Annual Report 2012

Department of Neonatology
Brighton & Sussex University Hospitals
NHS Trust

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
CEMACH	Confidential Enquiry into Maternal and Child Health
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
IVH	Intraventricular Haemorrhage
KSS	Kent, Surrey and Sussex
MRSA	Methicillin Resistant Staphlococcus Aureus
MSSA	Methacillin Sensitive Staphlococcus Aureus
OAE	Otoacoustic emissions
PDA	Patent Ductus Arteriosus
PRH	Princess Royal Hospital
RACH	Royal Alexandra Children's Hospital
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.

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This report can be found on the BSUH Neonatal website:

http://www.bsuh.nhs.uk/tmbu

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.

The TMBU is one of three intensive care units in the Kent, Surrey and Sussex Neonatal Network. We provide a tertiary, neonatal medical and surgical service for Brighton, East and West Sussex and a special care service for Brighton and Mid-Sussex. In 2012, there were 3,569 deliveries at the Royal Sussex County Hospital and 2,466 deliveries at the Princess Royal Hospital.

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 are set to provide sufficient medical and surgical intensive care facilities for Sussex babies. Transitional care is provided on the postnatal wards at RSCH and PRH, but there is no designated transitional care unit on either site.

The SCBU at Princess Royal Hospital is staffed for 8 special care cots. The unit is one of two in the UK led by a team of ANNPs, supported by consultant neonatologists. The ANNP team is supplemented by an Associate Specialist and Specialty Doctor. 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.

During 2012 there have been two very important events for the department. Towards the end of the year Jennifer Deeney, was appointed as the new Neonatal Matron for BSUH - a very big welcome to you Jen. In September the Neonatal Outreach Service was launched. The service aims to support early discharge by bridging the gap between special care and home. We hope this will be a very positive contribution towards care at home. In 2013 we hope to secure permanent funding for the neonatal outreach service and launch transitional care units at RSCH and PRH.

The department of neonatology at the BSUH has a full programme of research, clinical governance and education. Research within the Department has been boosted by Dr Rabe's appointment as Senior Clinical Lecturer – many congratulations. Our goal is to improve the quality and safety of clinical care through clinical governance, education and multidisciplinary working. We liaise closely with obstetric colleagues to improve standards of perinatal care. 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.

Our neonatal surgery service continues to develop. 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.

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.

We benefit from the developing tertiary services at the RACH, including respiratory medicine 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 on both units involving a nurse, health visitor or consultant in child protection and a paediatric social worker. 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 at the RACH 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.

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	Paed 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, Vice President of the ESPR, Senior Lecturer
Dr Paul Seddon	Interest in Paediatric Respiratory Medicine
Dr Ryan Watkins	Honorary Clinical Senior Lecturer, Deputy Chief of Women & Children (Children), Deputy Chief of Safety (Children)

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

Consultant Ophthalmologist: Mr Dominic Heath, Miss Victoria Barrett

Consultant Audiologist: Mr Rob Low

Consultant Pathologist: Dr Jo Wyatt Ashmead (St Thomas' Hospital)

Consultant Obstetricians:

Mr Salah Abdu	Mr Tosin Ajala
Mrs Thikra Bashir	Mr Rob Bradley
Miss Heather Brown	Mr Jim English
Mr Ayman Fouad	Mr Ani Gayen
Dr Sharif Ismail	Mr Des Holden
Mr Richard Howell	Mr Greg Kalu
Mr Ehab Kelada	Mr Tony Kelly
Miss Julia Montgomery	Mr Onome Ogueh
Mr Peter Larsen-Disney	Mr Andrew Fish

Consultant Paediatric Surgeons:
Mr Varadarajan Kalidasan
Miss Ruth Hallows
Miss Anouk van der Avoirt
Mr Anies Mohammed
Mr Bommaya Narayanaswamy
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:	2 Associate Specialist / Specialist Doctor
	4 Specialist Registrars
	4 Trust Clinical Fellows / 1 ANNP
Tier 1:	6 ST3
	1 Trust Clinical Fellow

