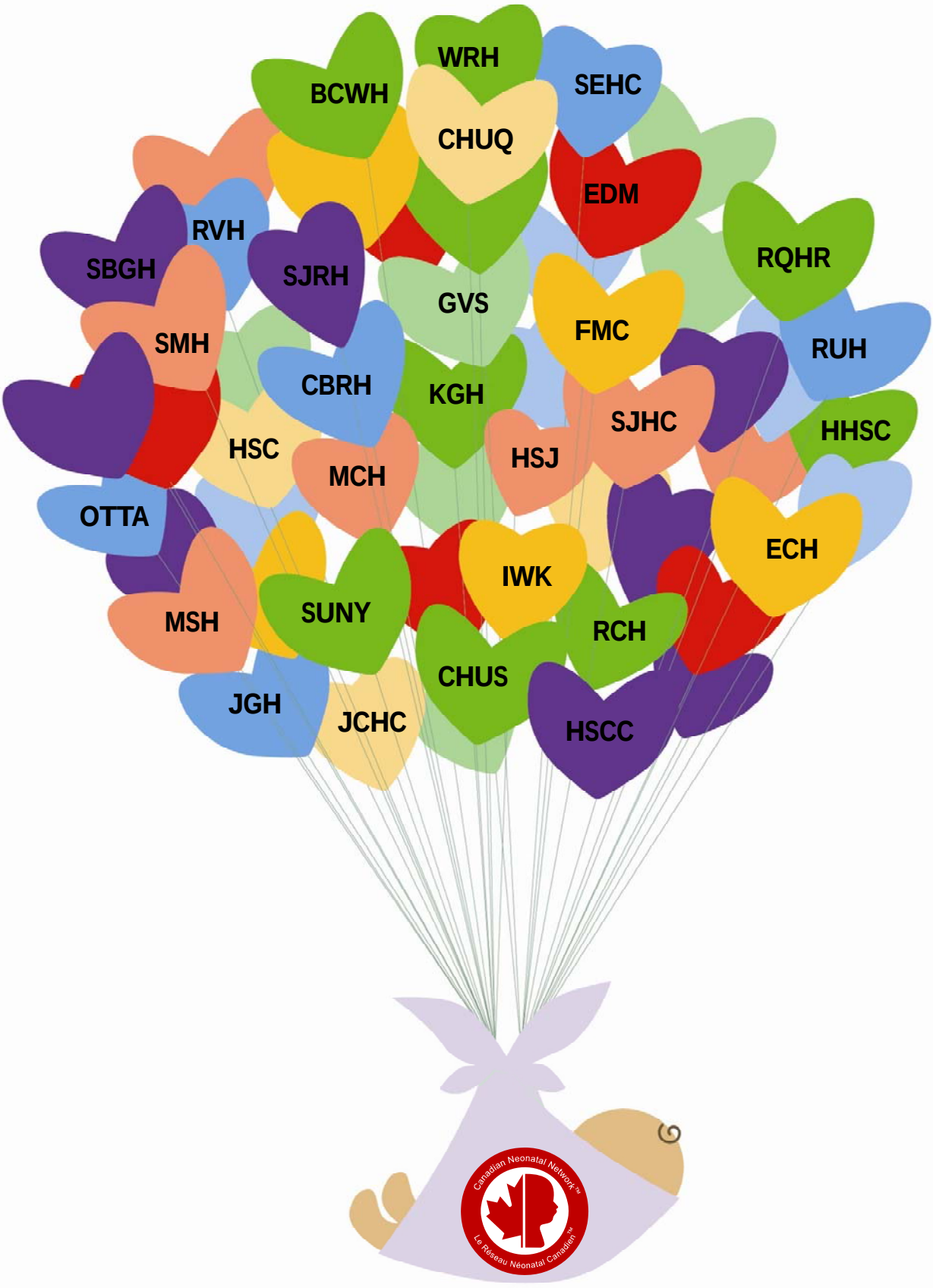


The Canadian Neonatal Network™
Le Réseau Néonatal Canadien™

Annual Report 2011 Rapport Annuel

Acknowledgements

This report is based upon data collected from 30 Health Care Organizations from across Canada that were members of the Canadian Neonatal Network™ during the year 2011. 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 unique opportunities 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 quality, effectiveness and efficiency of neonatal care. Research results are published in Network reports and in peer-reviewed journals.

Funding

The CNN infrastructure is funded by the Canadian Institutes of Health Research. Individual participating hospitals provided additional funding for data collection and other related resources. The Maternal-Infant Care Research Center is supported by funding from the Ministry of Health and Long-Term Care, Ontario.

Coordinating Centre of the CNN

Maternal-Infant Care Research Centre, Mount Sinai Hospital, Toronto, Ontario

Network Director:	Dr. Shoo K. Lee, University of Toronto
Associate Director:	Dr. Prakesh Shah, University of Toronto
Steering Committee:	Dr. Abhay Lodha, University of Calgary
	Dr. Adele Harrison, University of British Columbia
	Dr. Christoph Fusch, McMaster University
	Dr. Kimberly Dow, Queen's University
	Ms. Martine Claveau, McGill University
	Dr. Vibhuti Shah, University of Toronto
	Dr. Wendy Yee, University of Calgary
Study Coordinator:	Ms. Priscilla Chan, Mount Sinai Hospital
Analyst:	Mr. Woojin Yoon, Mount Sinai Hospital

Report Review Committee:	Dr. Alexander Allen, Dalhousie University
	Dr. Arne Ohlsson, University of Toronto
	Dr. Keith Barrington, University of Montreal

Report Review Committee: Dr. Mary Seshia, University of Manitoba
Dr. Michael Dunn, University of Toronto
Dr. Nalini Singhal, University of Calgary
Dr. Nicole Rouvinez-Bouali, University of Ottawa
Dr. Orlando Da Silva, University of Western Ontario
Dr. Prakesh Shah, University of Toronto (Chair)
Ms. Wendy Seidlitz, Hamilton Health Sciences Centre

Participating CNN Sites and Site Investigators for the 2011 Report:

Victoria General Hospital, Victoria, British Columbia	Dr. Adele Harrison
BC Women's Hospital, Vancouver, British Columbia	Dr. Anne Synnes
Royal Columbian Hospital, New Westminster, British Columbia	Dr. Zenon Cieslak
Surrey Memorial Hospital, Surrey, British Columbia	Dr. Todd Sorokan
Foothills Medical Centre, Calgary, Alberta	Dr. Wendy Yee
Royal Alexandra Hospital, Edmonton, Alberta	Dr. Khalid Aziz
University of Alberta Hospital – Stollery Children's, Edmonton, Alberta	
Regina General Hospital, Regina, Saskatchewan	Dr. Zarin Kalapesi
Royal University Hospital, Saskatoon, Saskatchewan	Dr. Koravangattu Sankaran
Winnipeg Health Sciences Centre, Winnipeg, Manitoba	Dr. Mary Seshia
St. Boniface General Hospital, Winnipeg, Manitoba	Dr. Ruben Alvaro
Hamilton Health Sciences Centre, Hamilton, Ontario	Dr. Sandesh Shivananda
London Health Sciences Centre, London, Ontario (formerly St. Joseph's Health Centre)	Dr. Orlando Da Silva
Windsor Regional Hospital, Windsor, Ontario	Dr. Chuks Nwaesei
Hospital for Sick Children, Toronto, Ontario	Dr. Kyong-Soon Lee
Mount Sinai Hospital, Toronto, Ontario	Dr. Prakesh Shah
Sunnybrook Health Sciences Centre, Toronto, Ontario	Dr. Michael Dunn
Children's Hospital of Eastern Ontario, Ottawa, Ontario Ottawa General Hospital, Ottawa, Ontario	Dr. Nicole Rouvinez-Bouali
Kingston General Hospital, Kingston, Ontario	Dr. Kimberly Dow
Jewish General Hospital, Montréal, Québec	Dr. Lajos Kovacs
Hôpital Sainte-Justine, Montréal, Québec	Dr. Keith Barrington
Centre Hospitalier Universitaire de Québec, Sainte Foy, Québec	Dr. Bruno Piedboeuf
Montréal Children's Hospital, Montréal, Québec	Dr. Patricia Riley
Royal Victoria Hospital, Montréal, Québec	Dr. Daniel Faucher
Centre Hospitalier Universitaire de Sherbrooke, Sherbrooke, Québec	Dr. Valerie Bertelle
Moncton Hospital, Moncton, New Brunswick	Dr. Rody Canning
Dr. Everett Chalmers Hospital, Fredericton, New Brunswick	Dr. Barbara Bulleid
Saint John Regional Hospital, Saint John, New Brunswick	Dr. Cecil Ojah
Janeway Children's Health and Rehabilitation Centre, St. John's, Newfoundland	Dr. Wayne Andrews
IWK Health Centre, Halifax, Nova Scotia	Dr. Douglas McMillan
Cape Breton Regional Hospital, Sydney, Nova Scotia	Dr. Andrzej Kajetanowicz

Written & Prepared By:
Dr. Prakesh Shah, Dr. Shoo Lee, Woojin Yoon, Priscilla Chan, Vinthiya Param and Members of the Annual Report Review Committee

Cover page adapted by Ruth Warre and Vinthiya Param
®iStockphoto.com/chuwy

Table of contents

List of Abbreviations

BW	Birth Weight
CONS	Coagulase-Negative Staphylococcus
CPAP	Continuous Positive Airway Pressure
CVL	Central Venous Line
EPIQ	Evidence-based Practice for Improving Quality
ETT	Endotracheal Tube
GA	Gestational Age
GBS	Group B Streptococcus
GM	Germinal Matrix
HFV	High Frequency Ventilation
HIE	Hypoxic Ischemic Encephalopathy
ICROP	International Classification of Retinopathy of Prematurity
IPPV	Intermittent Positive Pressure Ventilation
IVH	Intra-Ventricular Hemorrhage
NEC	Necrotizing Enterocolitis
NI	Non-Invasive
NICE	Neonatal-Perinatal Interdisciplinary Capacity Enhancement
NICU	Neonatal Intensive Care Units
NTISS	Neonatal Therapeutic Intervention Scoring System
PEC	Parenchymal Echodensities
PICC	Peripherally Inserted Central Catheters
PIV	Peripheral Intravenous
PMA	Postmenstrual Age
PPV	Positive Pressure Ventilation
RDS	Respiratory Distress Syndrome
ROP	Retinopathy of Prematurity
SD	Standard Deviation
SEM	Standard Error of Mean
SGA	Small for Gestational Age
SNAP	Score for Acute Neonatal Physiology

SNAP-IIPE	Score for Acute Neonatal Physiology Version II, Perinatal Extension
TPN	Total Parenteral Nutrition
TRIPS	Transport Risk Index of Physiologic Stability
UV	Umbilical Vein
VE	Ventricular Enlargement
VEGF	Vascular Endothelial Growth Factor
VLBW	Very Low Birth Weight
VP	Ventriculoperitoneal

Definitions

A list of the CNN definitions can be found in the CNN abstractor's manual. The manual can be accessed on the CNN website (www.canadianneonatalnetwork.org/portal) at the following link:

http://www.canadianneonatalnetwork.org/Portal/LinkClick.aspx?fileticket=6fcxsf4rDi8%3d&tabid=69

A. Executive Summary

This report from the Canadian Neonatal Network™ (CNN) is based on data from 30 tertiary NICUs, which contributed data in the year 2011. The CNN is funded through the Canadian Institutes of Health Research 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, 2011 and December 31, 2011 who were discharged by March 31, 2012 are included.

Total number of eligible admissions to participating Canadian NICUs (See section D.1 for analyses)	14 661
Total number of eligible individual neonates (See section D.2. for analyses)	13 549
Total number of eligible very preterm (<33 weeks GA) neonates (See section D.3. for analyses)	4 041
Total number of eligible very low birth weight (VLBW) neonates (See section D.3. for analyses)	2 747
Total number of small for gestational age (SGA) neonates	2 247

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

Five sites during 2011 were limited by funding and therefore were 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 (SNAP-II) [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 that should be targeted for 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 first 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 published in 2009.[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 Network™. Separate ethics approvals were obtained from the participating institutions for specific projects as indicated.

[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

HOSPITAL	CNN data collection criteria	Level II / Step-down nursery?	Level II / Step-down data included in CNN?	Delivery room deaths included in CNN 2011 data	ROP surgical / laser service?	PDA surgical service?
Victoria General Hospital	All eligible admissions	y	y	n	y	y
Children's & Women's Health Centre of BC	All eligible admissions	y	n	n	y	y
Royal Columbian Hospital	All eligible admissions	n	n/a	n/a	y	n
Surrey Memorial Hospital	All eligible admissions	n	n/a	y	n	n
Foothills Medical Centre	All eligible admissions	y	y	n	y	y
Royal Alexandra Hospital (Edmonton)	< 33 weeks GA & all HIE	y	y	n	y	n
University of Alberta Hospital - Stollery (Edmonton)	All eligible admissions	n	n/a	n	n	y
Regina General Hospital	All eligible admissions	y	y	y	y	n
Royal University Hospital	All eligible admissions	y	n	n	y	y
Health Sciences Centre Winnipeg	All eligible admissions	y	y	y	y	y
St. Boniface General Hospital	All eligible admissions	n	n/a	n	y	y
Hamilton Health Sciences Centre	All eligible admissions	y	n	n	y	y
London Health Sciences Centre	All eligible admissions	y	y	y	y	y
Windsor Regional Hospital	< 33 weeks GA and /or < 1500g	n	n/a	n	y	n
Hospital for Sick Children	All eligible admissions	n	n/a	n/a	y	y
Mount Sinai Hospital	All eligible admissions	y	y	y	n	n
Sunnybrook Health Sciences Centre	All eligible admissions	n	n/a	y	n	n
Children's Hospital of Eastern Ontario	< 33 weeks GA	y	y	y	y	y
Kingston General Hospital	All eligible admissions	y	y	y	y	y
Jewish General Hospital	All eligible admissions	n	n/a	y	y	n
Hôpital Sainte-Justine	All eligible admissions	y	y	y	y	y
Centre Hospitalier Universitaire de Quebec	< 29 weeks GA	y	n	y	y	y
Montreal Children's Hospital	All eligible admissions	n		n/a	y	y
Royal Victoria Hospital	All eligible admissions	n	n/a	n	y	n
Centre Hospitalier Universitaire de Sherbrooke	< 29 weeks GA	y	n	y	n	n
The Moncton Hospital	All eligible admissions	n	n/a	y	n	n
Dr. Everett Chalmers Hospital	All eligible admissions	y	y	y	n	n
Saint John Regional Hospital	All eligible admissions	y	y	y	n	n
Janeway Children's Health and Rehabilitation Centre	All eligible admissions	y	y	y	y	y
IWK Health Centre	All eligible admissions	y	y	y	y	y
Cape Breton Regional Hospital	All eligible admissions	n	n/a	y	n	n

C. Information Systems

Neonates included in this report are those who were admitted to a CNN participating site between January 1, 2011 and December 31, 2011, and were discharged by March 31, 2012. 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 13 549 patients accounted for 14 661 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 always 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 14 661 eligible admissions (including readmissions) to 30 NICUs. 25 of these hospitals submitted complete data (n=13 740) on all admissions and 5 hospitals submitted data on a selected admission cohort (n=921).

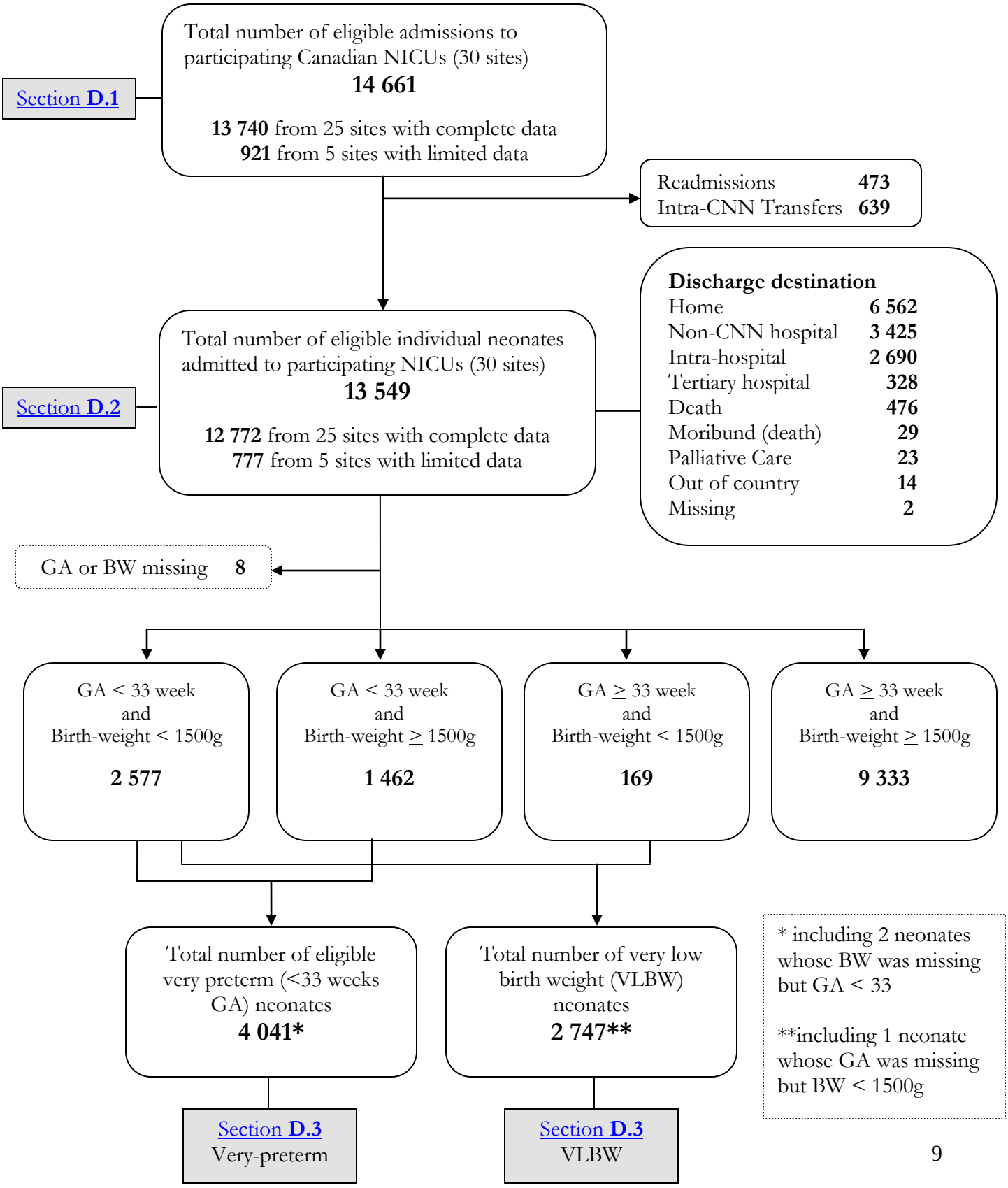
Section D.2. Analyses based on number of eligible neonates admitted to participating NICUs

These include data from 13 549 eligible neonates admitted to 30 NICUs. 25 of these hospitals submitted complete data (n=12 772) on all eligible admitted neonates and 5 hospitals submitted data on selected eligible admitted neonates (n=777).

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 4 041 eligible very preterm neonates and 2 747 eligible VLBW neonates.

Canadian Neonatal Network™ Database: Admissions between January 1, 2011 and December 31, 2011 who were discharged by March 31, 2012. Readmissions from 2010 and delivery room deaths were excluded.

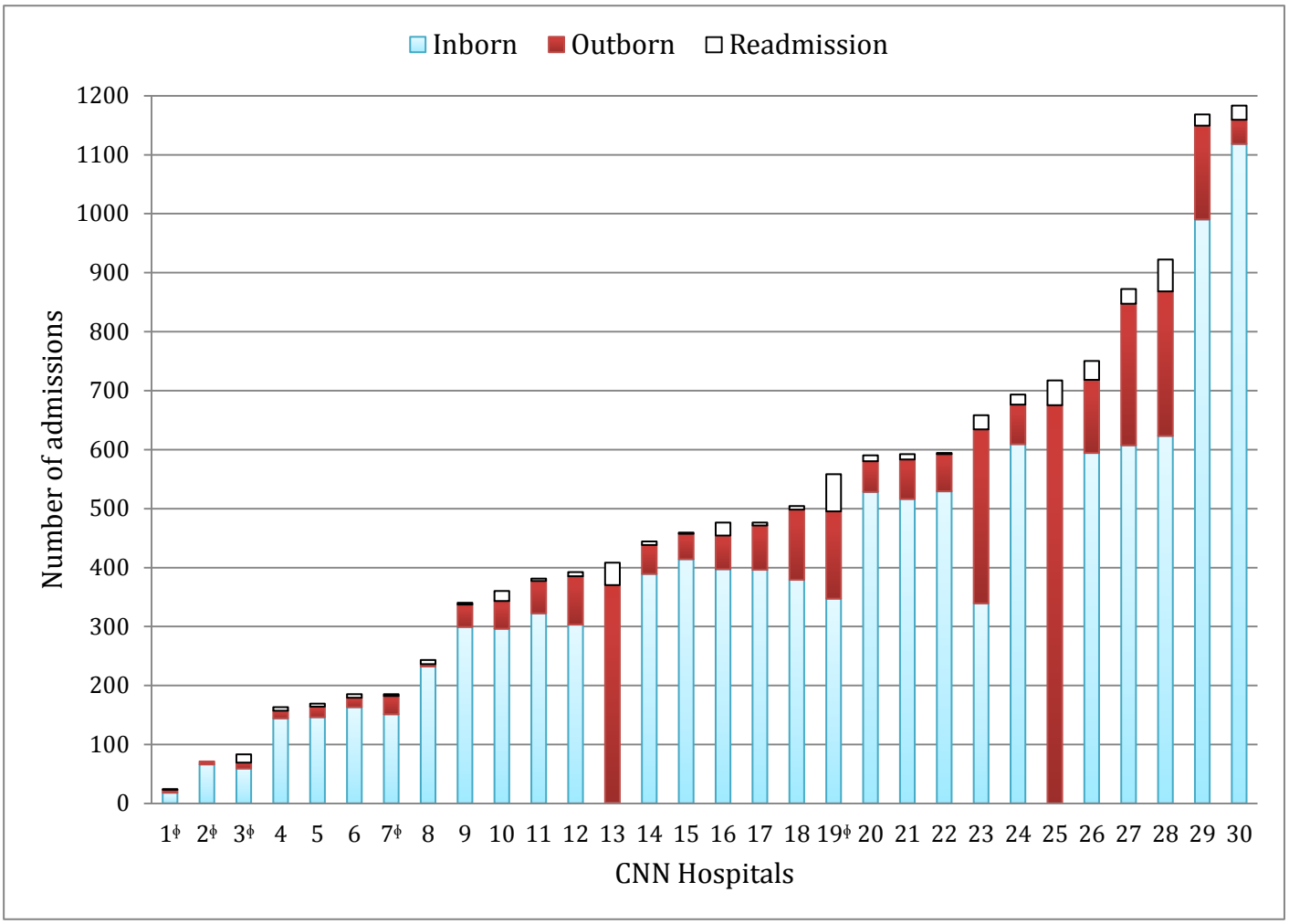


Section D.1

Analyses based on number of eligible admissions to participating NICUs

These include data from 14 661 eligible admissions (including readmissions) to 30 NICUs. 25 of these hospitals submitted complete data (n=13 740) on all admissions and 5 hospitals submitted data on a selected admission cohort (n=921).

Presentation #1
Admissions to Canadian Neonatal Network participating centres



ϕ Data collected on selected cohort of eligible admissions only.

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

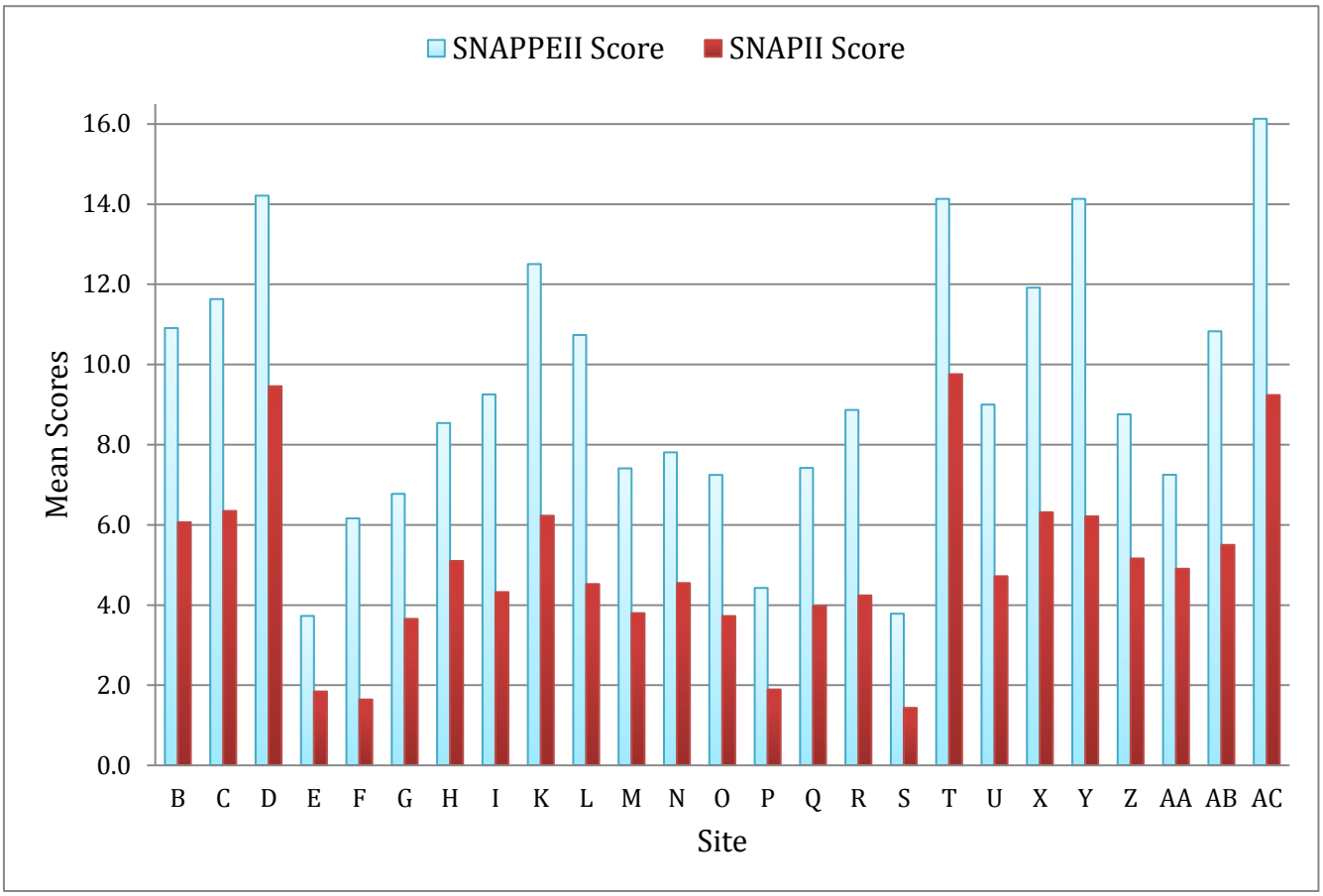
Hospitals		Admission Status			Total
		Inborn	Outborn	Readmission	
1ϕ	Count	18	5	1	24
	%	75	20.83	4.17	(100.0)
2ϕ	Count	66	5	0	71
	%	92.96	7.04	0	(100.0)
3ϕ	Count	59	10	14	83
	%	71.08	12.05	16.87	(100.0)
4	Count	144	13	6	163
	%	88.34	7.98	3.68	(100.0)
5	Count	146	18	5	169
	%	86.39	10.65	2.96	(100.0)
6	Count	163	16	6	185
	%	88.11	8.65	3.24	(100.0)
7ϕ	Count	151	31	3	185
	%	81.62	16.76	1.62	(100.0)
8	Count	232	4	7	243
	%	95.47	1.65	2.88	(100.0)
9	Count	299	38	3	340
	%	87.94	11.18	0.88	(100.0)
10	Count	296	47	17	360
	%	82.22	13.06	4.72	(100.0)
11	Count	322	55	4	381
	%	84.51	14.44	1.05	(100.0)
12	Count	303	82	7	392
	%	77.3	20.92	1.79	(100.0)
13	Count	0	370	38	408
	%	0.00	90.69	9.31	(100.0)
14	Count	389	49	6	444
	%	87.61	11.04	1.35	(100.0)
15	Count	414	43	2	459
	%	90.2	9.37	0.44	(100.0)

Hospitals		Admission status			Total
		Inborn	Outborn	Readmission	
16	Count	397	57	22	476
	%	83.4	11.97	4.62	(100.0)
17	Count	396	75	5	476
	%	83.19	15.76	1.05	(100.0)
18	Count	379	119	6	504
	%	75.2	23.61	1.19	(100.0)
19ϕ	Count	347	148	63	558
	%	62.19	26.52	11.29	(100.0)
20	Count	528	52	10	590
	%	89.49	8.81	1.69	(100.0)
21	Count	516	67	9	592
	%	87.16	11.32	1.52	(100.0)
22	Count	529	63	2	594
	%	89.06	10.61	0.34	(100.0)
23	Count	339	295	24	658
	%	51.52	44.83	3.65	(100.0)
24	Count	609	67	17	693
	%	87.88	9.67	2.45	(100.0)
25	Count	0	675	42	717
	%	0	94.14	5.86	(100.0)
26	Count	594	124	32	750
	%	79.2	16.53	4.27	(100.0)
27	Count	607	240	25	872
	%	69.61	27.52	2.87	(100.0)
28	Count	623	245	54	922
	%	67.57	26.57	5.86	(100.0)
29	Count	990	159	19	1168
	%	84.76	13.61	1.63	(100.0)
30	Count	1118	41	24	1183
	%	94.51	3.47	2.03	(100.0)

Total number of admissions: 14 661
Inborn: 10 974 (74.9%)
Outborn: 3 213 (21.9%)
Readmission: 473 (3.2%)
Missing data on admission status: 1 (0.01%)

COMMENTS: These analyses include 14 661 admissions to participating NICUs across Canada during the period of January 1, 2011 to December 31, 2011. Adjusting for readmission, these represent 13 549 Neonates. **Twenty-five hospitals collected data on all eligible admissions whereas five hospitals (marked by ϕ) collected data on selected cohort of eligible admissions only.**

Presentation #2
Admission illness severity scores (SNAP-II and SNAP-IIPE) by hospital
(only for hospitals that contributed data on all eligible admissions)
(n=25 hospitals, 13 740 admissions, 358 missing data)



Presentation #2 (continued)

Admission illness severity scores (SNAP-II and SNAP-IIPE) by hospital

Site		SNAP-IIPE	SNAP-II	Site		SNAP-IIPE	SNAP-II
Aϕ	Mean	19.5	11.2	**P**	Mean	4.4	1.9
	SEM	1.5	0.9		SEM	0.4	0.2
B	Mean	10.9	6.1	**Q**	Mean	7.4	4.0
	SEM	0.8	0.5		SEM	0.7	0.4
C	Mean	11.6	6.3	**R**	Mean	8.9	4.2
	SEM	0.7	0.4		SEM	1.1	0.6
D	Mean	14.2	9.5	**S**	Mean	3.8	1.4
	SEM	0.5	0.3		SEM	0.8	0.4
E	Mean	3.7	1.8	**T**	Mean	14.1	9.8
	SEM	0.8	0.5		SEM	0.5	0.3
F	Mean	6.2	1.6	**U**	Mean	9.0	4.7
	SEM	0.4	0.2		SEM	0.7	0.4
G	Mean	6.8	3.6	**Vϕ**	Mean	19.5	8.8
	SEM	0.6	0.4		SEM	0.9	0.5
H	Mean	8.5	5.1	**Wϕ**	Mean	10.9	3.2
	SEM	0.8	0.5		SEM	1.5	0.6
I	Mean	9.2	4.3	**X**	Mean	11.9	6.3
	SEM	0.6	0.3		SEM	0.6	0.3
Jϕ	Mean	38.9	22.9	**Y**	Mean	14.1	6.2
	SEM	3.4	2.2		SEM	0.9	0.6
K	Mean	12.5	6.2	**Z**	Mean	8.8	5.2
	SEM	0.6	0.4		SEM	0.5	0.3
L	Mean	10.7	4.5	**AA**	Mean	7.2	4.9
	SEM	0.9	0.4		SEM	0.7	0.5
M	Mean	7.4	3.8	**AB**	Mean	10.8	5.5
	SEM	0.5	0.3		SEM	0.7	0.4
N	Mean	7.8	4.5	**AC**	Mean	16.1	9.2
	SEM	1.0	0.7		SEM	0.7	0.5
O	Mean	7.2	3.7	**ADϕ**	Mean	27.8	14.4
	SEM	0.5	0.3		SEM	4.4	2.2

All eligible admissions overall(25 sites) - Mean(SEM): SNAP-IIPE 10.2 (0.1), SNAP-II 5.6 (0.1)
Selected admissions overall(5 sites) - Mean(SEM): SNAP-IIPE 20.4 (0.7), SNAP-II 10.0 (0.4)

COMMENTS: These analyses include 14 661 admissions (376 missing data) to participating NICUs across Canada during the period of January 1, 2011 to December 31, 2011. Adjusting for readmission, these analyses represent 13 549 Neonates. **Twenty-five hospitals collected data on all eligible admissions whereas five hospitals (marked by ϕ) collected data on a selected cohort of eligible admissions only.** These five hospitals have not been included in the previous bar graph but have been included in the above Table. ϕ Please note that the criteria for entering neonates in the CNN dataset are not the same for these five hospitals and thus, the scores are not comparable with each other or with centers contributing complete data. These five hospitals included neonates at lower GAs and/or lower BWs; thus, their severity of illness scores may be higher than the remaining hospitals.

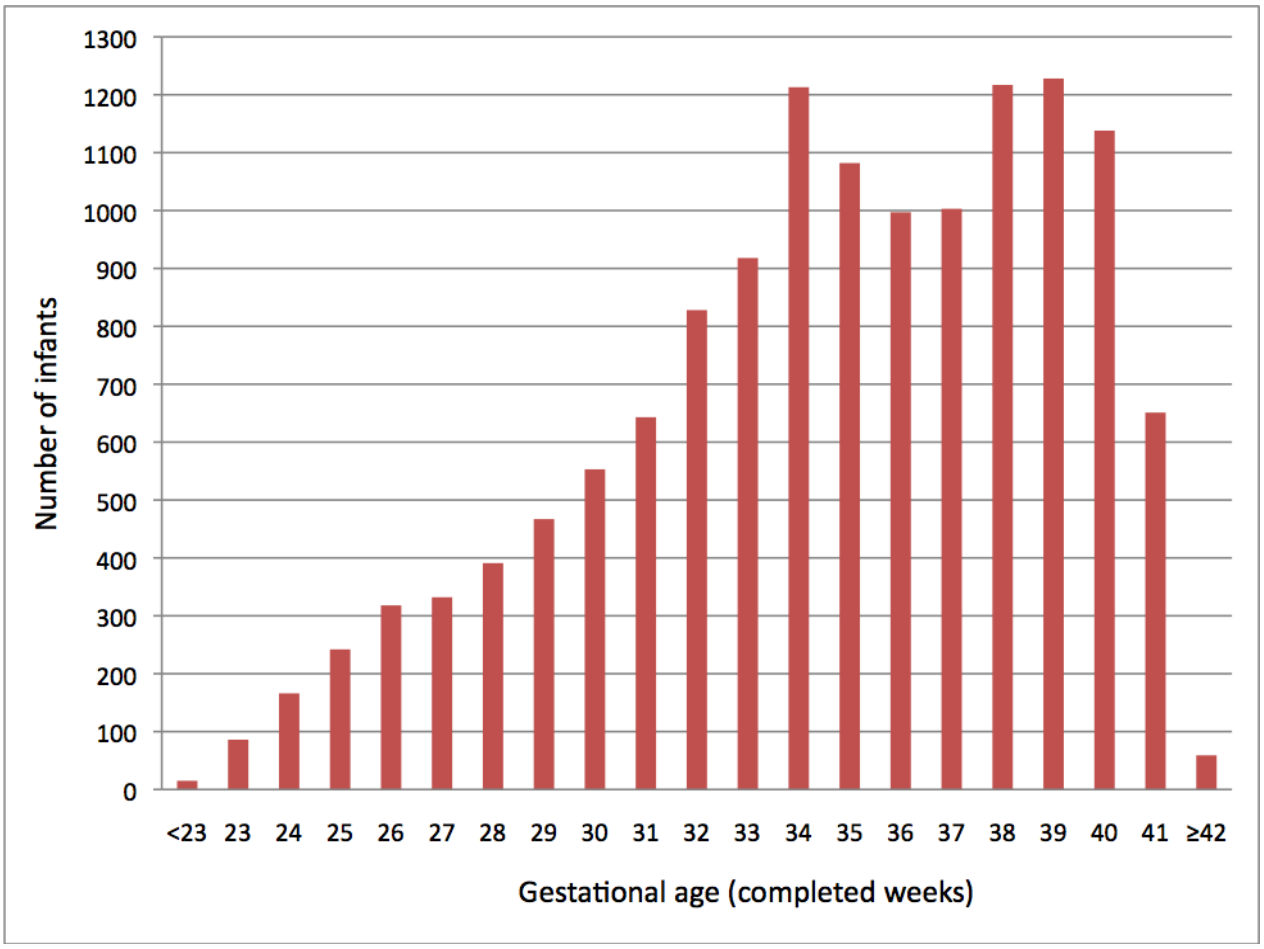
Section D.2

Analyses based on number of eligible neonates admitted to participating NICUs

These include data from 13 549 eligible neonates admitted to 30 NICUs. 25 of these hospitals submitted complete data (n=12 772) on all eligible admitted neonates and 5 hospitals submitted data on a selected cohort of eligible admitted neonates (n=777).

Presentation #3

Gestational age at birth

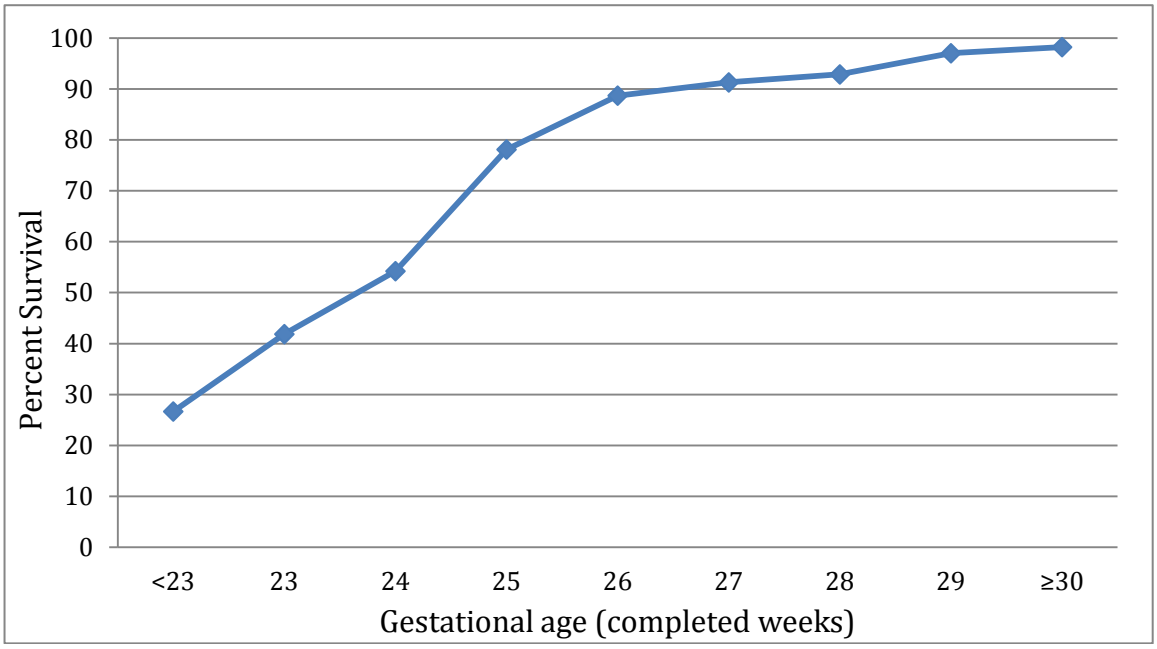


Presentation #3 (continued)
Gestational age at birth

GA in completed weeks at birth	Frequency	Percent	Cumulative percent
<23	15	0.1	0.1
23	86	0.6	0.8
24	166	1.2	2.0
25	242	1.8	3.8
26	318	2.4	6.1
27	332	2.5	8.6
28	391	2.9	11.4
29	467	3.5	14.9
30	553	4.1	19.0
31	643	4.8	23.7
32	828	6.1	29.8
33	918	6.8	36.6
34	1213	9.0	45.6
35	1082	8.0	53.6
36	997	7.4	60.9
37	1003	7.4	68.3
38	1217	9.0	77.3
39	1228	9.1	86.4
40	1138	8.4	94.8
41	651	4.8	99.6
≥42	59	0.4	100.0
Total included	13 547	100.0	
Total # of missing (GA)	2		
Total # of infants	13 549		

COMMENTS: The GA distribution of neonates is shown here. Term babies (≥37 weeks) represent approximately 39% of the total number of neonates. Twenty-five hospitals collected data on all eligible admissions whereas five hospitals collected data on a selected cohort of eligible admissions.

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



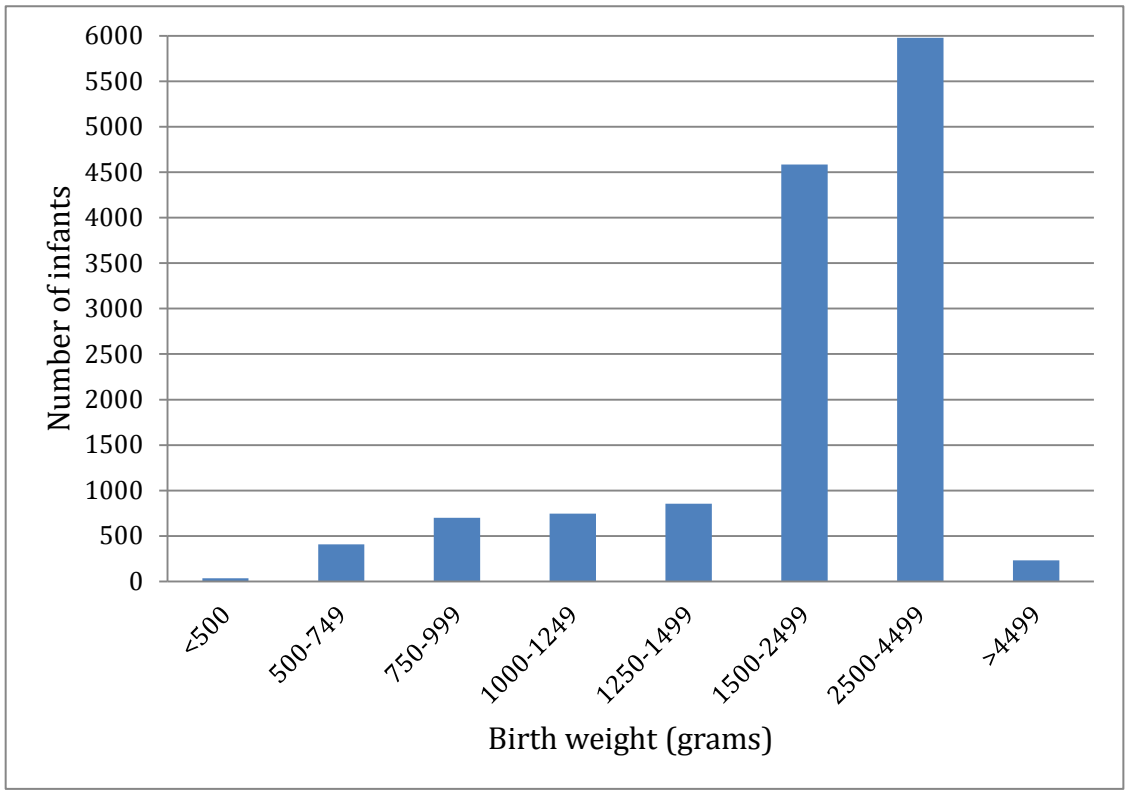
CNN Admissions						Delivery room deaths*		Total CNN admissions + Delivery room deaths*			
GA (completed weeks)	Number of infants	Number of survivors	% survival among CNN admissions	Number of infants who received palliative care		Palliative care	Active care	Total	Number of infants who received palliative care	Number of infants who received active care	Percentage survival among those who received active care
<23	15	4	27	6		19	4	38	25	13	31
23	86	36	42	4		15	4	105	19	86	42
24	166	90	54	3		9	3	178	12	166	54
25	242	189	78	1		2	2	246	3	243	78
26	318	282	89	0		2	0	320	2	318	89
27	332	303	91	2		0	1	333	2	331	92
28	391	363	93	1		0	1	392	1	391	93
29	467	453	97	0		2	0	469	2	467	97
≥30	11 530	11 323	98	4		6	3	11 539	10	11 529	98
Total included	13 547	13 043	96	21		55	18	13 620	76	13 544	96
Total # of missing (GA)	2					2	0	4	2	2	
Total # of infants	**13 549**					**57**	**18**	**13 624**	**78**	**13 546**	

***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 delivery room deaths is an ongoing process and not all sites contributed delivery room death data.

Presentation #5

Birth weight distribution

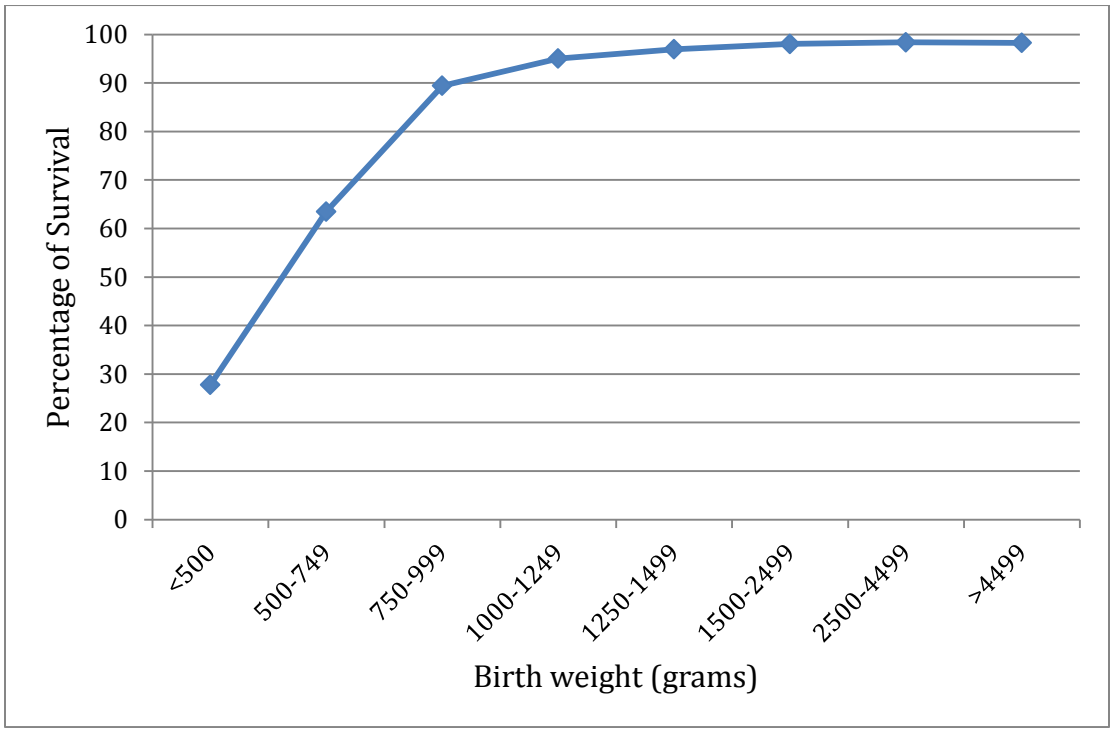


BW (grams)	Frequency	Percent from total number of neonates	Cumulative percent
<500	36	0.3	0.3
500-749	408	3.0	3.3
750-999	701	5.2	8.5
1000-1249	747	5.5	14.0
1250-1499	855	6.3	20.3
1500-2499	4585	33.9	54.1
2500-4499	5978	44.1	98.3
>4499	232	1.7	100.0
Total included	13 542	100.0	
Missing (BW)	7		
Total # of neonates	13 549		

COMMENTS: The BW distribution of neonates admitted to NICUs. Eighty percent weighed more than 1 500g at birth and 46% weighed more than 2 500g. Twenty-five hospitals collected data on all admissions whereas five 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	36	10	28
500-749	408	259	63
750-999	701	627	89
1000-1249	747	710	95
1250-1499	855	829	97
1500-2499	4 585	4 495	98
2500-4499	5 978	5 881	98
>4499	232	228	98
Total included	13 542	13 039	96
Missing (BW)	7		
Total # of neonates	13 549		

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					**GA at birth (completed weeks)**			
		Missing	**Unknown**		**<33**	**33 - 36**	**≥37**	**Total**
Total		2			**4041**	**4210**	**5296**	**13547**
No prenatal care		19	963	N	58	52	50	160
				%	1.6	1.3	1.0	1.3
Illicit drug use		8		N	166	199	341	706
				%	4.1	4.7	6.4	5.2
Smoking		8		N	605	618	826	2049
				%	15.0	14.7	15.6	15.1
Maternal hypertension		22	439	N	740	754	488	1980
				%	18.8	18.4	9.6	15.2
Maternal diabetes		24	523	N	439	627	661	1727
				%	11.3	15.4	13.1	13.3
Assisted pregnancy		25	521	N	558	487	212	1257
				%	14.3	12.0	4.2	9.7
Multiples		3		N	1248	1227	171	2646
				%	30.9	29.1	3.2	19.4
$MgSO_4$ during labor		15	779	N	906	266	43	1215
				%	23.7	6.7	0.9	9.5
Prenatal steroids	None	12	494	N	537	2563	4938	8038
				%	13.7	62.9	97.9	61.6
	Complete in last week			N	1460	529	12	2001
				%	37.2	13.0	0.2	15.3
	Complete before last week			N	1035	709	78	1822
				%	26.4	17.4	1.6	14.0
	Complete (timing unknown)			N	116	46	6	168
				%	3.0	1.1	0.1	1.3
	Partial <24h			N	708	187	6	901
				%	18.0	4.6	0.1	6.9
	Partial >24h			N	46	25	3	74
				%	1.2	0.6	0.1	0.6
	Partial (timing unknown)			N	25	13	1	39
				%	0.6	0.3	0.0	0.3

Presentation #7 (continued)
Maternal characteristics

Characteristics					**GA at birth (completed weeks)**			
		Missing	**Unknown**		**31 - 32**	**33 - 36**	**≥37**	**Total**
Total		2			**4041**	**4210**	**5296**	**13547**
Mode of birth	Vaginal	11	54	N	1716	2123	3137	6976
				%	42.6	50.6	59.6	51.7
	C/S			N	2309	2070	2129	6508
				%	57.4	49.4	40.4	48.3
Presentation	Vertex	14	851	N	2466	3152	4587	10205
				%	65.0	79.8	92.9	80.5
	Breech			N	1066	675	280	2021
				%	28.1	17.1	5.7	15.9
	Other			N	265	121	72	458
				%	7.0	3.1	1.5	3.6
Rupture of membranes	<24 h	12	617	N	3078	3493	4698	11269
				%	79.6	86.8	93.5	87.2
	24h to 1wk			N	443	376	323	1142
				%	11.5	9.3	6.4	8.8
	>1 wk			N	346	157	6	509
				%	9.0	3.9	0.1	3.9
Chorioamnionitis*		4327		N	550	163	262	975
				%	18.0	5.6	8.0	10.6
Antenatal interventions**		20	394	N	116	69	39	224
				%	2.9	1.7	0.8	1.7

*Chorioamnionitis is defined as documented "suspected or confirmed clinical chorioamnionitis" in 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)**								
			≤23	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**Total**
Total			**101**	**166**	**242**	**318**	**332**	**391**	**467**	**553**	**2570**
No resuscitation needed/provided		N	6	1	0	4	3	14	24	56	108
		%	5.9	0.6	0.0	1.3	0.9	3.6	5.1	10.1	4.2
CPAP only		N	6	8	31	62	84	129	175	203	698
		%	5.9	4.8	12.8	19.6	25.3	33.0	37.5	36.7	27.2
PPV via mask		N	64	112	185	216	235	246	274	288	1620
		%	63.4	67.5	76.5	68.1	70.8	62.9	58.7	52.1	63.1
PPV via ETT		N	78	130	201	216	212	163	147	134	1281
		%	77.2	78.3	83.1	68.1	63.9	41.7	31.5	24.2	49.9
Chest compression		N	14	24	25	34	24	25	20	14	180
		%	13.9	14.5	10.3	10.7	7.2	6.4	4.3	2.5	7.0
Epinephrine		N	8	11	16	13	12	6	6	6	78
		%	7.9	6.6	6.6	4.1	3.6	1.5	1.3	1.1	3.0
Palliative		N	10	3	1	0	2	1	0	1	18
		%	9.9	1.8	0.4	0.0	0.6	0.3	0.0	0.2	0.7
Unknown		N	0	5	3	2	4	6	8	8	36
		%	0.0	3.0	1.2	0.6	1.2	1.5	1.7	1.5	1.4
Any resuscitation provided*		N	85	155	236	310	320	359	410	444	2319
		%	84.2	93.4	97.5	97.8	96.4	91.8	87.8	80.3	90.3
Initial gas	Air	N	19	31	38	78	100	82	138	137	623
		%	18.8	18.7	15.7	24.5	30.1	21.0	29.6	24.8	24.2
	Suppl. O_2	N	16	39	72	86	104	127	148	182	774
		%	15.8	23.5	29.8	27.0	31.3	32.5	31.7	32.9	30.1
	100% O_2	N	34	64	104	110	78	99	84	68	641
		%	33.7	38.6	43.0	34.6	23.5	25.3	18.0	12.3	24.9
	Unknown	N	13	20	25	28	29	50	40	65	270
		%	12.9	12.1	10.3	8.8	8.7	12.8	8.6	11.8	10.5
	Missing	N	19	12	3	16	21	33	57	101	262
		%	18.8	7.2	1.2	5.0	6.3	8.4	12.2	18.3	10.2
Maximum O_2 conc. during resus.	21%	N	1	0	0	2	4	4	11	22	44
		%	1.0	0.0	0.0	0.6	1.2	1.0	2.4	4.0	1.7
	22-40%	N	3	12	24	39	73	76	96	112	435
		%	3.0	7.2	9.9	12.3	22.0	19.4	20.6	20.3	16.9
	41-70%	N	4	15	23	40	40	59	61	74	316
		%	4.0	9.0	9.5	12.6	12.1	15.1	13.1	13.4	12.3
	>70%	N	62	106	157	184	151	163	172	132	1127
		%	61.4	63.9	64.9	57.9	45.5	41.7	36.8	23.9	43.9
	Missing	N	31	33	38	53	64	89	127	213	648
		%	30.7	19.9	15.7	16.7	19.3	22.8	27.2	38.5	25.2

* 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 table were evolving during this first year of this data collection. Please use caution while interpreting these data. Resuscitation time was defined as first 30 minutes after birth.

