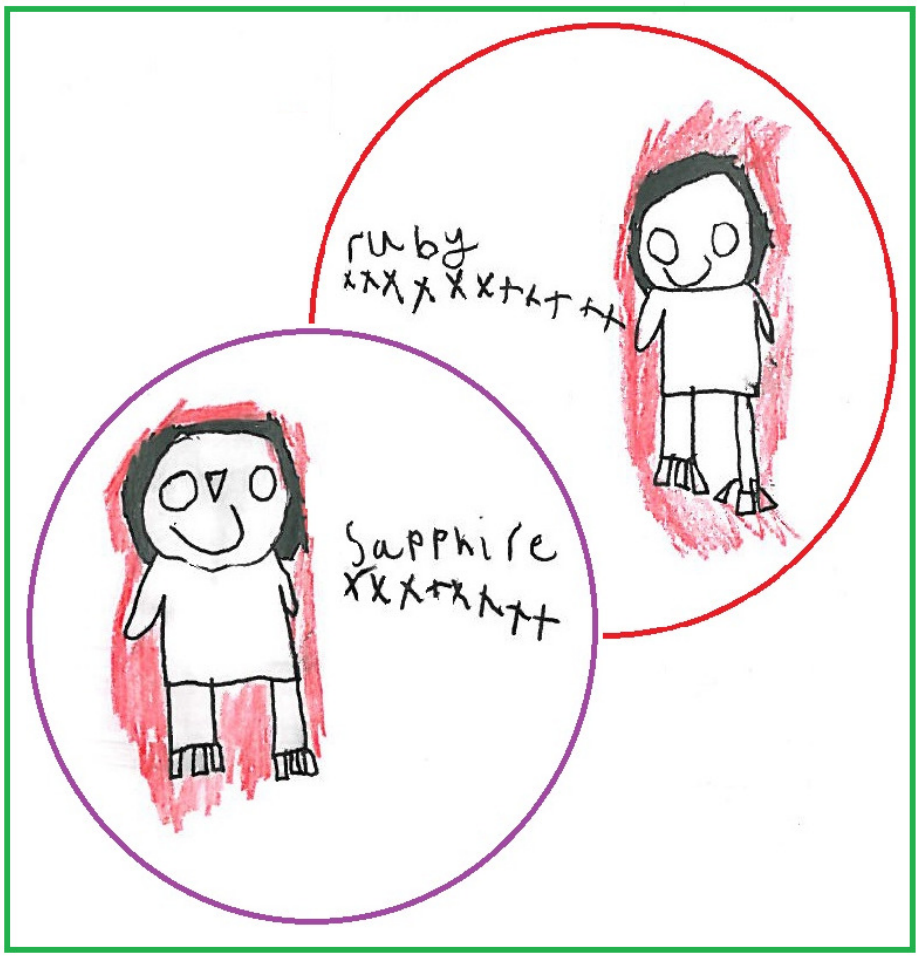
Annual Report 2014



Department of Neonatology
Brighton & Sussex University Hospitals
NHS Trust

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Abbreviations	
AABR	Auditory Acoustic Brainstem Responses
ANNP	Advanced Neonatal Nurse Practitioner
BAPM	British Association of Perinatal Medicine
BSUH	Brighton and Sussex University Hospitals
CA	Corrected age
CDC	Child Development Centre
CLD	Chronic Lung Disease
CPAP	Continuous Positive Airway Pressure
CVL	Central venous line
DEBM	Donor expressed breast milk
EBA	Early Birth Association
ETT	Endotracheal tube
FTE	Full time equivalent
GA	Gestational age
HD	High dependency
HHFNC	Humidified High Flow Nasal Cannula
HIE	Hypoxic Ischaemic Encephalopathy
IC	Intensive care
IUGR	Intrauterine Growth Restriction
IVH	Intraventricular Haemorrhage
KSS	Kent, Surrey and Sussex
LW	Labour Ward
MRSA	Methicillin Resistant Staphlococcus Aureus
MSSA	Methacillin Sensitive Staphlococcus Aureus
NEC	Necrotising Enterocolitis
NNU	Neonatal Unit
OAE	Otoacoustic emissions
PDA	Patent Ductus Arteriosus
PM	Post Mortem
PPHN	Persistent Pulmonary Hypertension
PRH	Princess Royal Hospital
PROM	Premature Rupture of Membranes
RACH	Royal Alexandra Children's Hospital
RDS	Respiratory Distress Syndrome
ROP	Retinopathy of Prematurity
RSCH	Royal Sussex County Hospital
SC	Special Care
SCBU	Special Care Baby Unit
TOF	Tracheo-Oesophageal Fistula
TMBU	Trevor Mann Baby Unit
VRE	Vancomycin Resistant Enterococcus

Data used to compile this report has been collected from BadgerNet. Thanks go to Patricia Walker for data management. Thank you to Ruby and Sapphire's big sister for her art work on the front cover.

For enquiries please contact: philip.amess@bsuh.nhs.uk

This report can be found on the BSUH Neonatal website:
http://www.bsuh.nhs.uk/tmb

Introduction

The Department of Neonatology is based on the Trevor Mann Baby Unit at the Royal Sussex County Hospital and the Special Care Baby Unit at Princess Royal Hospital. In 2014, there were 3,400 deliveries at the Royal Sussex County Hospital and 2,429 deliveries at the Princess Royal Hospital.

The Trevor Mann Baby Unit, Brighton:
The TMBU is one of three intensive care units in the Kent, Surrey and Sussex Neonatal Network. It provides a tertiary, neonatal medical and surgical service for Brighton, East and West Sussex and a special care service for Brighton and Mid-Sussex. The Sussex Neonatal Transport Service is based at the TMBU and provides 24/7 cover alongside similar services in Kent and Surrey. We have a team of drivers, our own ambulance, and provide a dedicated consultant for the service during daytime hours.

There are 27 cots on the TMBU of which 9 are staffed for intensive care, 8 for high dependency care and 10 for special care. Current cot levels in Brighton are set to provide sufficient medical and surgical intensive care facilities for Sussex babies. Transitional care is provided on the postnatal wards at RSCH. The Neonatal Outreach Service offers the opportunity for earlier, supported discharge. Length of stay for near term babies seems to have fallen over the last 2 years. A co-located midwifery led birthing unit in Brighton is awaited along with expansion of feto-maternal services.

The Special Care Baby Unit, Haywards Heath:
The SCBU at Princess Royal Hospital is staffed for 8 special care cots. Transitional care is provided on the postnatal ward. The baby unit is one of two in the UK led by a team of ANNPs, supported by consultant neonatologists. Women likely to deliver at less than 34 weeks gestation or whose baby is likely to require high dependency or intensive care are transferred to the RSCH. There are facilities at PRH for short term ventilation and stabilisation of infants prior to transfer. Infants requiring short periods of care on CPAP or HHFNC are routinely managed at PRH.

Neonatal Surgery:
There is a high risk pregnancy unit for fetal assessment and fetal medicine, and referrals are accepted for perinatal care prior to neonatal surgery. There is a monthly antenatal surgical clinic. All neonatal surgery is performed on site at the RACH with a team of dedicated paediatric surgeons and paediatric anaesthetists. There is sufficient IC and HD capacity across the TMBU and RACH for neonatal surgery to be referred from around Sussex and a proportion of the Kent, Surrey and Sussex Neonatal Network.

Support services and ongoing care:
We benefit from the developing tertiary services at the RACH, including respiratory medicine, cardiology and gastroenterology. Infants with ongoing medical or surgical needs beyond the neonatal period are transferred to the 'Alex' as soon as possible. Our department is supported by a team of paediatric radiologists providing a 24/7 on call service. MRI, spiral CT and nuclear medicine investigations are all available on site. The neurophysiology department based at Hurstwood Park provides a mobile EEG service. We also have access to paediatric dietetics, physiotherapy, pharmacy, speech and language therapy, audiology, ophthalmology and a breast feeding advisor and maternity counselor. Dr Paul Seddon and the Community Paediatric Nursing Team continue to coordinate the discharge and follow-up of infants requiring home oxygen. There is a weekly multidisciplinary Family & Social Meeting. We have access to a parent counselor and support from the chaplaincy team.

A perinatal pathology service is provided at St Thomas' Hospital, London, with visiting support from other tertiary specialists from the Evelina Children's Hospital including those from genetics, cardiology, nephrology and neurology.

Weekly neonatal follow-up clinics are held on both the RSCH and PRH sites. Monthly neurodevelopmental clinics are used to follow preterm and birth asphyxiated babies. We aim to provide comprehensive follow-up of high risk infants until two years corrected age. The Seaside View and Nightingale Child Development Centres provide multi-disciplinary care for those infants needing ongoing neurodevelopmental support. The weekly One-Stop Clinic cares for babies of mothers with problems of substance misuse.

Unit Up-date for 2014:
A full programme of research, clinical governance and education has continued.

The NeoCirculation trial started in 2014. This is a multicenter, European Commission funded project exploring the use of dobutamine in newborns and a new definition of neonatal shock. Brighton is the lead centre for this study with PD Dr. Heike Rabe responsible for the 6 million Euro research budget.

Along with 2 other UK centres, Brighton is now hosting the Advanced Resuscitation of the Newborn Infant course – ARNI.

The Sussex Transport Service will host the UK National Conference for Neonatal Transport in 2015.

Nurse development has advanced over the last year with nurses completing the neonatal pathway, child protection modules, neonatal surgical modules, degree and master's programs. The Karen Booth Memorial Fund continues to help fund training for nurses. Karen was one of the first ANNPs and we continue to try and follow her great example. During the last 2 years 3 ANNPs have been trained and there will be 2 further places for ANNP training in 2015.

A real-time patient feedback tool, Fabio the Frog has been introduced which should allow us to gauge the opinion of parents and have the results instantaneously. The aim is to facilitate change within the unit helping us deliver more effective and efficient care and improve the experience of the families we care for.

SCBU is progressing with work as a pilot site for the BLISS, Family Friendly Accreditation scheme. This project is being carried out with nursing staff, parents and BLISS working in partnership to achieve each of the standards. Once 90% of the standards are met, Family Friendly Accreditation will be awarded.

The neonatal department is very lucky to have the help of many parents, families and friends. Their amazing fund raising efforts continue to allow the unit to develop beyond its stretched NHS budget. It is impossible to name all those involved but thank you for the time and energy you have invested. Football matches, sponsored runs, walks, climbs, jumps, cycles, pushes, teas, coffees, dinners, raffles, sweep stakes……..thank you!

During 2014 charity funds have purchased two major pieces of equipment. A new cerebral function monitor now allows us to port electroencephalograms for immediate review and reporting. The RetCam is a piece of equipment that is used for eye examinations and allows documentation of retinal images. We hope this will improve our screening and treatment of neonatal retinopathy. Charity funds will be making significant contributions to completing plans to increase space in the nurseries and improve parent facilities at the TMBU and SCBU PRH. We hope these changes will maximize the chance to deliver best care to our babies and families.

Staffing

Medical Staff

Consultant Neonatologists:

Dr Neil Aiton	Interest in Cardiology, One Stop Clinic
Dr Philip Amess	Lead Clinician, interest in Developmental Outcome
Dr Robert Bomont	Paediatric College Tutor, Training Programme Director
Dr Ramon Fernandez	Lead for Clinical Governance
Dr Cathy Garland	Transport Consultant
Dr Cassie Lawn	Transport Lead, interest in neonatal resuscitation
PD Dr Heike Rabe	Lead for Research, President of the International Paediatric Research Foundation (IPRF), Senior Lecturer
Dr Paul Seddon	Interest in Paediatric Respiratory Medicine
Dr Ryan Watkins	Honorary Clinical Senior Lecturer, Clinical Director Children's Services.

