0	99.0
W	0.0	36.8	88.0	88.9	94.7	100.0	98.0	94.6
X	0.0	51.7	85.3	94.6	93.9	98.9	97.0	93.7
Y	0.0	80.0	91.7	100.0	100.0	99.0	98.0	96.8
Z	NA	60.0	80.0	93.1	100.0	92.7	95.9	93.9
AA	NA	60.0	81.3	93.8	100.0	98.5	99.3	97.3
Overall survival rate for BW**	21.9	68.3	88.3	95.5	98.0	98.6	98.4	96.5

These analyses include 13 147 neonates from 27 hospitals (4 neonates had missing data for BW). **Twenty-three hospitals collected data on all eligible admissions whereas four hospitals (marked by ^φ) collected data on selected eligible admissions only.**

^φ Please note that the criteria for entering neonates in the CNN dataset are not the same for these four hospitals and thus, the rates may not be comparable with other sites.

Overall* = (number of neonates survived by site / total number of neonates for site)*100

Overall** = (number of neonates survived for BW category / total number of neonates in BW category)*100

NA = no data available, 0 = no neonates survived

Presentation #30

Site comparison of mortality

Figure1: Crude odds ratio (Number of neonates: 13 151)

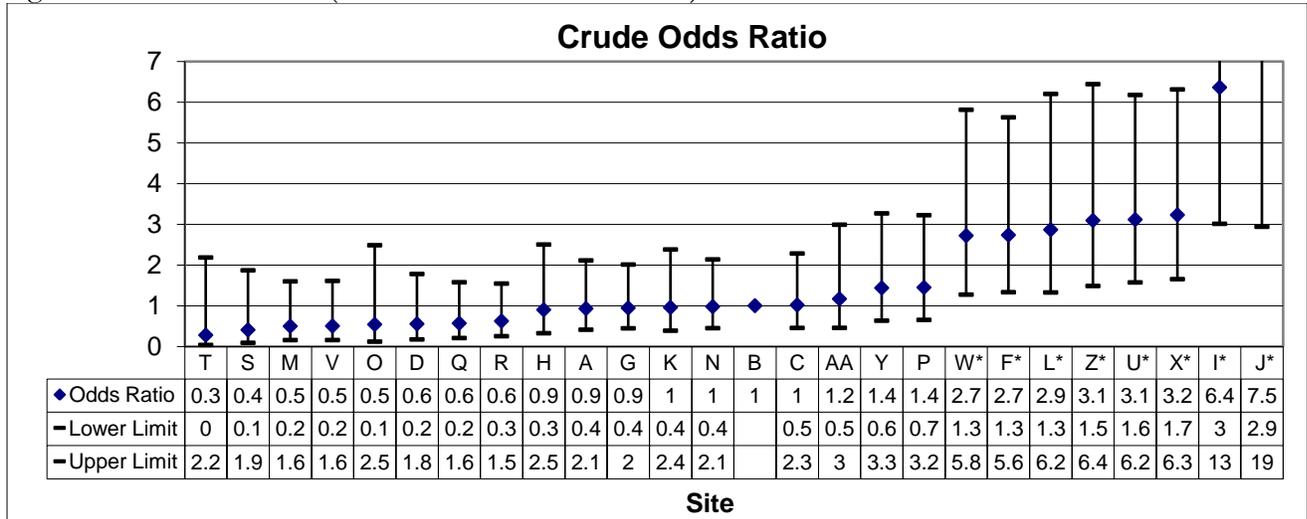
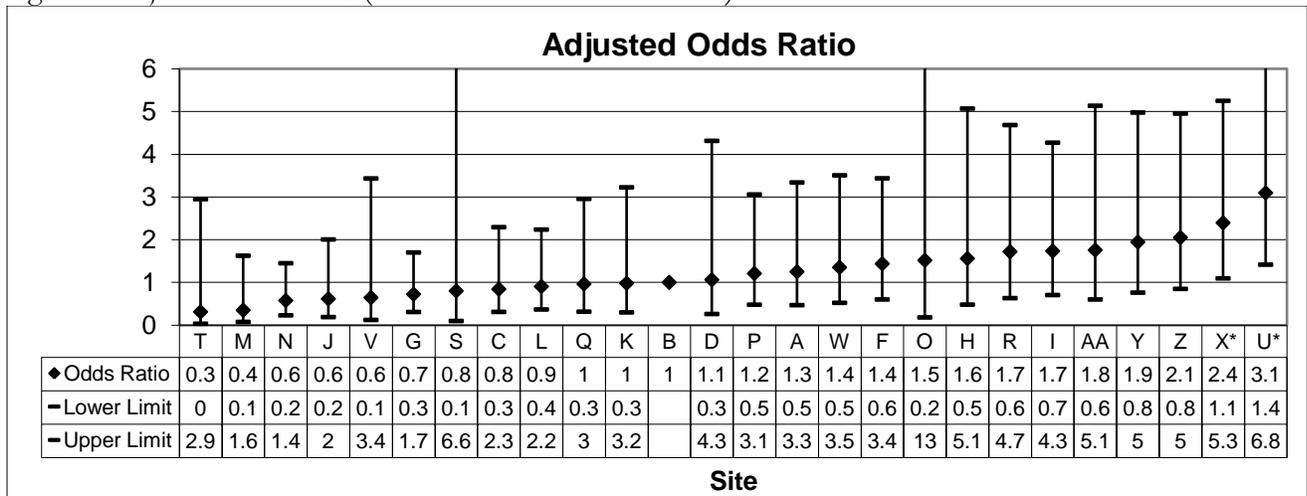


Figure2: Adjusted odds ratio (Number of neonates: 12 187)



Reference site: B

*Sites significantly different from reference site (P<0.05)

Inclusion criteria:
All neonates included

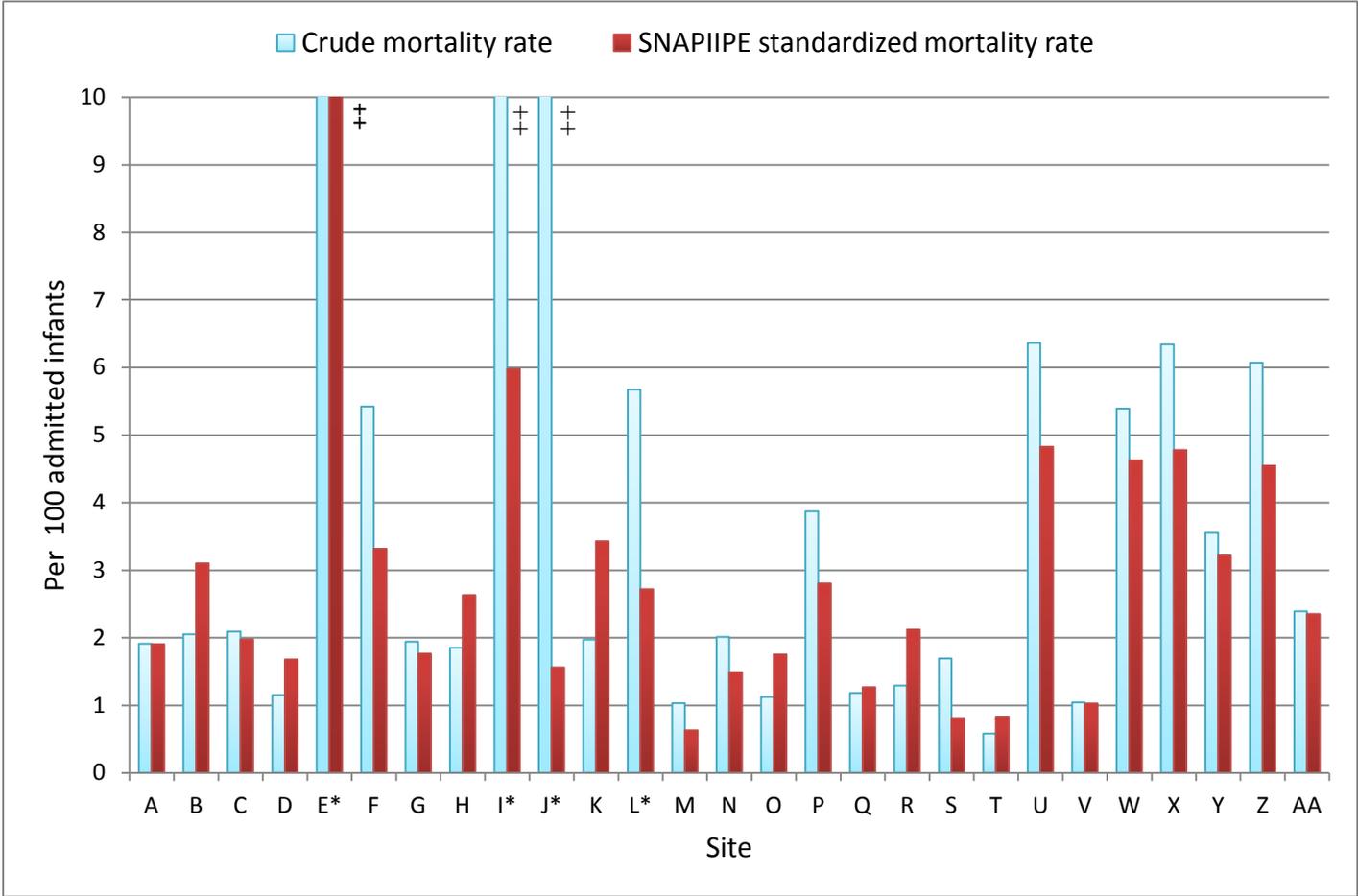
Site E has different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites, thus not included in this analysis

Significant predictors identified by multivariate analysis and adjusted for:

- Congenital anomalies
- Apgar at 5 min
- GA
- SGA (BW <10th centile for GA)
- Antenatal corticosteroid
- SNAP-II
- Outborn

Mortality is attributed to the network hospital of first admission

Presentation #31
 SNAP-II PE adjusted site mortality rates



‡ Site E has a crude mortality rate of 47% and an adjusted mortality rate of 30.5%, site I has a crude mortality rate of 13%, site J has a crude mortality rate of 17%, but they are not shown completely in the graph. Please refer to the table for the actual percentage for sites E, I, and J.

Presentation #31 (continued)

SNAP-II PE adjusted site mortality rates

Site	Mortality rate (%)	SNAP-II PE Standardized rate (%)
A	1.9	1.9
B	2.1	3.1
C	2.1	2.0
D	1.2	1.7
E ^φ	46.9	30.5
F	5.4	3.3
G	1.9	1.8
H	1.9	2.6
I ^φ	12.7	6.0
J ^φ	16.7	1.6
K	2.0	3.4
L ^φ	5.7	2.7
M	1.0	0.6
N	2.0	1.5
O	1.1	1.8
P	3.9	2.8
Q	1.2	1.3
R	1.3	2.1
S	1.7	0.8
T	0.6	0.8
U	6.4	4.8
V	1.0	1.0
W	5.4	4.6
X	6.3	4.8
Y	3.6	3.2
Z	6.1	4.5
AA	2.4	2.3
Mean	3.5	3.5

COMMENTS: SNAP-II PE standardized mortality rates were calculated by adjusting mortality for illness severity. Mortality is attributed to the hospital of first admission. Adjusting for readmission and transfers, this analysis represents 13 151 neonates. **Twenty-three hospitals collected data on all eligible admissions whereas four hospitals (marked by ^φ) collected data on a selected cohort of eligible admissions only.**

^φ Please note that the criteria for entering neonates in the CNN dataset are not the same for these four hospitals and thus, the rates may not be comparable with other sites.

E3. Site Comparisons – Morbidities and Risks Adjusted Analyses

Comments: Logistic regression is used for this section – Risk Adjusted Analysis. This technique is used to analyze interactions in which there are one or more independent variables that determine an outcome. The outcome is measured using a dichotomous variable.

The goal of logistic regression is to find the best fitting (yet biologically reasonable) model to describe the relationship between the dichotomous characteristic of interest (dependent variable = response or outcome variable) and a set of independent (predictor or explanatory) variables. Logistic regression generates the coefficients (and its standard errors and significance levels) of a formula to predict a logit transformation of the probability of presence of the characteristic of interest:

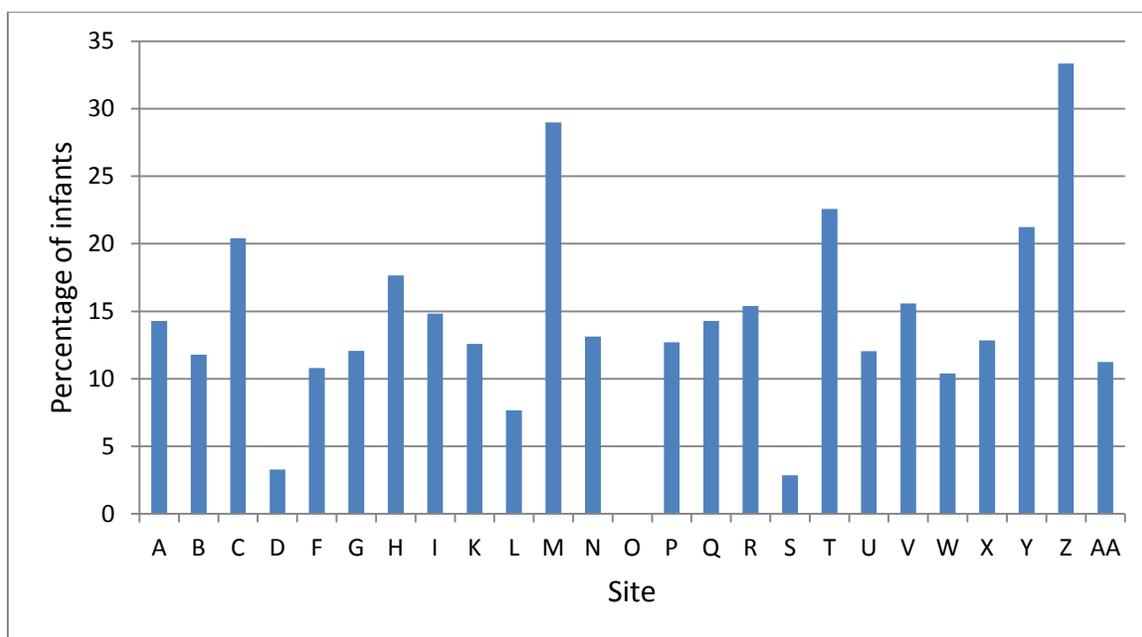
$$\text{logit}(p) = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + \dots + b_k X_k$$

where p is the probability of presence of the characteristic of interest

Presentation #32

Late onset sepsis* for neonates with GA < 33 weeks (site rates)

Hospitals that contributed data on all eligible admissions for neonates with GA < 33 (n=25 hospitals, 4 034 neonates, 63 excluded due to death before 3 days of age)

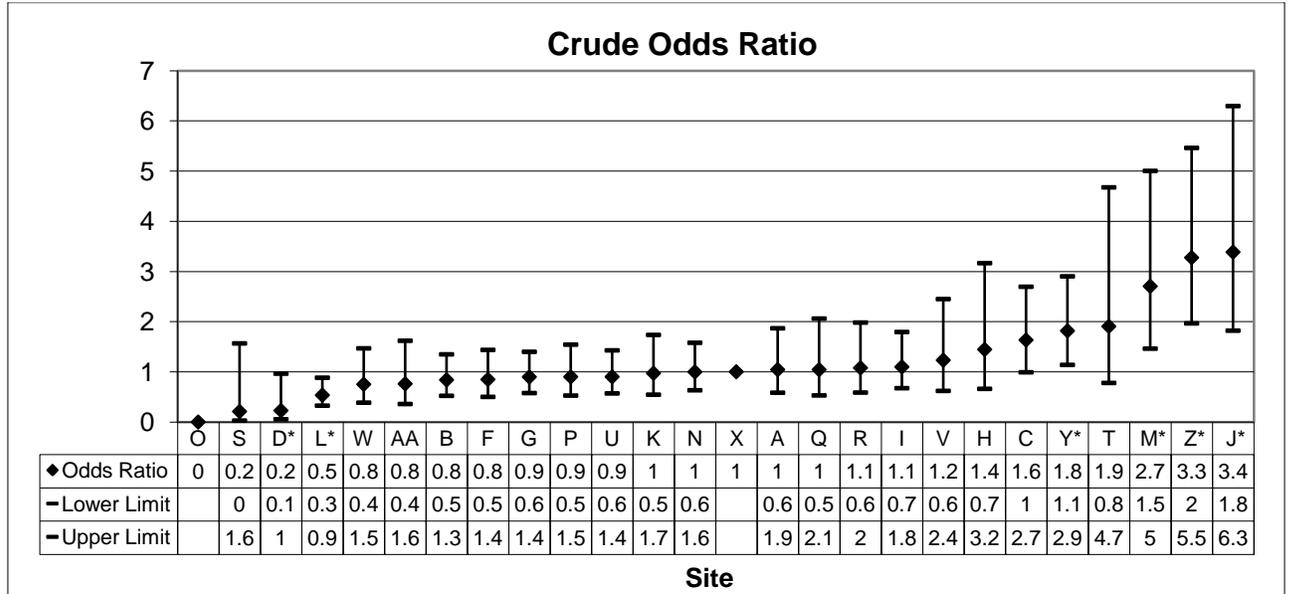


Site	A	B	C	D	F	G	H	I	K	L	M	N	O	
%	14.3	11.8	20.4	3.3	10.8	12.1	17.6	14.8	12.6	7.7	29.0	13.1	0.0	
Site	P	Q	R	S	T	U	V	W	X	Y	Z	AA		Mean
%	12.7	14.3	15.4	2.9	22.6	12.0	15.6	10.4	12.9	21.2	33.3	11.2		13.5

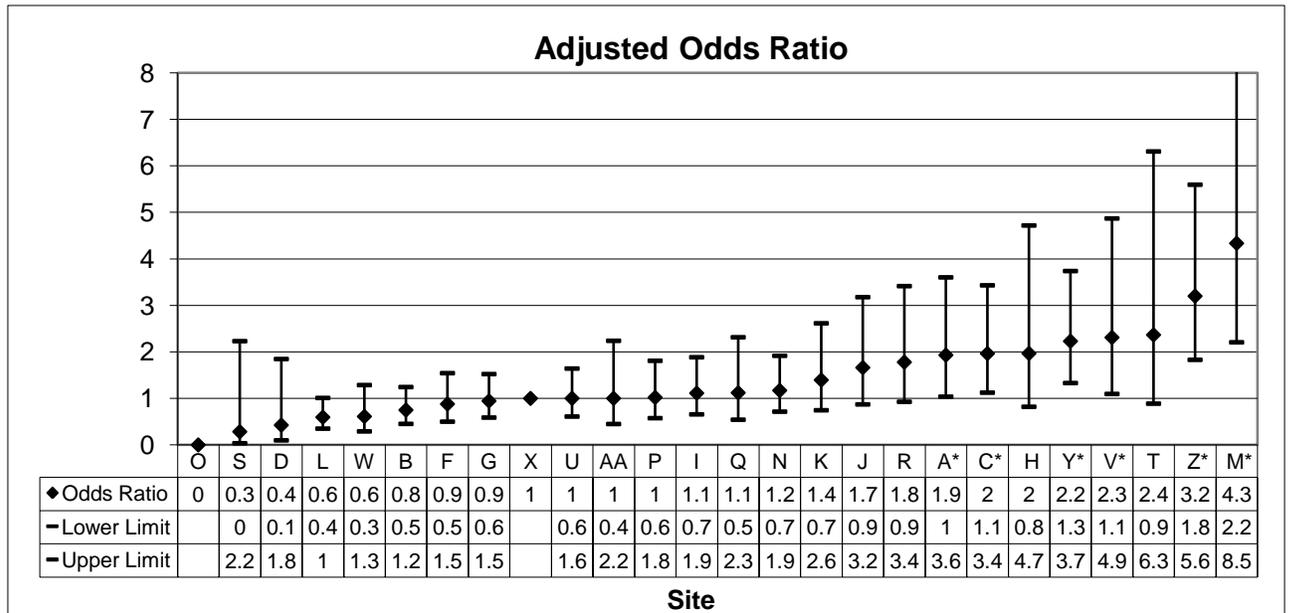
COMMENTS: *Late onset sepsis is indicated by any positive blood and/or cerebrospinal fluid culture after 2 days of age (analysis is neonate-based and deaths before 3 days of age are excluded).

Presentation #33

Late onset sepsis among neonates with GA < 33 weeks (site comparison)



Number of neonates: 3 879



Number of neonates: 3 875

Reference site: X

Inclusion criteria:

- GA < 33 weeks
- Age at admission less than 4 days
- Remained hospitalized beyond 2 days after birth

Site E has different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites, thus it is not included in this analysis

Significant predictors identified by multivariate analysis and adjusted for:

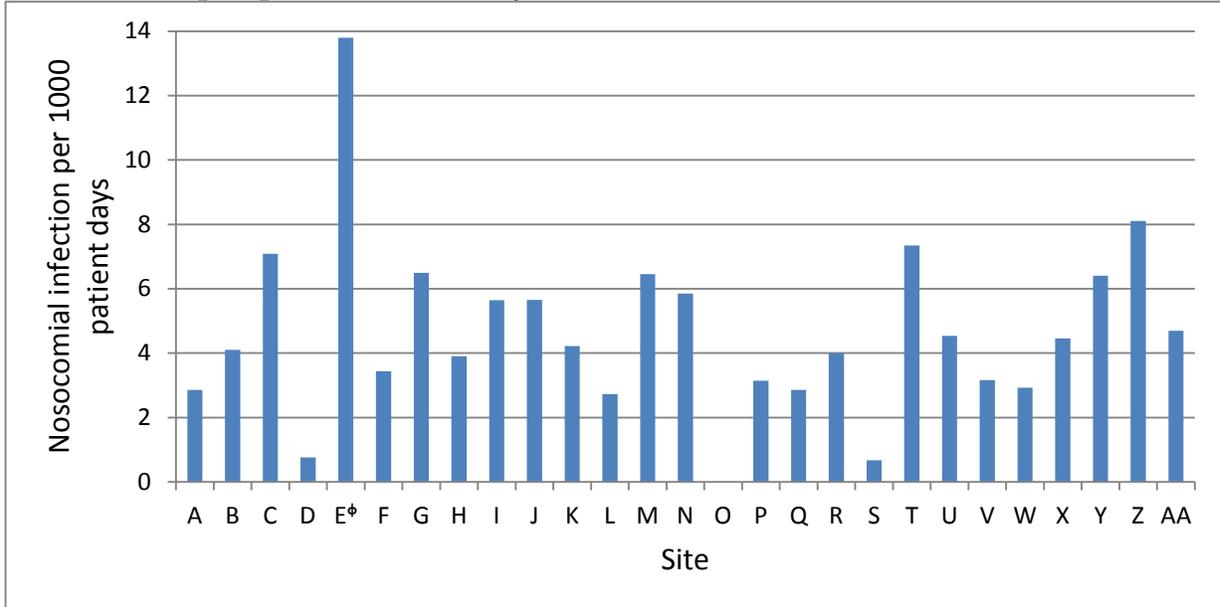
- GA
- S GA (BW <10th centile for GA)

Outcome is attributed to the hospital in which the infection occurred first (adjusted for transfer)

*Sites significantly different from reference site (P<0.05)

Presentation #34

Late onset sepsis per 1000 Patient days for neonates with GA < 33 weeks



Site	Infections per 1000 patient days	Site	Infections per 1000 patient days
A	2.9	O	0.0
B	4.1	P	3.1
C	7.1	Q	2.9
D	0.8	R	4.0
E [†]	13.8	S	0.7
F	3.4	T	7.3
G	6.5	U	4.5
H	3.9	V	3.2
I	5.6	W	2.9
J	5.7	X	4.5
K	4.2	Y	6.4
L	2.7	Z	8.1
M	6.5	AA	4.7
N	5.8		
		Total	4.6

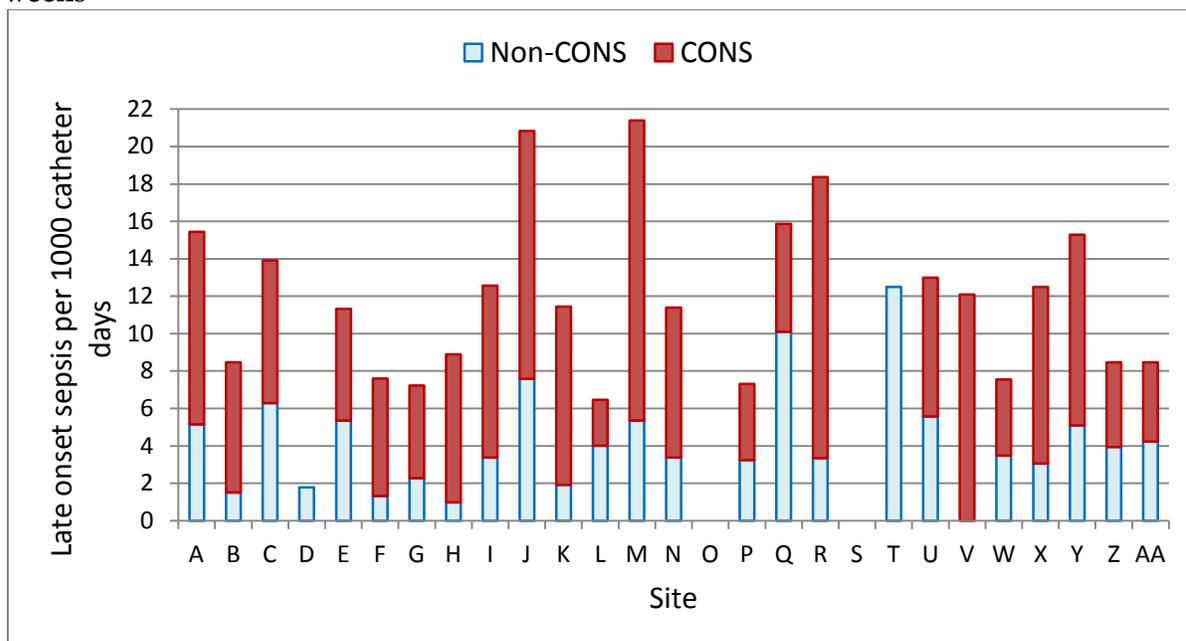
Total number of neonates = 4 173

***Note that the criteria for entering neonates with GA <33 in the CNN dataset are not the same for site E and thus, the rates may not be comparable with other sites.**

COMMENTS: Late onset sepsis is indicated by positive blood and/or cerebrospinal fluid culture after 2 days of age (includes all admissions). Considerable variation exists when late onset sepsis is analyzed as infections per 1000 patient days. Note that it is possible that certain sites with high retro transfer rates may report a high incidence per 1000 patient days since neonates who are transferred are those with lower acuity. If a neonate had >1 distinct episodes of infections, they will be counted as separate episodes of infections in the numerator.

