Annual Report
2015

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.

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

This report can be found on the BSUH Neonatal website:
https://www.bsuh.nhs.uk/departments/neonatal-services/professionals/guidelines/

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 2015, there were 3,415 deliveries at the Royal Sussex County Hospital and 2,477 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 few 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 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 counsellor 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.

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, Reader
Dr Ryan Watkins	Honorary Clinical Senior Lecturer, Clinical Director Children's Services.

Consultant Radiologists: Dr Lorraine Moon, Dr Ima Moorthy, Dr Lavanya Vitta, Dr Kyriakos Iliadis, Dr Jacqueline DuToit

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 Ani Gayen	Mr Greg Kalu
Mr Ehab Kelada	Mr Tony Kelly
Mr Onome Ogueh	Miss Jo Sinclair
Mr David Utting	

Consultant Paediatric Surgeons:
Miss Ruth Hallows
Mr Varadarajan Kalidasan
Miss Anouk van der Avoirt
Mr Bommaya Narayanaswamy
Mr Saravanakumar Paramalingam
Mr Nicholas Alexander (locum)
Mr Subramanyam Maripuri (Orthopaedics)
Mr Simon Watts, Mr Prodip Das (ENT)

Visiting Consultants:

Dr Owen Miller	Cardiology
Dr Kuberan Pushparajah	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
Clare Morfoot	Matron, Neonatology
Mrs Susanne Simmons	Lecturer Practitioner

Band 7

Clare Morfoot (Clinical Practice Educator)
Clare Baker (Senior Sister, PRH)
Louise Watts (Transport Lead)
Chrissie Leach (Transport lead)
Jackie Cherry
Sandra Hobbs
Karen Marchant
Judith Simpson
Judy Edwards (PRH, Outreach)
Carly Taylor

Advanced Neonatal Nurse Practitioners

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

Support Staff

Unit Technician: John Caisley

Pharmacist: Bhumik Patel

Speech and Language Therapists: Rachelle Quaid, Amanda Harvey

Physiotherapy: Melanie Smith

Dietician: Carole Davidson

Counsellor: Sally Meyer (post currently vacant)

Secretarial support: Emma Morris, Patricia Walker, Jane Battersby

Admissions, Activity and Mortality
Trevor Mann Baby Unit

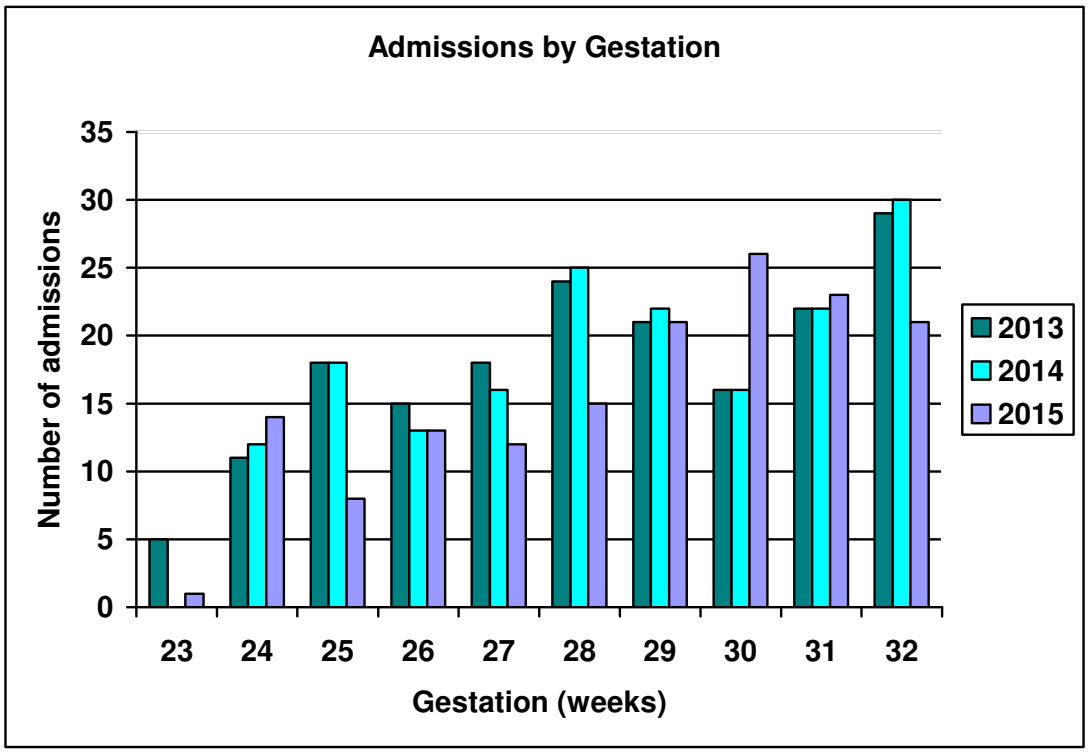
TMBU Admissions	Total Admissions per year
2005	444
2006	415
2007	465
2008	524
2009	456
2010	525
2011	562
2012	567
2013	528
2014	516
2015	**534**

Includes re-admissions

TMBU Admissions	2013	2014	2015
Total number of live births (RSCH)	3292	3400	**3415**
Total admissions (including re-admissions)	528	516	**534**
Inborn	362	350	**357**
Inborn booked RSCH	299	292	**272**
Inborn booked elsewhere	68	58	**75**
Outborn	134	146	**146**
Re-admissions	28	20	**30**
Admissions from home	4	4	**1**
Percentage inborn births admitted to TMBU	11	10	**10**

Admission details	2013		2014		2015	
Gestation (weeks)	**Babies**	**%**	**Babies**	%	**Babies**	%
23	5	1	0	0	**1**	**<1**
24	11	2	12	2	**14**	**3**
25	18	3	18	4	**8**	**1.5**
26	15	3	13	3	**13**	**2.5**
27	18	3	16	4	**12**	**2**
28	24	4	25	5	**15**	**3**
29	21	4	22	4	**21**	**4**
30	16	3	16	3	**26**	**5**
31	22	4	22	4	**23**	**4.5**
32	29	5	30	6	**21**	**4**
33-36	135	25	144	29	**137**	**27**
37-41	182	34	172	35	**205**	**41**
>42	7	1	6	1	**8**	**1.5**
Birth weight (g)						
<500	4	1	4	1	**2**	**<1**
<750	27	5	22	4	**19**	**4**
<1000	43	8	35	7	**24**	**5**
<1500	66	12	65	13	**66**	**13**
Multiple pregnancies (number of babies)						
Twins	71	13	90	23	**101**	**20**
Triplets	6	1	9	2	**0**	**0**