Consultant Radiologists: Dr Ian Kenney, Dr Lorraine Moon, Dr Ima Moorthy, Dr Lavanya Vitta, Dr Kyriakos Iliadis

Consultant Ophthalmologist: Mr Dominic Heath, Miss Victoria Barrett

Consultant Audiologist: Mr Rob Low

Consultant Pathologist: Dr Mudher Al-Adnani (St Thomas' Hospital)

Consultant Obstetricians:

Mr Salah Abdu	Mr Tosin Ajala
Mr Rob Bradley	Miss Heather Brown
Mr Ayman Fouad	Mr Ani Gayen
Dr Sharif Ismail	Mr Richard Howell
Mr Greg Kalu	Mr Ehab Kelada
Mr Tony Kelly	Miss Julia Montgomery
Mr Onome Ogueh	

Consultant Paediatric Surgeons:
Mr Varadarajan Kalidasan
Miss Ruth Hallows
Miss Anouk van der Avoirt
Mr Anies Mohammed
Mr Bommaya Narayanaswamy
Ms Victoria Scott (locum)
Miss Alexandra Smith (Orthopaedics)
Mr Simon Watts, Mr Prodip Das (ENT)

Visiting Consultants:

Dr Owen Miller	Cardiology
Dr Shelagh Mohammed	Genetics
Dr Chris Reid	Nephrology
Dr Tammy Hedderly	Neurology

Junior and Middle Grades Medical Staff:

Tier 2:	Associate Specialist (Dr Michael Samaan)
	Specialist Doctor (Dr Fatou Wadda)
	4 Specialist Registrars
	4 Trust Clinical Fellows / 1 ANNP
Tier 1:	6 ST3, 1 Trust Clinical Fellow

Neonatal Nurses

Senior Nursing Staff

Lorraine Tinker	Head of Paediatrics and Neonatal Nursing
Jennifer Deeney	Matron Neonatology
Mrs Susanne Simmons	Lecturer Practitioner

Advanced Neonatal Nurse Practitioners

Jamie Blades
Maggie Bloom
Dee Casselden
Lisa Chaters
Naomi Decap
Karen Hoover
Caroline McFerran
Simone van Eijck
Nicola McCarthy
Sarah Quinton
Lisa Kaiser

Band 7

Clare Morfoot (Clinical Practice Educator)
Clare Baker (PRH)
Chrissie Leach (Transport Nurse)
Jackie Cherry
Sandra Hobbs
Karen Marchant
Judith Simpson
Judy Edwards (PRH, Outreach)
Carly Taylor
Clare Hunt

Support Staff

Unit Technician: John Caisley

Pharmacist: Mike Pettit

Speech and Language Therapist: Rachelle Quaid

Physiotherapy: Melanie Smith

Dietician: Carole Davidson

Counsellor: Sally Meyer

Secretarial support: Emma Morris, Alex Panton, Patricia Walker

Admissions, Activity and Mortality

Trevor Mann Baby Unit

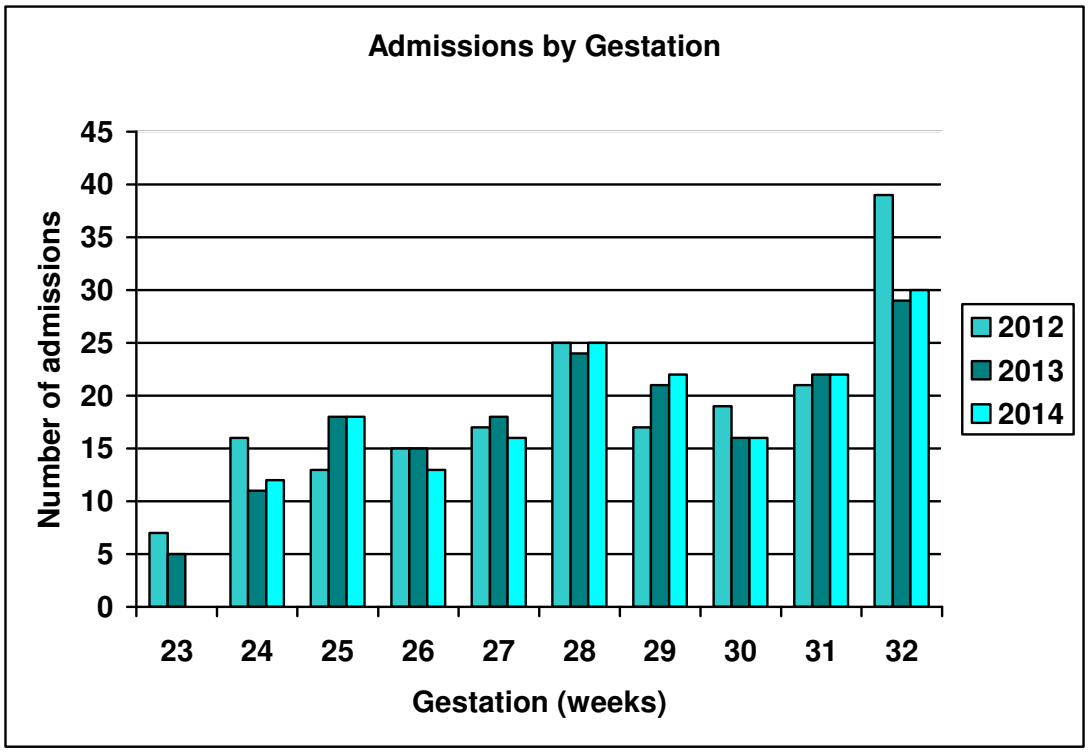
TMBU Admissions	Total Admissions per year
2001	424
2002	364
2003	450
2004	404
2005	444
2006	415
2007	465
2008	524
2009	456
2010	525
2011	562
2012	567
2013	528
2014	516

Includes re-admissions

TMBU Admissions	2012	2013	2014
Total number of live births (RSCH)	3569	3292	3400
Total admissions (including re-admissions)	567	528	516
Inborn	403	362	350
Inborn booked RSCH	313	299	292
Inborn booked elsewhere	90	68	58
Outborn	126	134	146
Re-admissions	32	28	20
Admissions from home	6	4	4
Percentage inborn births admitted to TMBU	11	11	10

Admission details	2012		2013		2014	
Gestation (weeks)	**Babies**	**%**	**Babies**	**%**	**Babies**	**%**
23	7	1	5	1	**0**	**0**
24	16	3	11	2	**12**	**2**
25	13	2	18	3	**18**	**4**
26	15	3	15	3	**13**	**3**
27	17	3	18	3	**16**	**4**
28	25	4	24	4	**25**	**5**
29	17	3	21	4	**22**	**4**
30	19	3	16	3	**16**	**3**
31	21	4	22	4	**22**	**4**
32	39	7	29	5	**30**	**6**
33-36	127	22	135	25	**144**	**29**
37-41	218	38	182	34	**172**	**35**
>42	1	<1	7	1	**6**	**1**
Birthweight (g)						
<500	4	<1	4	1	**4**	**1**
<750	32	6	27	5	**22**	**4**
<1000	32	6	43	8	**35**	**7**
<1500	72	13	66	12	**65**	**13**
Multiple pregnancies (number of babies)						
Twins	83	15	71	13	**90**	**23**
Triplets	21	4	6	1	**9**	**2**

Inborn and ex-utero admissions: does not include re-admissions

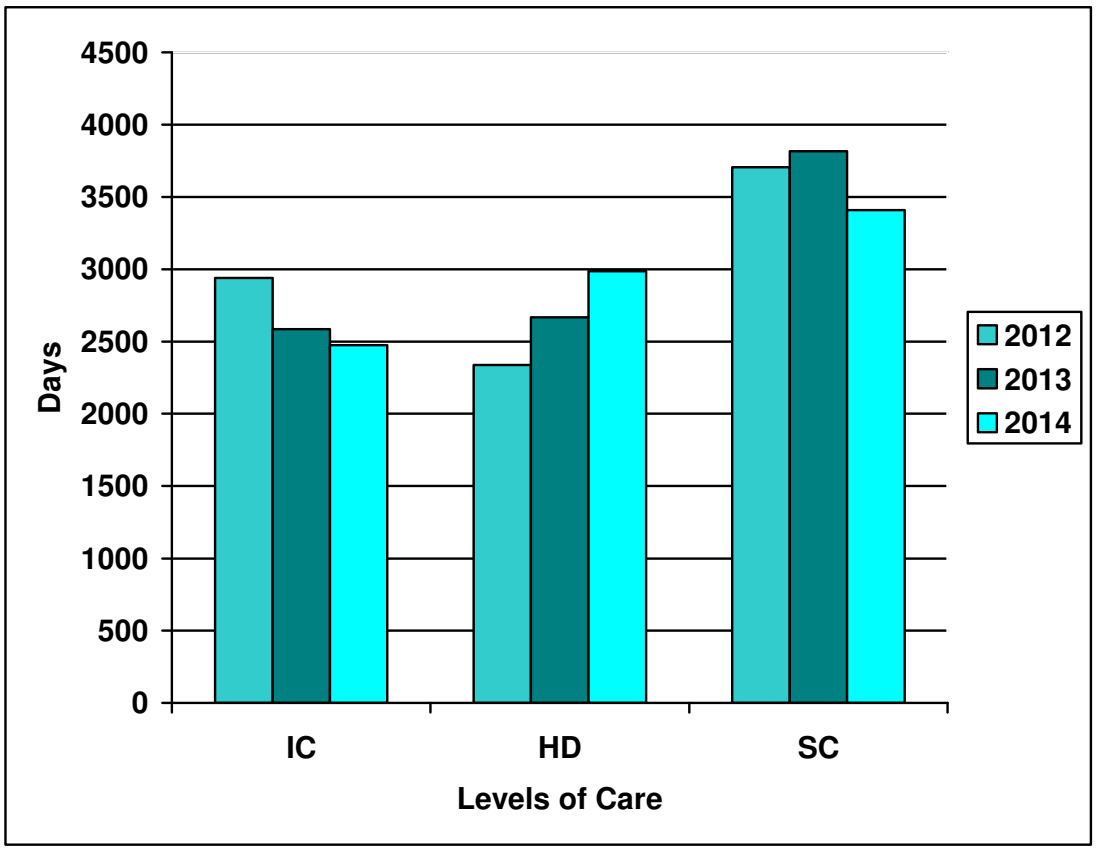


Transfers in	2012	2013	2014
In-Utero			
Babies delivered and admitted	90	68	**59**
Refused in-utero transfers	170	89	**77**
Ex-Utero	126	134	**146**
Princess Royal Hospital	37	24	**31**
East Sussex Hospitals	29	32	**37**
West Sussex Hospitals	18	23	**18**
Other Network Hospitals	22	26	**24**
Outside Network	23	16	**30**
Refused ex-utero transfers	32	29	**17**

Does not include re-admissions or home births

Cot occupancy	2012		2013		2014	
Cots	**Days**	**% occ**	**Days**	**% occ**	**Days**	**% occ**
IC	2941	90	2585	79	**2474**	**75**
HD	2337	80	2669	91	**2987**	**102**
IC & HD (total)	5278	85	5254	85	**5461**	**88**
SC	3707	102	3817	105	**3410**	**93**
Total	8985	91	9071	92	**8871**	**90**

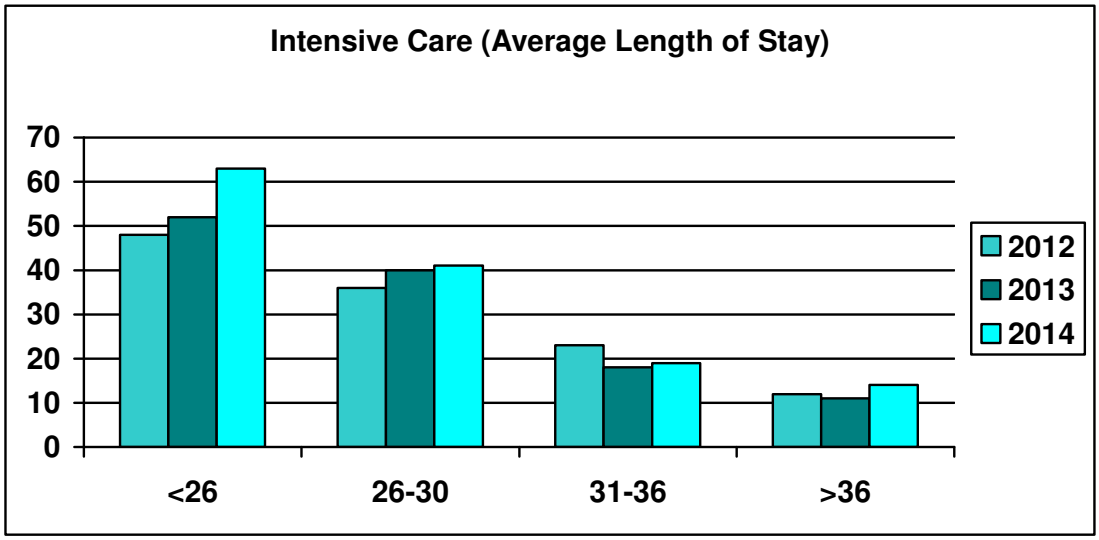
2001 BAPM definition for care levels

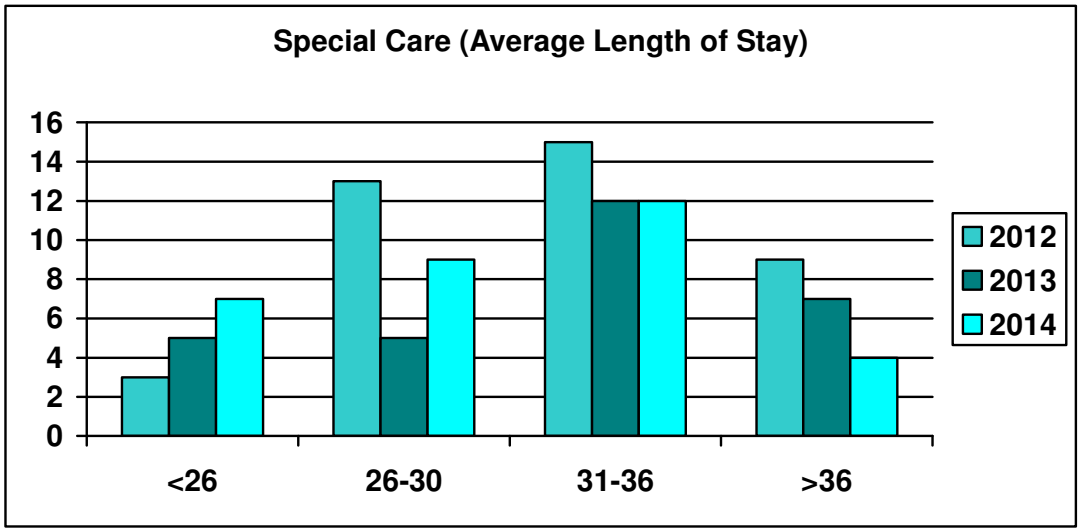


TMBU Care Categories 2014						
Gestation at birth (weeks)	IC		HD		SC only	
	Babies	Days	Babies	Days	Babies	Days (total days)
< 23	0	0	0	0	0	0
23	0	0	0	0	0	0
24	12	449	9	474	0	0
25	18	481	14	556	0	0
26	13	202	9	261	0	0
27	15	230	14	314	0	0
28	23	166	26	283	0	0
29	20	149	19	168	0	0
30	10	58	13	78	2	11
31	17	101	13	54	1	25
32	21	76	9	54	7	110
33-36	68	246	35	215	61	525
37-41	84	297	46	229	73	223
>41	4	8	0	0	2	6