Presentation #8 (continued)
Resuscitation (GA ≥ 31 weeks)

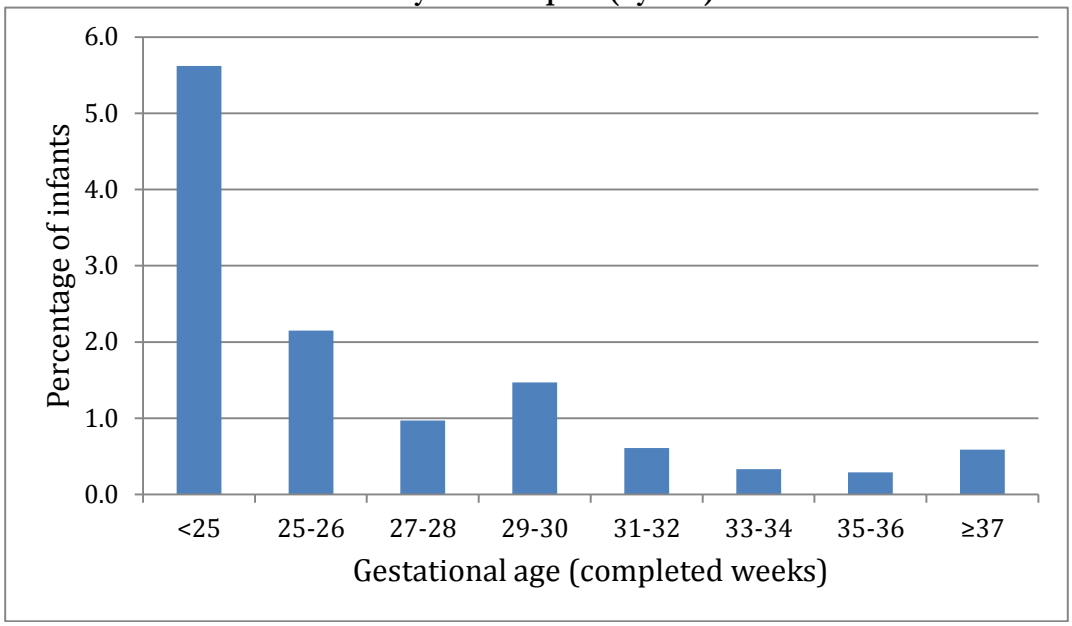
Characteristics			**GA at birth (completed weeks)**							
			31	**32**	**33**	**34**	**35**	**36**	**≥37**	**Total**
Total			**643**	**828**	**918**	**1213**	**1082**	**997**	**5296**	**10977**
No resuscitation needed		N	64	187	249	424	382	367	1901	3574
		%	10.0	22.6	27.2	35.0	35.3	36.8	35.9	32.6
CPAP only		N	253	254	183	184	145	91	455	1565
		%	39.4	30.7	20.0	15.2	13.4	9.1	8.6	14.3
PPV via mask		N	315	307	280	295	221	252	1494	3164
		%	49.1	37.1	30.5	24.4	20.4	25.3	28.2	28.8
PPV via ETT		N	124	97	60	56	46	64	549	996
		%	19.3	11.7	6.5	4.6	4.3	6.4	10.4	9.1
Chest compression		N	17	17	10	15	7	18	192	276
		%	2.7	2.1	1.1	1.2	0.7	1.8	3.6	2.5
Epinephrine		N	5	4	4	3	3	10	90	119
		%	0.8	0.5	0.4	0.3	0.3	1.0	1.7	1.1
Palliative		N	0	1	0	0	1	0	1	3
		%	0.0	0.1	0.0	0.0	0.1	0.0	0.2	0.0
Unknown		N	4	11	18	18	34	28	142	255
		%	0.6	1.3	2.0	1.5	3.1	2.8	2.7	2.3
Any resuscitation provided*		N	504	501	424	455	342	321	1958	4505
		%	78.4	60.5	46.2	37.6	31.6	32.2	37.0	41.1
Initial gas	Air	N	178	194	202	198	193	156	795	1916
		%	27.7	23.4	22.0	16.3	17.8	15.7	15.0	17.5
	Suppl. O_2	N	199	198	161	160	132	144	687	1681
		%	31.0	23.9	17.5	13.2	12.2	14.4	13.0	15.3
	100% O_2	N	87	88	85	123	93	102	622	1200
		%	13.5	10.6	9.3	10.1	8.6	10.2	11.7	10.9
	Unknown	N	57	89	104	153	143	103	672	1321
		%	8.9	10.8	11.3	12.6	13.2	10.3	12.7	12.0
	Missing	N	122	259	366	579	521	492	2520	4859
		%	19.0	31.3	39.9	47.7	48.2	49.4	47.6	44.3
Maximum O_2 conc. during resus	21%	N	22	32	52	59	73	55	240	533
		%	3.4	3.9	5.7	4.9	6.8	5.5	4.5	4.9
	22-40%	N	152	141	108	120	100	89	340	1050
		%	23.6	17.0	11.8	9.9	9.2	8.9	6.4	9.6
	41-70%	N	83	82	60	43	38	31	174	511
		%	12.9	9.9	6.5	3.5	3.5	3.1	3.3	4.7
	>70%	N	150	154	144	178	143	161	988	1918
		%	23.3	18.6	15.7	14.7	13.2	16.2	18.7	17.5
	Missing	N	236	419	554	813	728	661	3554	6965
		%	36.7	50.6	60.4	67.0	67.3	66.3	67.1	63.5

* 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 table were evolving during this first year of this data collection. Please use caution while interpreting these data. Resuscitation time was defined as first 30 minutes after birth.

Presentation #9

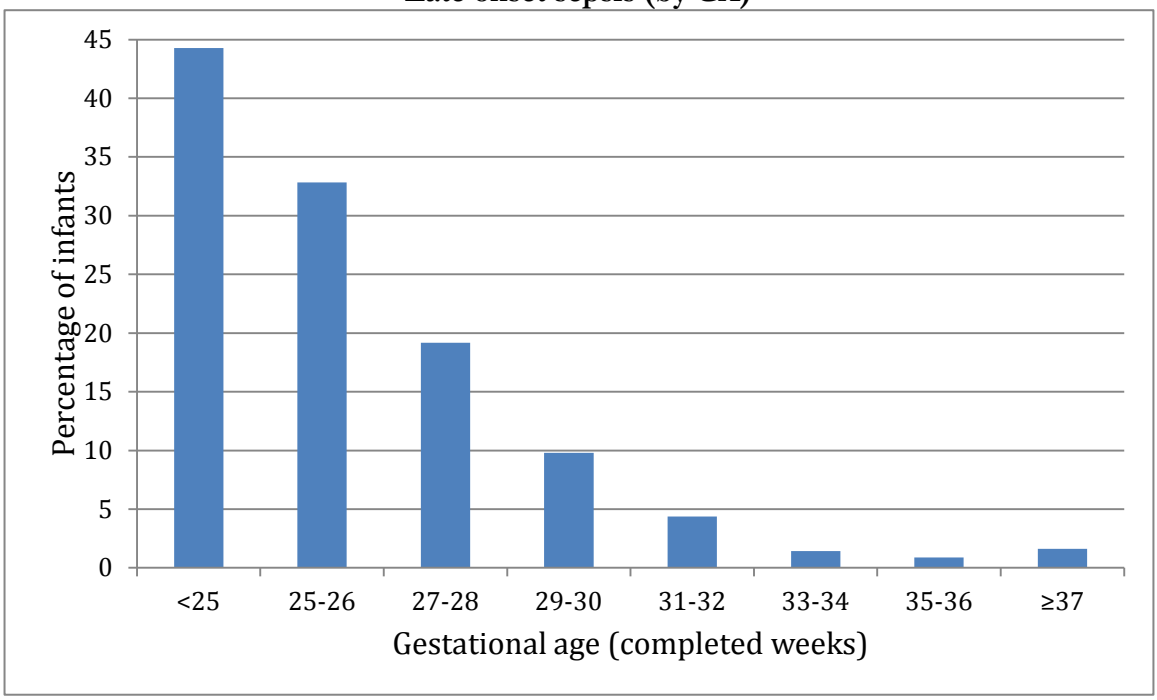
Early onset sepsis (by GA)



GA at birth (completed weeks)	Total number of neonates	No. of neonates with infection	% of neonates with infection	Total number of organisms	Organism			
					E. Coli	GBS	CONS	Others
<25	267	15	5.6	15	7	6	0	2
25-26	559	12	2.2	12	4	2	1	5
27-28	723	7	1.0	7	3	1	2	1
29-30	1 020	15	1.5	15	2	3	4	6
31-32	1 471	9	0.6	10	3	2	1	4
33-34	2 131	7	0.3	7	3	0	1	3
35-36	2 079	6	0.3	6	1	0	3	2
≥37	5 296	31	0.6	32	5	9	8	10
Total included	**13 546**	**102**	**0.8**	**104**	**28**	**23**	**20**	**33**
Missing	**3**							
Total # of neonates	**13 549**							

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.

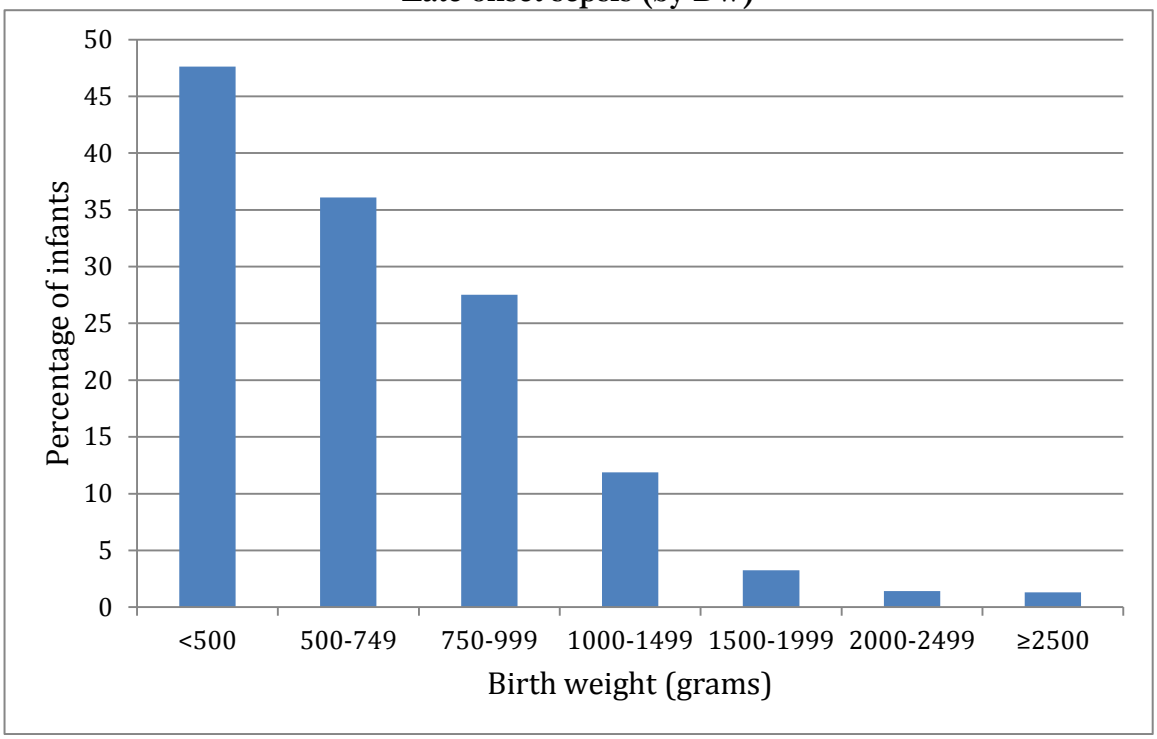
Presentation #10
Late onset sepsis (by GA)



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 organisms	Organisms			
								CONS	E. Coli	Staph Aureus Coag +	Other
<25	267	57	210	93	36	44	141	63	17	6	55
25-26	560	18	542	178	52	33	251	137	22	11	81
27-28	723	19	704	135	21	19	177	103	11	9	54
29-30	1 020	8	1 012	99	13	10	116	72	8	7	29
31-32	1 471	4	1 467	64	7	4	77	47	5	6	19
33-34	2 131	8	2 123	30	1	1	33	22	1	0	10
35-36	2 079	7	2 072	18	3	1	26	13	1	0	12
≥37	5 296	23	5 273	85	10	2	105	45	15	6	39
Total included	13 547	144	13 403	702	143	5	926	502	80	45	299
Missing (GA)	2										
Total # of neonates	**13 549**										

COMMENTS: Late onset sepsis is defined as 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			
								CONS	E. Coli	Staph Aureus Coag +	Others
<500	36	15	21	10	3	48	13	7	3	0	3
500-749	408	45	363	131	44	36	196	92	21	11	72
750-999	701	18	683	188	54	28	269	149	19	9	92
1000-1499	1 602	19	1 583	188	23	12	226	138	15	15	58
1500-1999	2 165	16	2 149	70	5	3	80	52	5	2	21
2000-2499	2 420	8	2 412	34	4	1	42	22	3	2	15
≥2500	6 210	22	6 188	80	10	1	99	41	14	6	38
Total included	13 542	143	13 399	701	143	5	925	501	80	45	299
Missing (GA)	7										
Total # of neonates	**13 549**										

COMMENTS: Late onset sepsis is defined as 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)**						
				≤25	**26 - 28**	**29 - 30**	**31 - 32**	**33 - 36**	**≥37**	**Total**
Total				509	1041	1020	1471	4210	5296	13547
		Missing**								
Prophylactic	Indomethacin	33	N	49	40	3	3	1	3	99
			%	10.1	3.9	0.3	0.2	0.0	0.1	0.7
	HFV	33	N	28	42	4	3	1	2	80
			%	5.8	4.0	0.4	0.2	0.0	0.0	0.6
	Vitamin A	33	N	2	5	1	0	1	0	9
			%	0.4	0.5	0.1	0.0	0.0	0.0	0.1
	Probiotics	33	N	17	35	27	22	4	4	109
			%	3.5	3.4	2.7	1.5	0.1	0.1	0.8
	Phototherapy	33	N	43	112	55	63	131	111	515
			%	8.8	10.8	5.4	4.3	3.1	2.1	3.8
	L-Arginine	33	N	12	44	3	0	0	0	59
			%	2.5	4.2	0.3	0.0	0.0	0.0	0.4
	Surfactant*		N	228	279	87	31	13	2	640
			%	46.8	26.9	8.5	2.1	0.3	0.0	4.7
RDS	Unknown	35	N	5	1	7	4	41	114	172
			%	1.0	0.1	0.7	0.3	1.0	2.2	1.3
	Uncertain		N	8	27	36	46	57	53	227
			%	1.6	2.6	3.5	3.1	1.4	1.0	1.7
	None		N	23	134	367	882	3471	4823	9700
			%	4.7	12.9	36.0	60.0	82.5	91.2	71.8
	Definite		N	451	876	609	538	639	300	3413
			%	92.6	84.4	59.8	36.6	15.2	5.7	25.3
Pneumothorax diagnosis		33	N	51	62	28	26	126	318	611
			%	10.5	6.0	2.8	1.8	3.0	6.0	4.5
Pneumothorax treatment	Observation	33	N	11	14	6	7	59	200	297
			%	2.3	1.4	0.6	0.5	1.4	3.8	2.2
	Needle drainage	33	N	17	20	10	7	26	39	119
			%	3.5	1.9	1.0	0.5	0.6	0.7	0.9
	Chest tube	33	N	35	39	19	14	57	79	243
			%	7.2	3.8	1.9	1.0	1.4	1.5	1.8
	100% O_2	33	N	11	5	3	5	18	57	99
			%	2.3	0.5	0.3	0.3	0.4	1.1	0.7
Seizures	Definite /suspected	35	N	32	34	16	16	54	389	541
			%	6.6	3.3	1.6	1.1	1.3	7.4	4.0

*Surfactant given within 30 minutes of birth
** Among the missing were 28 patients who were moribund on admission

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

Characteristics				**GA at birth (completed weeks)**						
				≤25	**26 - 28**	**29 - 30**	**31 - 32**	**33 - 36**	**≥37**	**Total**
Total				509	1041	1020	1471	4210	5296	13547
		Missing**								
Operations	Laparotomy	33	N	34	57	29	30	99	192	441
			%	7.0	5.5	2.9	2.0	2.4	3.6	3.3
	Thoracotomy	33	N	5	8	6	9	13	46	87
			%	1.0	0.8	0.6	0.6	0.3	0.9	0.6
	VP shunt	33	N	4	9	1	4	5	17	40
			%	0.8	0.9	0.1	0.3	0.1	0.3	0.3
Gastro-intestinal perforation	Spontaneous	68	N	12	16	7	8	5	6	54
			%	2.5	1.6	0.7	0.6	0.1	0.1	0.4
	NEC related		N	28	16	4	5	6	5	64
			%	5.8	1.6	0.4	0.3	0.1	0.1	0.5
Acquired stricture		33	N	7	12	9	5	5	0	38
			%	1.4	1.2	0.9	0.3	0.1	0.0	0.3
Acute bilirubin encephalopathy		33	N	0	1	0	2	2	7	12
			%	0.0	0.1	0.0	0.1	0.1	0.1	0.1
Exchange transfusion		33	N	0	2	1	0	12	17	32
			%	0.0	0.2	0.1	0.0	0.3	0.3	0.2
Congenital anomaly*	None		N	383	803	852	1256	3595	3927	10816
			%	75.3	77.1	83.5	85.4	85.4	74.2	79.8
	Minor		N	98	184	124	143	329	669	1547
			%	19.3	17.7	12.2	9.7	7.8	12.6	11.4
	Major		N	28	54	44	72	286	700	1184
			%	5.5	5.2	4.3	4.9	6.8	13.2	8.7

* Please see appendix of CNN Manual for detailed description of congenital anomaly classifications

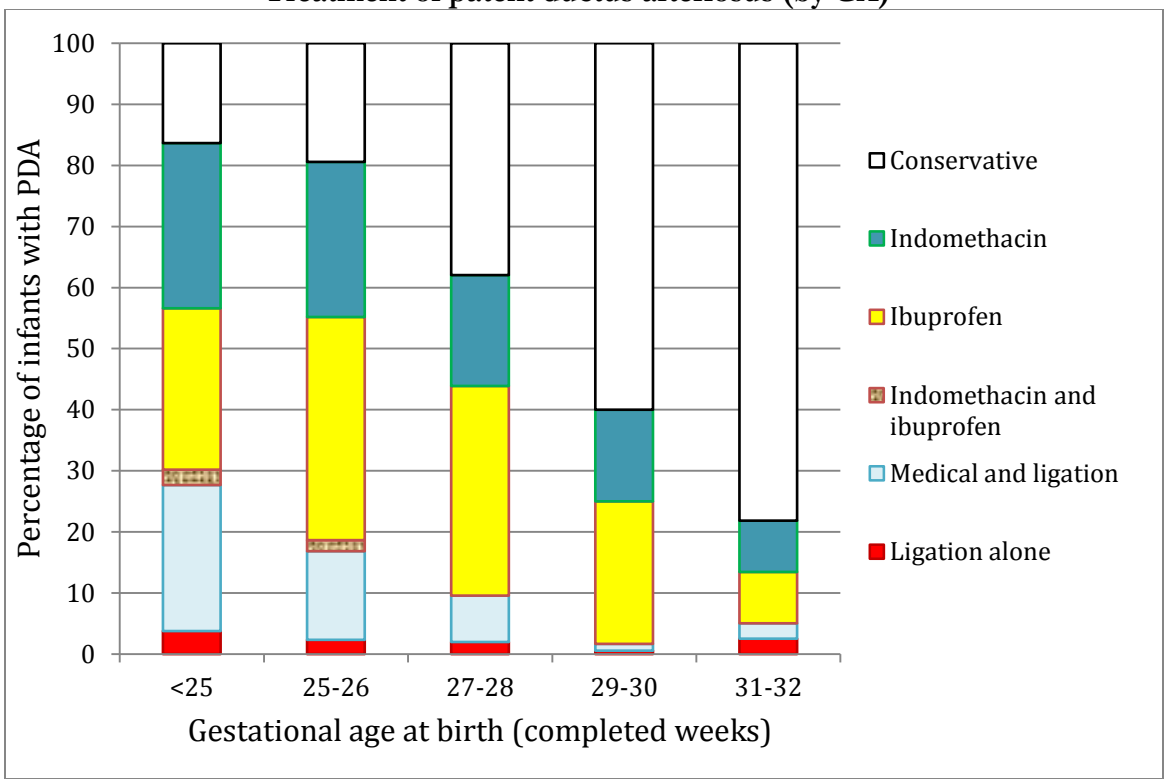
** Among the missing were 28 patients who were moribund on admission

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 4 041 eligible very preterm neonates and 2 747 eligible VLBW neonates.

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

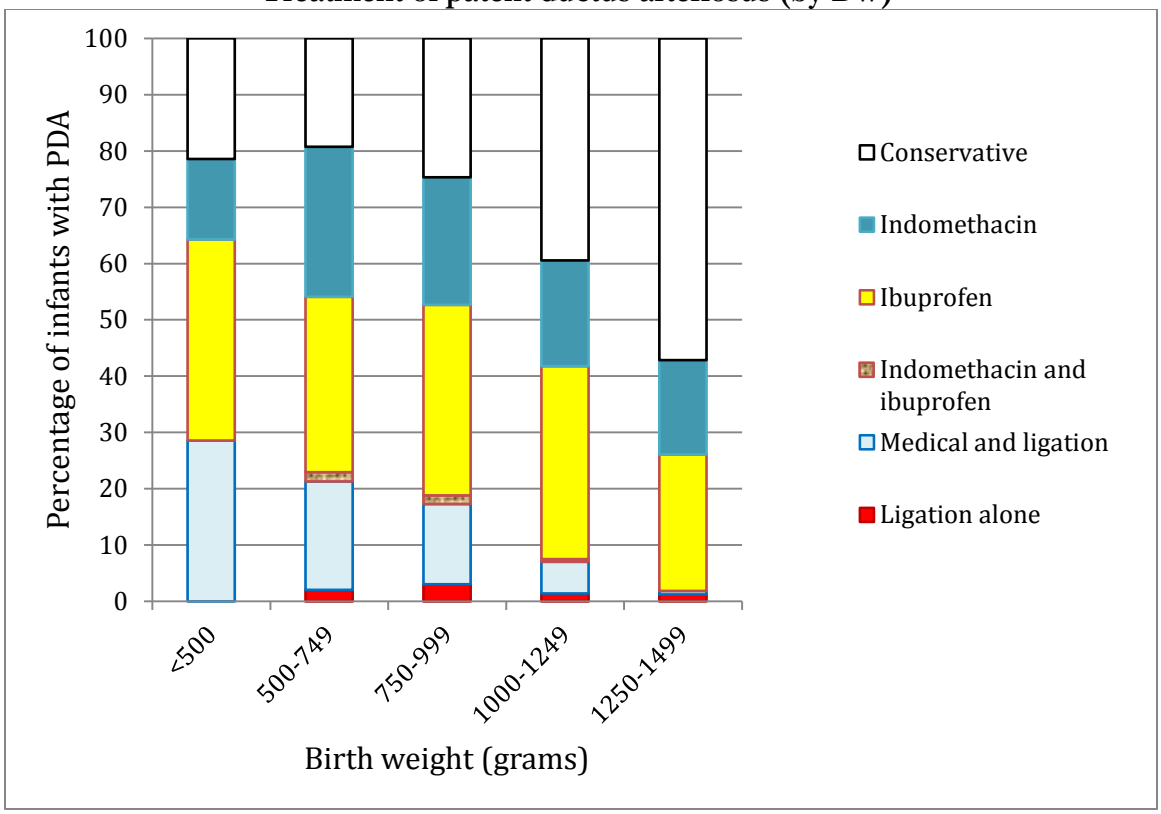


Birth GA (completed weeks)		Total	Missing data on PDA	PDA information unknown	No PDA	# with PDA	Treatment*					
							Conse-rvative	Indom-ethacin	Ibuprofen	Indomet-hacin and Ibuprofen	Medical and ligation#	Ligation alone
<25	**N**	267	22	14	72	159	26	43	42	4	38	6
	%						16%	27%	26%	3%	24%	4%
25-26	**N**	560	1	10	163	386	75	98	141	7	56	9
	%						19%	25%	37%	2%	15%	2%
27-28	**N**	723	2	7	411	303	115	55	104	0	23	6
	%						38%	18%	34%	0%	8%	2%
29-30	**N**	1020	1	9	830	180	108	27	42	0	2	1
	%						60%	15%	23%	0%	1%	1%
31-32	**N**	1471	1	3	1348	119	93	10	10	0	3	3
	%						78%	8%	8%	0%	3%	3%
Total included	**N**	4041	27	43	2824	1147	417	233	339	11	122	25
	%						36%	20%	30%	1%	11%	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)

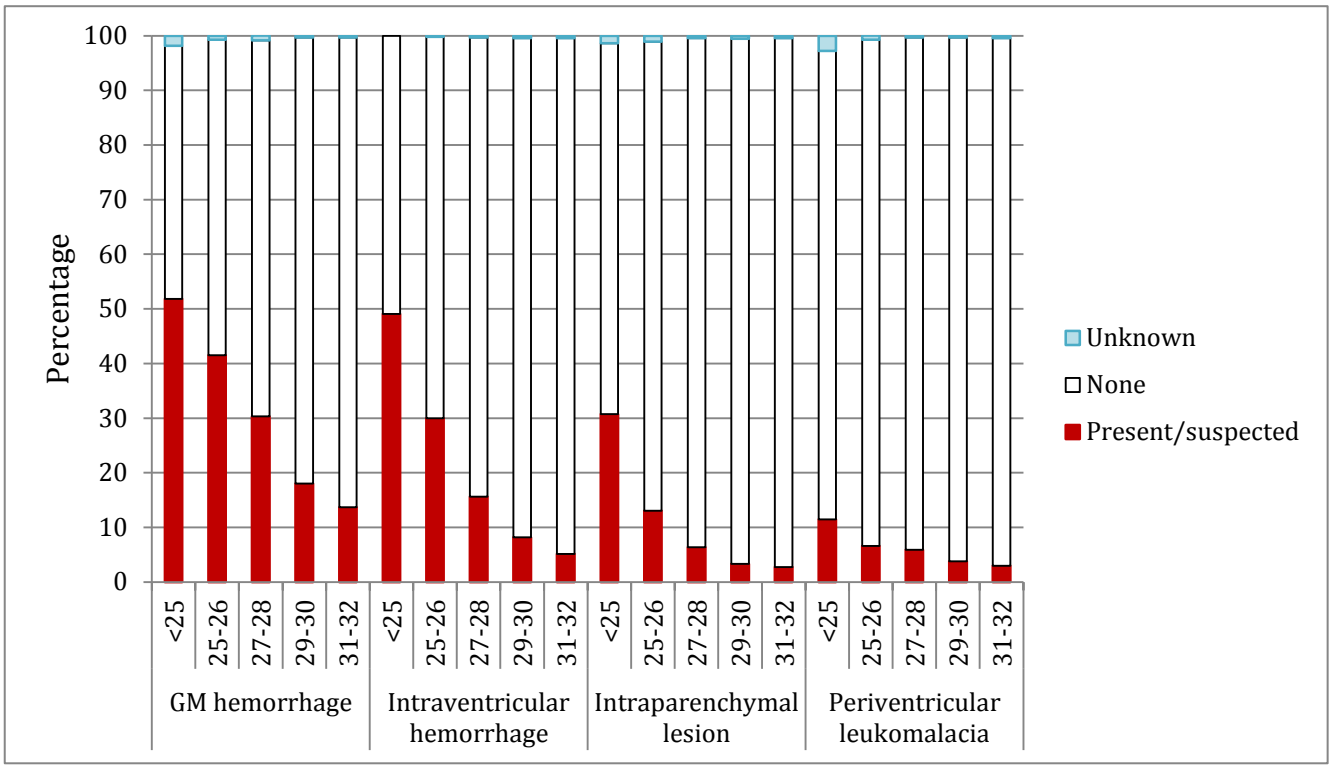


BW (grams)		Total	Missing data on PDA	PDA information unknown	No PDA	Neonates with PDA	Treatment*					
							Conse-rvative	Indom-ethacin	Ibuprofen	Indometh-acin and Ibuprofen	Medical and ligation#	Ligatio n alone
<500	**N**	36	9	5	8	14	3	2	5	0	4	0
	%						21%	14%	36%	0%	29%	0%
500-749	**N**	408	12	11	141	244	47	65	76	4	47	5
	%						19%	27%	31%	2%	19%	2%
750-999	**N**	701	2	13	293	393	97	89	133	6	56	12
	%						25%	23%	34v	2%	14%	3%
1000-1249	**N**	747	0	7	527	213	84	40	73	1	12	3
	%						39%	19%	34%	0%	6%	1%
1250-1499	**N**	855	0	3	691	161	92	27	39	0	1	2
	%						57%	17%	24%	0%	1%	1%
Total included	**N**	2747	23	39	1660	1025	323	223	326	11	120	22
	%						32%	22%	32%	1%	12%	2%

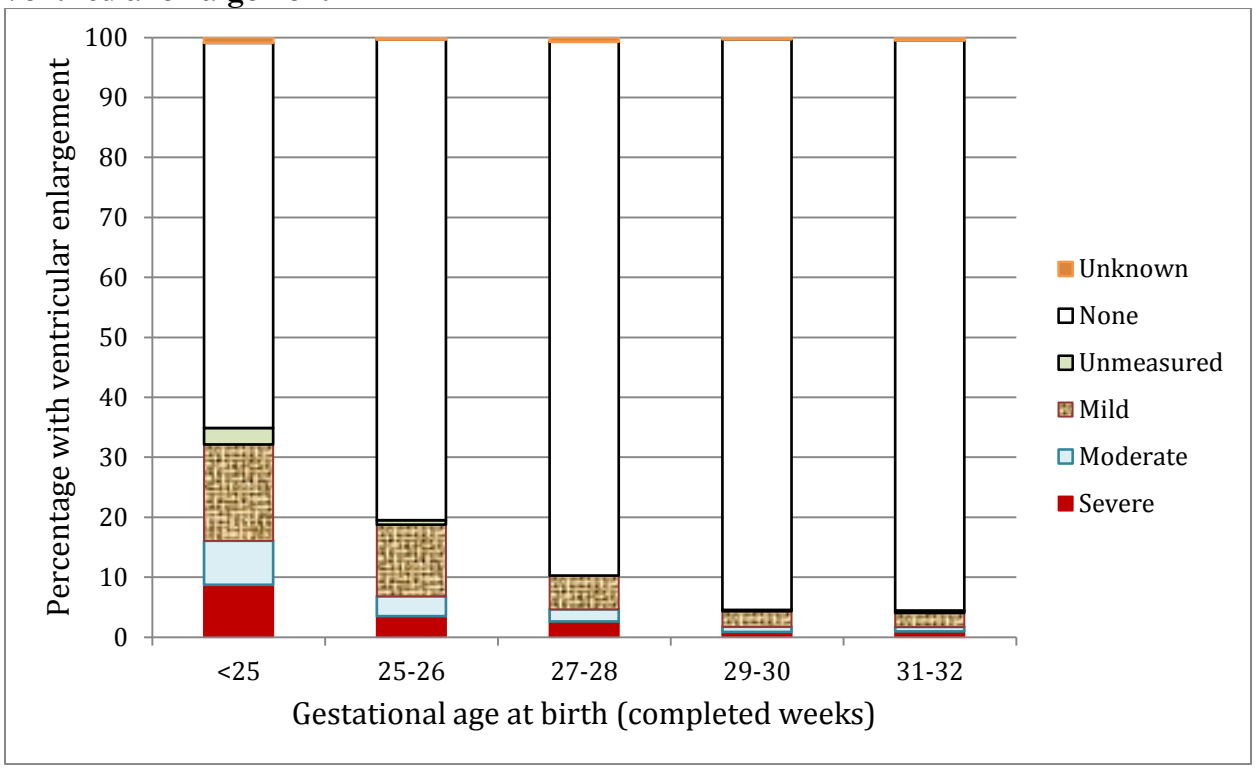
***The percentages of treatment of patent ductus arteriosus are calculated out of number of neonates with diagnosed PDA. #Medical and ligation = Ligation + at least one of (Indomethacin or Ibuprofen)**

COMMENTS: Specific reasons for treatment with indomethacin and frequency of 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)



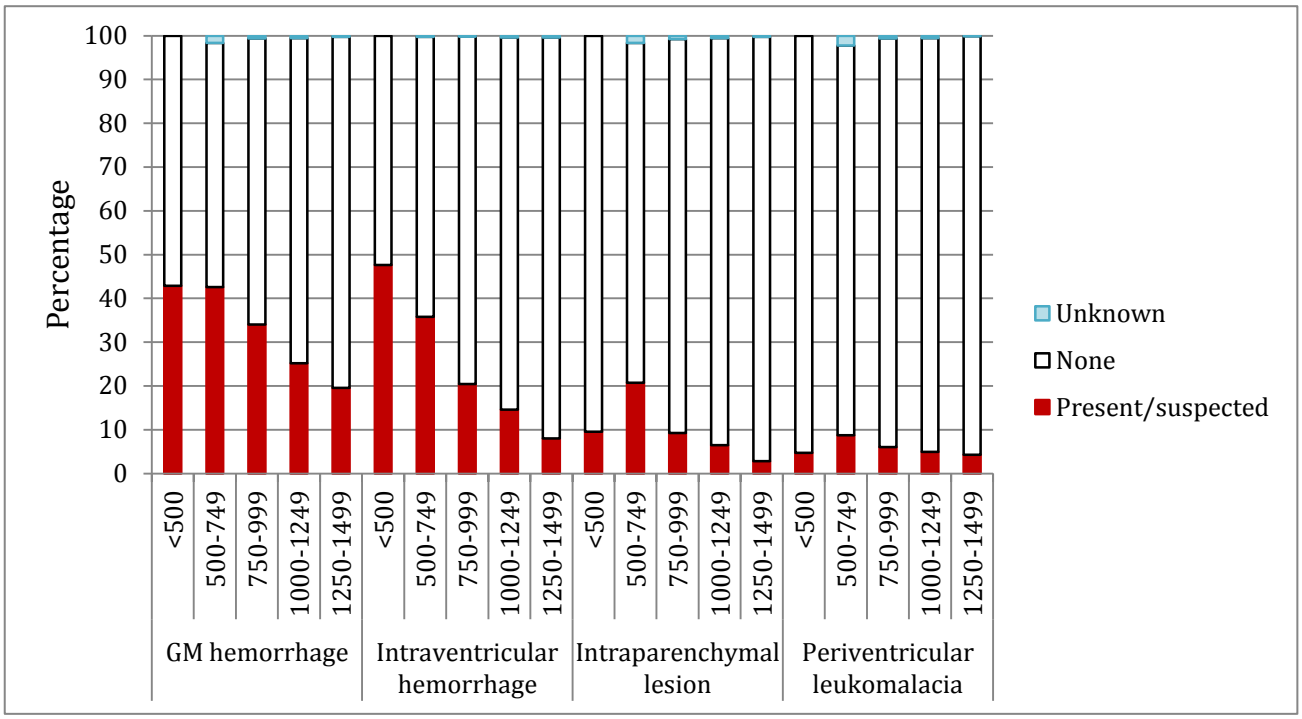
Ventricular enlargement



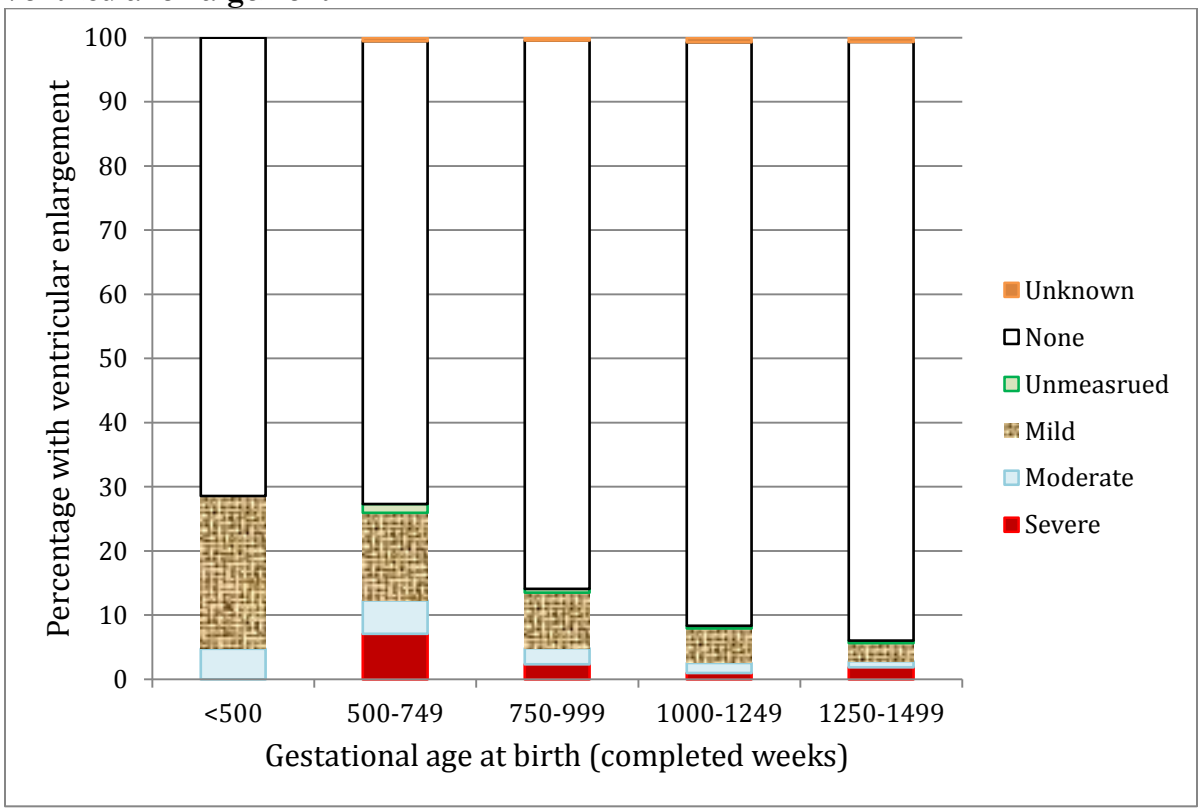
Presentation #15 (continued)
Neuroimaging findings (by GA)

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	Unmeasured	None	Unknown	Present/suspected	None	Unknown	Present/suspected	None	Unknown
<25	N	267	218	113	101	4	107	111	0	35	16	19	6	140	2	67	148	3	25	187	6
	%			52%	46%	2%	49%	51%	0%	16%	7%	9%	3%	64%	1%	31%	68%	1%	11%	86%	3%
25-26	N	560	544	226	314	4	163	380	1	65	18	19	4	436	2	71	467	6	36	504	4
	%			42%	58%	1%	30%	70%	0%	12%	3%	3%	1%	80%	0%	13%	86%	1%	7%	93%	1%
27-28	N	723	692	210	476	6	108	582	2	39	14	18	0	616	5	44	645	3	41	649	2
	%			30%	69%	1%	16%	84%	0%	6%	2%	3%	0%	89%	1%	6%	93%	0%	6%	94%	0%
29-30	N	1020	928	167	758	3	76	848	4	24	8	8	2	883	3	31	892	5	35	890	3
	%			18%	82%	0%	8%	91%	0%	3%	1%	1%	0%	95%	0%	3%	96%	1%	4%	96%	0%
31-32	N	1471	949	130	816	3	49	896	4	22	7	9	4	902	5	26	919	4	28	917	4
	%			14%	86%	0%	5%	94%	0%	2%	1%	1%	0%	95%	%1	3%	97%	0%	3%	97%	0%
Total included	N	4041	3331	846	2465	20	503	2817	11	185	63	73	16	2977	17	239	3071	21	165	3147	19
	%			25%	74%	1%	15%	85%	0%	6%	2%	2%	0%	89%	%1	7%	92%	1%	5%	94%	1%

Presentation #16
Neuroimaging findings (by BW)



Ventricular enlargement

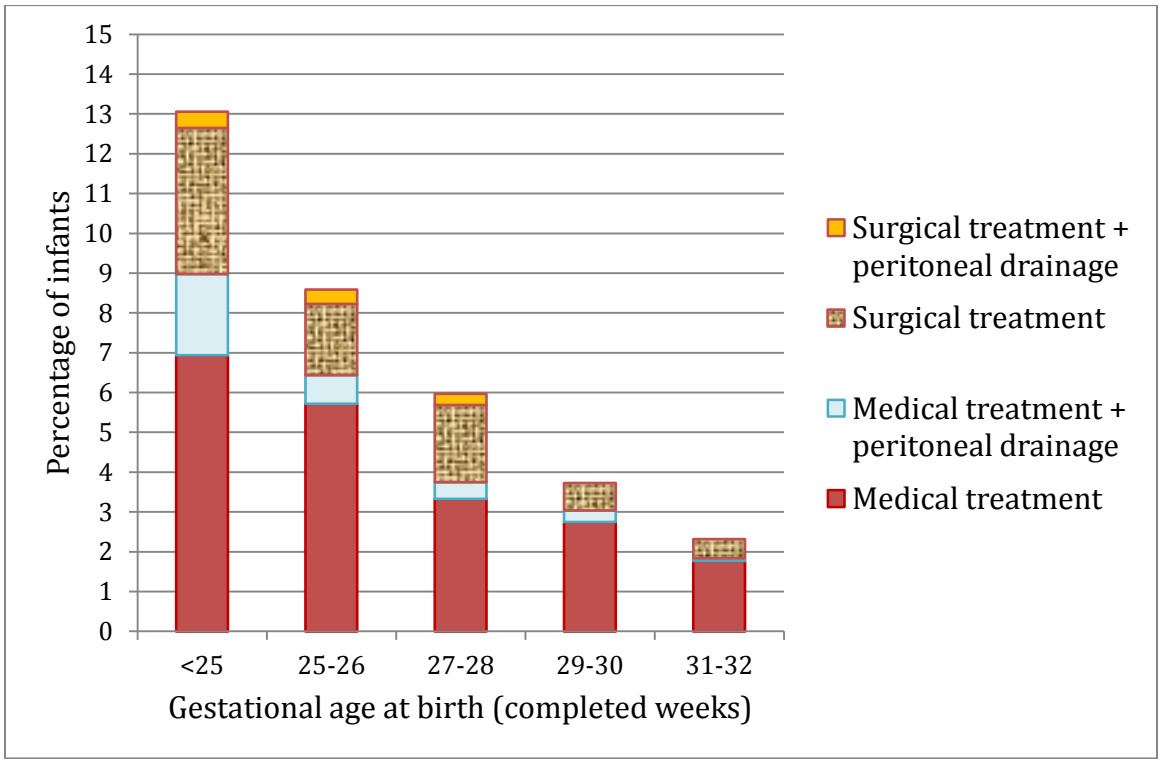


Presentation #16 (continued)
Neuroimaging findings (by BW)

BW (grams)		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	Unmeasured	None	Unknown	Present/suspected	None	Unknown	Present/suspected	None	Unknown
<500	N	36	21	9	12	0	10	11	0	5	1	0	0	15	0	2	19	0	1	20	0
	%			43%	57%	0%	48%	52%	0%	24%	5%	0%	0%	71%	0%	10%	90%	0%	5%	95%	0%
500-749	N	408	366	156	204	6	131	234	1	50	19	26	5	264	2	76	284	6	32	326	8
	%			43%	56%	2%	36%	64%	0%	14%	5%	7%	1%	72%	1%	21%	78%	2%	9%	89%	2%
750-999	N	701	681	232	445	4	139	541	1	59	17	16	4	582	3	63	613	5	41	636	4
	%			34%	65%	1%	20%	79%	0%	9%	3%	2%	1%	85%	0%	9%	90%	1%	6%	93%	1%
1000-1249	N	747	706	178	524	4	103	600	3	38	11	7	3	642	5	46	656	4	35	667	4
	%			25%	74%	1%	15%	85%	0%	5%	2%	1%	0%	91%	1%	7%	93%	1%	5%	94%	1%
1250-1499	N	855	745	146	597	2	60	682	3	21	7	14	3	695	5	21	722	2	32	712	1
	%			20%	80%	0%	8%	92%	0%	3%	1%	2%	0%	93%	1%	3%	97%	0%	4%	96%	0%
Total included	N	2747	2519	721	1782	16	443	2068	8	173	55	63	15	2198	15	208	2294	17	141	2361	17
	%			29%	71%	1%	18%	82%	0%	7%	2%	3%	1%	87%	1%	8%	91%	1%	6%	94%	1%

Presentation #17

Necrotizing enterocolitis and treatment modalities received (by GA)

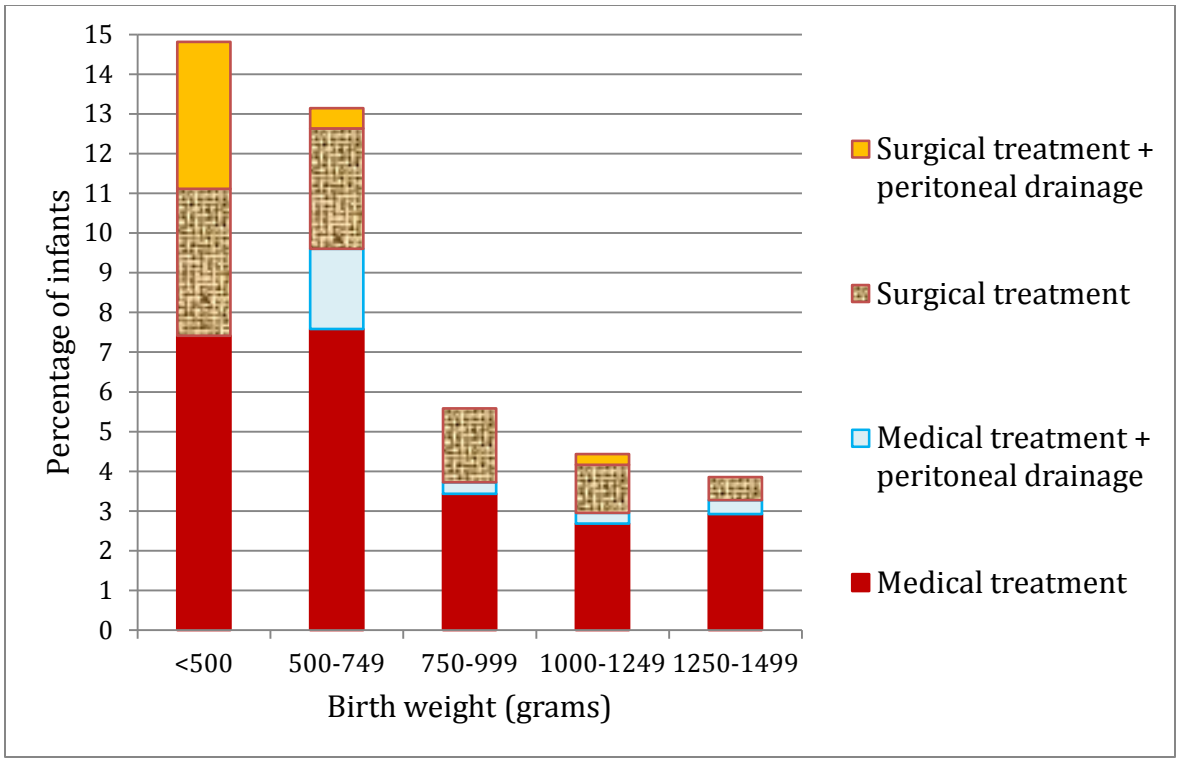


GA at birth (completed weeks)		Total number of neonates	Missing data on NEC	No NEC	Neonates with necrotizing enterocolitis*			
					Medical treatment only	Medical + peritoneal drainage	Surgical treatment	Surgical + peritoneal drainage
<25	N	267	22	213	17	5	9	1
	%			86.9%	6.9%	2.0%	3.7%	0.4%
25-26	N	560	1	511	32	4	10	2
	%			91.4%	5.7%	0.7%	1.8%	0.4%
27-28	N	723	3	677	24	3	14	2
	%			94.0%	3.3%	0.4%	1.9%	0.3%
29-30	N	1020	1	981	28	3	7	0
	%			96.3%	2.8%	0.3%	0.7%	0.0%
31-32	N	1471	1	1436	26	1	7	0
	%			97.7%	1.8%	0.1%	0.5%	0.0%
Total	N	4041	28	3818	127	16	47	5
				95.1%	3.2%	0.4%	1.2%	0.1%

***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 gas 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 pneumoperitoneum without pneumatosis are not classified as NEC.

Presentation #18
Necrotizing enterocolitis and treatment modalities received (by BW)

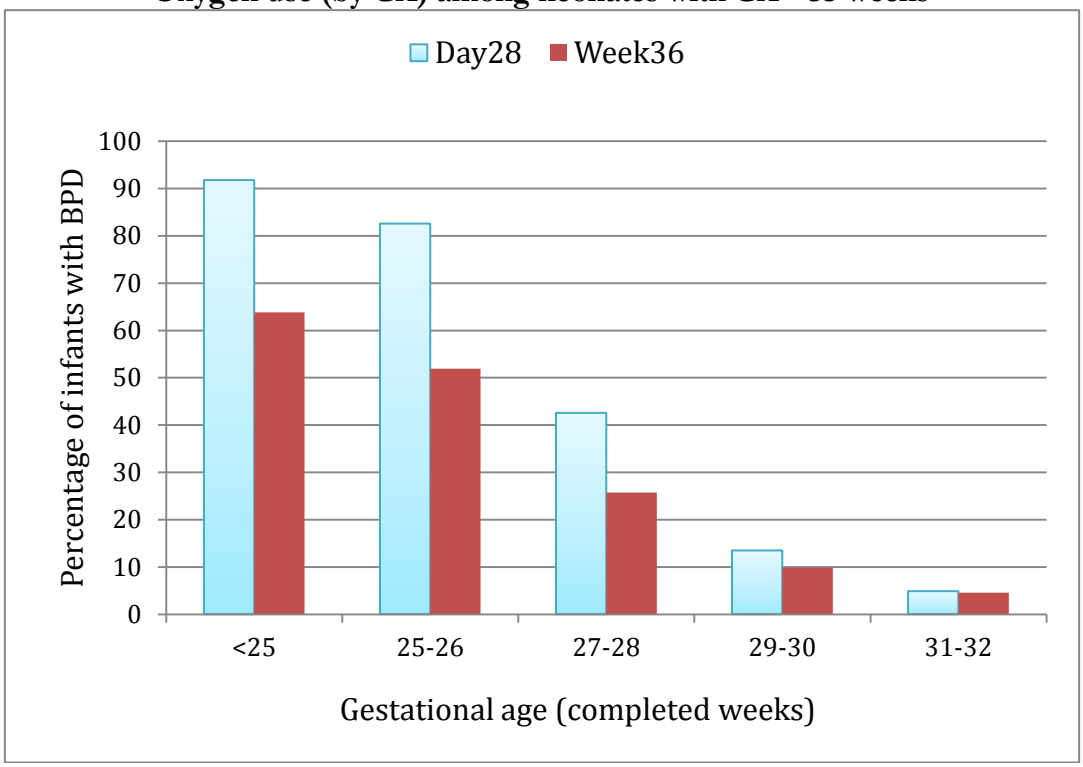


Birth weight (grams)		Total number of neonates	Missing data on NEC	No NEC	Neonates with necrotizing enterocolitis*			
					Medical treatment only	Medical + peritoneal drainage	Surgical treatment	surgical + peritoneal drainage
<500	N	36	9	23	2	0	1	1
	%			85.2%	7.4%	0.0%	3.7%	3.7%
500-749	N	408	12	344	30	8	12	2
	%			86.9%	7.6%	2.0%	3.0%	0.5%
750-999	N	701	2	660	24	2	13	0
	%			94.4%	3.4%	0.3%	1.9%	0.0%
1000-1249	N	747	1	713	20	2	9	2
	%			95.6%	2.7%	0.3%	1.2%	0.3%
1250-1499	N	855	0	822	25	3	5	0
	%			96.1%	2.9%	0.4%	0.6%	0.0%
Total	N	2747	24	2562	101	15	40	5
	%			94.1%	3.7%	0.6%	1.5%	0.2%

***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 gas 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 pneumoperitoneum without pneumatosis are not classified as NEC.