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

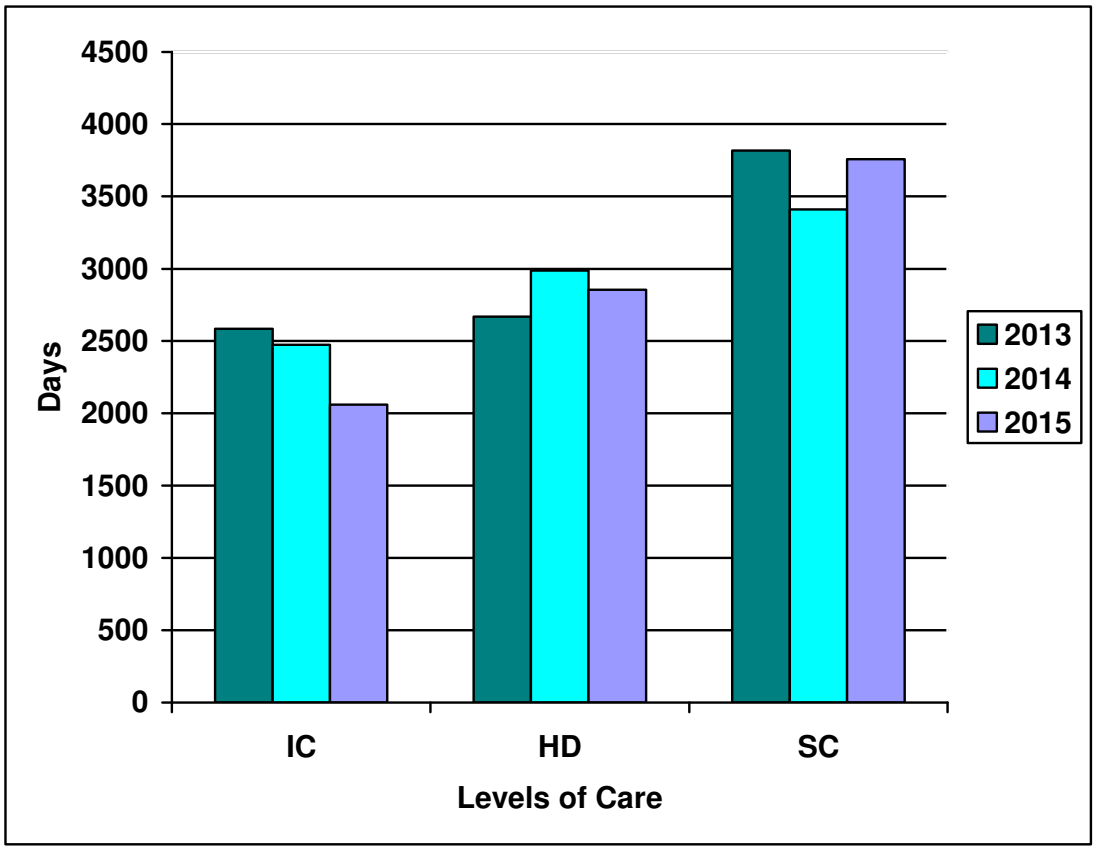


Transfers in	2013	2014	2015
In-Utero			
Babies delivered and admitted	68	59	**75**
Refused in-utero transfers	89	77	**73**
Ex-Utero	134	146	**146**
Princess Royal Hospital	24	31	**31**
East Sussex Hospitals	32	37	**39**
West Sussex Hospitals	23	18	**21**
Other Network Hospitals	26	24	**43**
Outside Network	16	30	**34**
Refused ex-utero transfers	29	17	**11**

Does not include re-admissions or home births

Cot occupancy	2013		2014		2015	
Cots	**Days**	**% occ**	**Days**	**% occ**	**Days**	**% occ**
IC	2585	79	2474	75	**2061**	**63**
HD	2669	91	2987	102	**2853**	**98**
IC & HD (total)	5254	85	5461	88	**4914**	**79**
SC	3817	105	3410	93	**3756**	**103**
Total	9071	92	8871	90	**8670**	**88**

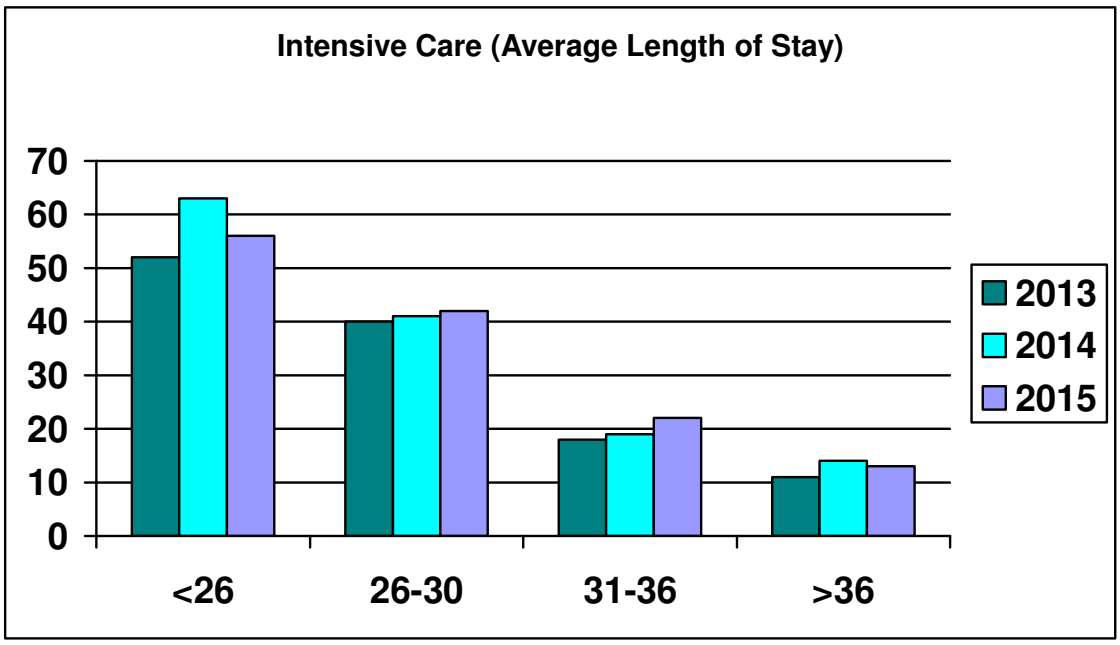
2001 BAPM definition for care levels in 2013 and 2014
2011 BAPM definition for care levels in 2015



TMBU Care Categories 2015						
Gestation at birth (weeks)	IC		HD		SC only	
	Babies	Days	Babies	Days	Babies	Days (total days)
< 23	0	0	0	0	0	0
23	**1**	32	1	1	0	0
24	**14**	476	10	424	0	0
25	**8**	247	5	331	0	0
26	**13**	251	12	363	0	0
27	**12**	152	12	263	0	0
28	**15**	159	13	281	1	11
29	**21**	195	20	181	1	10
30	**26**	97	22	215	1	11
31	**23**	64	15	88	8	175
32	**21**	24	10	85	9	103
33-36	**137**	176	46	364	52	450
37-41	**207**	259	51	287	98	345
>41	**2**	8	6	12	2	10

2011 BAPM definition for care levels **– based on 2015 admissions**

Average length of stay by gestation			
Gestation	2013	2014	2015
	IC days		
<26	52	63	**56**
26-30	40	41	**42**
31-36	18	19	**22**
>36	11	14	**13**
	HDU days		
<26	35	37	**33**
26-30	27	20	**21**
31-36	18	16	**16**
>36	8	7	**9**



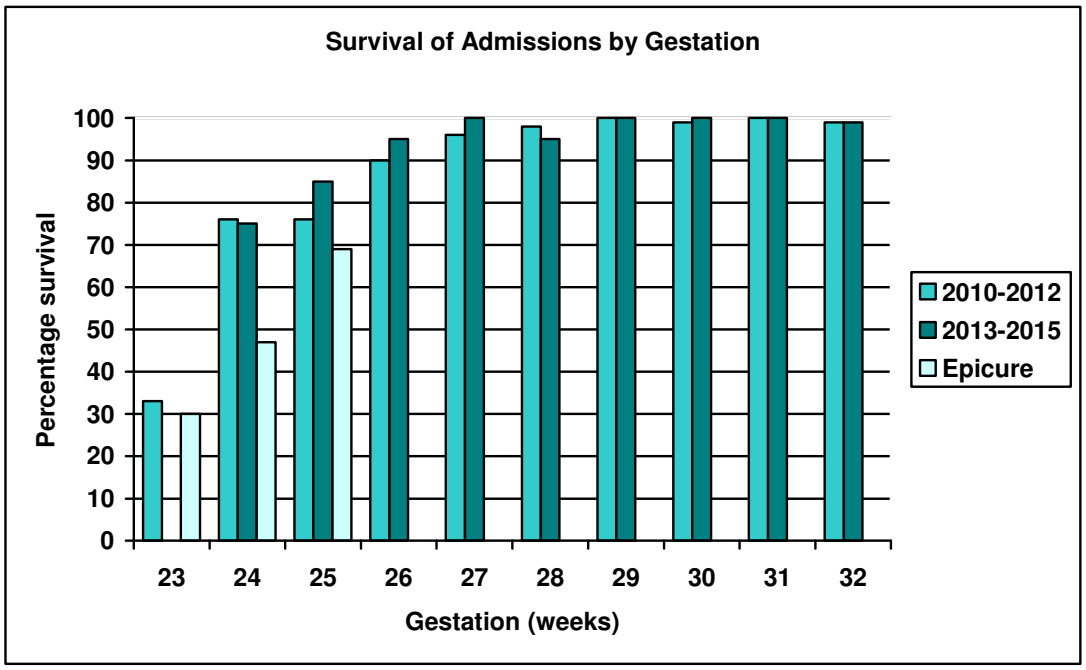
Transfers out	2013	2014	2015
Specialist medical care	5	5	**4**
Cardiac care	21	9	**13**
Discharges			
Home	160	155	**177**
Postnatal ward	129	133	**120**
Local hospital care	170	193	**192**
Princess Royal Hospital	62	67	**68**
RACH	14	27	**20**
East Sussex Hospitals	36	45	**39**
West Sussex Hospitals	28	21	**23**
Other KSS Network Hospitals	24	23	**21**
Other Hospitals Outside KSS Network	6	5	**21**
Delayed transfer out to local care (days)	100	95	**145**