2001 BAPM definition for care levels **– based on 2014 admissions**

Average length of stay by gestation			
Gestation	2012	2013	2014
	IC days		
<26	48	52	**63**
26-30	36	40	**41**
31-36	23	18	**19**
>36	12	11	**14**
	HDU days		
<26	N/A	5	**37**
26-30	23	27	**20**
31-36	15	18	**16**
>36	8	8	**7**
	SC days		
<26	3	5	**7**
26-30	13	5	**9**
31-36	15	12	**12**
>36	9	7	**4**





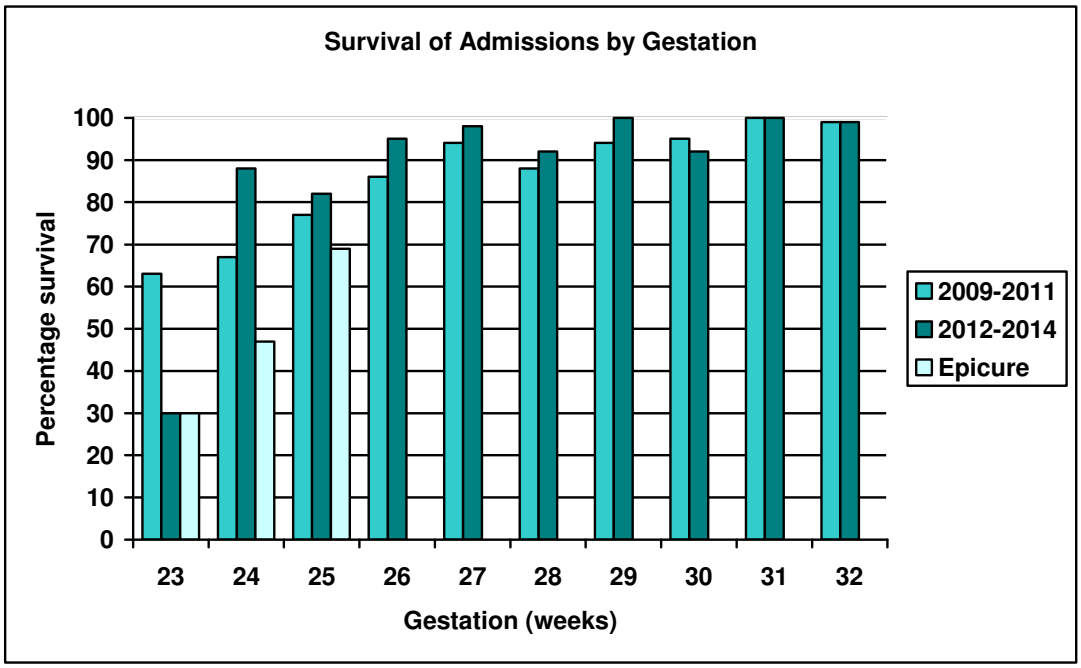
Transfers out	2012	2013	2014
Specialist medical care	14	5	**5**
Cardiac care	8	21	**9**
Discharges			
Home	155	160	**155**
Postnatal ward	157	129	**133**
Local hospital care	164	170	**193**
Princess Royal Hospital	62	62	**67**
RACH	15	14	**27**
East Sussex Hospitals	43	36	**45**
West Sussex Hospitals	20	28	**21**
Other KSS Network Hospitals	17	24	**23**
Other Hospitals Outside KSS Network	N/A	6	**5**
Delayed transfer out to local care (days)	77	100	**95**

Survival of all inborn live births by gestation 2014								
GA	**Live births**	**Admitted to TMBU***	**Died before admission**	**Died <7d**	**Died 7-28d**	**Died >28d**	**Total deaths**	**Admissions surviving to discharge**
23								
24	8	7	1	1			1	**6**
25	7	7	0	1			1	**6**
26	7	7	0		2		2	**5**
27	7	7	0					**7**
28	16	16	0		1		1	**15**
29	10	10	0					**10**
30	10	10	0					**10**
31	16	16	0			1	1	**15**
32	26	26	0			1	1	**25**
33-36	206	113	1	1			1	**112**
37-42	2974	131	0	1	1	1	3	**128**
>42	24	0						
Total							**11**	**339**

Inborn (booked and unbooked) excluding lethal congenital abnormalities
Not including re-admissions

TMBU, 3 year rolling survival to discharge for extreme preterm admissions							
	2012		**2013**		**2014**		
GA	**Admitted**	**Died**	**Admitted**	**Died**	**Admitted**	**Died**	**Survival to discharge %**
23	7	4	3	3	**0**	**0**	**30**
24	16	1	6	1	**12**	**2**	**88**
25	13	3	13	3	**18**	**2**	**82**
26	15	0	15	0	**13**	**2**	**95**
27	17	1	15	0	**16**	**0**	**98**

Includes inborn and ex-utero transfers



Mortality Statistics (RSCH)	2009	2010	2011	2012	2013	2014
Total deliveries	3345	3412	3721	3582	3303	**3410**
Total livebirths	3332	3389	3695	3569	3292	**3400**
Total stillbirths	13	23	26	13	11	**10**
Deaths before admission*	4	3	4	0	0	**2**
Total neonatal deaths	21	12	22	23	19	**14**
Inborn	16	7	13	17	11	**11**
Outborn	5	5	9	6	8	**3**
Early neonatal deaths**	10	4	10	8	5	**3**
Late neonatal deaths**	4	3	2	4	5	**3**
Deaths >28 days**	3	2	1	5	0	**1**
Still birth rate	3.9	6.7	7.0	3.6	3.3	**2.9**
Perinatal mortality rate	6.9	7.9	9.7	5.9	4.8	**3.8**
Neonatal mortality rate**	4.2	2.1	3.2	3.4	3.0	**1.8**
Mortality Statistics (BSUH = RSCH + PRH)		**2010**	**2011**	**2012**	**2013**	**2014**
Total deliveries		5886	6162	6057	5841	**5851**
Total livebirths		5852	6126	6035	5828	**5729**
Total stillbirths		32	36	22	13	**22**
Deaths before admission*		3	4	0	0	**1**
Early neonatal deaths**		4	11	8	6	**5**
Late neonatal deaths**		3	2	4	5	**4**
Deaths >28 days**		2	1	5	0	**1**
Still birth rate		5.4	5.8	3.6	2.2	**3.8**
Perinatal mortality rate		6.6	8.3	5.0	3.3	**4.6**
Neonatal mortality rate**		1.7	2.8	2.0	1.9	**1.6**

Terminations and deaths <23 weeks gestation not included.

****Inborn (booked and unbooked) excluding lethal congenital abnormalities***

TMBU deaths (inborn and ex-utero transfers) 2014					
Delivered	**GA**	**BW**	**Age d**	**PM**	**Cause of death, related factors**
Deaths related to prematurity					
RSCH	24	704	<1	Yes	Extreme prematurity
PRH	25	701	4	No	Extreme prematurity, grade 4 IVH, pulmonary haemorrhage
RSCH	26	1023	7	No	Extreme prematurity, pulmonary haemorrhage
Conquest	29	860	4	No	Intraventricular & intracortical haemorrhage, PPHN
NEC					
RSCH	26	870	14	No	Fulminant NEC
RSCH	31	2250	56	Yes	Congenital ascites (cause unknown), fulminant NEC
Sepsis					
Conquest	24	750	6	No	Candida sepsis, bilateral grade 4 IVH, extreme prematurity
Deaths related to perinatal asphyxia					
RSCH	39	3092	5	No	Grade 3 HIE
PRH	32	1725	28	No	Grade 3 HIE
Deaths related to a lethal congenital abnormality					
RSCH	37	2140	8	Yes	Nemaline myopathy, lung hypoplasia
RSCH	36	3917	<1	Yes	Holoprosencephaly
RSCH	39	3590	98	No	Migrating partial epilepsy of childhood
Others					
RSCH	25	761	<1	Yes	Rapidly progressive pulmonary interstitial emphysema (cause unknown)
RSCH	28	1200	12	Yes	Rapidly progressive pulmonary interstitial emphysema (cause unknown)

Post Mortems	2012	2013	2014
Total deaths	23	19	**14**
Post Mortems performed (% of deaths)	**5 (22)**	**7 (37)**	**6 (43)**

TMBU, 4 year rolling mortality											
	Total Admissions:					Deaths					Survival to discharge
	2011	2012	2013	2014	Total	2011	2012	2013	2014	Total	(%)
Inborn	390	402	362	350	**1504**	13	17	12	11	**53**	**96.5**
Outborn	133	133	134	146	**546**	9	6	7	3	**25**	**95.4**
<26 weeks	22	36	34	30	**122**	10	8	12	4	**34**	**72**
<28 weeks	30	32	57	29	**148**	4	1	0	2	**7**	**95**
<31 weeks	59	61	43	63	**226**	3	3	2	2	**10**	**96**
31+ weeks	414	406	353	374	**1547**	5	11	5	6	**27**	**98**
<500g	2	4	4	4	**14**	1	2	5	0	**8**	**43**
<750g	21	32	27	22	**102**	8	6	10	2	**26**	**75**
<1000g	34	32	43	35	**144**	5	1	0	4	**10**	**93**
<1500g	70	72	66	65	**273**	1	4	2	2	**9**	**97**
>1500g	398	395	354	370	**1517**	7	10	5	6	**28**	**98**

Admissions, Activity and Mortality
Special Care Baby Unit, Princess Royal Hospital

SCBU Admissions	2012	2013	2014
Total number of livebirths	2466	2536	**2429**
Total number of stillbirths	9	2	**12**
Total admissions*	279 (27)	273 (20)	**273 (20)**
Percentage of live births admitted	11%	11%	**11%**

***Includes re-admissions**

Admission details	2012		2013		2014	
	Babies	%	Babies	%		%
Total admissions	252		253		**253**	
Inborn	195	77	196	77	**189**	**75**
Outborn	57	23	54	21	**64**	**25**
Gestation ( ) = babies born elsewhere and transferred back to PRH						
23	0		0		**0**	
24	2(2)		3(2)		**1**	
25	1(1)		2(3)		**5(3)**	
26	4(4)		3(3)		**2(1)**	
27	5(5)		3(3)		**1(1)**	
28	7(7)		3(2)		**6(5)**	
29	1(1)		7(7)		**5(3)**	
30	4(4)		7(6)		**5(5)**	
31	5(5)		7(6)		**9(7)**	
32	15(15)		7(5)		**13(9)**	
33-36	80(23)		62(6)		**75(20)**	
37-42	128(12)		149(7)		**136(17)**	
>42	0		0		**0**	
Birthweight (g) ( ) = babies born elsewhere and transferred back to PRH						
<500	0		0		**2(1)**	
<750	2(2)		4(4)		**3(1)**	
<1000	9(9)		6(5)		**5(5)**	
<1500	17(17)		18(5)		**20(14)**	
Multiple births (number of babies)						
Twins	46		28		**35**	
Triplets	11		0		**6**	

Does not include re-admissions

Transfers	2012	2013	2014
Ex-Utero			
Transfers out to Brighton	36	23	**24**
Transfers out to elsewhere	7	4	**1**
Transfers in from Brighton	60	60	**46**
Transfers in from elsewhere	10	5	**7**
Transfers in from home	6	14	**6**

Cot occupancy	2012		2013		2014	
Cots	**Days**	**% occ**	**Days**	**% occ**	**Days**	**% occ**
IC	92	-	112	-	144	-
HD	106	-	231	-	211	-
SC	2145	-	2035	-	2018	-
Total	**2343**	**80**	**2379**	**81**	**2374**	**81**

Mortality Statistics (PRH)	2011	2012	2013	2014
Total deliveries	2441	2475	2538	**2441**
Total livebirths	2431	2466	2536	**2429**
Total stillbirths	10	9	2	**12**
Early neonatal deaths*	1	0	1	**2**
Late neonatal deaths*	0	0	0	**1**
Post neonatal deaths (>28 days)*	0	0	0	**0**
Still birth rate	4.1	3.6	0.8	**4.9**
Perinatal mortality rate	4.5	3.6	1.2	**5.3**
Neonatal mortality rate*	0.4	0	0.4	**0.8**