All neonatal posts are compliant with European Working Time directive, 2009

<u>Neonatal Nurses</u> (TMBU)

Senior Nursing Staff

Helen O'Dell	Associate Chief Nurse Women & Children/ Head of Midwifery
Lorraine Tinker	Head of Paediatrics and Neonatal Nursing
Jenny Deeney	Matron Neonatology
Mrs Susanne Simmons	Lecturer Practitioner
Mrs Clare Morfoot	Clinical Practice Educator

Advanced Neonatal Nurse Practitioners

Jamie Blades
Maggie Bloom
Dee Casselden
Lisa Chaters
Naomi Decap
Karen Hoover
Caroline McFerran
Kathy Mellor
Sandra Summers
Simone van Eijck

Band 7

Clare Baker
Louise Barton (Transport Nurse)
Jackie Cherry
Lauren Devoy (Community Outreach)
Sandra Hobbs
Karen Marchant
Judith Simpson

Band 6

Linda Barrow, Nicky Clark, Belinda Coetzee, Katie Hogben, Betina Jahnke, Tracey Joyce, Alice Le Voi, Mel Townsend, Samantha Walters, Melanie Brittain, Wen Chiu, Tina Evans, Gill Hobden, Natalie Jestico, Chrissie Leach, Suzanne Paginton, Hilary Sparkes, Teresa Wilkinson, Clare Dickinson, Cathy Garner, Alice Kavati, Marie Dudley-Ward, Belinda Gardner, Chris Fern, Libby Emery, Julie Nalletamby, Carly Taylor, Francis Pante, Emma Binns, Nancy Willis, Jenna Jarvis, Lathia Alosius, Claire Watson, Rachel Burton, Melanie Hobson.

Band 5

Clare Hunt, Nikki Still, Iva Richards, Lucy Green, Zoe Hall, Rebecca Friedrich, Corrie Hoelters, Beena George, Jonathan O'Keeffe, Rachel Beston, Leonara Enriquez, Hui Chen Lin, Tania white, Nikki Perretta, Nicky Ford, Hannah Fraser-James, Jo Makri, Sylvia Walker-Spiers, Alison Avery, Germaine McElwaine, Rebecca Brook, Emma Neville, Marijane Hermoso, Bethany Turner, Lucy Brian, Laura Harris, Louise Ridgeway, Stephanie McAreavy, Flo Mykura, Charlotte Isted, Nancy Mulligan, Hannah Giles, Rachel Levey, Eleanor Turk.

Band 4

Mavis Dawson, Sara Arief, Jackie Mason, Samantha Jones, Darcy Tobin-Dougan, Kristian Ravangard.

Band 2

Jenny Perry, Julie Munro.

Neonatal Nurses (PRH)

Band 7
Judy Edwards

Band 6
Debbie Collen, Sarah Gray, Pauline Taylor, Kathi Wood, Jessica Stoffell, Dede Atkinson, Sue Robinson, Michelle Wilmont, Avryl Way, Sarah Stillwell, K. Wood, Michelle De La Mar.

Band 5
Sue Nightingale, Irene Silander, R. Jones, K Wainwright, J. Dinesham, R. Darbyshire.

Band 4
Judy Chadd, Jo Cottington, Naylia Mogel, D. Fish, K. Johnson.

Support Staff

Unit Technician
John Caisley

Pharmacist
Mike Pettit

Speech and Language Therapists
Jane Pettigrew

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**

Includes re-admissions

TMBU Admissions	2010	2011	2012
Total number of live births (RSCH)	3412	3695	**3569**
Total admissions (including re-admissions)	525	562	**567**
Inborn	361	390	**403**
Inborn booked RSCH	291	300	**313**
Inborn booked elsewhere	70	90	**90**
Outborn	128	133	**126**
Re-admissions	30	37	**32**
Admissions from home	4	2	**6**
Percentage inborn births admitted to TMBU	10.5	10.7	**11.3**