Survival of all inborn live births by gestation 2015								
GA	**Live births**	**Admitted to TMBU***	**Died before admission**	**Died <7d**	**Died 7-28d**	**Died >28d**	**Total deaths**	**Admissions surviving to discharge**
23	3	**1**	2	0	0	1	1	**0**
24	10	**10**	0		2	1	3	**7**
25	6	**5**	0	0	0	0	0	**5**
26	6	**6**	0	0	0	0	0	**6**
27	10	**10**	0	0	0	0	0	**10**
28	9	**9**	0	0	0	0	0	**9**
29	13	**13**	0	0	0	0	0	**13**
30	15	**15**	0	0	0	0	0	**15**
31	15	**15**	0	0	0	0	0	**15**
32	13	**13**	0	0	0	0	0	**13**
33-36	182	**112**	0	0	0	1	1	**111**
37-42	3022	**146**	0	1	0	0	1	**145**
>42	40	**0**	0	0	0	0	0	**0**
Total		**355**	**0**	**1**	**2**	**3**	**6**	**349**

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

TMBU, 3 year rolling survival to discharge for extreme preterm admissions							
	2013		**2014**		**2015**		
GA	**Admitted**	**Died**	**Admitted**	**Died**	**Admitted**	**Died**	**Survival to discharge %**
23	3	3	0	0	**1**	**1**	**0**
24	6	1	12	2	**14**	**5**	**75**
25	13	3	18	2	**8**	**1**	**85**
26	15	0	13	2	**13**	**0**	**95**
27	15	0	16	0	**12**	**0**	**100**

Includes inborn and ex-utero transfers



Mortality Statistics (RSCH)	2010	2011	2012	2013	2014	2015
Total deliveries	3412	3721	3582	3303	3410	**3428**
Total livebirths	3389	3695	3569	3292	3400	**3415**
Total stillbirths	23	26	13	11	10	**12**
Deaths before admission*	3	4	0	0	2	**2**
Total neonatal deaths	12	22	23	19	14	**11**
Inborn	7	13	17	11	11	**6**
Outborn	5	9	6	8	3	**5**
Early neonatal deaths**	4	10	8	5	3	**1**
Late neonatal deaths**	3	2	4	5	3	**2**
Deaths >28 days**	2	1	5	0	1	**3**
Still birth rate	6.7	7.0	3.6	3.3	2.9	**3.5**
Perinatal mortality rate	8.8	10.7	5.9	4.8	4.4	**4.4**
Neonatal mortality rate**	2.1	3.2	3.4	3.0	1.8	**1.5**
Mortality Statistics (BSUH = RSCH + PRH)	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Total deliveries	5886	6162	6057	5841	5851	**5915**
Total livebirths	5852	6126	6035	5828	5729	**5892**
Total stillbirths	32	36	22	13	22	**22**
Deaths before admission*	3	4	0	0	1	**2**
Early neonatal deaths**	4	11	8	6	5	**1**
Late neonatal deaths**	3	2	4	5	4	**3**
Deaths >28 days**	2	1	5	0	1	**3**
Still birth rate	5.4	5.8	3.6	2.2	3.8	**3.7**
Perinatal mortality rate	6.6	8.3	5.0	3.3	4.6	**3.9**
Neonatal mortality rate**	1.7	2.8	2.0	1.9	1.7	**0.8**

Terminations and deaths <23 weeks gestation not included.

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

TMBU deaths (inborn and ex-utero transfers) 2015					
Delivered	**GA**	**BW**	**Age d**	**PM**	**Cause of death, related factors**
Deaths related to prematurity					
Home	25+1	700	1	No	Grade 4 IVH
Hastings	24+0	500	6	No	Grade 4 IVH, PPHN, hypotension
RSCH	23+2	495	33	No	Pulmonary haemorrhage
NEC					
William Harvey	24+0	910	30	No	Perforated NEC
RSCH	24+0	575	22	No	Perforated NEC, Grade 4 IVH
William Harvey	26+6	989	55	No	Perforated NEC, Grade 4 IVH
Sepsis					
RSCH	24+3	630	31	No	Enterobacter cloacae
RSCH	24+0	564	9	No	Pseudomonas
Deaths related to perinatal asphyxia					
RSCH	40+6	3220	2	No	HIE grade 3
PRH	37+5	2670	19	No	HIE grade 3
Hastings	40+3	4285	5	Yes	HIE grade 3
Deaths related to a lethal congenital abnormality					
Guy's	32+5	1710	19	No	Complex congenital heart defect
Others					
RSCH	36+6	2200	6 wks	Yes	Gastroschisis, possible sepsis

Post Mortems	2013	2014	2015
Total deaths	19	14	**13**
Post Mortems performed (% of deaths)	7 (37)	6 (43)	**2 (15)**

TMBU, 4 year rolling mortality (all admissions)											
	Total Admissions:					Deaths					Survival to discharge
	2012	2013	2014	2015	Total	2012	2013	2014	2015	Total	(%)
Inborn	402	362	350	357	**1471**	17	12	11	6	**46**	**97**
Outborn	133	134	146	146	**559**	6	7	3	7	**23**	**96**
<26 weeks	36	34	30	23	**123**	8	12	4	7	**31**	**75**
<28 weeks	32	57	29	25	**143**	1	0	2	0	**3**	**98**
<31 weeks	61	43	63	62	**229**	3	2	2	0	**7**	**97**
31+ weeks	406	353	374	394	**1527**	11	5	6	5	**27**	**98**
<500g	4	4	4	2	**14**	2	4	0	1	**7**	**50**
<750g	32	27	22	19	**100**	6	10	2	5	**23**	**77**
<1000g	32	43	35	22	**132**	1	0	4	2	**7**	**95**
<1500g	72	66	65	66	**269**	4	2	2	0	**8**	**97**
>1500g	395	354	370	395	**1514**	10	5	6	5	**26**	**98**

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

SCBU Admissions	2013	2014	2015
Total number of livebirths	2536	2429	**2477**
Total number of stillbirths	2	12	**10**
Total admissions*	273 (20)	273 (20)	**284 (24)**
Percentage of live births admitted	11%	11%	**11%**

***(re-admissions)**

Admission details	2013		2014		2015	
	Babies	%	Babies	%		%
Total admissions	253		253		**260**	
Inborn	196	77	189	75	**199**	70
Outborn	54	21	64	25	**61**	21
Gestation ( ) = babies born elsewhere and transferred to PRH						
23	0		0		**0**	
24	3(2)		1		**1(1)**	
25	2(3)		5(3)		**0**	
26	3(3)		2(1)		**0**	
27	3(3)		1(1)		**3(3)**	
28	3(2)		6(5)		**2(2)**	
29	7(7)		5(3)		**12(11)**	
30	7(6)		5(5)		**7(4)**	
31	7(6)		9(7)		**4(4)**	
32	7(5)		13(9)		**5(4)**	
33-36	62(6)		75(20)		**86(25)**	
37-42	149(7)		136(17)		**144(21)**	
>42	0		0		**0**	
Birthweight (g) ( ) = babies born elsewhere and transferred back to PRH						
<500	0		2(1)		**0**	
<750	4(4)		3(1)		**0**	
<1000	6(5)		5(5)		**1(1)**	
<1500	18(5)		20(14)		**17(17)**	
Multiple births (number of babies)						
Twins	28		35		**30**	
Triplets	0		6		**0**	

Does not include re-admissions

Transfers	2013	2014	2015
Ex-Utero			
Transfers out to Brighton	23	24	**31**
Transfers out to elsewhere	4	1	**3**
Transfers in from Brighton	60	46	**65**
Transfers in from elsewhere	5	7	**5**
Transfers in from home	14	6	**11**

Cot occupancy	2013		2014		2015	
Cots	**Days**	**% occ**	**Days**	**% occ**	**Days**	**% occ**
IC	112	-	144	-	45	-
HD	231	-	211	-	184	-
SC	2035	-	2018	-	1929	-
Total	**2379**	**81**	**2374**	**81**	**2158**	**74**