****Inborn (booked) excluding lethal congenital abnormalities***

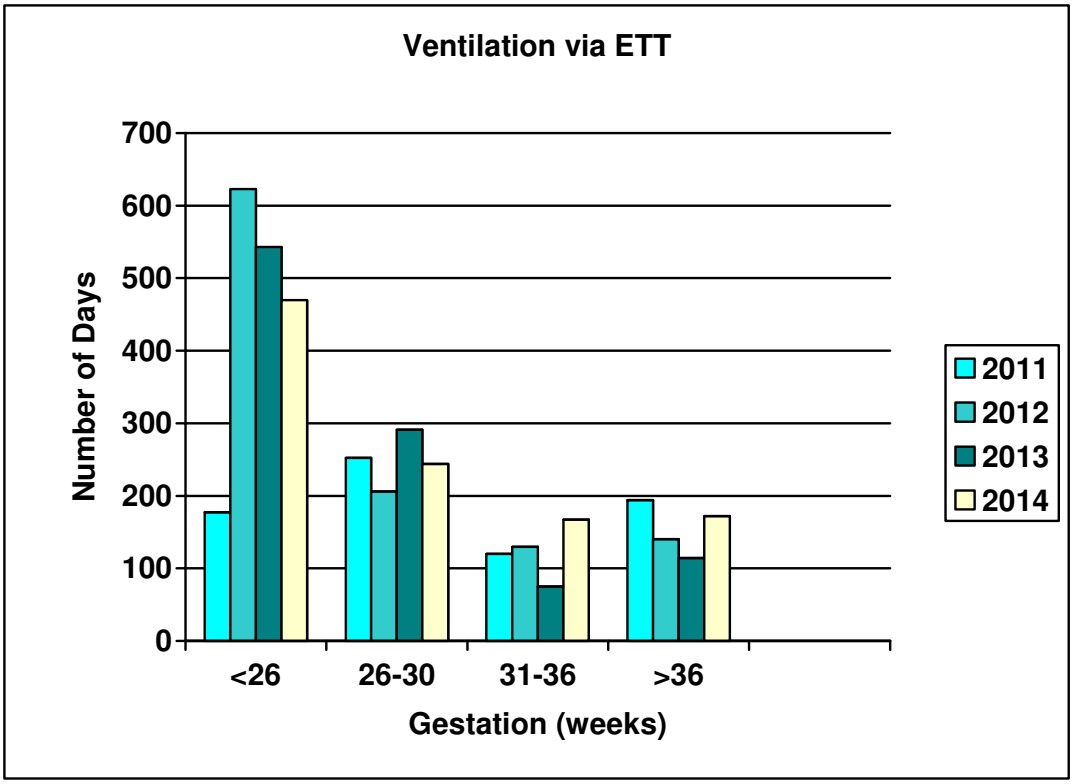
PRH deaths 2014					
Delivered	**GA**	**BW**	**Age d**	**PM**	**Cause of death, related factors**
PRH	32	1725	28	No	Grade 3 HIE
PRH	25	701	4	No	Extreme prematurity, grade 4 IVH, pulmonary haemorrhage
PRH	36		2	Yes	Postnatal collapse (cause unknown)
PRH	36		1	No	Congenital posterior urethral valves (PUV), pulmonary hypoplasia

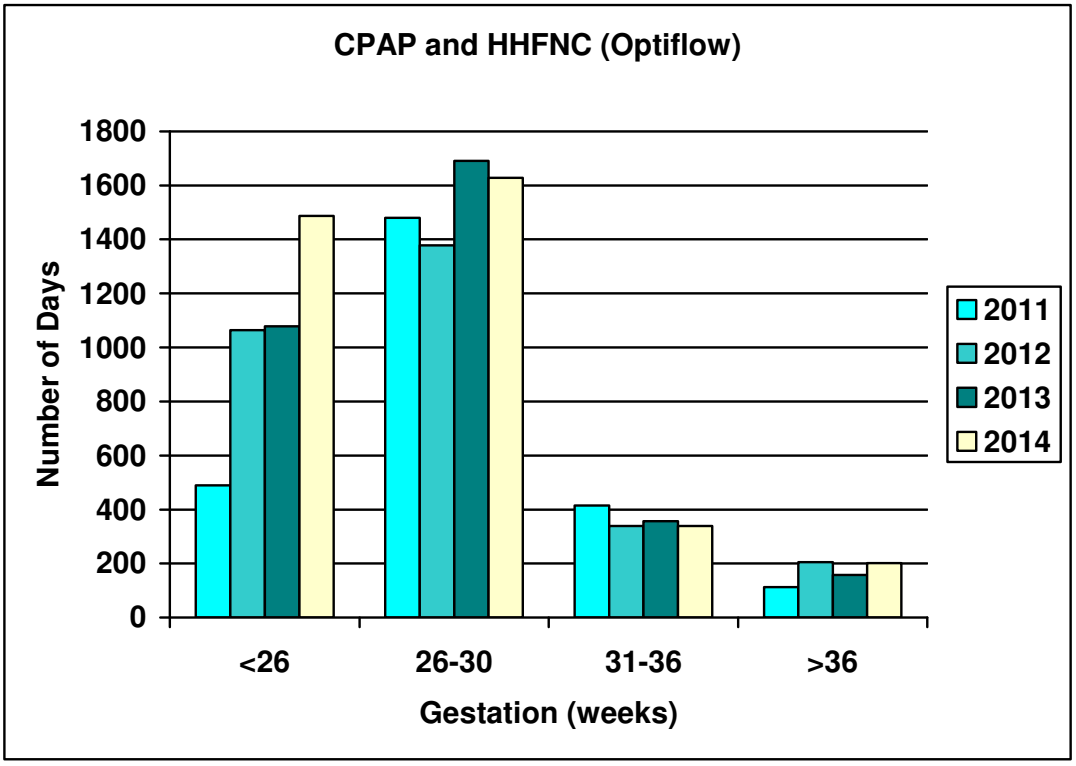
Summary of Clinical Activity
Trevor Mann Baby Unit

Respiratory Support	2012		2013		2014	
	Days	Babies	Days	Babies	Days	Babies
Ventilation via ETT	1208	240	1026	180	**1053**	**158**
HFOV	109	35	43	19	**84**	**28**
CPAP and/or HHFNC	2987	290	3285	270	**3656**	**288**
HHFNC	1204	151	1954	200	**1589**	**171**
Oxygen therapy	501	106	368	106	**345**	**110**
Surfactant (doses)		116		109		**84 (96)**
Nitric Oxide	43	19	36	14	**102**	**28**

Respiratory diagnoses	Number of Babies		
	2012	2013	2014
Respiratory Distress Syndrome	176	145	**165**
Transient Tachypnoea	17	9	**19**
Signs of respiratory distress of the newborn	141	149	**182**
Persistent Pulmonary Hypertension	14	18	**19**
Pulmonary hypoplasia	3	0	**5**
Meconium aspiration	15	14	**15**
Cystic Fibrosis	0	0	**3**

Respiratory Complications	2012	2013	2014
Pulmonary haemorrhage	9	7	**11**
Pulmonary air leak requiring drain	29	24	**27**
Oxygen at 36 weeks CA	23	27	**34**
Oxygen at 28 days	70	65	**63**
Discharged with home oxygen	8	11	**10**


Ventilation via ETT
700
600
500
400
300
200
100
0
Number of Days
<26
26-30
31-36
>36
Gestation (weeks)
2011
2012
2013
2014


CPAP and HHFNC (Optiflow)
1800
1600
1400
1200
1000
800
600
400
200
0
Number of Days
<26
26-30
31-36
>36
Gestation (weeks)
2011
2012
2013
2014

Management of PDA	2012	2013	2014
Patent Ductus Arteriosus	52	61	**46**
PDA treated medically	30	33	**14**
PDA ligated	8	11	**14**

Infection	Positive Blood Cultures		
	2012	2013	2014
Group B streptococcus	1	1	1
Alpha haemolytic streptococcus	1	7	1
Haemophilus	0	1	0
Coagulase-negative staphylococcus	34	26	31
MSSA	0	2	1
MRSA	1	0	0
Enterococcus faecalis	6	2	2
Listeria	0	0	0
Escherichia Coli	1	3	5
Bacillus Cereus	0	0	5
Klebsiella species	0	1	0
Serratia species	2	2	0
Enterobacter species	1	2	0
Pseudomonas species	0	1	2
Candida species	0	0	3
TOTAL	**47**	**48**	**51**

Catheter Associated Blood Stream Infection Rates	2012	2013	2014
Babies with BC(s) taken at < 72 hours			233
Number of BCs recorded with CVL in > 72 hours			137
Positive BC with CVL in > 72 hours			4
Number of CVL days with CVL in > 72 hours			1861
CABSI / 1000 catheter days			2.1

Necrotising Enterocolitis	2012	2013	2014
NEC (confirmed cases)	16 5 ex-utero transfers	9 6 ex-utero transfers	6 3 ex-utero transfers
NEC (suspected cases)	10	17	16
Perforated NEC	4	4	3
NEC treated surgically	8	7	4

Neonatal Surgical Cases (not NEC)	2012 Cases	2013 Cases	2014 Cases
Gastroschisis	5	1	5
Exomphalos	0	3	1
Hirschsprungs	3	4	3
Malrotation	0	4	1
Meconium ileus	2	5	3
Gut perforation (not NEC)	3	4	2
Oesophageal Atresia / TOF	4	9	12
Intestinal atresia/obstruction	6	6	1
Inguinal hernia repair	4	8	4
Imperforate anus/rectal anomaly	3	5	0
Lung cyst/sequestration	2	0	1
Diaphragmatic eventration	1	1	0
Diaphragmatic hernia	2	2	2
TOTAL	**35**	**51**	**35**

Cranial Ultrasound Diagnoses	Number of Babies		
	2012	2013	2014
IVH with parenchymal involvement	9	4	9
Post haemorrhagic hydrocephalus (requiring surgical intervention)	3 (0)	5 (2)	4 (0)
Infarction without IVH	2	0	0
Periventricular ischaemic injury with cyst formation	2	4	2

All babies <32 weeks gestation have routine cranial ultrasound examination

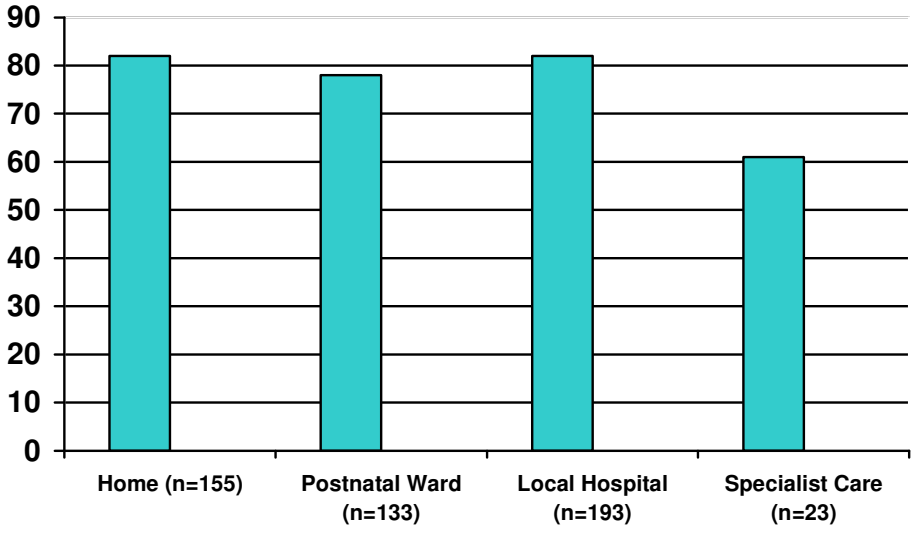
Hypoxic Ischaemic Encephalopathy	2012	2013	2014
HIE grade 1	10	11	9
HIE grade 2	11	10	12
HIE grade 3	4	7	4
Hypothermia therapy	20	21	22
- *Inborn*	8	3	9
- *Outborn*	12	18	13

Retinopathy of Prematurity	2012	2013	2014
ROP grades 3/4	1	3	5
ROP treated with laser therapy	1	2	5

Screening as per recommendations from Royal College of Ophthalmologists

Neonatal Dashboard	2014		
	Eligible	Result	%
Antenatal steroids given (24 – 34 weeks gestation)	153	143	93
Admission temperature <36 °C (from LW) (<29 weeks gestation at birth)	45	8	18
Parent seen within first 24 hours of admission (first admission to TMBU)	365	333	91
TPN commenced by day 2 <29 weeks gestation, <1000g BW	60	57	95
ROP screening (<32 weeks gestation and or <1500g BW)	177	176	99
Breast milk at discharge home (<33 weeks and first admission to TMBU)	62	35	56
Breast milk exclusively at discharge <33 weeks and first admission to TMBU)	62	20	32

Percentage of discharged babies receiving breastmilk during their admissions



Discharge Destinations

Summary of Clinical Incidents

We collect information on clinical incidents using the Datix system. Our trigger list includes:

Safety triggers:
Breach of safe delivery of care (insufficient staffing or other)
Failure or lack of equipment,
Poor communication or consent
Failure in documentation
Breach of confidentiality
Failure of child protection procedure.