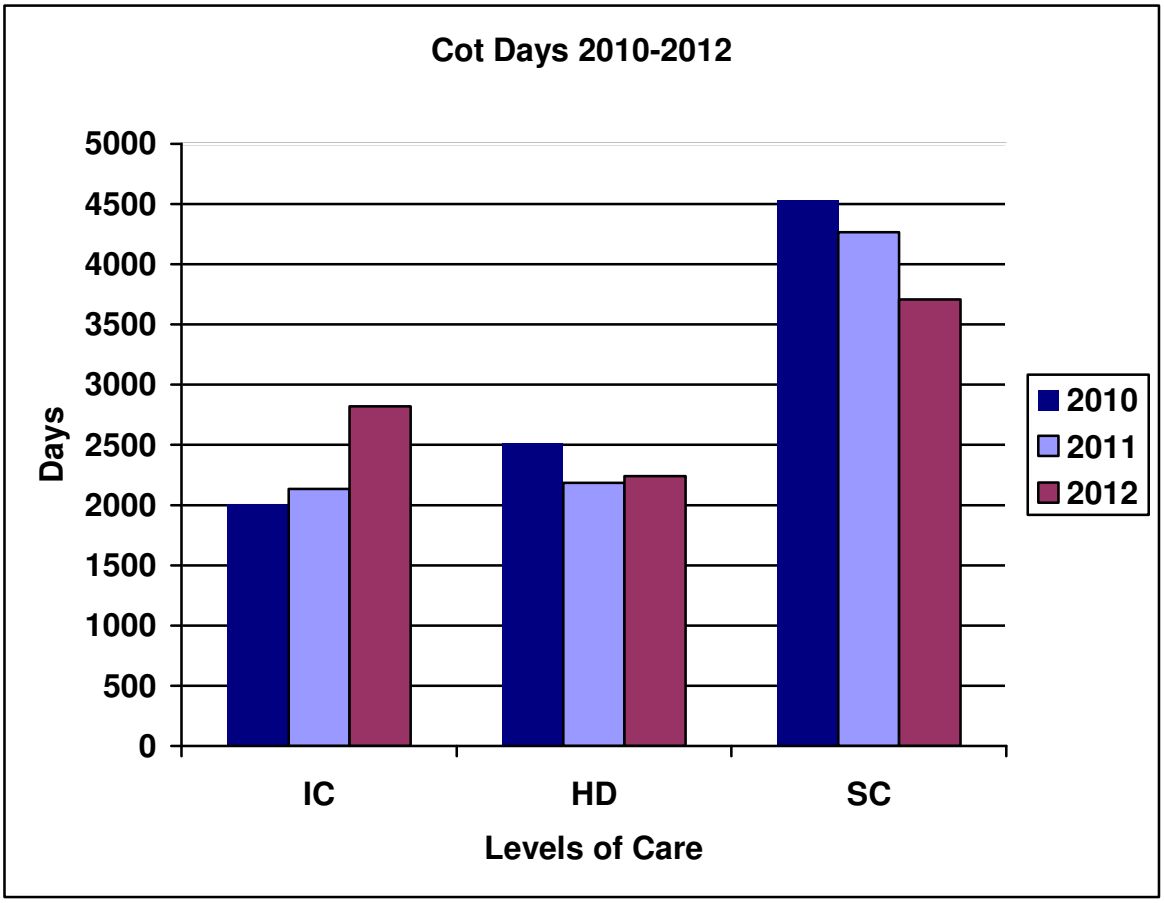
Admission details*	2010		2011		2012	
Gestation (weeks)	**Babies**	**%**	**Babies**	**%**	**Babies**	**%**
23	**1**	<1	**1**	<1	**7**	1
24	**12**	2	**10**	2	**16**	3
25	**10**	2	**11**	2	**13**	2
26	**10**	2	**15**	3	**15**	3
27	**16**	3	**15**	3	**17**	3
28	**19**	4	**26**	5	**25**	4
29	**14**	3	**17**	3	**17**	3
30	**23**	5	**16**	3	**19**	3
31	**21**	4	**21**	4	**21**	4
32	**36**	7	**42**	8	**39**	7
33-36	**155**	31	**132**	25	**127**	22
37-42	**178**	36	**219**	42	**218**	38
>42	**0**	0	**0**	0	**1**	<1
Birthweight (g)						
<500	**1**	<1	**1**	<1	**4**	<1
<750	**17**	3	**17**	3	**32**	6
<1000	**25**	5	**25**	5	**32**	6
<1500	**66**	13	**66**	13	**72**	13
Multiple pregnancies (number of babies)						
Twins	**100**	20	**100**	20	**83**	15
Triplets	**17**	3	**17**	3	**21**	4