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

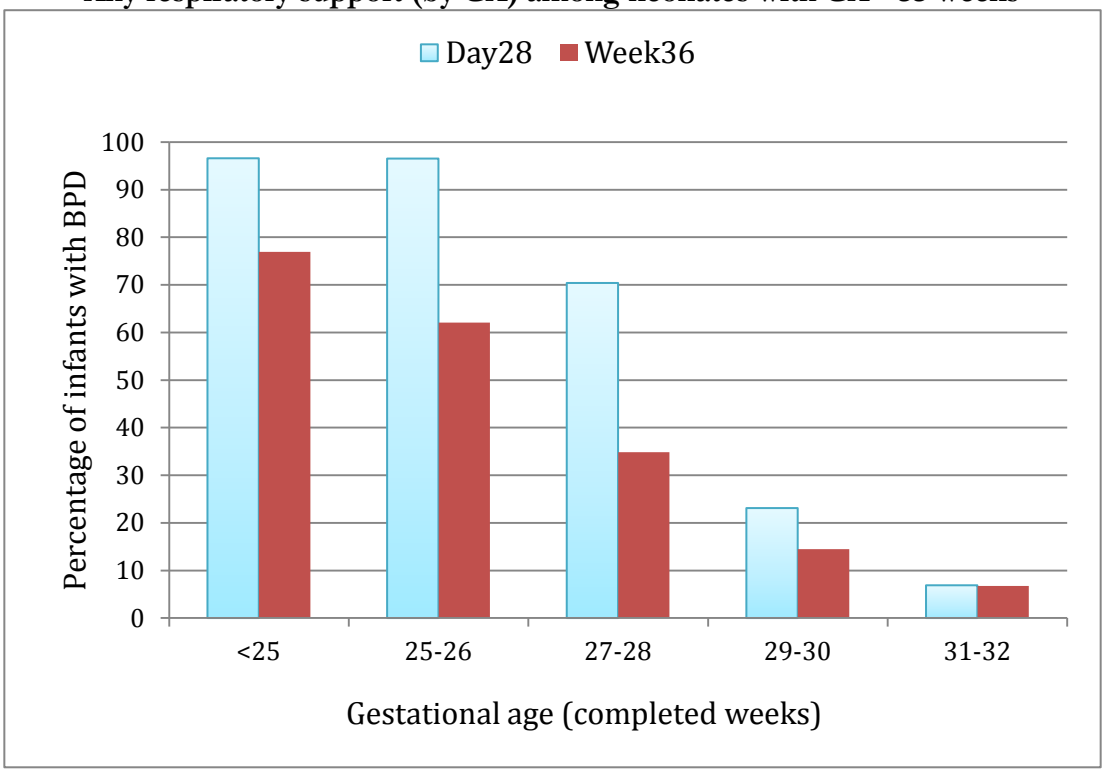


GA	Total number of neonates	Day 28				Week 36			
		Number of neonates whose oxygen use is unknown*	Number of neonates with known results	Number of neonates with oxygen use	% of neonates with oxygen use among neonates with known results	Number of neonates whose oxygen use is unknown**	Number of neonates with known results	Number of neonates with oxygen use	% of neonates with oxygen use among neonates with known results
<25	267	121	146	134	92	137	130	83	64
25-26	560	72	488	403	83	88	472	245	52
27-28	723	51	672	286	43	55	668	172	26
29-30	1 020	33	987	133	13	34	986	97	10
31-32	1 471	33	1 438	70	5	36	1 435	66	5
Total	**4 041**	**310**	**3 731**	**1 026**	**27**	**350**	**3 691**	**663**	**18**

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

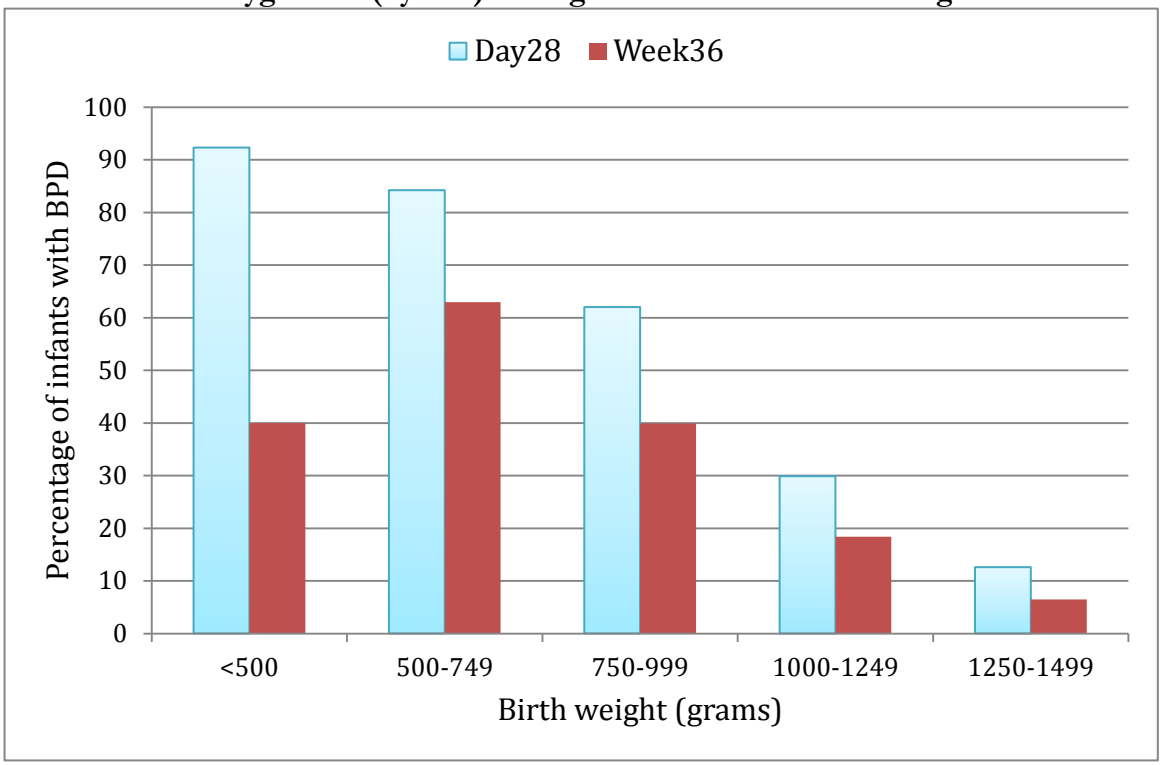


GA	Total number of neonates	Day 28				Week 36			
		Number of neonates whose respiratory support is unknown*	Number of neonates with known results	Number of neonates with any respiratory support	% of neonates with any respiratory support among neonates with known results	Number of neonates whose respiratory 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	267	121	146	141	97	137	130	100	77
25-26	560	72	488	471	97	88	472	293	62
27-28	723	51	672	473	70	55	668	233	35
29-30	1 020	33	987	228	23	34	986	143	15
31-32	1 471	33	1 438	99	7	36	1 435	97	7
Total	**4 041**	**310**	**3 731**	**1 412**	**38**	**350**	**3 691**	**866**	**23**

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 use (by BW) among neonates with BW < 1500g



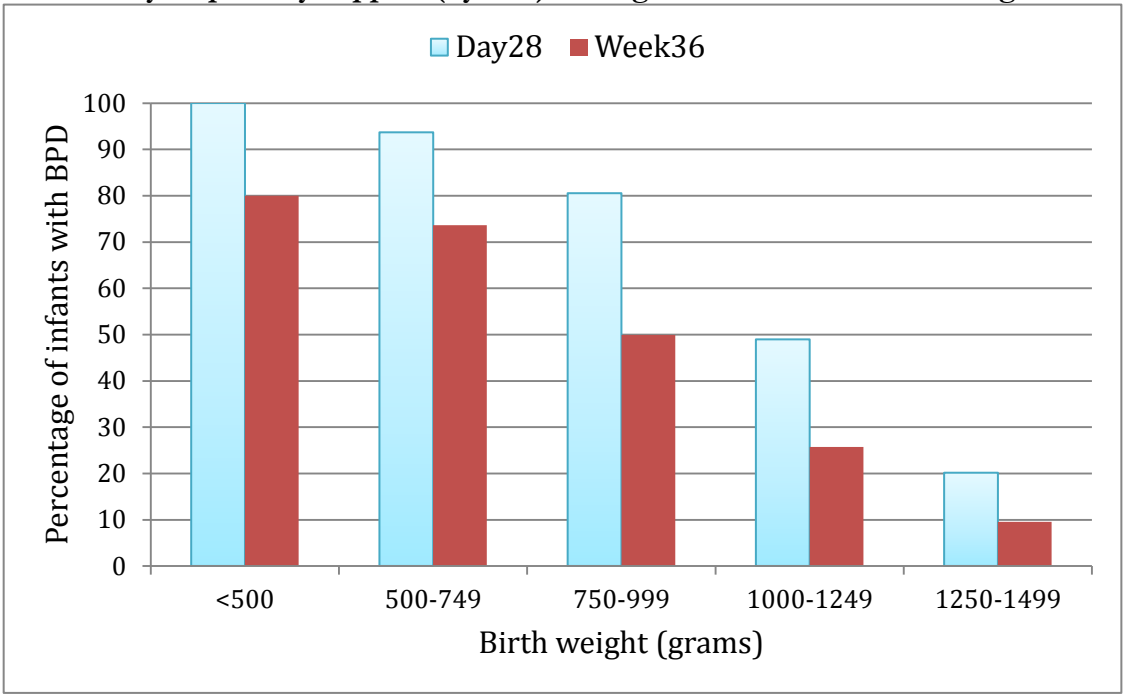
BW (grams)	Total number of neonates	Day 28				Week 36			
		Number of neonates whose oxygen use is unknown*	Number of neonates with known results	Number of neonates with oxygen use	% of neonates with oxygen use among neonates with known results	Number of neonates whose oxygen use is unknown**	Number of neonates with known results	Number of neonates with oxygen use	% of neonates with oxygen use among neonates with known results
<500	36	23	13	12	92	26	10	4	40
500-749	408	123	285	240	84	146	262	165	63
750-999	701	64	637	395	62	72	629	251	40
1000-1249	747	34	713	213	30	35	712	131	18
1250-1499	855	21	834	105	13	25	830	54	7
Total	**2 747**	**265**	**2 482**	**965**	**39**	**304**	**2 443**	**605**	**25**

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

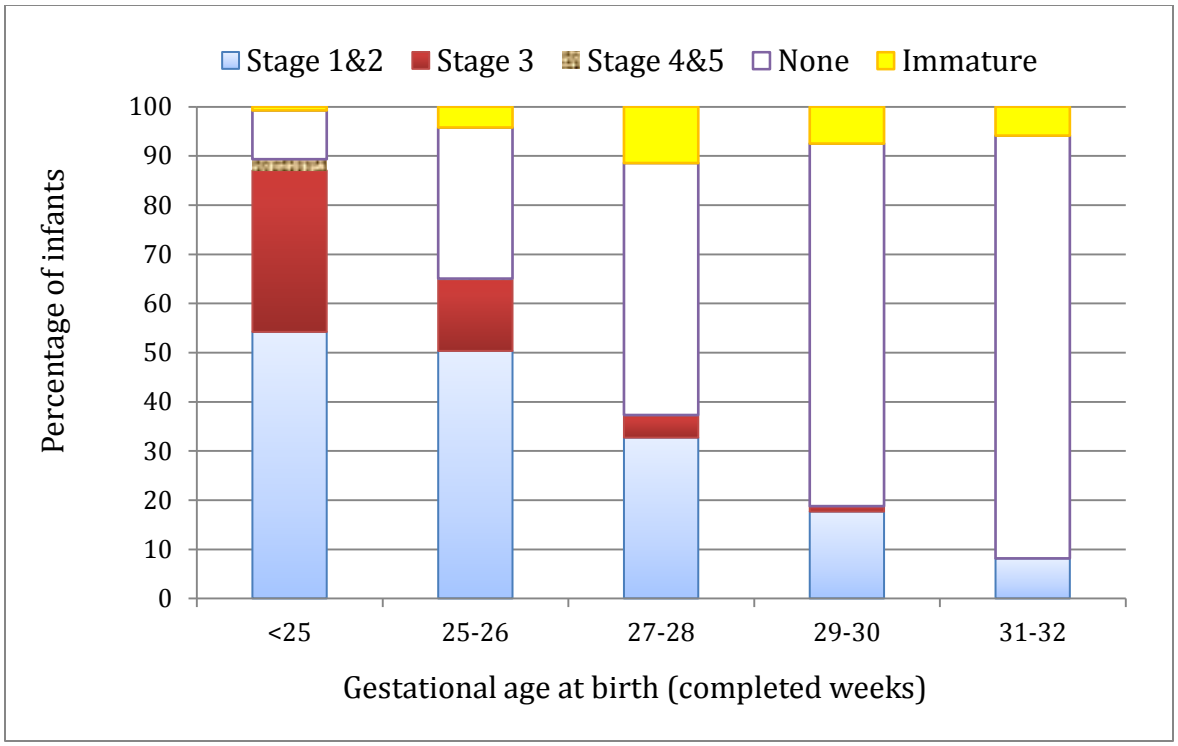


BW (grams)	Total number of neonates	Day 28				Week 36			
		Number of neonates whose respiratory support is unknown*	Number of neonates with known results	Number of neonates with any respiratory support	% of neonates with any respiratory support among neonates with known results	Number of neonates whose 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	36	23	13	13	100	26	10	8	80
500-749	408	123	285	267	94	146	262	193	74
750-999	701	64	637	513	81	72	629	314	50
1000-1249	747	34	713	349	49	35	712	183	26
1250-1499	855	21	834	168	20	25	830	79	10
Total	**2 747**	**265**	**2 482**	**1 310**	**53**	**304**	**2 443**	**777**	**32**

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)

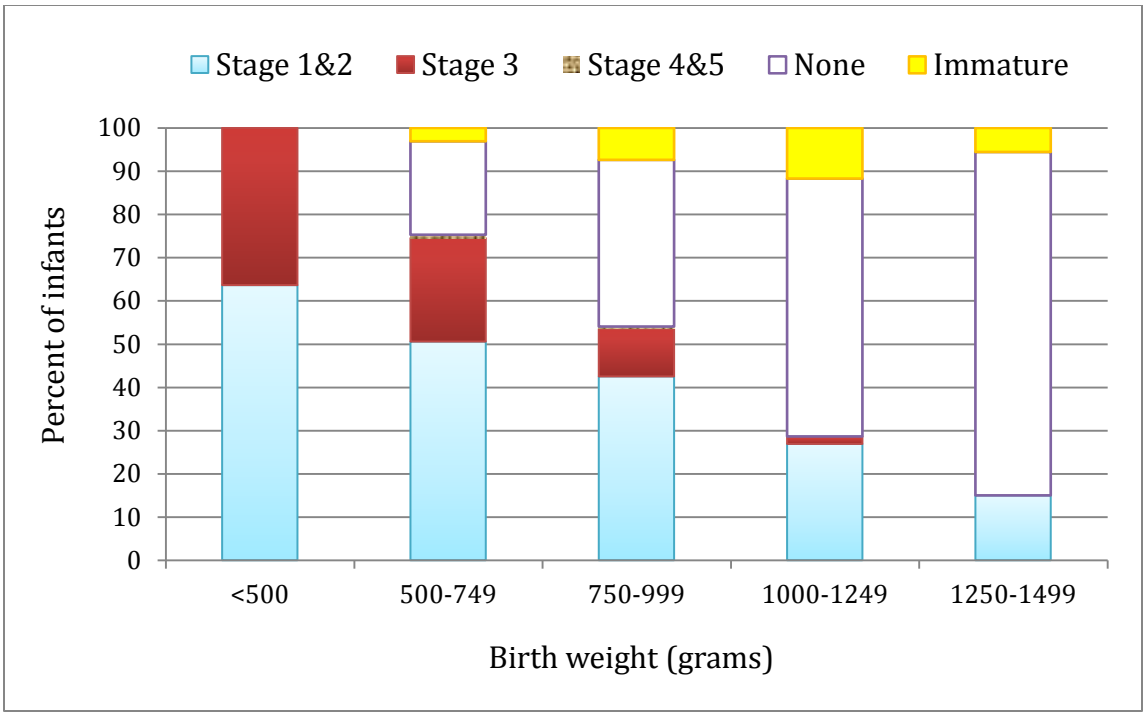


GA (completed weeks)		Total number of neonates	Number of neonates alive at 6 weeks	Number of neonates with known eye examination results	Retinopathy of prematurity*				
					Immature	None	Stages 1 & 2	Stage 3	Stage 4 & 5
<25	N	267	139	131	1	13	71	43	3
	%				1%	10%	54%	33%	2%
25-26	N	560	481	449	19	138	226	65	1
	%				4%	31%	50%	14%	0%
27-28	N	723	671	523	60	268	171	23	1
	%				11%	51%	33%	4%	0%
29-30	N	1 020	993	453	34	334	80	5	0
	%				8%	74%	18%	1%	0%
31-32	N	1 471	1 451	221	13	190	18	0	0
	%				6%	86%	8%	0%	0%
Total included	N	4 041	3 735	1 777	127	943	566	136	5
	%				7%	53%	32%	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)



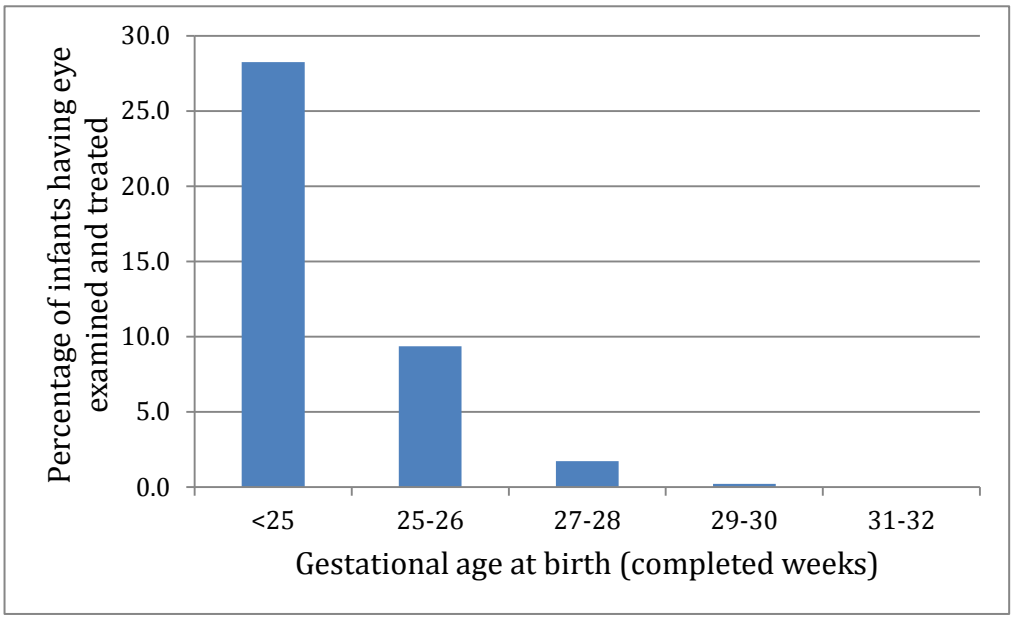
BW (grams)		Total number of neonates	Number of neonates alive at 6 weeks	Number of neonates with known eye examination results	Retinopathy of prematurity*				
					Immature	None	Stages 1 & 2	Stage 3	Stage 4 & 5
<500	N	36	12	11	0	0	7	4	0
	%				0%	0%	64%	36%	0%
500-749	N	408	273	259	8	56	131	62	2
	%				3%	22%	51%	24%	0.8%
750-999	N	701	636	555	41	214	236	61	3
	%				7%	39%	43%	11%	1%
1000-1249	N	747	710	461	54	275	124	8	0
	%				12%	60%	27%	2%	0%
1250-1499	N	855	831	360	20	286	54	0	0
	%				6%	79%	15%	0%	0.0%
Total included	N	2 747	2 462	1 646	123	831	552	135	5
	%				7%	50%	34%	8%	0.3%

***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)

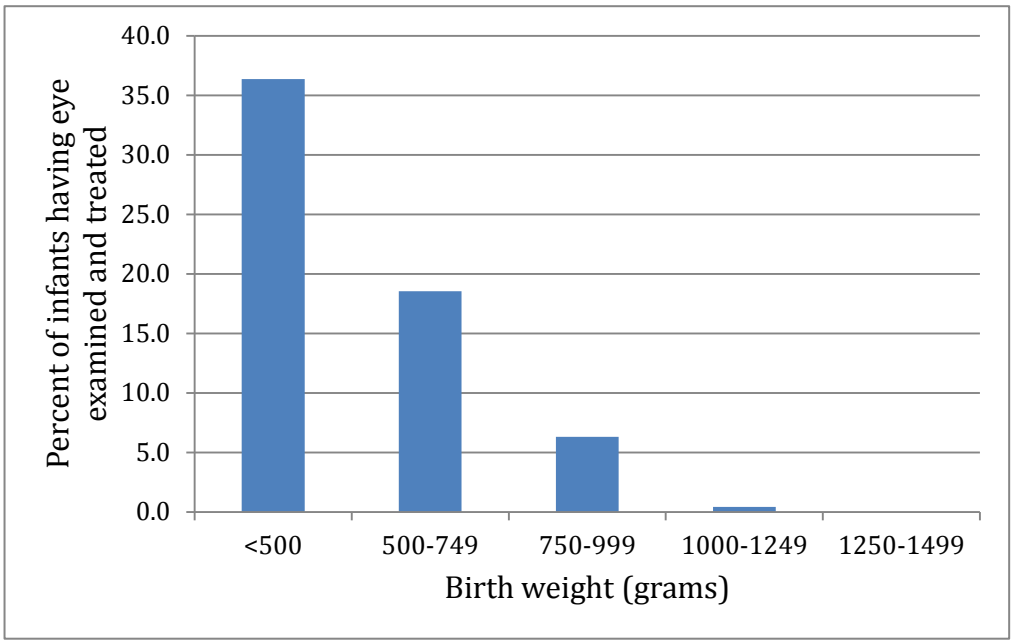


Birth GA (completed weeks)		Total number of neonates	Number of neonates with known eye examination results	Therapy for retinopathy of prematurity *	Therapy for retinopathy of prematurity **		
					Laser	Anti-VEGF	Other surgery
<25	**N**	267	131	37	28	13	0
	%			28%			
25-26	**N**	560	449	42	31	12	2
	%			9%			
27-28	**N**	723	523	9	4	5	0
	%			2%			
29-30	**N**	1 020	453	1	1	0	0
	%			0.2%			
31-32	**N**	1 471	221	0	0	0	0
	%			0%			
Total included	**N**	4 041	1 777	89	64	30	2
	%			5%			

***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 one type of therapy.**

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 as some neonates did not have eye examination 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 surgery
<500	N	36	11	4	3	1	0
	%			36%			
500-749	N	408	259	48	33	19	2
	%			19%			
750-999	N	701	555	35	28	8	0
	%			6%			
1000-1249	N	747	461	2	0	2	0
	%			0.4%			
1250-1499	N	855	360	0	0	0	0
	%			0%			
Total included	N	2 747	1646	89	64	30	2
	%			5%			

***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 one type of therapy.**

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 as some neonates did not have eye examination 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	101	40 (40)	19	5 (26)	5 (26)	3 (16)	2 (11)	0	0	4 (21)
24	166	90 (54)	47	9 (19)	20 (43)	10 (21)	5 (11)	0	0	3 (6)
25	242	189 (78)	104	29 (28)	31 (30)	14 (13)	13 (13)	0	0	17 (16)
26	318	282 (89)	134	50 (37)	29 (22)	16 (12)	1 (1)	0	0	38 (28)
27	332	303 (91)	133	43 (32)	21 (16)	4 (3)	3 (2)	1 (1)	0	61 (46)
28	391	363 (93)	150	54 (36)	18 (12)	3 (2)	0	0	0	75 (50)
29	467	453 (97)	170	40 (24)	10 (6)	1 (1)	0	0	0	119 (70)
30	553	537 (97)	207	38 (18)	4 (2)	0	0	0	0	165 (79)
31	643	631 (98)	227	27 (12)	7 (3)	0	0	0	0	193 (85)
32	828	815 (98)	367	30 (8)	4 (1)	1 (0)	0	0	0	332 (90)
Total	**4041**	**3703(92)**	**1558**	**325 (21)**	**149 (10)**	**52 (3)**	**24 (2)**	**1 (0)**	**0**	**1007 (65)**

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 higher ROP
iii. Oxygen use at 36 weeks or discharge home if earlier
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	101	40 (40)	19	7 (37)	4 (21)	2 (11)	6 (32)
24	166	90 (54)	47	23 (49)	10 (21)	3 (6)	11 (23)
25	242	189 (78)	104	47 (45)	30 (29)	2 (2)	25 (24)
26	318	282 (89)	134	53 (40)	18 (13)	2 (2)	61 (46)
27	332	303 (91)	133	42 (32)	10 (8)	1 (1)	80 (60)
28	391	363 (93)	150	41 (27)	7 (5)	0	102 (68)
29	467	453 (97)	170	29 (17)	1 (1)	0	140 (82)
30	553	537 (97)	207	14 (7)	0	0	193 (93)
31	643	631 (98)	227	18 (8)	1 (0)	0	208 (92)
32	828	815 (98)	367	14 (4)	1 (0)	0	352 (96)
Total	**4041**	**3703 (92)**	**1558**	**288 (18)**	**82 (5)**	**10 (1)**	**1178 (76)**

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 higher ROP
iii. Oxygen use at 36 weeks or discharge home if earlier

E. Site Comparisons

E.1. Site Comparisons – Population

Presentation #26
Site-specific GA categories of neonates

Site		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	1.3	2.9	3.7	10.2	17.7	14.3	49.7	384	Complete
	2	1.3	2.2	5.7	9.3	13.7	19.2	11.5	37.2	454	Complete
	3	1.9	5.0	5.8	7.5	12.6	19.2	12.8	35.2	843	Complete
	4	1.2	1.5	1.5	4.3	6.7	16.7	23.2	44.9	586	Complete
	5	20.0	45.0	35.0	0.0	0.0	0.0	0.0	0.0	20	Partial
	6	0.5	0.5	2.6	3.0	8.4	21.0	18.9	45.1	428	Complete
	7	0.0	1.2	5.6	3.7	13.0	23.0	17.4	36.0	161	Complete
	8	14.3	41.4	40.0	4.3	0.0	0.0	0.0	0.0	70	Partial
	9	4.7	4.9	5.6	8.2	11.3	17.3	14.6	33.5	574	Complete
	10	1.6	4.7	3.9	7.6	8.2	16.0	17.8	40.2	1149	Complete
	11	0.9	0.4	1.3	1.7	4.7	11.6	20.7	58.6	232	Complete
	12	1.2	4.5	3.3	5.7	10.5	18.0	18.6	38.1	333	Complete
	13	3.1	6.0	6.2	6.7	13.1	24.9	16.7	23.2	449	Complete
	14	1.2	1.4	3.4	4.6	4.5	14.4	16.1	54.5	697	Complete
	15	2.3	3.8	4.8	3.4	7.6	9.9	10.9	57.4	477	Complete
	16	6.0	10.0	17.0	21.0	31.0	2.7	1.8	10.5	448	Partial
	17	6.2	11.2	17.4	33.7	30.3	1.1	0.0	0.0	178	Partial
	18	1.0	3.2	7.3	9.6	14.3	12.1	12.0	40.5	602	Complete
	19	0.8	1.2	2.3	6.6	7.8	19.1	18.5	43.8	665	Complete
	20	1.2	0.0	5.2	2.9	7.5	12.1	28.7	42.5	174	Complete
	21	0.7	2.0	2.9	4.6	8.4	20.3	18.3	43.0	454	Complete
	22	2.4	5.6	5.3	7.1	15.0	18.5	17.4	28.8	340	Complete
	23	1.0	1.4	2.1	3.8	8.8	12.5	22.0	48.5	423	Complete
	24	2.2	3.7	4.6	9.1	12.3	17.1	15.4	35.6	862	Complete
	25	0.0	0.4	0.8	2.9	4.5	6.2	11.5	73.7	243	Complete
	26	1.3	0.0	0.0	3.4	0.7	6.7	12.1	75.8	149	Complete
	27	5.0	5.0	15.0	30.0	40.0	1.7	1.7	1.7	60	Partial
	28	2.5	7.8	4.5	7.4	10.1	16.3	14.1	37.3	1152	Complete
	29	2.6	7.0	13.1	15.4	14.8	16.4	11.2	19.6	573	Complete
	30	0.8	1.9	3.8	4.4	6.5	16.9	23.7	42.0	367	Complete
Total		2.0	4.1	5.3	7.5	10.9	15.7	15.3	39.1	13547	

Number of neonates with missing GA = 2

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

Presentation #27
Site-specific BW categories of neonates

Site		BW (g) <500	500-749	750-999	1000-1249	1250-1499	1500-2499	≥2500	Total number of neonates	Criteria of data collecting
Neonates per site (%)	**1**	0.0	1.3	0.8	3.4	5.2	27.3	62.0	384	Complete
	2	0.4	1.8	4.0	5.7	7.1	35.7	45.4	454	Complete
	3	0.5	4.0	6.2	5.2	6.8	34.5	42.8	843	Complete
	4	0.3	1.9	1.0	2.4	2.9	34.1	57.4	584	Complete
	5	0.0	30.0	45.0	25.0	0.0	0.0	0.0	20	Partial
	6	0.0	0.7	2.3	1.6	3.5	40.0	51.9	428	Complete
	7	0.0	1.2	6.2	3.7	3.7	37.9	47.2	161	Complete
	8	4.2	18.3	39.4	29.6	7.0	1.4	0.0	71	Partial
	9	1.2	3.8	6.3	6.3	6.1	37.2	39.1	573	Complete
	10	0.2	2.9	5.6	4.8	6.1	34.3	46.2	1149	Complete
	11	0.4	0.9	1.7	2.2	1.7	32.3	60.8	232	Complete
	12	0.0	3.0	3.3	4.8	1.8	42.3	44.7	333	Complete
	13	0.2	4.7	5.8	6.3	8.5	45.1	29.5	448	Complete
	14	0.3	1.3	2.3	2.7	4.0	29.6	59.8	697	Complete
	15	0.2	2.9	4.6	4.6	5.0	22.9	59.7	476	Complete
	16	0.7	8.3	12.5	16.3	15.0	34.8	12.5	448	Partial
	17	0.6	10.1	14.0	21.9	18.5	34.8	0.0	178	Partial
	18	0.2	2.0	6.5	7.1	9.5	28.9	45.9	602	Complete
	19	0.0	0.5	2.4	4.1	4.7	35.0	53.4	665	Complete
	20	0.0	0.6	2.9	2.9	2.9	33.9	56.9	174	Complete
	21	0.0	1.1	2.9	2.2	3.5	37.0	53.3	454	Complete
	22	0.3	5.0	5.3	5.9	9.1	40.3	34.1	340	Complete
	23	0.0	1.4	2.4	1.7	4.3	32.2	58.2	423	Complete
	24	0.1	2.6	4.5	6.0	6.0	36.2	44.6	862	Complete
	25	0.0	0.0	0.8	0.8	2.5	14.5	81.4	242	Complete
	26	0.7	0.7	0.7	0.7	0.7	16.8	79.9	149	Complete
	27	0.0	10.0	11.7	13.3	28.3	36.7	0.0	60	Partial
	28	0.2	4.4	7.1	5.6	7.0	34.2	41.5	1152	Complete
	29	0.2	5.8	11.0	12.0	11.7	36.5	22.9	573	Complete
	30	0.0	0.8	2.7	2.7	4.4	36.2	53.1	367	Complete
Total		0.3	3.0	5.2	5.5	6.3	33.9	45.9	13542	

Number of neonates with missing BW = 7

*Please note that five 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)								
	<25	**25-26**	**27-28**	**29-30**	**31-32**	**33-34**	**35-36**	**≥37**	**Overall survival rate for sites***
Aϕ	27.3	75.0	96.8	98.3	100.0	100.0	NA	NA	91.6
B	0.0	83.3	77.8	100.0	100.0	100.0	98.9	98.0	97.2
C	53.3	87.5	94.7	97.7	98.8	100.0	100.0	99.1	96.5
D	48.3	83.3	90.4	91.8	98.3	96.3	96.9	98.6	94.6
E	50.0	100.0	100.0	100.0	90.9	100.0	100.0	99.3	98.7
F	57.1	77.8	100.0	96.0	100.0	99.0	97.1	99.2	97.8
G	0.0	77.8	92.3	95.2	97.4	100.0	98.8	99.0	97.6
H	25.0	73.3	100.0	100.0	100.0	100.0	100.0	97.6	97.0
I	71.4	77.8	89.3	93.3	96.6	98.2	98.7	100.0	95.5
Jϕ	30.0	72.4	89.3	100.0	NA	NA	NA	NA	74.3
K	45.5	77.8	95.7	87.5	86.1	89.4	92.3	93.1	90.4
L	62.5	89.5	88.9	100.0	100.0	100.0	100.0	100.0	97.9
M	60.0	100.0	73.3	95.5	100.0	97.6	98.4	99.7	97.9
N	50.0	NA	100.0	80.0	92.3	100.0	100.0	100.0	98.3
O	62.5	100.0	91.7	96.9	100.0	98.0	96.4	98.7	97.6
P	50.0	100.0	100.0	100.0	97.2	98.9	100.0	99.5	99.1
Q	66.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7
R	NA	100.0	100.0	100.0	100.0	94.6	100.0	98.3	98.1
S	50.0	NA	NA	100.0	100.0	100.0	100.0	100.0	99.3
T	72.2	96.3	95.6	100.0	97.9	99.5	98.5	98.7	98.2
U	66.7	100.0	96.2	100.0	100.0	100.0	100.0	99.4	99.1
Vϕ	33.3	84.4	94.7	96.8	99.3	91.7	100.0	87.2	91.1
Wϕ	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
X	50.0	76.2	83.7	92.1	98.1	100.0	98.1	96.6	94.7
Y	NA	100.0	100.0	100.0	100.0	86.7	96.4	98.3	97.5
Z	63.2	93.8	92.5	100.0	99.1	100.0	97.0	98.4	97.4
AA	100.0	60.0	100.0	100.0	100.0	98.5	100.0	98.4	98.4
AB	25.9	75.0	90.6	95.7	95.4	98.0	97.6	97.9	92.5
AC	50.0	78.9	81.8	100.0	97.7	93.2	94.4	96.3	94.2
ADϕ	75.0	88.9	100.0	NA	NA	NA	NA	NA	90.0
Overall survival rate for GA**	48.7	84.1	92.1	97.1	98.3	98.4	98.2	98.2	96.3

These analyses include 13 547 neonates from 30 hospitals (2 neonates had missing data for GA). **Twenty-five hospitals collected data on all eligible admissions whereas five 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 five 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

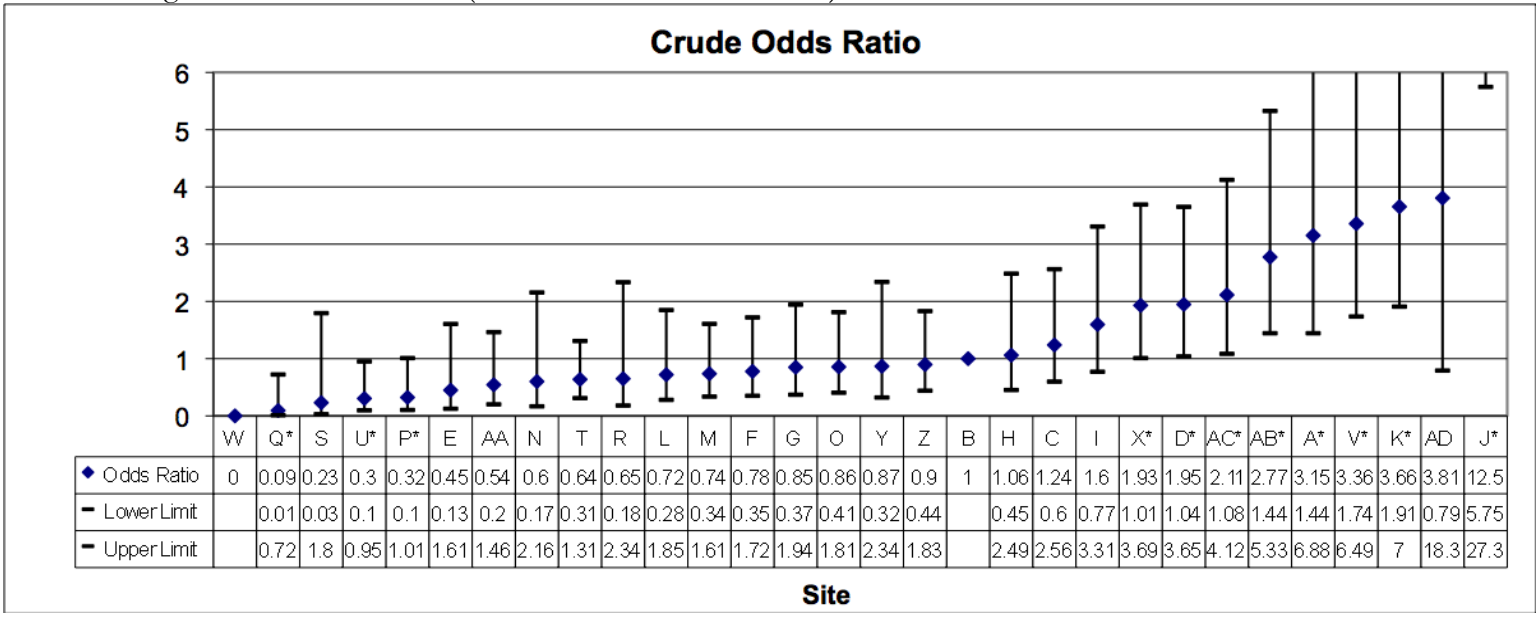
Site	Percentage survival for each BW (g) category							
	<500	**500-749**	**750-999**	**1000-1249**	**1250-1499**	**1500-2499**	**≥2500**	**Overall survival rate for sites***
Aϕ	0.0	44.4	88.0	97.4	100.0	100.0	NA	91.6
B	NA	16.7	100.0	85.7	94.4	99.3	98.4	97.2
C	100.0	69.7	95.2	97.1	95.5	99.5	99.2	96.5
D	0.0	56.9	90.2	95.3	95.1	95.9	98.5	94.6
E	0.0	100.0	75.0	100.0	100.0	100.0	99.3	98.7
F	50.0	72.7	100.0	92.9	100.0	98.5	98.5	97.8
G	NA	60.0	76.9	80.0	100.0	99.4	98.8	97.6
H	NA	50.0	81.8	100.0	100.0	99.3	98.7	97.0
I	0.0	66.7	84.6	96.4	97.4	97.5	100.0	95.8
Jϕ	33.3	53.8	71.4	85.7	100.0	100.0	NA	73.2
K	0.0	50.0	86.4	90.9	83.3	89.9	93.7	90.3
L	0.0	70.6	100.0	95.0	100.0	100.0	100.0	97.9
M	NA	66.7	93.8	85.2	93.5	98.7	99.2	97.9
N	NA	0.0	100.0	100.0	100.0	96.6	100.0	98.3
O	100.0	55.6	100.0	94.7	96.4	97.1	98.8	97.6
P	NA	66.7	100.0	85.7	100.0	98.8	100.0	99.1
Q	NA	66.7	100.0	100.0	100.0	100.0	100.0	99.7
R	NA	100.0	100.0	100.0	83.3	98.4	98.7	98.1
S	0.0	100.0	100.0	100.0	100.0	100.0	100.0	99.3
T	100.0	84.8	98.4	96.4	97.1	98.7	98.9	98.2
U	50.0	87.5	100.0	96.2	100.0	100.0	99.5	99.1
Vϕ	33.3	56.8	80.4	98.6	98.5	98.1	89.3	91.1
Wϕ	NA	100.0	100.0	100.0	100.0	100.0	NA	100.0
X	0.0	58.8	88.5	95.5	96.5	97.6	97.2	94.7
Y	NA	NA	100.0	100.0	100.0	94.3	98.0	97.5
Z	100.0	68.2	92.3	96.2	100.0	99.4	97.9	97.4
AA	NA	80.0	66.7	100.0	100.0	100.0	98.3	98.4
AB	0.0	54.5	75.0	91.7	94.3	96.2	98.7	92.7
AC	0.0	66.7	84.6	93.0	96.5	94.3	96.7	94.2
ADϕ	NA	83.3	88.9	100.0	NA	NA	NA	90.0
Overall survival rate for BW**	27.8	63.5	89.4	95.0	97.0	98.0	98.4	96.3

These analyses include 13 542 neonates from 30 hospitals (7 neonates had missing data for BW). **Twenty-five hospitals collected data on all eligible admissions whereas five 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 five 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

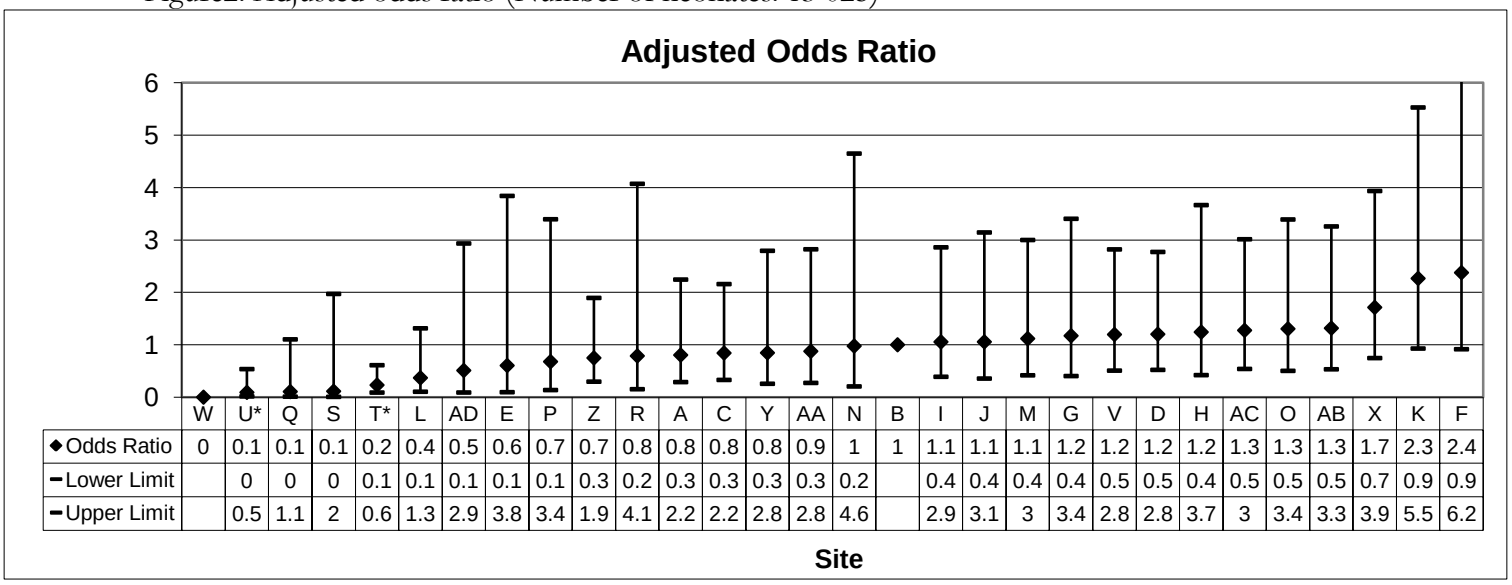
Presentation #30
Site comparison of mortality

Figure1: Crude odds ratio (Number of neonates: 13 549)



	W	Q*	S	U*	P*	E	AA	N	T	R	L	M	F	G	O	Y	Z	B	H	C	I	X*	D*	AC*	AB*	A*	V*	K*	AD	J*
Odds Ratio	0	0.09	0.23	0.3	0.32	0.45	0.54	0.6	0.64	0.65	0.72	0.74	0.78	0.85	0.86	0.87	0.9	1	1.06	1.24	1.6	1.93	1.95	2.11	2.77	3.15	3.36	3.66	3.81	12.5
Lower Limit		0.01	0.03	0.1	0.1	0.13	0.2	0.17	0.31	0.18	0.28	0.34	0.35	0.37	0.41	0.32	0.44		0.45	0.6	0.77	1.01	1.04	1.08	1.44	1.44	1.74	1.91	0.79	5.75
Upper Limit		0.72	1.8	0.95	1.01	1.61	1.46	2.16	1.31	2.34	1.85	1.61	1.72	1.94	1.81	2.34	1.83		2.49	2.56	3.31	3.69	3.65	4.12	5.33	6.88	6.49	7	18.3	27.3

Figure2: Adjusted odds ratio (Number of neonates: 13 025)



	W	U*	Q	S	T*	L	AD	E	P	Z	R	A	C	Y	AA	N	B	I	J	M	G	V	D	H	AC	O	AB	X	K	F
Odds Ratio	0	0.1	0.1	0.1	0.2	0.4	0.5	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.9	1	1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.7	2.3	2.4
Lower Limit		0	0	0	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.3	0.3	0.3	0.3	0.2		0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.5	0.5	0.7	0.9	0.9
Upper Limit		0.5	1.1	2	0.6	1.3	2.9	3.8	3.4	1.9	4.1	2.2	2.2	2.8	2.8	4.6		2.9	3.1	3	3.4	2.8	2.8	3.7	3	3.4	3.3	3.9	5.5	6.2

Reference site: B

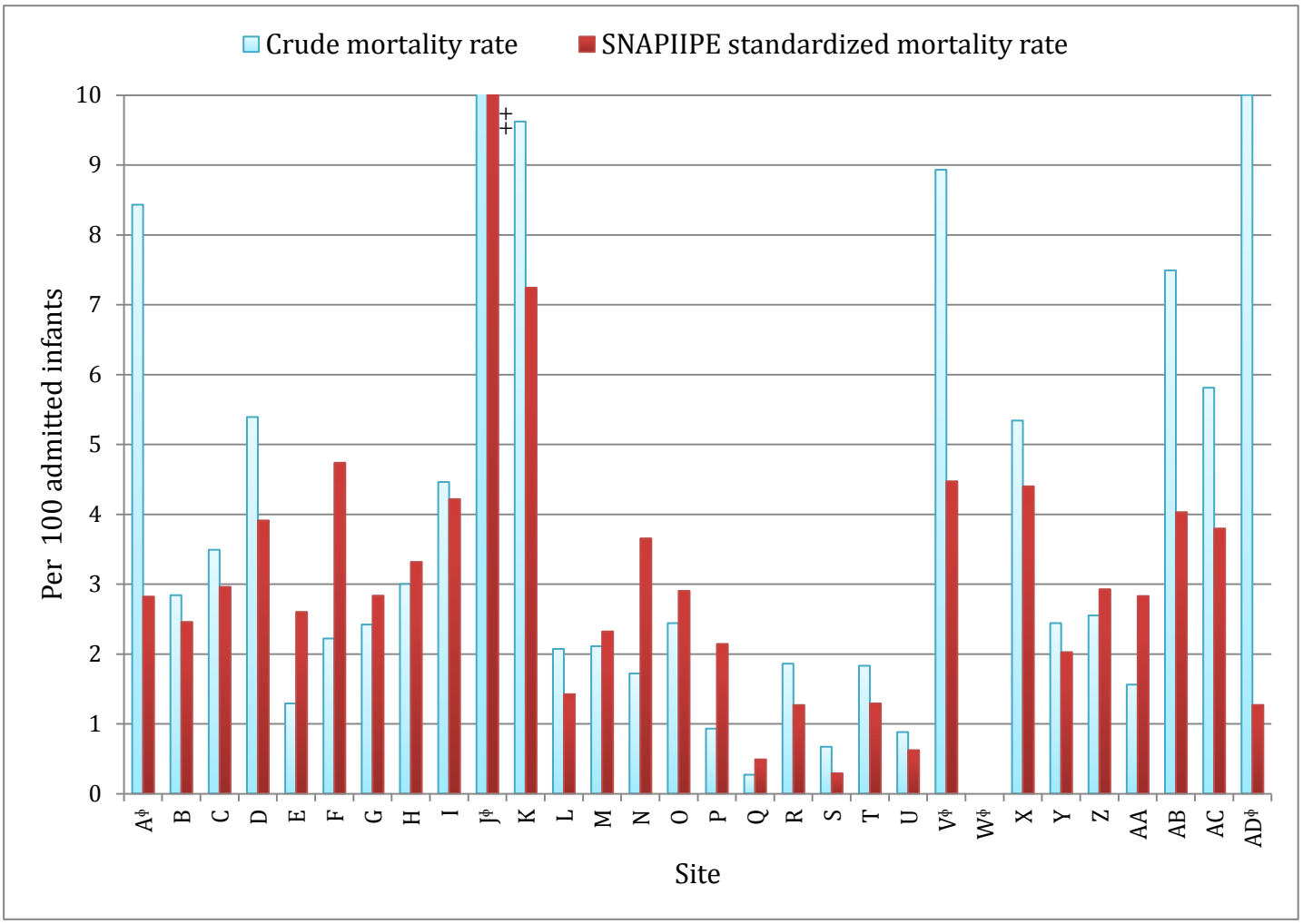
***Sites significantly different from reference site (P<0.05)**

Inclusion criteria:
All neonates included

Significant predictors identified by multivariate analysis and adjusted for:
Congenital anomalies
Apgar at 5 min
GA
SGA (BW <10th centile for GA)
SNAP-II
Outborn

Mortality is attributed to the network hospital of first admission

Presentation #31
SNAP-II PE standardized site mortality rates



‡ Site J has a crude mortality rate of 27% and an adjusted mortality rate of 12%, but they are not shown completely in the graph. Please refer to the table for the actual percentage for sites J.

Presentation #31 (continued)

SNAP-II PE standardized site mortality rates

Site	Mortality rate (%)	SNAP-II PE standardized rate (%)
Aϕ	8.4	2.8
B	2.8	2.5
C	3.5	3.0
D	5.4	3.9
E	1.3	2.6
F	2.2	4.7
G	2.4	2.8
H	3.0	3.3
I	4.5	4.2
Jϕ	26.8	12.2
K	9.6	7.2
L	2.1	1.4
M	2.1	2.3
N	1.7	3.7
O	2.4	2.9
P	0.9	2.1
Q	0.3	0.5
R	1.9	1.3
S	0.7	0.3
T	1.8	1.3
U	0.9	0.6
Vϕ	8.9	4.5
Wϕ	0.0	0.0
X	5.3	4.4
Y	2.4	2.0
Z	2.6	2.9
AA	1.6	2.8
AB	7.5	4.0
AC	5.8	3.8
ADϕ	10.0	1.3
Mean	3.7	3.7

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 13 549 neonates. **Twenty-five hospitals collected data on all eligible admissions whereas five 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 five 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:

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

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

Presentation #32
Site specific morbidities among GA <33 weeks

Site	Number	Mortality	Severe neurological injury	Severe ROP	BPD	NEC stage 2 or 3	Late onset sepsis	Mortality or severe morbidity
	N	%	%	%	%	%	%	%
S	<50	12.5	0.0	0.0	16.7	0.0	0.0	25.0
R		0.0	7.1	36.4	13.2	0.0	10.5	23.7
AD*		10.0	20.0	33.3	55.6	10.0	30.0	80.0
Y		0.0	23.1	0.0	27.8	0.0	19.1	33.3
E		9.5	17.7	6.7	21.1	0.0	9.5	33.3
N		10.3	3.6	0.0	7.7	6.9	17.2	31.0
H	51-100	8.3	16.4	9.1	9.1	3.6	10.7	33.3
P		3.1	4.0	0.0	7.9	1.6	12.5	21.9
W		0.0	5.4	2.0	10.7	8.8	19.3	35.1
J*		25.7	12.5	4.3	29.4	7.7	40.6	74.3
AA		2.9	15.0	9.7	13.2	2.9	21.4	38.6
B		9.7	15.5	0.0	15.4	1.4	11.1	40.3
Q		1.6	6.0	4.8	11.1	1.6	4.7	17.2
G		9.5	8.3	12.5	10.5	11.9	20.2	36.9
F		6.7	11.1	5.7	0.0	1.1	13.5	27.0
O	101-200	5.7	12.6	12.8	18.2	7.6	18.1	41.9
K		17.3	25.0	11.1	22.6	5.8	22.1	51.9
U		2.1	2.2	12.7	6.3	0.0	11.0	19.2
L		5.8	9.6	8.2	14.2	10.1	16.7	36.7
I		10.8	7.4	3.0	10.5	2.6	19.6	34.2
M		6.5	11.0	6.7	5.2	3.2	9.7	25.0
A		8.5	11.7	4.1	18.0	4.1	10.8	38.6
AB		17.6	15.2	6.2	31.7	5.4	9.6	47.2
X	>200	12.0	6.1	8.4	23.5	10.2	17.8	40.2
C		6.3	12.9	4.7	11.3	3.3	7.6	29.7
AC		8.0	8.5	11.1	9.6	2.8	9.4	28.2
T		3.7	12.4	13.3	32.2	5.4	17.5	45.3
Z		4.7	15.5	12.8	10.7	6.2	9.5	28.7
D		11.8	12.4	12.1	28.6	4.8	20.2	47.0
V		8.7	17.5	17.1	24.3	4.2	8.7	39.9
Total CNN		8.4	12.0	8.6	18.0	4.9	14.1	37.2

Mortality or morbidity = Mortality prior to discharge or any of the five morbidities

*Site J and AD do not have complete data for infants with GA < 33 and may not be comparable with other sites.