Clinical Incident triggers:
Accidental extubation
Extravasation injury
Facial/nasal damage related to CPAP in transfer.
Failure of infection policy
Cross infection
Medication and prescribing errors.

Transport triggers:
Low temperature on arrival (<36 ^{0}C)
Accidental extubation
No discharge summary prepared causing delay

Clinical incidents are reviewed by the Neonatal Risk Panel with the aim of identifying common themes or trends and addressing issues of clinical risk. Findings are disseminated at clinical governance meetings and via the 'Baby Watch' newsletter.

Incident Category	2009	2010	2011	2012	2013	2014
Access, admission, transfer, discharge	9	8	5	0	8	**3**
Clinical assessment (including diagnosis, scans, tests, assessments)	7	12	5	2	6	**6**
Consent, communication, confidentiality	9	9	8	7	7	**12**
Documentation (including records, identification)	14	15	18	9	11	**15**
Implementation of care and ongoing monitoring / review	0	4	5	5	12	**8**
Infection Control Incident	0	1	1	2	1	**4**
Infrastructure (including staffing, facilities, environment)	4	7	4	11	16	**16**
Medical device / equipment	11	16	19	9	11	**11**
Drugs and prescribing	47	72	80	53	58	**59**
Patient accident	0	1	1	0	1	**0**
Treatment, procedure	30	28	19	19	12	**10**
Other Incident	0	2	5	16	42	**31**
Total	**131**	**175**	**170**	**133**	185	**175**

Grade	2009	2010	2011	2012	2013	2014
No Harm: Impact Prevented	78	37	37	20	12	**11**
No Harm: Impact not Prevented	25	100	116	108	150	**141**
Low	25	35	16	12	18	**18**
Moderate	3	3	1	0	5	**2**
Severe	0	0	0	0	0	**3**
Death	0	0	0	0	0	**0**
Total	**131**	**175**	**160**	**140**	**185**	**175**

Summary of Developmental Outcomes

Developmental follow-up takes place in baby clinic.

All babies who are likely to have developmental problems are referred to their local Child Development Centre.

All preterm infants born at < 29 weeks gestation and/or <1000g and cared for on the TMBU during the first 24 hours of life have been entered into a formal neurodevelopmental follow-up programme since 1st October 2002

Follow-up schedule for pre-term babies:

Prior to discharge / at term corrected age
- Physiotherapy and / or speech and language therapy assessment
- Audiology screening
- Screening for Retinopathy of Prematurity

At 3 months' corrected age
- Review of development and neurological assessment by consultant in baby clinic.
- Refer to specialist services as appropriate.

At 12 months' corrected age
- Review of development and neurological assessment by consultant in baby clinic.
- Refer to specialist services as appropriate.

At 24 months' corrected age

- Schedule of Growing Skills or Bayley Scales of Infant Development III from September 2006 onwards)
- Health Status Questionnaire
- Refer to specialist services as appropriate or discharge if no concerns.

Results for the 24 month check have been analysed for 308 Sussex born babies cared for on the TMBU within the first 24 hours of life.

Gestation at birth	23	24	25	26	27	28	>28	Total
Admitted from LW	11	37	40	41	60	64	11	253
Ex-utero transfers	5	14	2	8	13	13	0	55
Total admitted	16	51	42	49	73	77	11	308
Survived to discharge	7	19	30	34	60	66	11	227

For this report neurodevelopmental outcome is summarized as no disability, mild impairment or moderate and severe disability. Criteria for the level of neurodevelopmental outcome were defined according to the assessment undertaken.

SGS	Months behind corrected age	Bayley III	SD below mean for composite score
Normal	≤ 3 months	Normal	≥ 1SD below
Mild	> 3 to <6	Mild	> 1SD to ≤ 2SD
Moderate	≥ 6 to <9	Moderate	> 2SD to ≤ 3S
Severe	≥ 9	Severe	> 3SD

Of the 227 survivors, 212 infants had 24 month developmental assessments completed.

Outcome (%)	23	24	25	26	27	28	>29	Total
Cognitive								
Normal	4	9	14	23	38	45	8	141 (66.5)
Mild	2	3	7	4	9	13	3	41 (19.3)
Moderate	1	4	4	3	5	2	0	19 (9.0)
Severe	0	2	3	2	4	0	0	11 (5.2)
Communication								
Normal	2	6	14	11	28	44	7	112 (52.8)
Mild	3	4	5	14	11	10	3	50 (23.6)
Moderate	1	4	7	4	8	1	1	26 (12.3)
Severe	1	4	2	3	9	5	0	24 (11.3)
Motor								
Normal	3	9	17	15	29	41	10	124 (58.5)
Mild	3	2	6	12	16	13	1	53 (25.0)
Moderate	1	4	3	1	6	5	0	20 (9.4)
Severe	0	3	2	4	5	1	0	15 (7.1)
Combined outcomes								
Normal	2	6	10	8	23	33	7	89 (42.0)
Mild	3	3	7	16	13	20	3	65 (30.7)
Moderate	1	6	8	4	12	2	1	34 (16.0)
Severe	1	3	3	4	8	5	0	24 (11.3)
Total assessed	7	18	28	32	56	60	11	212

Outcome according to gestation was as follows:

23 and 24 weeks gestation (n=25)

Outcome (%)	Cognitive	Communication	Motor
Normal	13 (52)	8 (32)	12 (48)
Mild impairment	5 (20)	7 (28)	5 (20)
Moderate impairment	5 (20)	5 (20)	5 (20)
Severe disability	2 (8)	5 (20)	3 (12)

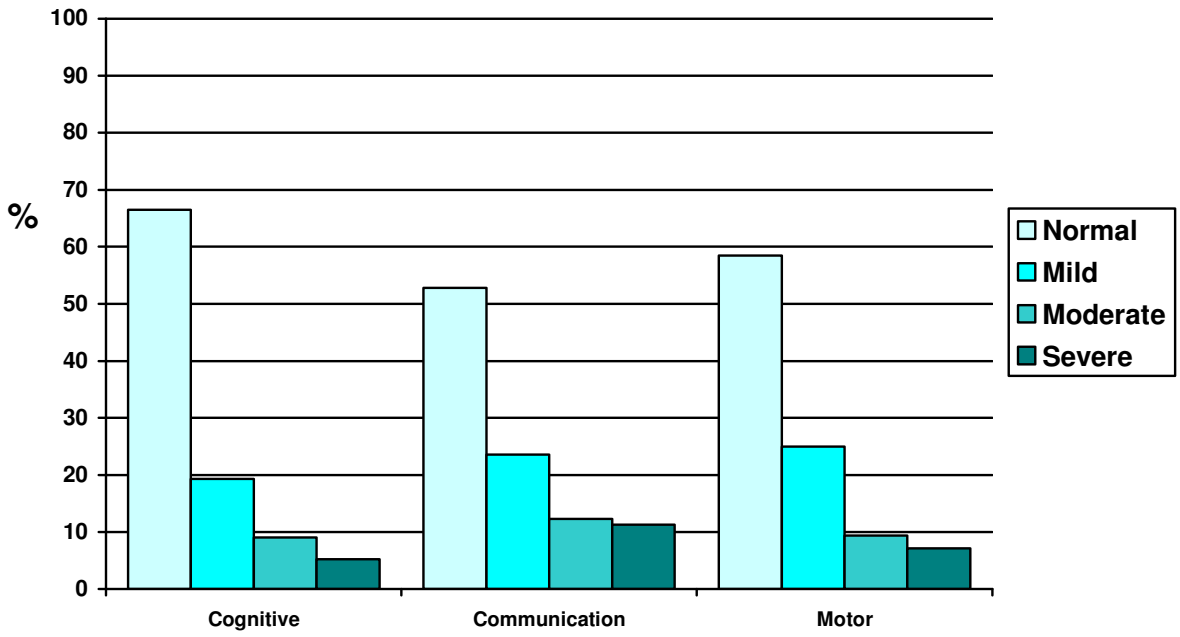
25 and 26 weeks gestation (n=60)

Outcome (%)	Cognitive	Communication	Motor
Normal	37 (62)	25 (42)	32 (53)
Mild impairment	11 (18)	19 (32)	18 (30)
Moderate impairment	7 (12)	11 (18)	4 (7)
Severe disability	5 (8)	5 (8)	6 (10)

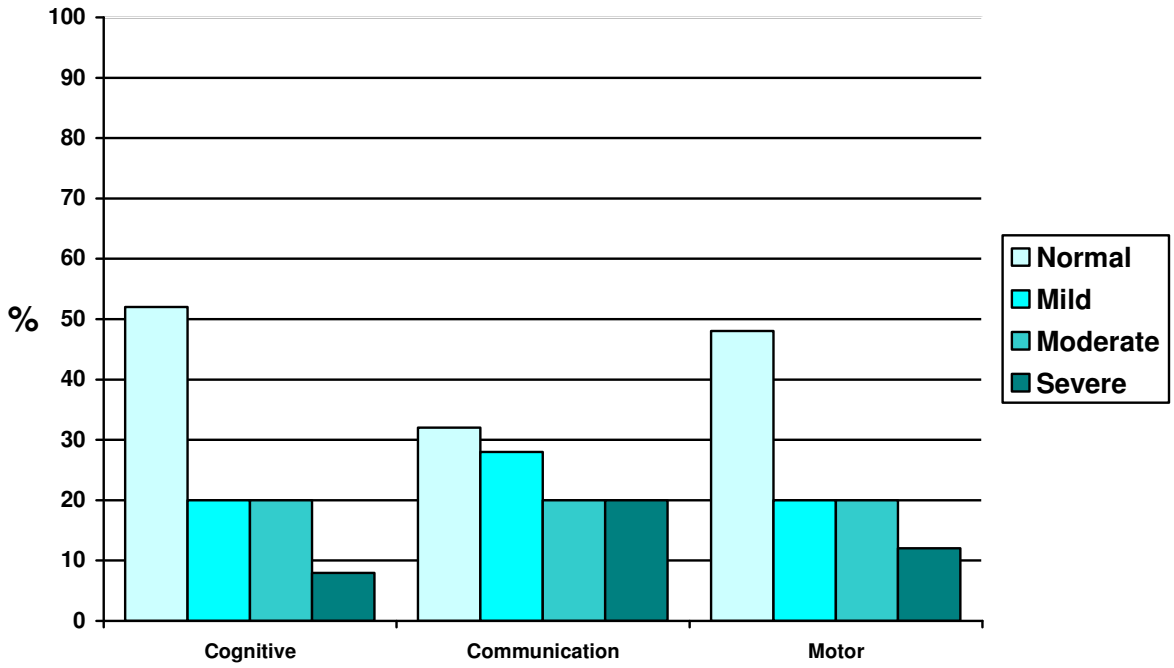
27 weeks gestation and above if <1000g (n=127)

Outcome (%)	Cognitive	Communication	Motor
Normal	91 (71)	79 (62)	80 (63)
Mild impairment	25 (20)	24 (19)	30 (23)
Moderate impairment	7 (6)	10 (8)	11 (9)
Severe disability	4 (3)	14 (11)	6 (5)

Neurodevelopmental Outcome of Pre-term Infants
<29 wks at 24 months CA
(n = 212)



Neurodevelopmental Outcome of Pre-term Infants
23 & 24 weeks at 24 months CA
(n = 25)

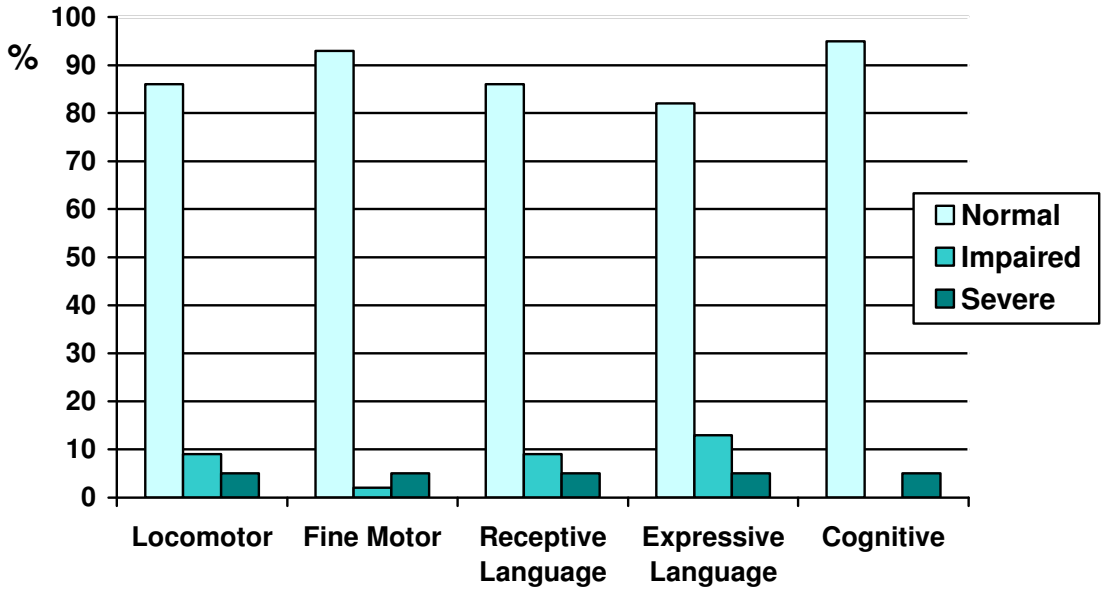


Since 2009 term babies who have received cooling therapy on the TMBU for hypoxic ischaemic encephalopathy have been assessed using Bayley III scales at 24 months.