Mortality Statistics (PRH)	2012	2013	2014	2015
Total deliveries	2475	2538	2441	**2487**
Total livebirths	2466	2536	2429	**2477**
Total stillbirths	9	2	12	**10**
Early neonatal deaths*	0	1	2	**0**
Late neonatal deaths*	0	0	1	**1**
Post neonatal deaths (>28 days)*	0	0	0	**0**
Still birth rate	3.6	0.8	4.9	**4.0**
Perinatal mortality rate	3.6	1.2	5.7	**4.0**
Neonatal mortality rate*	0	0.4	1.2	**0.4**

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

PRH deaths 2015					
Delivered	**GA**	**BW**	**Age d**	**PM**	**Cause of death, related factors**
PRH	37+5	2670	19	No	HIE grade 3

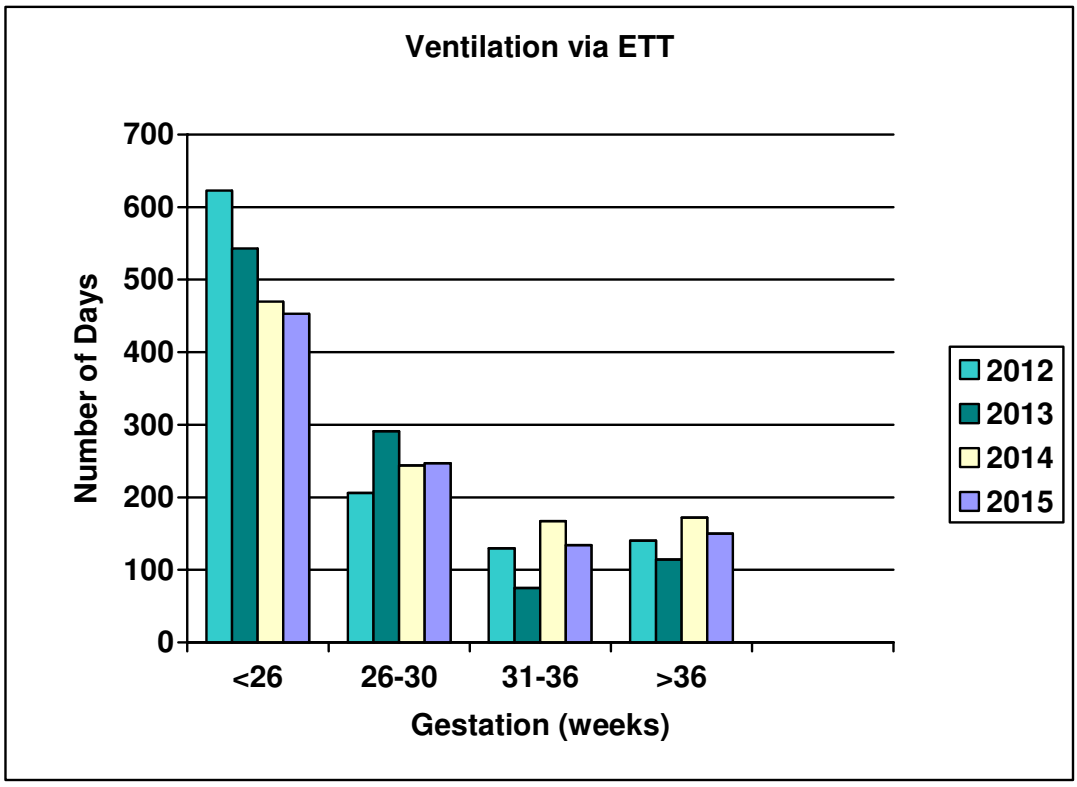
Summary of Clinical Activity
Trevor Mann Baby Unit

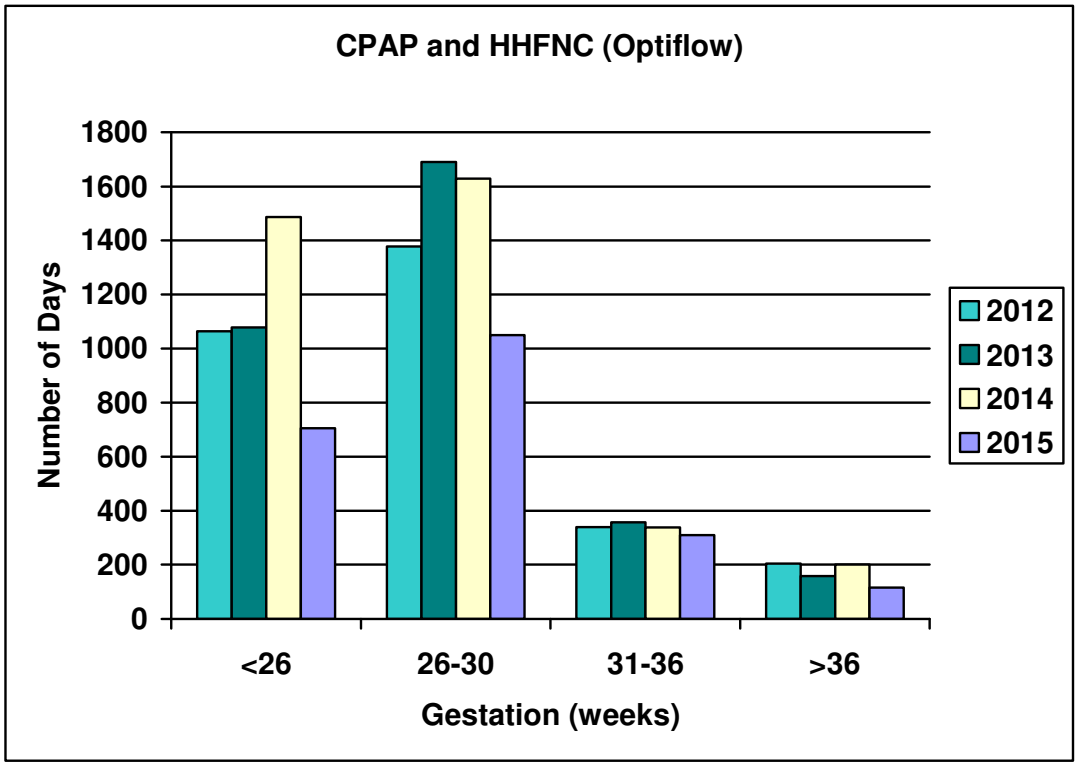
Respiratory Support	2013		2014		2015	
	Days	Babies	Days	Babies	Days	Babies
Ventilation via ETT	1026	180	1053	158	**984**	**181**
HFOV	43	19	84	28	**46**	**17**
CPAP	717	142	710	125	**460**	**115**
HHFNC	1772	205	2201	235	**1721**	**222**
Oxygen therapy	1059	147	1039	165	**974**	**151**
Surfactant (doses)		109		84 (96)		**114 (100)**
Nitric Oxide	36	14	102	28	**47**	**17**

Respiratory diagnoses	Number of Babies		
	2013	2014	2015
Respiratory Distress Syndrome	145	165	**129**
Transient Tachypnoea	9	19	**19**
Signs of respiratory distress of the newborn	149	182	**184**
Persistent Pulmonary Hypertension	18	19	**19**
Pulmonary hypoplasia	0	5	**2**
Meconium aspiration	14	15	**10**
Cystic Fibrosis	0	3	**0**

Respiratory Complications	2013	2014	2015
Pulmonary haemorrhage	7	11	**10**
Pulmonary air leak	24	27	**24**
Oxygen at 36 weeks CA	27	34	**26**
Oxygen at 28 days	65	63	**59**
Discharged with home oxygen	11	10	**7**

Management of PDA	2013	2014	2015
Patent Ductus Arteriosus	61	46	**45**
PDA treated medically	33	14	**16**
PDA ligated	11	14	**5**


Ventilation via ETT
700
600
500
400
300
200
100
0
Number of Days
<26
26-30
31-36
>36
Gestation (weeks)
2012
2013
2014
2015


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)
2012
2013
2014
2015

Infection	Positive Blood Cultures		
	2013	2014	2015
Acinetobacter species	0	0	1
Paenibacillus species	0	0	1
Group B streptococcus	1	1	2
Non-haemolytic streptococcus	0	0	1
Alpha haemolytic streptococcus	7	1	0
Haemophilus	1	0	0
Coagulase-negative staphylococcus	26	31	42
MSSA	2	1	2
MRSA	0	0	0
Enterococcus faecalis	2	2	11
Listeria	0	0	0
Escherichia coli	3	5	5
Bacillus cereus	0	5	0
Klebsiella species	1	0	2
Serratia species	2	0	0
Enterobacter species	2	0	2
Pseudomonas species	1	2	1
Candida species	0	3	1
TOTAL	**48**	**51**	**71**