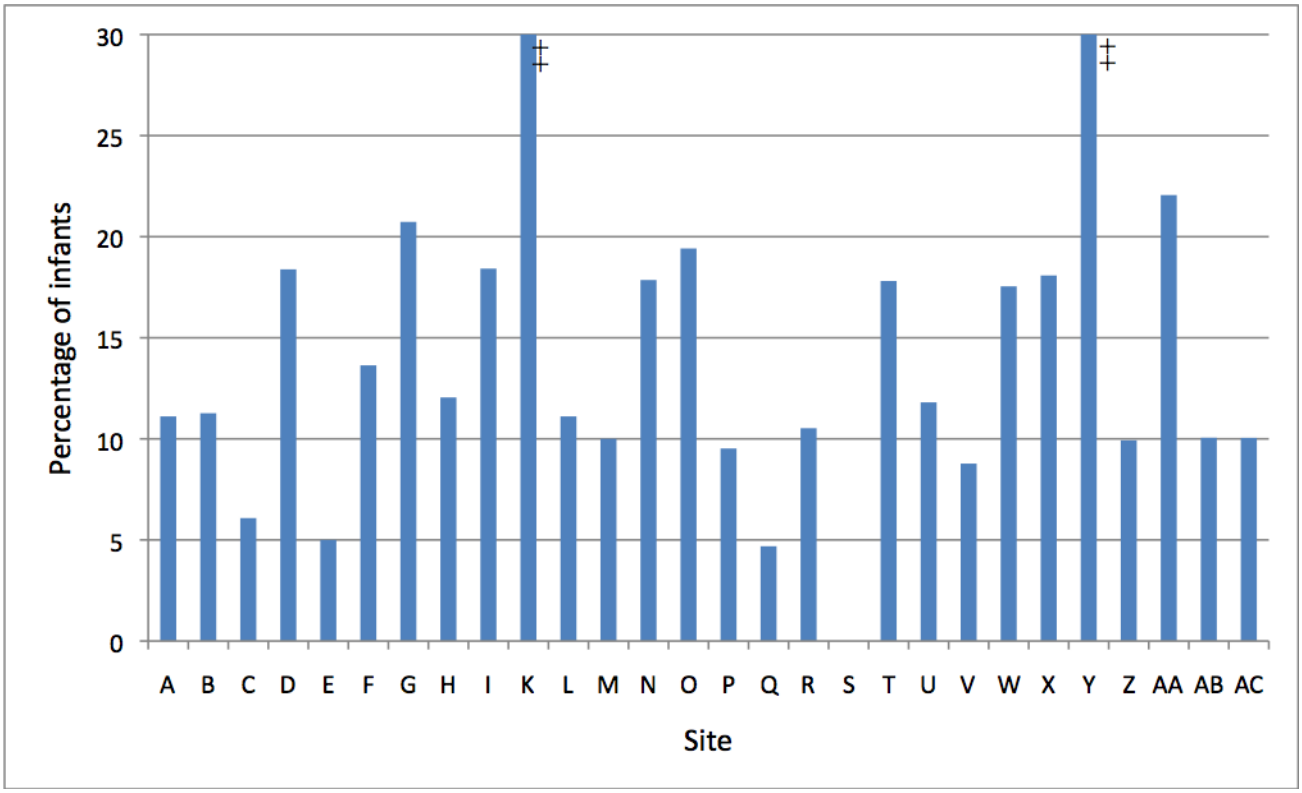
Presentation #33
Site specific morbidities among GA <29 weeks

Site	Number range	Mortality	Severe neurological injury	Severe ROP	BPD	NEC stage 2 or 3	Late onset sepsis	Mortality or severe morbidity
	N	%	%	%	%	%	%	%
W	<15	0.0	20.0	7.7	33.3	13.3	46.7	80.0
Y		0.0	0.0	0.0	50.0	0.0	33.3	33.3
S		50.0	0.0	0.0	100.0	0.0	0.0	100.0
E		16.7	50.0	20.0	40.0	0.0	16.7	66.7
R		0.0	10.0	57.1	36.4	0.0	36.4	63.6
P		6.7	7.1	0.0	21.4	0.0	33.3	60.0
N		9.1	9.1	0.0	20.0	9.1	18.2	45.5
B	16-30	36.8	36.8	0.0	41.7	0.0	15.8	79.0
AA		11.8	50.0	20.0	33.3	11.8	41.2	94.1
AD		10.0	20.0	33.3	55.6	10.0	30.0	80.0
H		23.3	32.1	14.3	21.7	3.3	13.3	60.0
Q		4.2	8.3	9.1	21.7	0.0	12.5	33.3
G		24.0	20.8	27.8	36.8	12.0	36.0	76.0
F		20.0	12.5	5.9	0.0	4.0	28.0	64.0
M		21.4	16.0	22.7	13.6	7.1	32.1	71.4
U	31-70	7.1	7.5	16.7	18.0	0.0	28.6	47.6
O		11.9	19.5	19.4	37.8	11.9	31.0	66.7
L		15.6	19.1	14.3	23.7	18.2	28.9	62.2
AC		21.7	11.1	12.5	20.0	8.7	17.4	55.1
A		22.6	17.2	5.1	43.8	8.5	22.6	74.2
J		26.9	13.1	4.4	31.3	8.1	42.4	77.6
I		18.8	11.1	5.6	20.7	4.6	26.1	53.6
K		21.2	27.5	12.9	35.0	3.9	32.7	69.2
Z	>70	13.2	34.8	16.9	34.2	12.1	23.1	68.1
V		19.6	28.0	20.7	52.5	5.4	14.2	69.6
AB		34.5	26.8	10.0	66.7	9.5	17.2	81.6
X		24.3	10.7	15.7	55.4	18.9	38.3	75.7
D		20.5	17.5	15.6	51.5	5.9	33.3	74.9
T		7.7	14.7	15.1	64.8	10.3	34.2	81.2
C		12.3	19.7	6.2	21.9	5.4	12.3	50.8
Total CNN		18.3	19.6	13.3	39.4	8.1	26.2	68.3

Mortality or morbidity = Mortality prior to discharge or any of the five morbidities

Presentation #34

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=28 hospitals, 3 951 neonates, 97 excluded due to death before 3 days of age)

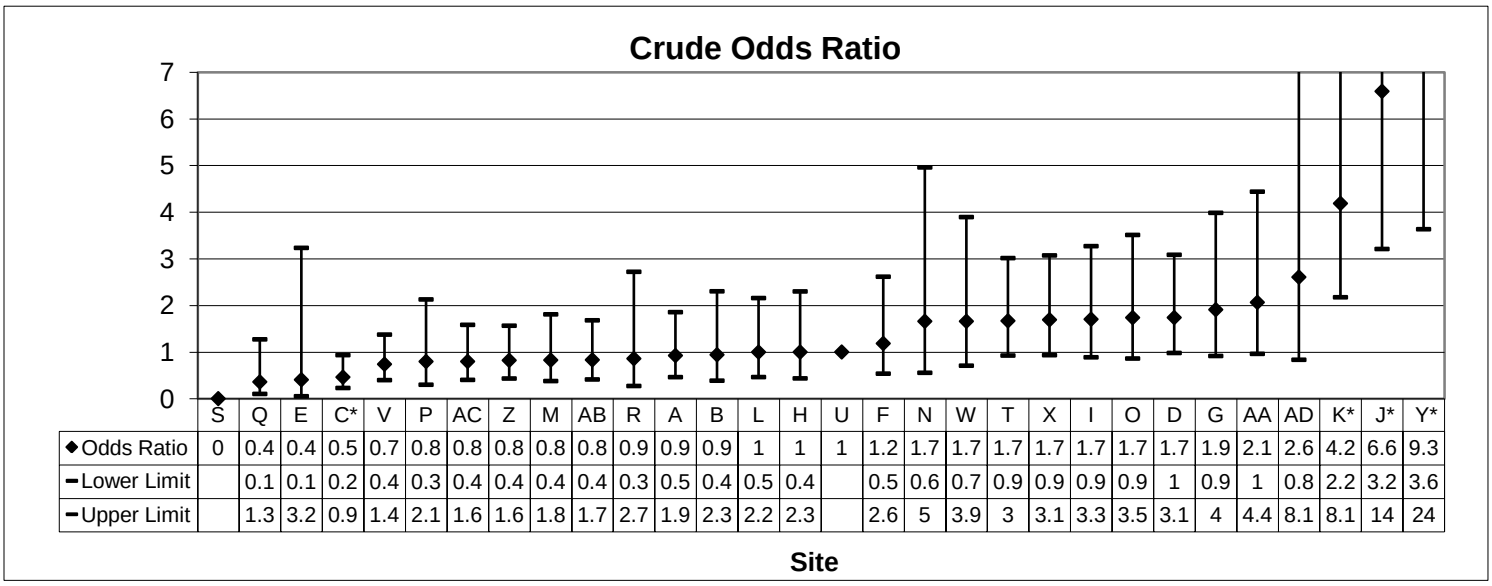


‡ Site K has a late onset sepsis rate of 35.9% and site Y has a late onset sepsis rate of 71.4%, but they are not shown completely in the graph. Please refer to the table for the actual percentages for sites K and Y.

Site	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**K**
%	11.1	11.3	6.1	18.4	5.0	13.6	20.7	12.0	18.4	35.9
Site	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**
%	11.1	10.0	17.9	19.4	9.5	4.7	10.5	0.0	17.8	11.8
Site	**V**	**W**	**X**	**Y**	**Z**	**AA**	**AB**	**AC**	**Mean**	
%	8.8	17.5	18.1	71.4	9.9	22.1	10.1	10.0	13.9	

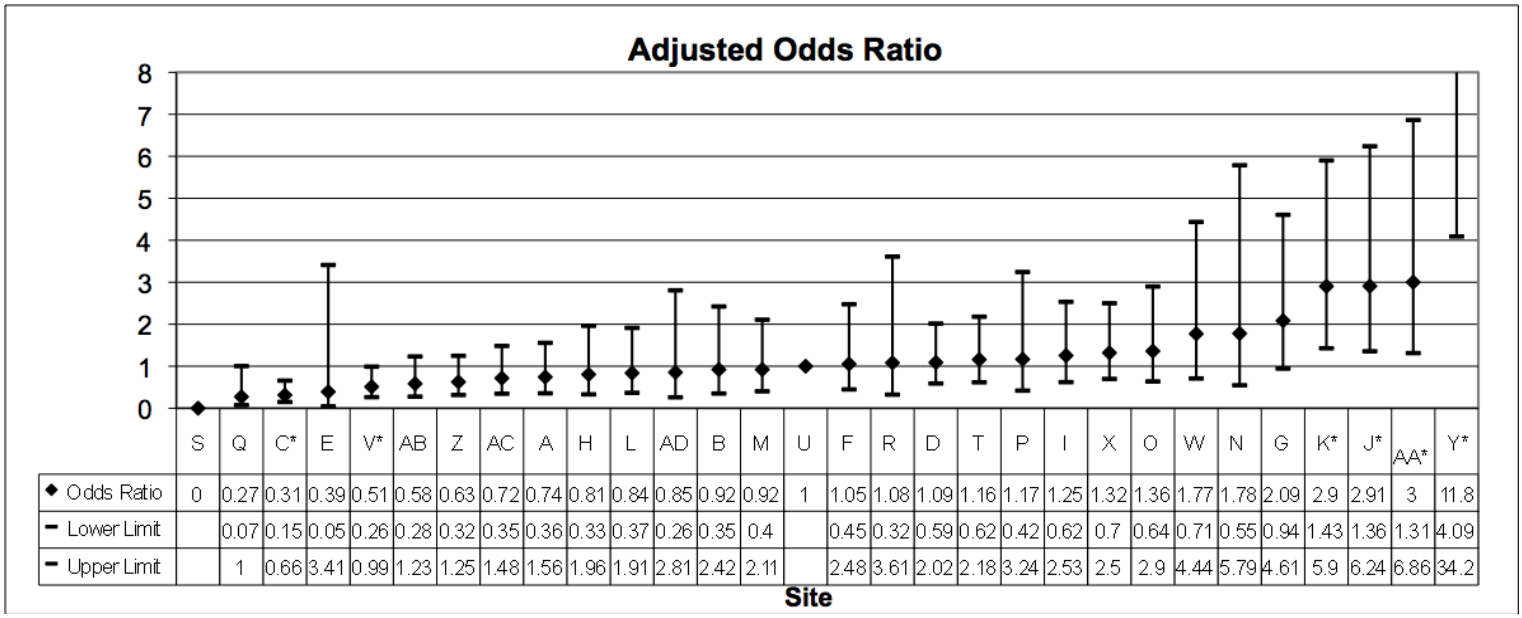
**COMMENTS: ***Late onset sepsis is defined as any positive blood and/or cerebrospinal fluid culture after 2 days of age (analysis is neonate-based and deaths before 3 days of age are excluded).

Presentation #35
Late onset sepsis among neonates with GA < 33 weeks (site comparison)



	S	Q	E	C*	V	P	AC	Z	M	AB	R	A	B	L	H	U	F	N	W	T	X	I	O	D	G	AA	AD	K*	J*	Y*
◆Odds Ratio	0	0.4	0.4	0.5	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	1	1	1	1.2	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.9	2.1	2.6	4.2	6.6	9.3
━Lower Limit		0.1	0.1	0.2	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.5	0.4	0.5	0.4		0.5	0.6	0.7	0.9	0.9	0.9	0.9	1	0.9	1	0.8	2.2	3.2	3.6
━Upper Limit		1.3	3.2	0.9	1.4	2.1	1.6	1.6	1.8	1.7	2.7	1.9	2.3	2.2	2.3		2.6	5	3.9	3	3.1	3.3	3.5	3.1	4	4.4	8.1	8.1	14	24

Number of neonates: 3 809



	S	Q	C*	E	V*	AB	Z	AC	A	H	L	AD	B	M	U	F	R	D	T	P	I	X	O	W	N	G	K*	J*	AA*	Y*
◆ Odds Ratio	0	0.27	0.31	0.39	0.51	0.58	0.63	0.72	0.74	0.81	0.84	0.85	0.92	0.92	1	1.05	1.08	1.09	1.16	1.17	1.25	1.32	1.36	1.77	1.78	2.09	2.9	2.91	3	11.8
━ Lower Limit		0.07	0.15	0.05	0.26	0.28	0.32	0.35	0.36	0.33	0.37	0.26	0.35	0.4		0.45	0.32	0.59	0.62	0.42	0.62	0.7	0.64	0.71	0.55	0.94	1.43	1.36	1.31	4.09
━ Upper Limit		1	0.66	3.41	0.99	1.23	1.25	1.48	1.56	1.96	1.91	2.81	2.42	2.11		2.48	3.61	2.02	2.18	3.24	2.53	2.5	2.9	4.44	5.79	4.61	5.9	6.24	6.86	34.2

Number of neonates: 3 806

Reference site: U

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

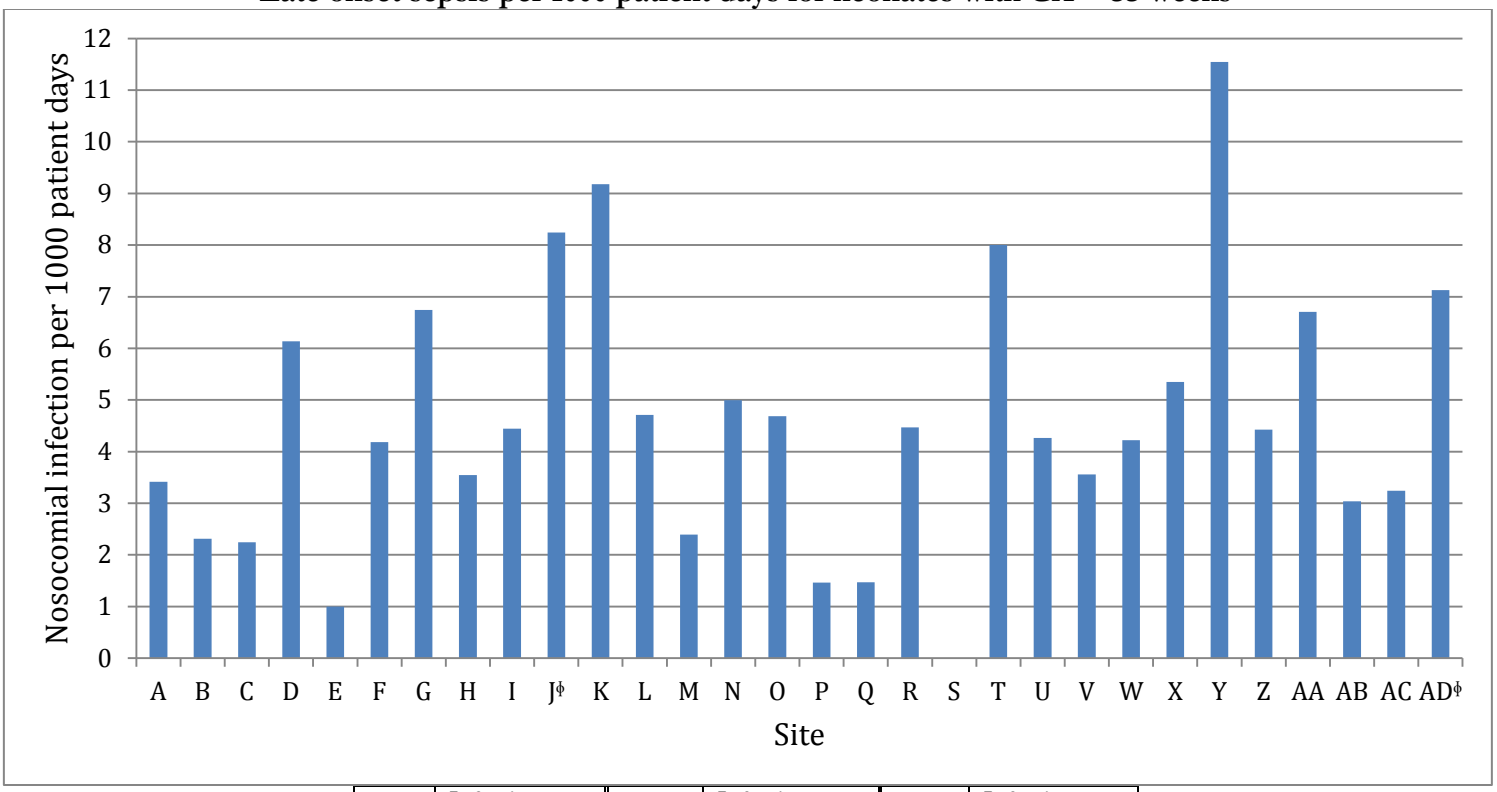
Sites J and AD have different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites.

Significant predictors identified by multivariate analysis and adjusted for:
GA Male
SGA (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 #36
Late onset sepsis per 1000 patient days for neonates with GA < 33 weeks



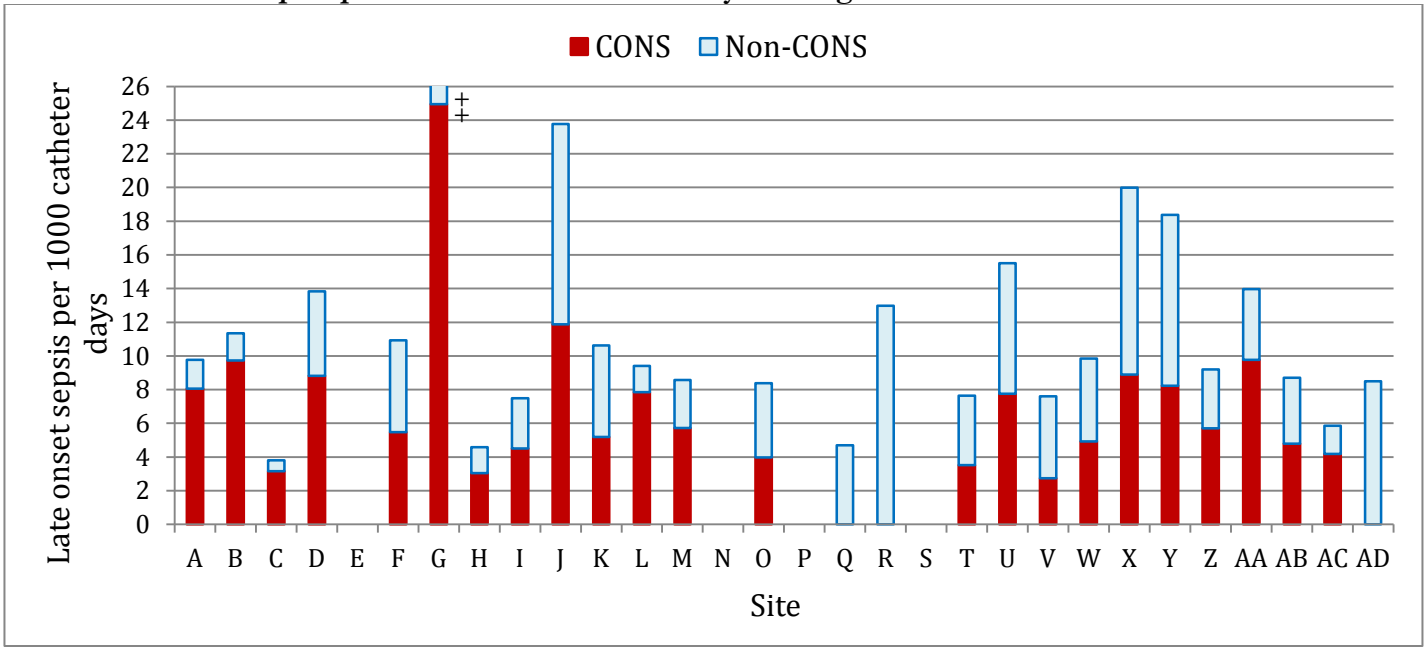
Site	Infections per 1000 patient days	Site	Infections per 1000 patient days	Site	Infections per 1000 patient days
A	3.4	**K**	9.2	**U**	4.3
B	2.3	**L**	4.7	**V**	3.6
C	2.2	**M**	2.4	**W**	4.2
D	6.1	**N**	5.0	**X**	5.4
E	1.0	**O**	4.7	**Y**	11.5
F	4.2	**P**	1.5	**Z**	4.4
G	6.7	**Q**	1.5	**AA**	6.7
H	3.5	**R**	4.5	**AB**	3.0
I	4.4	**S**	0.0	**AC**	3.2
Jϕ	8.2	**T**	8.0	**ADϕ**	7.1
				Total	4.7

Total number of neonates = 4 041

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

COMMENTS: Late onset sepsis is defined as 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 out 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 #37
Late onset sepsis per 1000 central catheter* days among neonates with GA < 33 weeks



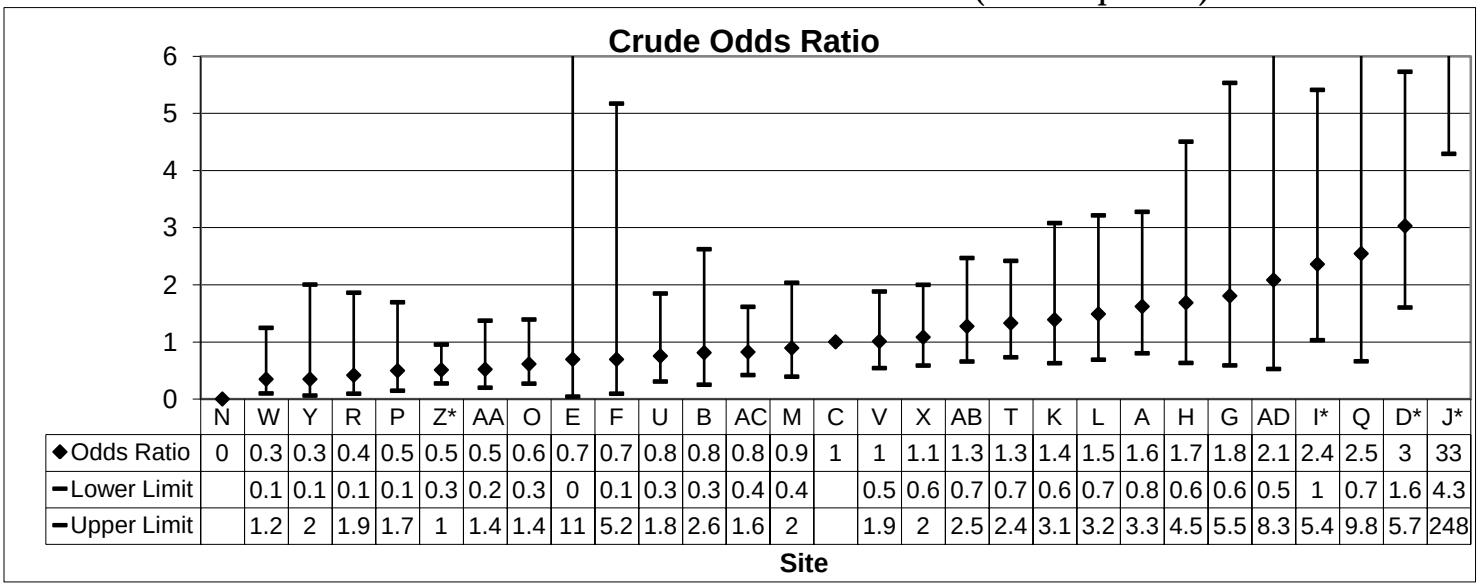
‡ The total rate for Site G is not shown completely in the graph. Please refer to the table for the actual rate for sites G.

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	
	CONS	Non-CONS		CONS	Non-CONS		CONS	Non-CONS		CONS	Non-CONS
A	14	3	1739	8.1	1.7	**P**	0	0	259	0.0	0.0
B	6	1	617	9.7	1.6	**Q**	0	3	639	0.0	4.7
C	10	2	3164	3.2	0.6	**R**	0	2	154	0.0	13.0
D	30	17	3399	8.8	5.0	**S**	0	0	31	0.0	0.0
E	0	0	98	0.0	0.0	**T**	18	21	5111	3.5	4.1
F	1	1	183	5.5	5.5	**U**	4	4	516	7.8	7.8
G	11	6	441	24.9	13.6	**V**	14	25	5131	2.7	4.9
H	2	1	656	3.0	1.5	**W**	3	3	609	4.9	4.9
I	9	6	2002	4.5	3.0	**X**	32	40	3601	8.9	11.1
J	6	6	505	11.9	11.9	**Y**	13	16	1579	8.2	10.1
K	20	21	3857	5.2	5.4	**Z**	13	8	2282	5.7	3.5
L	15	3	1913	7.8	1.6	**AA**	7	3	716	9.8	4.2
M	4	2	700	5.7	2.9	**AB**	11	9	2297	4.8	3.9
N	0	0	33	0.0	0.0	**AC**	10	4	2393	4.2	1.7
O	9	10	2269	4.0	4.4	**AD**	0	8	942	0.0	8.5
						Total	**262**	**225**	**47836**	**5.5**	**4.7**

*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.

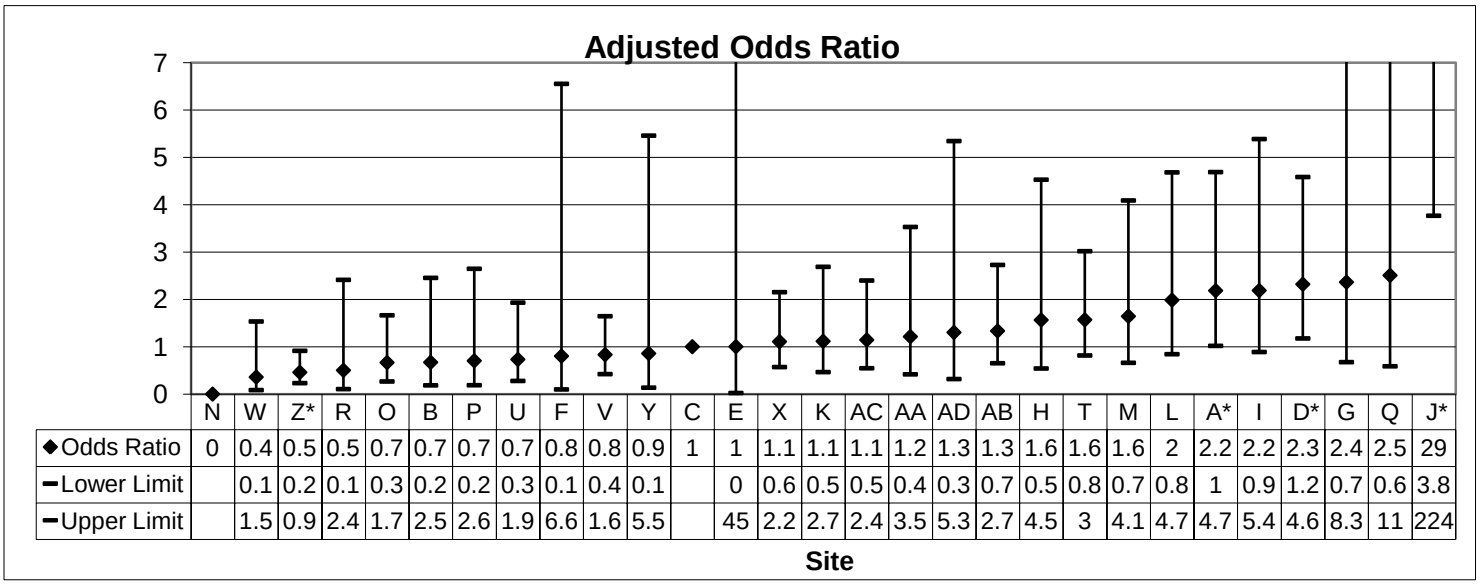
Presentation #38

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



	N	W	Y	R	P	Z*	AA	O	E	F	U	B	AC	M	C	V	X	AB	T	K	L	A	H	G	AD	I*	Q	D*	J*
◆Odds Ratio	0	0.3	0.3	0.4	0.5	0.5	0.5	0.6	0.7	0.7	0.8	0.8	0.8	0.9	1	1	1.1	1.3	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.4	2.5	3	33
━Lower Limit		0.1	0.1	0.1	0.1	0.3	0.2	0.3	0	0.1	0.3	0.3	0.4	0.4		0.5	0.6	0.7	0.7	0.6	0.7	0.8	0.6	0.6	0.5	1	0.7	1.6	4.3
━Upper Limit		1.2	2	1.9	1.7	1	1.4	1.4	11	5.2	1.8	2.6	1.6	2		1.9	2	2.5	2.4	3.1	3.2	3.3	4.5	5.5	8.3	5.4	9.8	5.7	248

Number of neonates: 1 147



	N	W	Z*	R	O	B	P	U	F	V	Y	C	E	X	K	AC	AA	AD	AB	H	T	M	L	A*	I	D*	G	Q	J*
◆Odds Ratio	0	0.4	0.5	0.5	0.7	0.7	0.7	0.7	0.8	0.8	0.9	1	1	1.1	1.1	1.1	1.2	1.3	1.3	1.6	1.6	1.6	2	2.2	2.2	2.3	2.4	2.5	29
━Lower Limit		0.1	0.2	0.1	0.3	0.2	0.2	0.3	0.1	0.4	0.1		0	0.6	0.5	0.5	0.4	0.3	0.7	0.5	0.8	0.7	0.8	1	0.9	1.2	0.7	0.6	3.8
━Upper Limit		1.5	0.9	2.4	1.7	2.5	2.6	1.9	6.6	1.6	5.5		45	2.2	2.7	2.4	3.5	5.3	2.7	4.5	3	4.1	4.7	4.7	5.4	4.6	8.3	11	224

Number of neonates: 1 147

Reference site: C

Inclusion criteria:
GA <33 weeks
Neonates who had PDA

Outcome is attributed to the network hospital of first admission

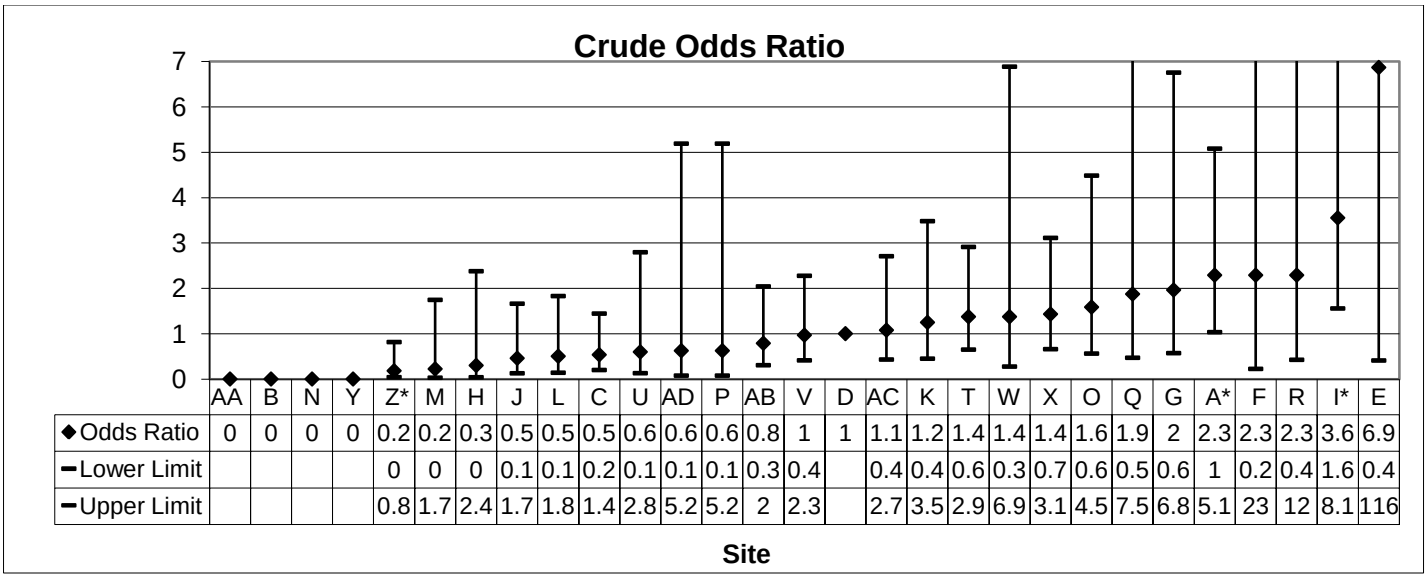
[#]Treatment of PDA includes any of indomethacin, ibuprofen, or ligation

Significant predictors identified by multivariate analysis and adjusted for:
GA

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

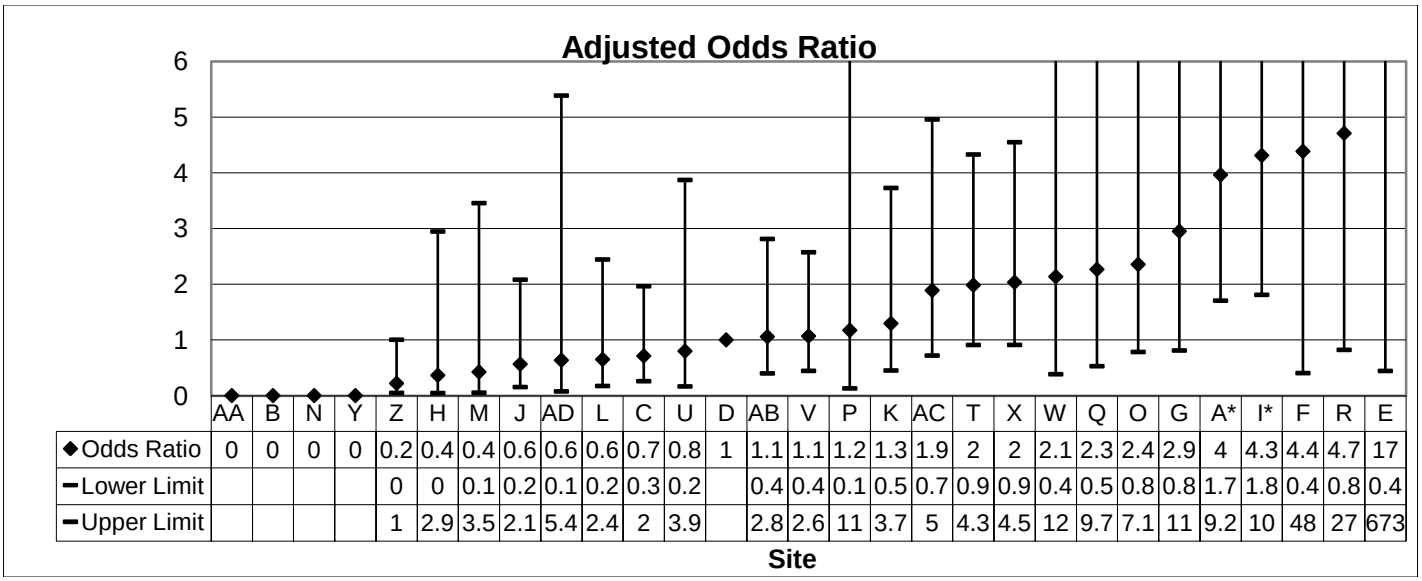
Sites J and AD have different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites.

Presentation #39
Surgical ligation of PDA for neonates with GA < 33 weeks (site comparison)



	AA	B	N	Y	Z*	M	H	J	L	C	U	AD	P	AB	V	D	AC	K	T	W	X	O	Q	G	A*	F	R	I*	E
◆Odds Ratio	0	0	0	0	0.2	0.2	0.3	0.5	0.5	0.5	0.6	0.6	0.6	0.8	1	1	1.1	1.2	1.4	1.4	1.4	1.6	1.9	2	2.3	2.3	2.3	3.6	6.9
━Lower Limit					0	0	0	0.1	0.1	0.2	0.1	0.1	0.1	0.3	0.4		0.4	0.4	0.6	0.3	0.7	0.6	0.5	0.6	1	0.2	0.4	1.6	0.4
━Upper Limit					0.8	1.7	2.4	1.7	1.8	1.4	2.8	5.2	5.2	2	2.3		2.7	3.5	2.9	6.9	3.1	4.5	7.5	6.8	5.1	23	12	8.1	116

Number of neonates: 1 147



	AA	B	N	Y	Z	H	M	J	AD	L	C	U	D	AB	V	P	K	AC	T	X	W	Q	O	G	A*	I*	F	R	E
◆Odds Ratio	0	0	0	0	0.2	0.4	0.4	0.6	0.6	0.6	0.7	0.8	1	1.1	1.1	1.2	1.3	1.9	2	2	2.1	2.3	2.4	2.9	4	4.3	4.4	4.7	17
━Lower Limit					0	0	0.1	0.2	0.1	0.2	0.3	0.2		0.4	0.4	0.1	0.5	0.7	0.9	0.9	0.4	0.5	0.8	0.8	1.7	1.8	0.4	0.8	0.4
━Upper Limit					1	2.9	3.5	2.1	5.4	2.4	2	3.9		2.8	2.6	11	3.7	5	4.3	4.5	12	9.7	7.1	11	9.2	10	48	27	673

Number of neonates: 1 147

Reference site: D

Inclusion criteria:
GA <33 weeks
Neonates who had PDA

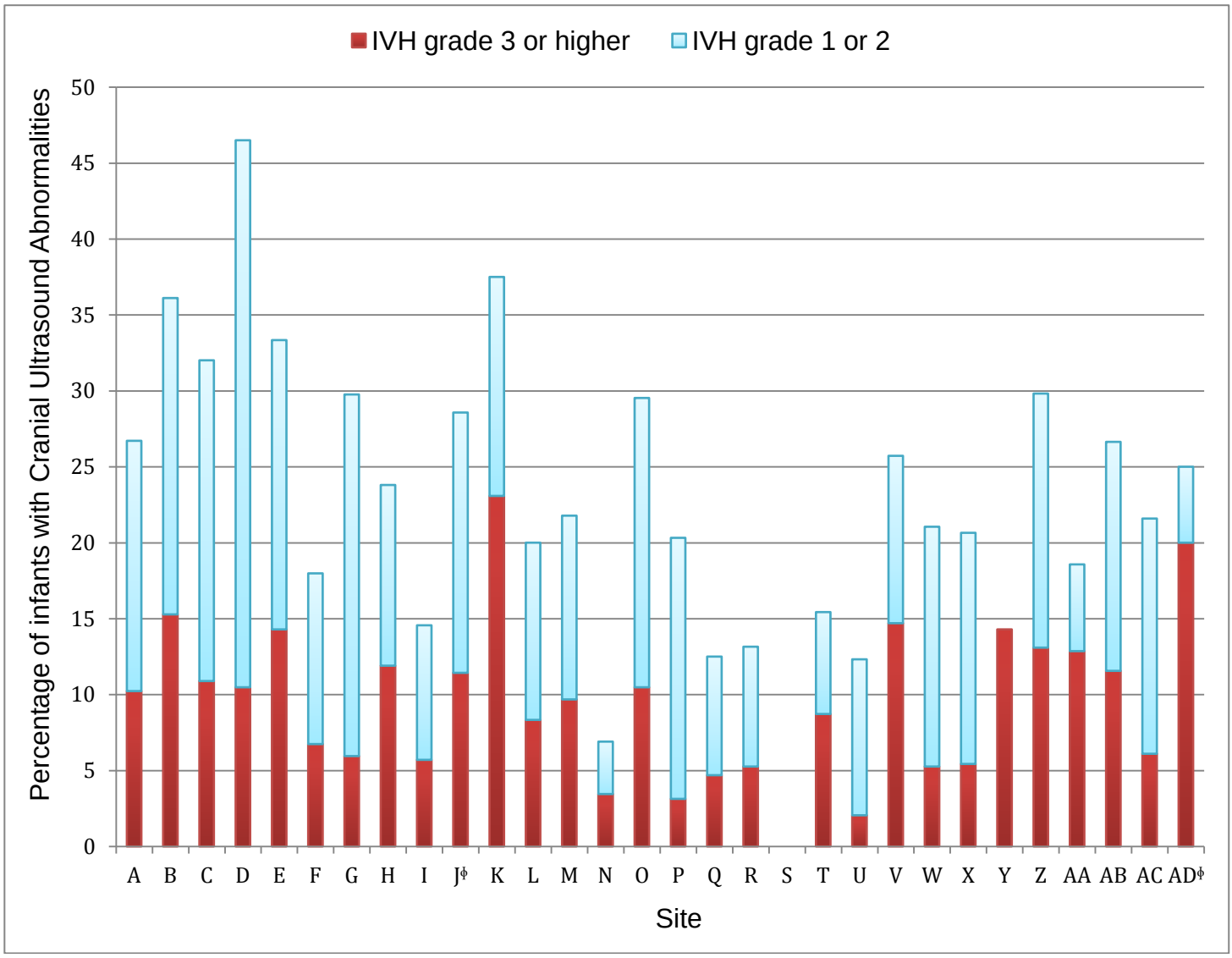
***Sites significantly different from reference site (P<0.05)**

Outcome is attributed to the network hospital of first admission

Significant predictors identified by multivariate analysis and adjusted for:
GA

Sites J and AD have different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites.

Presentation #40
Neuroimaging abnormalities among neonates <33 weeks of GA



IVH grade 1 or 2 = Germinal matrix hemorrhage or intraventricular hemorrhage without ventricular enlargement

IVH grade 3 or 4 = Intraventricular hemorrhage with ventricular enlargement or persistent parenchymal echogenicity or periventricular leukomalacia

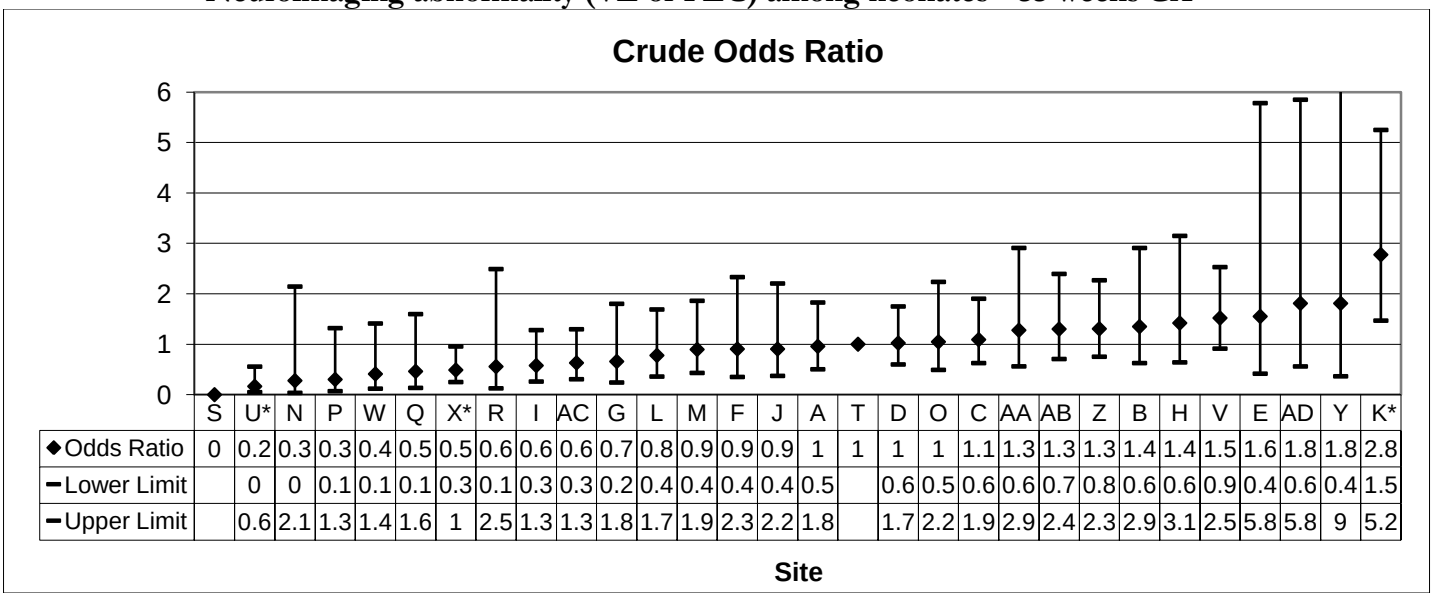
Presentation #40 (continued)
IVH with VE or persistent PEC (IVH grade 3 or 4) among neonates <33 weeks of GA

Site	<25	25-26	27-28	29-30	31-32	Overall rate* per sites %
A	27.3	25.0	6.5	6.7	7.4	10.2
B	75.0	33.3	22.2	12.5	5.4	15.3
C	40.0	25.0	10.7	6.8	3.5	10.9
D	24.1	17.8	9.6	7.1	4.3	10.5
E	50.0	100.0	33.3	0.0	0.0	14.3
F	14.3	11.1	11.1	8.0	2.6	6.7
G	0.0	33.3	15.4	0.0	0.0	6.0
H	25.0	40.0	18.2	0.0	2.9	11.9
I	14.3	14.8	3.6	0.0	3.4	5.7
Jϕ	10.0	13.8	10.7	0.0	NA	11.4
K	36.4	33.3	17.4	25.0	16.7	23.1
L	50.0	21.1	0.0	0.0	3.9	8.3
M	0.0	25.0	13.3	13.6	3.9	9.7
N	0.0	NA	11.1	0.0	0.0	3.5
O	37.5	20.0	12.5	9.4	0.0	10.5
P	0.0	50.0	0.0	0.0	2.8	3.1
Q	66.7	0.0	0.0	6.3	0.0	4.7
R	NA	0.0	11.1	0.0	4.8	5.3
S	0.0	NA	NA	0.0	0.0	0.0
T	16.7	18.5	6.7	5.8	5.3	8.7
U	16.7	10.0	3.9	0.0	0.0	2.1
V	55.6	31.1	14.5	8.5	5.8	14.7
W	0.0	33.3	22.2	0.0	0.0	5.3
X	6.3	14.3	8.2	4.8	0.9	5.4
Y	NA	0.0	0.0	28.6	9.1	14.3
Z	63.2	31.3	22.5	3.9	1.9	13.1
AA	100.0	20.0	54.6	7.1	0.0	12.9
AB	33.3	10.7	21.9	2.1	4.6	11.6
AC	16.7	5.3	11.4	5.2	3.5	6.1
ADϕ	25.0	11.1	28.6	NA	NA	20.0
Overall rate per GA group %**	30.7	20.5	12.2	5.9	3.6	9.9

Total number of neonates = 4 041
VE=ventricular enlargement, PE=parenchymal echogenecity
ϕ Note that the criteria for entering neonates with GA **<**33 in the CNN dataset are not same for sites J and AD and thus, the rates may not be comparable with other sites.

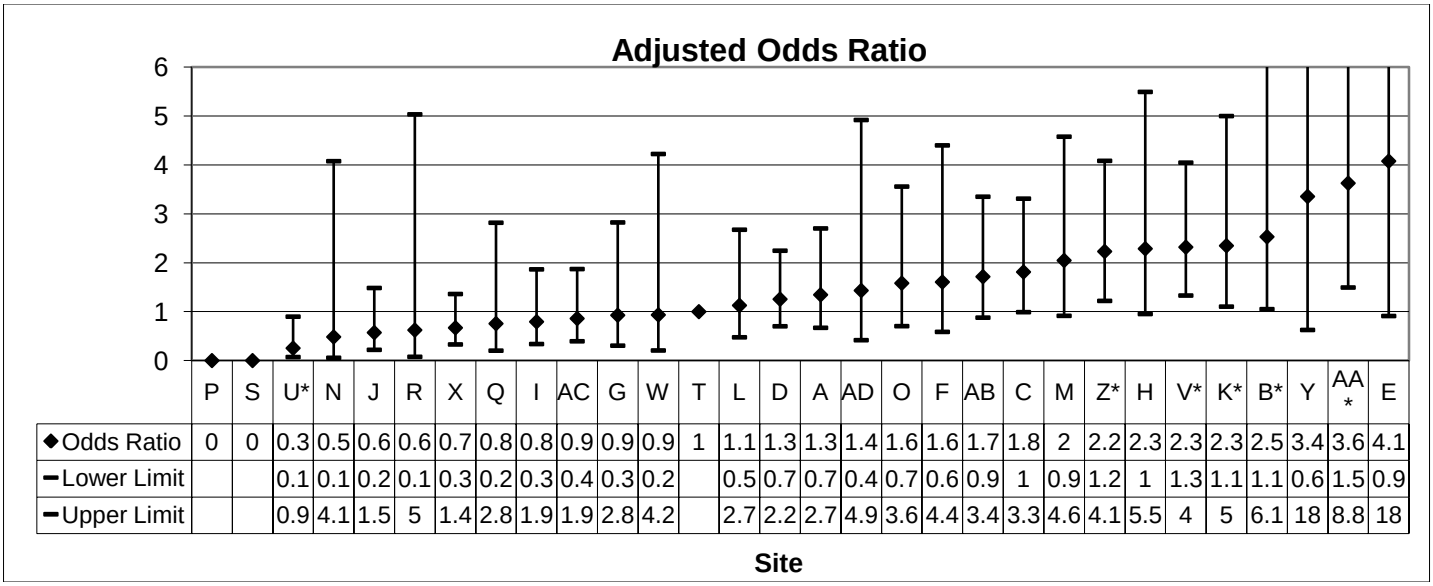
Overall %* = (number of neonates with cranial ultrasound abnormalities for site / total number of neonates for site)*100
Overall %** = (number of neonates with cranial ultrasound abnormalities for GA category / total number of neonates in gestational category)*100
NA = no data available

Presentation #41
Neuroimaging abnormality (VE or PEC) among neonates <33 weeks GA



	S	U*	N	P	W	Q	X*	R	I	AC	G	L	M	F	J	A	T	D	O	C	AA	AB	Z	B	H	V	E	AD	Y	K*
◆Odds Ratio	0	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.6	0.6	0.7	0.8	0.9	0.9	0.9	1	1	1	1	1.1	1.3	1.3	1.3	1.4	1.4	1.5	1.6	1.8	1.8	2.8
━Lower Limit		0	0	0.1	0.1	0.1	0.3	0.1	0.3	0.3	0.2	0.4	0.4	0.4	0.4	0.5		0.6	0.5	0.6	0.6	0.7	0.8	0.6	0.6	0.9	0.4	0.6	0.4	1.5
━Upper Limit		0.6	2.1	1.3	1.4	1.6	1	2.5	1.3	1.3	1.8	1.7	1.9	2.3	2.2	1.8		1.7	2.2	1.9	2.9	2.4	2.3	2.9	3.1	2.5	5.8	5.8	9	5.2

Number of neonates: 3 281



	P	S	U*	N	J	R	X	Q	I	AC	G	W	T	L	D	A	AD	O	F	AB	C	M	Z*	H	V*	K*	B*	Y	AA*	E
◆Odds Ratio	0	0	0.3	0.5	0.6	0.6	0.7	0.8	0.8	0.9	0.9	0.9	1	1.1	1.3	1.3	1.4	1.6	1.6	1.7	1.8	2	2.2	2.3	2.3	2.3	2.5	3.4	3.6	4.1
━Lower Limit			0.1	0.1	0.2	0.1	0.3	0.2	0.3	0.4	0.3	0.2		0.5	0.7	0.7	0.4	0.7	0.6	0.9	1	0.9	1.2	1	1.3	1.1	1.1	0.6	1.5	0.9
━Upper Limit			0.9	4.1	1.5	5	1.4	2.8	1.9	1.9	2.8	4.2		2.7	2.2	2.7	4.9	3.6	4.4	3.4	3.3	4.6	4.1	5.5	4	5	6.1	18	8.8	18

Number of neonates: 3 217

Reference site: T

Inclusion criteria:
GA <33 weeks
Age at admission less than 4 days
Neuroimaging results available

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

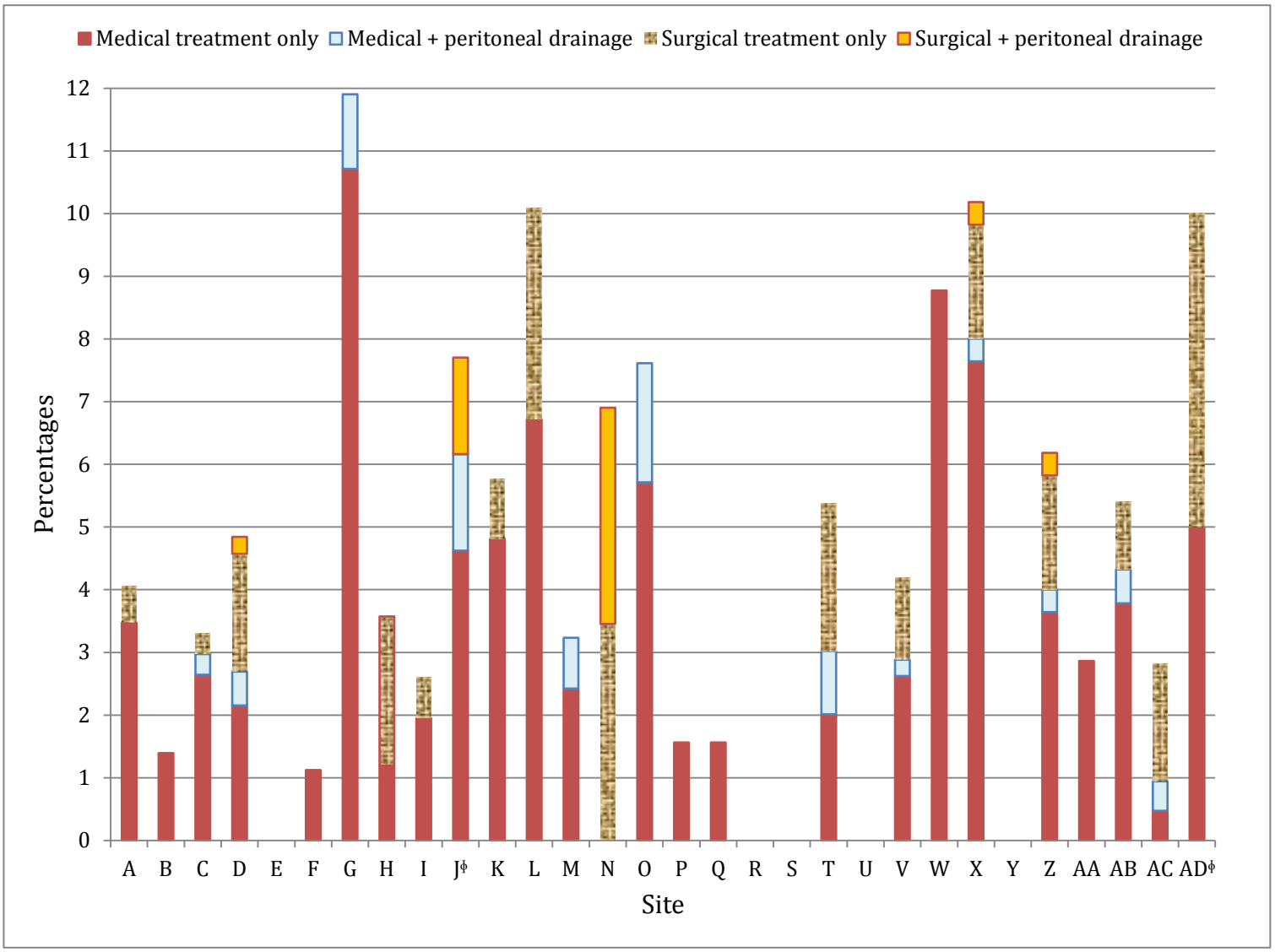
Significant predictors identified by multivariate analysis and adjusted for:

GA	Male
Apgar at 5 minutes	SNAP-II Score
Outborn	

Sites J and AD have different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites.