Cooled babies from 2009	94
Assessments performed:	55
Died	25
Did Not Attend	5
Out of area (referred for assessment locally)	8

Neurodevelopmental Outcome of Cooled Babies (n=55)

Outcome (%)	Locomotor	Fine Motor	Receptive Language	Expressive Language	Cognitive
Normal	47 (86)	51 (93)	47 (86)	45 (82)	52 (95)
Impaired	5 (9)	1 (2)	5 (9)	7 (13)	0
Severe disability	3 (5)	3 (5)	3 (5)	3 (5)	3 (5)


%
100
90
80
70
60
50
40
30
20
10
0
Normal
Impaired
Severe
Locomotor
Fine Motor
Receptive Language
Expressive Language
Cognitive

Transport

The Sussex Neonatal Transport Service together with similar services in Kent and Surrey provide 24 hour cover across the KSS Neonatal Network.

Transports Undertaken	Referring Network			Grand Total
	Kent	Surrey	Sussex	
Unplanned	181	111	129	421
Planned	179	144	185	508
Grand Total	360	255	314	929

In 2014 there were 109 Sussex unplanned postnatal transfers for medical IC. 65.1% stayed within Sussex.

	Referring Network			Grand Total
	Kent	Surrey	Sussex	
Required medical IC and received outside region	31 (32.3%)	20 (24.7%)	38 (34.9%)	89 (31.1%)
Required medical IC and received within region	65 (67.7%)	61 (75.3%)	71 (65.1%)	197 (68.9%)
Total postnatal referrals for medical IC	96	81	109	286

Of the 110 unplanned surgical transfers referred postnatally, 86 originated in Kent & Surrey. 17 of these received surgical care in Sussex. Of the 24 referrals for postnatal transfers originating in Sussex, all 24 stayed in Sussex for surgery

Receiving Network	Referring Network			Grand Total
	Kent	Surrey	Sussex	
Sussex	10	7	24	41
London	45	16	0	61
Surrey	0	0	0	0
Out of Region	0	8	0	8
Grand Total	55	31	24	110

Guidelines and Audit
(Appendix 3)

There is an active programme of clinical governance within the department including 3 monthly multidisciplinary clinical governance meetings and monthly perinatal mortality and morbidity meetings. Review of neonatal deaths occurs within departmental grand rounds and at overview meetings. There are common medical, nursing and drug protocols for both units with a rolling programme of guideline review. Guidelines are available on the departmental website http://www.bsuh.nhs.uk/tmbu. We are committed to audit and have a well developed programme under the supervision of Dr Fernandez.

Research
(Appendix 4)

There is an active departmental research programme. We have strong links with the Academic Department of Paediatrics, Brighton & Sussex Medical School.

There is an active team which supports the research portfolio:

Kate Moscovici	Lead research nurse
John Bell	Research midwife
Libby Emery	Research nurse
Cathy Olden	Research nurse
Sonia Sobowiec Kouman	Research nurse
Liz Symes	Research nurse
Paul Frattaroli	Data Officer
Duncan Fatz	Monitoring, Trial Manager
Hector Rojas	FP7 Project Manager
Liam Mahoney	PhD student

Libby Emery has left to concentrate on her clinical work. Hanna Butler has moved on into a Research Governance role and we have welcomed Paul Frattaroli as part time data officer.
Duncan Fatz acts as Monitor for BSUH/BSMS led clinical trials.

In the past year the unit has participated in multi-centre studies as well as locally initiated projects.

Dr Rabe and Dr Rojas have worked intensively on the final protocol and regulatory approvals for the first clinical study to be performed as part of the European Commission's FP7 Health Research Project NEOCIRCULATION (NEO-CIRC €5.99m, 18 partners in 8 countries) (www.neocirculation.eu). The first pilot study has opened in August 2014.

The unit has supported other European multicentre initiatives by taking part in EUROPAIN, which is part of the FP7 funded NeoOpioid project (www.europainsurvey.com) which has now closed. Dr Bomont has acted as local lead in this study as well as in the multi-centre European PANNA study which investigates the effects of anti-retroviral agents in HIV positive mothers and their babies (www.pannastudy.com).

The Department has been involved in several other studies which have completed recruitment. The Go-Child Study is in follow-up phase, The Neomero II Trial (Meropenem for meningitis in babies <3 months of age) has closed recruitment and is now in follow-up period.

Dr Seddon and his respiratory research team have continued recruitment into the NIHR-RfPB funded study of pulse oximetry and respiratory rate detection. Recruitment for the neurodevelopmental follow-up studies of pre-term infants are ongoing.

The Unit is also part of the NIHR programme grant for improving quality of care and outcome of very pre-term infants (Lead Prof. L Duley, Nottingham), together with other collaborators from the Department of Maternal and Child Health, City University London (Dr Susan Ayers, Dr Alexandra Sawyers). We have successfully completed the final stage of our work package in which parents were interviewed about the care of their pre-term infant. As part of this work package a parent questionnaire on the care of their preterm infant at delivery has been developed and piloted. The work results have been published and the newly developed questionnaire for parents has been translated into other European languages.

Joint multidisciplinary research meetings are held and links continued with various groups such as the Paediatric Respiratory Research Group at the RACH, the Obstetric team, the Department of Clinical Pathology, Department of Psychology (University of Sussex, City University of London) and with the School of Pharmacy & Biomolecular Sciences (University of Brighton). We are planning studies with Dr Greg Scutt, Dr Bhavik Patel and Dr Mike Pettit on the safety of medicines.

All studies are performed in close collaboration with the BSUH Research and Development department and we express our thanks to Scott Harfield, Dr David Crook and the R&D team for their ongoing support.

The department is an active member of the Surrey & Sussex Paediatric and Neonatal Research Network. On behalf of the network, and in collaboration with the BSMS, PD Dr Rabe organized the 8th Regional Paediatric and Neonatal Research Day, which was again very well attended. Date for the next research day is **Monday, 30th November 2015**.

Education

Neonatal Nurse Pathway

The Neonatal Pathway was designed to acknowledge the recommendations from key documents relating to neonatal care, by offering nursing staff a qualification in the specialty. The aim is to address the significant shortfall in staff holding a neonatal qualification. The pathway promotes the opportunity for local neonatal units to develop highly skilled neonatal staff from among their current workforce.

The pathway is held at the University of Brighton and led by Senior Lecturer Susanne Simmons. It comprises two modules: a 20 credit work based learning module: Foundations in Neonatal Practice and a 30 credit taught module: Neonatal High Dependency and Intensive care.

Mentors (approved by the unit manager and pathway leader) support, supervise and assess students in practice. They meet with the student at the beginning of each module; supervise the student's completion of skills; meet with the student mid-way through the module to discuss progress; liaise with the pathway leader on the student's progress; and meet with the student at the end of the module to check completion of clinical skills.

Practice is assessed using clinical skills inventories. Students from level 1 and 2 units have a practice placement in a level 3 unit to gain experience in neonatal high dependency and intensive care.

Students on completion of the two neonatal modules receive a neonatal pathway certificate. They then have the opportunity to continue their studies to gain a degree in Acute Clinical Practice awarded by the University of Brighton.

Undergraduate Medical Education

The Department has continued its involvement in the delivery of module BSMS 305 Reproductive and Child Health. The students attend seminars on selected topics in Peri/Neonatology, neonatal teaching sessions, tutorials and ward rounds. They learn to carry out a structured newborn examination both at the RSCH and PRH sites. Consultants and registrars are involved in the student assessments at the end of the module and in the end of year three and year five OSCE's.

A number of students chose to undertake the student selected module (SSC) BSMS 404 in year 4. During this module they learn research related skills e.g. how to complete a structured literature search and an appraisal on a focused topic or join in one of the ongoing research projects.

The Department also supervises 5th year students during their Paediatric module to develop further their understanding of newborn medicine. Each year some students spend their end of year 5 module 505 in our department in order to gain in-depth experience in neonatal medicine.

Individual consultants have been supporting the Medical School in other tasks such as admission interviews, designing exam questions and online learning modules, organizing and supervising elective placements and tutoring small groups.

Dr Rabe, in her role of Senior Clinical Lecturer, has taken over as lead for the module BSMS 404.

Postgraduate Education

The department continues its commitment to providing a high quality, structured training, assessment and appraisal programme for Neonatal Medical and Nursing Staff. In addition staff organise, host and deliver many additional educational sessions including Deanery simulation and PLEAT days. We host and direct the ALSG Neonatal Life Support and PaNSTAR courses. Dr Lawn is on the Board for the novel Resuscitation Council (UK) Advanced Resuscitation of the Newborn Infant Course and two courses have now been delivered in Brighton.

We have a well established Local Faculty Group which overseas educational governance. Dr Bomont is Paediatric Tutor and Training Programme Director for Core Paediatric Trainees within KSS.

Speech & Language Therapy Service (SLT)

This service is generally provided by 2 Speech and Language Therapists (1.3 FTE) employed by Sussex Community Trust under a Service Level Agreement with the Brighton and Sussex University Hospitals Trust. Unfortunately this year there have been significant staffing difficulties, resulting in reduced SLT service across all areas.

The service is provided on a needs basis, with priority being given to inpatients both on the Trevor Mann Baby Unit and the Royal Alexandra Children's Hospital. Cover is also provided to various inpatient and outpatient clinics, including joint dietetics/SLT clinics and the BPD Clinic. Support for

Neonatal follow up clinics can be arranged as required by contacting the department. Referrals are made to the team by phoning (ext 2527), emailing or writing to Amanda Harvey and Rachelle Quaid (Level 5 RACH).

The service provides assessment and management of feeding difficulties for all babies admitted to TMBU. Feeding difficulties may occur for the following reasons and may be transient or life long:

- neurological anomalies; e.g. HIE, IVH
- anatomical anomalies; e.g. TOF
- babies with syndromes; e.g. Trisomy 21
- prematurity
- respiratory difficulties

Other services provided include:

- videofluoroscopy swallow studies
- teaching for new staff
- involvement with neurodevelopment team
- liaison/advice for dysphagia therapists across Sussex.

Babies transferred to PRH and RACH will continue to be seen by the service, although babies at PRH are likely to have less frequent input. Babies discharged home with feeding difficulties who live in Brighton and Hove or those who attend the BPD Clinic will have ongoing input. Babies from outside of Brighton and Hove who continue to have significant feeding difficulties and are seen by a consultant and another professional at the hospital, may be seen as an outpatient if there is no appropriate local service for them to be transferred to.

Due to limited SLT staffing this year, 47 babies were seen by the department. This is significantly less than previous years when full staffing was available.

Physiotherapy

TMBU has input from Melanie Smith a band 7 physiotherapist for 8 hours per week.

Over the past year she has provided support for the team for children with a variety of conditions from chest infections to orthopaedic issues and neuro-developmental problems.

The service has improved patient care by increasing the clinical decision making in regards to chest physiotherapy. She has completed training sessions for doctors and nurses via in-service training, group teaching and 1:1 bedside training. She has also gone to the university and taught developmental care and chest physiotherapy to the NICU students. She has gone on a study day with other neonatal physiotherapists ensuring she is up to date with the latest evidence.

Dietetic Service

The dietician undertakes a weekly review of babies on the TMBU. In addition a nutrition meeting focuses on the most difficult cases. The service continues into neonatal and chronic lung disease

outpatients. Babies with severe nutritional problems will often continue their care with the gastroenterology and surgical teams at the RACH.

Donor Breast Milk

Support is given to mothers so they are able to provide their own breast milk to feed their baby as soon as possible. There are however some circumstances where use of donor breast milk may be useful in promoting good infant health. As supply is limited and cost is significant use of donor milk is restricted according to unit guidelines.

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Outreach

The Neonatal Outreach team continues to work to support the discharge of infants from TMBU and the Special Care Baby Unit at Princess Royal Hospital. The team comprises of a sister who works full time and a nursery nurse who works 22.5 hours per week. The nurses work with families and support them in feeding and caring for their baby prior to discharge home. Families may choose to feed babies by nasogastric tube at home.