Necrotising Enterocolitis	2013	2014	2015
NEC (confirmed cases)	9 6 ex-utero transfers	6 3 ex-utero transfers	19 9 ex-utero transfers
NEC (suspected cases)	17	16	27
Perforated NEC	4	3	7 4 ex-utero transfers
NEC treated surgically	7	4	18 9 ex-utero transfers

Neonatal Surgical Cases (not NEC)	2013 Cases	2014 Cases	2015 Cases
Gastroschisis	1	5	7
Exomphalos	3	1	3
Hirschsprungs	4	3	1
Malrotation	4	1	0
Meconium ileus	5	3	3
Gut perforation (not NEC)	4	2	2
Oesophageal Atresia / TOF	9	12	8
Intestinal atresia/obstruction	6	1	5
Inguinal hernia repair	8	4	5
Imperforate anus/rectal anomaly	5	0	3
Lung cyst/sequestration	0	1	0
Diaphragmatic eventration	1	0	0
Diaphragmatic hernia	2	2	0
TOTAL	**51**	**35**	**37**

Cranial Ultrasound Diagnoses	Number of Babies		
	2013	2014	2015
IVH with parenchymal involvement (EUT)	4 (4)	9 (7)	14 (10)
Post haemorrhagic hydrocephalus (requiring surgical intervention)	5 (2)	4 (0)	4 (1)
Infarction without IVH	0	0	2
Periventricular ischaemic injury with cyst formation	4	2	4

All babies <32 weeks gestation have routine cranial ultrasound examinations

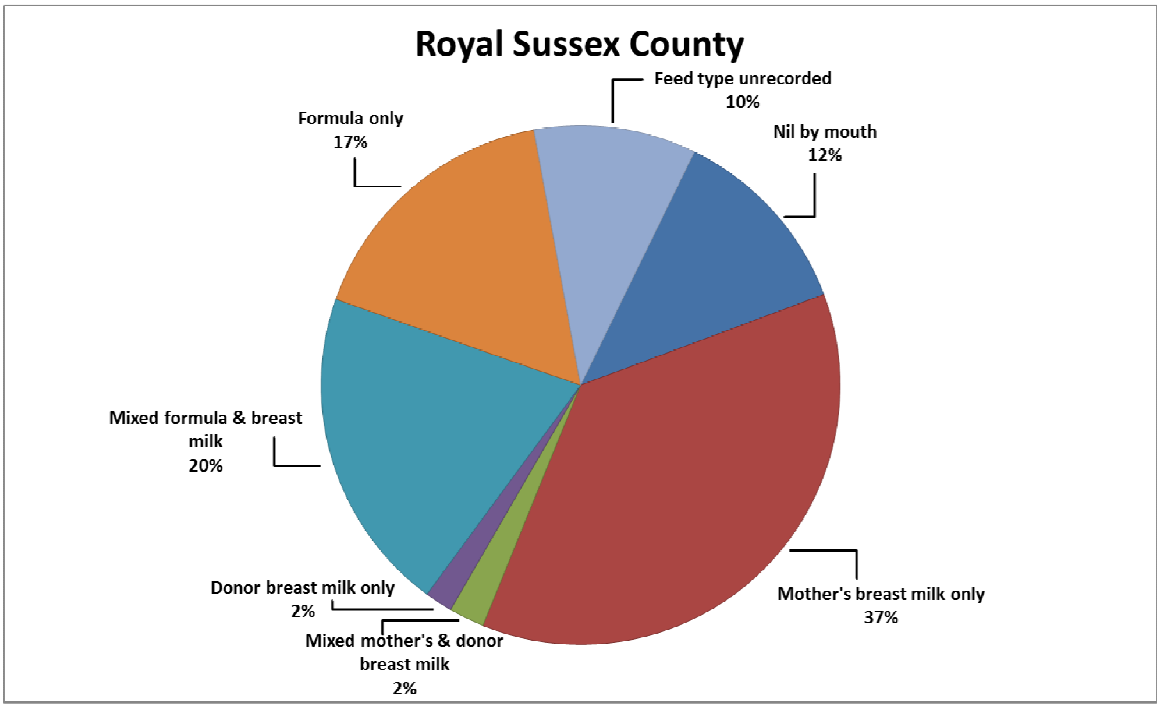
Hypoxic Ischaemic Encephalopathy	2013	2014	2015
HIE grade 1	11	9	10
HIE grade 2	10	12	18
HIE grade 3	7	4	6
Hypothermia therapy	21	22	28
- Inborn (BSUH)	6	9	11
- Outborn	15	13	17

Retinopathy of Prematurity	2013	2014	2015
ROP grades 3/4	3	5	5
ROP treated with laser therapy	2	5	3

Screening as per recommendations from Royal College of Ophthalmologists

Neonatal Dashboard	2015		
	Eligible	Result	%
Antenatal steroids given (24 – 34 weeks gestation)	139	120	86
Temperature <36 ^{o}C on admission from LW (<32 weeks gestation at birth)	79	9	11
Parent seen within first 24 hours of admission (first admission to TMBU)	538	505	94
TPN commenced by day 2 (<29 weeks gestation, <1000g BW)	47	45	96
ROP screening completed on time (<32 weeks gestation and or <1500g BW)	70	68 1 early, 1 late	97
Breast milk at discharge home (<33 weeks and first admission to TMBU)	51	37	73
Breast milk exclusively at discharge <33 weeks and first admission to TMBU)	51	21	41

LocationName	Nil by mouth	Mothers breast milk only	Mixed mothers & Donor breast milk	Donor breast milk only	Mixed formula & breast milk	Formula only	Feed type unrecorded	TotalDays
RSCH	1135	3453	208	162	1901	1570	948	9377
Percentage	12.1(%)	36.82(%)	2.22(%)	1.73(%)	20.27(%)	16.74(%)	10.11(%)	100(%)
National Average	7.11(%)	35.81(%)	1.76(%)	1.03(%)	21.17(%)	27.69(%)	5.42(%)	100(%)



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
Failure of infection policy
Cross infection
Medication and prescribing errors.

Transport triggers:
Low temperature on arrival (<36 ^{0}C)
Accidental extubation
Delay – no discharge summary.

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	2010	2011	2012	2013	2014	2015
Access, admission, transfer, discharge	8	5	0	8	3	**1**
Clinical assessment (including diagnosis, scans, tests, assessments)	12	5	2	6	6	**21**
Consent, communication, confidentiality	9	8	7	7	12	**9**
Documentation (including records, identification)	15	18	9	11	15	**30**
Implementation of care and ongoing monitoring / review	4	5	5	12	8	**10**
Infection Control Incident	1	1	2	1	4	**2**
Infrastructure (including staffing, facilities, environment)	7	4	11	16	16	**16**
Medical device / equipment	16	19	9	11	11	**15**
Drugs and prescribing	72	80	53	58	59	**56**
Patient accident	1	1	0	1	0	**1**
Treatment, procedure	28	19	19	12	10	**17**
Other Incident	2	5	16	42	31	**18**
Total	**175**	**170**	**133**	**185**	**175**	**196**

Grade	2010	2011	2012	2013	2014	2015
No Harm: Impact Prevented	37	37	20	12	11	**21**
No Harm: Impact not Prevented	100	116	108	150	141	**153**
Low	35	16	12	18	18	**19**
Moderate	3	1	0	5	2	**1***
Severe	0	0	0	0	3	**0**
Unavoidable adverse event	0	0	0	0	0	**1****
Death	0	0	0	0	0	**1*****
Total	**175**	**160**	**140**	**185**	**175**	**196**

***Failure to detect congenital hip dysplasia at newborn check**
****Unavoidable death from HIE**
*****Death due to pseudomonas sepsis**

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

- 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 304 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
Total admitted	22	61	57	64	93	100	11	408
Survived to discharge	9	26	42	49	79	88	11	304

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 304 survivors eligible for follow-up, 244 infants had 24 month developmental assessments completed.