Inborn and exutero admissions: does not include re-admissions

Transfers in	2010	2011	2012
In-Utero	144	216	**157**
Babies delivered and admitted	70	90	**90**
Refused transfers in	145	96	**170**
Ex-Utero	128	133	**126**
Princess Royal Hospital	35	26	**37**
East Sussex Hospitals	39	36	**29**
West Sussex Hospitals	24	28	**18**
Other Network Hospitals	11	22	**22**
Outside Network	46	18	**23**
Refused transfers in	59 (3 surgery)	20 (3 surgery)	**32** (3 surgery)

Does not include re-admissions or home births

Cot occupancy	2010		2011		2012	
Cots	**Days**	**% occ**	**Days**	**% occ**	**Days**	**% occ**
IC (Level 1)	2001	61	2135	65	**2941**	**90**
HD (Level 2 care)	2510	88	2186	75	**2337**	**80**
IC & HD (total)	4511	74	4321	70	**5278**	**85**
SC (Level 3, 4 & 5 care)	4529	124	4267	117	**3707**	**102**
Total	9040	93	8588	87	**8985**	**91**



TMBU Care Categories 2012						(*2001 BAPM definition for care levels, see Appendix 1)*
Gestation at birth (weeks)	IC		HD		SC only	
	Babies	Days	Babies	Days	Babies	Days (total days)
< 23	0		0		0	
23	7	224	2	74	0	
24	16	581	9	370	0	
25	13	347	7	223	0	
26	15	332	11	318	0	
27	17	230	14	241	0	
28	25	261	19	341	0	
29	17	73	15	161	1	5
30	19	79	13	120	1	8
31	21	70	8	45	3	61
32	39	121	19	85	3	34
33	19	62	13	53	8	137
34 – 36	49	193	28	114	37	308
37 - 41	96	358	39	189	102	383
> 41	2	10	1	3	4	20
Total	**355**	**2941**	**198**	**2337**	**159**	**956**

Mean lengths of stay from birth on TMBU (days)				
Gestation (weeks)	Discharged Home		Discharged to referring hospital	
	2011	2012	2011	2012
23	-	122	-	-
24	-	128	41	53
25	-	-	16	41
26	74	-	35	45
27	85	60	41	24
28	55	61	25	32
29	55	50	15	7
30	44	31	14	20
31	33	27	13	11
32	30	23	10	9
33- 36	17	13	7	10
37-42	10	5	8	6

Transfers out	2010	2011	2012
Specialist medical care	15	15	**14**
Cardiac care	4	5	**8**
Discharges			
Home	163	158	**155**
Postnatal ward	115	150	**157**
Local hospital care	189	207	**164**
Princess Royal Hospital	72	50	**62**
RACH	37	23	**15**
East Sussex Hospitals	38	60	**43**
West Sussex Hospitals	33	28	**20**
Other Network Hospitals	10	24	**17**
Delayed transfer out to local care (days)	194	106	**77**

Mortality Statistics (RSCH)	2008	2009	2010	2011	2012
Total deliveries	3528	3345	3412	3721	**3582**
Total livebirths	3516	3332	3389	3695	**3569**
Total stillbirths	12	13	23	26	**13**
Deaths before admission*	N/K	4	3	4	**0**
Total neonatal deaths on TMBU	29	21	12	22	**23**
Inborn	14	16	7	13	**17**
Outborn	15	5	5	9	**6**
Early neonatal deaths**	6	10	4	10	**8**
Late neonatal deaths**	4	4	3	2	**4**
Deaths >28 days**	4	3	2	1	**5**
Still birth rate	3.4	3.9	6.7	7.0	**3.6**
Perinatal mortality rate	5.1	6.9	7.9	10.7	**5.3**
Neonatal mortality rate**	2.8	5.4	2.9	4.3	**4.8**

Terminations and deaths <23 weeks gestation not included. Deaths before admission have been included into neonatal mortality rates from 2009.