Maternal Substance Misuse Clinic (One-Stop Clinic)

The One-Stop clinic is a multidisciplinary, multi-agency clinic which operates across both sites. No appointment is necessary and referrals can come from any source: health or social care professionals in the community, or clients themselves. The clinic was set up in January 2002 by Dr Aiton and representatives from other services to meet the increasing local need. The following staff contribute regularly to the clinic:

- 2 specialist midwives with responsibility for substance misuse
- A representative of the Substance Misuse service
- A representative of Brighton Oasis Project
- Liaison Health Visitor
- Social Worker from Dept, Social Care & Health
- Neonatal Nurse Practitioner
- Consultant Neonatologist

The aims of the clinic are:

- to offer an open-access service, offer appropriate advice to clients on substance misuse, harm minimisation, and to deal with the wide variety of issues surrounding substance misuse in pregnancy
- to provide the level and degree of care and support appropriate to the client during their pregnancy and to the newborn baby.

The clinic includes postnatal infants and their mothers with particular emphasis on babies prescribed medication to deal with symptoms of withdrawal.

Some mothers receive nearly all their antenatal and healthcare through the clinic, whereas others may only need to come for one appointment and continue to access routine services. A multi-disciplinary meeting takes place one hour before the RSCH clinic.

Clinics run on Thursday afternoons each month as follows:

Week 1 PRH One Stop Clinic – antenatal and postnatal

Week 2 RSCH One Stop Clinic – antenatal

Week 3 RSCH One Stop Clinic – baby appointments/antenatal prescribed medications

Week 4 RSCH One Stop Clinic – antenatal

In 2013 seven babies were admitted to Trevor Mann Baby Unit with Neonatal Abstinence Syndrome.

Counselling

There is a dedicated counsellor who works part time (0.6WTE) as part of the Department of Women & Children's Health and provides counselling services for maternity, gynaecology and parents on TMBU. The counsellor sees clients who have been referred by staff within the hospital or in the community and people can self refer. She offers a flexible service to parents with babies on TMBU, which might involve seeing them on the wards for some support. Couples or individuals can attend counselling throughout their baby's stay on TMBU. People can come back when they have left the unit or a baby has died. She also offers bereavement counselling and EMDR for processing traumatic experiences.

Parent Information

A wide range of information for parents is available. Around the time of admission, parents are given a booklet specifically about the TMBU or SCBU. In addition all parents receive a copy of the BLISS Parent Information Guide. Unfortunately both of these publications are only printed in English. However, we freely access the Trust funded Sussex Interpreting Service to facilitate communications with parents whose first language is not English.

A parent information area provides health promotion information leaflets on a variety of baby, maternal and family health issues. There is also Social Security benefits' information, and travel information for parents whose baby is transferred to London. Information on consent and how to access the hospital Patients Advocacy and Liaison Service (PALS) is displayed in the information area alongside parent support group information. Planned future developments for the information area include internet access to enable parents to do supported literature searches and the installation of a TV and video/DVD for health promotion information.

Main stream diagnostic specific information is available on the TMBU but more unusual diagnosis information is obtained as required ensuring that it is up to date and accurate. The Contact-A-Family Directory is used regularly to access accurate contact details for parent support organisations.

Information packs are available for Down Syndrome and other information packs are complied as required.

The Trust supports the hiring of registered sign language interpreters and two members of staff have a basic knowledge of British Sign Language.

Where parent information is available in languages other than English these are downloaded from the Internet as required e.g. Reducing the Risks of Cot Death leaflet.

A small but growing Parents Library contains a selection of books on premature babies and neonatal units. There are also some books specifically for children of Special Care Babies.

Training sessions for parents on infant resuscitation techniques are held regularly.

When a baby dies parents are given an 'Annabel Harwood' pack which contains books, leaflets and contact details of support organisations to help and support parents following the death of their baby. This pack is complemented by a 'Memories Folder'.

Parent Forum

The Parent Forum has now been established for over 7 years and meets quarterly. The group represents parents of babies who have been on the TMBU and Special Care Baby Unit at Princess Royal Hospital.

The group contributes to the design of regular parent feedback exercises which we now undertake using the Fabio the Frog platform. The results of these questionnaires are shared with the group which assists with the identification and prioritisation of actions to respond to feedback received.

The group assists with the development of parent information leaflets used in the service. This includes those written to support a range of local and international research studies in which we participate. Members of the group also kindly provide input into the design of new studies.

The forum has helped with the development and review of our unit guidelines and protocols, including proposed changes to the uniform policy and visiting policy.

We also share the Babywatch publication with the forum, seeking their views on how we can improve safety and quality in the service to further improve the experience of babies and their families and long term outcomes.

Early Birth Association

The Early Birth Association (EBA) is a registered charity (286727) formed of a group of parents who have had premature or sick babies in BSUH special care units. They realised the need to talk to someone who has been in a similar situation at this time was a great way to help with anxiety and any problems that the parents were facing. The EBA was formed on TMBU 33 years ago and offers help and support to both units and new parents who are facing the same worrying experiences that they once faced.

Money raised and donated to the EBA is spent on items for TMBU and PRH SCBU, ranging from vital pieces of equipment such as the transport resuscitaire, incubators, cooling mats, shawls (some of these are for bereaved parents so they will have a keepsake), incubator bonnets, triangular pillows and the fabric for covers. The list is endless.

As many parents want to maintain close ties with TMBU & PRH SCBU, the EBA publish quarterly newsletters that keep members informed of the various fundraising activities, invitations to social events and general updates about the unit. More information about the EBA is available on their website (http://www.earlybirth.co.uk/).

Rockinghorse Children's Charity

As a historical part of the Trevor Mann Baby Unit, Rockinghorse Children's Charity continues to strengthen its links with the neonatal service, also supporting the Special Care baby Unit at Princess Royal Hospital.

The charity hosts a fund dedicated to the support of TMBU, all of which is specifically for TMBU and its work. The charity welcomes donations to this fund.

In 2015, Rockinghorse has supported the purchase of a new Retcam machine for performing retinal examinations on preterm infants. Rockinghorse has also raised the funds for the purchase of 10 new cots for PRH SCBU.

It has hosted two 'Dragons Den' style events inviting bids for available funds from staff and others and has been delighted to support over 12 projects, some of which have been in the neonatal service as well as in the Royal Alexandra Children's Hospital.

The charity continues to collaborate with the Early Birth Association and future plans remain to keep working with the EBA charity for the mutual benefit of the unit and its patients.

Appendix 1

BAPM Categories of Neonatal Care 2001

Intensive Care
These babies have the most complex problems. They need 1:1 care by a nurse with a neonatal qualification. The possibility of acute deterioration is such that there should be the constant availability
of a competent doctor.

1. receiving any respiratory support via a tracheal tube and in the first 24 hours after its withdrawal
2. receiving NCPAP for any part of the day and less than five days old
3. below 1000g current weight and receiving NCPAP for any part of the day and for 24 hours after withdrawal
4. less than 29 weeks gestational age and less than 48 hours old
5. requiring major emergency surgery, for the pre-operative period and post-operatively for 24 hours
6. requiring complex clinical procedures:
   Full exchange transfusion
   Peritoneal dialysis
   Infusion of an inotrope, pulmonary vasodilator or prostaglandin and for 24 hours afterwards
7. any other very unstable baby considered by the nurse-in-charge to need 1:1 nursing: *for audit, a register should be kept of the clinical details of babies recorded in this category*
8. a baby on the day of death.

High Dependency Care
A nurse should not be responsible for the care of more than two babies in this category –

1. receiving NCPAP for any part of the day and not fulfilling any of the criteria for intensive care
2. below 1000g current weight and not fulfilling any of the criteria for intensive care
3. receiving parenteral nutrition
4. having convulsions
5. receiving oxygen therapy and below 1500g current weight
6. requiring treatment for neonatal abstinence syndrome
7. requiring specified procedures that do not fulfil any criteria for intensive care:
   Care of an intra-arterial catheter or chest drain
   Partial exchange transfusion
   Tracheostomy care until supervised by a parent
8. requiring frequent stimulation for severe apnoea.

Special Care
A nurse should not be responsible for the care of more than four babies receiving Special or Normal Care.

- Special care is provided for all other babies who could not reasonably be expected to be looked after at home by their mother.
- Is provided for babies who themselves have no medical indication to be in hospital.

Appendix 2

Definitions according to CEMACH 2006	
Stillbirth	A baby delivered with no signs of life after 24 completed weeks of pregnancy is registered as a stillbirth. Any babies known to have died between 22-24 weeks gestation are reported as a late fetal loss. Any babies known to have died before 22 weeks gestation are not included in this report.
Early neonatal death	Death of a liveborn baby occurring less than 7 days from the time of birth.
Late neonatal death	Death of a liveborn baby occurring after the 7th day and before 28 completed days from the time of birth.
Stillbirth rate	Number of stillbirths per 1000 livebirths and stillbirths.
Perinatal mortality rate	Number of stillbirths and early neonatal deaths per 1000 livebirths and stillbirths.
Neonatal mortality rate	Number of neonatal deaths per 1000 livebirths.

Appendix 3

Clinical Governance Performance 2014

CLINICAL GOVERNANCE ELEMENT	COMPLETED/ IMPLEMENTED	PRESENTED	DATE	COMMENTS & ACTIONS	ACTIONS COMPLETED
International & National Guidance					
NICE Guidance Intrapartum Care CG 55/Antibiotics for Early-onset Neonatal Infection CG 149	Yes	No, circulated via e-mail + discussed at senior staff meeting		• New guideline CG149 implemented • All requirements fulfilled • Compliance with guideline generally good • Improve blood culture reporting system • Improve follow-up CRP checks • Audit of Gentamicin dosing schedule	In progress In progress Required
NICE Guidance Postnatal Care CG 37/NIPE Guidance	Yes	No, circulated via e-mail		• Site for NIPE • Guidelines revised to meet BFI and NICE standards • All requirements according to NIPE fulfilled including DDH screening • Saturation screening pilot site	In progress
Hypoglycaemia Guideline/NICE Guidance Diabetes in Pregnancy CG 63	Yes	No, circulated via e-mail		• Guideline amended for new WHO-UK growth charts • Guideline revised to meet BFI standards • All requirements fulfilled • Audit of updated guideline	Required
NICE Guidance Neonatal Jaundice CG 98	Yes	No, circulated via e-mail		• All requirements fulfilled • Compliance with guideline generally good • Audit of updated guideline	Required
Therapeutic Hypothermia IPG 347	Yes	No, report awaited from Badgernet		• All requirements fulfilled • TOBY register data entry now included in NNAP database (Badgernet) • Local audit of practice	Required

National Audits					
Maternal & Perinatal Mortality Notifications	Ongoing	Awaiting start of new system		• CEMACE was replaced by MPMN in April 2011. From the 1st January 2013, data collection became the responsibility of MBRRACE-UK • The last CEMACE Report on Perinatal Mortality 2009 showed that our neonatal mortality rate was below national average for surgical level 3 units • Continue work on improving survival	In progress
National Neonatal Audit Programme	Ongoing	Yes, circulated via e-mail + discussed at senior staff meeting	02/2015	• Overall good performance and reporting quality • 20% of babies have low admission temperatures • Audit of admission temperatures to address possible shortfalls	In progress
National Training Survey	Ongoing	No, circulated via e-mail		• Brighton identified as above average outlier in access to educational resources • Continue efforts to excel in all areas of trainee education	In progress
BLISS Survey of Parental Experiences 2010 - 2011	Completed	Yes, circulated via e-mail + discussed at senior staff meeting	11/2011	• TMBU scored in most areas above national average and in 5/7 areas above national average for similar units. • TMBU was never lower than national average in any area • Facilitate unit visits before delivery • Provide written/visual information about TMBU before birth • Aim for early feeding back about the child's condition	Completed Completed In progress
National Programmes & Projects					
Neonatal Hearing Screening	Ongoing	No, reported		• Compliant with national requirements	

		separately by Audiology			
Neurodevelopmental Outcome	Ongoing	No, reported separately in departmental annual report		• Follow-up continued for preterm infants < 29 weeks gestation: ▪ Schedule of Growing Skills at 12 months CGA ▪ Bayley III Developmental Assessment at 24 moths CGA • Term newborns after cooling treatment: ▪ Bayley III Developmental Assessment at 24 moths CGA	
Neonatal Transport Service	Ongoing	No, reported separately in departmental annual report		• Since September 2009 a 24/7 regional neonatal transport service is running, shared between the teams from Surrey, Kent and Sussex • Develop standard electronic activity database • Develop standard risk reporting system for KSS • Develop standard national reporting system	Completed Completed In progress
National HIV and Syphilis Surveillance	Ongoing	No, reported separately by GUM team		• Top antenatal screening centre in the UK	
Trust Identified Projects					
Perinatal Mortality & Morbidity Meeting	Ongoing	Yes, circulated via e-mail + discussed at senior staff meeting		• Monthly joint meeting with Obstetrics & Gynaecology mortality and morbidity meetings	
Neonatal Mortality & Morbidity Review	Ongoing	Yes, circulated via e-mail + discussed at senior staff meeting		• Quarterly presentation at Neonatal Clinical Governance Meeting • Summary report available in departmental annual report • Audit of waterbirth related neonatal complications	In progress
Audit of Blood Cultures (Microbiology)	Ongoing	Yes, circulated via e-	11/2014	• 6 monthly review	

		mail + discussed at senior staff meeting		• Rate of positive gr+ blood cultures has risen to a level just below that in 2010 • This is mainly due to CONS pos. blood cultures • Rate of gr- blood cultures has not changed to previous years • Continue work on improving infection rates	In progress
Audit: Infection Control	Ongoing	No, circulated via intranet infection control dashboard		• Very good compliance generally including hand hygiene and care bundles • Documentation needs improvement	In progress
The Safety Thermometer	Ongoing	No, awaiting report		• National audit on nursing safety metrics, e.g. catheter care and pressure sores •	
Review of Risks, Incidents, Complaints & Claims	Ongoing	Yes, circulated via e-mail + discussed at senior staff meeting		• NCPAP nasal injuries increasingly a problem • Medication errors still featuring high, but static • Maternal expressed milk related errors addressed • No major incidents otherwise • Review risk panel structure and risk review process • Explore new ways of improving medication errors and communication	In progress In progress
Survey: Parent Satisfaction	Ongoing	No, awaiting implementation of new system		• Not completed as will be replaced by bespoke wireless real-time feedback system in 2015	In progress
Specialty Identified Projects					
Proposal for Clinical Communication Tool (SBAR)	Completed	Yes, circulated via e-mail + discussed at senior staff meeting	2/2014	• In response to DATIX and incidents • Rolled out and in use at medical handovers and when phoning Consultant for advice	Completed
Proposal for Saturation Screening for	Ongoing	Yes, circulated via e-	2/2014	• In response to evolving research evidence	