Presentation #35

Late onset sepsis per 1000 central catheter* days among neonates with GA < 33 weeks



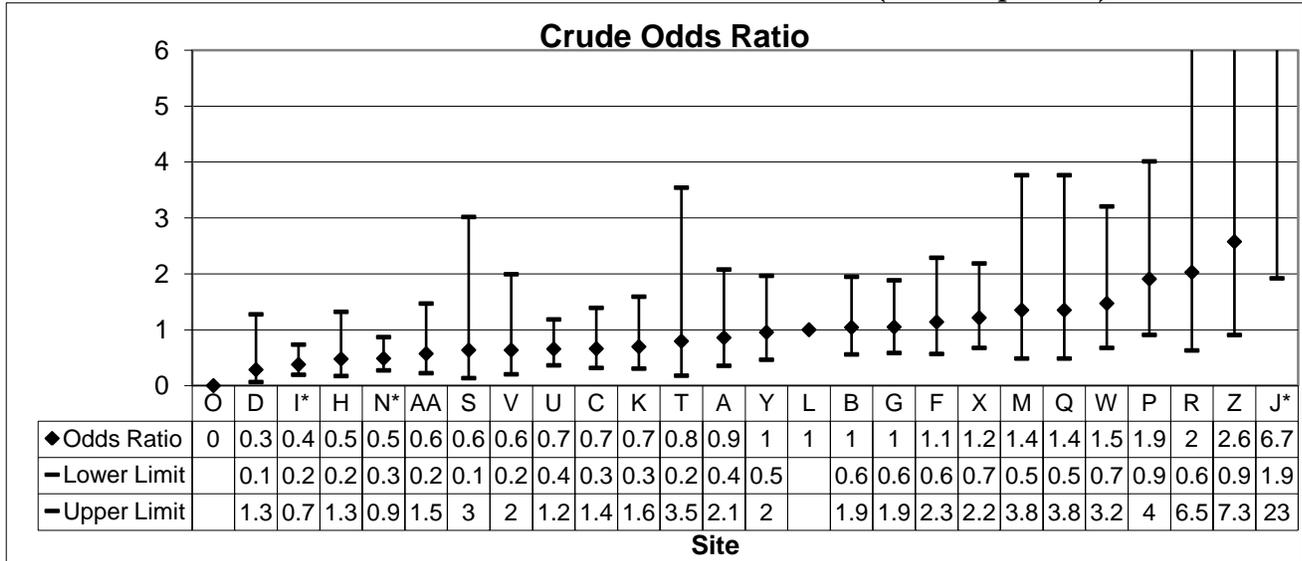
Site	Catheter associated late onset sepsis**		Catheter days	Late onset sepsis per 1000 catheter days		Site	Catheter associated late onset sepsis**		Catheter days	Late onset sepsis per 1000 catheter days	
	Non-CONS	CONS		Non-CONS	CONS		Non-CONS	CONS		Non-CONS	CONS
A	5	10	971	5.1	10.3	O	0	0	88	0.0	0.0
B	5	23	3307	1.5	7.0	P	8	10	2465	3.2	4.1
C	19	23	3018	6.3	7.6	Q	7	4	693	10.1	5.8
D	1	0	560	1.8	0.0	R	2	9	599	3.3	15.0
E	9	10	1679	5.4	6.0	S	0	0	34	0.0	0.0
F	4	19	3025	1.3	6.3	T	2	0	160	12.5	0.0
G	11	24	4846	2.3	5.0	U	21	28	3772	5.6	7.4
H	1	8	1013	1.0	7.9	V	0	4	331	0.0	12.1
I	7	19	2069	3.4	9.2	W	6	7	1724	3.5	4.1
J	4	7	528	7.6	13.3	X	11	34	3602	3.1	9.4
K	1	5	524	1.9	9.5	Y	9	18	1767	5.1	10.2
L	18	11	4492	4.0	2.4	Z	20	23	5076	3.9	4.5
M	5	15	935	5.3	16.0	AA	3	3	709	4.2	4.2
N	11	26	3250	3.4	8.0						
						Total	190	340	51237	3.7	6.6

*Catheter = any of UV, Surgical CVL, or PICC

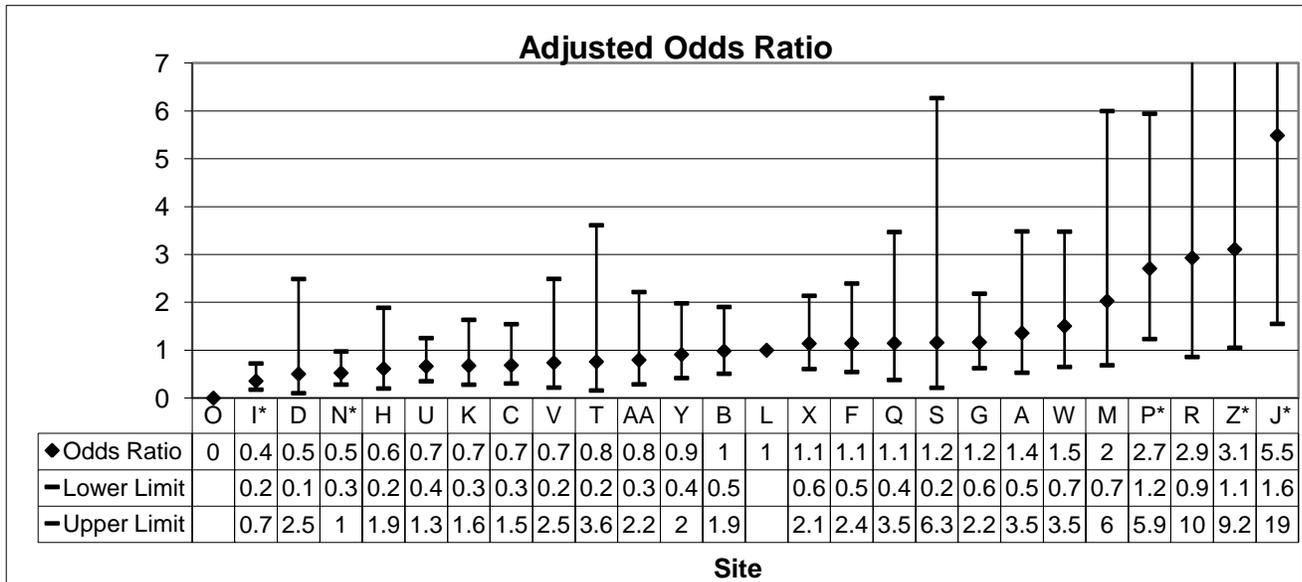
**Late onset sepsis was defined as catheter associated if a catheter was in place within 2 days before the onset of the sepsis.

Presentation #36

Treatment[#] of PDA for neonates with GA < 33 weeks (site comparison)



Number of neonates: 1 228



Number of neonates: 1 228

Reference site: L

Inclusion criteria:

GA <33 weeks

Neonates who had PDA

Outcome is attributed to the network hospital of first admission

[#]Treatment of PDA includes any of indomethacin, ibuprofen, or ligation

Significant predictors identified by multivariate analysis and adjusted for:

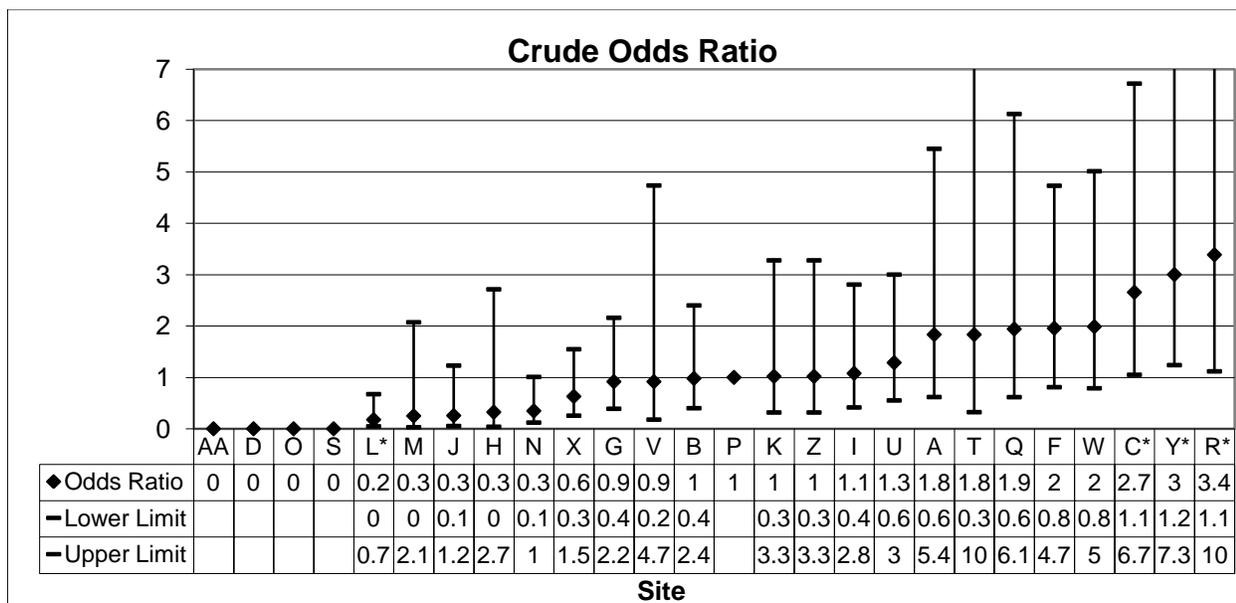
GA

*Sites significantly different from reference site (P<0.05)

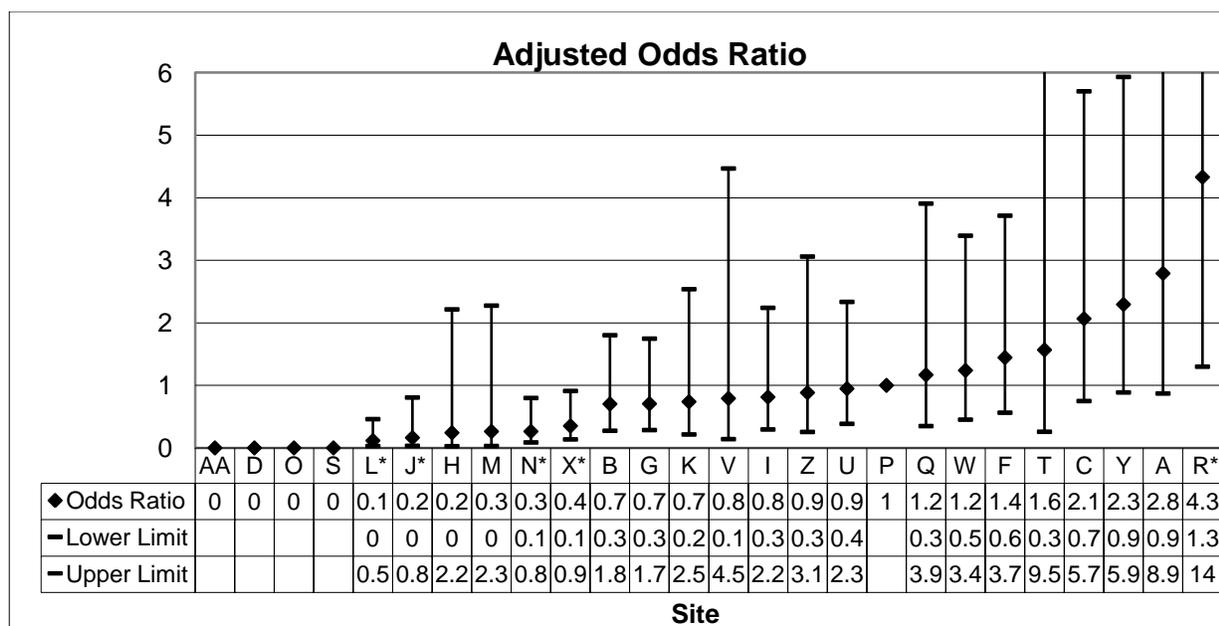
Site E has different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites, thus it is not included in this analysis

Presentation #37

Surgical ligation of PDA for neonates with GA < 33 weeks (site comparison)



Number of neonates: 1 228



Number of neonates: 1 226

Reference site: P

Inclusion criteria:

GA <33 weeks
Neonates who had PDA

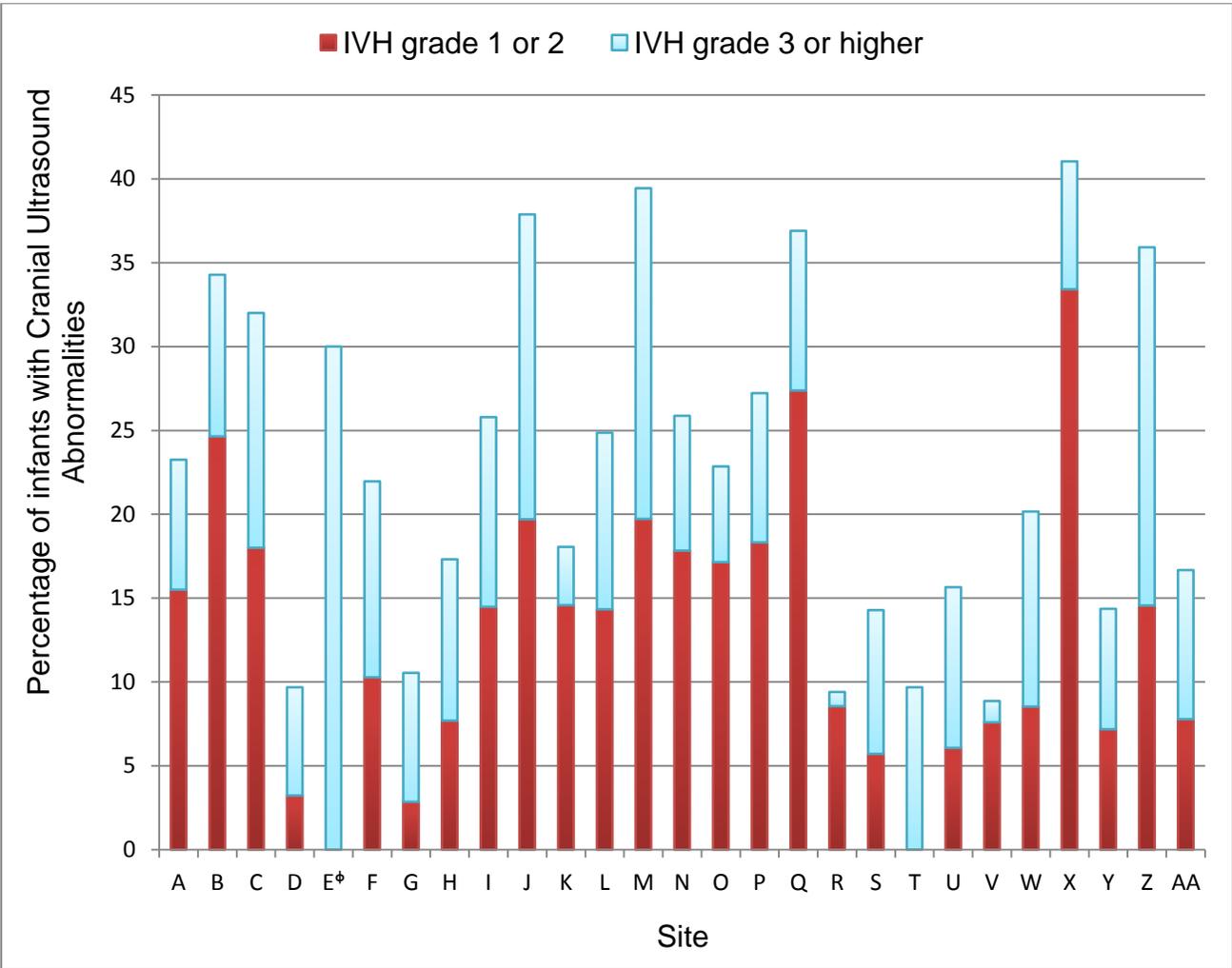
*Sites significantly different from reference site (P<0.05)

Outcome is attributed to the network hospital of first admission

Significant predictors identified by multivariate analysis and adjusted for:
GA
SGA (BW <10th centile for GA)

Site E has different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites, thus it is not included in this analysis

Presentation #38
Neuroimaging abnormalities among neonates <33 weeks of GA



IVH grade 1 or 2 = Germinal matrix hemorrhage or IVH without VE

IVH grade 3 or 4 = IVH with VE or persistent PE

Presentation #38 (continued)
IVH with VE or persistent PE (IVH grade 3 or 4) among neonates <33 weeks of GA

Site	<25	25-26	27-28	29-30	31-32	Overall rate* per sites %
A	0.0	27.3	21.7	0.0	3.3	7.8
B	30.0	15.2	9.6	4.2	5.8	9.6
C	61.5	26.3	25.0	6.5	1.5	14.0
D	NA	25.0	33.3	3.3	0.0	6.5
E ^φ	NA	0.0	0.0	100.0	50.0	30.0
F	8.3	21.9	17.0	8.3	6.7	11.7
G	30.8	20.5	7.7	3.6	1.0	7.7
H	25.0	20.0	16.7	5.6	5.3	9.6
I	46.7	33.3	3.8	3.9	3.1	11.3
J	25.0	13.8	21.4	0.0	NA	18.2
K	0.0	4.8	5.9	5.4	1.5	3.5
L	43.8	33.3	6.9	7.3	1.6	10.5
M	0.0	28.6	25.0	23.1	12.9	19.7
N	29.4	23.5	10.5	1.3	2.9	8.0
O	NA	0.0	0.0	16.7	4.8	5.7
P	23.1	21.4	7.7	8.8	0.0	8.9
Q	33.3	20.0	6.7	9.7	0.0	9.5
R	NA	6.7	0.0	0.0	0.0	0.9
S	50.0	33.3	25.0	0.0	0.0	8.6
T	0.0	33.3	0.0	10.0	0.0	9.7
U	35.0	20.4	0.0	13.2	2.5	9.6
V	20.0	0.0	0.0	0.0	0.0	1.3
W	43.8	20.0	16.7	0.0	0.0	11.6
X	20.0	21.7	10.0	3.3	0.8	7.6
Y	30.8	7.1	6.7	10.0	2.5	7.2
Z	66.7	16.7	17.9	17.9	20.7	21.4
AA	33.3	36.4	14.3	6.3	0.0	8.9
Overall rate** per GA group %	31.9	20.9	10.3	6.1	2.7	9.4

Total number of neonates = 4 173

^φ Note that the criteria for entering neonates with GA <33 in the CNN dataset are not same for site E and thus, the rates may not be comparable with other sites.

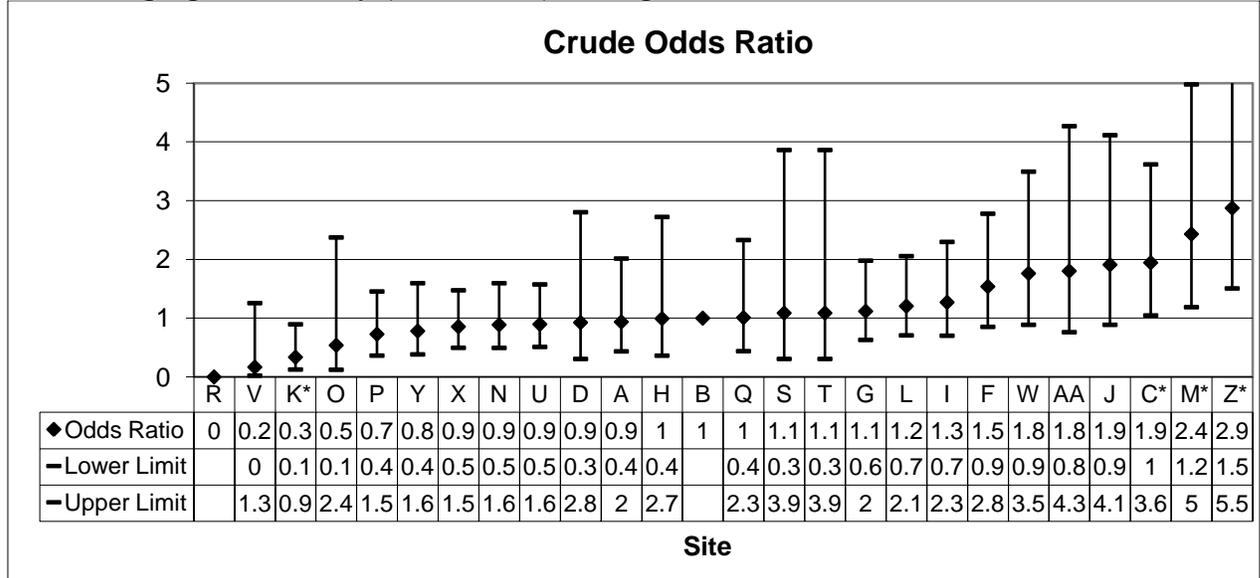
Overall %* = (number of neonates with cranial ultrasound abnormalities for site / total number of neonates for site)*100

Overall %** = (number of neonates with cranial ultrasound abnormalities for GA category / total number of neonates in gestational category)*100

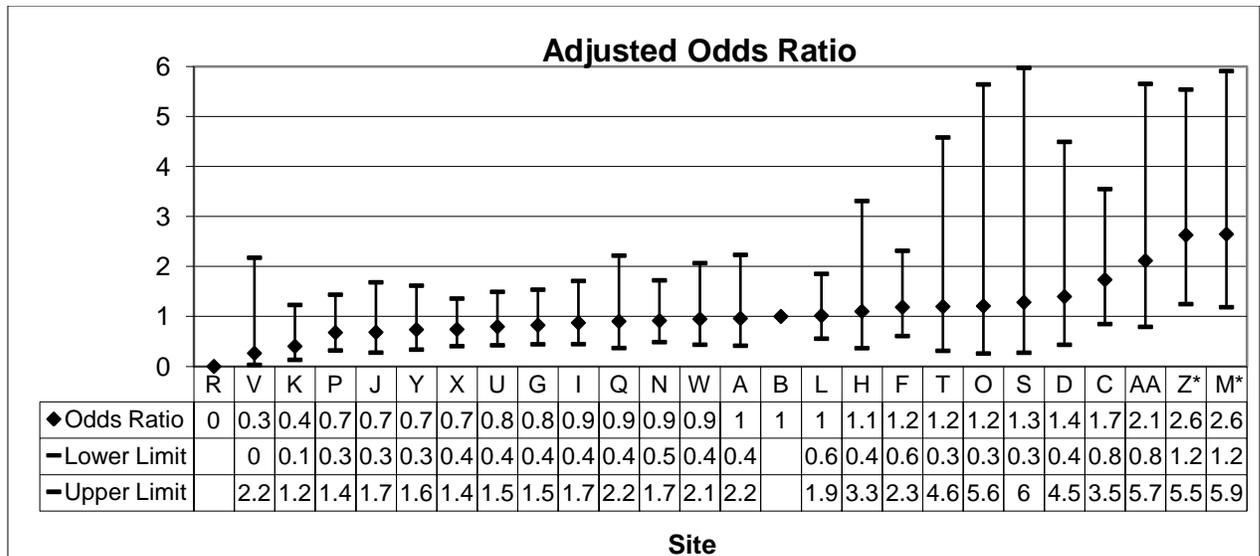
NA = no data available

Presentation #39

Neuroimaging abnormality (VE or PEC) among neonates <33 weeks GA



Number of neonates: 3 259



Number of neonates: 3 129

Reference site: B

Inclusion criteria:

- GA <33 weeks
- Age at admission less than 4 days
- Ultrasound reports

*Sites significantly different from reference site (P<0.05)

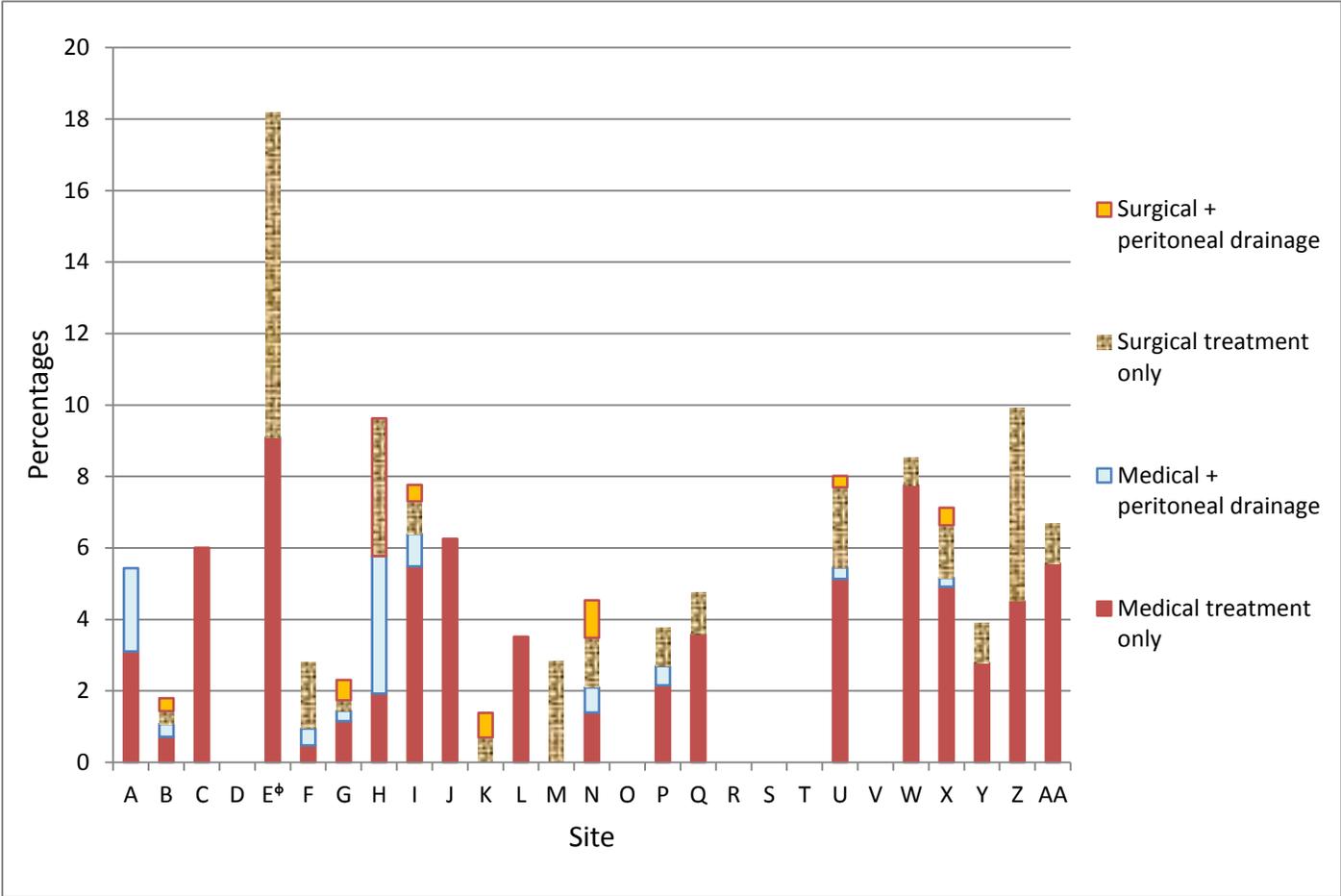
Significant predictors identified by multivariate analysis and adjusted for:

- GA
- Cesarean section
- Apgar at 5 minutes
- SNAP-II Score
- Outborn

Site E has different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites, thus it is not included in this analysis

Outcome is attributed to the network hospital of first admission

Presentation #40
 Necrotizing enterocolitis (≥stage 2) for neonates with GA < 33 weeks (site rates)



Presentation #40 (continued)

Necrotizing enterocolitis for neonates with GA < 33 weeks

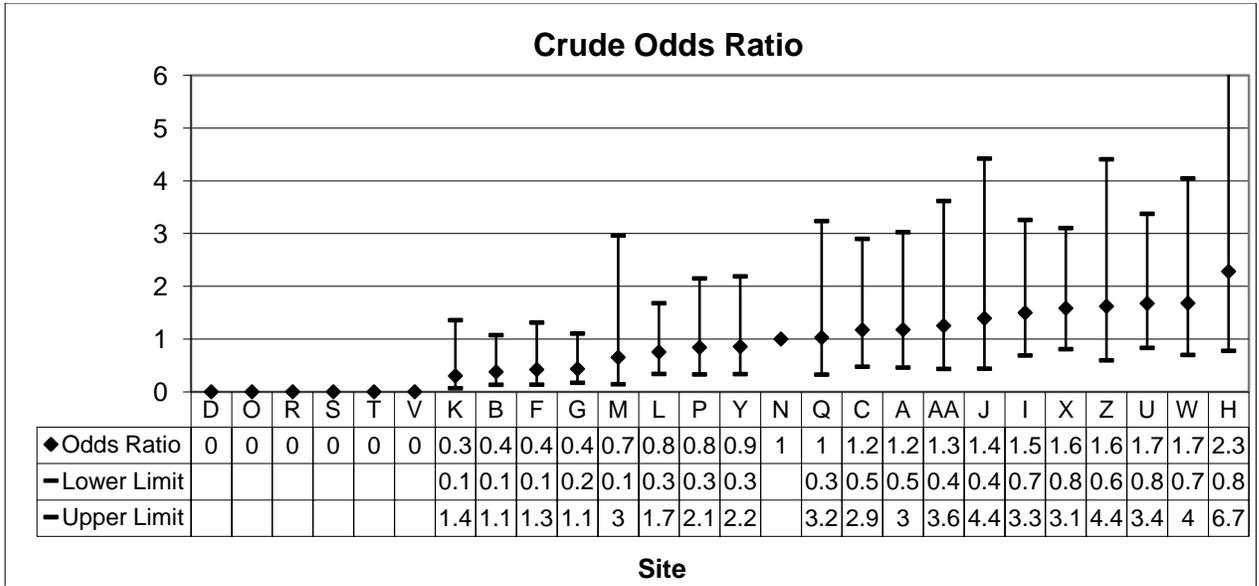
Site	Treatment (%)				
	Medical treatment only	Medical + peritoneal drainage	Surgical treatment only	Surgical + peritoneal drainage	Any
A	3.1	2.3	0.0	0.0	5.4
B	0.7	0.4	0.4	0.4	1.8
C	6.0	0.0	0.0	0.0	6.0
D	0.0	0.0	0.0	0.0	0.0
E ^φ	9.1	0.0	9.1	0.0	18.2
F	0.5	0.5	1.9	0.0	2.8
G	1.2	0.3	0.3	0.6	2.3
H	1.9	3.9	3.9	0.0	9.6
I	5.5	0.9	0.9	0.5	7.8
J	6.3	0.0	0.0	0.0	6.3
K	0.0	0.0	0.7	0.7	1.4
L	3.5	0.0	0.0	0.0	3.5
M	0.0	0.0	2.8	0.0	2.8
N	1.4	0.7	1.4	1.1	4.5
O	0.0	0.0	0.0	0.0	0.0
P	2.2	0.5	1.1	0.0	3.8
Q	3.6	0.0	1.2	0.0	4.8
R	0.0	0.0	0.0	0.0	0.0
S	0.0	0.0	0.0	0.0	0.0
T	0.0	0.0	0.0	0.0	0.0
U	5.1	0.3	2.2	0.3	8.0
V	0.0	0.0	0.0	0.0	0.0
W	7.8	0.0	0.8	0.0	8.5
X	4.9	0.3	1.5	0.5	7.1
Y	2.8	0.0	1.1	0.0	3.9
Z	4.5	0.0	5.4	0.0	9.9
AA	5.6	0.0	1.1	0.0	6.7
Total	2.9	0.4	1.1	0.3	4.6