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

For mortality rate definitions see Appendix 2

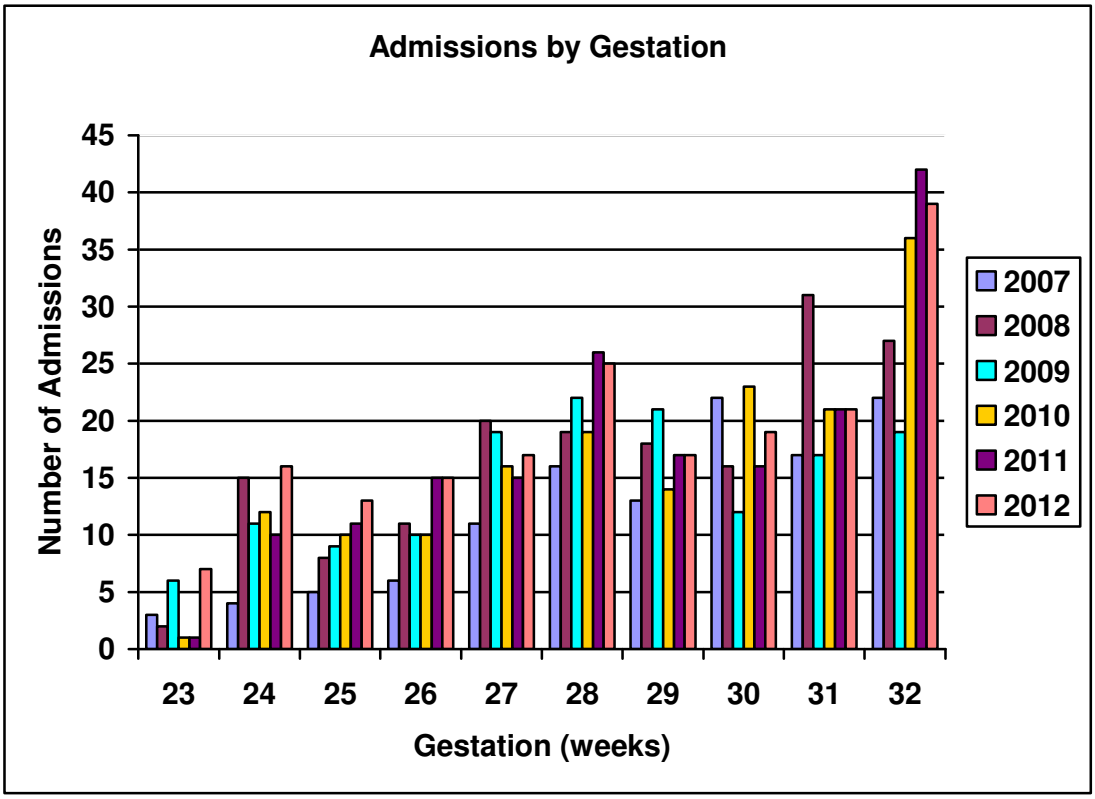
Survival of all live births by gestation 2012 (does not include exutero admissions)								
GA	**Live births**	**Admitted to TMBU***	**Died before admission**	**Died <7d**	**Died 7-28d**	**Died >28d**	**Total deaths**	**Admissions surviving to discharge**
23	7	**7**	0	1	3		4	**3**
24	10	**10**	0			1	1	**9**
25	5	**5**	0	1		2	3	**2**
26	8	**8**	0				0	**8**
27	8	**8**	0		1		1	**7**
28	19	**19**	0	1		1	2	**17**
29	11	**11**	0				0	**11**
30	16	**16**	0				0	**16**
31	16	**16**	0				0	**16**
32	32	**32**	0	1			1	**31**
33-36	219	**102**	0				0	**102**
37-42	3142	**167**	0	4	1		5	**162**
>42	59	**1**	0				0	**1**
Total	**3552**	**402**	**0**	**8**	**5**	**4**	**17**	**385**