Congenital Heart Diseases		mail + discussed at senior staff meeting		in support of this tool • Become one of few pilot sites in the country for NIPE screening for congenital heart diseases	In progress
Comparison of Indomethacin Infusion Guideline to Ibuprofen Bolus Guideline	Completed	Yes, circulated via e-mail + discussed at senior staff meeting	5/2014	• In view of changes in drug choice due to supply problems and perceived differences in complications • No clinically significant difference in outcomes or complications • Review current PDA treatment guidance	In progress
Proposal to Introduce Milk Analyzer to Improve Preterm Nutrition	Ongoing	Yes, circulated via e-mail + discussed at senior staff meeting	5/2014	• In view of technical developments and evolving research suggesting benefits with this technology • Changes to be considered as part of a wider project including milk kitchen facilities in the departmental building restructuring	In progress
Growth and Nutrition Audit	Completed	Yes, circulated via e-mail + discussed at senior staff meeting	5/2014	• To review effectiveness of current nutrition strategies related to parenteral nutrition in response to NCEPOD report 2012 • Very good nutrition practice overall • Compliant with NCEPOD recommendations	Completed
Audit of ROP Screening	Completed	Yes, circulated via e-mail + discussed at senior staff meeting	7/2014	• Previous reports suggested poor documentation of ROP screening • Much improved process for requesting and documenting ROP screening • Improve ROP screening documentation in Badger database • Development of practitioner led Retcam screening	In progress In progress
Review of Aminoglycosides and Hearing Impairment	Completed	Yes, circulated via e-mail + discussed at senior staff meeting	7/2014	• Presentation of current evidence related to • gentamicin and genetic susceptibility to gentamicin induced hearing impairment,	

				current NICE guidance for early onset sepsis and local antibiotic practice • Improve early onset sepsis management practice whilst reducing the risk for gentamicin related hearing problems	In progress
Audit of CMV Positive Patients and their Management	Ongoing	Yes, circulated via e-mail + discussed at senior staff meeting	7/2014	• In view of recent preterm patients with severe clinical course • Lower threshold for active screening and adjust indication for intervention • Amend current guideline accounting for postnatal infection of extreme preterm infants	In progress In progress
Proposal for Development of Light and Sound Exposure Guideline	Ongoing	Yes, circulated via e-mail + discussed at senior staff meeting	11/2014	• To be compliant with BLISS guidance • Staff survey and subsequent guideline consultation	In progress
Revisit of Pulmonary Haemorrhage Audit	Completed	Yes, circulated via e-mail + discussed at senior staff meeting	11/2014	• In response to ongoing concerns related to the significant impact of this rare complication on preterm health • To develop preventative strategies	In progress
Audit of PDA Management	Completed	Yes, circulated via e-mail + discussed at senior staff meeting	11/2014	• In response to changes in practice over the last years • Consider an early targeted approach to PDA management to catch the newborns who are at highest risk	In progress
Heated Humidified High-flow Nasal Cannula and Current Evidence Regarding its Use	Completed	Yes, circulated via e-mail + discussed at senior staff meeting	11/2014	• Review of current evidence supporting unit's non-invasive respiratory strategy • Amendments planned accounting for new evidence	In progress
Audit of Neonatal Transport Service	Completed	Yes, circulated via e-mail + discussed at senior staff meeting	11/2014	• General overview of service performance (424 transfers in 2013, 248 planned) and future developments • Introduction of HFOV and HHHFNC on transport	In progress

				• Development of national incident reporting tool	In progress
Thyroid Disorder Guideline	Completed	Yes, circulated via e-mail + discussed at senior staff meeting	2/2014	• In response to varying practices affecting overall management • Editing and ratification	In progress
Neonatal Seizure Guideline	Completed	No, to be circulated separately via e-mail + discussed at senior staff meeting	2014	• In response to varying practices affecting overall management • Editing and ratification	In progress
Immunisation Guideline	Completed	No, to be circulated separately via e-mail + discussed at senior staff meeting	2014	• In response to updated national/international recommendations • Editing and ratification	In progress
Neonatal Anaemia Guideline	Completed	No, to be circulated separately via e-mail + discussed at senior staff meeting	2014	• In response to varying practices affecting overall management • Editing and ratification	In progress

Appendix 2

List of Publications 2014

Peer reviewed papers

Fernandez-Alvarez JR, Gandhi RS, Amess P, Mahoney L, Watkins R, Rabe H: 3.
Heated humidified high-flow nasal cannula versus low-flow nasal cannula as weaning mode from nasal CPAP in infants ≤28 weeks of gestation.
Eur J Pediatr. 2014 Jan;173(1):93-8. doi: 10.1007/s00431-013-2116-2. Epub 2013 Aug 14

Wong HS, Santhakumaran S, Statnikov Y, Gray D, Watkinson M, Modi N; UK Neonatal Collaborative. Retinopathy of prematurity in English neonatal units: a national population-based analysis using NHS operational data.
Arch Dis Child Fetal Neonatal Ed. 2014 May;99(3):F196-202. doi: 10.1136/archdischild-2013-304508. Epub 2013 Dec 20

Battersby C, Santhakumaran S, Upton M, Radbone L, Birch J, Modi N; East of England Perinatal Networks; UK Neonatal Collaborative; Neonatal Data Analysis Unit. The impact of a regional care bundle on maternal breast milk use in preterm infants: outcomes of the East of England quality improvement programme.
Arch Dis Child Fetal Neonatal Ed. 2014 Sep;99(5):F395-401. doi: 10.1136/archdischild-2013-305475. Epub 2014 May 29

Sawyers A, Rabe H, Abbott J, Gyte G, Duley L, Ayers S on behalf of ´The Very Preterm Birth Collaborative Group': A questionnaire to measure parents' experiences and satisfaction with care during very preterm birth: A validation study.
BJOG 2014; DOI: 10.111/1471-0528.12925
The questionnaire development paper is now available online at BJOG
http://onlinelibrary.wiley.com/doi/10.1111/1471-0528.12925/abstract

Russell G, Sawyer A, Rabe H, Bliss J, Gyte G, Duley L, Ayers S: Parents' views on care of their very premature babies in neonatal intensive care units: A Qualitative Study.
BMC Pediatrics 2014;14(1):230. DOI: 10.1186/1471-2431-14-230

Ruggieri L, Giannuzzi V, Baiardi P, Bonifazi F, Haf Davies E, Giaquinto C, Bonifazi D, Felisi M, Chiron C, Pressler R, Rabe H, Whitaker MJ, Neubert A, Jacqz-Aigrain E, Eichler I, Turner MA, Ceci A on behalf of the GriP Consortium: Successful private-public funding of paediatric medicines research: lessons from the EU programme to fund research into off-patent medicines. Eur J Pediatr 2014 Sept 23 DOI 10.1007/s00431-014-2398-z

Ayers S, Sawyers A, During C, Rabe H on behalf of the Brighton Perinatal Study Group: Parents' perceptions of giving antenatal consent to include their preterm infant in a randomized controlled trial. Acta Pediatr 2015 (in prin

Presentations at national and international meetings:

Storring N, Hammerton C, Lawn C, Fernandez R, Rabe H: Simulation training – Transition from straight to pigtail catheter chest drain (PCCD) insertion.
RCPCH Annual Conference, Birmingham, UK, 8.-10.4.2014
Arch Dis Child 2014;99:A118

Sawyer A, Rabe H, Abbott J, Ayers S, Gyte G, Duley L and "The Very Preterm Birth Collaborative Group": Measuring parents´ experiences and satisfaction with care during very preterm birth: A questionnaire development study.
Perinatal Medicine Conference, Harrogate, UK, 9.-11.6.2014

Rabe H, Sawyers A, Amess P, Emery E, Ayers S on behalf of the Brighton Perinatal Study Group: Entwicklungsuntersuchung nach 3,5 Jahren bei Frühgeborenen der randomisierten Studie zur plazentaren Transfusion durch verzögerte Abnabelung (VA) oder Ausstreichen der Nabelschnur (AN).
40. Jahrestagung der Gesellschaft für Neonatologie und Pädiatrische Intensivmedizin, Bonn, Germany 26.-28.06.2014

Sawyer A, Rabe H, Abbott J, Ayers S, Gyte G, Duley L and "The Very Preterm Birth Collaborative Group": Parents' experiences and satisfaction with care during the birth of their very preterm baby.
ICAP 2014 congress, Paris, France 8.-13.7.2014

Rabe H, Sawyers A, Amess P, Emery E, Ayers S on behalf of the Brighton Perinatal Study Group: 3.5 year neurodevelopmental outcome of preterm infants randomized to delayed cord clamping (DCC) or milking of the cord (MC).
5th Congress of the European Academy of Paediatric Societies, Barcelona, Spain October 17-21, 2014
Arch Dis Child 2014; 99:A398-A399. doi: 10.1136/archdischild-2014-307384.1107

Rabe H, Olbert M, Jungmann H: White light spectroscopic transcutaneous measurements of bilirubin levels in jaundiced infants including Kramer zones.
5th Congress of the European Academy of Paediatric Societies, Barcelona, Spain October 17-21, 2014
Arch Dis Child 2014; 99:A398-A399. doi: 10.1136/archdischild-2014-307384.1285

Chan E, Smith C, Davidson C, Watkins R, Amess P, Rabe H, Fernandez Alvarez JR: Mixed bag – has the national confidential enquiry into patient outcome and death
(NCEPOD-REPORT, UK 2010) made a difference to the nutrition of preterm infants?
5th Congress of the European Academy of Paediatric Societies, Barcelona, Spain October 17-21, 2014
Arch Dis Child 2014; 99:A410. doi: 10.1136/archdischild-2014-307384.1230

Storring N, Amess P, Bomont R, Aiton N, Rabe H, Fernandez Alvarez JR: Intravenous ibuprofen (IBU) vs continuous indomethacin-infusion (IND-INF) for symptomatic patent ductus arteriosus (PDA) treatment in newborns.
5th Congress of the European Academy of Paediatric Societies, Barcelona, Spain October 17-21, 2014
Arch Dis Child 2014; 99:A410. doi: 10.1136/archdischild-2014-307384.1141

Reulecke B, Amess P, Garland C, Hallows R, Butt A, Rabe H, Fernandez Alvarez JR: Does local experience in the management of simple gastroschisis (SG) matter? (Local practice versus national benchmark data).
5th Congress of the European Academy of Paediatric Societies, Barcelona, Spain October 17-21, 2014
Arch Dis Child 2014; 99:A215-A216. doi: 10.1136/archdischild-2014-307384.587

Aiton N: The impact on infants – Introducing issues around fetal alcohol exposure. Drug and Alcohol Misuse Conference, The Mermaid Centre, London, UK 10.12.2014

Rabe H: When should we cut the cord?
Spring North Yorkshire Neonatal Discussion Forum, Skipton, UK 26. – 28.2. 2014

Rabe H: Optimizing Placental Transfusion for Preterm Infants: Short and Long-term Benefits and Side Effects
PAS Annual meeting, Vancouver, Canada, 3.-6.5.2014

Rabe H: Placento-fetal transfusion.
Wessex-Oxford Neonatal Study Day, Southampton, 31.07.2014

Rabe H: Neo-Circulation.
Wessex-Oxford Neonatal Study Day, Southampton, 31.07.2014

H Rabe: Clinical Outcome Assessments.
First Annual Neonatal Scientific Workshop: Roadmap for Applying regulatory Science to Neonates. FDA White Oak Campus, Silver Springs, Maryland, 28.-29.10.2014