COMMENTS: These analyses include 4 158 neonates from 27 hospitals. Fifteen (15) neonates were missing data on NEC. **Twenty-five hospitals collected data on all eligible admissions for neonates with GA < 33 weeks whereas one hospital (marked by ^φ) collected data on selected eligible admissions only.**

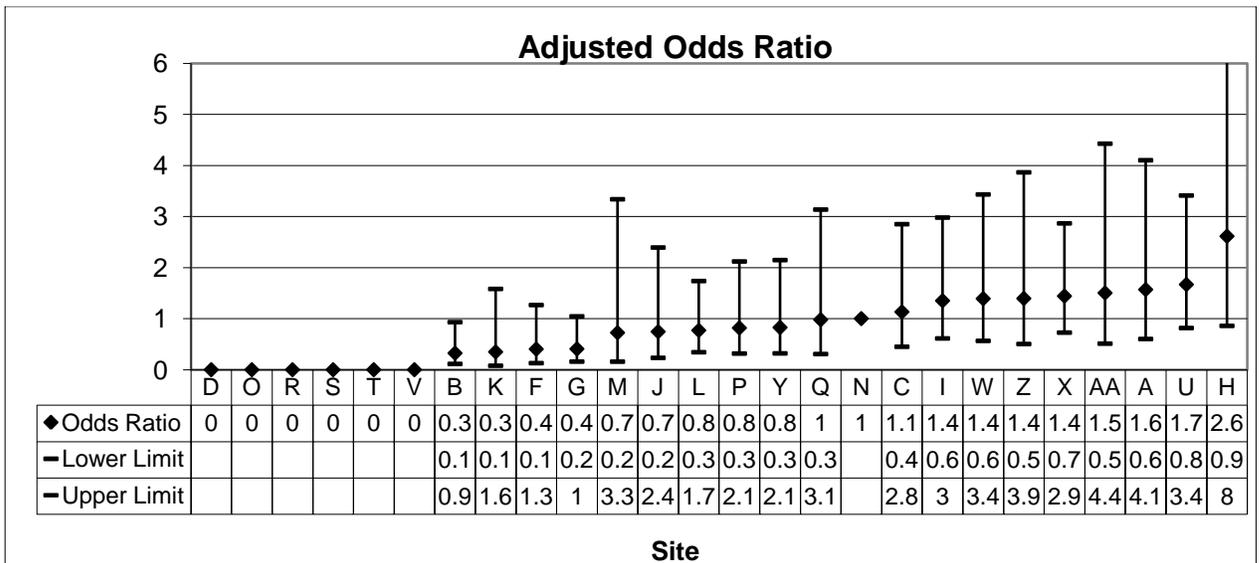
^φNote that the criteria for entering neonates with GA <33 weeks in the CNN dataset are not same for site E and thus, the rates may not be comparable with other sites.

Presentation #41

Necrotizing enterocolitis (\geq stage 2) among neonates with GA <33 weeks (site comparison)



Number of neonates: 4 014



Number of neonates: 3 792

Reference site: N

Inclusion criteria:

GA < 33 weeks

Age at admission less than 4 days

Outcome is attributed to the network hospital of first admission

All the neonates who meet the criteria in site D, O, R, S, T, and V did not have NEC stage 2 or higher (Odds Ratio: 0)

Significant predictors identified by multivariate analysis and adjusted for: GA

*Sites significantly different from reference site (P<0.05)

Site E has different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites, thus it is not included in this analysis

Presentation #42

Oxygen dependency at 28 days in neonates with GA <33 weeks at birth

GA at birth						
Site	<25	25-26	27-28	29-30	31-32	Overall rate for sites
A	NA	100.0	47.4	12.1	8.3	23.0
B	75.0	50.0	16.9	2.8	0.0	17.9
C	100.0	81.3	57.9	26.7	11.9	35.2
D	NA	0.0	40.0	10.0	0.0	8.5
E ^φ	NA	100.0	100.0	100.0	100.0	100.0
F	90.0	75.0	37.8	4.8	2.8	26.0
G	100.0	97.6	57.4	29.4	15.3	43.2
H	100.0	100.0	80.0	17.7	10.5	36.0
I	66.7	79.3	54.4	14.0	3.2	31.6
J	66.7	48.0	20.8	0.0	NA	35.9
K	50.0	31.3	13.3	8.3	0.0	9.0
L	88.9	87.5	68.4	26.6	6.7	36.1
M	100.0	91.7	100.0	58.3	16.1	52.9
N	100.0	85.3	50.0	12.2	2.0	28.7
O	NA	100.0	0.0	0.0	0.0	9.1
P	100.0	95.7	56.4	27.8	14.8	41.1
Q	100.0	100.0	42.9	10.0	10.0	32.9
R	NA	0.0	0.0	0.0	0.0	0.0
S	NA	100.0	50.0	10.0	15.4	26.7
T	NA	66.7	75.0	10.0	10.0	30.0
U	88.9	81.1	56.3	11.0	9.7	30.0
V	100.0	50.0	9.1	8.3	3.0	12.0
W	100.0	81.3	57.1	7.7	3.6	30.0
X	100.0	82.7	44.1	9.0	7.0	27.4
Y	100.0	78.3	37.9	13.8	0.0	25.3
Z	100.0	91.7	41.7	17.9	11.5	34.4
AA	50.0	28.6	28.6	18.8	8.6	16.9
Overall rate for GA group	91.0	75.5	45.3	15.5	6.5	28.6

Total number of neonates = 3 852; 321 neonates were excluded due to death prior to day 28 of age or first admission after day 28. NA = no data available.

^φNote that the criteria for entering neonates with GA <33 weeks in the CNN dataset are not same for site E and thus, the rates may not be comparable with other sites. Outcomes are attributed to the hospital of first admission.

Comments: Neonates were classified as having oxygen dependency at 28 days as follows: a) receiving supplemental oxygen on day 28 of age or b) discharged prior to day 28 of age and receiving supplemental oxygen at discharge. Neonates were excluded from analysis if they died prior to day 28 after birth or the first admission was after day 28. There were no requirements for chest radiographs at the time of diagnosis.

Presentation #43

Oxygen dependency at 36 weeks in neonates with GA <33 weeks at birth

GA at birth						
Site	<25	25-26	27-28	29-30	31-32	Overall rate for sites
A	NA	50.0	22.2	6.1	5.0	11.6
B	60.0	20.0	12.7	4.2	0.0	11.1
C	100.0	46.7	36.8	16.7	9.0	24.8
D	NA	50.0	0.0	3.3	0.0	3.4
E ^φ	NA	100.0	100.0	100.0	0.0	75.0
F	60.0	25.0	22.2	2.3	2.8	13.2
G	100.0	85.0	55.7	29.1	15.3	40.9
H	100.0	75.0	33.3	11.8	10.5	26.0
I	50.0	53.6	45.7	12.0	1.6	24.0
J	66.7	60.0	21.7	0.0	NA	42.3
K	66.7	37.5	18.8	2.8	0.0	9.0
L	100.0	73.7	49.1	18.1	5.9	27.9
M	100.0	23.1	33.3	16.7	9.7	18.8
N	72.7	51.5	43.6	10.8	2.0	21.6
O	NA	66.7	0.0	0.0	0.0	6.1
P	80.0	82.6	51.3	22.2	14.8	36.0
Q	0.0	53.9	14.3	0.0	5.0	12.7
R	NA	7.1	0.0	3.6	0.0	1.8
S	NA	33.3	25.0	0.0	7.7	10.0
T	NA	33.3	50.0	10.0	10.0	20.0
U	88.9	61.8	39.6	9.6	10.6	24.2
V	100.0	25.0	8.3	4.2	3.0	8.0
W	60.0	50.0	20.0	15.4	3.6	17.4
X	88.9	67.4	36.8	10.8	7.8	23.7
Y	66.7	50.0	10.7	10.3	0.0	14.2
Z	100.0	45.5	30.8	14.3	11.5	22.8
AA	0.0	28.6	57.1	19.4	2.9	16.1
Overall rate for GA group	78.2	52.5	33.2	12.4	5.7	21.4

Total number of neonates = 3 825. 348 neonates were excluded due to death prior to week 36 or first admission after week 36. NA = no data available

^φNote that the criteria for entering neonates with GA <33 weeks in the CNN dataset are not same for site E and thus, the rates may not be comparable with other sites. Outcomes are attributed to the hospital of first admission.

Comments: Neonates were classified as having oxygen dependency at 36 weeks as follows: a) receiving supplemental oxygen at week 36 postmenstrual age (PMA) or b) discharged prior to week 36 PMA and receiving supplemental oxygen at discharge. Neonates were excluded from analysis if they died prior to week 36 or the first admission was after week 36. There were no requirements for chest radiographs at the time of diagnosis.

Presentation #44

Oxygen dependency at 28 days or death at any time in neonates with GA <33 weeks at birth

GA at birth						
Site	<25	25-26	27-28	29-30	31-32	Overall rate for sites
A	100.0	100.0	56.5	14.7	8.3	27.1
B	80.0	50.0	18.1	2.8	0.0	19.4
C	100.0	84.2	60.0	29.0	11.9	38.7
D	NA	50.0	40.0	10.0	0.0	11.5
E ^φ	NA	100.0	100.0	100.0	100.0	100.0
F	90.9	78.1	39.1	11.1	5.5	30.0
G	100.0	97.6	58.1	30.6	16.2	44.8
H	100.0	100.0	80.0	22.2	10.5	37.3
I	86.7	83.3	58.0	17.3	7.7	39.5
J	87.5	53.6	26.9	0.0	NA	46.0
K	50.0	45.0	18.8	8.3	0.0	12.2
L	93.8	89.4	69.0	26.6	7.5	39.1
M	100.0	92.3	100.0	61.5	16.1	54.3
N	100.0	85.3	50.9	13.3	3.9	31.0
O	NA	100.0	0.0	0.0	0.0	14.3
P	100.0	96.4	56.4	30.4	14.8	45.8
Q	100.0	100.0	46.7	12.9	10.0	36.9
R	NA	0.0	5.6	0.0	0.0	0.9
S	100.0	100.0	50.0	18.2	15.4	33.3
T	100.0	66.7	75.0	10.0	10.0	32.3
U	95.0	85.4	56.3	13.3	12.1	36.2
V	100.0	50.0	9.1	8.3	5.9	15.4
W	100.0	84.2	60.9	14.3	3.6	39.4
X	100.0	85.0	45.0	15.8	8.4	35.2
Y	100.0	81.5	40.0	16.7	1.3	29.4
Z	100.0	91.7	46.2	17.9	14.8	38.4
AA	66.7	50.0	28.6	18.8	11.1	21.6
Overall rate for GA group	94.8	78.5	47.1	17.8	7.7	33.0

Total number of neonates = 4 104; NA= not available

^φNote that the criteria for entering neonates with GA <33 weeks in the CNN dataset are not same for site E and thus, the rates may not be comparable with other sites. Outcomes are attributed to the hospital of first admission.

Comments: Neonates were classified as having oxygen dependency at 28 days as follows: a) receiving supplemental oxygen on day 28 of age or b) discharged prior to day 28 of age and receiving supplemental oxygen at discharge. Neonates were excluded from analysis if the first admission was after day 28. There were no requirements for chest radiographs at the time of diagnosis. Deaths prior to day 28 of age are also included.

Presentation #45

Oxygen dependency at 36 weeks or death at any time in neonates with GA <33 weeks at birth

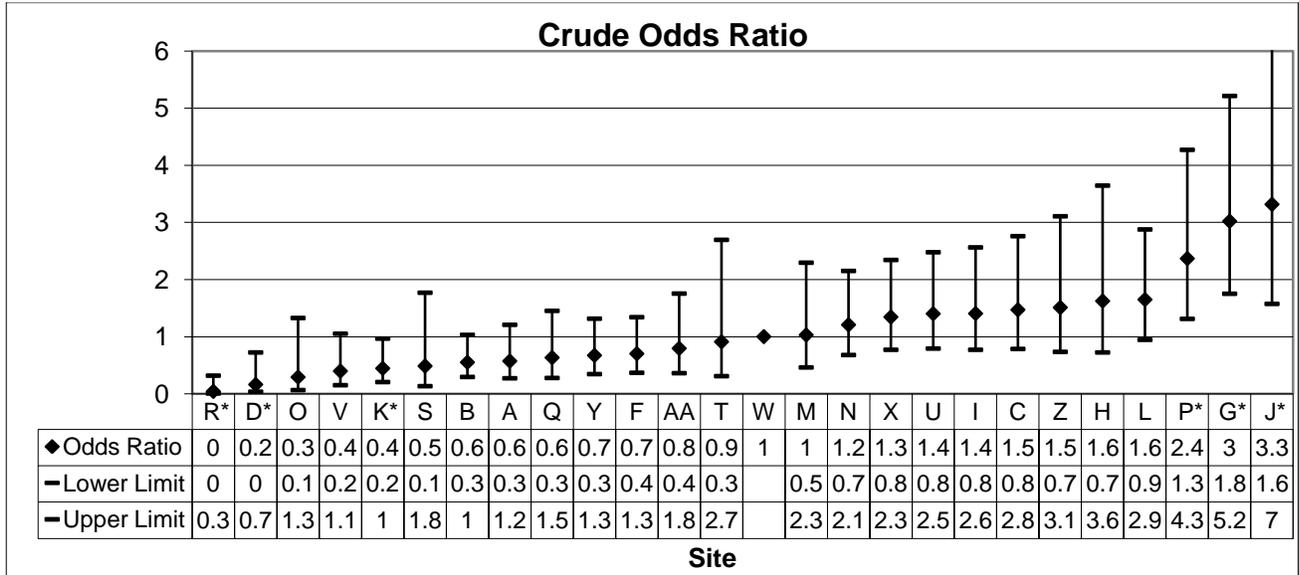
GA at birth						
Site	<25	25-26	27-28	29-30	31-32	Overall rate for sites
A	100.0	54.6	39.1	8.8	5.0	17.1
B	70.0	21.7	13.9	4.2	1.5	13.6
C	100.0	57.9	40.0	19.4	9.0	29.3
D	NA	75.0	0.0	3.3	0.0	6.6
E ^φ	NA	100.0	100.0	100.0	50.0	83.3
F	63.6	34.4	23.9	8.7	5.5	17.8
G	100.0	85.7	57.1	30.4	16.2	43.1
H	100.0	80.0	33.3	16.7	10.5	28.9
I	80.0	63.9	51.0	15.4	6.2	33.3
J	87.5	64.3	30.8	0.0	NA	52.4
K	75.0	50.0	23.5	2.8	0.0	12.9
L	100.0	78.7	50.0	18.1	6.7	31.9
M	100.0	28.6	33.3	23.1	9.7	21.1
N	81.3	52.9	45.6	12.0	3.9	24.7
O	NA	80.0	0.0	0.0	0.0	11.4
P	92.3	85.7	51.3	25.0	14.8	41.1
Q	33.3	60.0	20.0	3.2	5.0	17.9
R	NA	13.3	5.6	3.6	1.8	4.3
S	100.0	33.3	25.0	9.1	7.7	18.2
T	100.0	33.3	50.0	10.0	10.0	22.6
U	95.0	72.9	39.6	12.0	12.9	31.6
V	100.0	25.0	8.3	4.2	5.9	12.7
W	87.5	57.9	30.4	21.4	3.6	29.1
X	97.1	73.3	40.0	17.5	9.2	33.3
Y	76.9	57.1	16.7	13.3	1.3	19.9
Z	100.0	50.0	35.7	14.3	14.8	29.7
AA	66.7	54.6	57.1	21.9	5.6	23.6
Overall rate for GA group	88.5	59.5	36.2	14.9	7.1	26.9

Total number of neonates = 4 117. NA = no data available

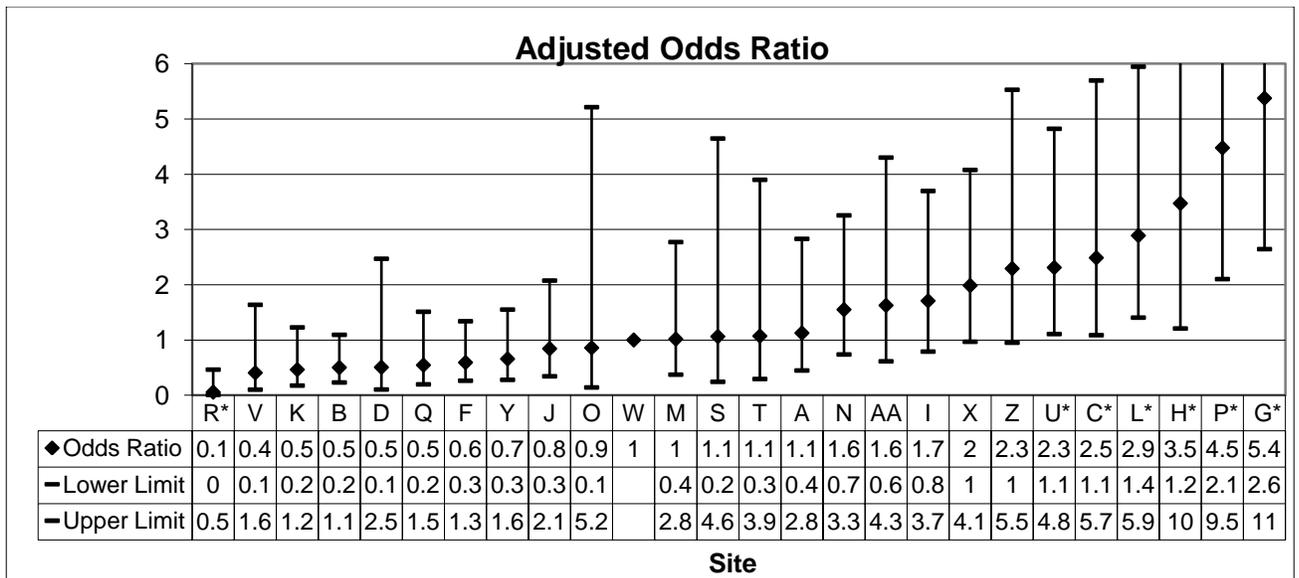
^φNote that the criteria for entering neonates with GA <33 weeks in the CNN dataset are not same for site E and thus, the rates may not be comparable with other sites. Outcomes are attributed to the hospital of first admission.

Comments: Neonates were classified as having oxygen dependency at 36 weeks as follows: a) receiving supplemental oxygen at week 36 postmenstrual age (PMA) or b) discharged prior to week 36 PMA and receiving supplemental oxygen at discharge. Neonates were excluded from analysis if the first admission was after week 36. There were no requirements for chest radiographs at the time of diagnosis. Deaths prior to week 36 PMA are included.

Presentation #46a
Oxygen dependency at 36 weeks post-menstrual age (site comparison)



Number of neonates: 3 716



Number of neonates: 3 666

Reference site: W

Inclusion criteria:

GA <33 weeks
Age at admission less than 4 days
Survival to 36 weeks post-menstrual age

Outcome is attributed to the network hospital of first admission

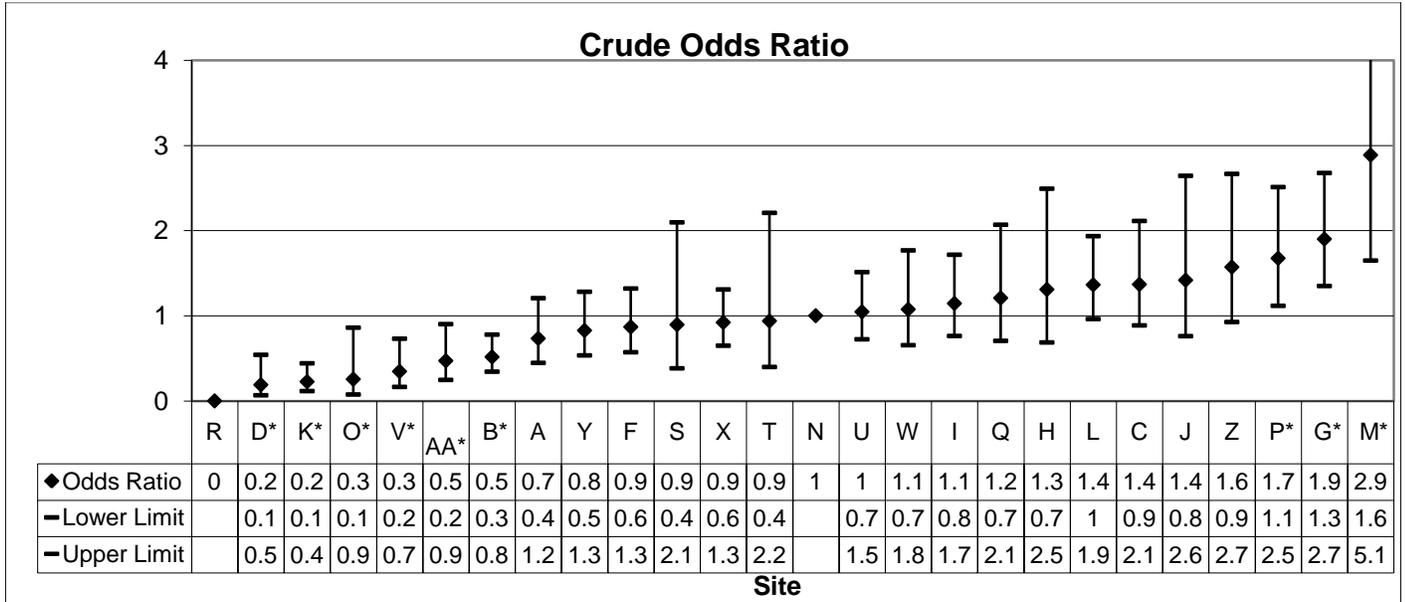
Significant predictors identified by multivariate analysis and adjusted for:

GA
Apgar at 5 minutes SNAP-II Score
SGA (BW <10th centile for GA)

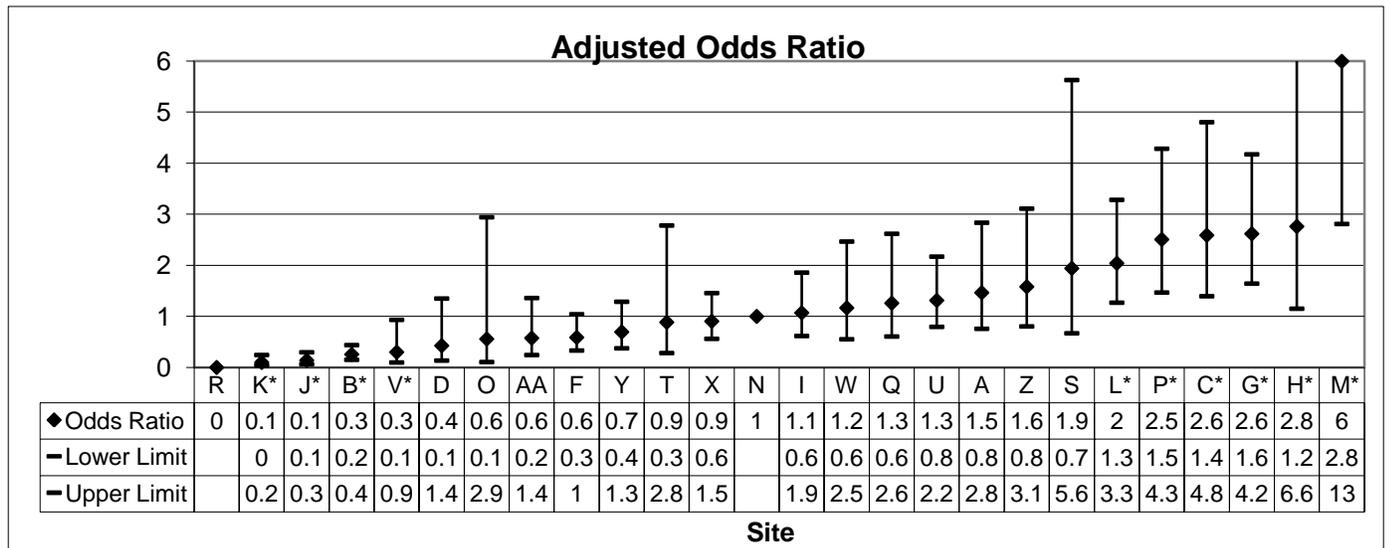
*Sites significantly different from reference site (P<0.05)

Site E has different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites, thus it is not included in this analysis

Presentation #46b
Oxygen dependency at 28 days after birth (site comparison)



Number of neonates: 3 754



Number of neonates: 3 702

Reference site: N

Inclusion criteria:

- GA < 33 weeks
- Age at admission less than 4 days
- Survival to 28 days after birth

*Sites significantly different from reference site (P < 0.05)

Outcome is attributed to the network hospital of first admission

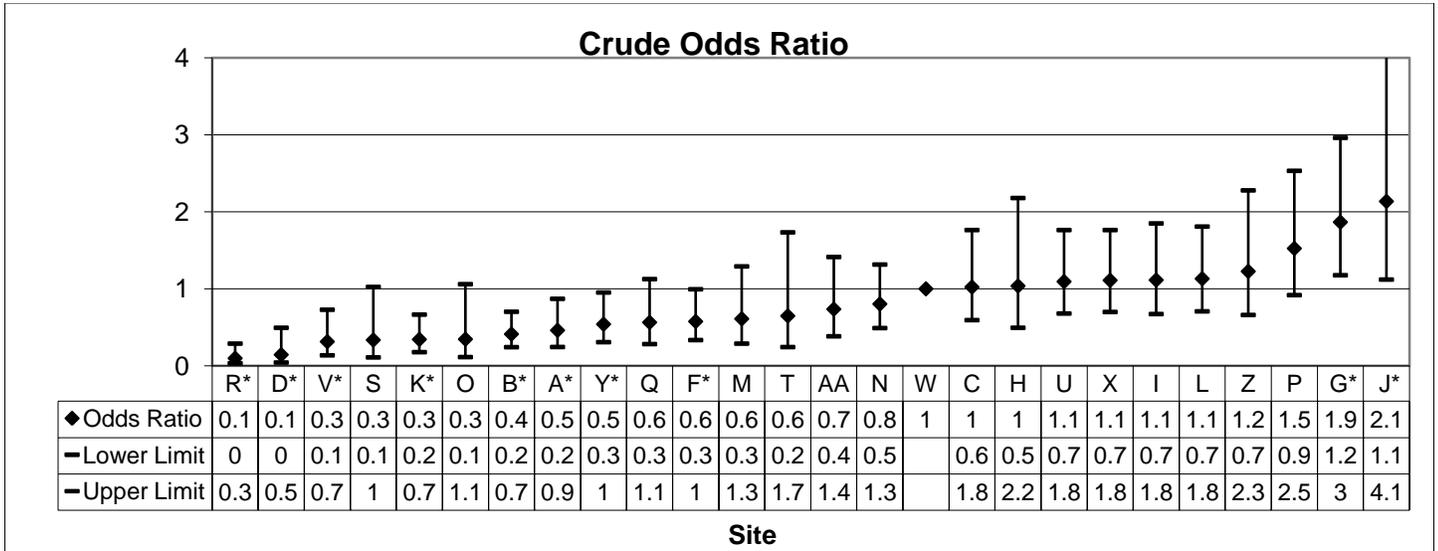
Significant predictors identified by multivariate analysis and adjusted for:

- GA
- SNAP-II Score
- Apgar at 5 minutes
- SGA (BW < 10th centile for GA)

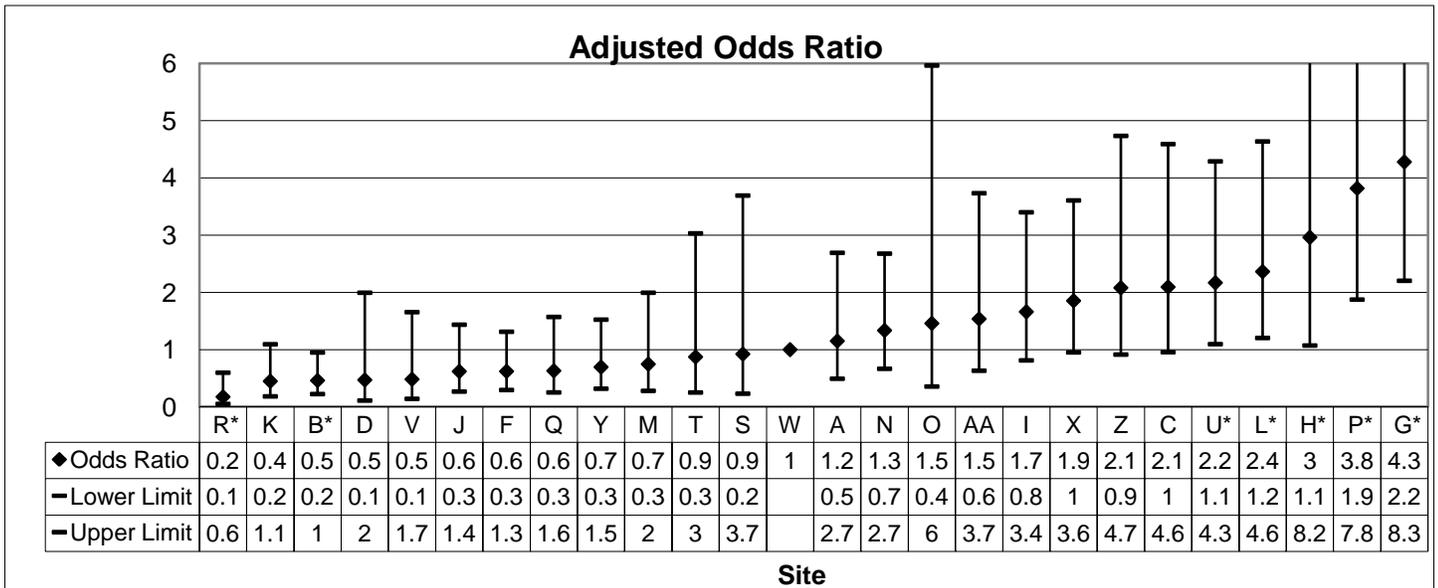
Site E has different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites, thus it is not included in this analysis

Presentation #47a

Oxygen dependency at 36 weeks post-menstrual age or death at any time (site comparison)



Number of neonates: 3 961



Number of neonates: 3 891

Reference site: W

Inclusion criteria:

GA <33 weeks

Age at admission less than 4 days

Site E has different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites, thus it is not included in this analysis

Significant predictors identified by multivariate analysis and adjusted for:

GA Apgar at 5 minutes

SGA (BW <10th centile for GA)

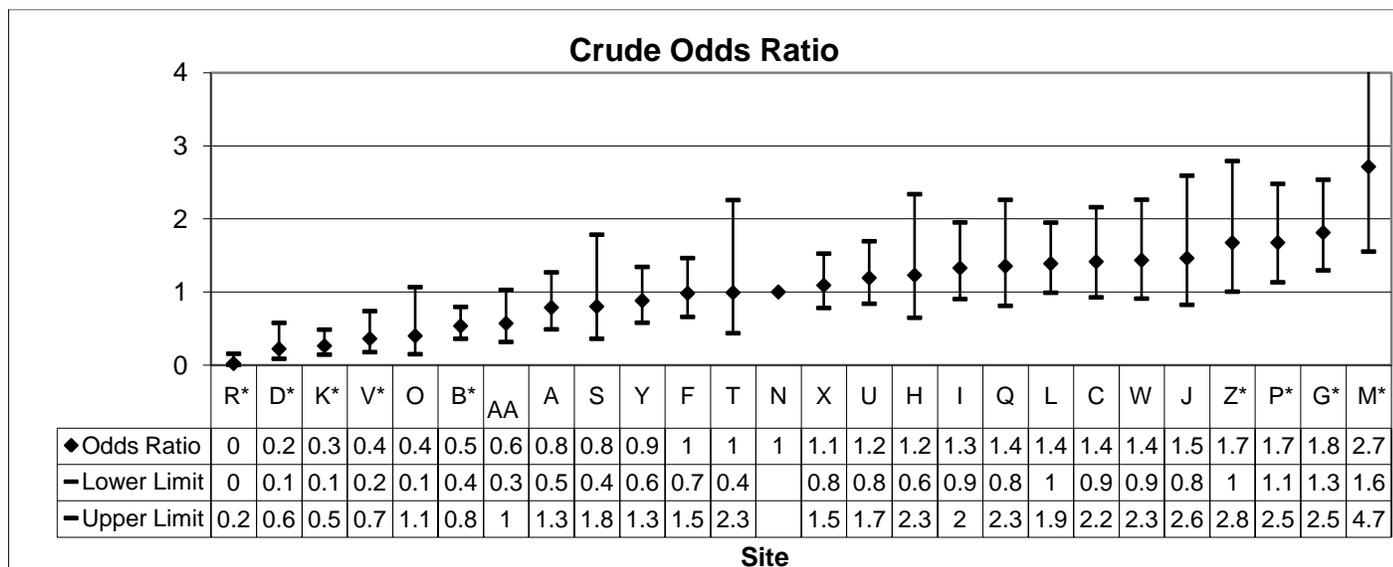
SNAP-II Score

*Sites significantly different from reference site (P<0.05)

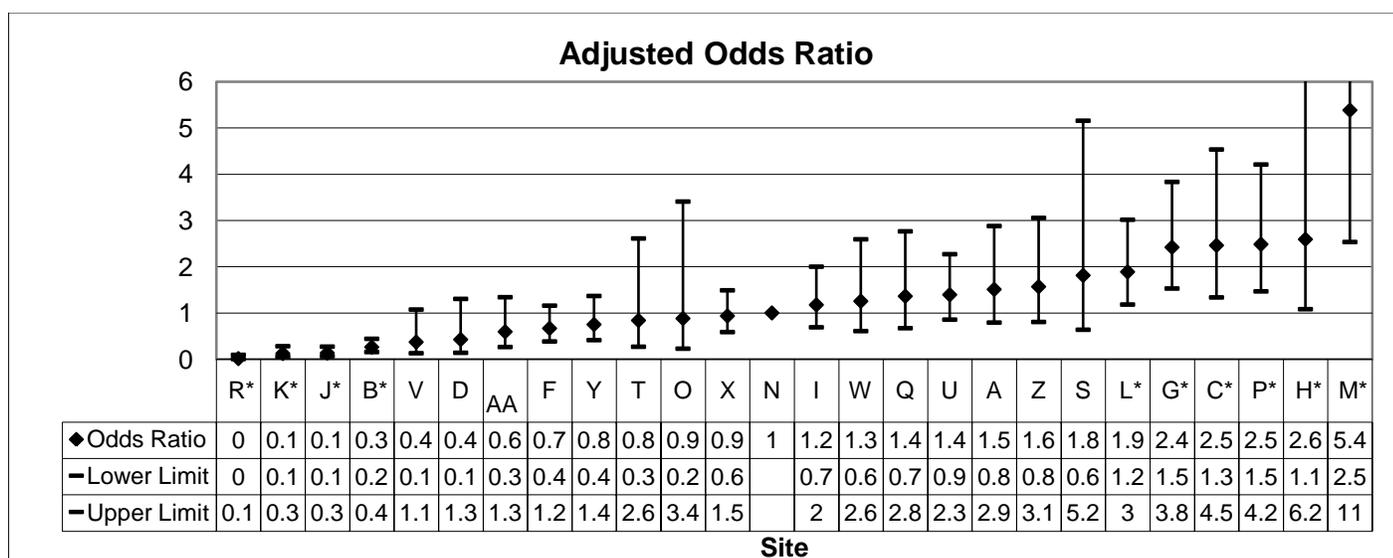
Outcome is attributed to the network hospital of first admission

Presentation #47b

Oxygen dependency at 28 days after birth or death at any time (site comparison)



Number of neonates: 3 961



Number of neonates: 3 891

Reference site: N

Inclusion criteria:

GA <33 weeks
Age at admission less than 4 days

Outcome is attributed to the network hospital of first admission

***Sites significantly different from reference site (P<0.05)**

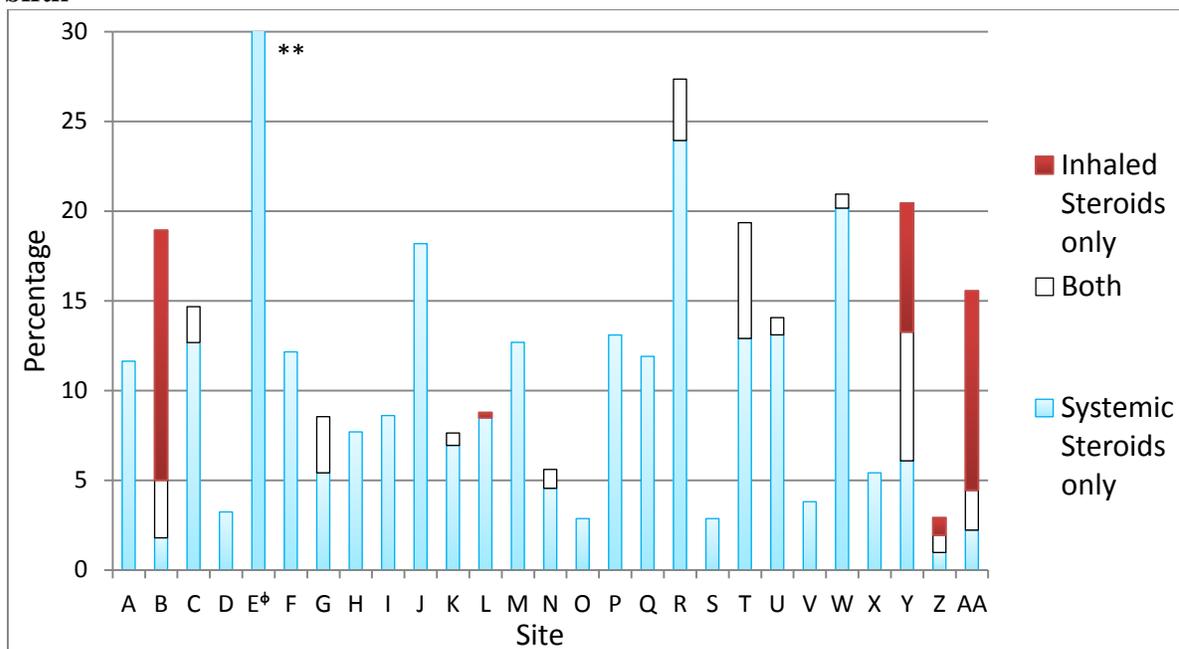
Significant predictors identified by multivariate analysis and adjusted for:

GA Apgar at 5 minutes
SNAP-II Score
SGA (BW <10th centile for GA)

Site E has different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites, thus it is not included in this analysis

Presentation #48

Postnatal use of steroids for any indication among neonates with GA <33 weeks at birth[†]



Site	Postnatal steroid use (%)		
	Systemic Steroids only	Both	Inhaled Steroids only
A	11.6	0.0	0.0
B	1.8	3.2	13.9
C	12.7	2.0	0.0
D	3.2	0.0	0.0
E ^φ	60.0	0.0	0.0
F	12.2	0.0	0.0
G	5.4	3.1	0.0
H	7.7	0.0	0.0
I	8.6	0.0	0.0
J	18.2	0.0	0.0
K	6.9	0.7	0.0
L	8.5	0.0	0.3
M	12.7	0.0	0.0
N	4.6	1.1	0.0

Site	Postnatal steroid use (%)		
	Systemic Steroids only	Both	Inhaled Steroids only
O	2.9	0.0	0.0
P	13.1	0.0	0.0
Q	11.9	0.0	0.0
R	23.9	3.4	0.0
S	2.9	0.0	0.0
T	12.9	6.5	0.0
U	13.1	1.0	0.0
V	3.8	0.0	0.0
W	20.2	0.8	0.0
X	5.4	0.0	0.0
Y	6.1	7.2	7.2
Z	1.0	1.0	1.0
AA	2.2	2.2	11.1
Total	8.7	1.3	1.5

Total number of neonates = 4 173

[†] Percentage of neonates to each network NICU and results are attributed to the original hospital.

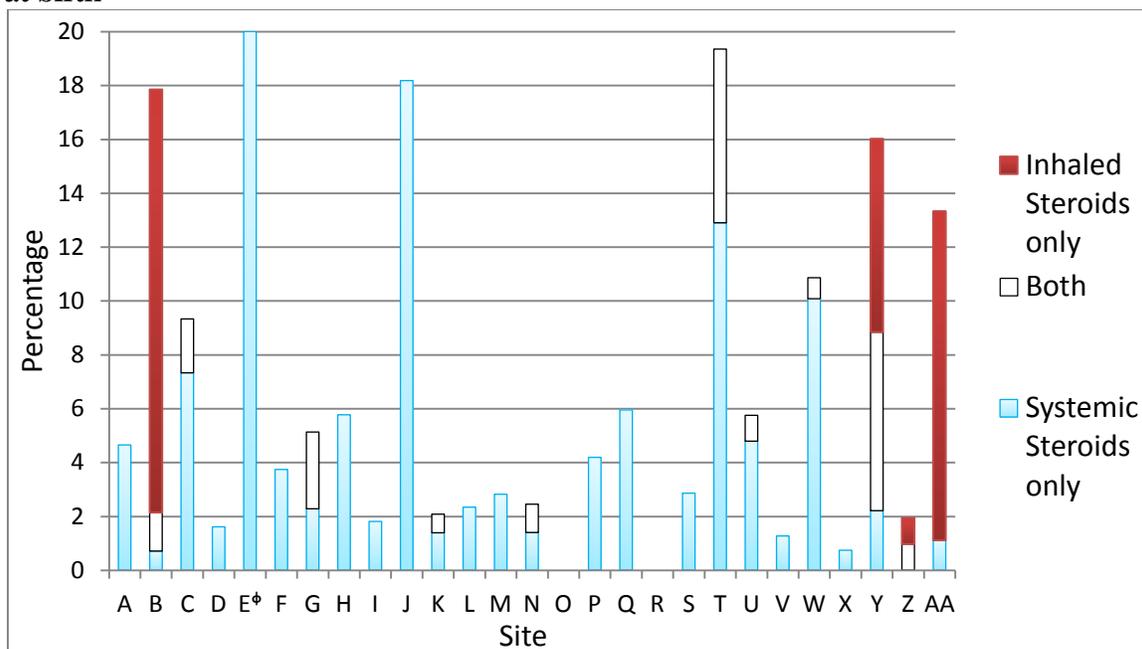
**Note that the bar representing site E's steroids use in the graph goes over the upper limit of this graph and is not completely shown. Refer to the table for the actual percentage.

^φNote that the criteria for entering neonates with GA <33 in the CNN dataset are not the same for site E and thus, the rates may not be comparable with other sites.

COMMENTS: Specific criteria for these treatments in each hospital are not documented here.

Presentation #48a

Postnatal use of steroids for treatment of BPD among neonates with GA <33 weeks at birth[†]



Site	Postnatal steroid use (%)		
	Systemic Steroids only	Both	Inhaled Steroids only
A	4.7	0.0	0.0
B	0.7	1.4	15.7
C	7.3	2.0	0.0
D	1.6	0.0	0.0
E ^φ	20.0	0.0	0.0
F	3.7	0.0	0.0
G	2.3	2.9	0.0
H	5.8	0.0	0.0
I	1.8	0.0	0.0
J	18.2	0.0	0.0
K	1.4	0.7	0.0
L	2.3	0.0	0.0
M	2.8	0.0	0.0
N	1.4	1.1	0.0

Site	Postnatal steroid use (%)		
	Systemic Steroids only	Both	Inhaled Steroids only
O	0.0	0.0	0.0
P	4.2	0.0	0.0
Q	6.0	0.0	0.0
R	0.0	0.0	0.0
S	2.9	0.0	0.0
T	12.9	6.5	0.0
U	4.8	1.0	0.0
V	1.3	0.0	0.0
W	10.1	0.8	0.0
X	0.7	0.0	0.0
Y	2.2	6.6	7.2
Z	0.0	1.0	1.0
AA	1.1	0.0	12.2
Total	3.1	1.0	1.7

Total number of neonates = 4 173

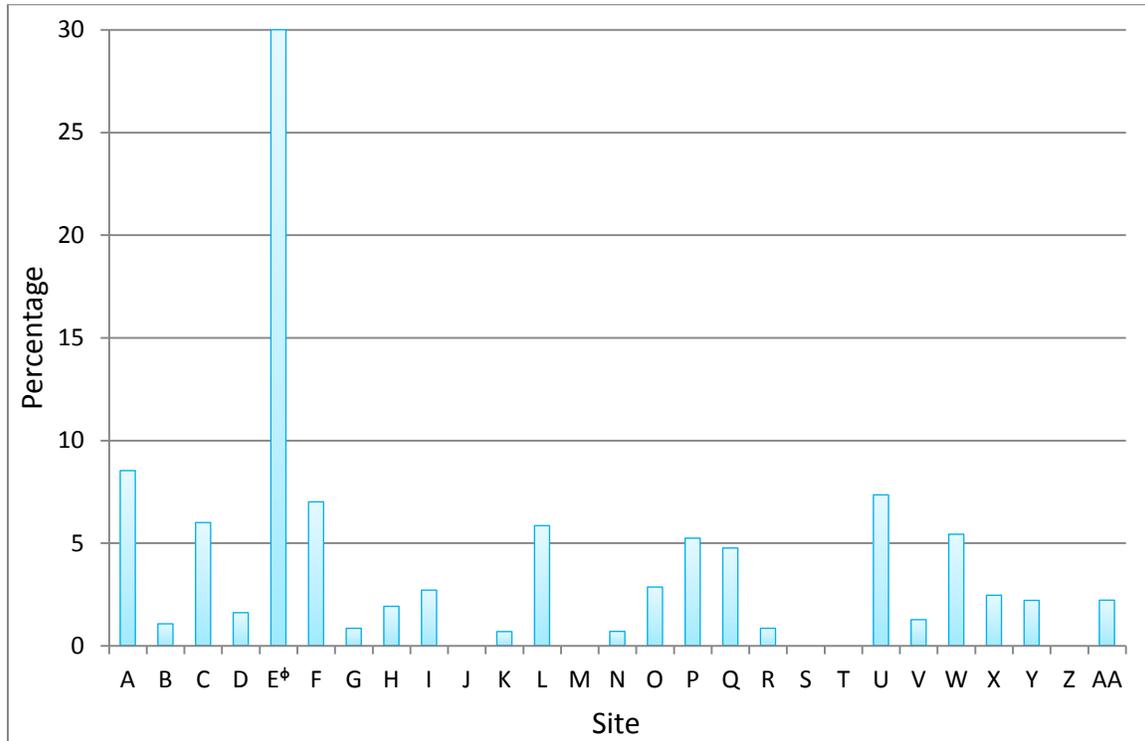
[†] Percentage of neonates to each network NICU and results are attributed to the original hospital.

^φNote that the criteria for entering neonates with GA <33 in the CNN dataset are not the same for site E and thus, the rates may not be comparable with other sites.

COMMENTS: Specific criteria for these treatments in each hospital are not documented here.

Presentation #48b

Postnatal use of systemic steroids for hypotension among neonates with GA <33 weeks at birth[†]



Site	Postnatal systemic steroids use (%)	Site	Postnatal systemic steroids use (%)
A	8.5	O	2.9
B	1.1	P	5.2
C	6.0	Q	4.8
D	1.6	R	0.9
E ^φ	30.0	S	0.0
F	7.0	T	0.0
G	0.9	U	7.4
H	1.9	V	1.3
I	2.7	W	5.4
J	0.0	X	2.5
K	0.7	Y	2.2
L	5.9	Z	0.0
M	0.0	AA	2.2
N	0.7		
		Total	3.3

Total number of neonates = 4 173

[†]Percentage of neonates to each network NICU and results are attributed to the original hospital.

^φNote that the criteria for entering neonates with GA <33 in the CNN dataset are not the same for site E and thus, the rates may not be comparable with other sites.

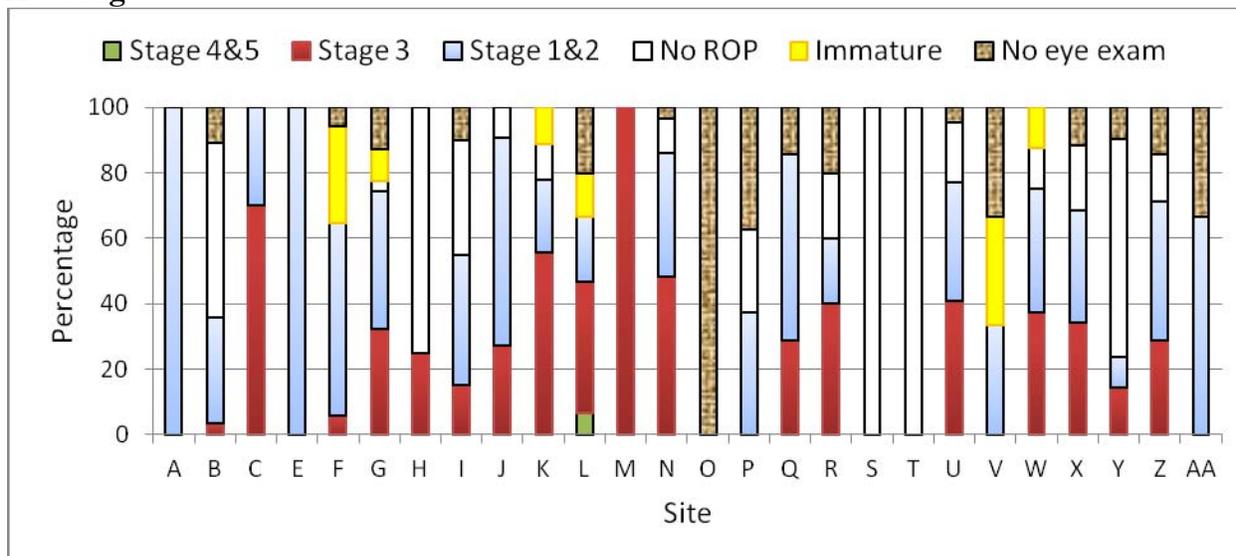
COMMENTS: Specific criteria for these treatments in each hospital are not documented here.

Amendment

Presentation #49a

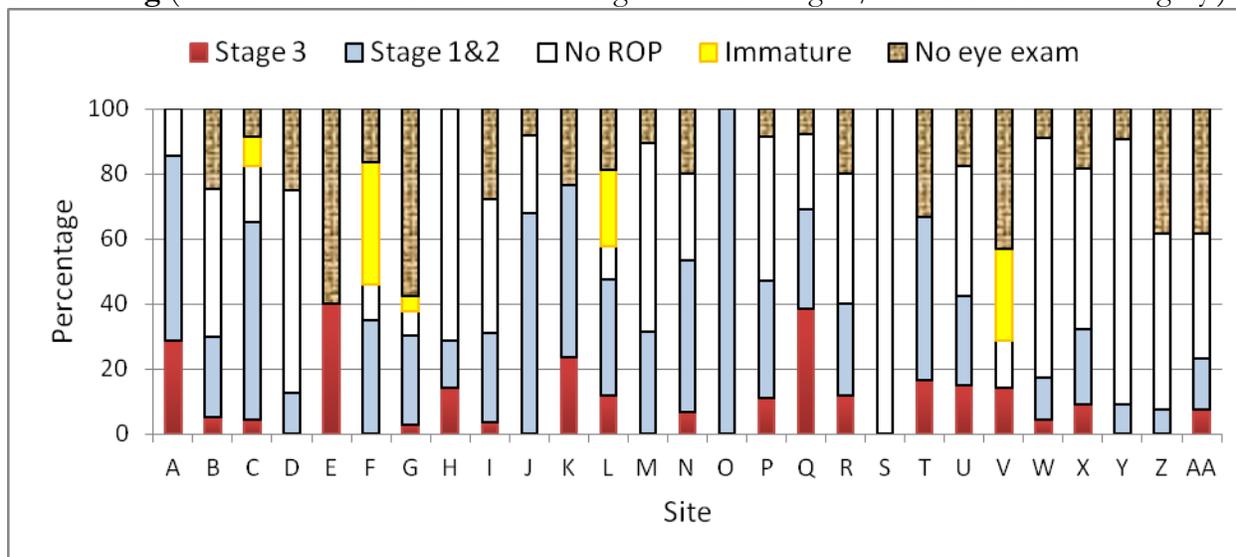
Retinopathy of prematurity among neonates with BW <1000g who survived beyond 6 weeks

A. <750g



There were no neonates in site D in this BW category.

B. 750-999g (Note that no sites had neonates diagnosed with Stage 4/5 ROP in this BW category.)



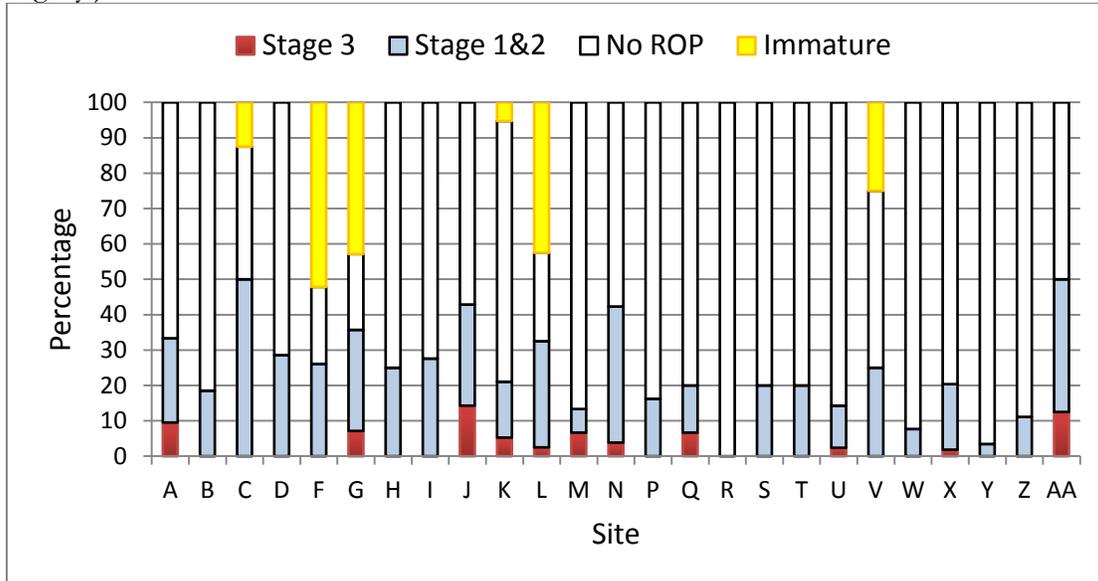
Note that for site S, among those neonates with eye exams, none was diagnosed with ROP, so the incidence is zero.

*Neonates who were transferred to non-participating CNN units are not captured here.