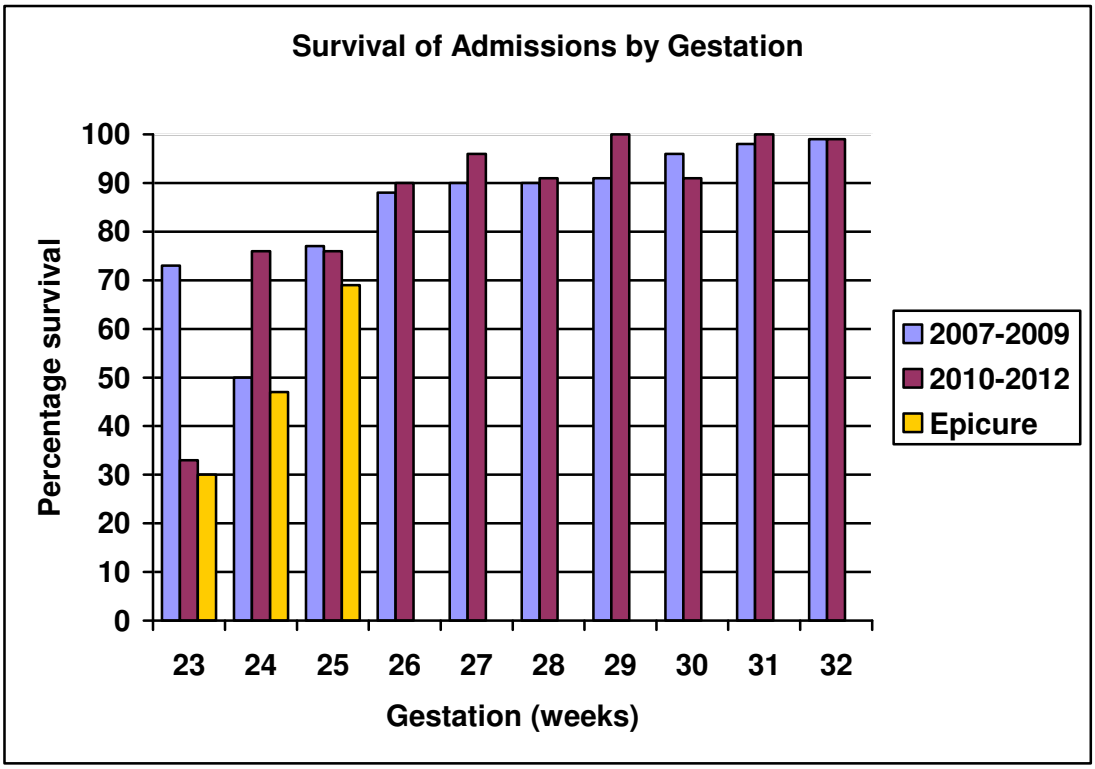
Inborn (booked and unbooked) excluding lethal congenital abnormalities

Not including re-admissions

TMBU, 3 year rolling survival to discharge for extreme preterm admissions							
GA	2010		2011		**2012**		**Survival to discharge %**
	admitted	died	admitted	died	**Admitted**	**died**	
23	1	1	1	1	**7**	**4**	**33**
24	12	3	10	5	**16**	**1**	**76**
25	10	1	11	4	**13**	**3**	**76**
26	10	1	15	3	**15**	**0**	**90**
27	16	0	15	1	**17**	**1**	**96**

Includes inborn and ex-utero transfers


Admissions by Gestation
Number of Admissions
45
40
35
30
25
20
15
10
5
0
23
24
25
26
27
28
29
30
31
32
Gestation (weeks)
2007
2008
2009
2010
2011
2012