Outcome (%)	23	24	25	26	27	28	>29	Total
Cognitive								
Normal	4	10	15	27	42	52	11	161 (66.0)
Mild	2	4	7	4	12	15	3	47 (19.3)
Moderate	1	4	4	4	5	2	1	21 (8.6)
Severe	0	3	3	3	5	1	0	15 (6.1)
Communication								
Normal	2	7	15	11	28	46	8	117 (48.0)
Mild	3	5	5	18	13	13	5	62 (25.4)
Moderate	1	4	7	4	10	6	2	34 (14.0)
Severe	1	5	2	5	13	5	0	31 (12.7)
Motor								
Normal	3	11	18	18	30	45	11	136 (55.7)
Mild	3	2	6	12	19	15	3	60 (24.6)
Moderate	1	4	3	2	7	7	0	24 (9.8)
Severe	0	4	2	6	8	3	1	24 (9.8)
Combined outcomes								
Normal	2	7	11	8	23	34	8	93 (38.1)
Mild	3	4	7	19	14	24	5	76 (31.1)
Moderate	1	6	8	4	14	5	1	39 (16.0)
Severe	1	4	3	7	13	7	1	36 (14.8)
Total assessed	7	21	29	38	64	70	15	244

Outcome according to gestation was as follows:

23 and 24 weeks gestation (n=28)

Outcome (%)	Cognitive	Communication	Motor
Normal	14 (50)	9 (32)	14 (50)
Mild impairment	6 (21)	8 (29)	5 (18)
Moderate impairment	5 (18)	5 (18)	5 (18)
Severe disability	3 (11)	6 (21)	4 (14)

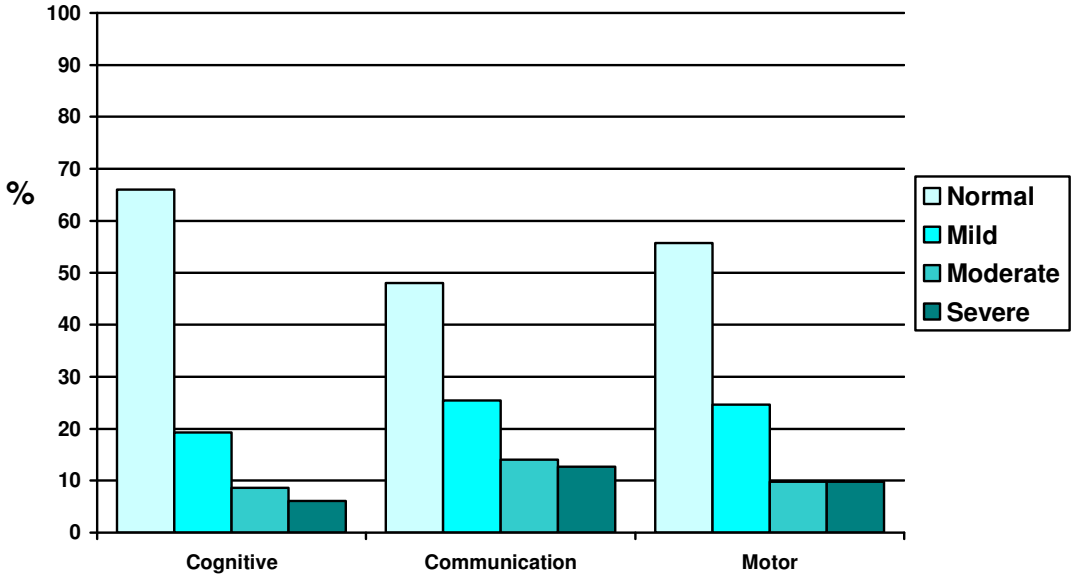
25 and 26 weeks gestation (n=67)

Outcome (%)	Cognitive	Communication	Motor
Normal	42 (63)	26 (39)	36 (54)
Mild impairment	11 (16)	23 (34)	18 (27)
Moderate impairment	8 (12)	11 (16)	5 (7)
Severe disability	6 (9)	7 (10)	8 (12)

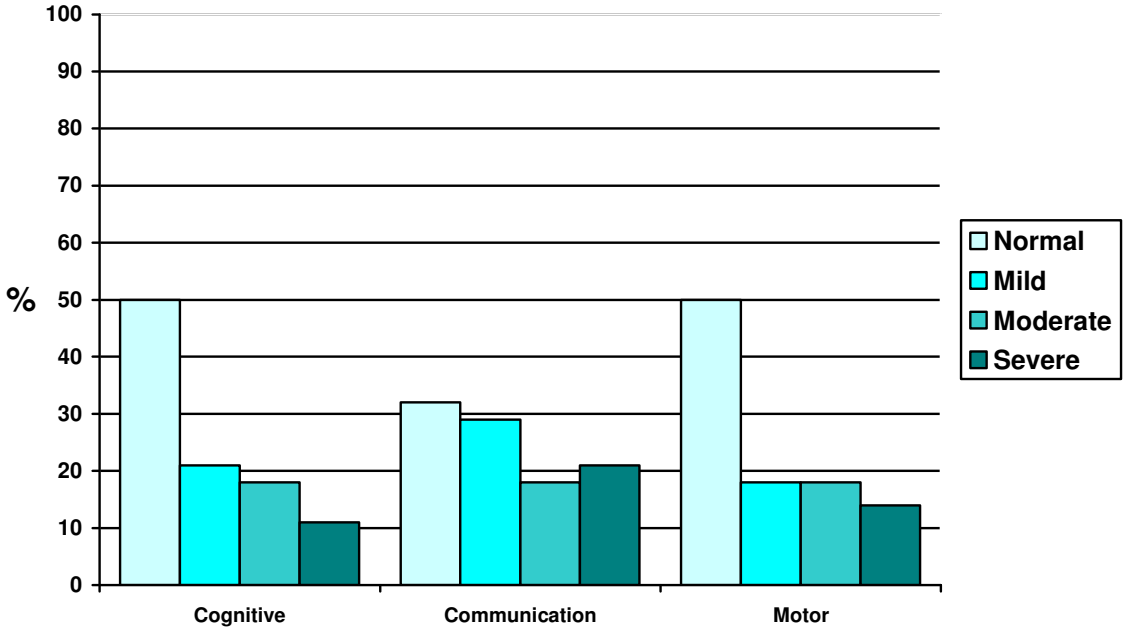
27 weeks gestation and above if <1000g (n=149)

Outcome (%)	Cognitive	Communication	Motor
Normal	105 (71)	82 (55)	86 (58)
Mild impairment	30 (20)	31 (21)	37 (25)
Moderate impairment	8 (5)	18 (12)	14 (9)
Severe disability	6 (4)	18 (12)	12 (8)

Neurodevelopmental Outcome of Pre-term Infants
<29 wks at 24 months CA
(n = 244)



Neurodevelopmental Outcome of Pre-term Infants
23 & 24 weeks at 24 months CA
(n = 28)

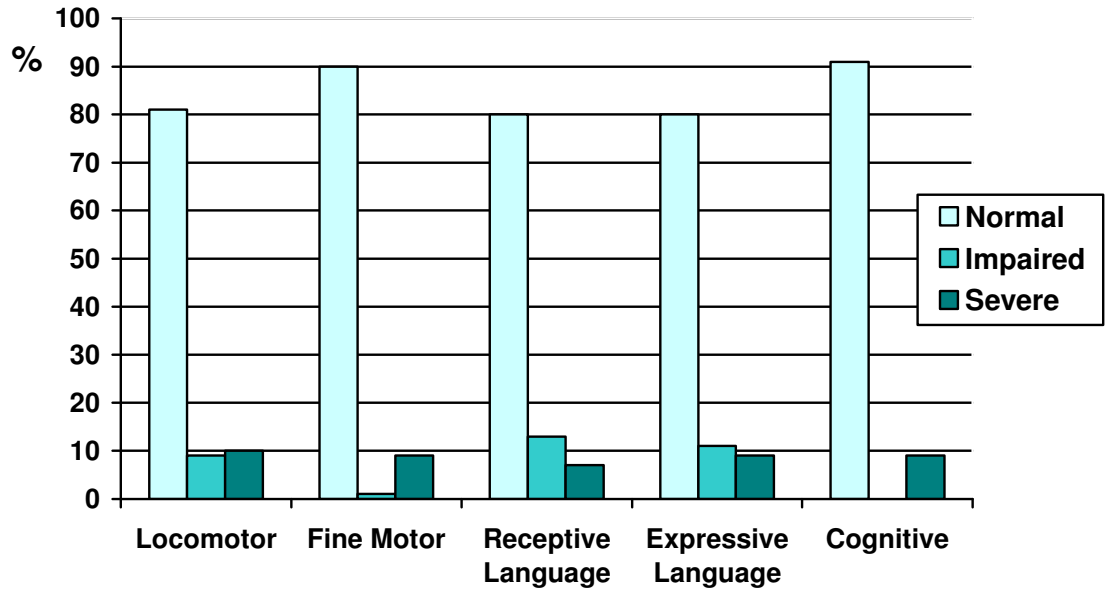


Since 2009 term babies who have received cooling therapy on the TMBU for hypoxic ischaemic encephalopathy have been assessed using Bayley III scales at 24 months.