Presentation #49b

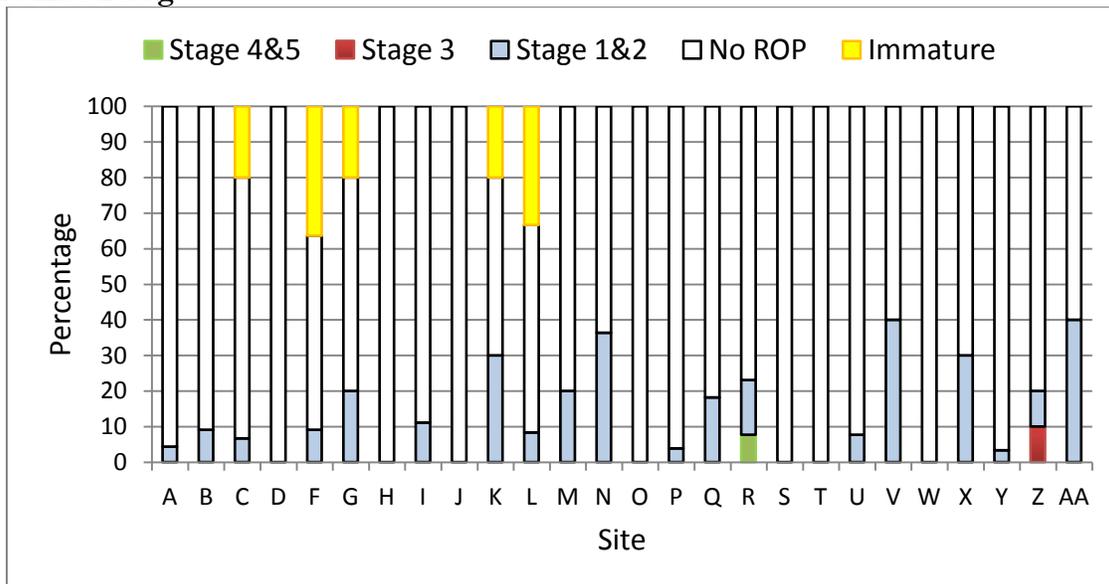
Retinopathy of prematurity among neonates with BW <1500g and who had eye exams*

C. 1000-1249g (Note that no sites had neonates diagnosed with Stage 4/5 ROP in this BW category.)



Note that for site R, among those neonates with eye exams, none was diagnosed with ROP, so the incidence is zero. There were no neonates in site E and O in this BW category.

D. 1250-1499g



Note that for site D, H, J, O, S, T, and W, among those neonates with eye exams, none were diagnosed with ROP, so the incidence is zero. There were no neonates in site E in this BW category.

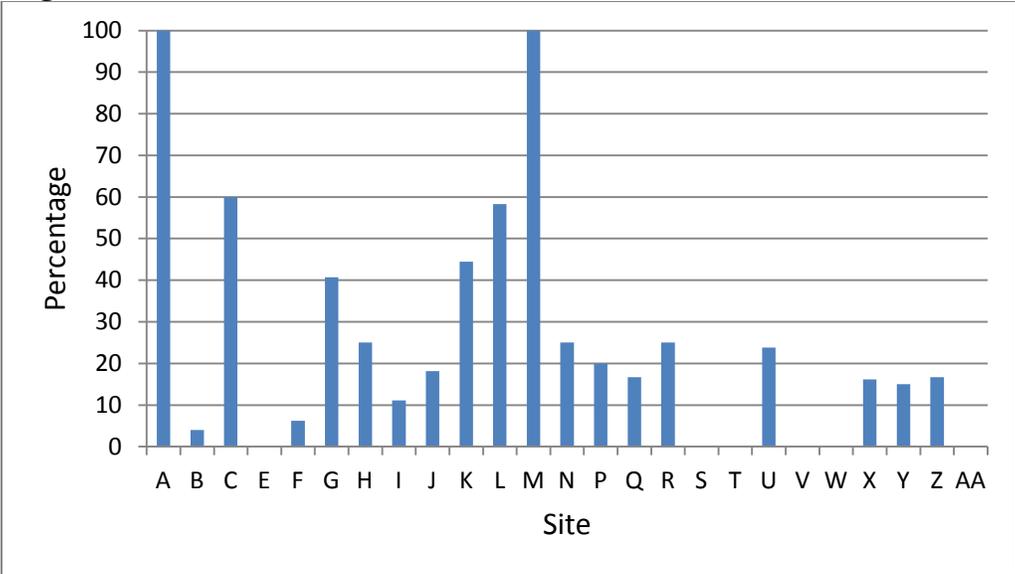
COMMENTS: Not all centers have data on neonates in each BW category.

***Only neonates with eye exams performed were included in this presentation because eye exams were not performed for large percentage of neonates in these BW categories.**

Presentation #50

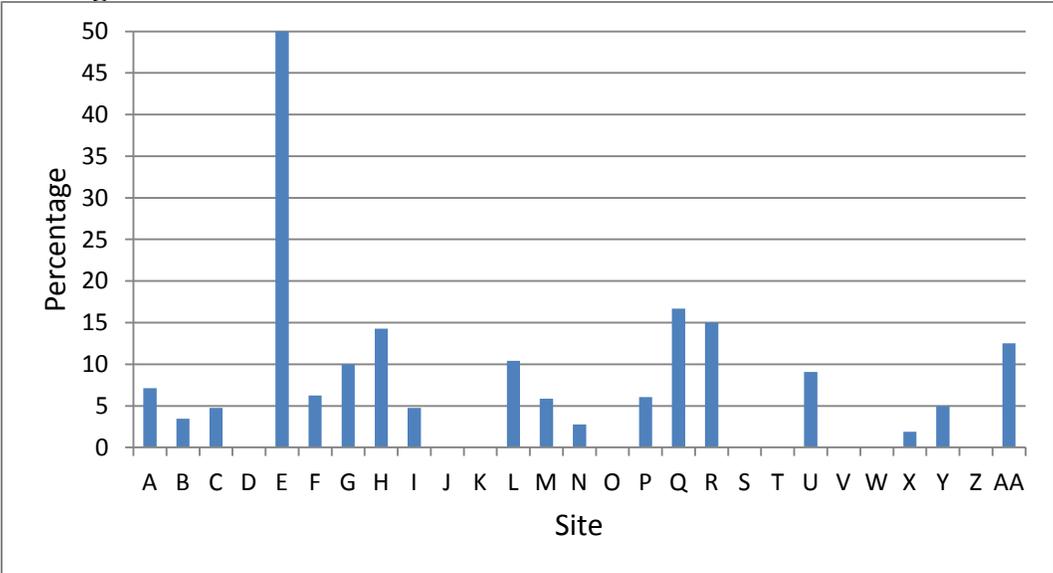
Treatment for retinopathy of prematurity among neonates with BW <1000g (who had eye exams)

A. <750g



For sites E, V, and AA, none of the neonates received treatment. For site S, and T, no neonates were diagnosed with ROP for this BW subgroup.

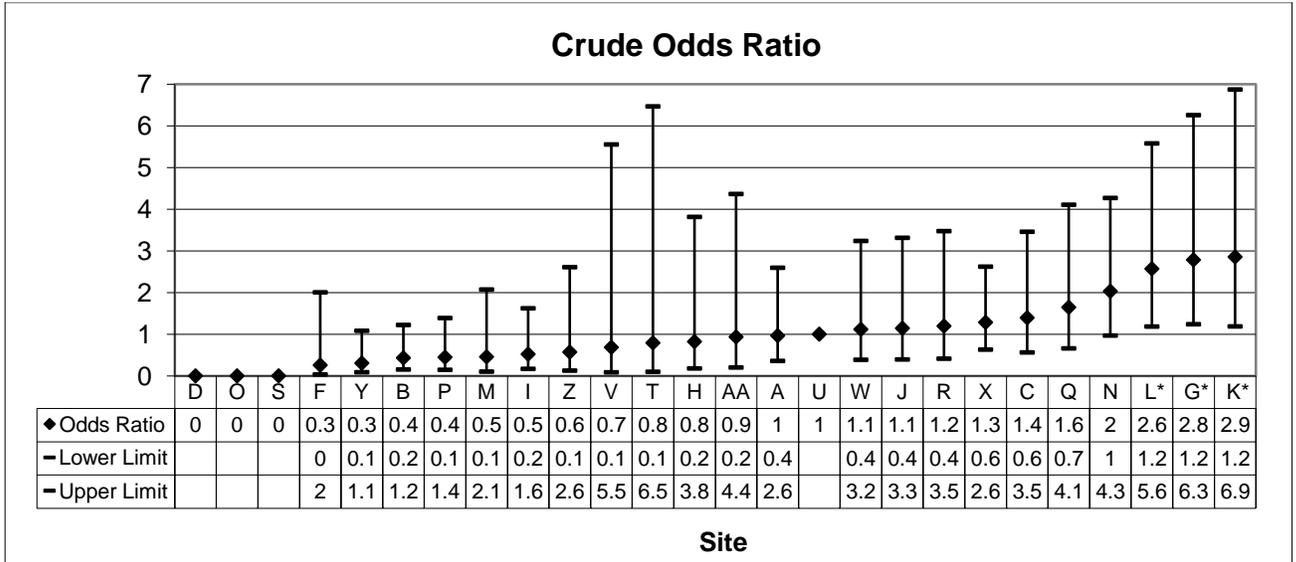
B. 750-999g



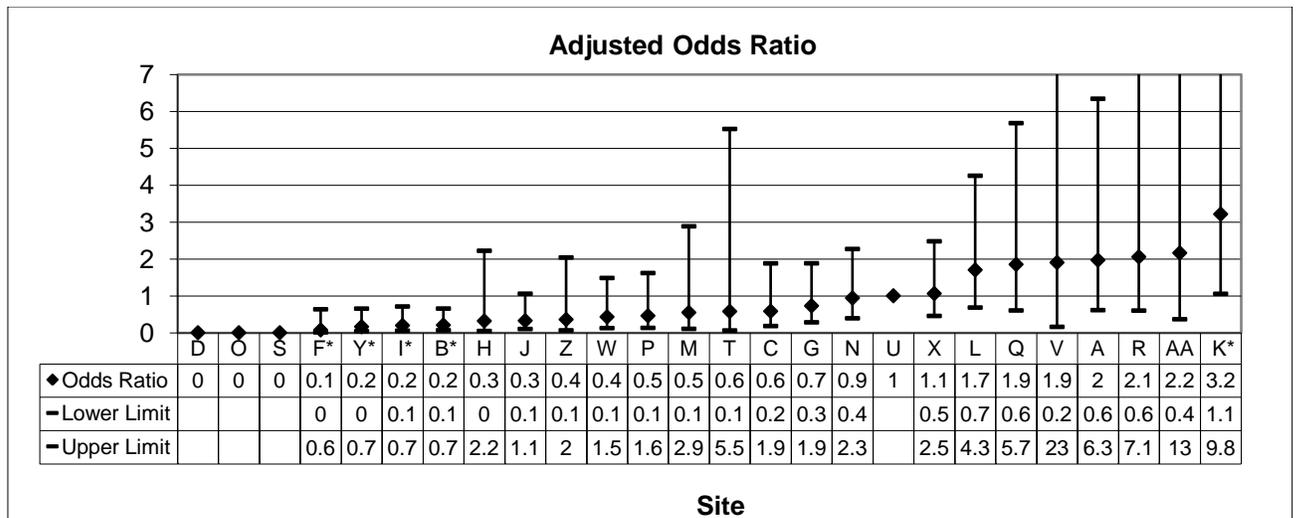
For sites D, J, K, O, V, W and Z, none of the neonates received treatment. For site S, no neonates were diagnosed with ROP for this BW subgroup.

COMMENTS: Not all centers have data on neonates in each BW category.

Presentation #51
Retinopathy of prematurity stage 3 and higher (site comparison)



Number of neonates: 1 643



Number of neonates: 1 600

Reference site: U

Inclusion criteria:

GA < 33 weeks Screened for ROP
 Age at admission less than 4 days

Significant predictors identified by multivariate analysis and adjusted for:

GA SNAP II Score
 SGA (BW <10th centile for GA)

Outcome is attributed to the network hospital of first admission

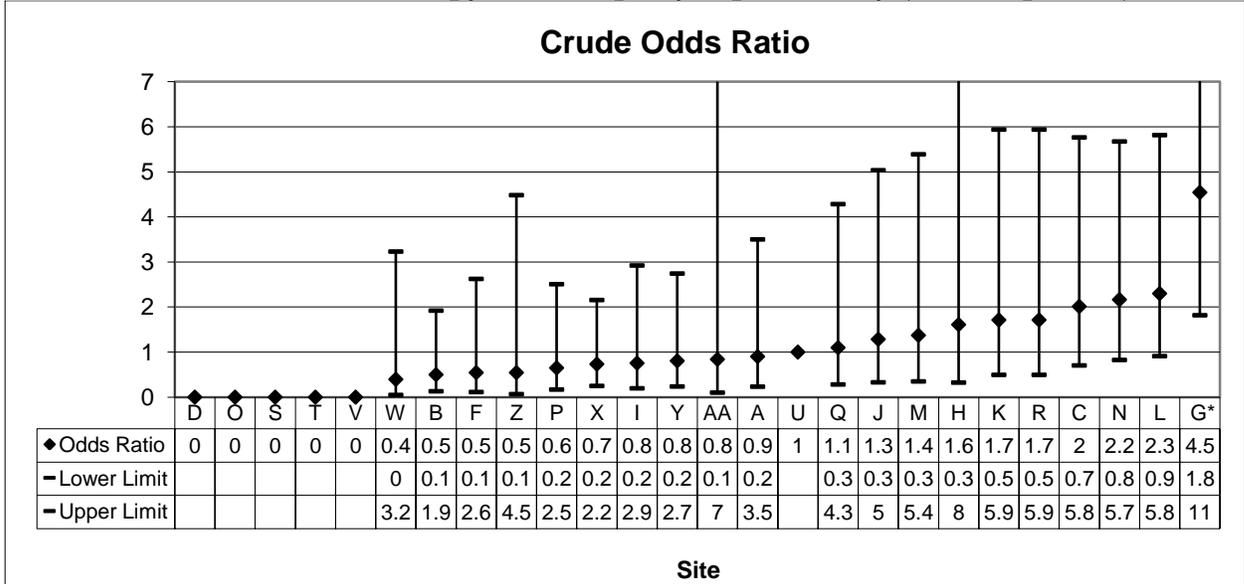
***Sites significantly different from reference site (P<0.05)**

All the neonates who meet the criteria in site D, O and S did not have retinopathy of prematurity stage 3 and higher (Odds Ratio: 0)

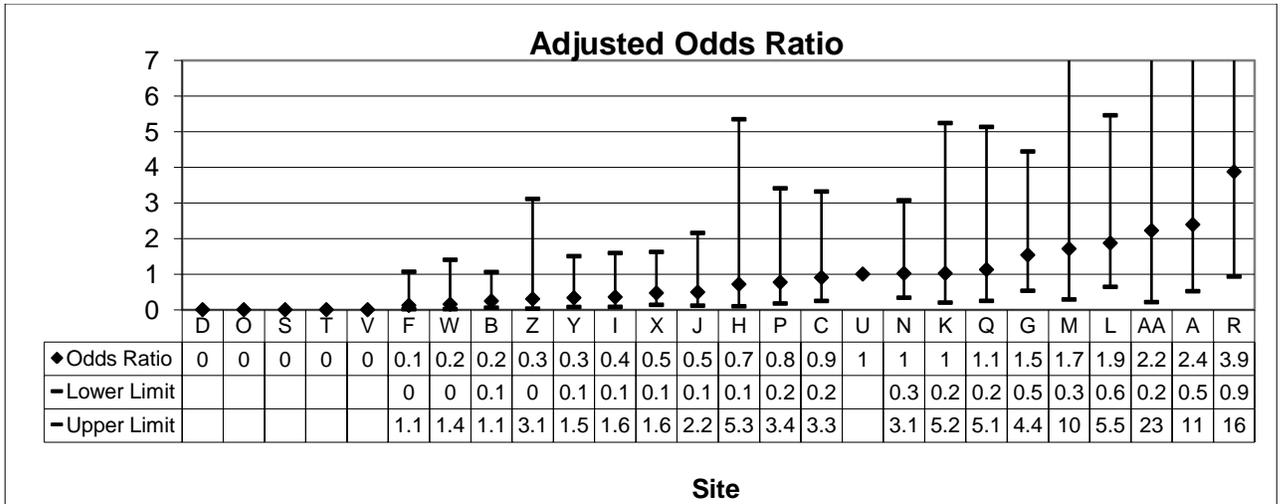
Site E has different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites, thus it is not included in this analysis

Presentation #52

Laser/Anti-VEGF blocker therapy for retinopathy of prematurity (site comparison)



Number of neonates: 1 703



Number of neonates: 1 635

Reference site: U

Inclusion criteria:

GA <33 weeks Screened for ROP
Age at admission less than 4 days

Outcome is attributed to the network hospital of first admission

All the neonates who meet the criteria in site D, O, S, T and V were not treated (Odds Ratio: 0) [No ROP grade 3 or higher in site D, O and S]

Significant predictors identified by multivariate analysis and adjusted for:

GA SNAP II Score
SGA (BW <10th centile for GA)

***Sites significantly different from reference site (P<0.05)**

Site E has different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites, thus it is not included in this analysis

Presentation 53a

Benchmarking for sites which contributed all eligible admission with GA < 33 weeks

Parameter / Site rank	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
	Lowest												Median												Highest	
According to total number of neonates																										
SNAPII-PE adjusted mortality rates (%)	M	S	T	V	Q	N	J	D	O	G	A	C	R	AA	H	L	P	B	Y	F	K	Z	W	X	U	I
Early onset sepsis rate (%)	O	Q	S	T	R	K	D	H	N	Z	W	M	A	V	G	C	F	X	AA	U	P	Y	I	L	B	J
Late onset sepsis rate (SNAPII-PE adjusted) (%)	O	D	S	AA	Q	G	H	A	F	R	K	W	T	P	V	Z	L	N	U	M	X	B	C	Y	I	J
Late onset sepsis /1000 patient days	O	D	S	Q	H	W	R	A	L	V	F	AA	P	K	X	U	B	T	M	N	G	Y	C	I	J	Z
Death or at least one of major morbidities (%)	D	O	S	R	Q	V	A	T	H	K	AA	M	W	C	N	Y	G	F	B	X	P	U	Z	L	I	J
Among neonates <33 weeks																										
Non-receipt of antenatal steroid (%)	U	B	J	Y	S	K	X	C	G	Q	I	M	V	F	AA	L	W	N	T	P	A	D	H	O	R	Z
Surgical ligation of PDA for neonates with PDA (%)	AA	D	O	S	L	M	J	H	N	X	G	V	B	P	K	Z	I	U	A	T	Q	F	W	C	Y	R
Stage 2 or 3 NEC (adjusted odds ratio) ¹	D	O	R	S	T	V	B	K	F	G	M	J	L	P	Y	Q	N	C	I	W	Z	X	AA	A	U	H
Stage 3-5 ROP (adjusted odds ratio) ²	D	O	S	F	Y	I	B	H	J	Z	W	P	M	T	C	G	N	U	X	L	Q	V	A	R	AA	K
Oxygen dependency at 36 wks (adjusted odds ratio) ³	R	V	K	B	D	Q	F	Y	J	O	W	M	S	T	A	N	AA	I	X	Z	U	C	L	H	P	G
VE or PEC (adjusted odds ratio) ⁴	R	V	K	P	J	Y	X	U	G	I	Q	N	W	A	B	L	H	F	T	O	S	D	C	AA	Z	M
Use of systemic steroids (%)	Z	O	S	D	AA	V	B	X	N	K	H	L	G	I	A	Q	F	M	P	Y	U	C	J	T	W	R
SNAPII-PE adjusted mortality for < 33 wks GA (%)	M	D	S	T	R	J	N	G	V	C	L	P	Q	F	B	A	K	AA	Y	H	I	U	Z	X	W	O
Death or at least one of major morbidities (%)	D	O	S	R	V	K	A	B	F	Q	AA	Y	W	N	L	H	U	I	C	T	X	P	G	M	Z	J
Among neonates < 1500g																										
Non-receipt of antenatal steroid (%)	S	B	J	U	Y	K	I	AA	C	Q	G	F	V	X	L	N	A	M	H	P	W	T	O	D	R	Z
Surgical ligation of PDA for neonates with PDA (%)	AA	D	O	S	L	J	N	M	H	X	B	Z	G	I	V	K	P	U	T	Q	W	A	F	Y	C	R
Stage 2 or 3 NEC (adjusted odds ratio) ¹	D	O	R	S	T	V	B	K	G	F	L	J	Y	M	Q	P	N	W	C	A	Z	I	X	U	AA	H
Stage 3-5 ROP (adjusted odds ratio) ²	D	O	S	F	Y	I	B	J	H	Z	W	P	M	T	C	G	N	U	X	L	V	Q	A	AA	R	K
Oxygen dependency at 36 wks (adjusted odds ratio) ³	R	V	Q	B	K	F	D	Y	J	T	W	M	O	A	S	AA	N	I	X	Z	U	C	L	P	H	G
VE or PEC (adjusted odds ratio) ⁴	O	R	V	K	U	J	Y	Q	P	X	N	G	I	B	A	W	F	L	T	H	C	E	D	S	Z	AA
Use of systemic steroids (%)	Z	AA	S	O	B	X	D	V	N	I	G	K	H	L	P	Q	F	U	M	J	Y	A	C	T	W	R
SNAPII-PE adjusted mortality for <1500g (%)	M	R	D	S	T	N	J	G	F	Q	C	V	L	P	Y	B	A	AA	K	H	I	Z	U	O	X	W
Death or at least one of major morbidities (%)	O	D	S	R	B	F	V	K	A	AA	Q	U	Y	X	P	N	I	T	L	W	H	Z	C	G	M	J

Presentation 53b

Benchmarking for sites which contributed all eligible admission with GA <29 weeks

Parameter / Site rank	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
	Lowest													Median										Highest			
According to number of neonates																											
Non-receipt of antenatal steroid (%)	B	J	M	U	K	AA	F	I	A	Y	V	S	G	N	H	L	X	C	T	Q	R	E†	W	P	D	O	Z
Surgical ligation of PDA for neonates with PDA (%)	AA	D	O	S	L	N	J	M	H	X	I	B	G	V	K	Z	P	U	F	Q	T	W	C	Y	A	R	E†
Stage 2 or 3 NEC (adjusted odds ratio) ¹	D	O	R	S	T	V	B	L	G	F	Z	AA	K	J	W	Y	M	Q	P	I	N	A	C	U	X	H	E†
Stage 3-5 ROP (adjusted odds ratio) ²	D	O	S	V	F	Y	B	I	H	J	Z	W	P	M	C	T	G	N	AA	X	U	Q	L	A	R	K	E†
Oxygen dependency at 36 wks (adjusted odds ratio) ³	R	V	B	D	K	F	Q	Y	T	M	W	J	AA	A	S	O	Z	N	C	I	U	X	L	P	G	H	E†
VE or PEC (adjusted odds ratio) ⁴	E†	O	R	K	V	Y	U	Q	J	P	G	X	I	B	L	F	T	N	H	W	A	Z	M	C	S	D	AA
Use of systemic steroids (%)	Z	B	AA	S	O	N	X	V	I	J	K	D	G	H	L	P	M	F	Q	U	Y	C	A	W	T	E†	R
SNAPII-PE adjusted mortality (%)	E†	M	R	D	S	T	J	N	G	V	F	Q	C	P	L	B	Y	O	A	K	H	AA	I	Z	W	U	X
Death or at least one of major morbidities (%)	R	B	V	E†	O	F	S	D	J	K	Q	P	I	A	Y	W	U	Z	H	M	N	L	AA	G	X	C	T

†The criteria for entering neonates in the CNN dataset for Site E is not the same and thus, may not be comparable with other sites.

*Site Z is not included in the VE or PEC benchmarking due to data acquisition problem at this site.

Variables adjusted for (selected based on univariate association and varied with outcomes)

¹ Stage 2 or 3 NEC – GA

² Stage 3-5 ROP – GA, SNAP II Score, SGA (BW <10th centile for GA)

³ Oxygen dependency at 36 wks – GA, Apgar at 5 minutes, SNAP-II Score, SGA (BW <10th centile for GA)

⁴ VE or PEC – GA: Cesarean section, Apgar at 5 minutes, SNAP-II Score, Outborn

F. Discharge Disposition and Status

Presentation #54

Discharge destination

		GA (completed weeks)								Total
		< 25	25-26	27-28	29-30	31-32	33-34	35-36	≥37	
Home	N	46	226	268	352	538	1 010	1 113	2 545	6 098
	%	18.1	37.5	35.3	32.3	36.7	50.0	55.1	51.6	46.4
Community hospital	N	44	188	384	620	761	743	336	421	3 497
	%	17.3	31.2	50.6	56.8	51.9	36.8	16.6	8.5	26.6
Tertiary hospital	N	15	50	24	31	45	40	56	223	484
	%	5.9	8.3	3.2	2.8	3.1	2.0	2.8	4.5	3.7
Died	N	115	97	39	30	27	21	29	84	442
	%	45.3	16.1	5.1	2.8	1.8	1.0	1.4	1.7	3.4
Palliative care (home/other institute)	N	1	1	1	4	4	2	2	12	27
	%	0.4	0.2	0.1	0.4	0.3	0.1	0.1	0.2	0.2
Another inpatient area in hospital	N	24	38	41	48	89	201	483	1 650	2 574
	%	9.5	6.3	5.4	4.4	6.1	10.0	23.9	33.4	19.6
Out of country discharge	N	1	1	2	1	2	2	0	0	9
	%	0.4	0.2	0.3	0.1	0.1	0.1	0.0	0.0	0.1
Moribund	N	8	2	0	5	0	0	0	1	16
	%	3.2	0.3	0.0	0.5	0.0	0.0	0.0	0.0	0.1
Total included	N	254	603	759	1 091	1 466	2 019	2 019	4 936	13 147
	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
GA Missing	N									4
Total	N									13 151

Presentation #55

Support at discharge

		GA (completed weeks)								Total
		< 25	25-26	27-28	29-30	31-32	33-34	35-36	≥37	
Total available	N	246	601	759	1088	1466	2019	2019	4935	13133
Oxygen	N	77	172	145	86	39	30	51	165	765
	%	31.3	28.6	19.1	7.9	2.7	1.5	2.5	3.3	5.8
Monitor	N	76	251	398	589	751	750	485	1065	4365
	%	30.9	41.8	52.4	54.1	51.2	37.2	24.0	21.6	33.2
Enterostomy	N	7	7	11	4	6	9	6	24	74
	%	2.9	1.2	1.5	0.4	0.4	0.5	0.3	0.5	0.6
Gavage	N	62	206	355	569	707	595	297	428	3219
	%	25.2	34.3	46.8	52.3	48.2	29.5	14.7	8.7	24.5
Tracheostomy	N	1	2	1	0	3	1	2	4	14
	%	0.4	0.3	0.1	0.0	0.2	0.1	0.1	0.1	0.1
Gastrostomy	N	3	3	6	0	3	5	7	19	46
	%	1.2	0.5	0.8	0.0	0.2	0.3	0.4	0.4	0.4
Ventilation	N	9	25	11	9	13	6	14	96	183
	%	3.7	4.2	1.5	0.8	0.9	0.3	0.7	2.0	1.4
CPAP	N	5	17	24	18	12	13	7	13	109
	%	2.0	2.8	3.2	1.7	0.8	0.6	0.4	0.3	0.8
Breast milk only	N	40	182	295	410	515	615	574	1529	4160
	%	16.3	30.3	38.9	37.7	35.1	30.5	28.4	31.0	31.7
Formula milk only	N	43	133	167	224	322	458	511	1048	2906
	%	17.5	22.1	22.0	20.6	22.0	22.7	25.3	21.2	22.1
Both breast and formula milk	N	38	152	218	357	502	784	752	1714	4517
	%	15.5	25.3	28.7	32.8	34.2	38.8	37.3	34.7	34.4
Missing	N									18
Total available	N	246	601	759	1088	1466	2019	2019	4935	13133
Total	N									13151

G. Duration of Support & Length of Stay

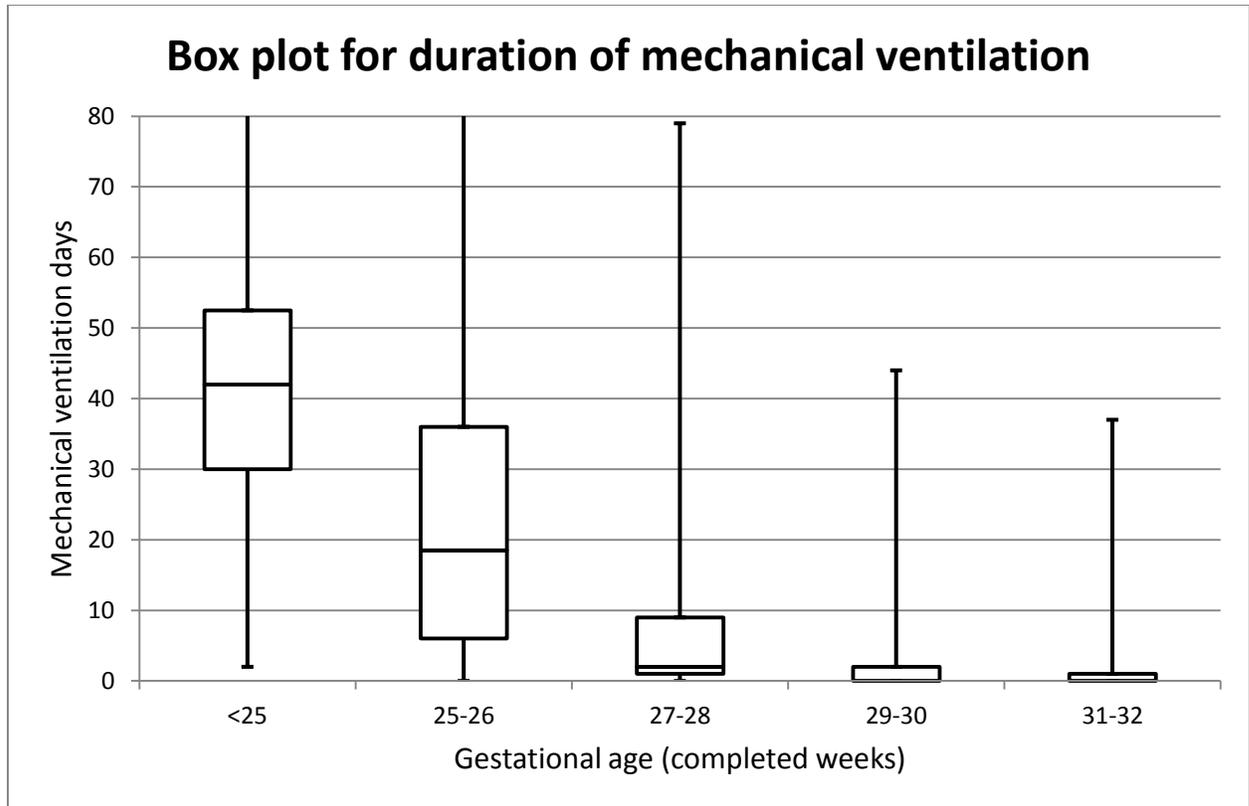
Analyses based on number of neonates with GA < 33 and discharged home from network hospitals (excluding major congenital anomalies). This includes 1 370 eligible neonates.