Outcome is attributed to the network hospital of first admission

Presentation #42
Necrotizing enterocolitis (≥stage 2) for neonates with GA < 33 weeks (site rates)



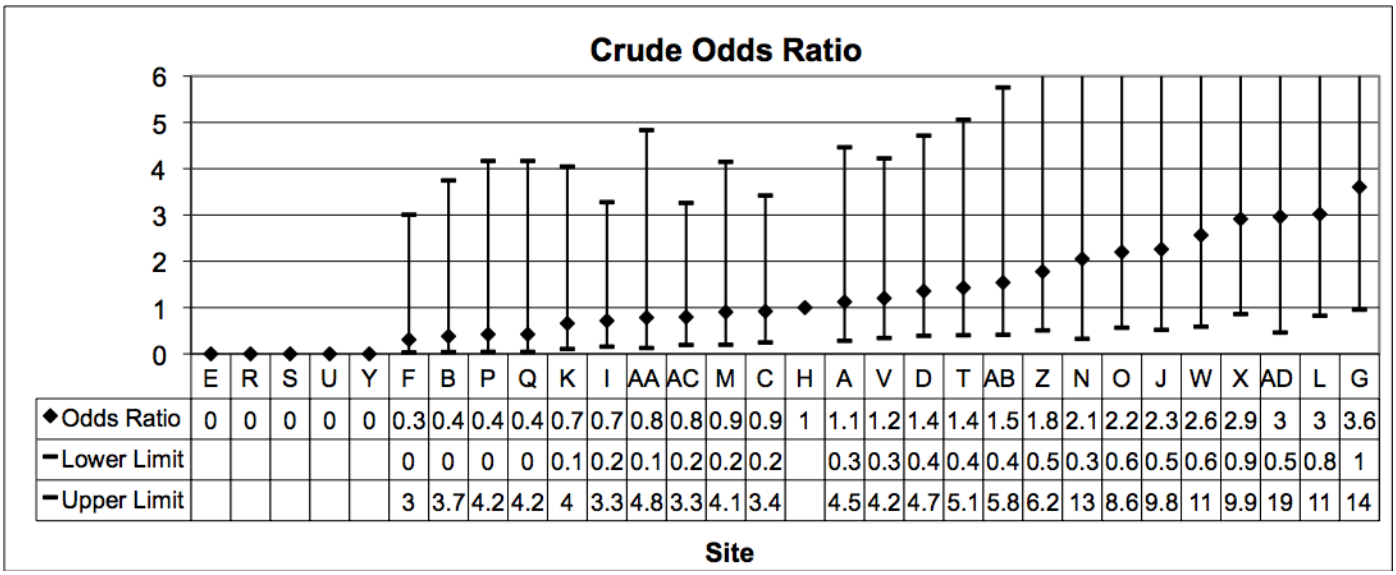
Presentation #42 (continued)
Necrotizing enterocolitis for neonates with GA < 33 weeks

Site	Treatment (%)				
	Medical treatment only	Medical + peritoneal drainage	Surgical treatment only	Surgical + peritoneal drainage	Any
A	3.5	0.0	0.6	0.0	4.1
B	1.4	0.0	0.0	0.0	1.4
C	2.6	0.3	0.3	0.0	3.3
D	2.2	0.5	1.9	0.3	4.8
E	0.0	0.0	0.0	0.0	0.0
F	1.1	0.0	0.0	0.0	1.1
G	10.7	1.2	0.0	0.0	11.9
H	1.2	0.0	2.4	0.0	3.6
I	2.0	0.0	0.7	0.0	2.6
Jϕ	4.6	1.5	0.0	1.5	7.7
K	4.8	0.0	1.0	0.0	5.8
L	6.7	0.0	3.4	0.0	10.1
M	2.4	0.8	0.0	0.0	3.2
N	0.0	0.0	3.5	3.5	6.9
O	5.7	1.9	0.0	0.0	7.6
P	1.6	0.0	0.0	0.0	1.6
Q	1.6	0.0	0.0	0.0	1.6
R	0.0	0.0	0.0	0.0	0.0
S	0.0	0.0	0.0	0.0	0.0
T	2.0	1.0	2.4	0.0	5.4
U	0.0	0.0	0.0	0.0	0.0
V	2.6	0.3	1.3	0.0	4.2
W	8.8	0.0	0.0	0.0	8.8
X	7.6	0.4	1.8	0.4	10.2
Y	0.0	0.0	0.0	0.0	0.0
Z	3.6	0.4	1.8	0.4	6.2
AA	2.9	0.0	0.0	0.0	2.9
AB	3.8	0.5	1.1	0.0	5.4
AC	0.5	0.5	1.9	0.0	2.8
ADϕ	5.0	0.0	5.0	0.0	10.0
Total	3.2	0.4	1.2	0.1	4.9

COMMENTS: These analyses include 4 013 neonates from 30 hospitals. Twenty-eight (28) neonates were missing data on NEC. **Twenty-eight hospitals collected data on all eligible admissions for neonates with GA < 33 weeks whereas two hospitals (marked by ϕ) collected data on selected eligible admissions only.**

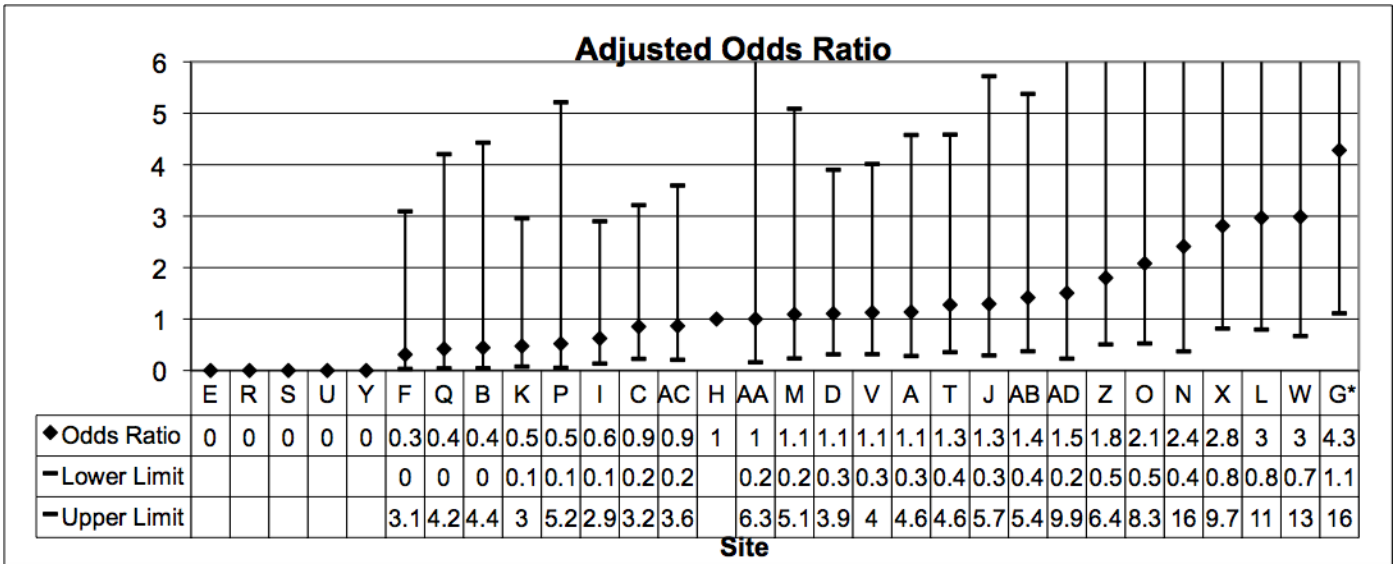
ϕNote that the criteria for entering neonates with GA **<33 weeks** in the CNN dataset are not same for sites J and AD and thus, the rates may not be comparable with other sites.

Presentation #43
Necrotizing enterocolitis (≥ stage 2) among neonates with GA <33 weeks (site comparison)



	E	R	S	U	Y	F	B	P	Q	K	I	AA	AC	M	C	H	A	V	D	T	AB	Z	N	O	J	W	X	AD	L	G
◆Odds Ratio	0	0	0	0	0	0.3	0.4	0.4	0.4	0.7	0.7	0.8	0.8	0.9	0.9	1	1.1	1.2	1.4	1.4	1.5	1.8	2.1	2.2	2.3	2.6	2.9	3	3	3.6
━Lower Limit						0	0	0	0	0.1	0.2	0.1	0.2	0.2	0.2		0.3	0.3	0.4	0.4	0.4	0.5	0.3	0.6	0.5	0.6	0.9	0.5	0.8	1
━Upper Limit						3	3.7	4.2	4.2	4	3.3	4.8	3.3	4.1	3.4		4.5	4.2	4.7	5.1	5.8	6.2	13	8.6	9.8	11	9.9	19	11	14

Number of neonates: 3 853



	E	R	S	U	Y	F	Q	B	K	P	I	C	AC	H	AA	M	D	V	A	T	J	AB	AD	Z	O	N	X	L	W	G*
◆Odds Ratio	0	0	0	0	0	0.3	0.4	0.4	0.5	0.5	0.6	0.9	0.9	1	1	1.1	1.1	1.1	1.1	1.3	1.3	1.4	1.5	1.8	2.1	2.4	2.8	3	3	4.3
━Lower Limit						0	0	0	0.1	0.1	0.1	0.2	0.2		0.2	0.2	0.3	0.3	0.3	0.4	0.3	0.4	0.2	0.5	0.5	0.4	0.8	0.8	0.7	1.1
━Upper Limit						3.1	4.2	4.4	3	5.2	2.9	3.2	3.6		6.3	5.1	3.9	4	4.6	4.6	5.7	5.4	9.9	6.4	8.3	16	9.7	11	13	16

Number of neonates: 3 850

Reference site: H

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 E, R, S, U, and Y did not have NEC stage 2 or higher (Odds Ratio: 0)

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

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

Site J and AD have different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites.

Presentation #44
Oxygen use 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	100.0	94.1	33.3	11.9	3.7	24.2
B	NA	100.0	85.7	25.0	5.4	27.3
C	87.5	71.4	21.1	8.1	3.5	20.0
D	100.0	79.8	34.7	20.0	8.9	36.2
E	100.0	100.0	66.7	0.0	10.0	26.3
F	0.0	0.0	11.1	0.0	0.0	1.2
G	NA	100.0	58.3	10.0	2.7	22.4
H	50.0	25.0	36.4	15.8	0.0	13.9
I	100.0	70.8	28.0	3.6	1.8	25.5
J$^{\phi}$	100.0	90.0	34.6	0.0	NA	57.7
K	100.0	80.0	15.0	20.0	10.3	31.8
L	80.0	76.5	41.2	20.8	3.9	27.2
M	100.0	100.0	58.3	7.1	3.9	19.8
N	100.0	NA	55.6	0.0	0.0	25.9
O	100.0	100.0	36.4	9.7	3.2	27.3
P	100.0	100.0	36.4	23.1	2.8	17.5
Q	100.0	57.1	42.9	12.5	0.0	22.2
R	NA	50.0	44.4	0.0	4.8	15.8
S	100.0	NA	NA	20.0	0.0	28.6
T	100.0	92.5	54.6	9.4	10.0	36.4
U	100.0	100.0	16.0	4.8	3.2	14.8
V	83.3	97.4	65.7	20.7	8.2	35.9
W	100.0	100.0	22.2	11.1	4.4	19.6
X	88.9	88.6	60.9	17.0	3.8	31.9
Y	NA	NA	100.0	33.3	20.0	29.4
Z	100.0	70.0	24.3	6.4	1.9	18.7
AA	100.0	100.0	63.6	28.6	5.1	25.0
AB	100.0	95.2	79.3	40.0	9.4	44.6
AC	100.0	82.4	44.4	6.9	1.2	20.1
AD$^{\phi}$	100.0	100.0	57.1	NA	NA	83.3
Overall rate for GA group	91.8	82.6	42.6	13.5	4.9	27.5

Total number of neonates = 3 731; 310 neonates were excluded due to death prior to day 28 of age or first admission after day 28. NA = no data available.

$^{\phi}$Note that the criteria for entering neonates with GA <33 weeks in the CNN dataset are not the same for sites J and AD 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 use 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 #45
Oxygen use 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	66.7	80.0	23.3	10.2	3.7	18.0
B	NA	60.0	28.6	12.5	8.1	15.4
C	50.0	34.3	12.7	7.0	1.2	11.3
D	80.0	60.0	29.2	14.1	10.6	28.6
E	100.0	100.0	0.0	25.0	10.0	21.1
F	0.0	0.0	0.0	0.0	0.0	0.0
G	NA	28.6	41.7	5.0	0.0	10.5
H	0.0	18.2	27.3	10.5	0.0	9.1
I	27.3	31.8	8.0	3.6	3.5	10.5
J[ϕ]	66.7	25.0	32.0	0.0	NA	29.4
K	75.0	50.0	18.2	20.0	6.9	22.6
L	40.0	29.4	12.5	16.7	5.9	14.2
M	33.3	25.0	0.0	4.8	2.0	5.2
N	100.0	NA	11.1	0.0	0.0	7.7
O	80.0	50.0	22.7	6.5	6.5	18.2
P	0.0	50.0	18.2	7.7	2.8	7.9
Q	50.0	28.6	14.3	12.5	0.0	11.1
R	NA	100.0	22.2	0.0	4.8	13.2
S	100.0	NA	NA	0.0	NA	16.7
T	92.3	76.9	41.9	12.9	11.1	32.2
U	0.0	50.0	8.0	2.4	1.6	6.3
V	77.8	68.4	40.9	14.8	5.9	24.3
W	100.0	33.3	11.1	0.0	4.4	10.7
X	57.1	68.8	45.5	15.3	2.9	23.5
Y	NA	0.0	100.0	33.3	20.0	27.8
Z	83.3	36.7	16.2	0.0	1.0	10.7
AA	100.0	66.7	18.2	21.4	2.6	13.2
AB	100.0	66.7	58.6	20.0	8.1	31.7
AC	33.3	25.0	16.7	8.6	3.6	9.6
AD[ϕ]	33.3	87.5	28.6	NA	NA	55.6
Overall rate for GA group	63.9	51.9	25.8	9.8	4.6	18.0

Total number of neonates = 3 691. 350 neonates were excluded due to death prior to week 36 or first admission after week 36. NA = no data available.

[ϕ]Note that the criteria for entering neonates with GA <33 weeks in the CNN dataset are not the same for sites J and AD 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 use 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 #46

Oxygen use 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	95.0	35.5	13.3	3.7	29.0
B	100.0	100.0	88.9	25.0	5.4	33.3
C	93.3	75.0	25.3	10.2	3.5	24.8
D	100.0	82.2	38.5	24.7	10.4	42.1
E	100.0	100.0	66.7	0.0	18.2	33.3
F	14.3	22.2	11.1	4.0	0.0	5.7
G	100.0	100.0	61.5	14.3	5.3	29.8
H	75.0	40.0	36.4	15.8	0.0	19.1
I	100.0	74.1	35.7	10.0	5.1	31.7
J[ϕ]	100.0	92.9	39.3	0.0	NA	68.1
K	100.0	83.3	19.1	25.0	23.5	42.0
L	87.5	79.0	44.4	20.8	3.9	30.8
M	100.0	100.0	66.7	11.4	3.9	24.4
N	100.0	NA	55.6	20.0	7.7	31.0
O	100.0	100.0	41.7	12.5	3.2	31.4
P	100.0	100.0	36.4	23.1	2.8	18.8
Q	100.0	57.1	42.9	12.5	0.0	23.4
R	NA	50.0	44.4	0.0	4.8	15.8
S	100.0	NA	NA	20.0	0.0	37.5
T	100.0	92.6	55.6	9.4	12.0	38.1
U	100.0	100.0	19.2	4.8	3.2	16.6
V	92.6	97.8	67.6	23.3	8.2	40.7
W	100.0	100.0	22.2	11.1	4.4	19.6
X	93.3	90.5	63.3	19.7	3.8	36.4
Y	NA	NA	100.0	33.3	20.0	29.4
Z	100.0	71.9	30.0	6.4	2.8	22.6
AA	100.0	100.0	63.6	28.6	5.1	27.1
AB	100.0	96.3	81.3	42.6	10.8	53.5
AC	100.0	84.2	54.6	6.9	2.4	24.6
AD[ϕ]	100.0	100.0	57.1	NA	NA	85.0
Overall rate for GA group	95.5	84.7	46.2	15.5	6.0	32.5

Total number of neonates = 4 006; 35 neonates were excluded due to first admission after day 28. NA = no data available.

[ϕ]Note that the criteria for entering neonates with GA <33 weeks in the CNN dataset are not the same for sites J and AD 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 use 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 #47

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

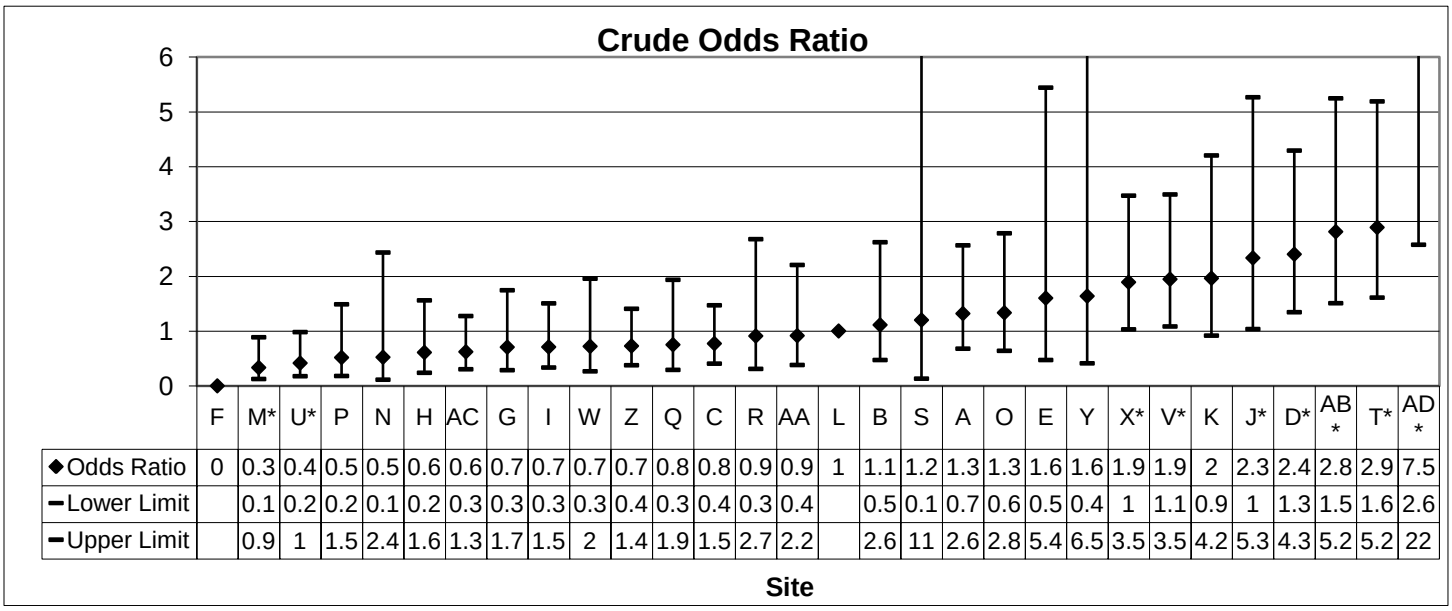
GA at birth						
Site	**<25**	**25-26**	**27-28**	**29-30**	**31-32**	**Overall rate for sites**
A	90.9	85.0	25.8	11.7	3.7	25.0
B	100.0	66.7	44.4	12.5	8.1	23.6
C	73.3	42.5	17.3	9.1	2.4	16.8
D	89.7	66.7	34.6	21.2	12.2	36.7
E	100.0	100.0	0.0	25.0	18.2	28.6
F	42.9	22.2	0.0	4.0	0.0	6.8
G	100.0	44.4	46.2	9.5	2.6	19.1
H	75.0	40.0	27.3	10.5	0.0	16.7
I	42.9	44.4	17.9	10.0	6.8	19.0
J$^{\phi}$	90.0	46.4	39.3	0.0	NA	47.8
K	90.0	61.1	21.7	25.0	20.6	35.6
L	62.5	36.8	22.2	16.7	5.9	19.2
M	60.0	25.0	26.7	9.1	2.0	11.4
N	100.0	NA	11.1	20.0	7.7	17.2
O	87.5	50.0	29.2	9.4	6.5	22.9
P	50.0	50.0	18.2	7.7	2.8	9.4
Q	66.7	28.6	14.3	12.5	0.0	12.5
R	NA	100.0	22.2	0.0	4.8	13.2
S	100.0	NA	NA	0.0	NA	28.6
T	94.4	77.8	44.4	12.9	13.0	34.7
U	33.3	50.0	11.5	2.4	1.6	8.2
V	92.6	73.3	44.0	17.6	5.9	30.8
W	100.0	33.3	11.1	0.0	4.4	10.7
X	80.0	76.2	51.0	19.4	2.9	30.8
Y	NA	0.0	100.0	33.3	20.0	27.8
Z	89.5	40.6	22.5	0.0	1.9	14.9
AA	100.0	80.0	18.2	21.4	2.6	15.7
AB	100.0	75.0	62.5	23.4	10.9	43.4
AC	66.7	36.8	31.8	8.6	4.7	16.0
AD$^{\phi}$	50.0	88.9	28.6	NA	NA	60.0
Overall rate for GA group	82.3	59.4	31.2	12.2	5.9	24.5

Total number of neonates = 4 012. Twenty nine neonates were excluded due to first admission after week 36. NA = no data available.

$^{\phi}$Note that the criteria for entering neonates with GA <33 weeks in the CNN dataset are not the same for sites J and AD and thus, the rates may not be comparable with other sites. Outcomes are attributed to the hospital of first admission.

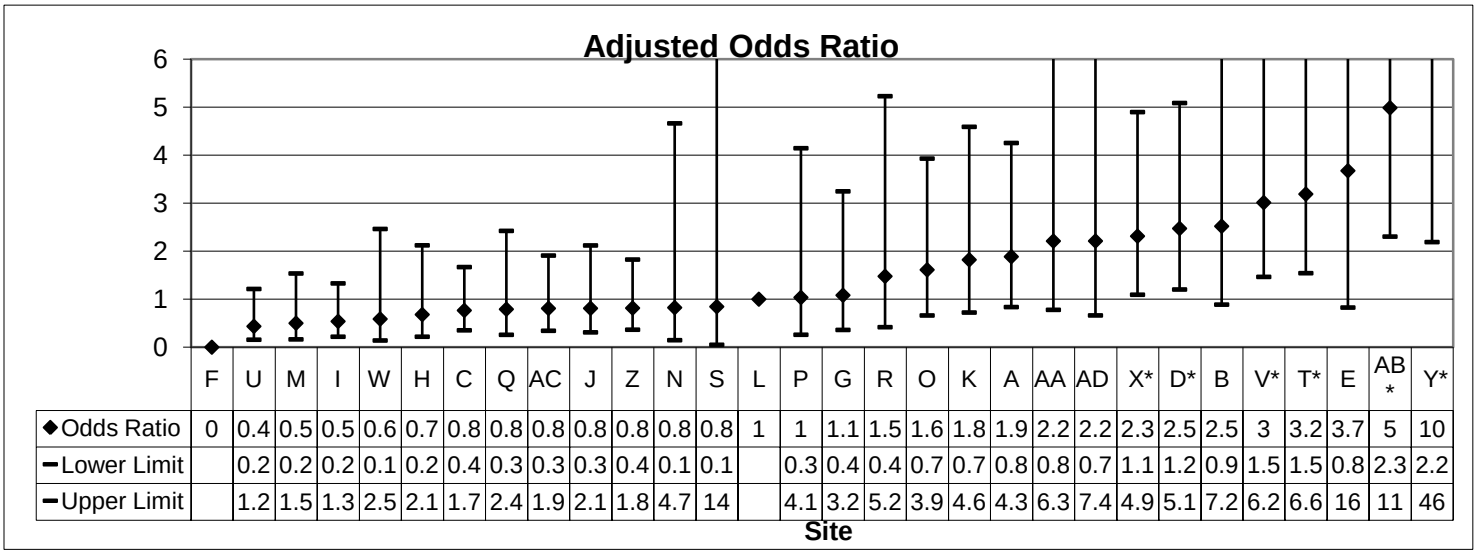
Comments: Neonates were classified as having oxygen use at 36 weeks as follows: a) receiving supplemental oxygen at week 36 postmenstrual age (PMA) or b) discharged prior to week 36 PMA and receiving supplemental oxygen at discharge. Neonates were excluded from analysis if the first admission was after week36. There were no requirements for chest radiographs at the time of diagnosis. Deaths prior to week 36 PMA are included.

Presentation #48a
Oxygen use at 36 weeks post-menstrual age (site comparison)



	F	M*	U*	P	N	H	AC	G	I	W	Z	Q	C	R	AA	L	B	S	A	O	E	Y	X*	V*	K	J*	D*	AB*	T*	AD*
◆Odds Ratio	0	0.3	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.9	0.9	1	1.1	1.2	1.3	1.3	1.6	1.6	1.9	1.9	2	2.3	2.4	2.8	2.9	7.5
━Lower Limit		0.1	0.2	0.2	0.1	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.4		0.5	0.1	0.7	0.6	0.5	0.4	1	1.1	0.9	1	1.3	1.5	1.6	2.6
━Upper Limit		0.9	1	1.5	2.4	1.6	1.3	1.7	1.5	2	1.4	1.9	1.5	2.7	2.2		2.6	11	2.6	2.8	5.4	6.5	3.5	3.5	4.2	5.3	4.3	5.2	5.2	22

Number of neonates: 3 630



	F	U	M	I	W	H	C	Q	AC	J	Z	N	S	L	P	G	R	O	K	A	AA	AD	X*	D*	B	V*	T*	E	AB*	Y*
◆Odds Ratio	0	0.4	0.5	0.5	0.6	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1	1	1.1	1.5	1.6	1.8	1.9	2.2	2.2	2.3	2.5	2.5	3	3.2	3.7	5	10
━Lower Limit		0.2	0.2	0.2	0.1	0.2	0.4	0.3	0.3	0.3	0.4	0.1	0.1		0.3	0.4	0.4	0.7	0.7	0.8	0.8	0.7	1.1	1.2	0.9	1.5	1.5	0.8	2.3	2.2
━Upper Limit		1.2	1.5	1.3	2.5	2.1	1.7	2.4	1.9	2.1	1.8	4.7	14		4.1	3.2	5.2	3.9	4.6	4.3	6.3	7.4	4.9	5.1	7.2	6.2	6.6	16	11	46

Number of neonates: 3 557

Reference site: L

Inclusion criteria:
GA <33 weeks
Age at admission less than 4 days
Survival to 36 weeks post-menstrual age or discharge

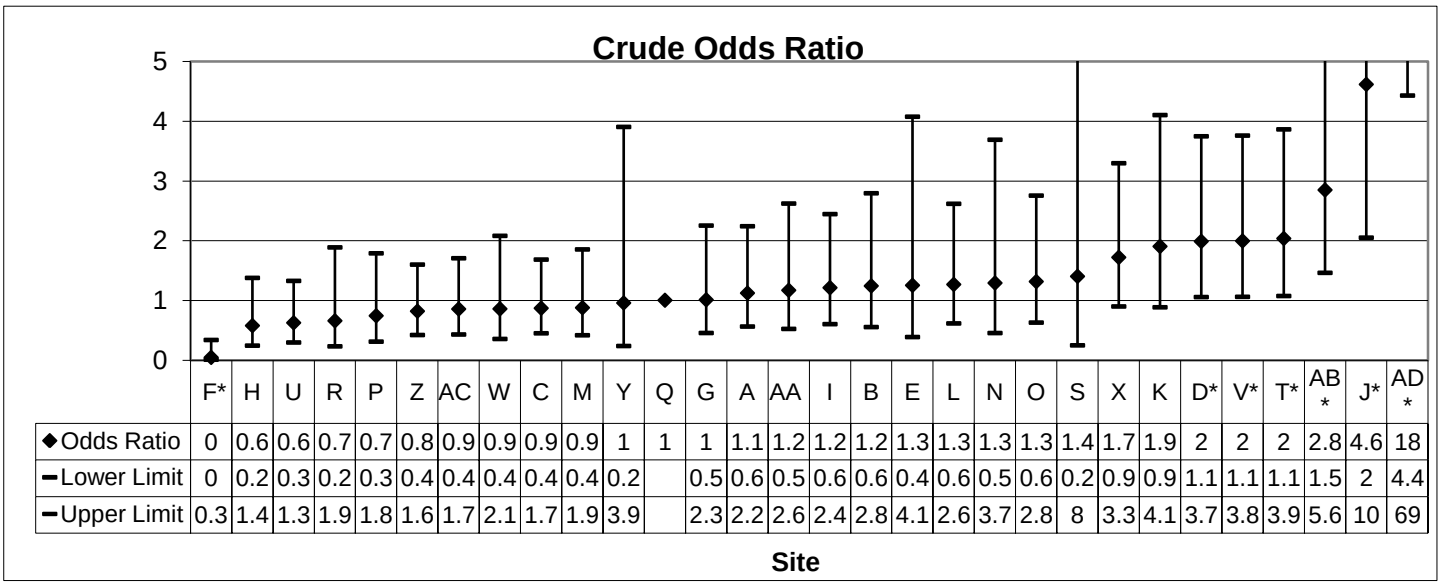
Outcome is attributed to the network hospital of first admission

Significant predictors identified by multivariate analysis and adjusted for:
GA Cesarean section
Apgar at 5 minutes SNAP-II Score
SGA (BW <10th percentile for GA)

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

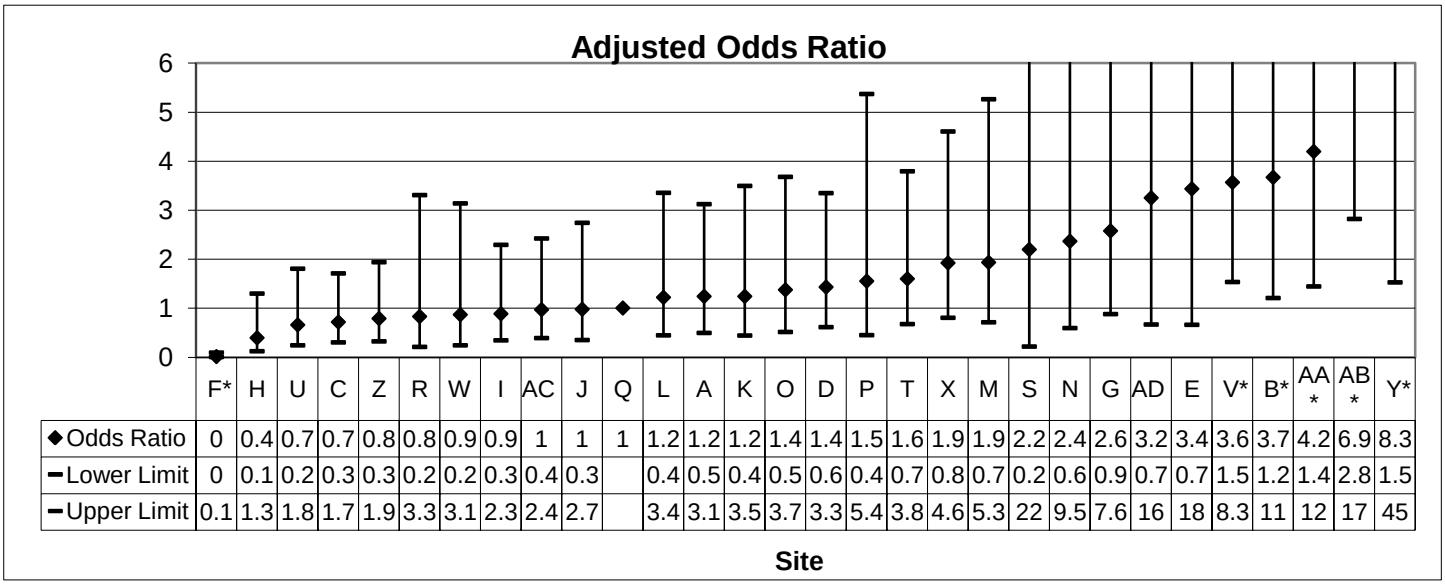
Site J and AD have different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites.

Presentation #48b
Oxygen use at 28 days after birth (site comparison)



	F*	H	U	R	P	Z	AC	W	C	M	Y	Q	G	A	AA	I	B	E	L	N	O	S	X	K	D*	V*	T*	AB*	J*	AD*
◆Odds Ratio	0	0.6	0.6	0.7	0.7	0.8	0.9	0.9	0.9	0.9	1	1	1	1.1	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.4	1.7	1.9	2	2	2	2.8	4.6	18
━Lower Limit	0	0.2	0.3	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.2		0.5	0.6	0.5	0.6	0.6	0.4	0.6	0.5	0.6	0.2	0.9	0.9	1.1	1.1	1.1	1.5	2	4.4
━Upper Limit	0.3	1.4	1.3	1.9	1.8	1.6	1.7	2.1	1.7	1.9	3.9		2.3	2.2	2.6	2.4	2.8	4.1	2.6	3.7	2.8	8	3.3	4.1	3.7	3.8	3.9	5.6	10	69

Number of neonates: 3 676



	F*	H	U	C	Z	R	W	I	AC	J	Q	L	A	K	O	D	P	T	X	M	S	N	G	AD	E	V*	B*	AA*	AB*	Y*
◆Odds Ratio	0	0.4	0.7	0.7	0.8	0.8	0.9	0.9	1	1	1	1.2	1.2	1.2	1.4	1.4	1.5	1.6	1.9	1.9	2.2	2.4	2.6	3.2	3.4	3.6	3.7	4.2	6.9	8.3
━Lower Limit	0	0.1	0.2	0.3	0.3	0.2	0.2	0.3	0.4	0.3		0.4	0.5	0.4	0.5	0.6	0.4	0.7	0.8	0.7	0.2	0.6	0.9	0.7	0.7	1.5	1.2	1.4	2.8	1.5
━Upper Limit	0.1	1.3	1.8	1.7	1.9	3.3	3.1	2.3	2.4	2.7		3.4	3.1	3.5	3.7	3.3	5.4	3.8	4.6	5.3	22	9.5	7.6	16	18	8.3	11	12	17	45

Number of neonates: 3 607

Reference site: Q

Inclusion criteria:
GA <33 weeks
Age at admission less than 4 days
Survival to 28 days after birth or discharge

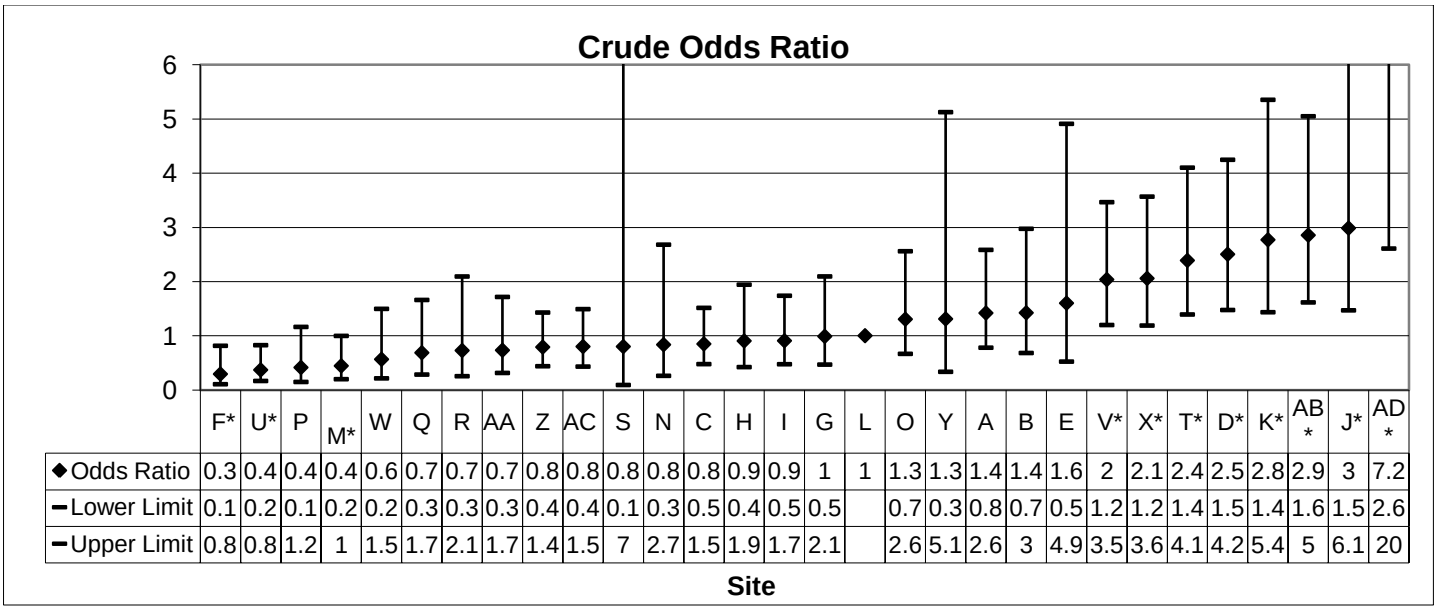
***Sites significantly different from reference site (P<0.05)**

Outcome is attributed to the network hospital of first admission

Significant predictors identified by multivariate analysis and adjusted for:
GA
Apgar at 5 minutes SNAP-II Score
SGA (BW <10th centile for GA)

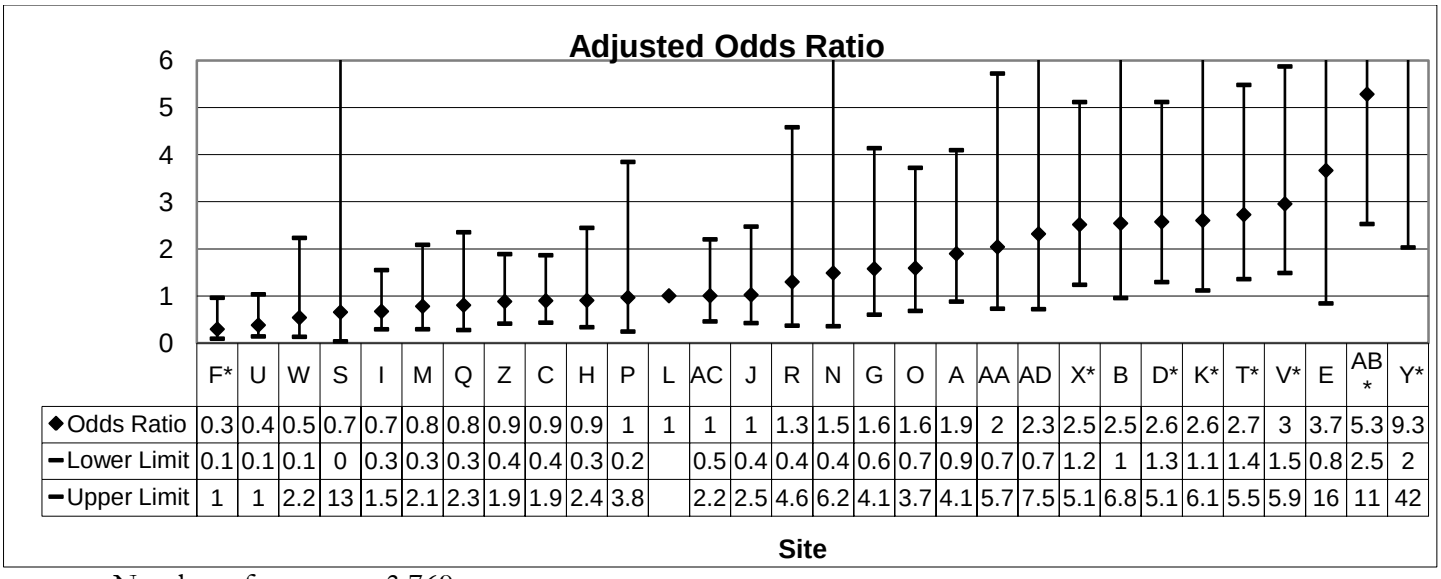
Sites J and AD have different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites.

Presentation #49a
Oxygen use at 36 weeks post-menstrual age or death at any time (site comparison)



	F*	U*	P	M*	W	Q	R	AA	Z	AC	S	N	C	H	I	G	L	O	Y	A	B	E	V*	X*	T*	D*	K*	AB*	J*	AD*
◆Odds Ratio	0.3	0.4	0.4	0.4	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	1	1	1.3	1.3	1.4	1.4	1.6	2	2.1	2.4	2.5	2.8	2.9	3	7.2
━Lower Limit	0.1	0.2	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.1	0.3	0.5	0.4	0.5	0.5		0.7	0.3	0.8	0.7	0.5	1.2	1.2	1.4	1.5	1.4	1.6	1.5	2.6
━Upper Limit	0.8	0.8	1.2	1	1.5	1.7	2.1	1.7	1.4	1.5	7	2.7	1.5	1.9	1.7	2.1		2.6	5.1	2.6	3	4.9	3.5	3.6	4.1	4.2	5.4	5	6.1	20

Number of neonates: 3 856



	F*	U	W	S	I	M	Q	Z	C	H	P	L	AC	J	R	N	G	O	A	AA	AD	X*	B	D*	K*	T*	V*	E	AB*	Y*
◆Odds Ratio	0.3	0.4	0.5	0.7	0.7	0.8	0.8	0.9	0.9	0.9	1	1	1	1	1.3	1.5	1.6	1.6	1.9	2	2.3	2.5	2.5	2.6	2.6	2.7	3	3.7	5.3	9.3
━Lower Limit	0.1	0.1	0.1	0	0.3	0.3	0.3	0.4	0.4	0.3	0.2		0.5	0.4	0.4	0.4	0.6	0.7	0.9	0.7	0.7	1.2	1	1.3	1.1	1.4	1.5	0.8	2.5	2
━Upper Limit	1	1	2.2	13	1.5	2.1	2.3	1.9	1.9	2.4	3.8		2.2	2.5	4.6	6.2	4.1	3.7	4.1	5.7	7.5	5.1	6.8	5.1	6.1	5.5	5.9	16	11	42

Number of neonates: 3 769

Reference site: L

Inclusion criteria:
GA <33 weeks
Age at admission less than 4 days

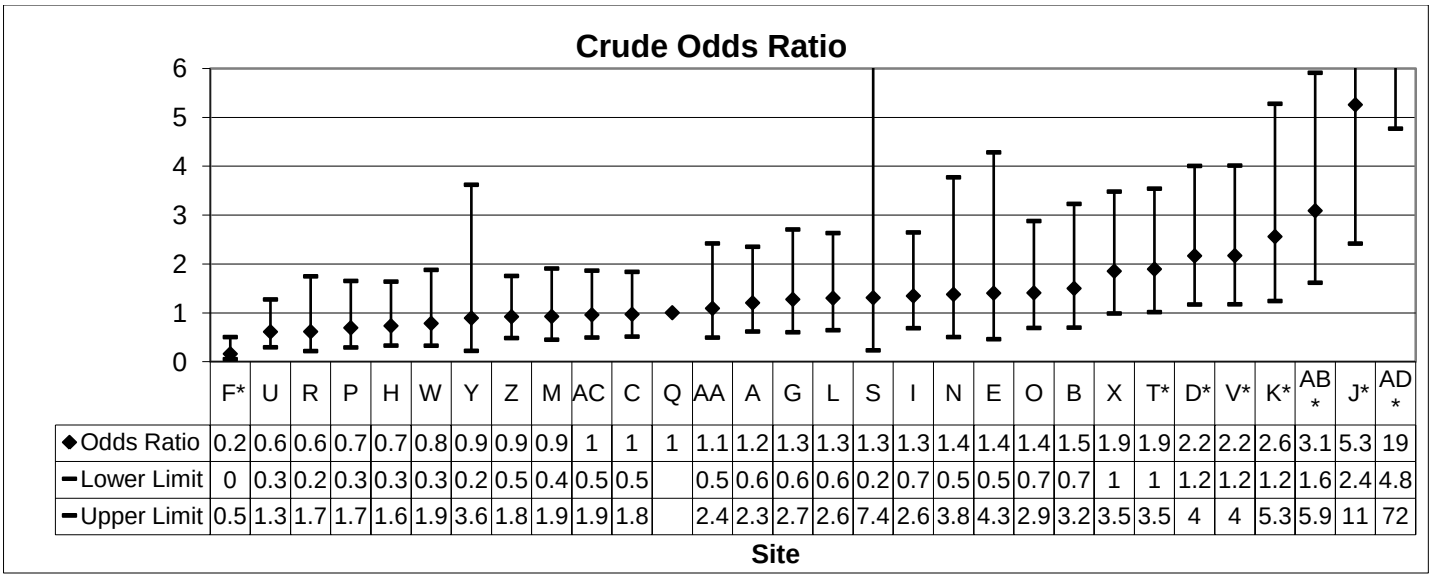
Sites J and AD have different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites.

Significant predictors identified by multivariate analysis and adjusted for:
GA Cesarean section
SGA (BW <10th percentile for GA)
SNAP-II Score Apgar at 5 minutes

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

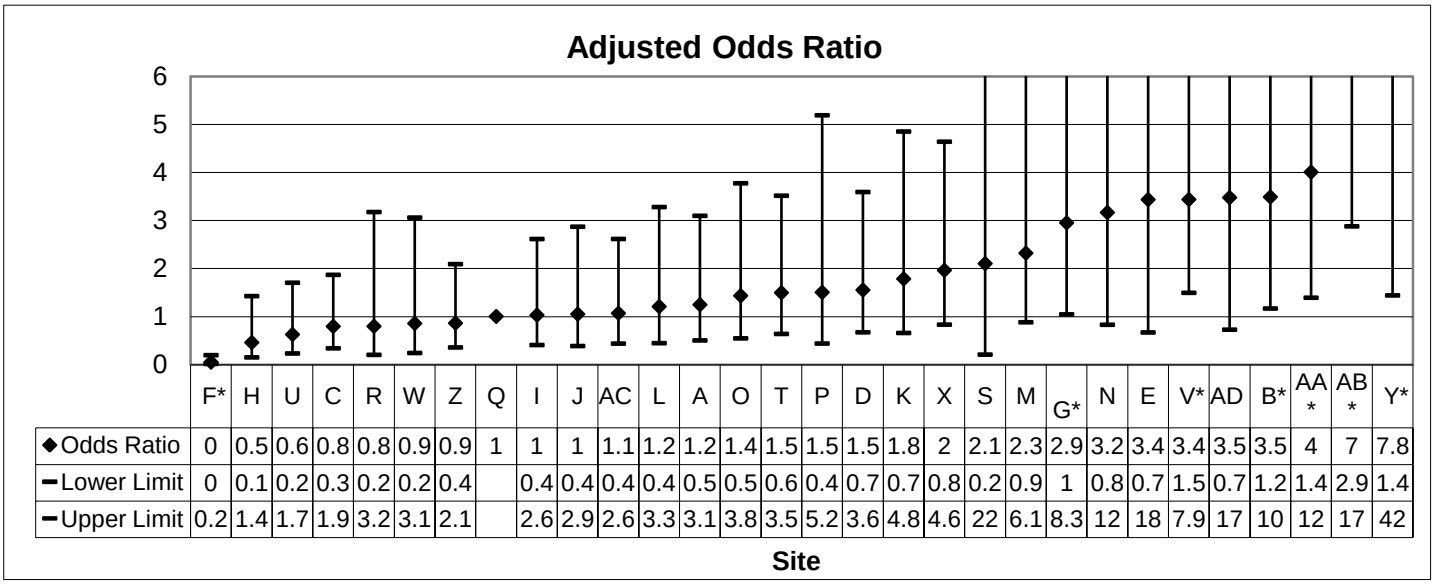
Outcome is attributed to the network hospital of first admission

Presentation #49b
Oxygen use at 28 days after birth or death at any time (site comparison)



	F*	U	R	P	H	W	Y	Z	M	AC	C	Q	AA	A	G	L	S	I	N	E	O	B	X	T*	D*	V*	K*	AB*	J*	AD*
◆Odds Ratio	0.2	0.6	0.6	0.7	0.7	0.8	0.9	0.9	0.9	1	1	1	1.1	1.2	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.5	1.9	1.9	2.2	2.2	2.6	3.1	5.3	19
━Lower Limit	0	0.3	0.2	0.3	0.3	0.3	0.2	0.5	0.4	0.5	0.5		0.5	0.6	0.6	0.6	0.2	0.7	0.5	0.5	0.7	0.7	1	1	1.2	1.2	1.2	1.6	2.4	4.8
━Upper Limit	0.5	1.3	1.7	1.7	1.6	1.9	3.6	1.8	1.9	1.9	1.8		2.4	2.3	2.7	2.6	7.4	2.6	3.8	4.3	2.9	3.2	3.5	3.5	4	4	5.3	5.9	11	72

Number of neonates: 3 856



	F*	H	U	C	R	W	Z	Q	I	J	AC	L	A	O	T	P	D	K	X	S	M	G*	N	E	V*	AD	B*	AA*	AB*	Y*
◆Odds Ratio	0	0.5	0.6	0.8	0.8	0.9	0.9	1	1	1	1.1	1.2	1.2	1.4	1.5	1.5	1.5	1.8	2	2.1	2.3	2.9	3.2	3.4	3.4	3.5	3.5	4	7	7.8
━Lower Limit	0	0.1	0.2	0.3	0.2	0.2	0.4		0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.4	0.7	0.7	0.8	0.2	0.9	1	0.8	0.7	1.5	0.7	1.2	1.4	2.9	1.4
━Upper Limit	0.2	1.4	1.7	1.9	3.2	3.1	2.1		2.6	2.9	2.6	3.3	3.1	3.8	3.5	5.2	3.6	4.8	4.6	22	6.1	8.3	12	18	7.9	17	10	12	17	42

Number of neonates: 3 779

Reference site: Q

Inclusion criteria:
GA <33 weeks
Age at admission less than 4 days

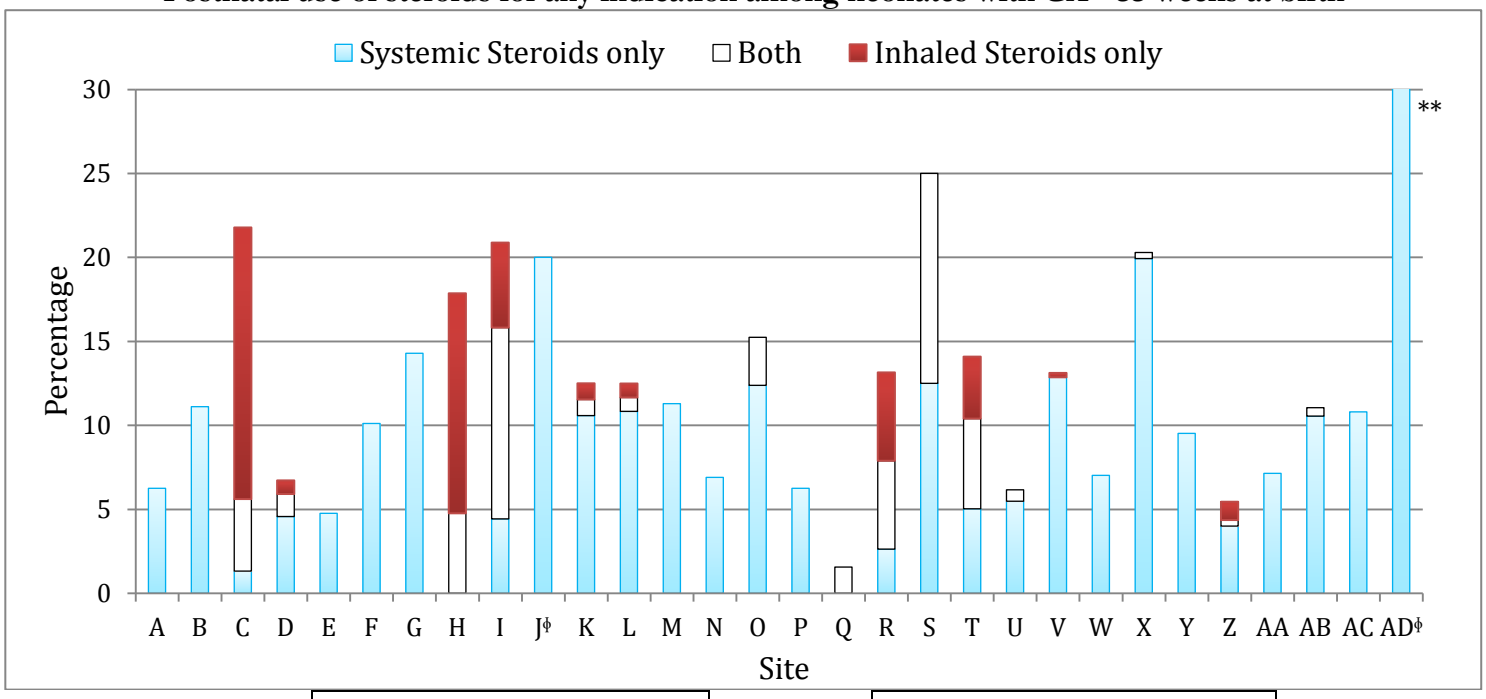
Outcome is attributed to the network hospital of first admission

***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 percentile for GA)

Sites J and AD have different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites.