Cooled babies from 2009	119
Assessments performed:	68
Died	27
Did Not Attend	6
Out of area (referred for assessment locally)	18

Neurodevelopmental Outcome of Cooled Babies (n=68)

Outcome (%)	Locomotor	Fine Motor	Receptive Language	Expressive Language	Cognitive
Normal	55 (81)	61 (90)	54 (80)	54 (80)	62 (91)
Impaired	6 (9)	1 (1)	9 (13)	8 (11)	0
Severe disability	7 (10)	6 (9)	5 (7)	6 (9)	6 (9)



Transport

The Sussex Neonatal Transport Service together with similar services in Kent and Surrey provide 24 hour cover across the KSS Neonatal Network. The annual transport report for 2015 will be published later in the year.

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
(See appendix 4)

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

There is an active team which supports the research portfolio:

Rebecca Ramsay	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

Kate Moscovici has retired at the end of last year and we all wish her well for her future.

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

Dr Rabe, Dr Rojas, Dr Fernandez and the whole team have continued to work on the first clinical study NEO-CIRC 001A, which 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). Recruitment has been completed in 2015. The next clinical trial is currently in the planning stage.

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 Bomont is local PI for the INTEREST study which looks at early biomarkers in babies with NEC. Recruitment of our control cohort has been completed and the study is still open to babies with confirmed NEC.

Dr Mahoney has completed recruitment to the NeoAdapt 1 and 2 studies. NeoAdapt 3, which assesses circulatory adaptation in babies with HIE and total body cooling therapy, is still open for recruitment.

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 these studies and neurodevelopmental follow-up studies of pre-term infants are ongoing.

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 undertaking 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 BSMS, we organized the 9th Regional Paediatric and Neonatal Research Day, which was again very well attended. The 10th research day is due to take place in late 2016.

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. This has been radically changed and we look forward to having more timetabled time with medical students. During their time with us 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 three courses have now been delivered in Brighton.

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

Support Services

Speech & Language Therapy (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.

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 including those transferred to the Royal Alexandra Children's Hospital. 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
- liaison/advice for dysphagia therapists across Sussex.

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.

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.

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 2015 eleven babies were admitted to Trevor Mann Baby Unit with Neonatal Abstinence Syndrome.

Counselling

There is currently a reduced counselling service available for parents. Our counselling post is currently vacant but help is available from the Trust Chaplaincy Service at both the TMBU and SCBU at PRH. The Revd Peter Wells attends staff meetings to give support and The Early Birth Association has kindly funded The Mind Clinic during 2015. The Mind Clinic is a non-NHS organization that comes into the work place to help staff.

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 Care 2011

INTENSIVE CARE

General principle
This is care provided for babies who are the most unwell or unstable and have the greatest needs in relation to staff skills and staff to patient ratios.
Definition of Intensive Care Day
• Any day where a baby receives any form of mechanical respiratory support via a tracheal tube
• **BOTH** non-invasive ventilation (e.g. nasal CPAP, SIPAP, BIPAP, vapotherm) and PN
• Day of surgery (including laser therapy for ROP)
• Day of death
• Any day receiving any of the following
o Presence of an umbilical arterial line
o Presence of an umbilical venous line
o Presence of a peripheral arterial line
o Insulin infusion
o Presence of a chest drain
o Exchange transfusion
o Therapeutic hypothermia
o Prostaglandin infusion
o Presence of replogle tube
o Presence of epidural catheter
o Presence of silo for gastroschisis
o Presence of external ventricular drain
o Dialysis (any type)

HIGH DEPENDENCY CARE

General principle
This is care provided for babies who require highly skilled staff but where the ratio of nurse to patient is less than intensive care.
Definition of High Dependency Care Day
Any day where a baby does not fulfill the criteria for intensive care where any of the following apply**:**
• Any day where a baby receives any form of non invasive respiratory support (e.g. nasal CPAP, SIPAP, BIPAP, HHFNC)
• Any day receiving any of the following:
o parenteral nutrition
o continuous infusion of drugs (except prostaglandin &/or insulin)
o presence of a central venous or long line (PICC)
o presence of a tracheostomy
o presence of a urethral or suprapubic catheter
BAPM - Categories of Care August 2011
o presence of trans-anastomotic tube following oesophageal atresia repair
o presence of NP airway/nasal stent
o observation of seizures / CF monitoring
o barrier nursing
o ventricular tap

SPECIAL CARE

General principle
Special care is provided for babies who require additional care delivered by the neonatal service but do not require either Intensive or High Dependency care.
Definition of Special Care Day
• Any day where a baby does not fulfill the criteria for intensive or high dependency care and requires any of the following:
o oxygen by nasal cannula
o feeding by nasogastric, jejunal tube or gastrostomy
o continuous physiological monitoring (excluding apnoea monitors only)
- care of a stoma
- presence of IV cannula
- baby receiving phototherapy
- special observation of physiological variables at least 4 hourly

TRANSITIONAL CARE

General principle
Transitional care can be delivered in two service models, within a dedicated transitional care ward or within a postnatal ward. In either case the mother **must be resident with her baby and providing care**. Care above that needed normally is provided by the mother with support from a midwife/healthcare professional who needs no specialist neonatal training. Examples include low birth-weight babies, babies who are on a stable reducing programme of opiate withdrawal for Neonatal Abstinence Syndrome and babies requiring a specific treatment that can be administered on a post-natal ward, such as antibiotics or phototherapy.

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 FOR NEONATOLOGY 2015

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	Yes, circulated via e-mail + discussed at senior staff meeting	2/2013	• 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 + discussed at senior staff meeting		• Site for NIPE • Guidelines revised to meet BFI and NICE standards • All requirements according to NIPE fulfilled including DDH screening • Saturation screening pilot site (see below)	 Completed
Hypoglycaemia Guideline/NICE Guidance Diabetes in Pregnancy CG 63	Yes	No, circulated via e-mail + discussed at senior staff meeting		• Guideline amended for new WHO-UK growth charts • Guideline revised to meet BFI standards • All requirements fulfilled • Audit of updated guideline	 In progress
NICE Guidance Neonatal Jaundice CG 98	Yes	No, circulated via e-mail + discussed		• All requirements fulfilled	

		at senior staff meeting		• 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, Newborn and Infant Clinical Outcome Review Programme	Ongoing	No, circulated via e-mail + discussed at senior staff meeting  Adobe Acrobat Document		• Stillbirth, neonatal and extended perinatal mortality up to 10% lower than national average • Data falsely compared with other level 3 neonatal units not accounting for neonatal surgery which, when taken into account, shows even better performance • Seek correction of our outcome data from MBRRACE • Continue work on improving survival at limit of viability	In progress In progress
National Neonatal Audit Programme	Ongoing	No, circulated via e-mail + discussed at senior staff meeting  Microsoft Excel Worksheet		• Overall good performance and reporting quality • Approx. 40% babies have low admission temperatures • Audit of admission temperatures to address possible shortfalls	In progress