Out of total 4 173 neonates whose GA < 33, 1 430 neonates were discharged home. Out of those 1 430 neonates who were discharged home, 1 370 neonates did not have any major congenital anomalies.

For presentations #58, #63 and #65, analyses are based on the number of neonates whose GA < 29 (including all discharge destinations and excluding major congenital anomalies). This includes 1 542 neonates.

Presentation #56

Duration of invasive mechanical ventilation* for neonates with GA < 33 and discharged home from network hospitals (excluding congenital anomalies)**



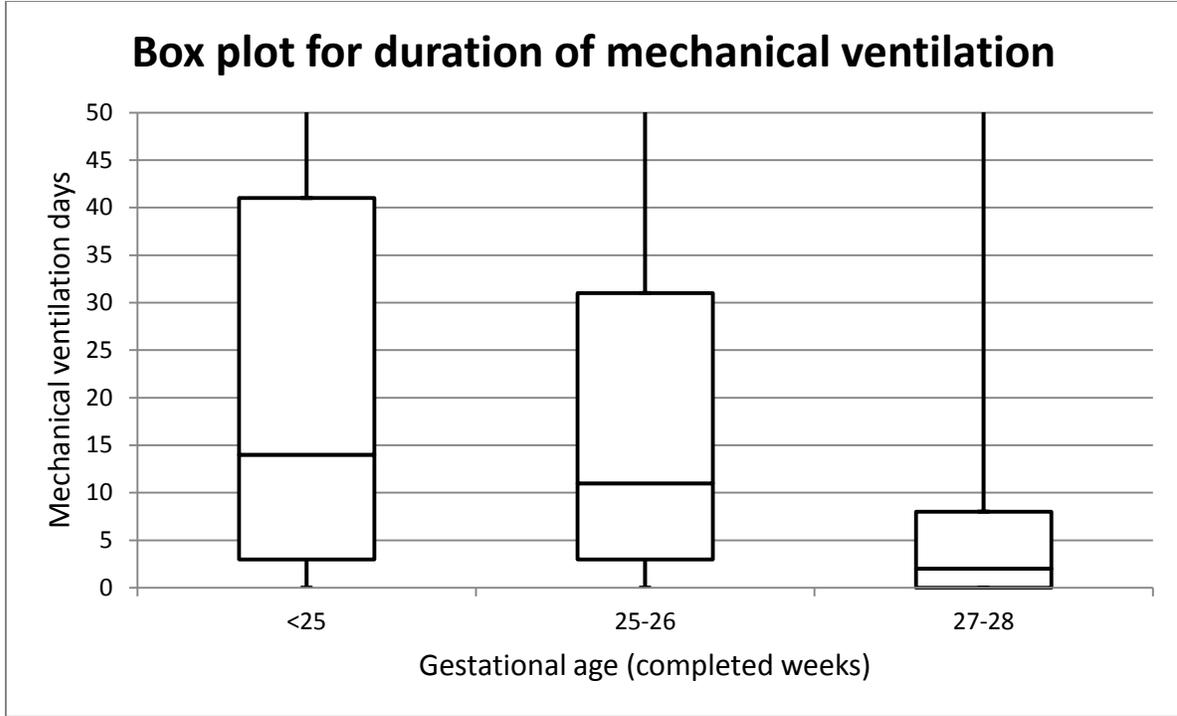
GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1 st Quartile	Median	3 rd Quartile	Max
<25	44	41.3	2.7	2	30	42	52.5	80
25-26	216	24.5	1.5	0	6	18.5	36	111
27-28	251	7.7	0.7	0	1	2	9	78
29-30	342	2.4	0.3	0	0	0	2	43
31-32	517	0.9	0.1	0	0	0	1	36
Total included	1370	7.5	0.4	0	0	1	6	111

*Invasive mechanical ventilation = any of HFV or IPPV

**Data shown apply to neonates discharged home from network hospitals (data for neonates transferred to other hospitals are presently unavailable)

Presentation #57

Duration of invasive mechanical ventilation* for neonates with GA < 29
(including all discharge destinations and excluding congenital anomalies)

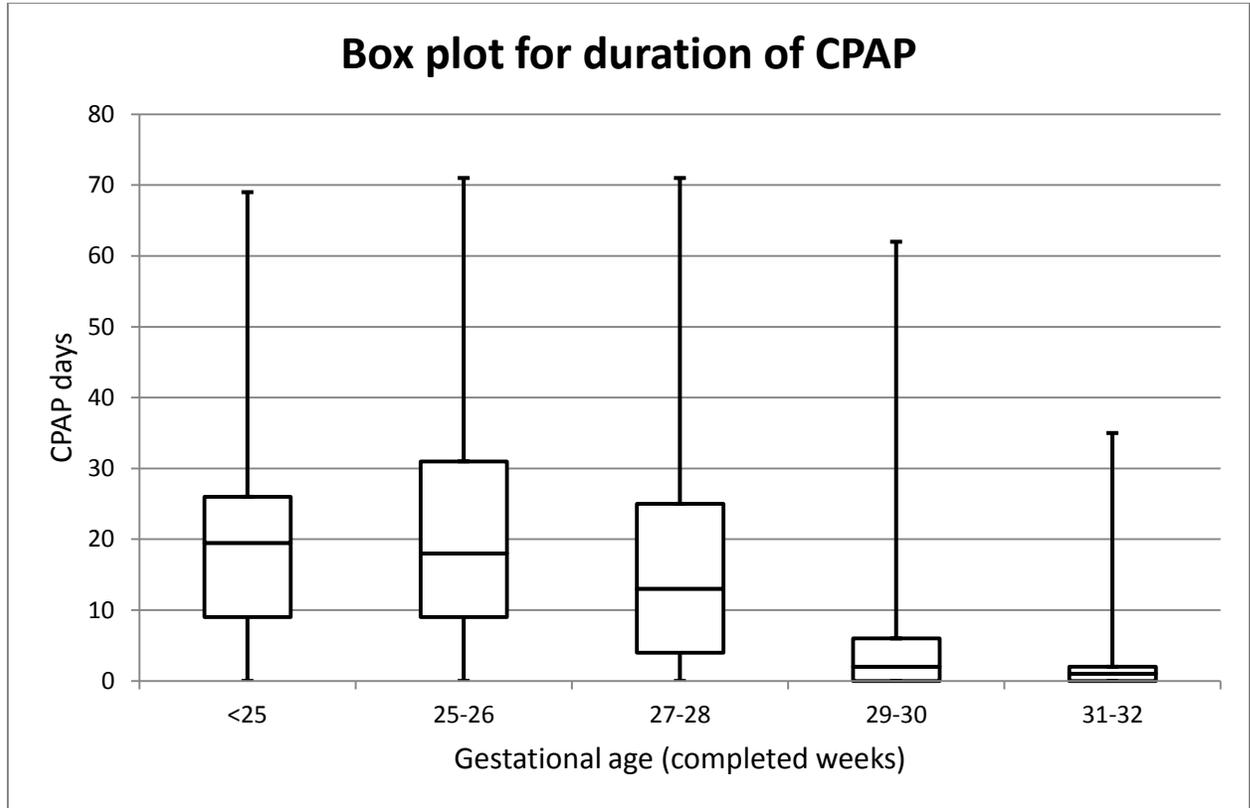


GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1 st Quartile	Median	3 rd Quartile	Max
<25	242	24.9	1.7	0	3	14	41	128
25-26	575	20.4	1.0	0	3	11	31	227
27-28	725	7.4	0.5	0	0	2	8	117
Total included	1542	15.0	0.6	0	1	5	22	227

*Invasive mechanical ventilation = any of HFV or IPPV

Presentation #58

Duration of CPAP for neonates with GA < 33 and discharged home from network hospitals
(excluding congenital anomalies)*

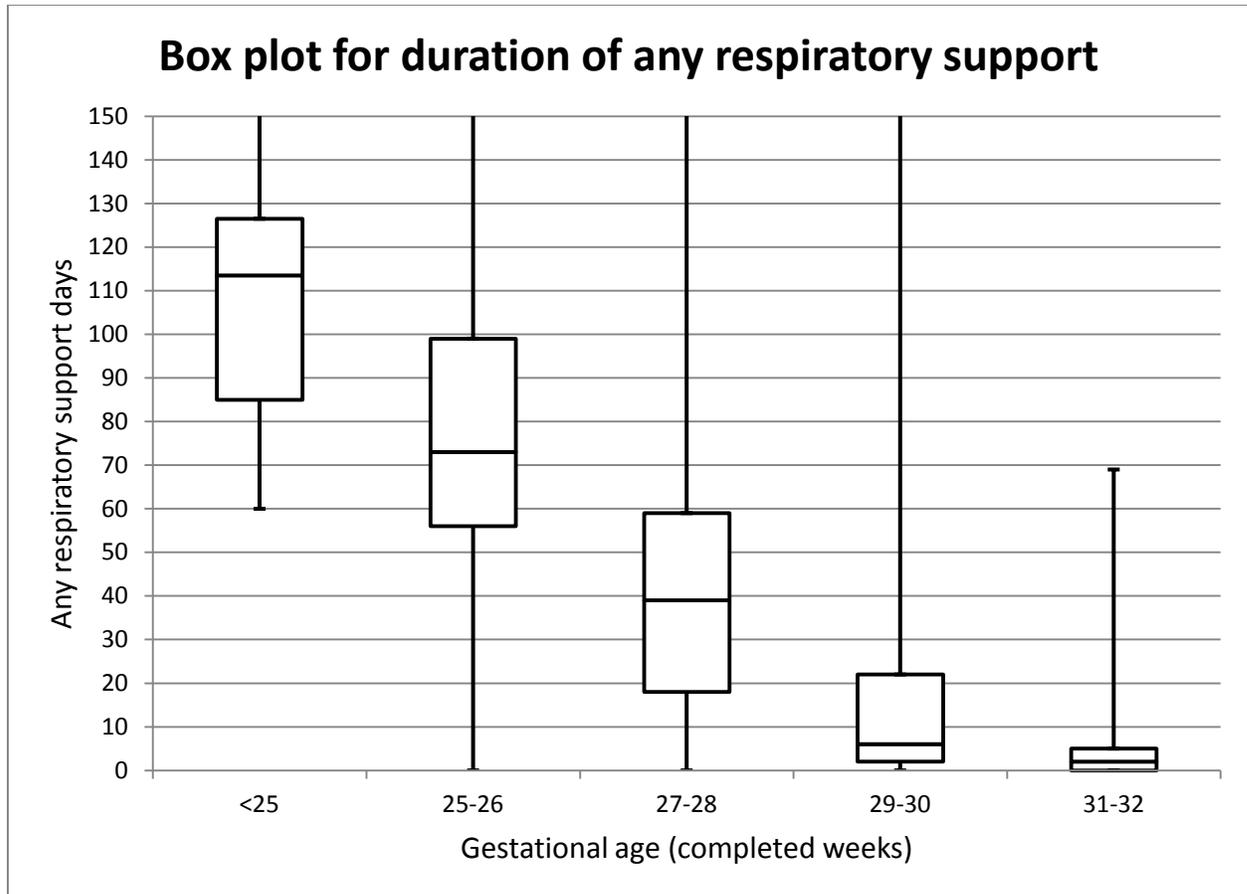


GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1 st Quartile	Median	3 rd Quartile	Max
<25	44	20.5	2.3	0	9	19.5	26	68
25-26	216	21.1	1.1	0	9	18	31	70
27-28	251	16.4	0.9	0	4	13	25	70
29-30	342	5.5	0.5	0	0	2	6	61
31-32	517	1.7	0.2	0	0	1	2	34
Total included	1370	9.0	0.4	0	0	3	13	70

*Data shown apply to neonates discharged home from network hospitals (data for neonates transferred to other hospitals are presently unavailable)

Presentation #59

Duration of any respiratory support* for neonates with GA < 33 and discharged home from network hospitals (excluding congenital anomalies)**



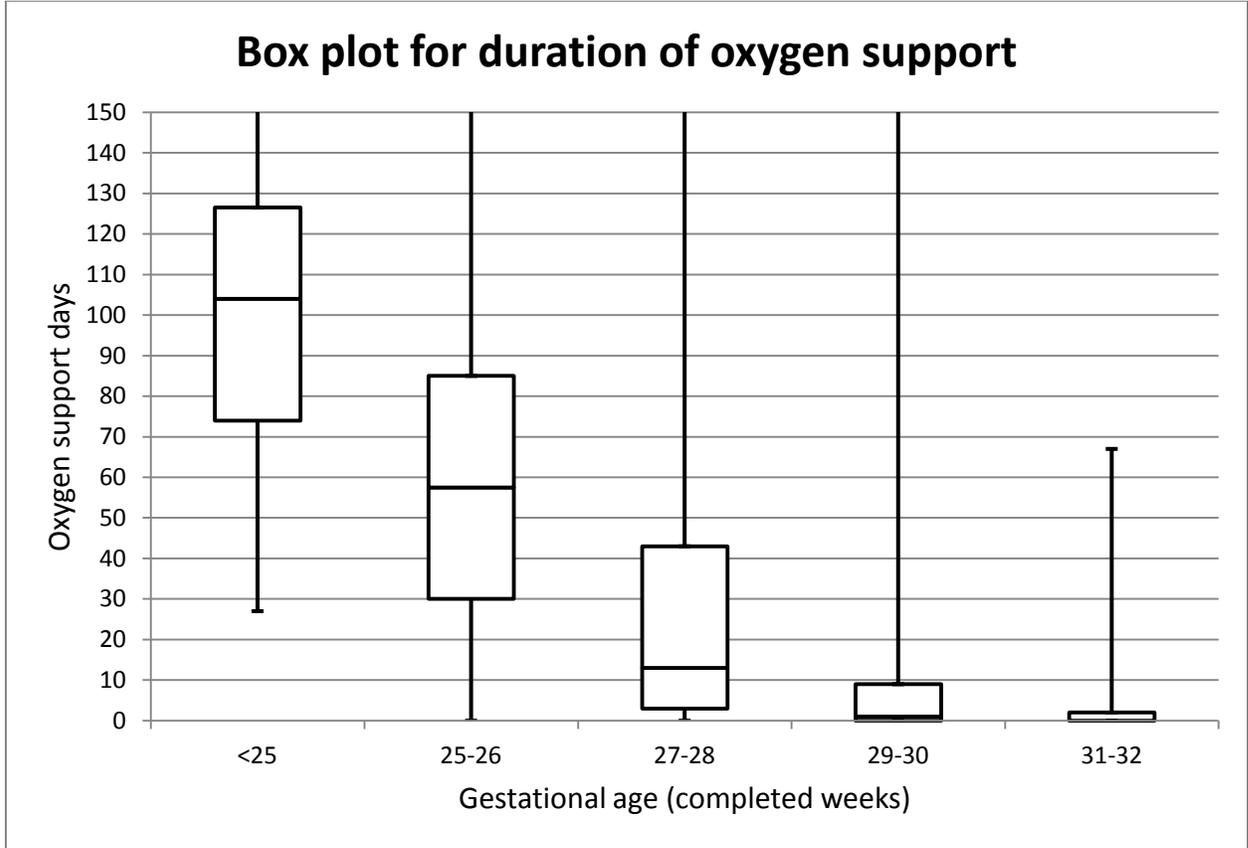
GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1 st Quartile	Median	3 rd Quartile	Max
<25	44	112.1	5.1	60	85	113.5	126.5	236
25-26	216	77.5	2.4	0	56	73	99	284
27-28	251	42.0	1.9	0	18	39	59	163
29-30	342	16.5	1.2	0	2	6	22	186
31-32	517	4.9	0.4	0	0	2	5	67
Total included	1370	29.5	1.0	0	2	9	50	284

*Any respiratory support = any of HFV, IPPV, NI ventilation, CPAP, High flow or Oxygen

**Data shown apply to neonates discharged home from network hospitals (data for neonates transferred to other hospitals are presently unavailable)

Presentation #60

Duration of oxygen support for neonates with GA < 33 and discharged home from network hospitals (excluding congenital anomalies)*

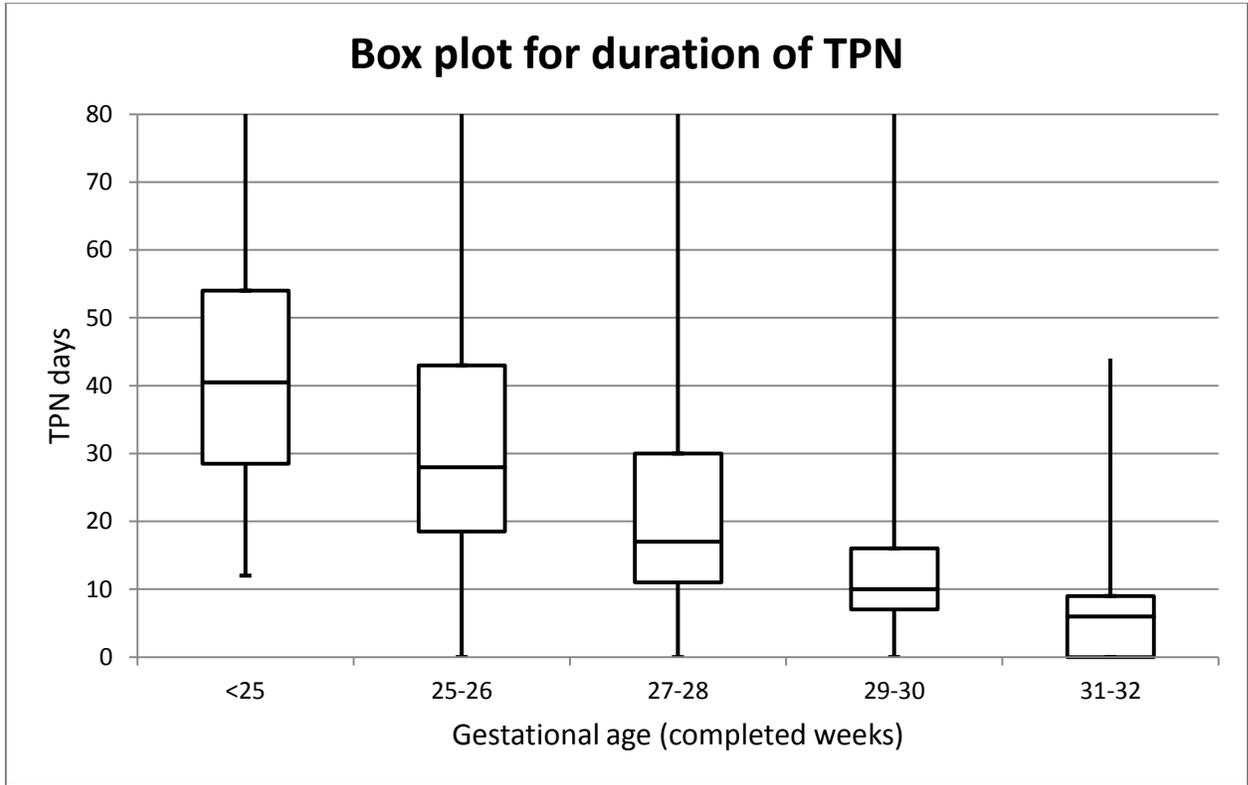


GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1 st Quartile	Median	3 rd Quartile	Max
<25	44	103.2	6.3	27	74	104	126.5	236
25-26	216	61.5	2.8	0	30	57.5	85	284
27-28	251	26.7	2.0	0	3	13	43	160
29-30	342	10.3	1.1	0	0	1	9	186
31-32	517	3.0	0.4	0	0	0	2	67
Total included	1370	21.6	1.0	0	0	3	30	284

*Data shown apply to neonates discharged home from network hospitals (data for neonates transferred to other hospitals are presently unavailable)

Presentation #61

Duration of TPN for neonates with GA < 33 and discharged home from network hospitals
(excluding congenital anomalies)*

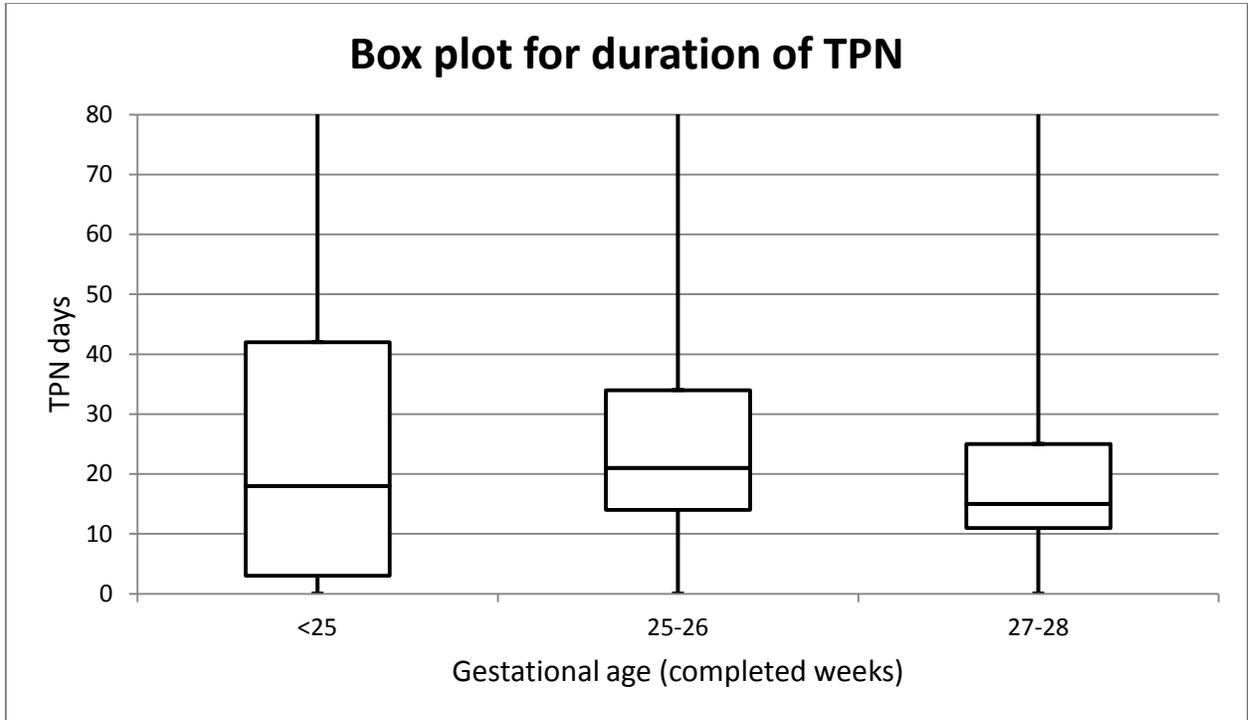


GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1 st Quartile	Median	3 rd Quartile	Max
<25	44	41.2	2.9	12	28.5	40.5	54	104
25-26	216	32.1	1.3	0	18.5	28	43	108
27-28	251	23.3	1.4	0	11	17	30	211
29-30	342	12.9	0.6	0	7	10	16	85
31-32	517	7.0	0.3	0	0	6	9	44
Total included	1370	16.5	0.5	0	6	11	23	211

*Data shown apply to neonates discharged home from network hospitals (data for neonates transferred to other hospitals are presently unavailable)

Presentation #62

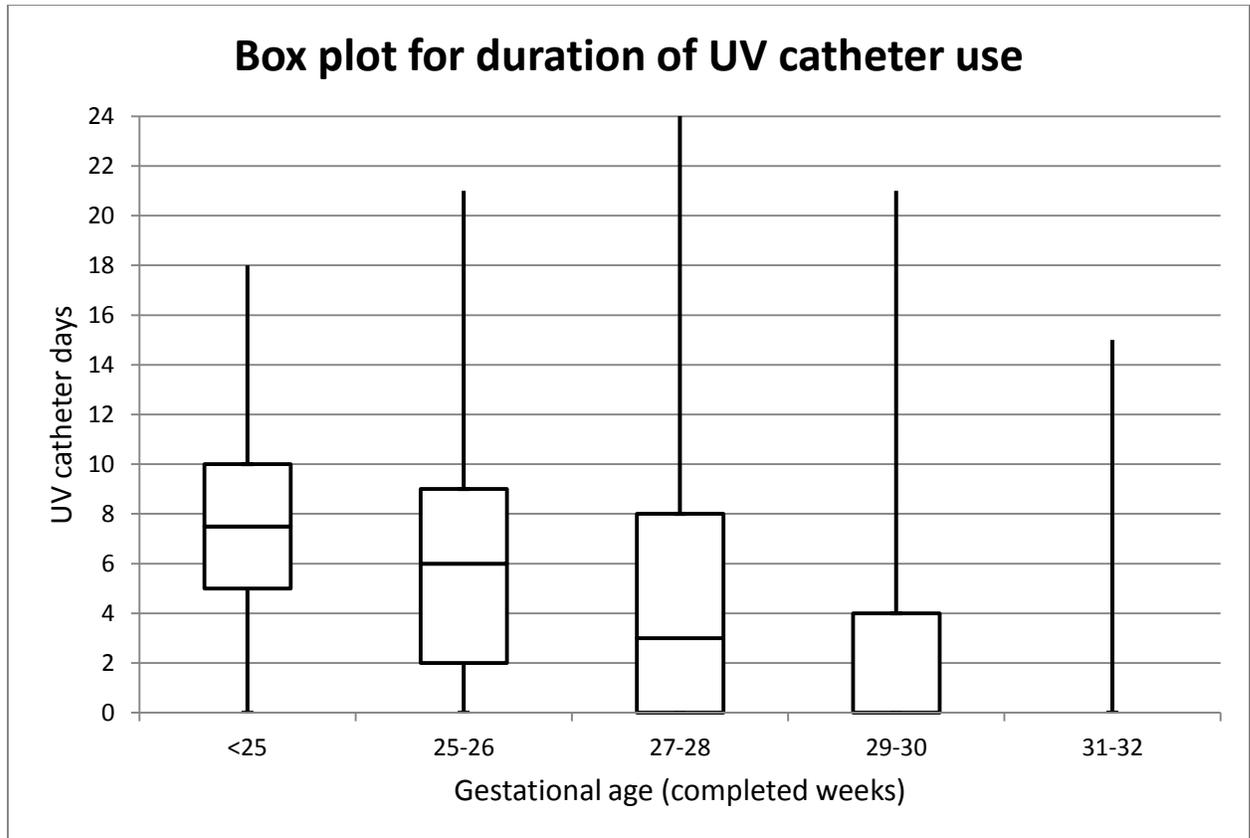
Duration of TPN for neonates with GA < 29
(including all discharge destinations and excluding congenital anomalies)



GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1 st Quartile	Median	3 rd Quartile	Max
<25	242	26.8	1.8	0	3	18	42	136
25-26	575	26.8	0.9	0	14	21	34	252
27-28	725	20.8	0.8	0	11	15	25	211
Total included	1542	24.0	0.6	0	11	18	30	252

Presentation #63

Duration of UV catheter use for neonates with GA < 33 and discharged home from network hospitals (excluding congenital anomalies)*

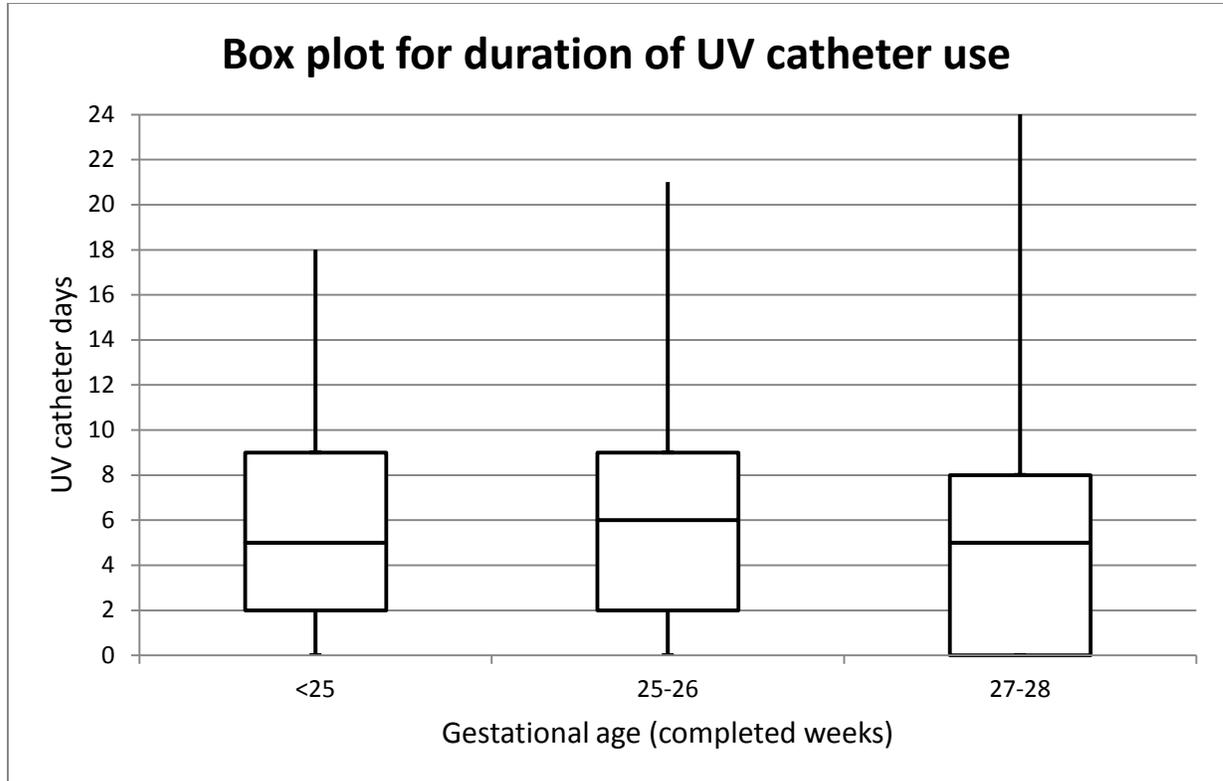


GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1 st Quartile	Median	3 rd Quartile	Max
<25	44	7.7	0.6	0	5	7.5	10	18
25-26	216	6.0	0.3	0	2	6	9	21
27-28	251	4.0	0.3	0	0	3	8	26
29-30	342	2.2	0.2	0	0	0	4	21
31-32	517	1.0	0.1	0	0	0	0	15
Total included	1370	2.8	0.1	0	0	0	6	26

*Data shown apply to neonates discharged home from network hospitals (data for neonates transferred to other hospitals are presently unavailable)

Presentation #64

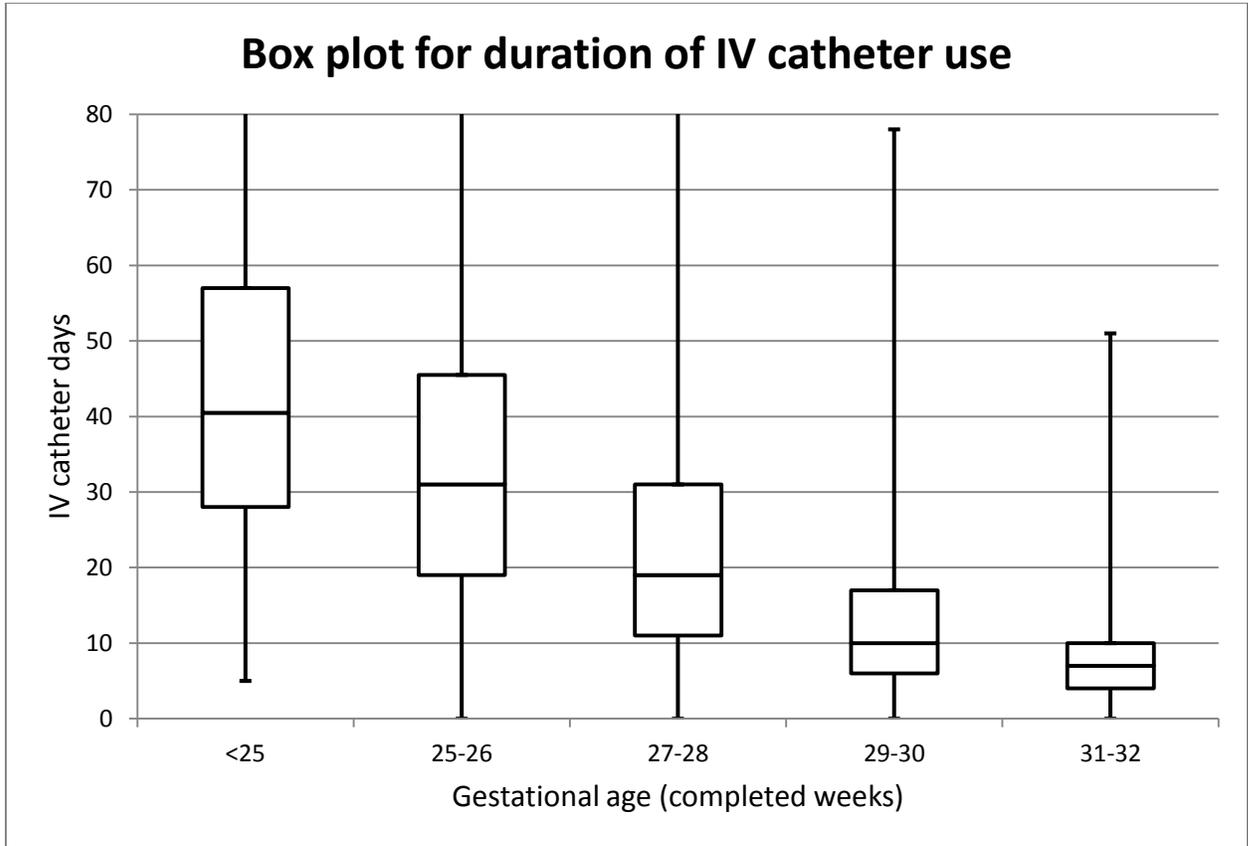
Duration of UV catheter use for neonates with GA < 29
(including all discharge destinations and excluding congenital anomalies)



GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1 st Quartile	Median	3 rd Quartile	Max
<25	242	5.7	0.3	0	2	5	9	18
25-26	574	5.7	0.2	0	2	6	9	21
27-28	725	4.9	0.2	0	0	5	8	26
Total included	1541	5.3	0.1	0	1	5	9	26

Presentation #65

Duration of IV catheter* use for neonates with GA < 33 and discharged home from network hospitals (excluding congenital anomalies)**



GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1 st Quartile	Median	3 rd Quartile	Max
<25	44	44.0	3.0	5	28	40.5	57	111
25-26	216	34.0	1.5	0	19	31	45.5	126
27-28	251	24.4	1.5	0	11	19	31	221
29-30	342	13.2	0.6	0	6	10	17	78
31-32	517	8.1	0.3	0	4	7	10	45
Total included	1370	17.6	0.5	0	6	11	25	221

*IV catheter = any of Surgical CVL, PICC, or PIV

**Data shown apply to neonates discharged home from network hospitals (data for neonates transferred to other hospitals are presently unavailable)

Presentation #66

Length of stay for neonates with GA < 33 and discharged home from network hospitals
(excluding congenital anomalies)*



GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1 st Quartile	Median	3 rd Quartile	Max
<25	44	132.7	3.8	95	115	128	143	236
25-26	216	101.6	2.0	9	89	100	116	284
27-28	251	80.3	1.7	3	64	77	93	263
29-30	342	54.1	1.0	7	42	51	62	186
31-32	517	34.8	0.6	5	25	33	41	104
Total included	1370	61.6	0.9	3	35	53	83	284

*Data shown apply to neonates discharged home from network hospitals (data for neonates transferred to other hospitals are presently unavailable)

H. Hypoxic Ischemic Encephalopathy

Presentation #67

Hypoxic Ischemic Encephalopathy

		HIE				
		Stage 3	Stage 2	Stage 1	Unknown stage	Total
Hypothermia treatment	Yes	51	73	34	1	159
	No	26	41	85	26	178
	Unknown	3	2	3	2	10
Total		80	116	122	29	347

Reason for no hypothermia treatment*

Reason	Number
Chromosomal anomalies	4
Major congenital anomalies	4
Weight < 2000g or GA < 35 weeks	21
Extreme condition	8
Head trauma or intracranial hemorrhage	3
Mild HIE	75
Unit policy	17
Health care team preference	11
Delayed transfer	12
Parental request	2
Unknown	32

*One neonate can have more than one reason

Presentation #67 (continued)

Hypoxic Ischemic Encephalopathy

For neonates who received hypothermia (N=159)

Characteristics	N		Results
Method	159	Selective head	3 (2%)
		Whole body cooling	156 (98%)
Target temperature	159	< 33 ⁰ C	2 (1%)
		33-34 ⁰ C	125 (79%)
		33.5-34.5 ⁰ C	22 (14%)
		34-35 ⁰ C	1 (1%)
		34.5-35.5 ⁰ C	2 (1%)
		Unknown	7 (4%)
Seizures at initiation	159		58 (36%)
Seizures at completion	159		25 (16%)
Side effects during hypothermia	151	Hypotension	64 (42%)
	150	Thrombocytopenia	32 (21%)
	151	Coagulaopathy	44 (29%)
	143	Persistent metabolic acidosis	30 (21%)
Death	159		36 (23%)

Encephalopathy stage		At the start of hypothermia				Total
		Stage 1	Stage 2	Stage 3	Unknown	
At the end of hypothermia	Stage 1	16	34	2	0	52
	Stage 2	1	31	11	0	43
	Stage 3	2	9	23	1	35
	Unknown	3	7	4	9	23
	Total	22	81	40	10	153

Presentation #67 (continued)

Hypoxic Ischemic Encephalopathy
For neonates who received hypothermia (N=159)

Characteristics		N	Mean	SD	Min	1 st Q	Median	3 rd Q	Max	Outside of recommendation	Time taken to achieve target
Timing* of hypothermia (in hours)	Initiation	155	3.6	3.2	0.0	1.2	2.8	5.1	16.2	After 6 hours 29 (19%)	
	Target temp achieved	147	6.4	4.5	0.8	3.3	4.8	8.4	22.9	After 10 hours 25 (17%)	After 4 hours of initiation 31 (21%)
	Age at rewarming	153	63.7	23.2	2.7	53.4	74.2	77.6	103.5	After 78 hours 33 (22%)	Rewarming started >72 hours after initiation 21 (14%)
	Age at return of temp to normal	130	81.3	25.5	3.8	81.3	85.5	92.4	134.3	After 86 hours 62 (48%)	Took >8 hours to return temperature to normal after starting rewarming 87 (67%)
Temperature during hypothermia	Lowest temp during hypothermia	158	32.5	1.1	25.1	32.2	32.8	33.1	35.8	Lowest temp < 32.5C 51 (32%)	
	Highest temp during hypothermia	158	34.3	0.8	32.0	33.8	34.1	34.6	36.6	Highest temp > 35.5C 14 (9%)	

*All timing calculated from time of birth

I. Trend Analyses over last 3 years

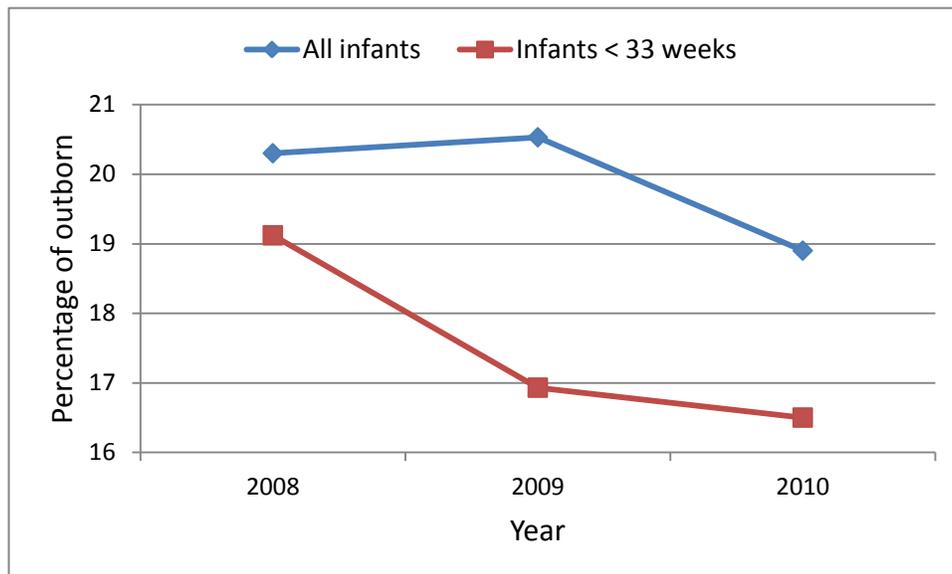
This section includes trend analyses in the last 3 years (2008-10) for specific outcomes for neonates <33 weeks GA admitted to network hospitals. The number of neonates included in these analyses is described in the following table for reference.

Number of neonates by admission year and GA

Year	GA									
	23	24	25	26	27	28	29	30	31	32
2008	64	174	255	281	355	427	501	614	692	888
2009	68	172	284	280	358	407	478	578	662	832
2010	82	172	270	333	388	371	480	611	678	788

1. Neonates in the participating hospitals: Admission status:

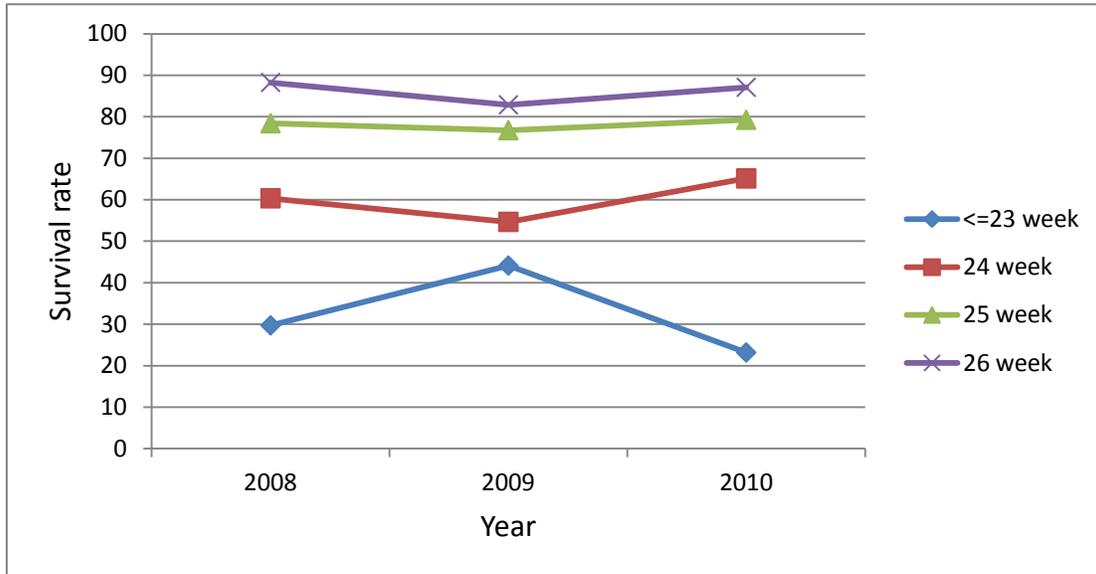
Year	Number of Hospitals	Total Number of Neonates*	Inborn	% (row)	Outborn	% (row)
2008	26	13 881	11050	79.7%	2815	20.3%
2009	26	13 109	10364	79.5%	2678	20.5%
2010	27	13 147	10662	81.1%	2485	18.9%



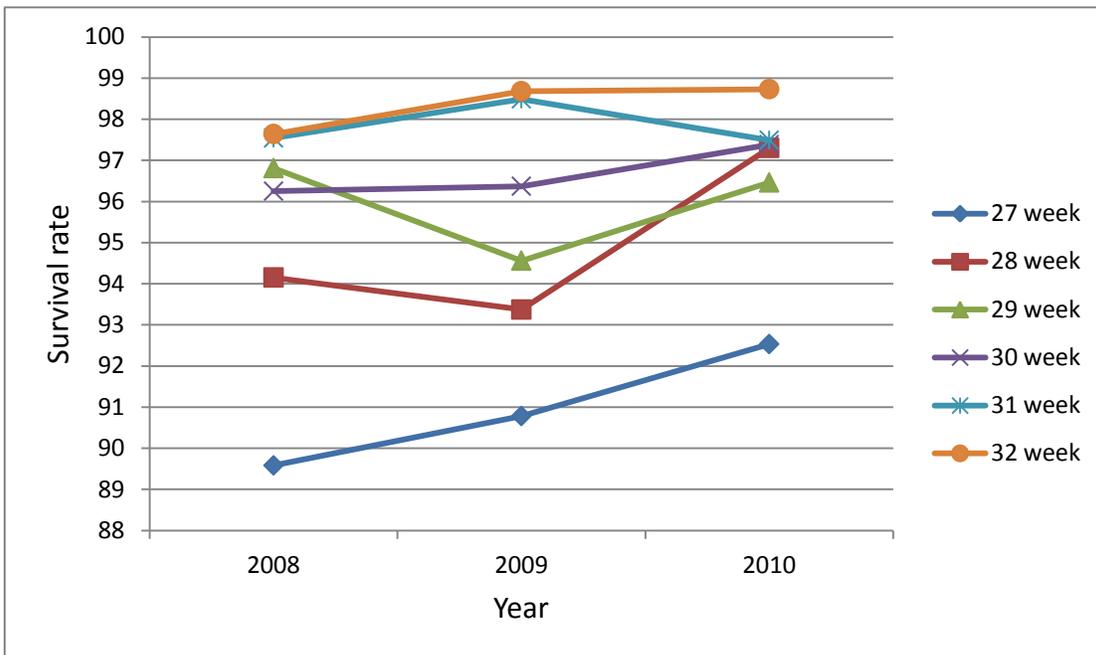
*total number of neonates excluding those who are missing admission status

2. Survival rate:

a. 23-26 weeks:

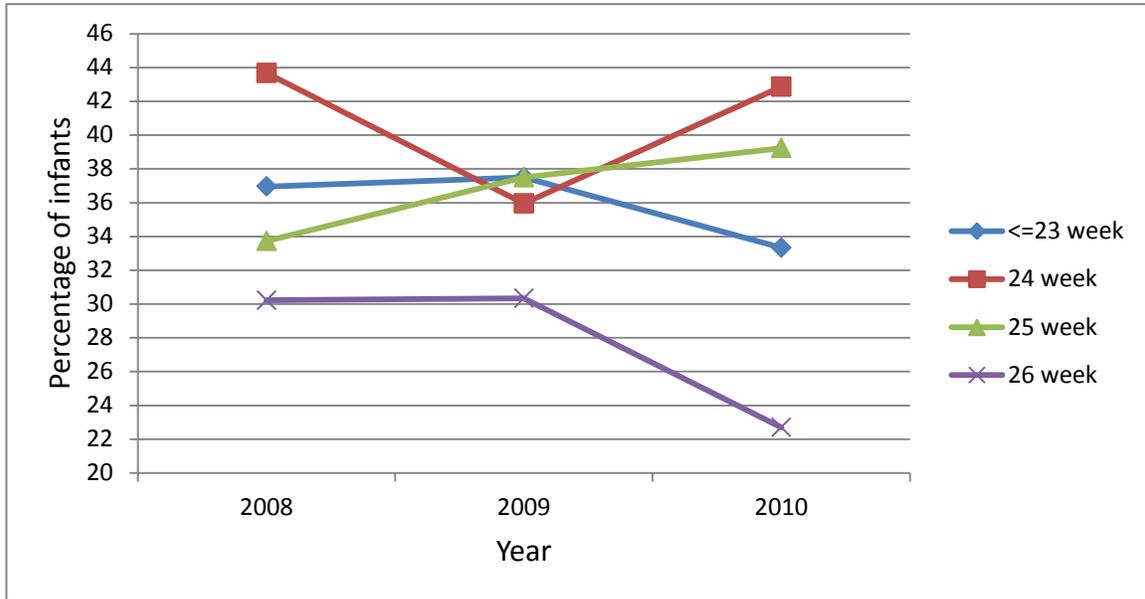


b. 27-32 weeks:

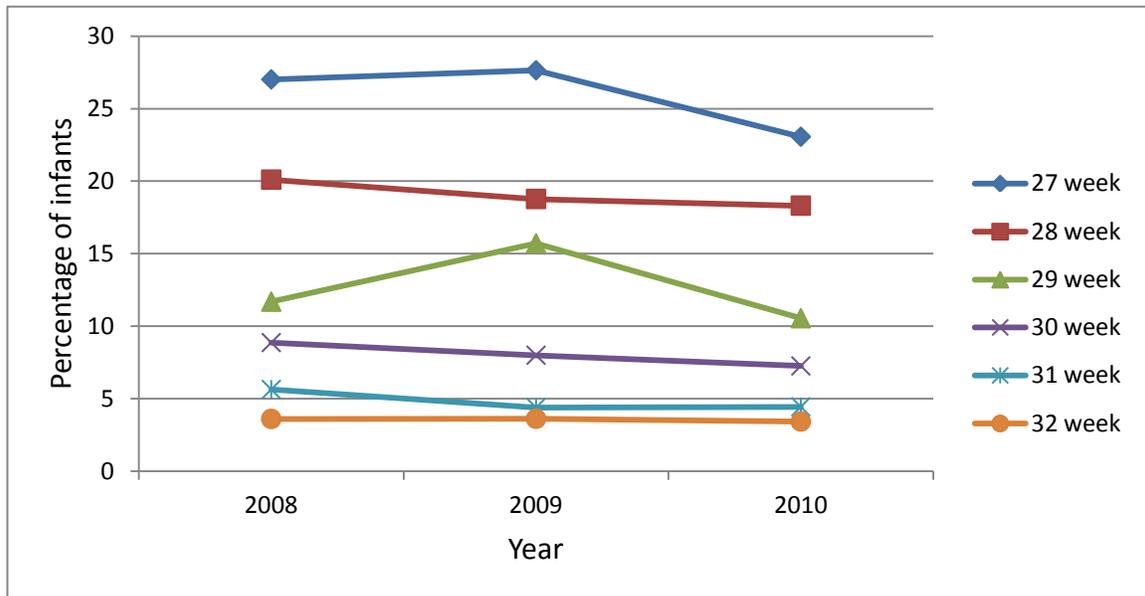


3. Late onset sepsis (with at least one infection) among neonates who survived beyond 2 days after birth

a. 23-26 weeks:

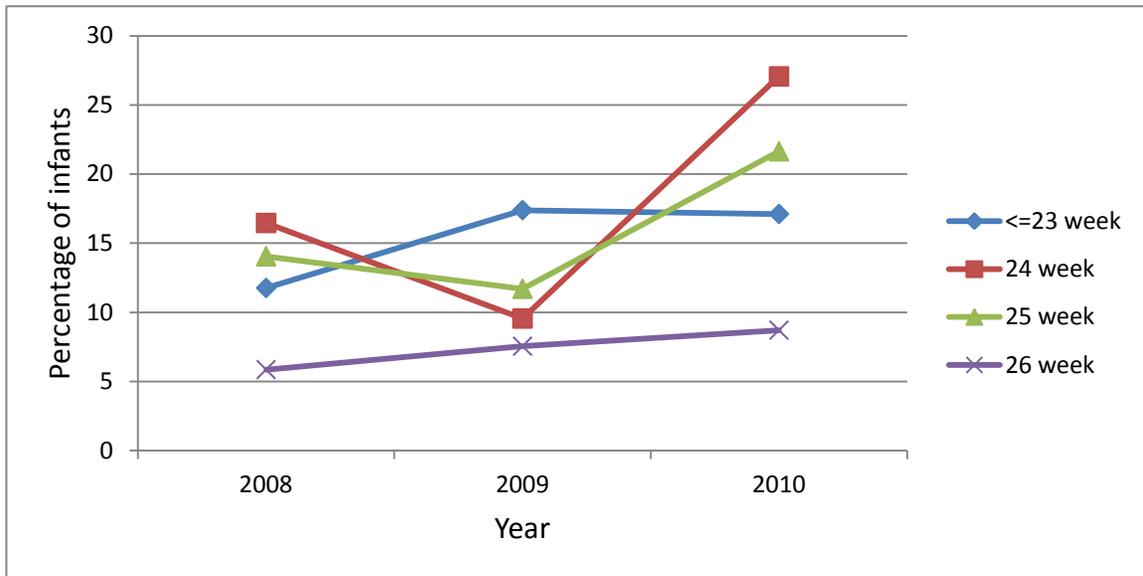


b. 27-32 weeks:

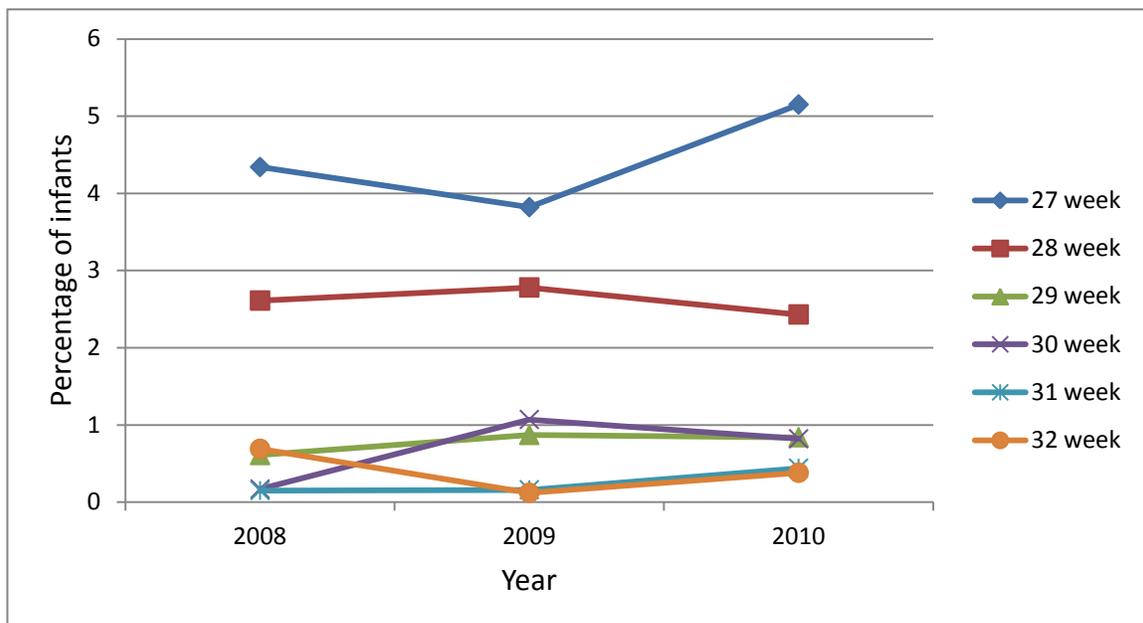


4. Surgical duct ligation for PDA

a. 23-26 weeks:

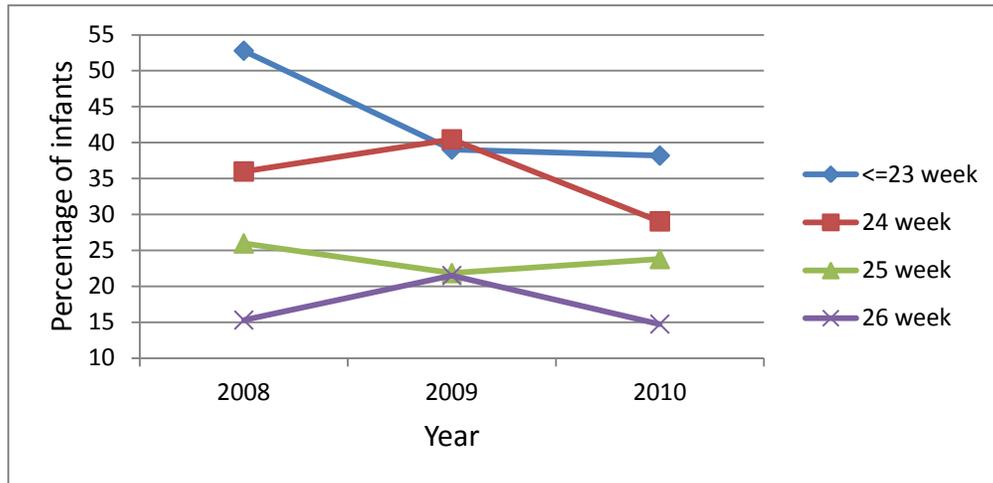


b. 27-32 weeks:

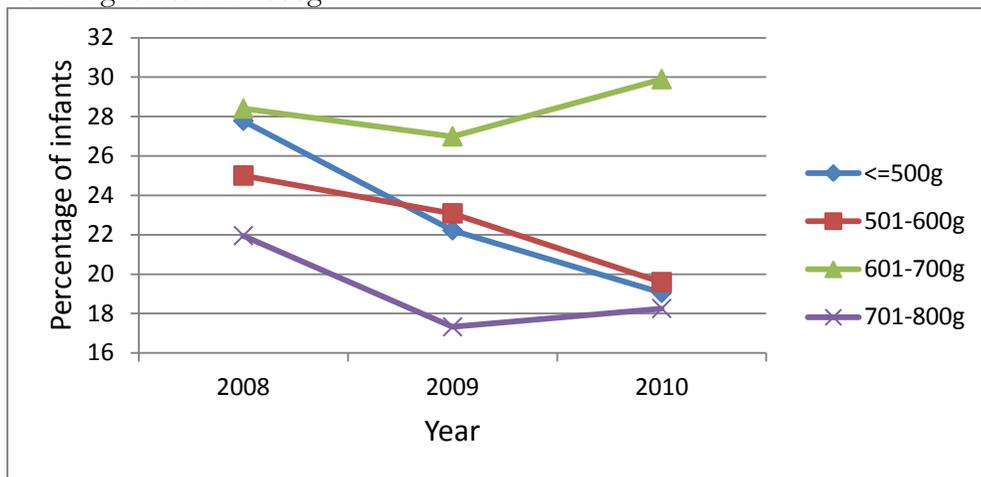


5. Ventricular enlargement: (among neonates who received ultrasound exams)

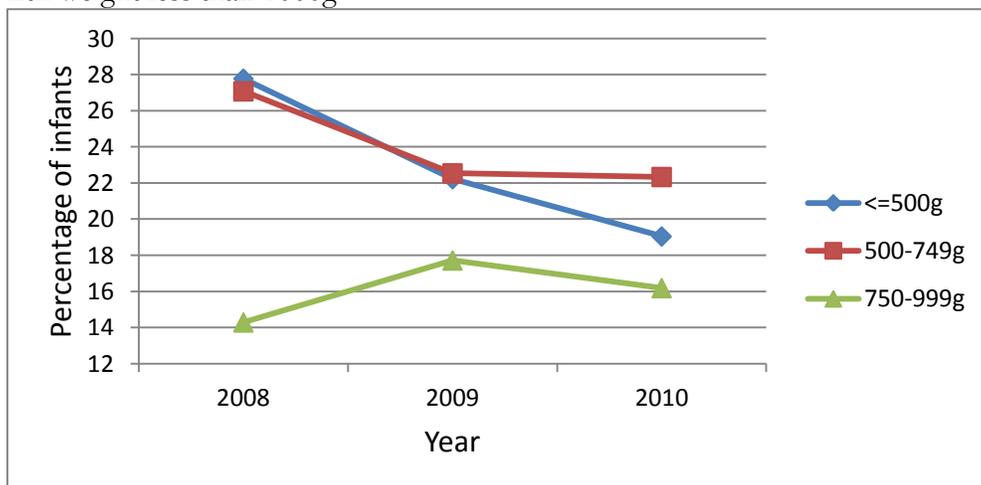
a. 23-26 weeks:



b_1. Birth weight less than 800g:

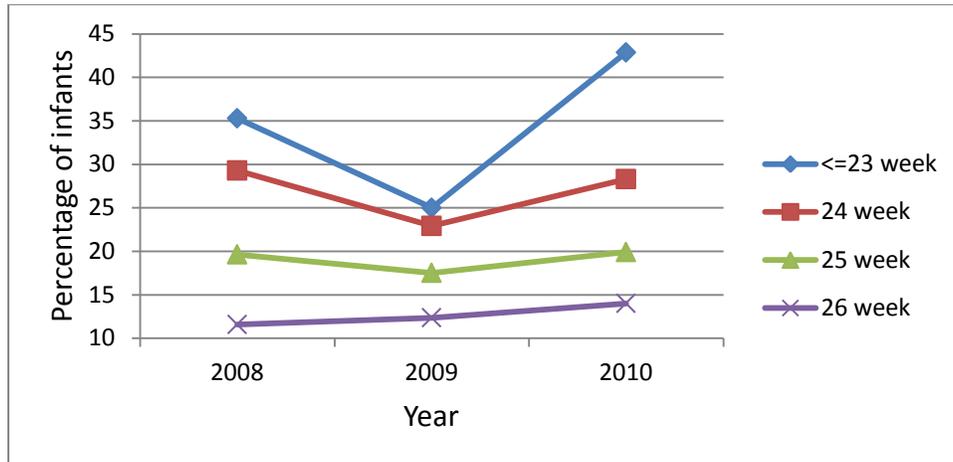


b_2. Birth weight less than 1000g

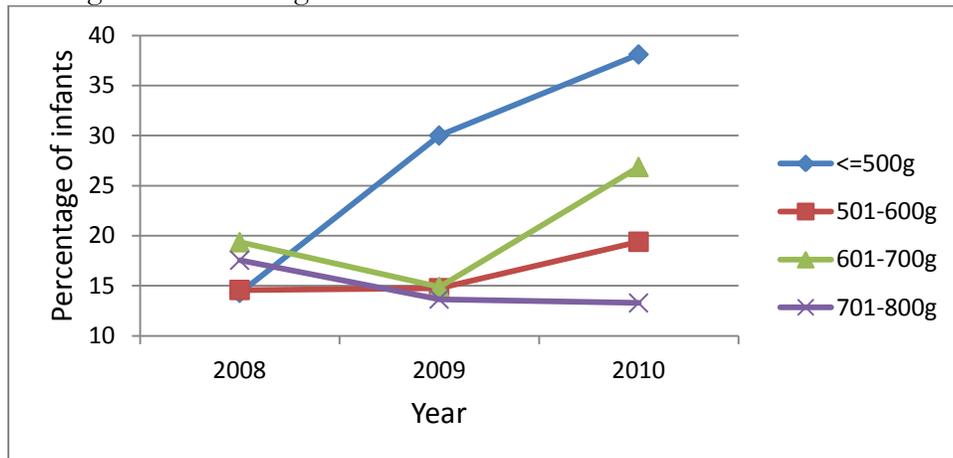


6. Parenchymal echogenicity: (among neonates who received ultrasound exams)

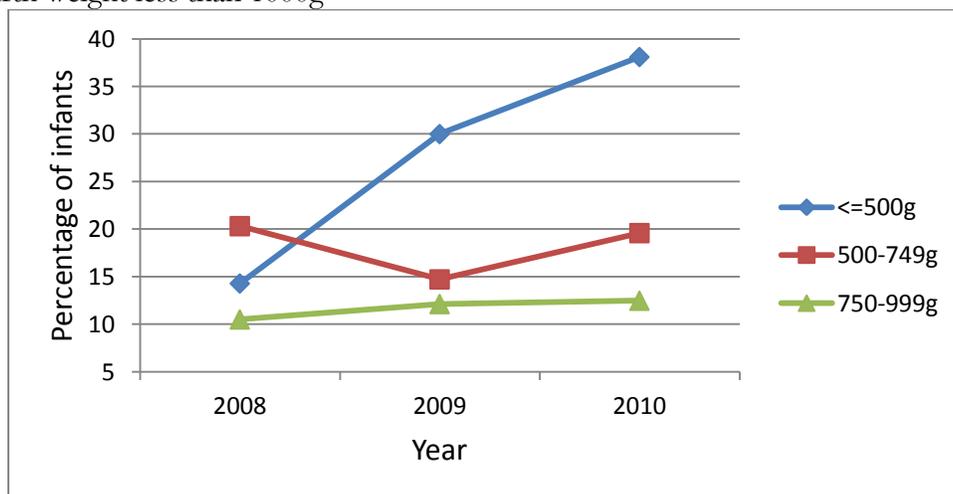
a. 23-26 weeks:



b_1. Birth weight less than 800g:

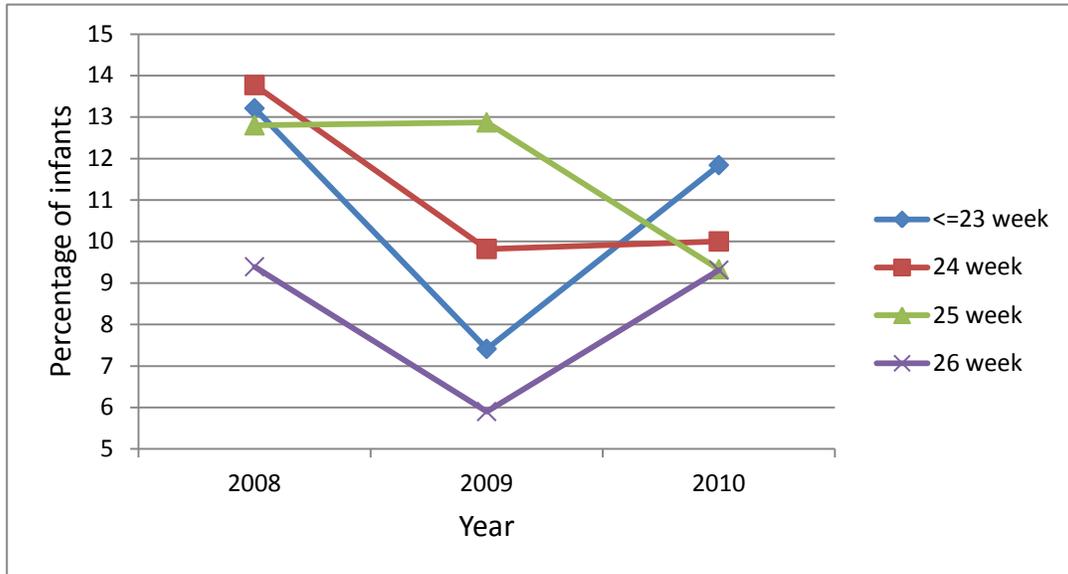


b_2. Birth weight less than 1000g

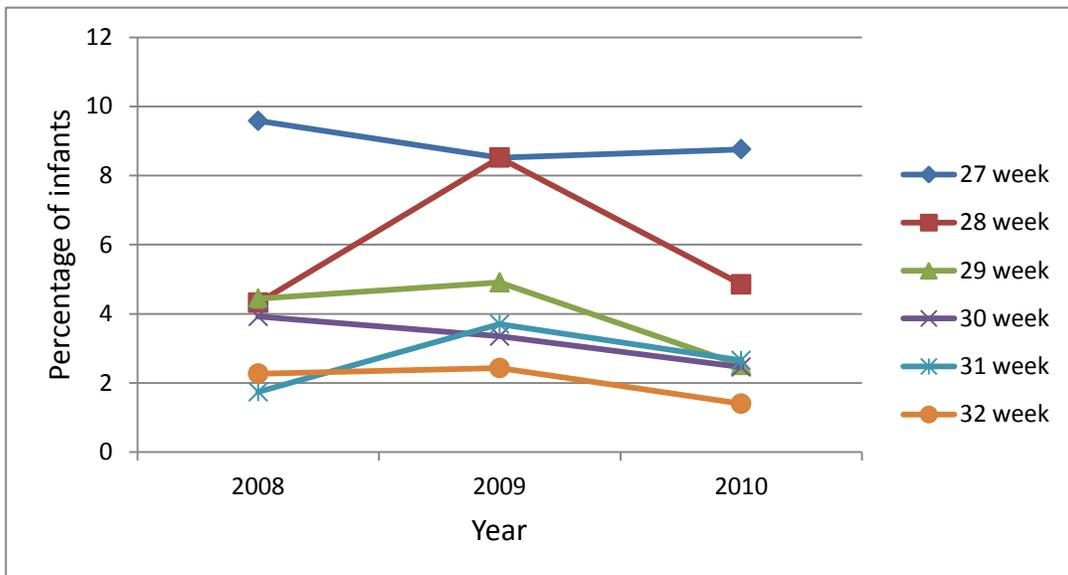


7. NEC:

a. 23-26 weeks:

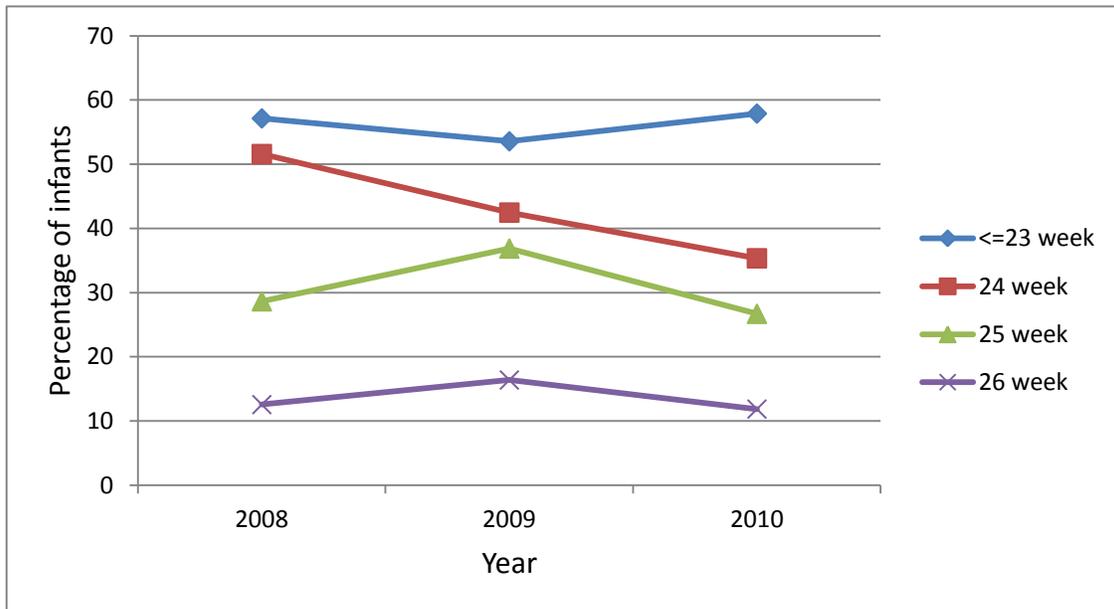


b. 27-32 weeks:

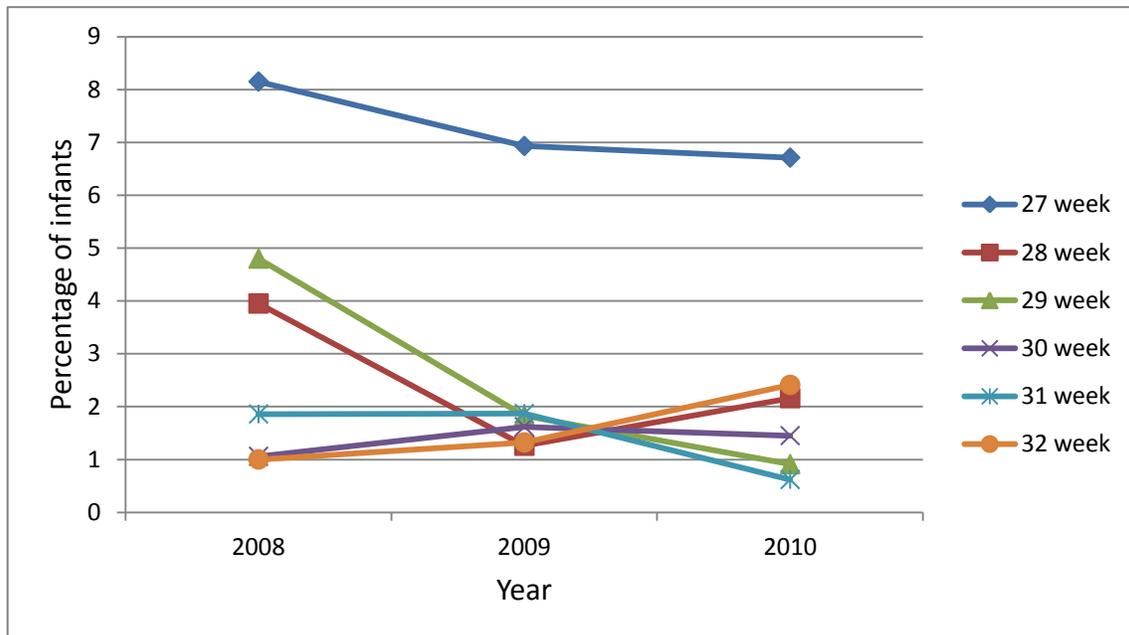


8. Stage 3, 4 and 5 ROP: (among neonates who received eye exams)

a. 23-26 weeks:

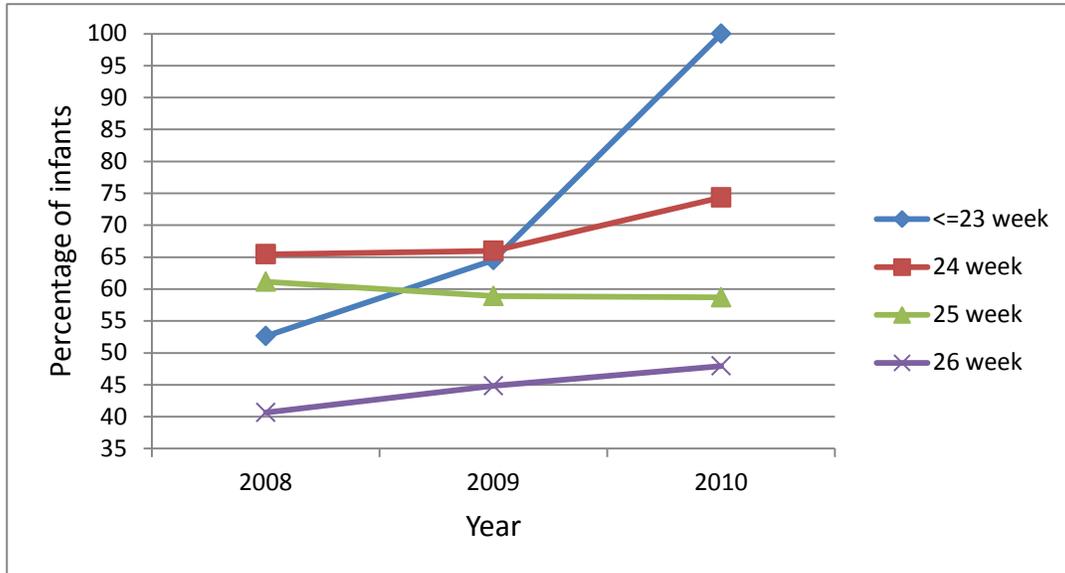


b. 27-32 weeks:

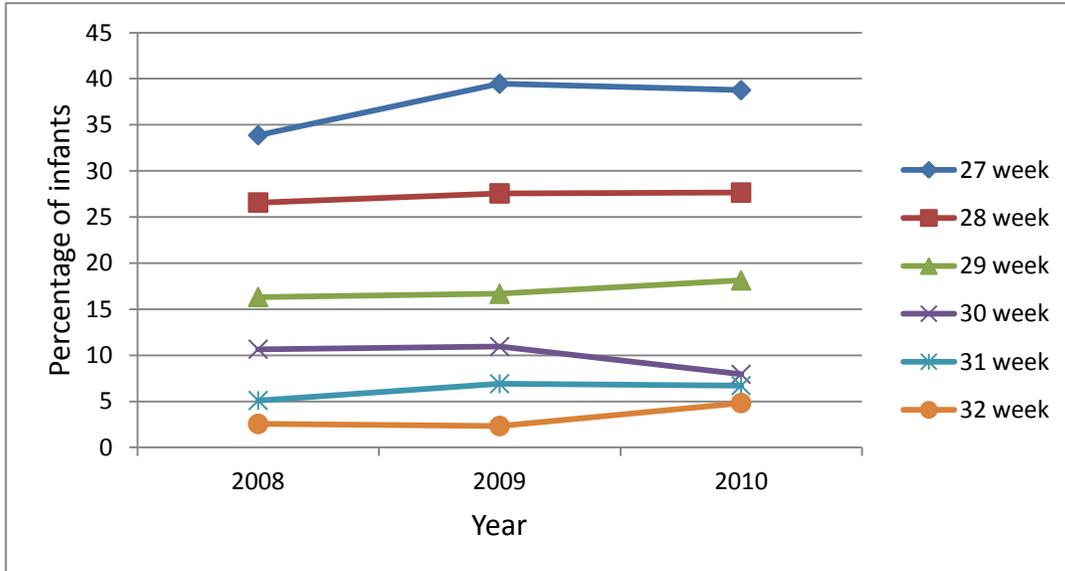


9. Oxygen dependency at 36 weeks (among neonates who survived beyond 36 weeks PMA):

a. 23-26 weeks:

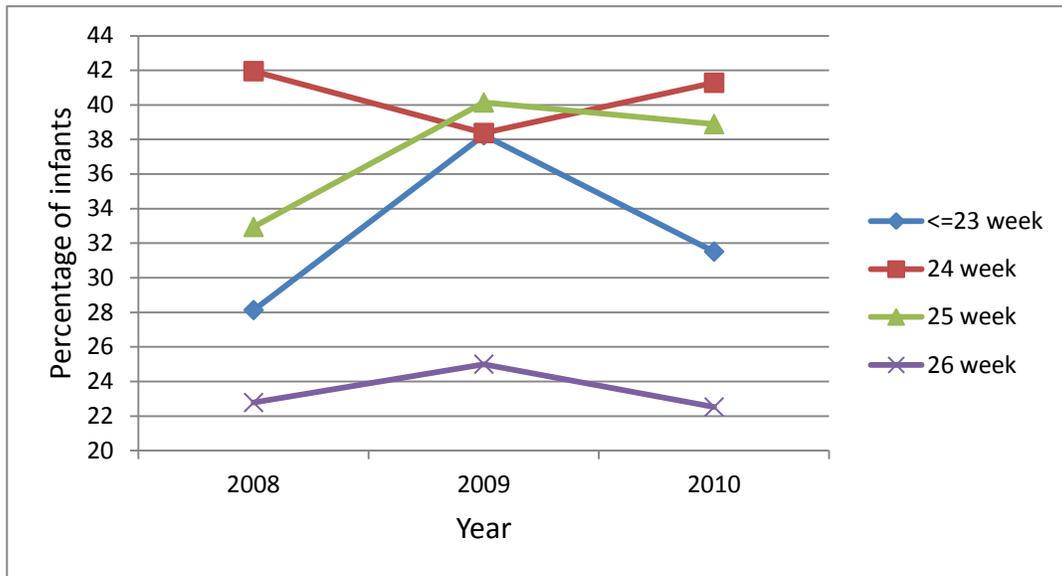


b. 27-32 weeks:

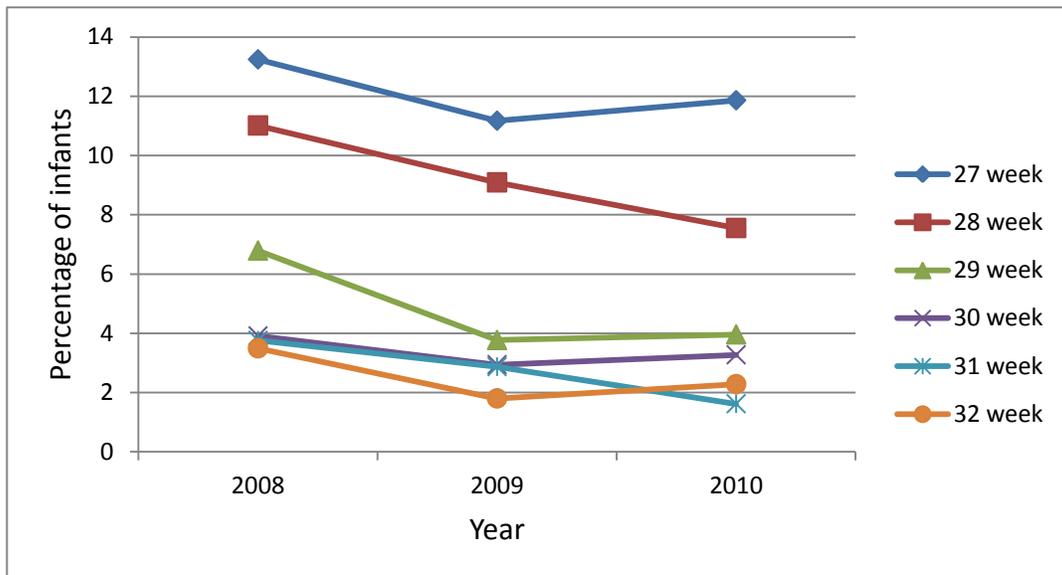


10. Systemic steroids use

a. 23-26 weeks:



b. 27-32 weeks:



J. Conclusions

The Canadian Neonatal Network™ was established in 1995. The number of NICUs participating in the national database has continued to increase, now with 27 sites participating in data collection for this report. As of November 2011, there are 30 centers participating across the country.

The data demonstrate continuing variations in risk-adjusted outcomes and practices, and provide benchmarking information for Canadian NICUs. Individual hospitals have the opportunity to review their outcomes and launch strategies to make improvements to the care provided.

CNN researchers continue to utilize the database and produce many publications that will have significant impact on neonatal care and policy in Canada and internationally. With the participation of additional NICUs for 2011, we anticipate that the CNN will strive to produce NICU population-based data on outcomes and practices, and apply quality improvement strategies.

K. Future Plans

- ❖ **Database Improvements:** Major changes have taken place to improve data collection for the CNN database.

After taking into consideration the input from abstractors and the database review committee, certain variables have been improved, deleted, or added to the database to incorporate changing needs from health care providers, policy makers, researchers and other potential users.

Future objectives include:

- To continue to report on population-based information and follow-up of all infants in a standardized manner by capturing information from hospitals to which infants are transferred.
 - To enhance the data management capabilities on both the data server and client applications to facilitate individual hospital analyses of their own data.
 - To provide multiple options in data capture and management to meet the unique needs of individual sites.
 - To improve the functionalities of the CNN portal
-
- ❖ **Expansion of Collaborative Efforts:** The CNN is in the process of establishing collaborative ties with other Neonatal Networks around the world. Results from our network will be compared to those from international networks and potential areas for change/improvement will be sought.

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