Presentation #50
Postnatal use of steroids for any indication among neonates with GA <33 weeks at birth†

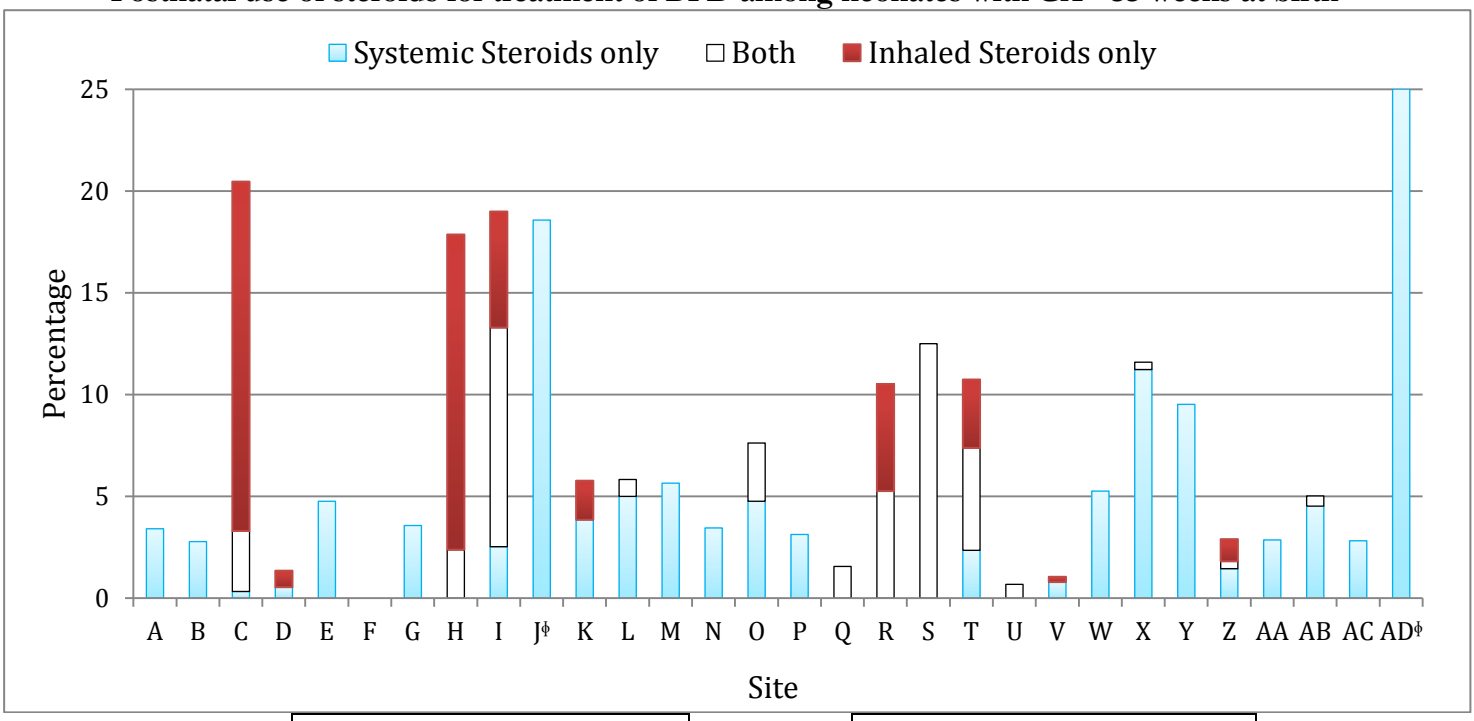


Site	Postnatal steroid use (%)		
	Systemic Steroids only	Both	Inhaled Steroids only
A	6.3	0.0	0.0
B	11.1	0.0	0.0
C	1.3	4.3	16.2
D	4.6	1.3	0.8
E	4.8	0.0	0.0
F	10.1	0.0	0.0
G	14.3	0.0	0.0
H	0.0	4.8	13.1
I	4.4	11.4	5.1
Jϕ	20.0	0.0	0.0
K	10.6	1.0	1.0
L	10.8	0.8	0.8
M	11.3	0.0	0.0
N	6.9	0.0	0.0
O	12.4	2.9	0.0

Site	Postnatal steroid use (%)		
	Systemic Steroids only	Both	Inhaled Steroids only
P	6.3	0.0	0.0
Q	0.0	1.6	0.0
R	2.6	5.3	5.3
S	12.5	12.5	0.0
T	5.0	5.4	3.7
U	5.5	0.7	0.0
V	12.9	0.0	0.3
W	7.0	0.0	0.0
X	19.9	0.4	0.0
Y	9.5	0.0	0.0
Z	4.0	0.4	1.1
AA	7.1	0.0	0.0
AB	10.6	0.5	0.0
AC	10.8	0.0	0.0
ADϕ	45.0	0.0	0.0
Total	8.5	1.7	2.2

Total number of neonates = 4 041
† Percentage of neonates to each network NICU and results are attributed to the original hospital.
**Note that the bar representing site AD'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 sites J and AD 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 #50a
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	3.4	0.0	0.0
B	2.8	0.0	0.0
C	0.3	3.0	17.2
D	0.5	0.0	0.8
E	4.8	0.0	0.0
F	0.0	0.0	0.0
G	3.6	0.0	0.0
H	0.0	2.4	15.5
I	2.5	10.8	5.7
Jϕ	18.6	0.0	0.0
K	3.9	0.0	1.9
L	5.0	0.8	0.0
M	5.7	0.0	0.0
N	3.5	0.0	0.0
O	4.8	2.9	0.0

Site	Postnatal steroid use (%)		
	Systemic Steroids only	Both	Inhaled Steroids only
P	3.1	0.0	0.0
Q	0.0	1.6	0.0
R	0.0	5.3	5.3
S	0.0	12.5	0.0
T	2.4	5.0	3.4
U	0.0	0.7	0.0
V	0.8	0.0	0.3
W	5.3	0.0	0.0
X	11.2	0.4	0.0
Y	9.5	0.0	0.0
Z	1.5	0.4	1.1
AA	2.9	0.0	0.0
AB	4.5	0.5	0.0
AC	2.8	0.0	0.0
ADϕ	25.0	0.0	0.0
Total	3.2	1.4	2.4

Total number of neonates = 4 041

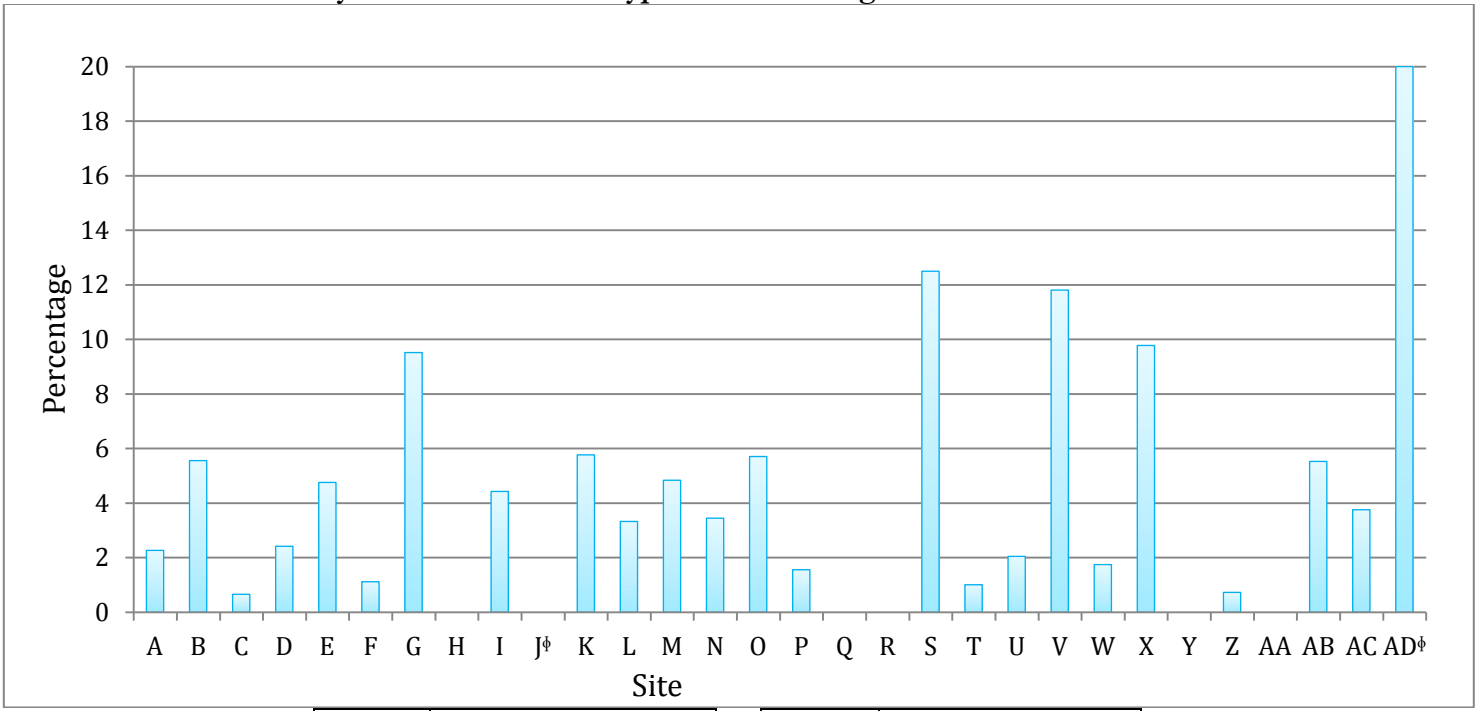
† Percentage of neonates to each network NICU and results are attributed to the original hospital.

ϕNote that the criteria for entering neonates with GA <33 in the CNN dataset are not the same for sites J and AD 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 #50b

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



Site	Postnatal systemic steroids use (%)
A	2.3
B	5.6
C	0.7
D	2.4
E	4.8
F	1.1
G	9.5
H	0.0
I	4.4
Jϕ	0.0
K	5.8
L	3.3
M	4.8
N	3.5
O	5.7

Site	Postnatal systemic steroids use (%)
P	1.6
Q	0.0
R	0.0
S	12.5
T	1.0
U	2.1
V	11.8
W	1.8
X	9.8
Y	0.0
Z	0.7
AA	0.0
AB	5.5
AC	3.8
ADϕ	20.0
Total	4.1

Total number of neonates = 4 041

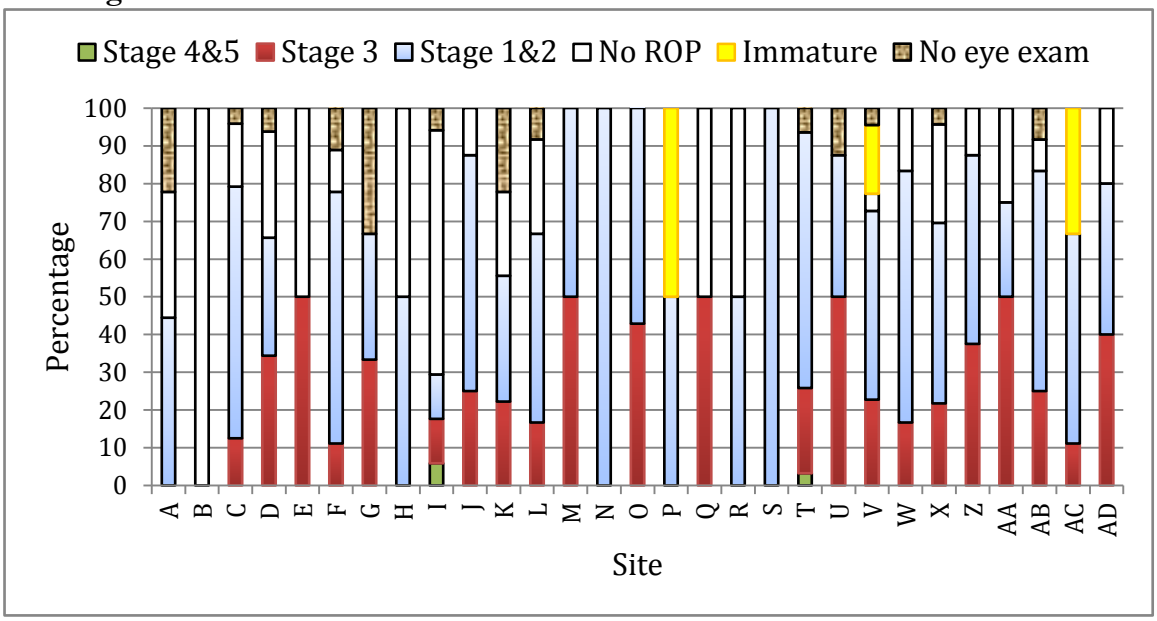
† Percentage of neonates to each network NICU and results are attributed to the original hospital.

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

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

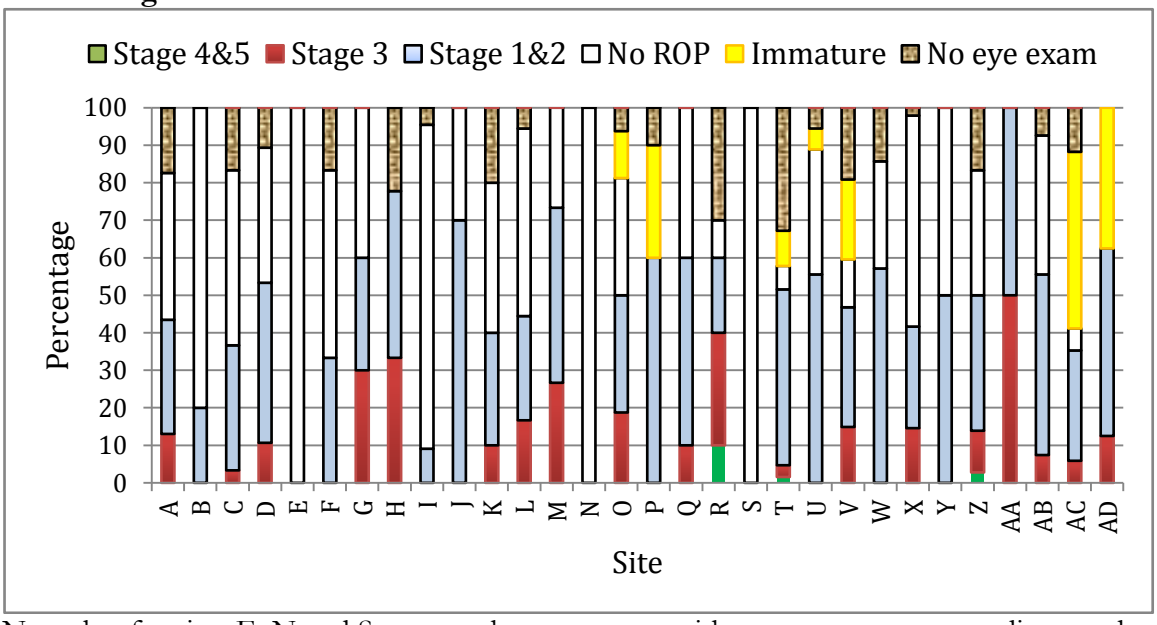
Presentation #51a
Retinopathy of prematurity among neonates with BW <1000g who survived beyond 6 weeks

A. <750g



For site B, among those neonates with eye exams, none was diagnosed with ROP, so the incidence is zero. There were no neonates in site Y in this BW category.

B. 750-999g

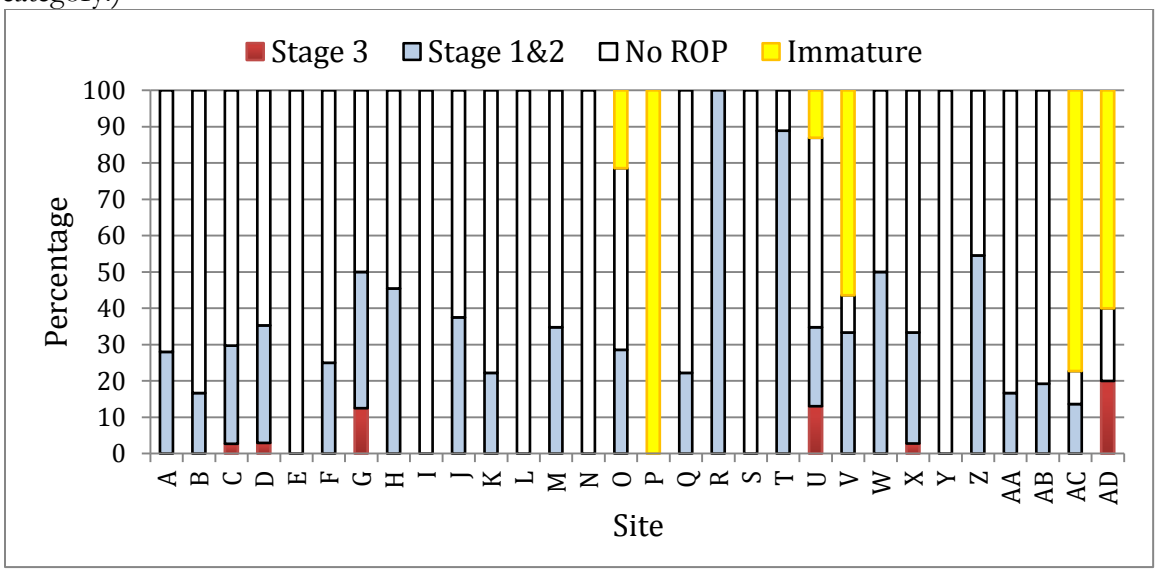


Note that for sites E, N and S, among those neonates with eye exams, none was diagnosed with ROP, so the incidence is zero.

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

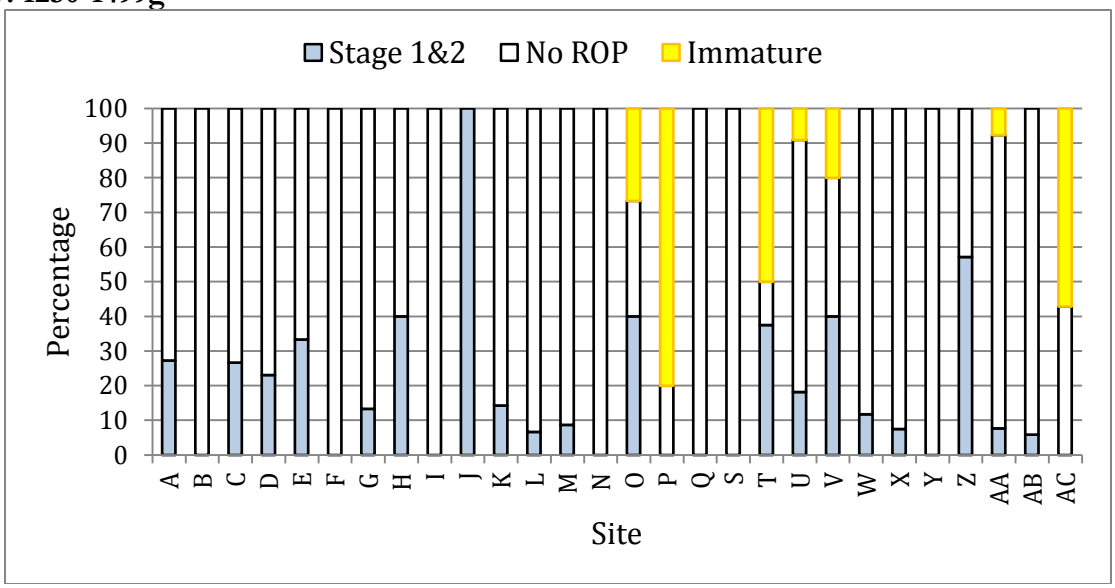
Presentation #51b
Retinopathy of prematurity among neonates with BW <1500g and who had eye exams*

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



Note that for sites E, I, L, N, S, and Y, among those neonates with eye exams, none was diagnosed with ROP, so the incidence is zero.

D. 1250-1499g



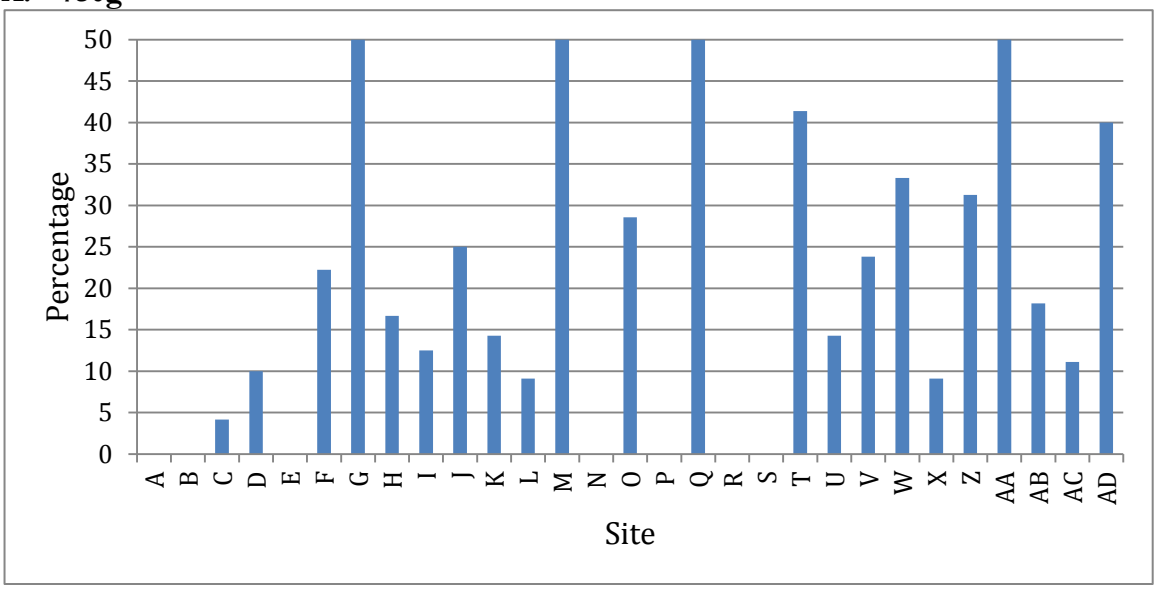
Note that for site B, F, I, N, Q, S, and Y, among those neonates with eye exams, none were diagnosed with ROP, so the incidence is zero. There were no neonates in sites R and AD in this BW category.

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.**

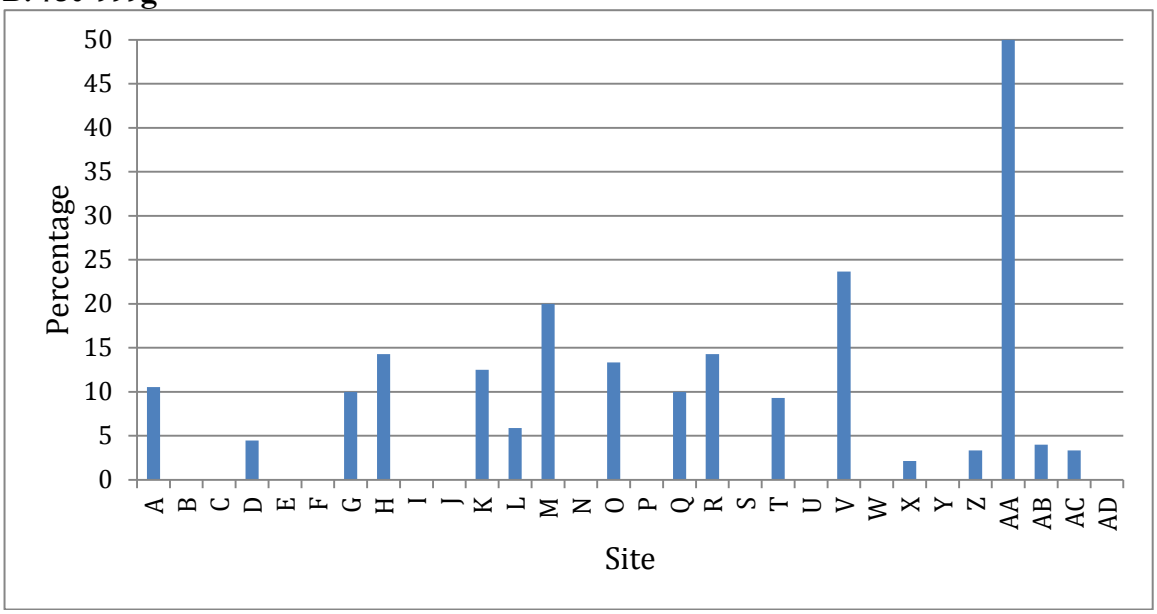
Presentation #52
Treatment for retinopathy of prematurity among neonates with BW <1000g (who had eye exams)

A. <750g



For sites A, E, N, P, R, and S, none of the neonates received treatment. For site B, no neonates were diagnosed with ROP for this BW subgroup. There were no neonates in site Y in this BW category.

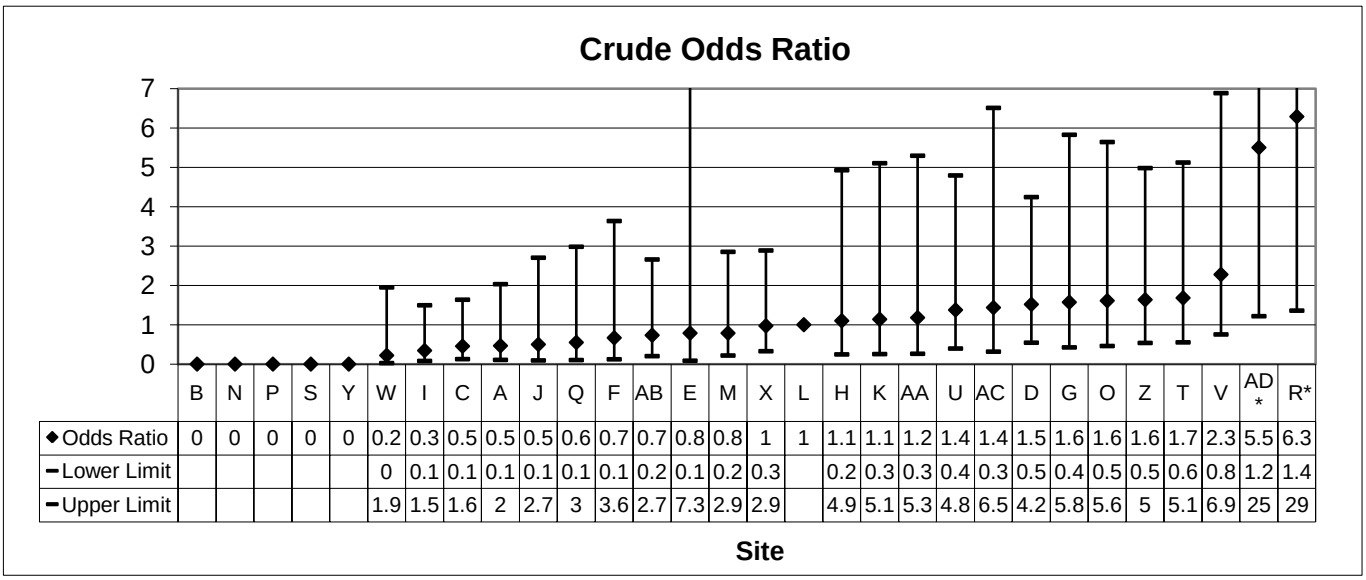
B. 750-999g



For sites B, C, F, I, J, P, U, W, Y, and AD, none of the neonates received treatment. For sites E, N, and S, no neonates were diagnosed with ROP for this BW subgroup.

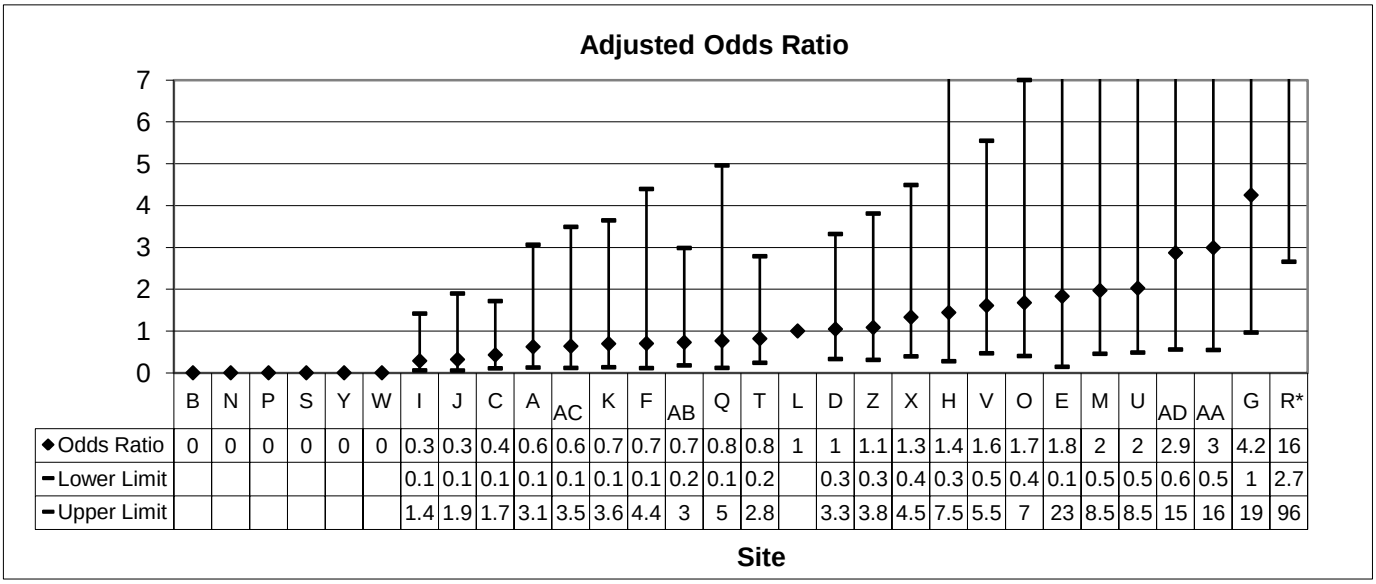
COMMENTS: Not all centers have data on neonates in each BW category. Treatment includes Anti-VEGF therapy, surgery or both.

Presentation #53
Retinopathy of prematurity stage 3 and higher (site comparison)



	B	N	P	S	Y	W	I	C	A	J	Q	F	AB	E	M	X	L	H	K	AA	U	AC	D	G	O	Z	T	V	AD *	R*
◆Odds Ratio	0	0	0	0	0	0.2	0.3	0.5	0.5	0.5	0.6	0.7	0.7	0.8	0.8	1	1	1.1	1.1	1.2	1.4	1.4	1.5	1.6	1.6	1.6	1.7	2.3	5.5	6.3
−Lower Limit						0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.3		0.2	0.3	0.3	0.4	0.3	0.5	0.4	0.5	0.5	0.6	0.8	1.2	1.4
−Upper Limit						1.9	1.5	1.6	2	2.7	3	3.6	2.7	7.3	2.9	2.9		4.9	5.1	5.3	4.8	6.5	4.2	5.8	5.6	5	5.1	6.9	25	29

Number of neonates: 1 604



	B	N	P	S	Y	W	I	J	C	A	AC	K	F	AB	Q	T	L	D	Z	X	H	V	O	E	M	U	AD	AA	G	R*
◆Odds Ratio	0	0	0	0	0	0	0.3	0.3	0.4	0.6	0.6	0.7	0.7	0.7	0.8	0.8	1	1	1.1	1.3	1.4	1.6	1.7	1.8	2	2	2.9	3	4.2	16
−Lower Limit							0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2		0.3	0.3	0.4	0.3	0.5	0.4	0.1	0.5	0.5	0.6	0.5	1	2.7
−Upper Limit							1.4	1.9	1.7	3.1	3.5	3.6	4.4	3	5	2.8		3.3	3.8	4.5	7.5	5.5	7	23	8.5	8.5	15	16	19	96

Number of neonates: 1 495

Reference site: L
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

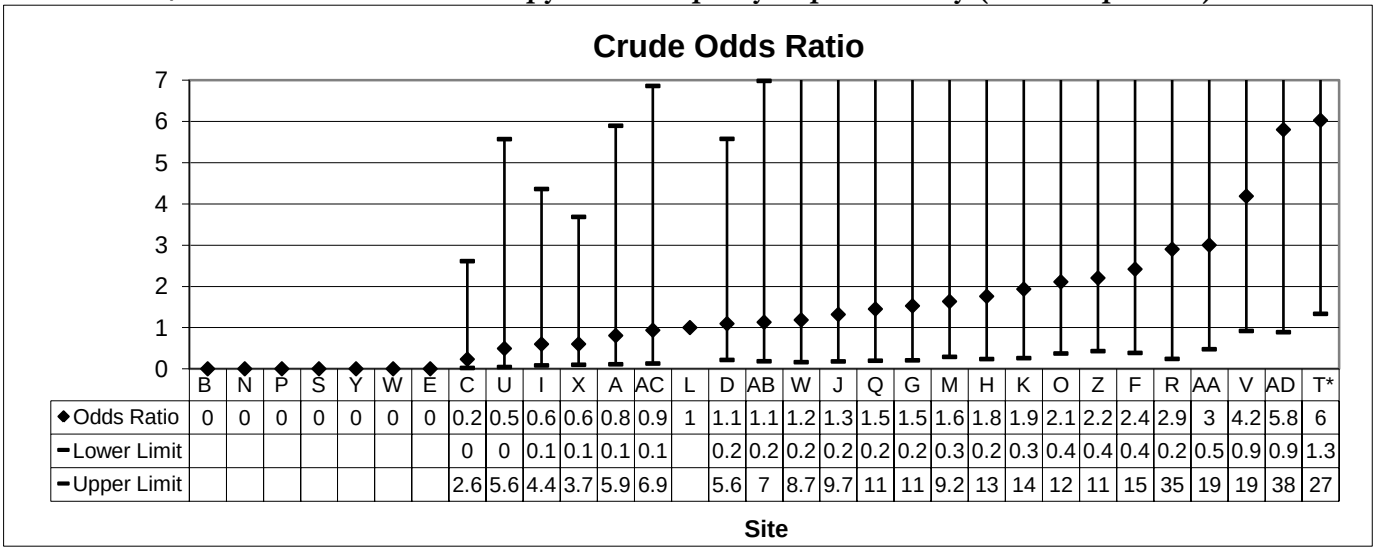
All the neonates who meet the criteria in sites B, N, P, S, and Y did not have retinopathy of prematurity stage 3 and higher (Odds Ratio: 0)

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

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

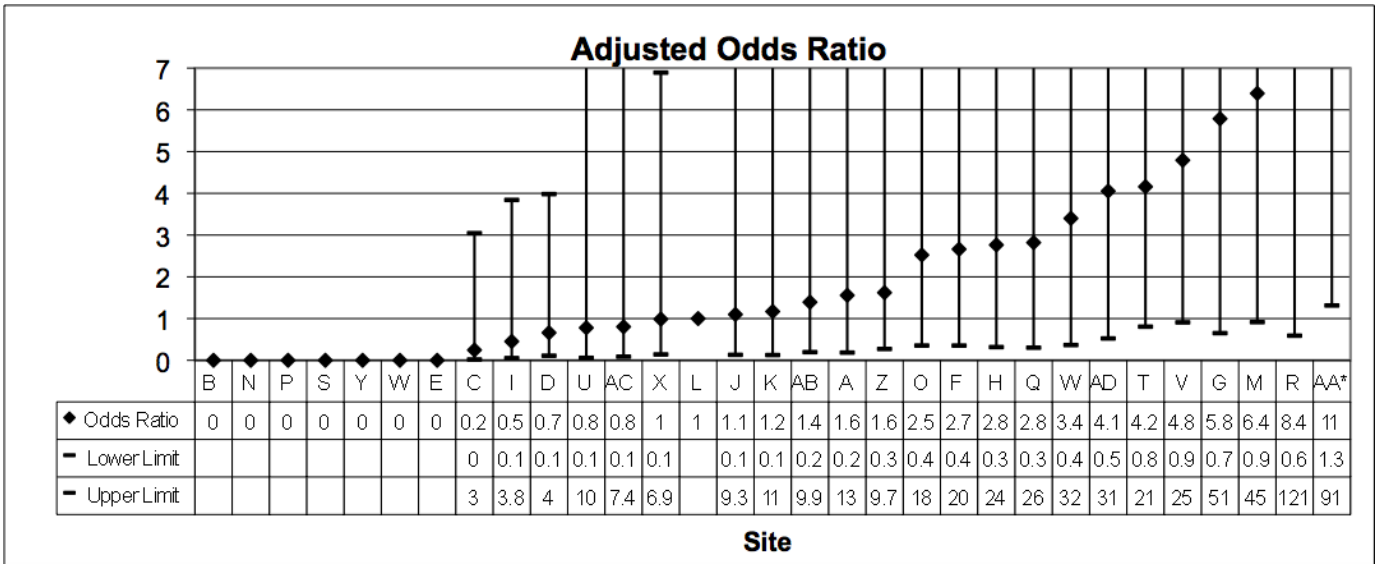
Sites J and AD have different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites.

Presentation #54
Laser/Anti-VEGF blocker therapy for retinopathy of prematurity (site comparison)



	B	N	P	S	Y	W	E	C	U	I	X	A	AC	L	D	AB	W	J	Q	G	M	H	K	O	Z	F	R	AA	V	AD	T*
◆Odds Ratio	0	0	0	0	0	0	0	0.2	0.5	0.6	0.6	0.8	0.9	1	1.1	1.1	1.2	1.3	1.5	1.5	1.6	1.8	1.9	2.1	2.2	2.4	2.9	3	4.2	5.8	6
━Lower Limit								0	0	0.1	0.1	0.1	0.1		0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.4	0.4	0.4	0.2	0.5	0.9	0.9	1.3
━Upper Limit								2.6	5.6	4.4	3.7	5.9	6.9		5.6	7	8.7	9.7	11	11	9.2	13	14	12	11	15	35	19	19	38	27

Number of neonates: 1 660



	B	N	P	S	Y	W	E	C	I	D	U	AC	X	L	J	K	AB	A	Z	O	F	H	Q	W	AD	T	V	G	M	R	AA*
◆ Odds Ratio	0	0	0	0	0	0	0	0.2	0.5	0.7	0.8	0.8	1	1	1.1	1.2	1.4	1.6	1.6	2.5	2.7	2.8	2.8	3.4	4.1	4.2	4.8	5.8	6.4	8.4	11
━ Lower Limit								0	0.1	0.1	0.1	0.1	0.1		0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.3	0.3	0.4	0.5	0.8	0.9	0.7	0.9	0.6	1.3
━ Upper Limit								3	3.8	4	10	7.4	6.9		9.3	11	9.9	13	9.7	18	20	24	26	32	31	21	25	51	45	121	91

Number of neonates: 1 658

Reference site: L

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 sites E, B, N, P, S and Y were not treated (Odds Ratio: 0) [No neonates had ROP grade 3 or higher in sites B, N, P, S and Y]

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

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

Refer to presentations #23 and #24 for the actual numbers of therapy for retinopathy of prematurity.

Sites J and AD have different criteria for entering neonates in the CNN dataset, and may not be comparable with other sites.

Presentation 55a
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
	Lowest													Median
According to total number of neonates														
SNAPII-PE adjusted mortality rates (%)	W	S	Q	U	R	T	L	Y	P	M	B	E	A	AA
Early onset sepsis rate (%)	L	V	AA	T	W	P	N	G	M	I	D	B	U	O
Late onset sepsis rate (SNAPII-PE adjusted) (%)	S	Q	E	R	M	H	P	B	F	N	T	AB	C	AC
Late onset sepsis /1000 patient days	S	E	Q	M	P	C	AB	R	H	F	AC	N	B	U
Death or at least one of major morbidities (%)	S	Q	E	N	P	M	F	U	H	G	R	B	AA	O
Among neonates <33 weeks														
Non-receipt of antenatal steroid (%)	S	N	O	X	D	A	C	U	E	I	L	M	Q	AC
Surgical ligation of PDA for neonates with PDA (%)	S†	AA	B	N	Y	Z	M	H	L	C	U	P	AB	V
Stage 2 or 3 NEC (adjusted odds ratio)[1]	E	R	S	U	Y	F	Q	B	K	P	I	C	AC	H
Stage 3-5 ROP (adjusted odds ratio)[2]	B	N	P	S	Y	W	I	C	A	AC	K	F	AB	Q
Oxygen use at 36 wks (adjusted odds ratio)[3]	F	U	M	I	W	H	C	Q	AC	Z	N	S	L	P
VE or PEC (adjusted odds ratio)[4]	P	S	U	N	R	X	Q	I	AC	G	W	T	L	D
Use of systemic steroids (%)	Q	Z	E	H	C	D	U	A	P	N	W	AA	R	Y
SNAPII-PE adjusted mortality for < 33 wks GA (%)	R	W	Y	S	U	Q	E	T	L	O	M	P	Z	B
Death or at least one of major morbidities (%)	Q	U	P	R	M	S	F	AC	Z	C	N	E	H	Y
Among neonates < 1500g														
Non-receipt of antenatal steroid (%)	E	S	R	O	H	N	I	U	X	D	C	A	P	AC
Surgical ligation of PDA for neonates with PDA (%)	S†	AA	B	N	Y	Z	M	H	C	L	U	P	AB	V
Stage 2 or 3 NEC (adjusted odds ratio)[1]	B	U	E	S	Y	R	F	K	Q	I	P	C	H	AC
Stage 3-5 ROP (adjusted odds ratio)[2]	P	S	Y	B	N	W	I	F	C	A	AC	K	AB	Q
Oxygen use at 36 wks (adjusted odds ratio)[3]	F	I	U	M	W	H	Q	C	AC	Z	N	G	S	L
VE or PEC (adjusted odds ratio)[4]	P	S	U	R	X	AC	I	N	Q	T	L	A	D	O
Use of systemic steroids (%)	Q	E	N	C	D	Z	P	H	A	W	U	AA	R	K
SNAPII-PE adjusted mortality for <1500g (%)	W	Y	S	U	Q	E	T	L	R	O	Z	P	B	M
Death or at least one of major morbidities (%)	Q	U	P	C	M	F	AC	R	I	S	Z	L	E	N

† None of the infants in Site S had PDA.

Variables adjusted for (selected based on univariate association and varied with outcomes)
[1] Stage 2 or 3 NEC – GA, SGA (BW <10th centile for GA)
[2] Stage 3-5 ROP – GA, SNAP II Score
[3] Oxygen use at 36 wks – GA, Apgar at 5 minutes, SNAP-II Score, Cesarean section, SGA (BW <10th centile for GA)
[4] VE or PEC – GA, Gender, Apgar at 5 minutes, SNAP-II Score, Outborn

Presentation #55a (continued)

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

15	16	17	18	19	20	21	22	23	24	25	26	27	28	**Parameter / Site rank**
Median													Highest	
														According to total number of neonates
G	O	Z	C	H	N	AC	D	AB	I	X	V	F	K	SNAPII-PE adjusted mortality rates (%)
A	Q	C	H	X	Z	AB	AC	E	F	K	R	S	Y	Early onset sepsis rate (%)
Y	Z	U	O	V	X	AA	L	G	D	K	I	A	W	Late onset sepsis rate (SNAPII-PE adjusted) (%)
A	V	I	O	L	Z	G	X	W	AA	D	K	T	Y	Late onset sepsis /1000 patient days
Z	I	T	L	AC	Y	C	X	D	AB	K	V	W	A	Death or at least one of major morbidities (%)
														Among neonates <33 weeks
T	V	Z	B	H	W	P	R	AB	AA	G	K	F	Y	Non-receipt of antenatal steroid (%)
D	AC	K	T	W	X	O	Q	G	A	F	R	I	E	Surgical ligation of PDA for neonates with PDA (%)
AA	M	D	V	A	T	AB	Z	O	N	X	L	W	G	Stage 2 or 3 NEC (adjusted odds ratio)[1]
T	L	D	Z	X	H	V	O	E	M	U	AA	G	R	Stage 3-5 ROP (adjusted odds ratio)[2]
G	R	O	K	A	AA	X	D	B	V	T	E	AB	Y	Oxygen use at 36 wks (adjusted odds ratio)[3]
A	O	F	AB	C	M	Z	H	V	K	B	Y	AA	E	VE or PEC (adjusted odds ratio)[4]
F	T	AC	AB	B	M	K	L	V	G	O	I	X	S	Use of systemic steroids (%)
A	AC	C	H	AA	V	G	D	F	X	AB	I	N	K	SNAPII-PE adjusted mortality for < 33 wks GA (%)
I	W	L	G	AA	A	V	X	B	O	T	D	AB	K	Death or at least one of major morbidities (%)
														Among neonates < 1500g
V	T	L	Z	Q	W	M	B	AB	G	AA	F	K	Y	Non-receipt of antenatal steroid (%)
D	K	T	W	AC	X	O	Q	G	A	R	F	I	E	Surgical ligation of PDA for neonates with PDA (%)
M	T	D	V	AA	A	N	AB	Z	O	L	G	W	X	Stage 2 or 3 NEC (adjusted odds ratio)[1]
T	L	D	Z	X	H	V	O	E	U	M	AA	G	R	Stage 3-5 ROP (adjusted odds ratio)[2]
P	O	R	K	B	A	D	AA	X	V	T	E	AB	Y	Oxygen use at 36 wks (adjusted odds ratio)[3]
G	M	AB	F	C	W	V	K	B	H	Z	AA	E	Y	VE or PEC (adjusted odds ratio)[4]
T	AB	F	AC	L	V	M	B	G	O	I	X	Y	S	Use of systemic steroids (%)
AC	C	A	N	G	F	D	AA	X	H	I	V	AB	K	SNAPII-PE adjusted mortality for <1500g (%)
W	O	A	X	T	V	G	B	D	H	K	AA	AB	Y	Death or at least one of major morbidities (%)

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

[1] Stage 2 or 3 NEC – GA, SGA (BW <10th centile for GA)

[2] Stage 3-5 ROP – GA, SNAP II Score

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

[4] VE or PEC – GA, Gender, Apgar at 5 minutes, SNAP-II Score, Outborn

Presentation #55b
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
	Lowest														Median
According to total number of neonates															
Non-receipt of antenatal steroid (%)	S	AD	E	P	R	Y	O	I	H	D	C	X	L	N	U
Surgical ligation of PDA for neonates with PDA (%)	S[†]	AA	B	N	Y	Z	H	J	M	AD	C	L	U	V	P
Stage 2 or 3 NEC (adjusted odds ratio)[1]	U	E	S	Y	R	B	P	Q	H	F	K	I	V	D	C
Stage 3-5 ROP (adjusted odds ratio)[2]	P	S	Y	B	N	W	I	J	F	A	C	AC	K	AB	T
Oxygen use at 36 wks (adjusted odds ratio)[3]	F	M	I	U	AC	H	L	Q	C	W	J	Z	N	K	P
VE or PEC (adjusted odds ratio)[4]	P	S	Y	U	J	AC	Q	X	I	T	M	N	A	R	F
Use of systemic steroids (%)	Q	N	D	C	Z	H	K	E	A	R	U	P	AB	J	V
SNAPII-PE adjusted mortality (%)	R	W	Y	S	Q	U	AD	E	P	O	M	T	L	Z	G
Death or at least one of major morbidities (%)	Q	Y	N	U	C	I	AC	H	P	L	R	F	E	O	Z

[†] None of the infants in Site S had PDA.

Variables adjusted for (selected based on univariate association and varied with outcomes)
[1] Stage 2 or 3 NEC – GA, SGA (BW <10th centile for GA)
[2] Stage 3-5 ROP – GA, SNAP II Score
[3] Oxygen use at 36 wks – GA, Apgar at 5 minutes, SNAP-II Score, Cesarean section, SGA (BW <10th centile for GA)
[4] VE or PEC – GA, Gender, Apgar at 5 minutes, SNAP-II Score, Outborn

Presentation 55b (continued)
Benchmarking for sites which contributed all eligible admission with GA <29 weeks

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	**Parameter / Site rank**
Median														Highest	
															According to total number of neonates
B	Q	T	M	Z	V	AC	G	J	A	W	AA	AB	K	F	Non-receipt of antenatal steroid (%)
AB	D	K	T	AC	X	Q	O	A	G	F	R	W	I	E	Surgical ligation of PDA for neonates with PDA (%)
M	J	A	AB	AD	T	AC	N	Z	O	G	AA	W	L	X	Stage 2 or 3 NEC (adjusted odds ratio)[1]
Q	D	L	Z	U	X	H	V	O	E	M	AD	AA	G	R	Stage 3-5 ROP (adjusted odds ratio)[2]
G	AA	O	R	E	B	AD	D	A	X	V	T	AB	S	Y	Oxygen use at 36 wks (adjusted odds ratio)[3]
D	L	K	AD	G	O	C	AB	W	V	B	H	Z	E	AA	VE or PEC (adjusted odds ratio)[4]
AA	F	T	L	W	O	AC	I	Y	G	M	B	X	AD	S	Use of systemic steroids (%)
B	C	N	A	D	F	J	AA	X	AC	H	AB	V	I	K	SNAPII-PE adjusted mortality (%)
K	V	M	A	D	X	G	J	B	AD	W	T	AB	AA	S	Death or at least one of major morbidities (%)

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 use 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 #56

Discharge destination

		GA (completed weeks)								
		< 25	**25-26**	**27-28**	**29-30**	**31-32**	**33-34**	**35-36**	**≥37**	**Total**
Home	N	66	238	283	377	594	1100	1123	2781	6562
	%	24.7	42.5	39.1	37.0	40.4	51.6	54.0	52.5	48.4
Community hospital	N	30	176	321	537	743	794	358	466	3425
	%	11.2	31.4	44.4	52.7	50.5	37.3	17.2	8.8	25.3
Tertiary hospital	N	18	12	15	11	18	27	24	203	328
	%	6.7	2.1	2.1	1.1	1.2	1.3	1.2	3.8	2.4
Died	N	115	89	55	29	24	35	38	91	476
	%	43.1	15.9	7.6	2.8	1.6	1.6	1.8	1.7	3.5
Palliative care (home/other institute)	N	0	0	2	1	2	0	4	14	23
	%	0.0	0.0	0.3	0.1	0.1	0.0	0.2	0.3	0.2
Another inpatient area in hospital	N	15	43	43	62	87	175	531	1733	2689
	%	5.6	7.7	6.0	6.1	5.9	8.2	25.5	32.7	19.8
Out of country discharge	N	1	2	2	2	2	0	1	4	14
	%	0.4	0.4	0.3	0.2	0.1	0.0	0.1	0.1	0.1
Total included	N	245	560	721	1019	1470	2131	2079	5292	13517
	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Moribund (Death)	N	Data not available in detail for these infants								28
Discharge destination missing	N									2
GA missing	N									2
Total	N									13 549

Presentation #57

Support at discharge

		GA (completed weeks)								
		< 25	**25-26**	**27-28**	**29-30**	**31-32**	**33-34**	**35-36**	**≥37**	**Total**
Total available	N	245	560	721	1019	1470	2131	2079	5294	13519
Oxygen	N	58	183	120	91	74	55	49	183	813
	%	23.7	32.7	16.6	8.9	5.0	2.6	2.4	3.5	6.0
Monitor	N	60	209	342	522	690	720	418	1015	3976
	%	24.5	37.3	47.4	51.2	46.9	33.8	20.1	19.2	29.4
Enterostomy	N	2	7	4	3	5	9	7	30	67
	%	0.8	1.3	0.6	0.3	0.3	0.4	0.3	0.6	0.5
Gavage	N	42	190	309	511	684	673	320	503	3232
	%	17.1	33.9	42.9	50.2	46.5	31.6	15.4	9.5	23.9
Tracheostomy	N	0	2	1	1	1	1	1	5	12
	%	0.0	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Gastrostomy	N	1	4	2	5	5	2	4	18	41
	%	0.4	0.7	0.3	0.5	0.3	0.1	0.2	0.3	0.3
Ventilation	N	7	10	2	4	4	7	6	59	99
	%	2.9	1.8	0.3	0.4	0.3	0.3	0.3	1.1	0.7
CPAP	N	3	10	17	12	16	8	4	11	81
	%	1.2	1.8	2.4	1.2	1.1	0.4	0.2	0.2	0.6
Breast milk only	N	26	124	222	354	477	659	559	1653	4074
	%	10.6	22.1	30.8	34.7	32.5	30.9	26.9	31.2	30.1
Formula only	N	46	120	179	207	292	477	519	1205	3045
	%	18.8	21.4	24.8	20.3	19.9	22.4	25.0	22.8	22.5
Both breast milk and formula	N	44	200	225	396	624	868	881	1976	5214
	%	18.0	35.7	31.2	38.9	42.5	40.7	42.4	37.3	38.6
Total available	N	245	560	721	1019	1470	2131	2079	5294	13519
Missing	N									30
Total	N									13549

G. Duration of Support & Length of Stay

Analyses based on number of neonates with GA < 33 weeks who were admitted within 4 days of birth and discharged home from network hospitals (excluding major congenital anomalies). 1 459 neonates were included in the analysis after excluding 6 neonates who had missing data on duration of support.