		 Adobe Acrobat Document			
NIPE Pilot Saturation Screening for Congenital Heart Diseases	Completed	No, to be circulated via e-mail + discussed at senior staff meeting		• In response to evolving research evidence in support of this tool • Pilot site for NIPE screening for congenital heart diseases • Analysis awaited	Completed In progress
National Training Survey	Ongoing	No, circulated via e-mail + discussed at senior staff meeting  Adobe Acrobat Document		• Within average for most, 1st quartile for overall satisfaction, but not below average outlier • Continue efforts to improve 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, circulated via e-mail + discussed		• Compliant with national requirements	

		at senior staff meeting			
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 incident reporting system	Completed Completed Completed
National HIV and Syphilis Surveillance	Ongoing	No, reported separately		• 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 mortality and morbidity meeting with Obstetrics & Gynaecology • Format under review	In progress
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	In progress

				complications	
Audit of Blood Cultures (Microbiology)	Ongoing	Yes, circulated via e-mail + discussed at senior staff meeting	11/2014	• 6 monthly review • 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 • More detailed audit of available data • Continue work on improving infection rates	In progress In progress
Audit: Infection Control	Ongoing	No, circulated via intranet infection control dashboard  Adobe Acrobat Document		• 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		• Medication errors still featuring high, but static • No major incidents otherwise • Review risk panel structure and risk review process • Explore new ways of improving medication errors and communication • Maternal expressed milk related errors addressed with better practice guidance • NCPAP nasal injuries addressed with	Completed In progress In progress In progress

				different NCPAP interface	
Survey: Parent Satisfaction	Ongoing	No, circulated via e-mail + discussed at senior staff meeting		• Replaced by bespoke wireless real-time feedback system in 2015 – annual report awaited	In progress
Specialty Identified Projects					
Audits					
Education Audit Chest Drain Insertion	Completed	Yes, circulated via e-mail + discussed at senior staff meeting	10/2014	• Success of teaching package for new technique confirmed • Presented results at RCPCH Conference	Completed
Gastroschisis Audit	Completed	Yes, circulated via e-mail + discussed at senior staff meeting	10/2014	• Outcome very good compared to national data • Fine-tune care immediately after surgery • Presented at EAPS Conference	In progress Completed
Neonatal Outreach Team Audit	Completed	Yes, circulated via e-mail + discussed at senior staff meeting	2/2015	• 119 and 71 SCBU days saved by gestation at TMBU and PRH • Develop service further with regard to low gestation and weight discharge	In progress
Non-Invasive Respiratory Management Audit	Ongoing	Yes, circulated via e-mail + discussed at senior staff meeting	11/2015	• Practice in keeping with general evidence showing some areas for improvement • Continue audit and publish results • Adjust current guidance to reflect new developments	In progress In progress
Update - Perioperative Management Guideline	Completed	Yes, circulated via e-mail + discussed at senior staff meeting	11/2015	• In response to incidents • Perioperative handover sheet being trialed	In progress

Guidelines					
Thyroid Disorder Guideline	Completed	Yes, circulated via e-mail + discussed at senior staff meeting	2/2014	• In response to varying practices affecting overall management • Currently for editing and ratification	In progress
Arterial Hypotension Guideline	In progress	No		• Currently under review	In progress
Neonatal Seizure Guideline	In progress	No		• Currently under review	In progress
Red Cell Guideline	In progress	No		• Currently under review	In progress
Kangaroo Guideline	In progress	No		• Currently under review	In progress
HSV and VZV Guideline	In progress	No		• Currently under review	In progress

Appendix 4

List of Publications 2015 TMBU

Peer reviewed papers

Rabe H, Sawyers A, Amess P, Ayers S: Neurodevelopmental outcomes at 2 and 3.5 years for very preterm babies enrolled to a randomized trial of milking the umbilical cord versus delayed cord clamping. Neonatology 2016;109:113-119 (e-pub 10 Dec 2015; DOI:10.1159/000441891

Ayers S, Sawyers A, During C, Rabe H on behalf of the Brighton Perinatal Study Group: Parents report positive experiences about enrolling babies in a cord-related trial before birth. Acta Pediatr 2015; 104:e164-e170. doi: 10.1111/apa.12922

Carbajal R, Eriksson M, Courtois E, Boyle E, Avila-Alvarez A, Andersen RD, Sarafidis K, Polkki T, Matos C, Lago P, Papadouri T, Montalto SA, Ilmoja ML, Simons S, Tameliene R, van Overmeire B, Berger A, Dobrzanska A, Schroth M, Bergqvist L, Lagercrantz H, Anand KJ; EUROPAIN Survey Working Group. Sedation and analgesia practices in neonatal intensive care units (EUROPAIN): results from a prospective cohort study.Lancet Respir Med. 2015 Oct;3(10):796-812. doi: 10.1016/S2213-2600(15)00331-8. Epub 2015 Sep 24.

Mahoney L, Shah G, Crook D, Rojas-Anaya H, **Rabe H**. A Literature Review of the Pharmacokinetics and Pharmacodynamics of Dobutamine in Neonates. Pediatr Cardiol. 2015 Sep 7. [Epub ahead of print]
PMID: 26346024

Faust K, Härtel C, Preuß M, Rabe H, Roll C, Emeis M, Wieg C, Szabo M, Herting E, Göpel W: the German Neonatal Network (GNN) and the NeoCirculation Project: Short term outcome of very low birth weight infants with arterial hypotension in the first 24 hours of life. Arch Dis Fetal Neonat Ed 2015; 0:F1-F5 (21 July) doi:10.1136/archdischild-2014-306483

Editorials

Rabe H, Erickson-Owens DA, Mercer JS: Long term follow-up of placental transfusion in term infants. JAMA Pediatrics 2015; Jul 1;169(7):623-4. doi: 10.1001/jamapediatrics.2015.0431 Epub 2015 May 26

Rabe H, Fernandez-Alvarez JR: Permissive Hypercarbia in Preterm Infants: the Discussion continues. Lancet Resp Med 2015; Jul;3(7):499-501. doi: 10.1016/S2213-2600(15)00240-4. Epub 2015 Jun 15

Presentations at national and international meetings

Basu K, Inglis S, Quin M, Memon A, Rabe H, Seddon P, Palmer C, Tavendale R, Mukhopadhyay S: Infection and wheeze in the first 6 months of life – an

interim analysis of the GO-CHILD birth cohort. RCPCH 2015 Annual Conference, 28.-30.4.2015, Birmingham, UK

Seddon P, Sobowiec-Kouman S, Castronovo G, Rabe H, Wertheim D: Respiratory monitoring by pulse oximetry plethysmogram analysis in preterm infants. The Neonatal Society Annual Spring Meeting, London 19.3.2015

Garland C, Lawn C, Bomont R, Morfoot C, Nalletamby J: Learning points from setting up and running our Neonatal Simulation Programme. 5th National Neonatal Simulation Conference, Leeds, UK, 5/6/15

Mahoney L, Wertheim D, Fernandez Alvarez JR, Aiton N, Rojas-Anaya H, Seddon P, Rabe H: Novel non-invasive measurements in the assessment of normal cardio- vascular adaptation in term & near term infants.
In: Selected Abstracts of the 1st Congress of joint European Neonatal Societies (jENS 2015); Budapest (Hungary); 16-20.09.2015; Session "Circulation, O_2 Transport and Haematology". J Pediatr Neonat Individual Med. 2015;4(2):e040207. doi: 10.7363/040207.

Mahoney L, Fernandez Alvarez JR, Rojas-Anaya H, Aiton N, Wertheim D, Seddon P, Rabe H: Point of care functional echocardiographic inter- and intra-observer variability: right ventricular outflow & superior vena cava flow in well and unwell newborn infants.
In: Selected Abstracts of the 1st Congress of joint European Neonatal Societies (jENS 2015); Budapest (Hungary); 16-20.09.2015; Session "Circulation, O_2 Transport and Haematology". J Pediatr Neonat Individual Med. 2015;4(2):e040207. doi: 10.7363/040207.

Thompson C, Mahoney L, Scutt G, Patel BA, Rabe H: Dopamine and dobutamine: does temperature or intravenous vehicle affect stability?
In: Selected Abstracts of the 1st Congress of joint European Neonatal Societies (jENS 2015); Budapest (Hungary); 16-20.09.2015; Session "Pharmacology". J Pediatr Neonat Individual Med. 2015;4(2):e040212. doi: 10.7363/040212.

Mahoney L, Seddon P, Wertheim D, Fernandez Alvarez JR, Aiton N, Rojas-Anaya H, Rabe H: The NeoAdapt Project: Novel non-invasive measurements in the assessment & treatment of cardiovascular compromise in severely unwell term & near term infants. NeoCard 2015: 6th Neonatal Cardiology & Haemodynamics Conference, Middlesborough, UK 12.-14.10.2015

Mahoney L, Wertheim D, Fernandez Alvarez JR, Aiton N, Rojas-Anaya H, Seddon P, Rabe H: Non-Invasive Measurements In The Assessment Of Normal Cardiovascular Adaptation In Term & Near Term Infants. Neonatal Society Autumn Meeting, London, UK 5.11.2015

Garland C: Palliative Care Transfers: Risks and Benefits. UK National Neonatal Transport Group Conference 2015, Brighton, UK 13/11/15

Garland C, Lawn C, Watts L, Leach C: Blue light transfers. UK National Neonatal Transport Group Conference 2015, Brighton, UK 13/11/15