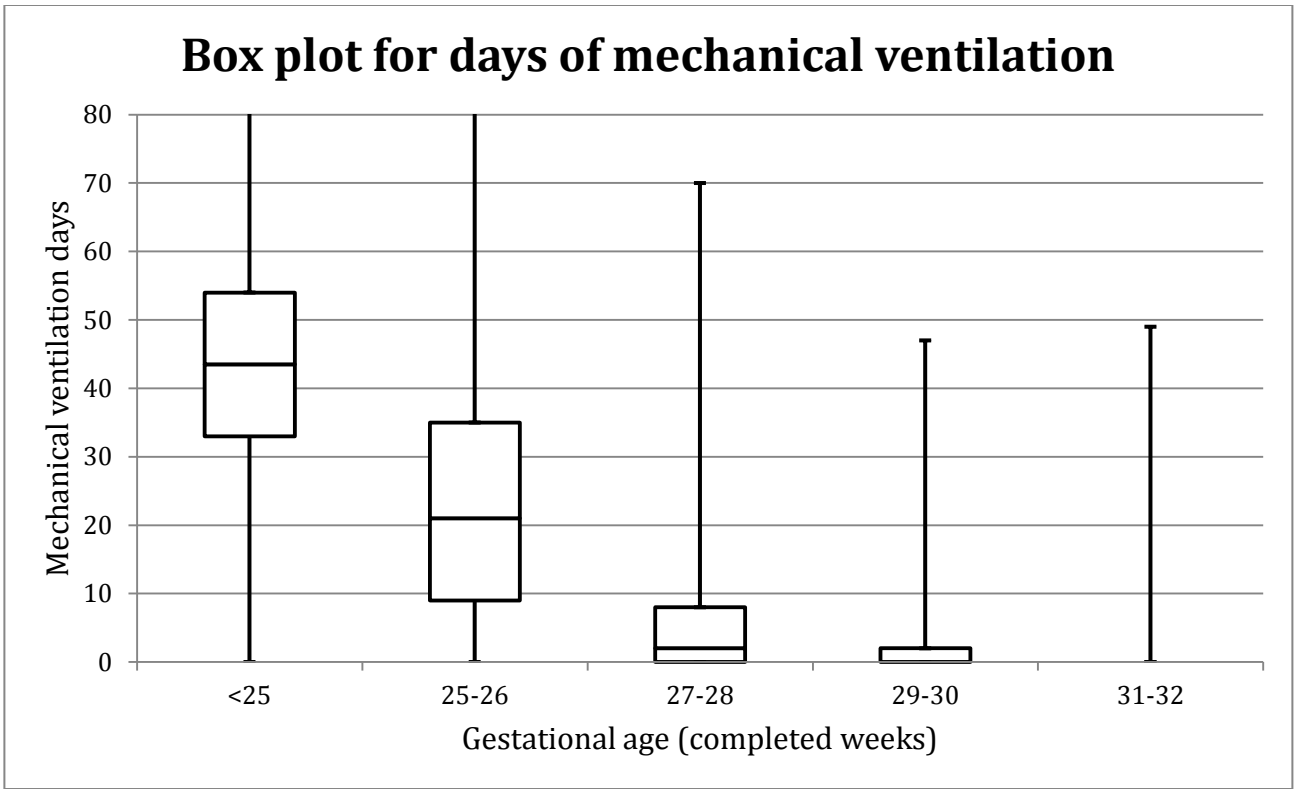
Out of total 4 041 neonates whose GA < 33, 1 558 neonates were discharged home. Out of those 1 558 neonates who were discharged home, 1 465 neonates were admitted within 4 days of birth and did not have any major congenital anomalies. Out of those 1 465 neonates, 6 neonates were missing data on duration of support.

For presentations #59, #64 and #66, analyses are based on the number of neonates whose GA were < 29 weeks and admitted within 4 days of birth (including all discharge destinations and excluding major congenital anomalies). After excluding 6 neonates who had missing data on duration of support, 1 444 neonates were included in the analysis.

Presentation #58

Days of invasive mechanical ventilation* (GA <33 weeks)

Inclusion:
1. GA < 33 weeks
2. Admission within 4 days of birth to CNN hospital
3. Discharged home from network hospitals**
4. No major congenital anomalies



GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1st Quartile	Median	3rd Quartile	Max
<25	58	44.0	2.5	0	33	43.5	54	93
25-26	225	23.6	1.3	0	9	21	35	90
27-28	267	7.5	0.7	0	0	2	8	69
29-30	355	2.0	0.2	0	0	0	2	46
31-32	554	0.6	0.1	0	0	0	0	48
Total included	1459	7.5	0.4	0	0	1	6	93

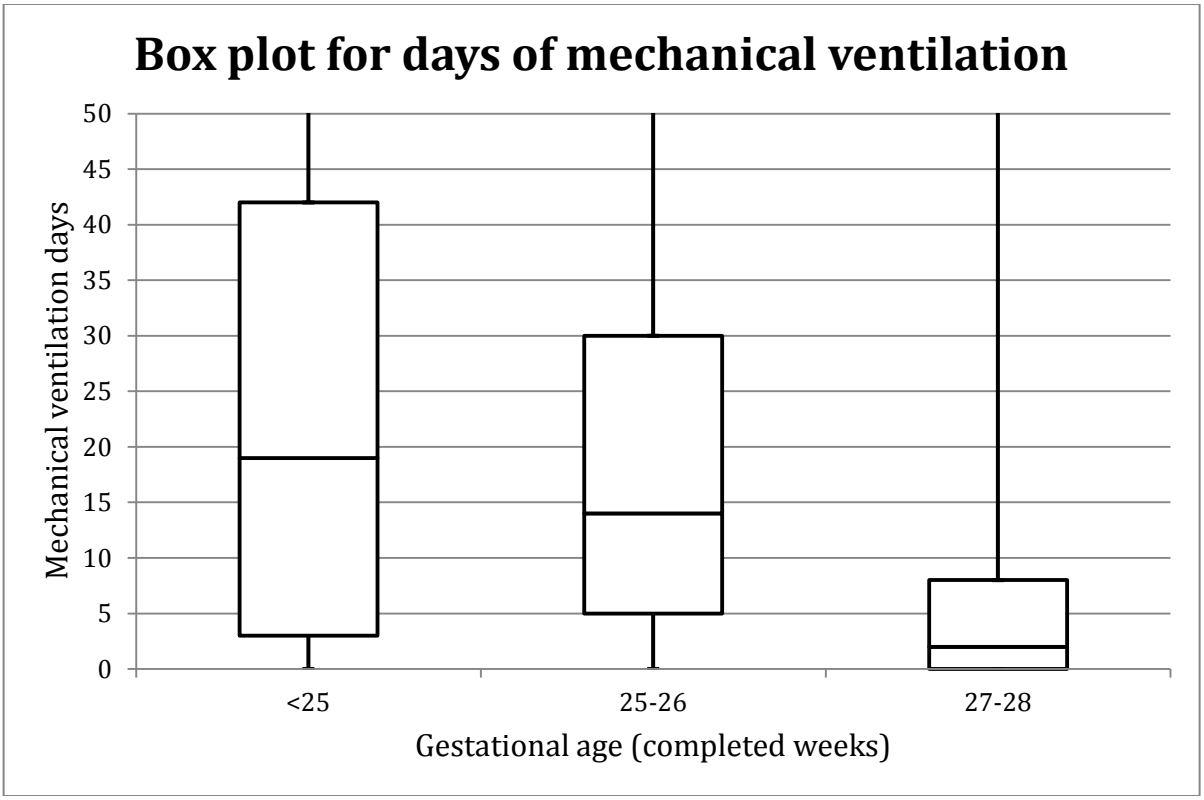
*Invasive mechanical ventilation = any of high frequency ventilation or intermittent positive pressure ventilation
**Data shown apply to neonates discharged home from network hospitals (data for neonates transferred to other hospitals are presently unavailable)

Presentation #59

Days of invasive mechanical ventilation* (GA < 29 weeks)

Inclusion:

1. GA <29 weeks
2. Admitted within 4 days of birth to CNN hospital
3. No major congenital anomalies
4. Discharge destination - ANY



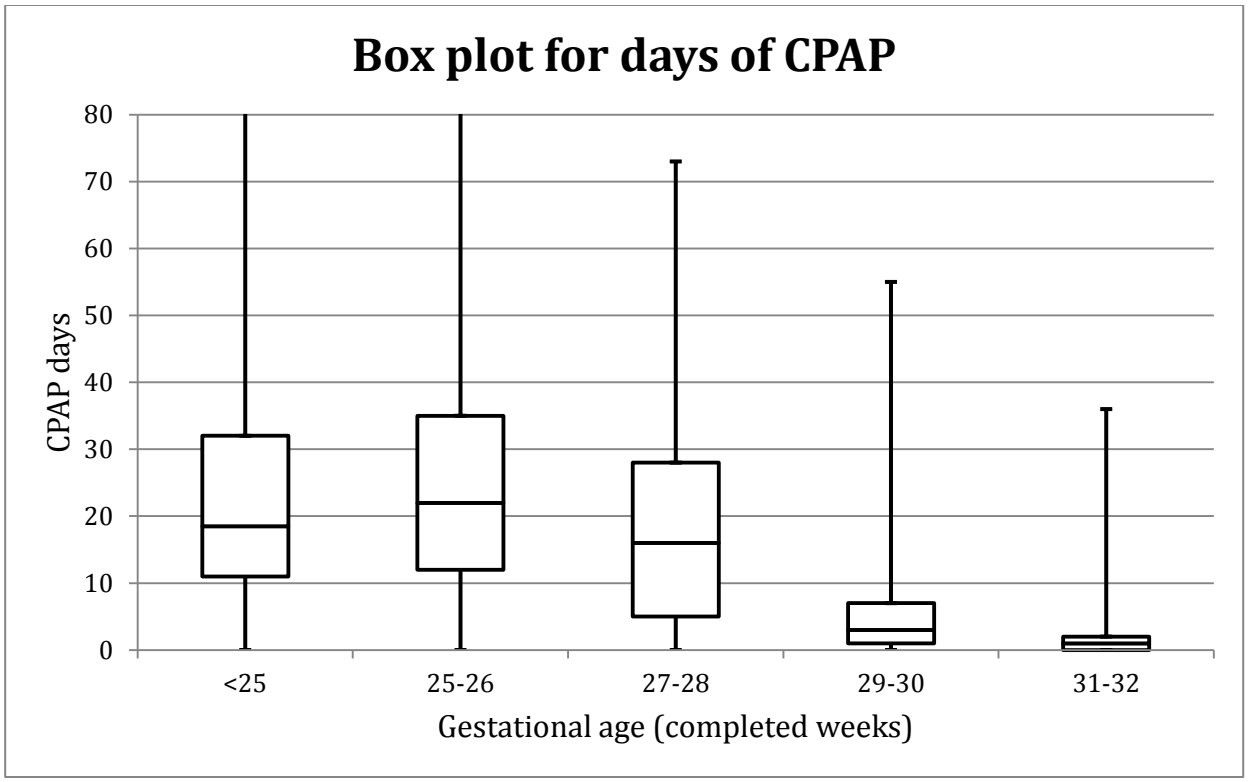
GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1st Quartile	Median	3rd Quartile	Max
<25	242	25.5	1.6	0	3	19	42	95
25-26	528	20.0	0.9	0	5	14	30	140
27-28	674	7.0	0.5	0	0	2	8	86
Total included	1444	14.9	0.5	0	1	6	23	140

*Invasive mechanical ventilation = any of high frequency ventilation or intermittent positive pressure ventilation

Presentation #60

Days of CPAP (GA < 33 weeks)

Inclusion:
1. GA < 33 weeks
2. Admission within 4 days of birth to CNN hospital
3. Discharged home from network hospitals*
4. No major congenital anomalies



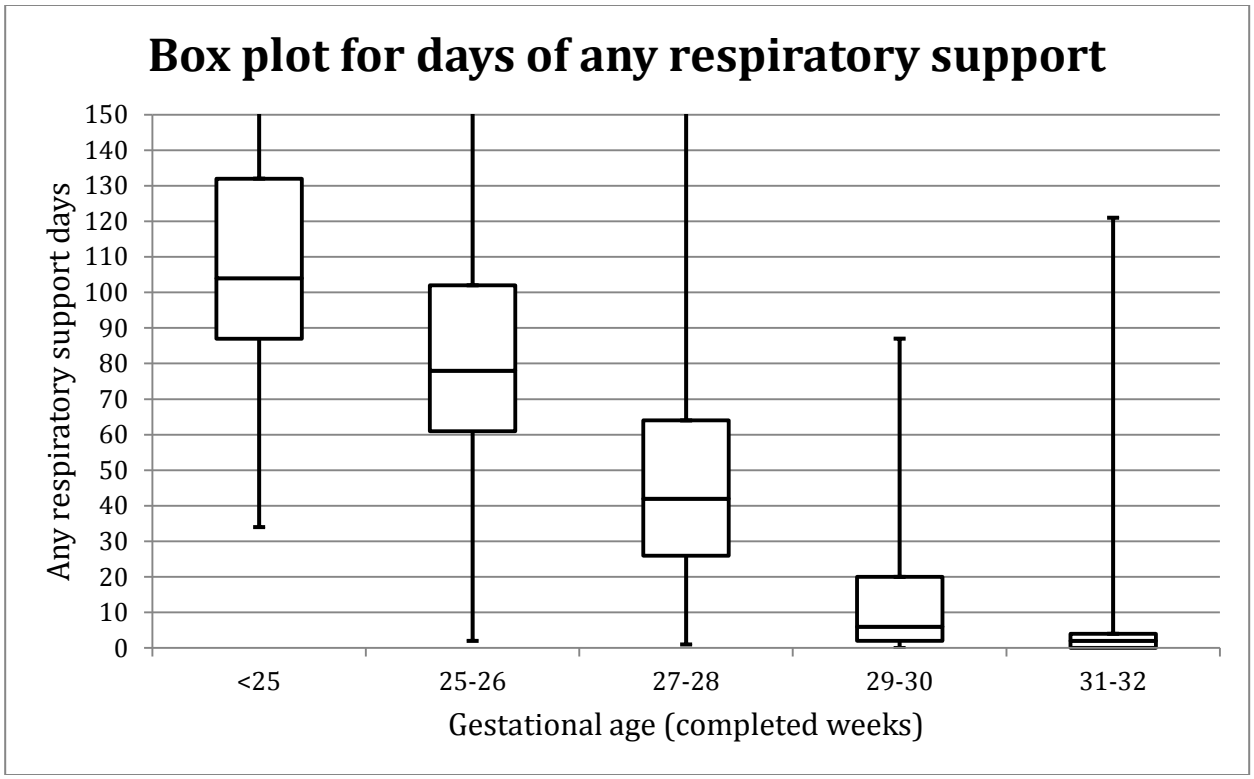
GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1st Quartile	Median	3rd Quartile	Max
<25	58	22.9	2.3	0	11	18.5	32	87
25-26	225	24.4	1.1	0	12	22	35	81
27-28	267	18.2	0.9	0	5	16	28	72
29-30	355	6.4	0.5	0	1	3	7	54
31-32	554	1.9	0.1	0	0	1	2	35
Total included	1459	10.3	0.4	0	1	3	16	87

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

Presentation #61

Days of any respiratory support* (GA < 33 weeks)

Inclusion:
1. GA < 33 weeks
2. Admission within 4 days of birth to CNN hospital
3. Discharged home from network hospitals**
4. No major congenital anomalies



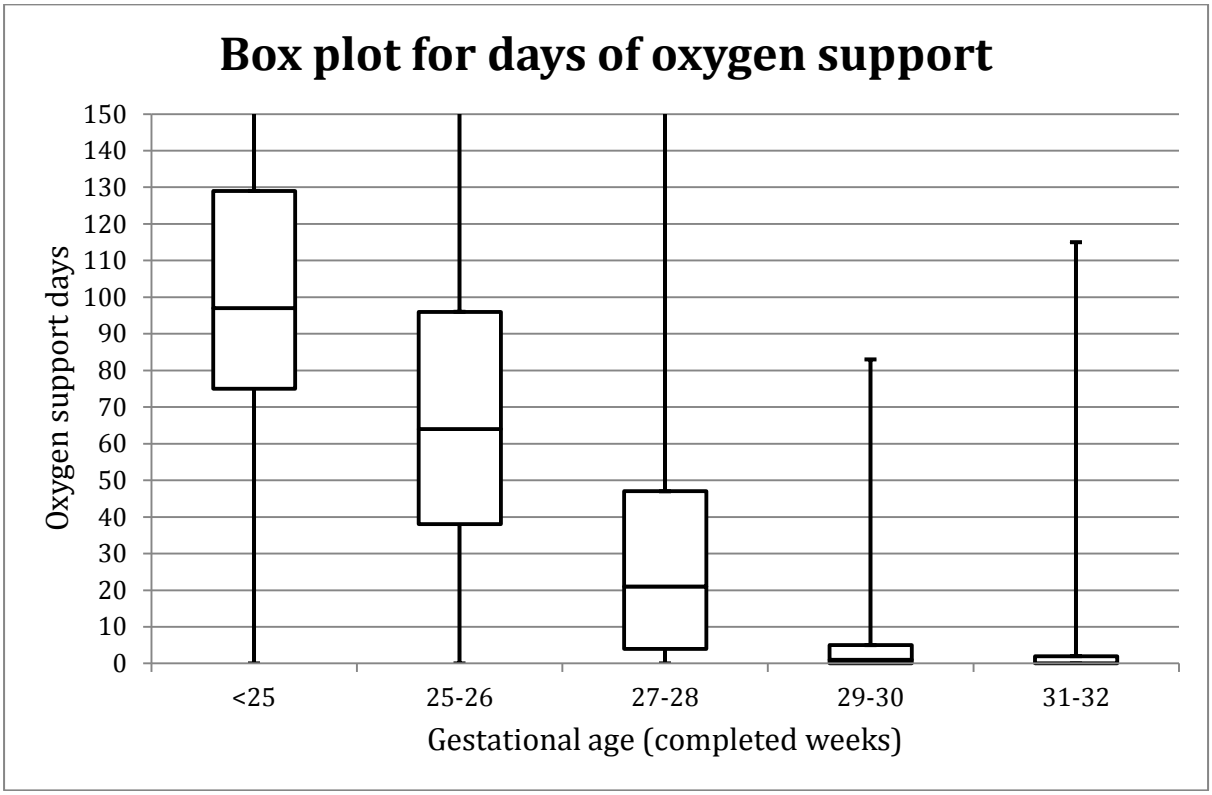
GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1st Quartile	Median	3rd Quartile	Max
<25	58	109.6	4.3	34	87	104	132	191
25-26	225	85.2	2.4	2	61	78	102	222
27-28	267	46.5	1.8	1	26	42	64	206
29-30	355	14.0	0.9	0	2	6	20	87
31-32	554	4.0	0.4	0	0	2	4	119
Total included	1459	30.9	1.0	0	2	9	51	222

*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 #62

Days of oxygen support (GA < 33 weeks)

Inclusion:
1. GA < 33 weeks
2. Admission within 4 days of birth to CNN hospital
3. Discharged home from network hospitals*
4. No major congenital anomalies



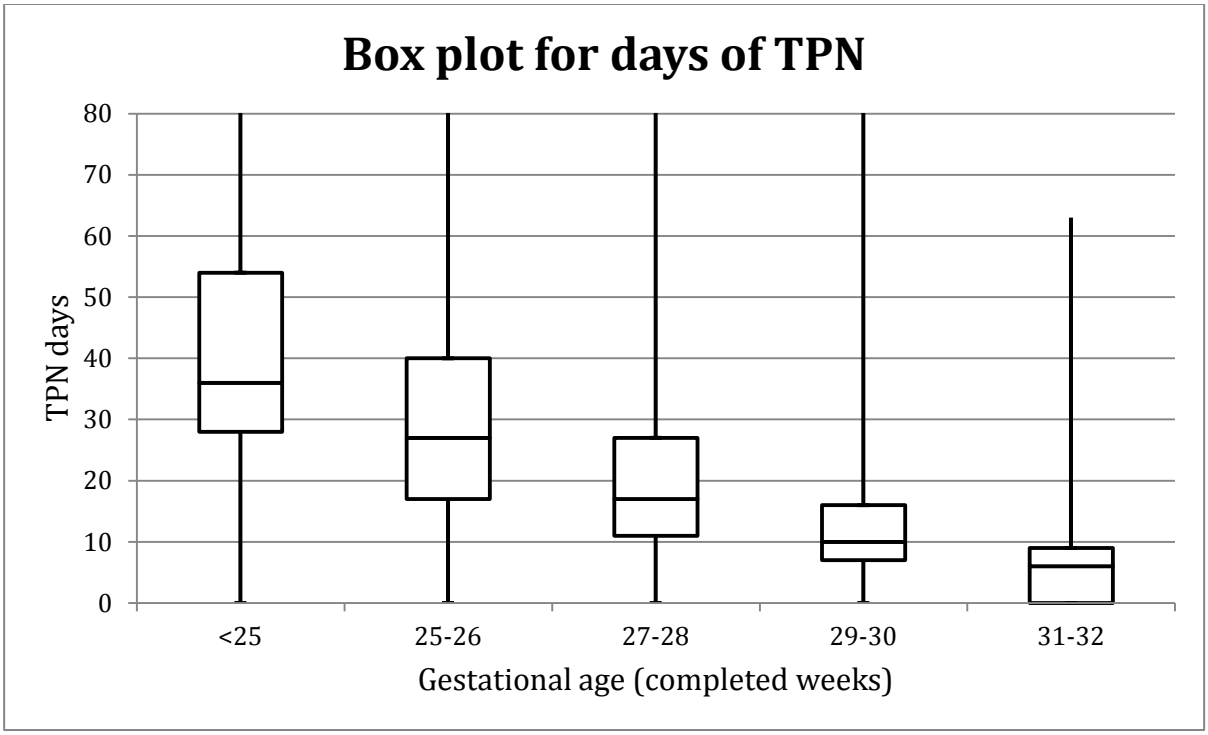
GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1st Quartile	Median	3rd Quartile	Max
<25	58	99.1	5.3	0	75	97	129	191
25-26	225	70.4	2.9	0	38	64	96	222
27-28	267	31.0	2.0	0	4	21	47	206
29-30	355	6.8	0.7	0	0	1	5	83
31-32	554	2.2	0.3	0	0	0	2	115
Total included	1459	22.9	1.0	0	0	3	31	222

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

Presentation #63

Days of TPN (GA < 33 weeks)

Inclusion:
1. GA < 33 weeks
2. Admission within 4 days of birth to CNN hospital
3. Discharged home from network hospitals*
4. No major congenital anomalies



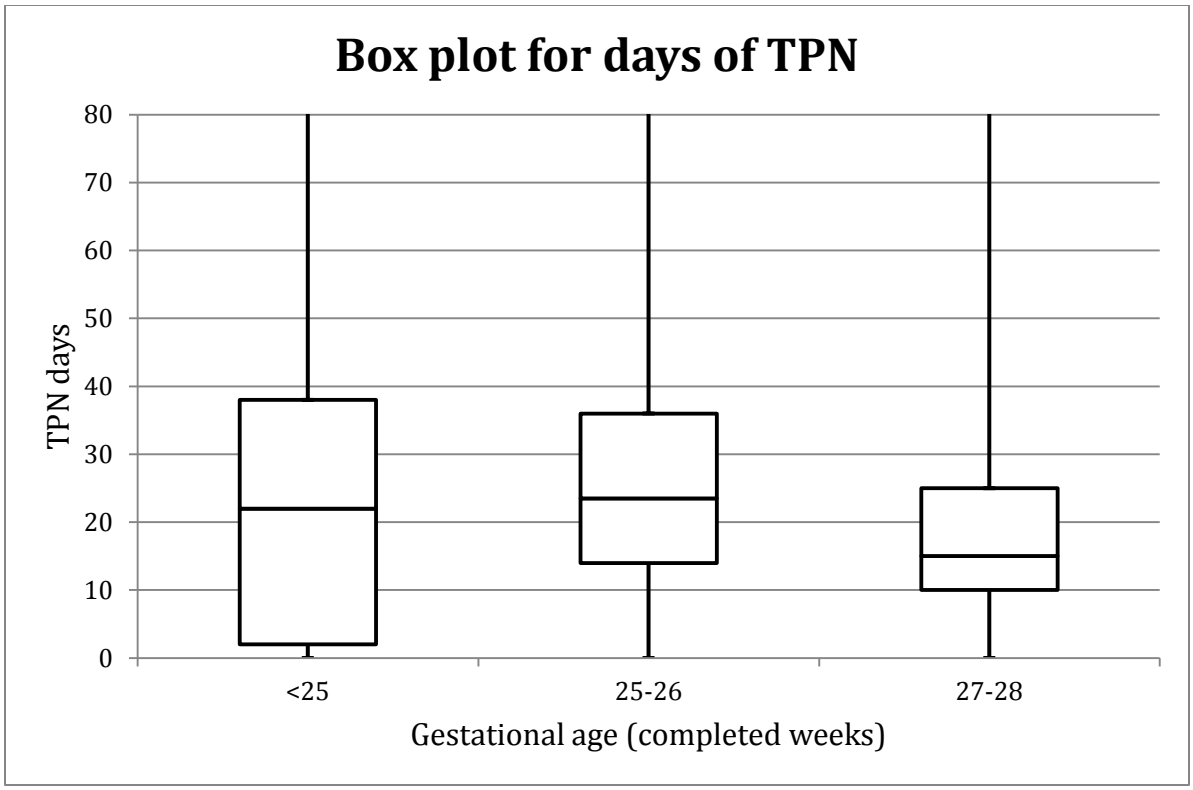
GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1st Quartile	Median	3rd Quartile	Max
<25	58	43.2	3.0	0	28	36	54	133
25-26	225	31.9	1.5	0	17	27	40	131
27-28	267	20.6	0.9	0	11	17	27	118
29-30	355	13.1	0.6	0	7	10	16	103
31-32	554	6.8	0.3	0	0	6	9	63
Total included	1459	16.2	0.5	0	6	11	21	133

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

Presentation #64

Days of TPN (GA < 29 weeks)

Inclusion:
1. GA <29 weeks
2. Admitted within 4 days of birth to CNN hospital
3. No major congenital anomalies
4. Discharge destination - ANY

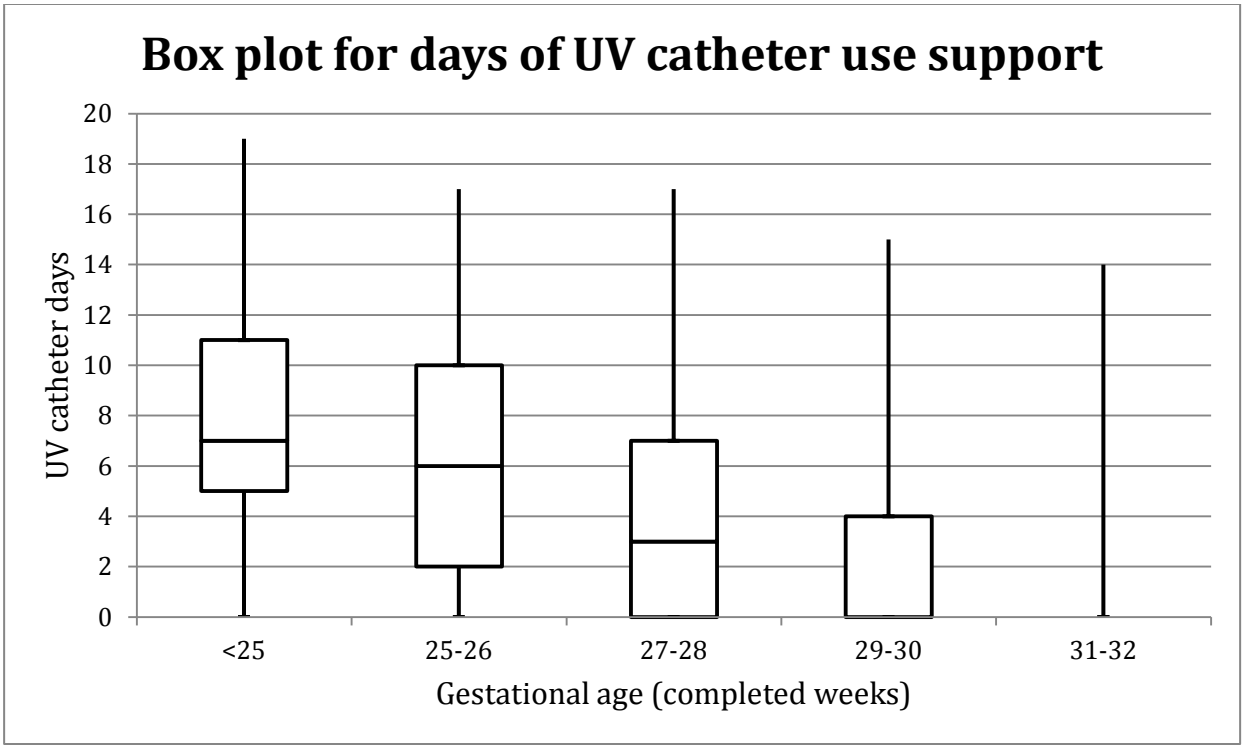


GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1st Quartile	Median	3rd Quartile	Max
<25	242	25.4	1.7	0	2	22	38	149
25-26	528	27.9	1.0	0	14	23.5	36	191
27-28	674	20.0	0.7	0	10	15	25	152
Total included	1444	23.8	0.6	0	11	18	31	191

Presentation #65

Days of UV catheter use (GA < 33 weeks)

Inclusion:
1. GA < 33 weeks
2. Admission within 4 days of birth to CNN hospital
3. Discharged home from network hospitals*
4. No major congenital anomalies



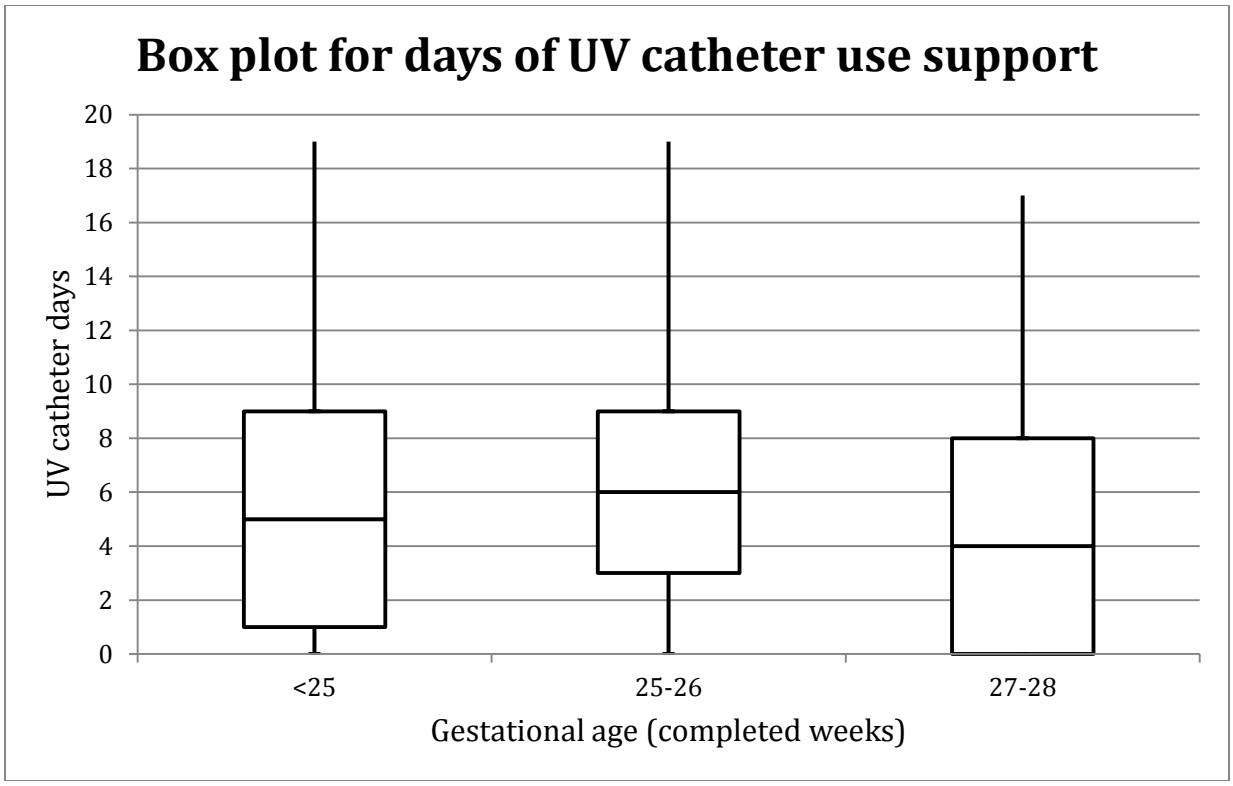
GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1st Quartile	Median	3rd Quartile	Max
<25	58	7.5	0.6	0	5	7	11	19
25-26	225	6.0	0.3	0	2	6	10	17
27-28	267	4.0	0.3	0	0	3	7	17
29-30	355	2.1	0.2	0	0	0	4	15
31-32	554	1.0	0.1	0	0	0	0	14
Total included	1459	2.8	0.1	0	0	0	6	19

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

Presentation #66

Days of UV catheter use (GA < 29 weeks)

Inclusion:
1. GA <29 weeks
2. Admitted within 4 days of birth to CNN hospital
3. No major congenital anomalies
4. Discharge destination - ANY

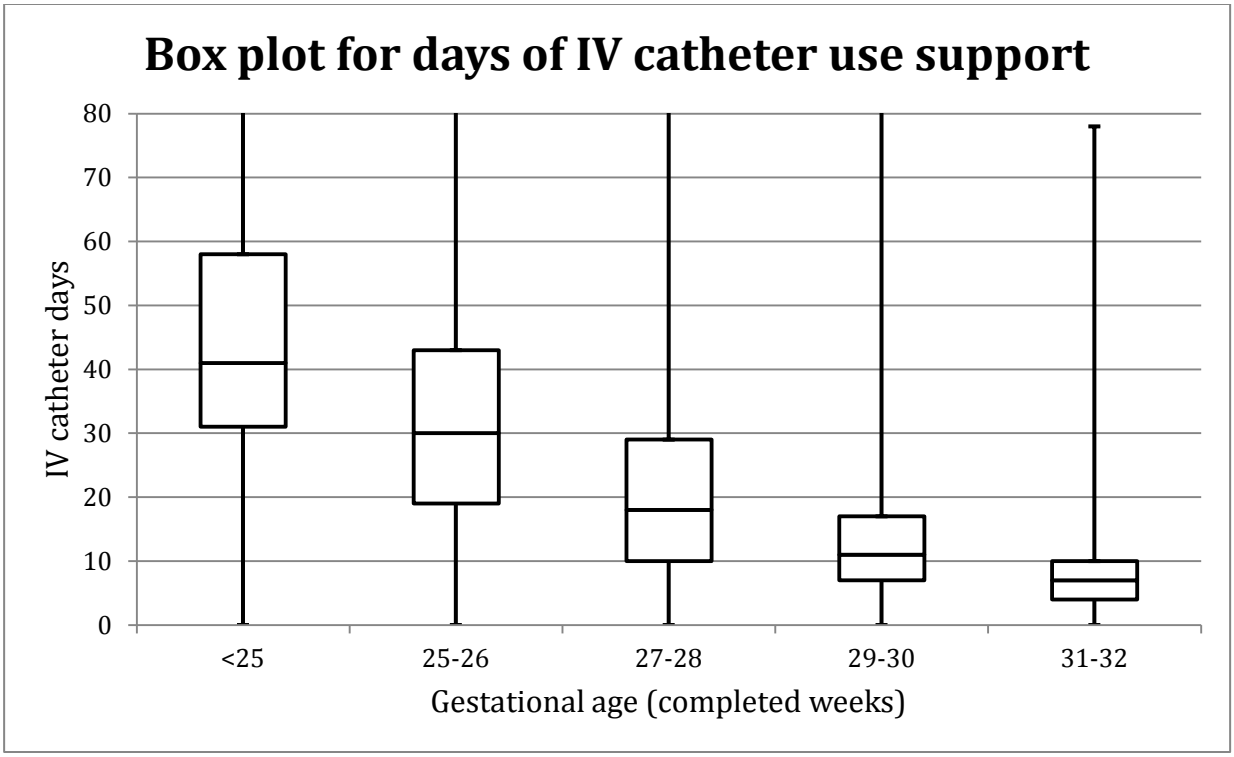


GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1st Quartile	Median	3rd Quartile	Max
<25	242	5.7	0.3	0	1	5	9	19
25-26	527	6.0	0.2	0	3	6	9	19
27-28	674	4.9	0.2	0	0	4	8	17
Total included	1443	5.5	0.1	0	1	5	9	19

Presentation #67

Days of IV catheter* use (GA < 33 weeks)

Inclusion:
1. GA < 33 weeks
2. Admission within 4 days of birth to CNN hospital
3. Discharged home from network hospitals**
4. No major congenital anomalies



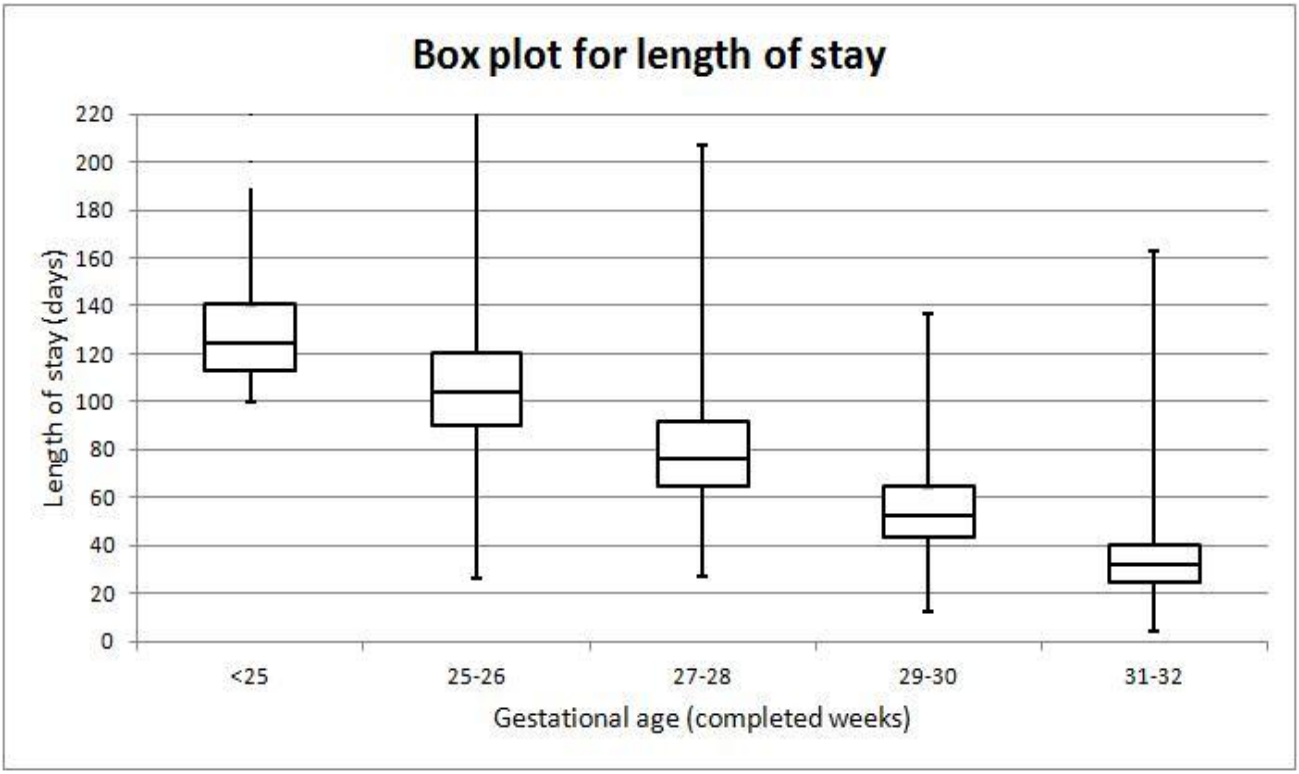
GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1st Quartile	Median	3rd Quartile	Max
<25	58	46.1	3.3	0	31	41	58	156
25-26	225	34.6	1.5	0	19	30	43	135
27-28	267	21.2	1.0	0	10	18	29	115
29-30	355	13.8	0.7	0	7	11	17	112
31-32	554	8.0	0.3	0	4	7	10	76
Total included	1459	17.4	0.5	0	6	11	24	156

*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 #68

Length of stay (GA < 33 weeks)

Inclusion:
1. GA < 33 weeks
2. Admission within 4 days of birth to CNN hospital
3. Discharged home from network hospitals*
4. No major congenital anomalies



GA at birth (completed weeks)	# of neonates	Mean	Std Error	Min	1st Quartile	Median	3rd Quartile	Max
<25	58	129.4	2.9	100	114	125.5	141	191
25-26	225	109.1	2.0	26	90	104	120	222
27-28	267	80.1	1.4	27	65	77	93	206
29-30	355	54.5	0.9	12	43	52	65	133
31-32	554	34.1	0.6	4	25	32	40	128
Total included	1459	62.8	0.9	4	35	54	84	222

*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 #69

Hypoxic Ischemic Encephalopathy

		Sarnat's staging of HIE on admission				
		Stage 3	**Stage 2**	**Stage 1**	**Unknown stage**	**Total**
Hypothermia treatment	**Yes**	78	96	53	11	238
	No	27	48	95	140	310
	Unknown	2	2	1	2	7
	Total	**107**	**146**	**149**	**153**	**555**

Reason for not receiving hypothermia treatment*

Reason	**Number**
Chromosomal anomalies	4
Major congenital anomalies	7
Weight < 2000g or GA < 35 weeks	34
Extreme condition	17
Head trauma or intracranial hemorrhage	5
Mild HIE	89
Unit policy	38
Health care team preference	8
Delayed transfer	27
Parental request	0
Unknown	124

*One neonate can have more than one reason.

Time of admission

Time	**Number**
<6 hours from birth	331
6 – 12 hours from birth	110
>12 hours from birth	98
Total**	539

**16 infants are missing either time of birth or time of admission.

Presentation #69 (continued)

Hypoxic Ischemic Encephalopathy
For neonates who received hypothermia (N=238)

Characteristics	N		Results
Method	238	Selective head	3 (1%)
		Whole body cooling	235 (99%)
Target temperature	238	< 33^{0}C	2 (1%)
		33-34^{0}C	192 (81%)
		33.5-34.5^{0}C	35 (15%)
		34-35^{0}C	3 (1%)
		34.5-35.5^{0}C	2 (1%)
		Unknown	4 (2%)
Seizures at initiation	238		103 (43%)
Seizures at completion	238		22 (9%)
Side effects during hypothermia	216	Hypotension	88 (41%)
	211	Thrombocytopenia	64 (30%)
	213	Coagulopathy	73 (34%)
	207	Persistent metabolic acidosis	53 (26%)
Death	238		38 (16%)

Encephalopathy stage		**At the end of hypothermia**				
		Stage 1	**Stage 2**	**Stage 3**	**Unknown**	**Total**
At the start of hypothermia	**Stage 1**	23	1	1	5	30
	Stage 2	54	28	11	19	112
	Stage 3	11	17	34	9	71
	Unknown	0	1	0	24	25
	Total	88	47	46	57	238

Presentation #69 (continued)
Hypoxic Ischemic Encephalopathy
For neonates* who received hypothermia (N=235)

Characteristics		N	Mean	SD	Min	1st Q	Median	3rd Q	Max	Outside of recommendation	Time taken to achieve target
Timing** of hypothermia (in hours)	**Initiation**	226	4.7	5.4	0.0	1.4	3.8	5.8	46.1	After 6 hours 48 (21%)	
	Target temp achieved	217	7.5	10.0	0.4	3.4	5.1	7.7	78.7	After 10 hours 27 (12%)	After 4 hours of initiation 28 (13%)
	Age at re-warming	230	70.3	18.1	5.6	72.7	75.5	77.7	124.5	After 78 hours 48 (21%)	Re-warming started >72 hours after initiation 36 (17%)
	Age at return of temp to normal	215	86.7	27.4	13.9	81.2	85.7	90.5	343.8	After 86 hours 105 (49%)	Took >8 hours to return temperature to normal after starting re-warming 137 (64%)
Temperature during hypothermia	**Lowest temp during hypothermia**	235	32.6	0.9	25.1	32.3	32.7	33.1	36.0	Lowest temp < 32.5C 70 (30%)	
	Highest temp during hypothermia	235	34.4	0.9	33.0	33.8	34.1	34.7	41.0	Highest temp > 35.5C 18 (8%)	

*Infants with time at initiation > 72 hours were excluded.
**All timing calculated from time of birth in hours of age.

I. Trend Analyses over last 3 years

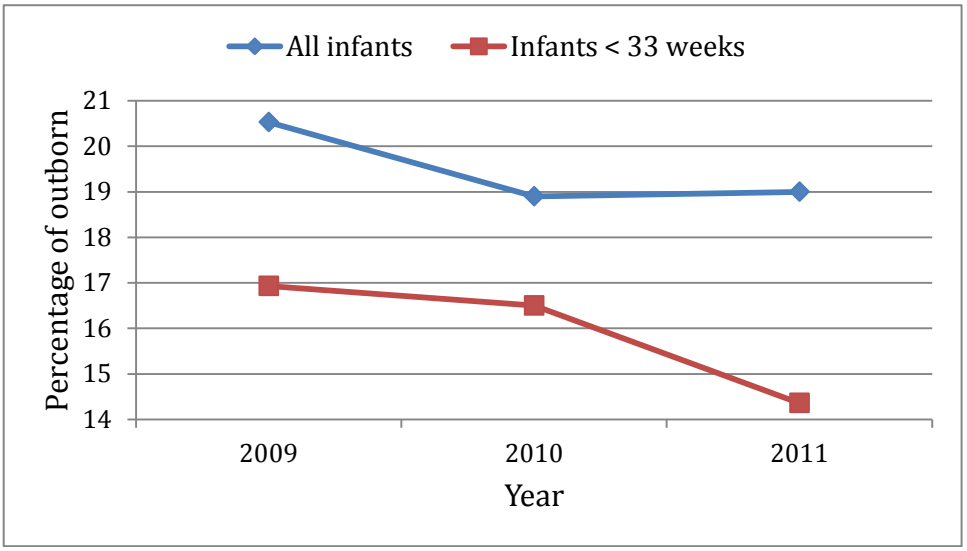
This section includes trend analyses in the last 3 years (2009-11) for specific outcomes for neonates <33 weeks GA in network hospitals. The number of neonates included in these analyses is described in the following table for reference.

Number of neonates by admission year and GA

	GA									
Year	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**
2009	68	172	284	280	358	407	478	578	662	832
2010	82	172	270	333	388	371	480	611	678	788
2011	101	166	242	318	332	391	467	553	643	828

1. Neonates in the participating hospitals: Admission status:

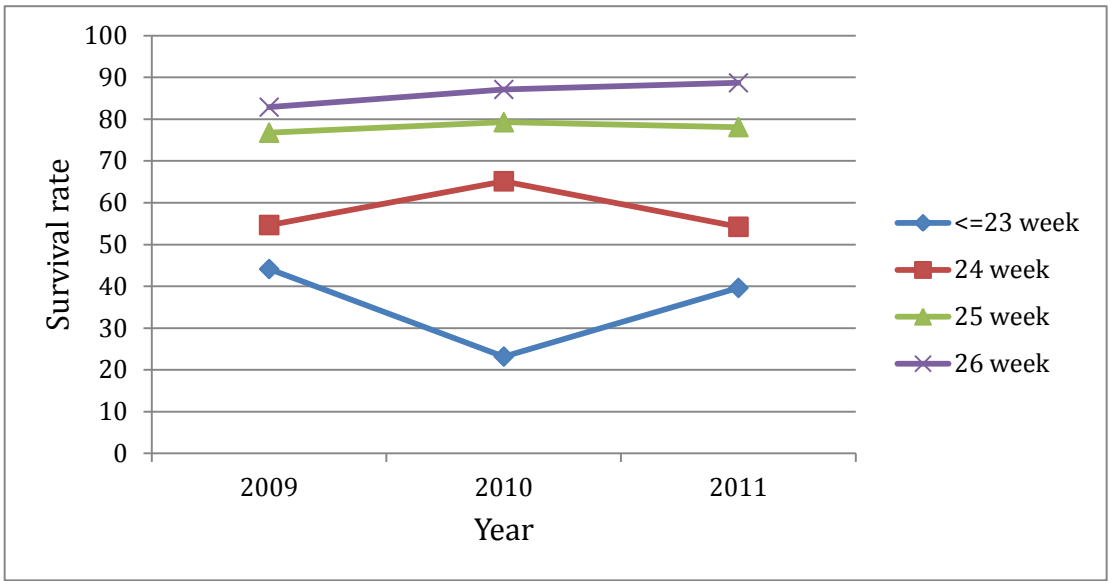
		All infants			Infants with GA<33 weeks		
Year	**Number of Hospitals**	**Total Number of Neonates***	**Inborn (%)**	**Outborn (%)**	**Number of Neonates* with GA<33**	**Inborn (%)**	**Outborn (%)**
2009	**26**	13 109	10364 (79.5%)	2678 (20.5%)	3 273	2719 (83.1%)	554 (16.9%)
2010	**27**	13 147	10662 (81.1%)	2485 (18.9%)	3 383	2824 (83.5%)	559 (16.5%)
2011	**30**	13 548	10972 (81.0%)	2576 (19.0%)	4 040	3460 (85.6%)	580 (14.4%)



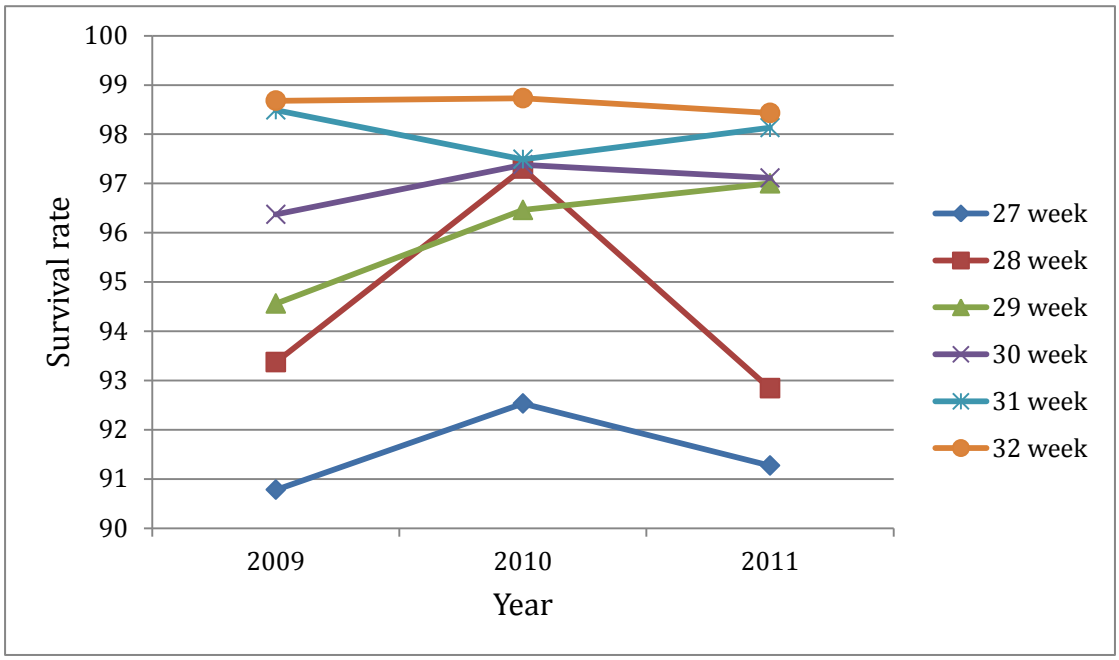
*total number of neonates excluding those who are missing admission status

2. Survival rate:

a. 23-26 weeks:

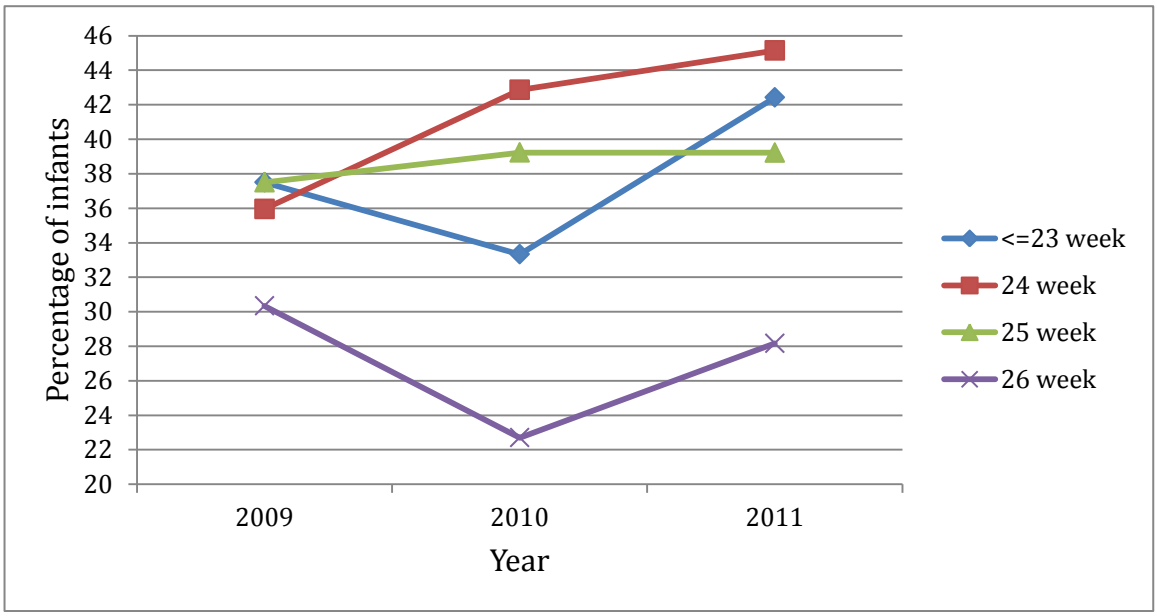


b. 27-32 weeks:

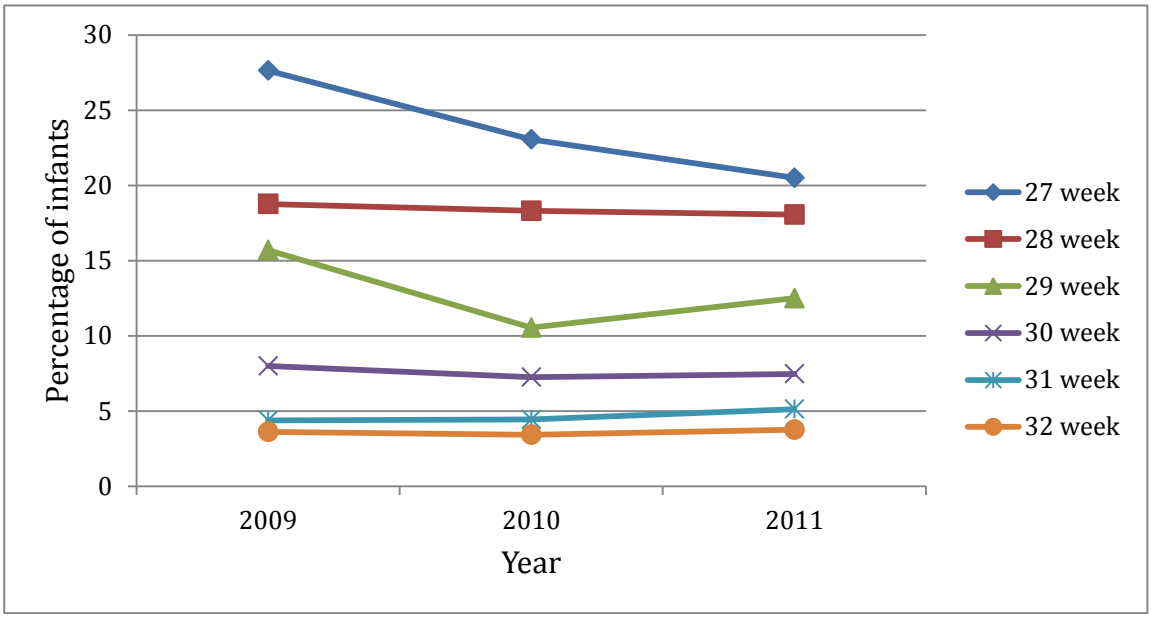


3. Late onset sepsis (with at least one infection) among neonates who survived beyond 2 days after birth

a. 23-26 weeks:

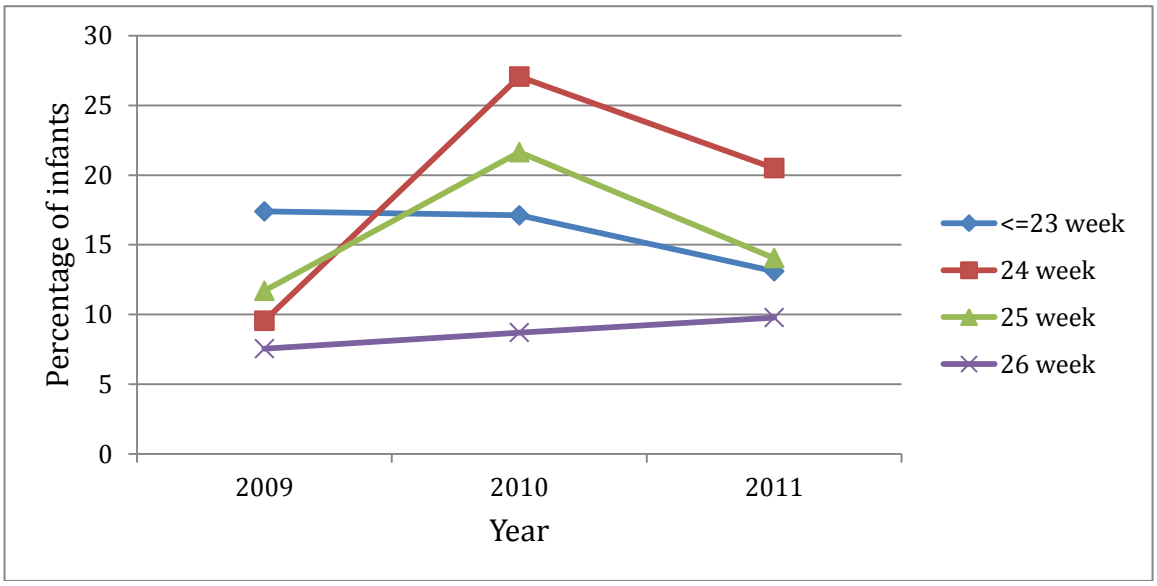


b. 27-32 weeks:

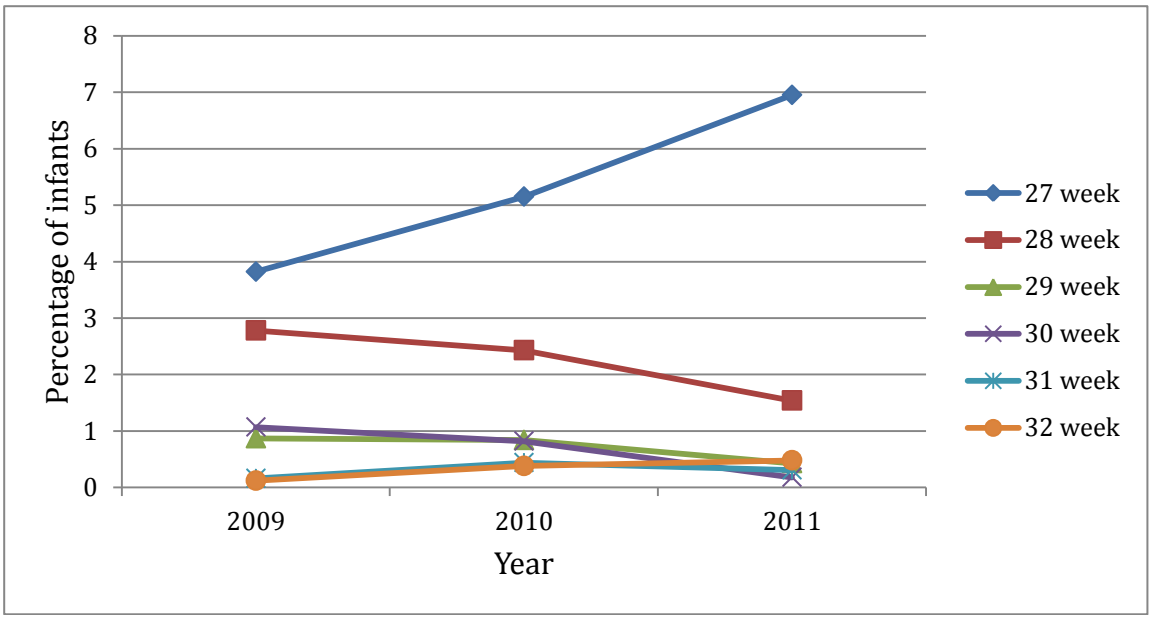


4. Surgical ligation of PDA

a. 23-26 weeks:

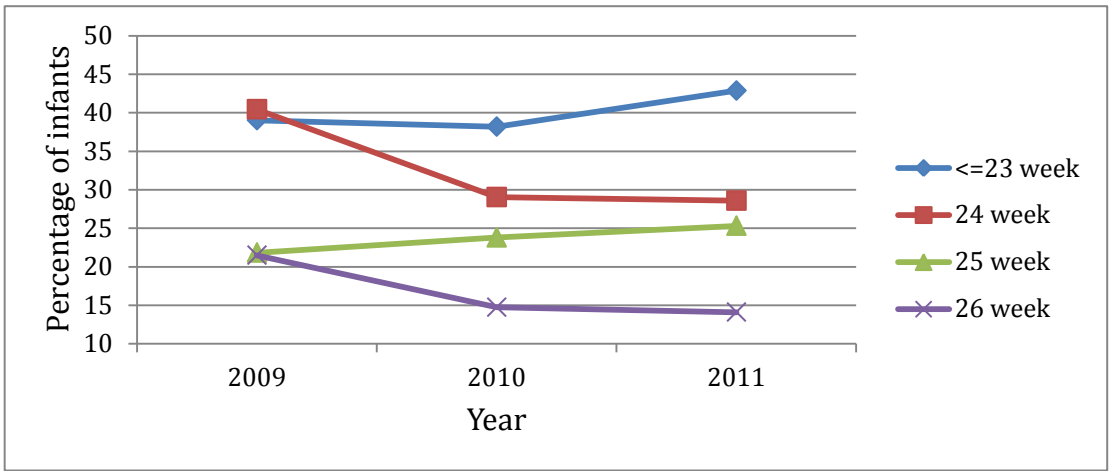


b. 27-32 weeks:

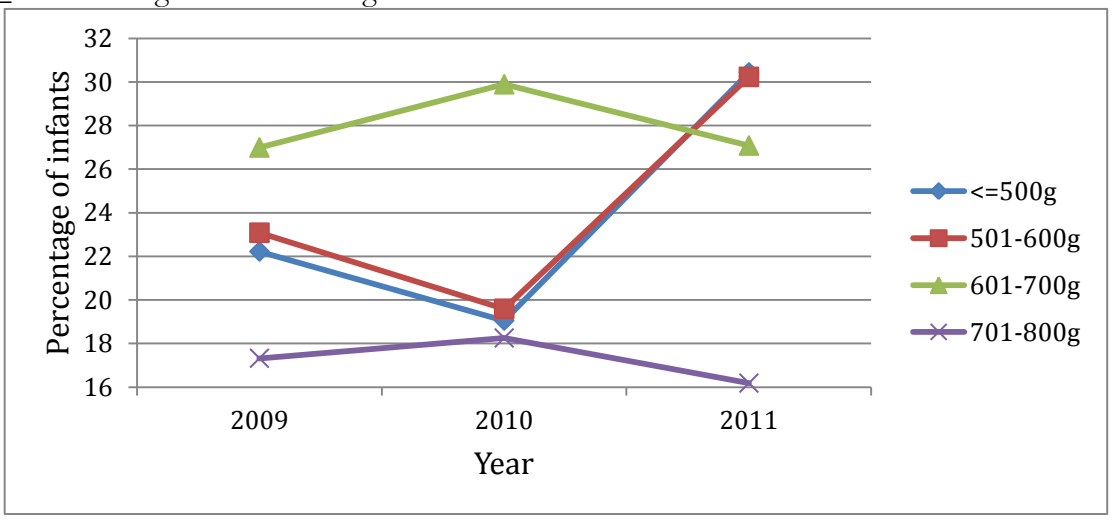


5. Ventricular enlargement: (among neonates who received ultrasound exams)

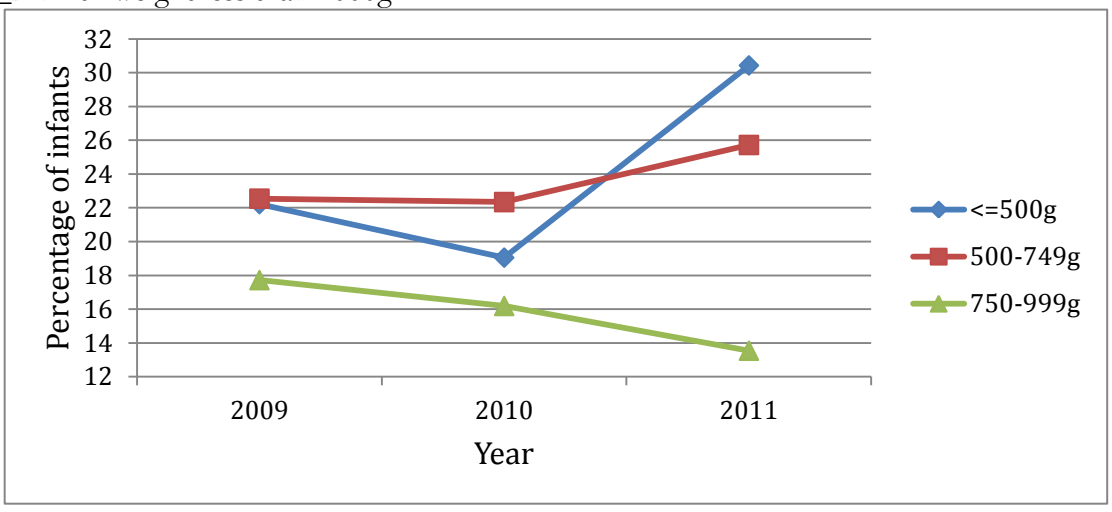
a. 23-26 weeks:



b_1. Birth weight less than 800g:

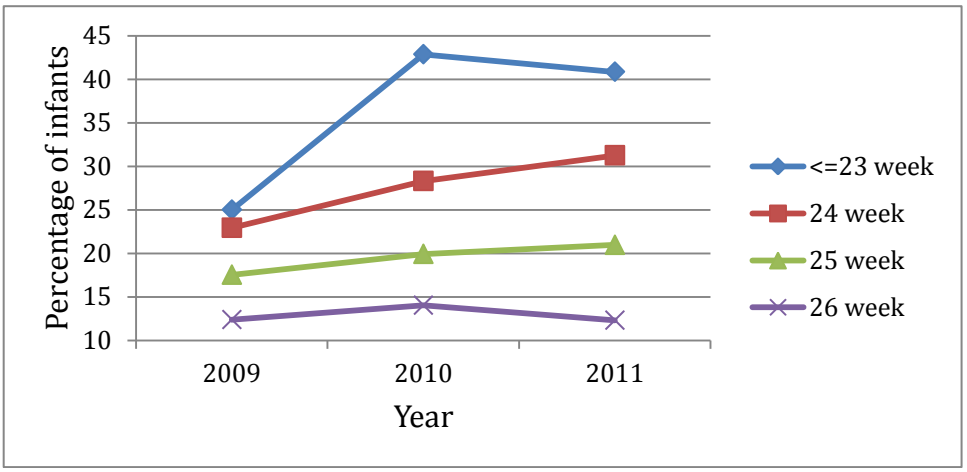


b_2. Birth weight less than 1000g

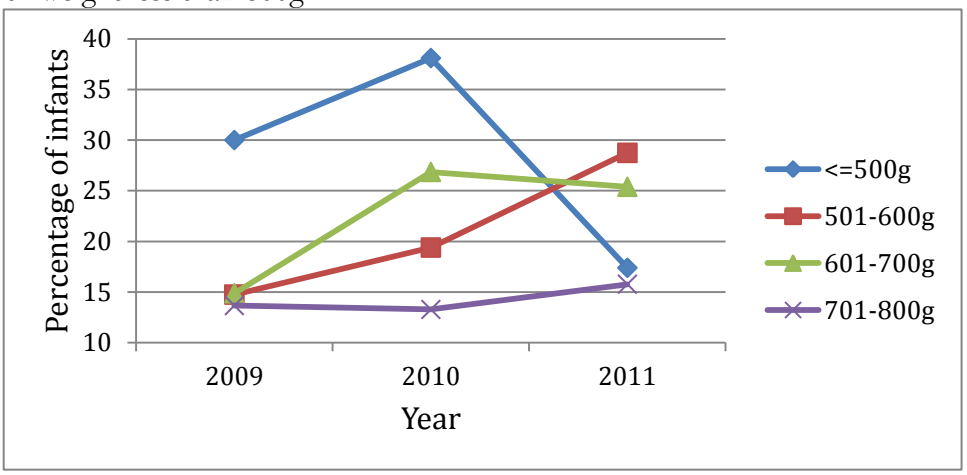


6. Parenchymal echogenicity: (among neonates who received ultrasound exams)

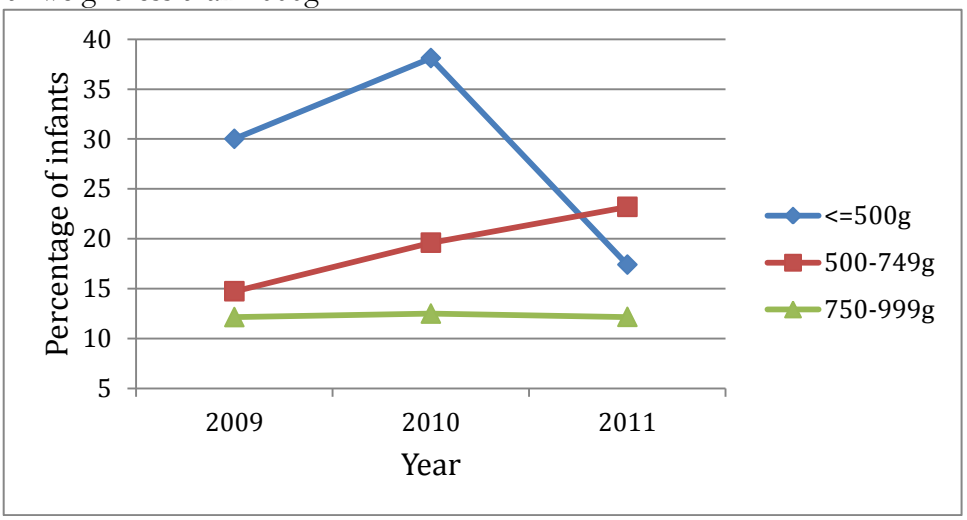
a. 23-26 weeks:



b_1. Birth weight less than 800g:

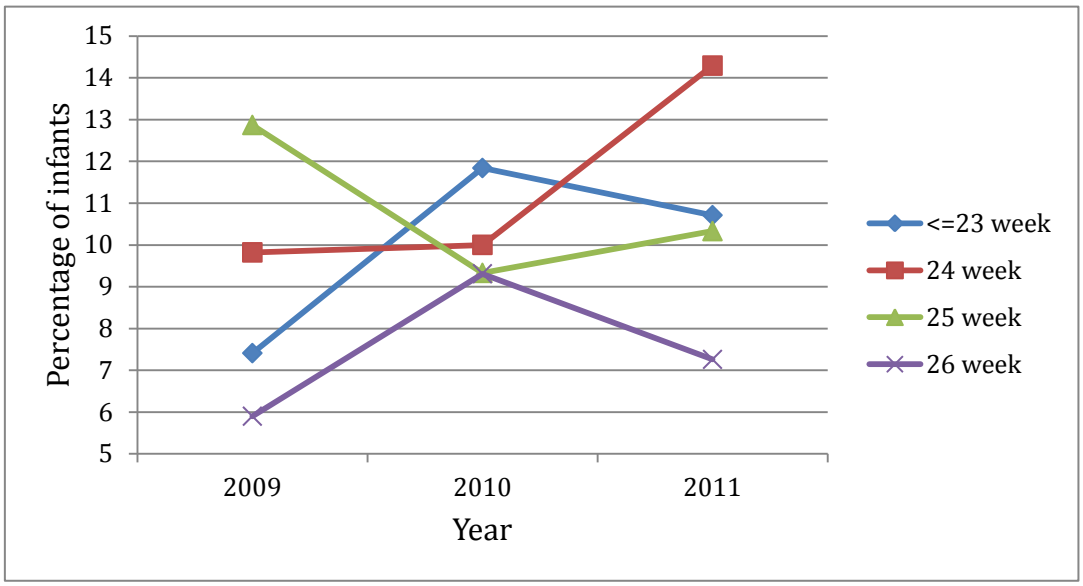


b_2. Birth weight less than 1000g

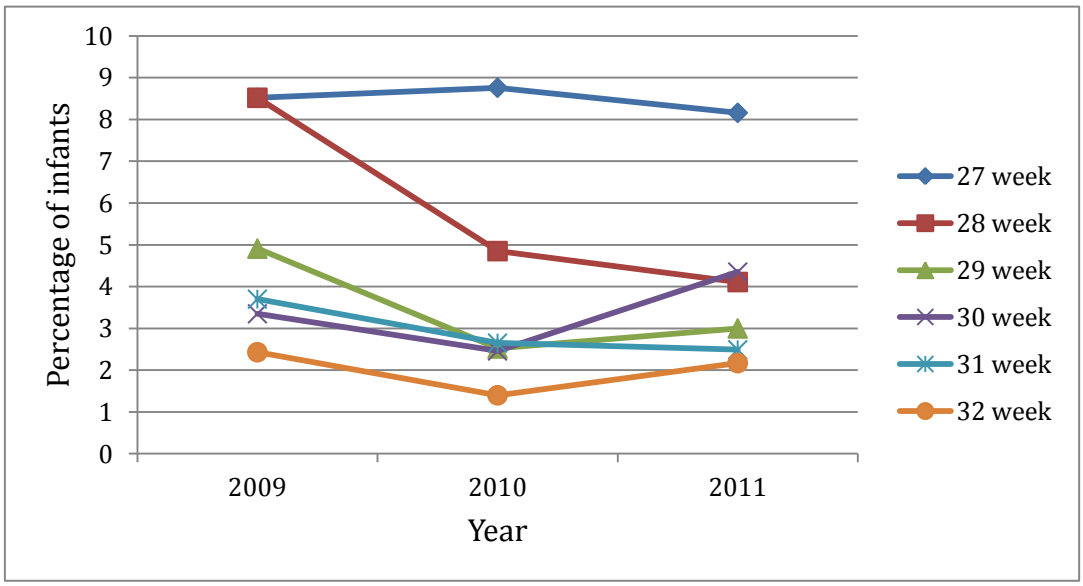


7. NEC:

a. 23-26 weeks:

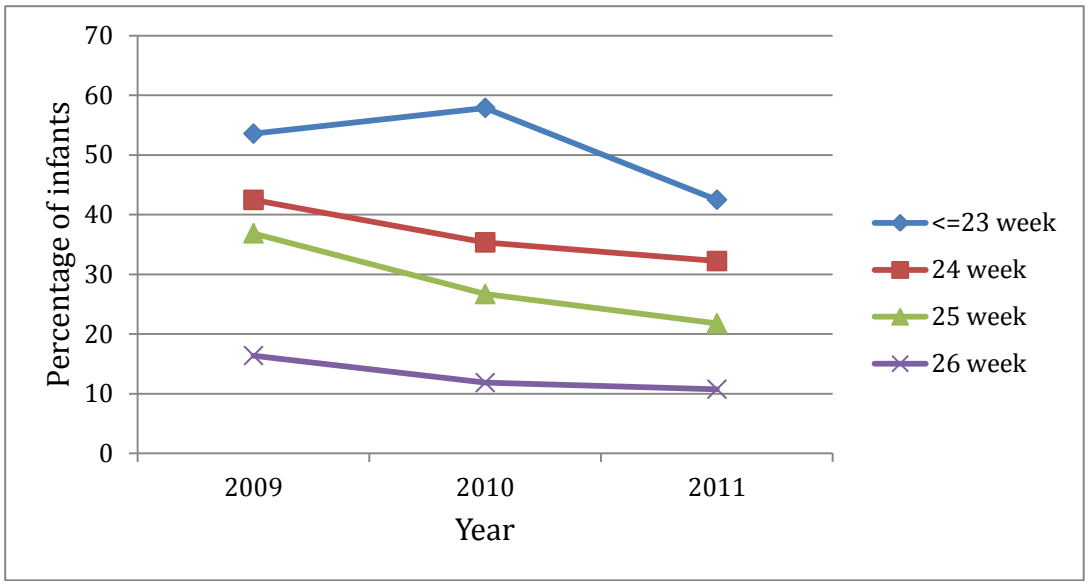


b. 27-32 weeks:

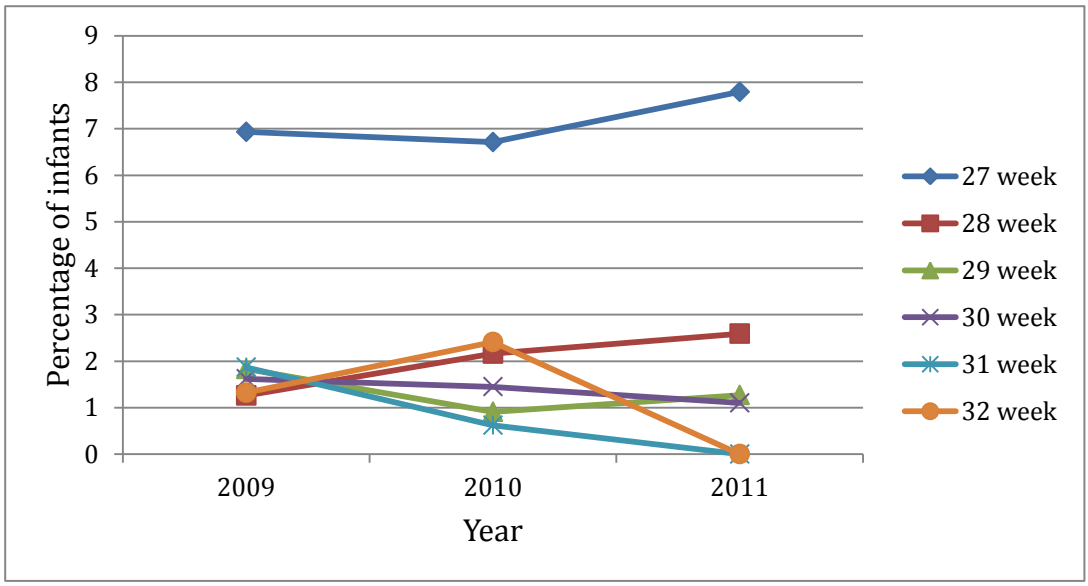


8. Stage 3, 4 and 5 ROP: (among neonates who received eye exams)

a. 23-26 weeks:

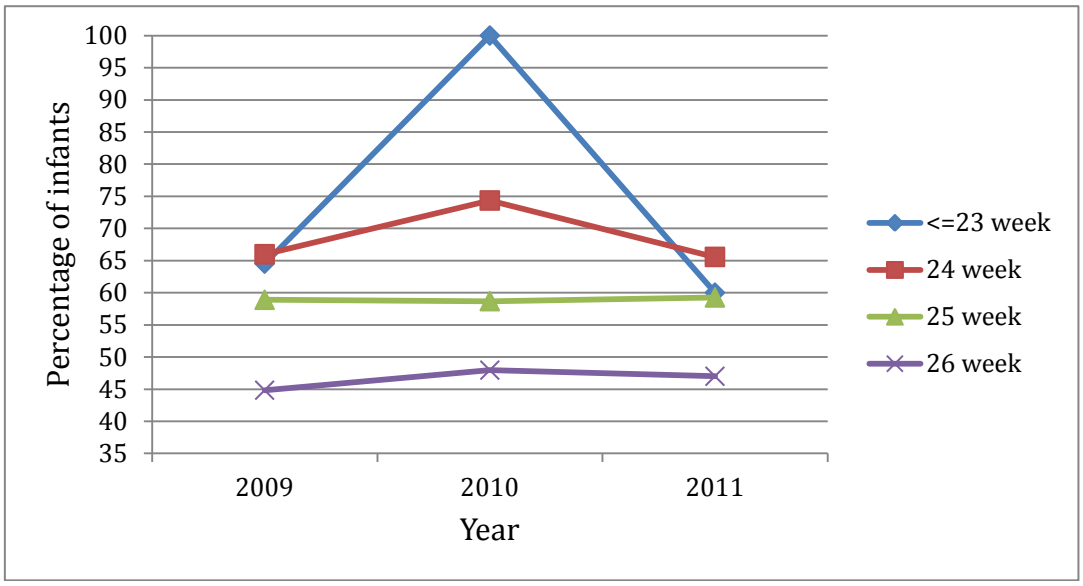


b. 27-32 weeks:

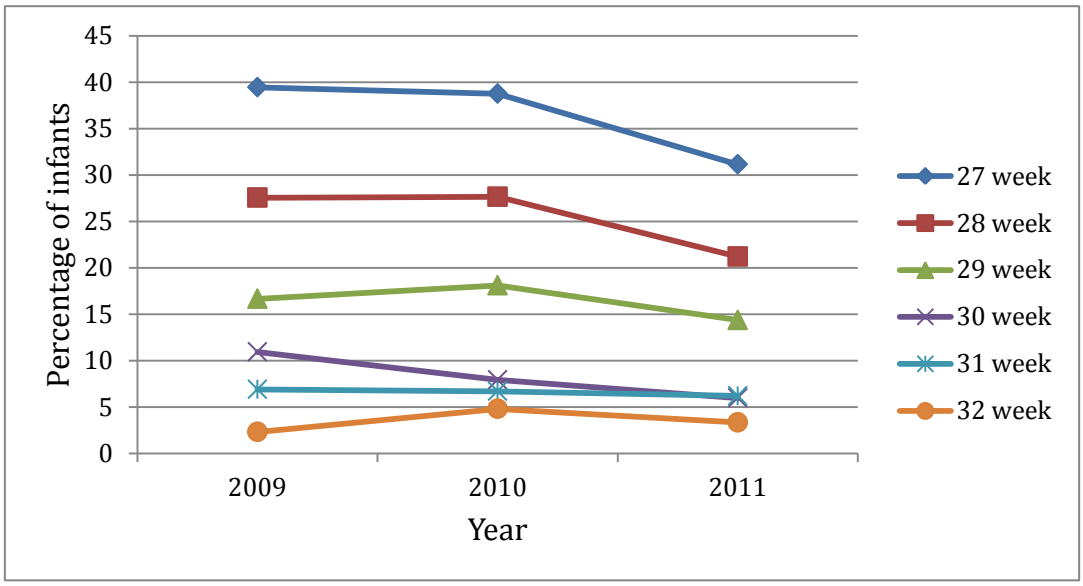


9. Oxygen use at 36 weeks (among neonates who survived beyond 36 weeks PMA):

a. 23-26 weeks:

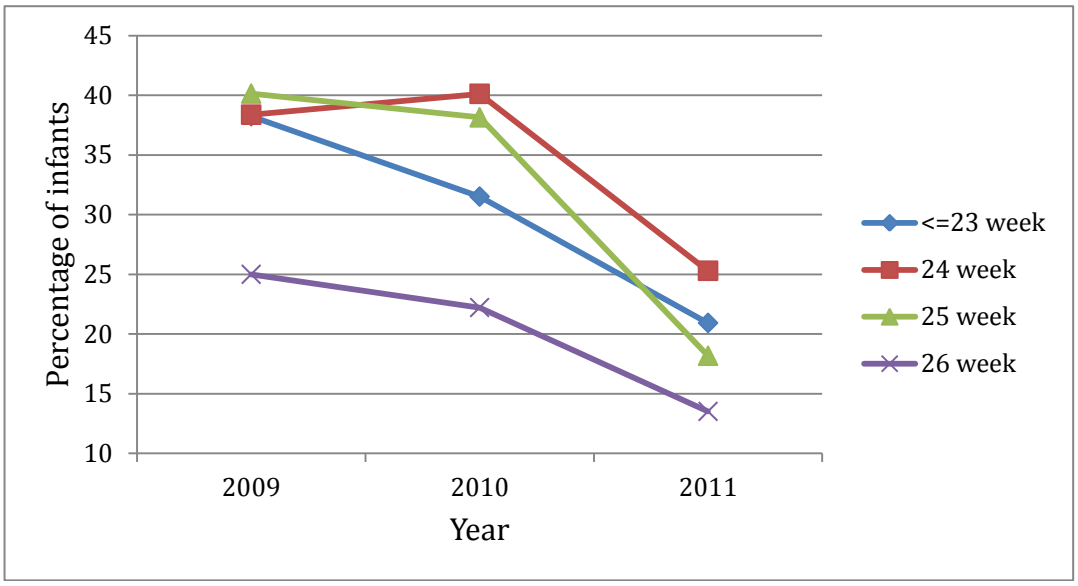


b. 27-32 weeks:

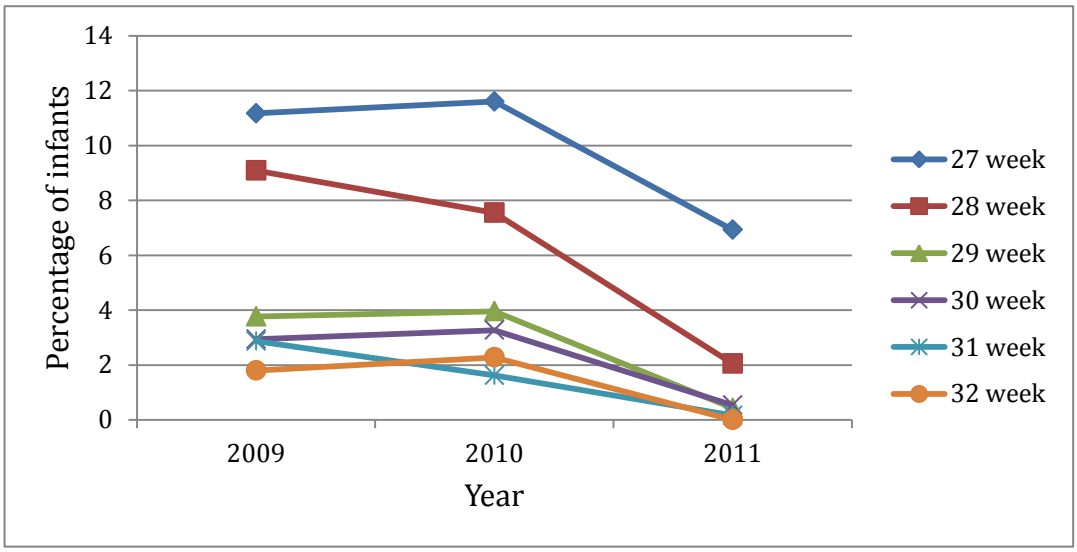


10. Postnatal systemic steroids use for BPD

a. 23-26 weeks:

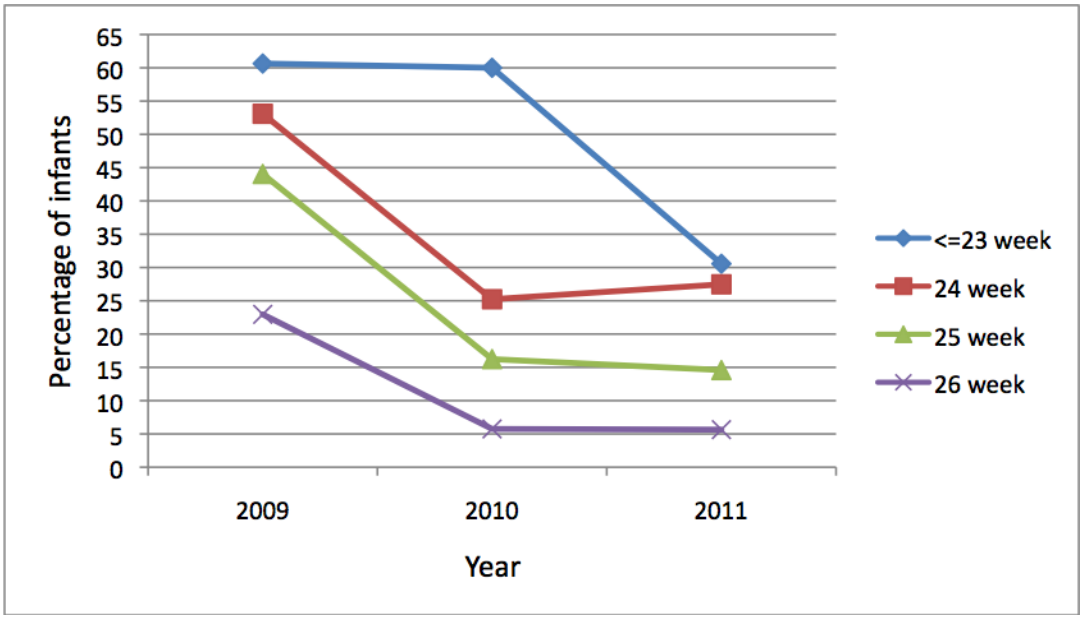


b. 27-32 weeks:

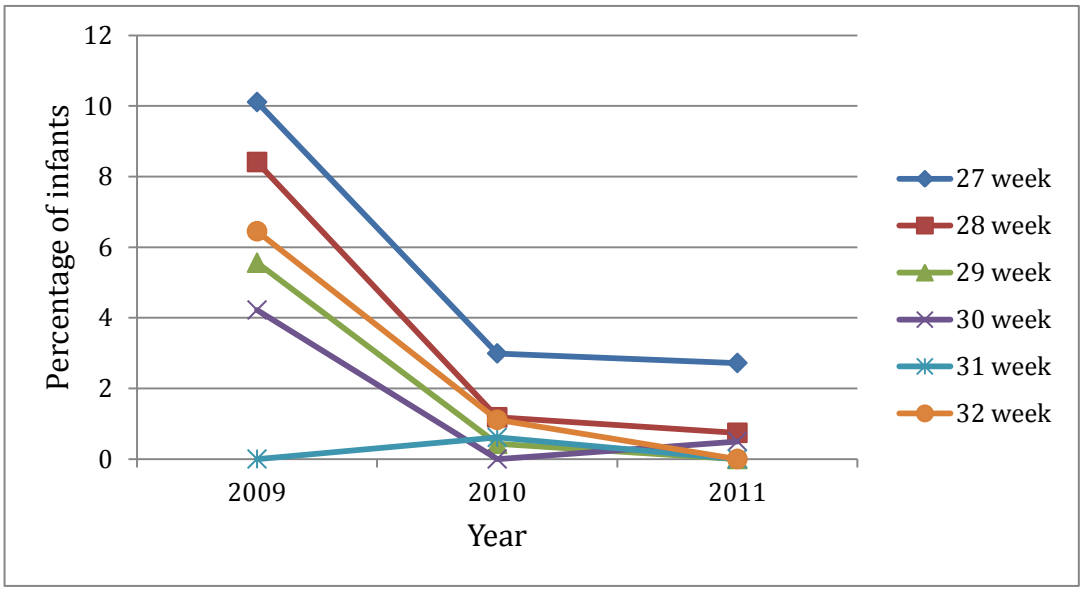


11. Therapy for ROP (among neonates who received eye exams)

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. As of October 2012, there were 30 hospitals participating in data collection 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. CNN will continue to produce NICU population-based data on outcomes and practices, and apply quality improvement strategies.

K. CNN publications for 2011

Manuscripts

1) Lodha A, Zhu Q, Lee SK, Shah PS. Neonatal outcomes of preterm infants in breech presentation according to mode of birth in Canadian NICUs. *Postgrad Med J. 2011; 87(1025): 175-9*
2) Binet ME, Bujold E, Lefebvre F, Tremblay Y, Piedboeuf B, Canadian Neonatal Network. Role of gender in morbidity and mortality of extremely premature neonates. American Journal of Perinatology. 2011 Aug 4 [epub ahead of print]
3) Sgro M, Shah PS, Campbell D, Tenuta A, Shivananda S, Lee SK. Early Onset Neonatal Sepsis and Meningitis in Canadian Neonatal Intensive Care Units. J Perinatol. 2011 Dec;31(12):794-8.
4) Shah PS, Sankaran K, Aziz K, Allen AC, Seshia M, Ohlsson A, Lee SK and the Canadian Neonatal Network. Changes in the outcomes of preterm infants of < 29 weeks gestational age born during 1996 to 1997 and 2006 to 2007 in Canada – a cause for concern? Journal of Perinatology. 2011 May 19 [epub head of print]
5) Bassil K, Shah PS, Barrington KJ, da Silva O, Harrison A, Lee SK and the Canadian Neonatal Network. Changing epidemiology and outcomes of preterm twins and triplets in Canada – 2003-2008. Am J Perinatol 2011 Aug 1. [Epub ahead of print].
6) Shah PS, Ye XY, Synnes A, Rouvinez-Bouali N, Yee W, Lee SK and the Canadian Neonatal Network. Prediction of survival without morbidity for infants born at <33 weeks gestational age: a user friendly graphical tool. E publication in Arch Dis Child Fetal Neonat Ed 2011, Sept 8.
7) Kanungo J, James A, Lodha A, McMillan D, Faucher D, Lee SK, Shah PS and the Canadian Neonatal Network. Advanced maternal age and the outcomes of preterm infants: a social paradox? Obstet Gynecol 2011 Oct;118(4):872-877.
8) Qiu X, Lodha A, Shah PS, Sankaran K, Seshia M, Jefferies A, Yee W, Lee SK and the Canadian Neonatal Network. Neonatal outcomes of small for gestational age preterm infants in Canada. Am J Perinatol 2011 Nov 30. [Epub ahead of print].
9) Shah PS, Dunn MS, Lee SK, Allen AC, Singhal N and the Canadian Neonatal Network. Early opioid infusion and neonatal outcomes in preterm neonates ≤28 weeks' gestation. Am J Perinatol 2011;28:361-6.
10) Cronin CM, Baker GR, Lee SK, Ohlsson A, McMillan DD, Seshia MM; Canadian Neonatal Network EPIQ Study Group. Reflections on knowledge translation in Canadian NICUs using the EPIQ method. Healthc Q 2011 Oct; 14 Spec No3:8-16.

Abstracts

1) Shah PS, Yoon W, Bassil K, Dunn M, Lee SK, Canadian Neonatal Network. Temporal Trends in Health Care Associated Infection in NICUs. PAS/ASPR 2011, Denver, CO
2) Shah PS, Ye XY, Synnes A, Rouvinez-Bouali N, Yee W, Lee SK, Canadian Neonatal Network. Prediction of intact survival for infants <33 weeks GA based on BW and GA: a user-friendly graphical tool. PAS/ASPR 2011, Denver, CO
3) Mahl S, Lee SK, Baker R, Cronin CMG, Stevens B, Ye XY, Canadian Neonatal Network. Assessing the Impact of Organizational Culture and Total Quality Management Factors on Outcomes in Canadian NICUs. PAS/ASPR 2011, Denver, CO
4) Mahl S, Lee SK, Baker R, Cronin CMG, Stevens B, Ye XY, Canadian Neonatal Network. Differences in the Perception of Organizational Culture & Total Quality Management Factors among Healthcare Professionals. PAS/ASPR 2011, Denver, CO
5) Qiu X, Jefferies A, Chen A, Lodha A, Shah P, Lee SK, Canadian Neonatal Network. Effect of Maternal Age on Outcomes of Very Preterm Infants among Women with Chorioamnionitis. PAS/ASPR 2011, Denver, CO
6) Wong J, Dow K, Shah P, Andrews W, Lee SK, Canadian Neonatal Network. Percutaneously placed central venous catheter related blood stream infections in Canadian NICUs: Impact on outcomes and variations. PAS/ASPR 2011, Denver, CO
7) Barbier A, Boivin A, Yoon W, Vallerand D, Platt R, Barrington K, Shah P, Nuyt AM, Canadian Neonatal Network. Updated Canadian newborn head circumference curves. PAS/ASPR 2011, Denver, CO
8) Stritzke A, Smyth J, Synnes A, Canadian Neonatal Network. Transfusion Associated Necrotizing Enterocolitis (TANEC) in Neonates: Single Site Study. PAS/ASPR 2011, Denver, CO
9) Stritzke A, Smyth J, Synnes A, Shah PS, Lee SK, Canadian Neonatal Network. Transfusion Associated Necrotizing Enterocolitis (TANEC) in Preterm Neonates. PAS/ASPR 2011, Denver, CO
10) Sgro M, Shah PS, Campbell D, Tenuta A, Shivananda S, Lee SK, Canadian Neonatal Network. Early Onset Neonatal Sepsis and Meningitis: Rate and organism pattern between 2003-2008. PAS/ASPR 2011, Denver, CO
11) Kanungo J, Shah PS, Lodha A, McMillan D, Faucher D, Lee SK, Canadian Neonatal Network. Advanced maternal age and the outcomes of preterm infants: a social paradox? PAS/ASPR 2011, Denver, CO
12) Zhao M, Shah PS, Lee SK, Canadian Neonatal Network. Contributing factors of poor outcome in outborn very low birth weight infants. PAS/ASPR 2011, Denver, CO
13) Ko G, Piedboeuf B, Riley P, Canning R, Shah PS, Lee SK. Very low birth weight babies born by caesarean section have lower mortality and morbidity than those born by vaginal delivery. PAS/ASPR 2011, Denver, CO
14) Ko G, Kovacs L, Ojah C, Shah PS, Lee SK. Effect of parental socioeconomic status on neonatal outcomes in the NICU. PAS/ASPR 2011, Denver, CO
15) Shah PS, Ye XY, Synnes A, Rouvinez-Bouali N, Yee W, Lee SK, Canadian Neonatal Network. Prediction of intact survival for infants <33 weeks GA based on BW and GA: a user-friendly graphical tool. CPS 2011, Quebec City, QC
16) Shah PS, Mirea L, Sankaran K, Seshia M, Ohlsson A, Allen A, Aziz K, Lee SK, Canadian Neonatal Network. PDA Treatment and Outcomes: Regression and Propensity Score based Analyses after Adjustment for Treatment Selection Bias. CPS 2011, Quebec City, QC

17) Wong J, Dow K, Shah P, Andrews W, Lee SK, Canadian Neonatal Network. Percutaneously placed central venous catheter related blood stream infections in Canadian NICUs: Impact on outcomes and variations. CPS 2011, Quebec City, QC

18) Stritzke A, Smyth J, Synnes A, Shah PS, Lee SK, Canadian Neonatal Network. Transfusion Associated Necrotizing Enterocolitis (TANEC) in Preterm Neonates. CPS 2011, Quebec City, QC

19) Sgro M, Shah PS, Campbell D, Tenuta A, Shivananda S, Lee SK, Canadian Neonatal Network. Early Onset Neonatal Sepsis and Meningitis: Rate and organism pattern between 2003-2008. CPS 2011, Quebec City, QC

20) Kanungo J, Shah PS, Lodha A, McMillan D, Faucher D, Lee SK, Canadian Neonatal Network. Advanced maternal age and the outcomes of preterm infants: a social paradox? CPS 2011, Quebec City, QC

21) Ko G, Kovacs L, Ojah C, Shah PS, Lee SK. Effect of parental socioeconomic status on neonatal outcomes in the NICU. CPS 2011, Quebec City, QC

22) Zhao M, Shah PS, Lee SK, Canadian Neonatal Network. Contributing factors of poor outcome in outborn very low birth weight infants. CPS 2011, Quebec City, QC

L. Future Plans

Database Improvements: Major changes have taken place to improve data collection for the CNN database over last 3 years. After taking into consideration the input from abstractors and the database review committee, few minor modification will be implemented in 2012.

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 improve the functionalities of the CNN portal.
- To continue collaboration with Canadian Follow up Network so that outcomes at 18-24 months corrected age will be studied for various clinical conditions or situations.

❖ **Expansion of Collaborative Efforts:** The CNN is in the process of establishing collaborative ties with other Neonatal Networks around the world. One such comparison was completed with Japan. Comparison with Australia and New Zealand and Sweden are on way. Results from our network will be compared to those from international networks and potential areas for change/improvement will be sought.

M. Appendix

Major anomalies list

System	ICD10 No	Description	CAtype
Nervous System	Q00	Anencephaly	Major
Nervous System	Q01	Encephalocele	Major
Nervous System	Q02	Microcephaly	Minor
Nervous System	Q03	Congenital Hydrocephalus	Major
Nervous System	Q04	Other Congenital Malformations Of The Brain	Minor
Nervous System	Q05	Spina Bifida	Major
Nervous System	Q06	Spinal Cord Anomaly Other Than Spina Bifida	Minor
Nervous System	Q07	Other Congenital Malformations Of The Nervous System	Minor
Eye	Q10	Congenital Malformations Of Eyelid, Lacrimal Apparatus And Orbit	Minor
Eye	Q11	Anophthalmos, Microphthalmos And Macrophthalmos	Minor
Eye	Q12	Congenital Lens Malformations	Minor
Eye	Q13	Congenital Malformations Of The Anterior Segment Of The Eye	Minor
Eye	Q14	Congenital Malformations Of The Posterior Segment Of The Eye	Minor
Eye	Q15	Other Congenital Malformations Of The Eye	Minor
Ear	Q16	Congenital Malformations Of The Ear Causing Impairment Of Hearing	Minor
Ear	Q17	Other Congenital Malformations Of The Ear	Minor
Face And Neck	Q18	Congenital Anomalies Of Neck Region	Minor
Cardiac Chambers And Circulation	Q20.1	Double Outlet Right Ventricle	Major
Cardiac Chambers And Circulation	Q20.3	Transposition Of The Great Vessels (Tgv)	Major
Cardiac Chambers And Circulation	Q21	Ventricular Septal Defect	Minor
Cardiac Chambers And Circulation	Q21.1	Atrial Septal Defect	Minor
Cardiac Chambers And Circulation	Q21.2	Atrioventricular Septal Defect	Major
Cardiac Chambers And Circulation	Q21.3	Tetralogy Of Fallot	Major

Cardiac Chambers And Circulation	Q22.1	Pulmonary Valve Stenosis	Minor
Cardiac Chambers And Circulation	Q23.4	Hypoplastic Left Heart Syndrome	Major
Cardiac Chambers And Circulation	Q24	Other Congenital Malformations Of The Heart	Minor
Cardiac Chambers And Circulation	Q24.6	Congenital Heart Block	Minor
Cardiac Chambers And Circulation	Q26.2	Total Anomalous Pulmonary Venous Connection	Major
Cardiac Chambers And Circulation	Q25.1	Coarctation Of The Aorta	Major
Cardiac Chambers And Circulation	Q27.0	Congenital Absence And Hypoplasia Of The Umbilical Artery (Single Umbilical Artery)	Minor
Cardiac Chambers And Circulation	Q28	Other Congenital Malformations Of The Circulatory System	Minor
Respiratory System	Q30	Congenital Malformations Of The Nose	Minor
Respiratory System	Q31	Congenital Malformations Of The Larynx	Major
Respiratory System	Q32	Congenital Malformations Of The Trachea And Bronchus	Minor
Respiratory System	Q33	Congenital Malformations Of The Lung	Minor
Respiratory System	Q33.0	Congenital Cystic Lung	Major
Respiratory System	Q33.2	Sequestration of The Lung	Major
Respiratory System	Q35	Cleft Palate	Minor
Respiratory System	Q36	Cleft Lip	Minor
Respiratory System	Q37	Cleft Palate With Lip	Minor
Digestive System	Q38	Congenital Malformations Of The Tongue, Mouth, Pharynx	Minor
Digestive System	Q39	Congenital Malformations Of The Esophagus	Minor
Digestive System	Q39.0	Atresia Of Oesophagus Without Fistula	Major
Digestive System	Q39.1	Atresia Of Oesophagus With Tracheo-Oesophageal Fistula	Major
Digestive System	Q40.0	Congenital Hypertrophic Pyloric Stenosis	Minor
Digestive System	Q41	Congenital Absence, Atresia And Stenosis Of The Small Intestine	Major
Digestive System	Q41.0	Congenital Absence, Atresia And Stenosis Of The Duodenum	Major
Digestive System	Q41.1	Congenital Absence, Atresia And Stenosis Of The Jejunum	Major
Digestive System	Q42.3	Congenital Absence, Atresia and Stenosis of The Anus (Imperforate Anus)	Major
Digestive System	Q43	Other Congenital Malformations Of The Intestine	Minor

Digestive System	Q44	Congenital Malformations Of The Gallbladder, Bile Ducts And Liver	Minor
Digestive System	Q44.2	Atresis Of The Bile Ducts	Major
Digestive System	Q45	Other Congenital Malformations Of The Digestive System	Minor
Genital System	Q50	Congenital Malformations Of Ovaries, Fallopian Tubes And Broad Ligaments	Minor
Genital System	Q51	Congenital Malformations Of The Uterus And Cervix	Minor
Genital System	Q52	Other Congenital Malformations Of The Female Genitals	Minor
Genital System	Q53.1	Undescended Testicle, Unilateral	Minor
Genital System	Q53.2	Undescended Testicle, Bilateral	Minor
Genital System	Q54.0	Hypospadias	Minor
Genital System	Q55	Other Congenital Malformations Of The Male Organs	Minor
Genital System	Q56	Indeterminate Sex And Pseudohermaphroditism	Major
Urinary System	Q60	Renal Agenesis And Other Defects Of The Kidney	Major
Urinary System	Q61	Congenital Renal Cystic Diseases	Major
Urinary System	Q62.0	Congenital Hydronephrosis	Major
Urinary System	Q64	Other Congenital Malformations Of The Urinary System	Minor
Urinary System	Q64.2	Congenital Posterior Urethral Valves	Major
Musculoskeletal System	Q65	Congenital Deformities Of The Hip	Minor
Musculoskeletal System	Q66	Congenital Deformities Of The Feet	Minor
Musculoskeletal System	Q67	Congenital Musculoskeletal Deformities Of Head, Face, Spine And Chest	Minor
Musculoskeletal System	Q68	Congenital Musculoskeletal Deformities Of Arm, Leg, Long Bones	Minor
Musculoskeletal System	Q69	Polydactyly	Minor
Musculoskeletal System	Q70	Syndactyly	Minor
Musculoskeletal System	Q71	Reduction Defects Of The Upper Limb	Major
Musculoskeletal System	Q72	Reduction Defects Of The Lower Limb	Major
Musculoskeletal System	Q73	Reduction Defects Of Unspecified Limb	Minor
Musculoskeletal System	Q74	Other Congenital Malformations Of Limbs (Shoulder Girdle, Knee, Arthrogryposis)	Minor
Musculoskeletal System	Q75	Other Congenital Malformations Of The Skull And Face Bones	Minor
Musculoskeletal System	Q75.0	Craniosynostosis	Major
Musculoskeletal System	Q76	Congenital Malformations Of The Spine And Bony Thorax	Minor
Musculoskeletal System	Q79	Congenital Malformations Of The Musculoskeletal System, Not Elsewhere Classified	Minor
Musculoskeletal System	Q79.0	Congenital Diaphragmatic Hernia	Major

Musculoskeletal System	Q79.2	Exomphalos	Major
Musculoskeletal System	Q79.3	Gastroschisis	Major
Other Congenital Malformations	Q80	Congenital Ichthyosis	Minor
Other Congenital Malformations	Q81	Epidermolysis Bullosa	Major
Other Congenital Malformations	Q82	Other Congenital Malformations Of The Skin	Minor
Other Congenital Malformations	Q83	Congenital Malformations Of The Breast	Minor
Other Congenital Malformations	Q84	Other Congenital Malformations Of Skin Appendages Such As Nail, Hair	Minor
Other Congenital Malformations	Q85	Neurocutaneous Syndromes	Minor
Other Congenital Malformations	Q86.0	Fetal Alcohol Syndrome (Dysmorphic)	Major
Other Congenital Malformations	Q86	Congenital Malformations Syndromes Due To Known Exogenous Causes Not Elsewhere Classified	Minor
Other Congenital Malformations	Q87	Other Specified Congenital Malformation Syndromes Affecting Multiple Systems	Minor
Other Congenital Malformations	Q89	Other Congenital Malformations, Not Elsewhere Classified	Minor
Other Congenital Malformations	Q89.3	Situs Inversus	Minor
Chromosomal Abnormalities	Q90	Down's Syndrome	Major
Chromosomal Abnormalities	Q91.3	Edwards' Syndrome Or Trisomy 18	Major
Chromosomal Abnormalities	Q91.7	Patau Syndrome Or Trisomy 13	Major
Chromosomal Abnormalities	Q92	Other Trisomies And Parial Trisomies Of The Autosomes Not Elsewhere Classified	Major
Chromosomal Abnormalities	Q93	Monosomies And Deletions From The Autosomes Not Elsewhere classified	Major
Chromosomal Abnormalities	Q95	Balanced Rearrangements And Structural Markers Not Elsewhere Classified	Minor
Chromosomal Abnormalities	Q96	Turner's Syndrome	Major
Chromosomal Abnormalities	Q97	Other Sex Chromosome Abnormalities, Female Phenotype Not Elsewhere Classified	Minor

(Canadian Neonatal Network™, MiCare, Ontario Power Generation Building,
700 University Avenue, Suite 8-500, Toronto ON M5G 1X6)