Survival of Admissions by Gestation
Percentage survival
100
90
80
70
60
50
40
30
20
10
0
23
24
25
26
27
28
29
30
31
32
Gestation (weeks)
2007-2009
2010-2012
Epicure

TMBU deaths (inborn and ex-utero transfers) 2012					
Delivered (booked)	**GA**	**BW**	**Age d**	**PM**	**Cause of death, related factors**
Preterm Infants					
RSCH (PRH)	23	460	1	N	Extreme prematurity, twin to twin transfusion
RSCH (PRH)	23	600	7	N	Extreme prematurity
RSCH	23	584	16	N	Extreme prematurity
RSCH (Poole)	25	551	1	N	Pulmonary haemorrhage
RSCH	28	1220	1	N	Persistent pulmonary hypertension of the newborn
RSCH	25	850	45	N	Chronic lung disease
RSCH (Tunbridge Wells)	24	714	29	No	Necrotising enterocolitis
RSCH	28	554	>30	N	Necrotising enterocolitis
RSCH	23	475	23	N	Necrotising enterocolitis
RSCH	27	1090	15	N	Necrotising enterocolitis
FRIMLEY PARK	28	1060	9	N	Bilateral Grade IV IVH
RSCH	25	821	54	N	Grade IV IVH with hydrocephalus
RSCH	32	1151	5	N	Trisomy 18
Deaths related to perinatal asphyxia					
RSCH	42	3485	8	Y	HIE Grade 3
RSCH	39	3480	1	Y	PPHN
RSCH	37	2913	4	N	Severe HIE
RSCH	40	2746	2	N	Severe HIE
Term Infants (deaths related to other causes)					
CONQUEST	41	3105	7	N	Dural sinus malformation
ROYAL SURREY	38	3500	4	N	Pulmonary hypoplasia, polycystic kidneys
PRH	39	3575	2	Y	Hypoplastic left heart syndrome
RSCH	39	2903	<1	N	Polycystic kidneys
PRH	37	3240	8	Y	Thrombotic microangiopathy
PRH	40	3475	5	Y	Bilateral schizencephaly

Post Mortems	2010	2011	2012
Total deaths	12	22	23
Post Mortems performed (% deaths)	5 (42%)	6 (27)	5 (22)

TMBU, 4 year rolling mortality											
	Total Admissions:					Deaths					Survival to discharge
	2009	2010	2011	2012	Total	2009	2010	2011	2012	Total	(%)
Inborn	358	361	390	402	1511	16	7	13	17	53	**96.5**
Outborn	79	128	133	133	473	5	5	9	6	25	**95**
<26 weeks	31	23	22	36	112	6	5	10	8	29	**74**
<28 weeks	33	25	30	32	120	3	2	4	1	10	**92**
<31 weeks	57	56	59	61	233	4	2	3	3	12	**95**
31+ weeks	316	390	414	406	1526	8	4	5	11	28	**98**
<500g	1	1	2	4	8	1	0	1	2	4	**50**
<750g	22	17	21	32	92	5	4	8	6	23	**75**
<1000g	36	25	34	32	127	3	2	5	1	11	**91**
<1500g	68	66	70	72	276	5	1	1	4	11	**96**
>1500g	310	386	398	395	1489	7	5	7	10	29	**98**

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

SCBU Admissions	2010	2011	2012
Total number of livebirths	2474	2441	**2466**
Total number of stillbirths	9	10	**9**
Total admissions*	286 (30)	246 (23)	**279 (27)**
Percentage of live births admitted	11.5%	10%	**11%**

***Includes re-admissions**

Admission details	2010		2011		2012	
	Babies	%	Babies	%		%
Total admissions	256		223		**252**	
Inborn	198	77	178	80	**195**	**77**
Outborn	58	23	45	20	**57**	**23**
Gestation ( ) = babies born elsewhere and transferred back to PRH						
23	0		0		**0**	
24	2(2)		1(1)		**2(2)**	
25	1(1)		0		**1(1)**	
26	0		0		**4(4)**	
27	5(4)		3(3)		**5(5)**	
28	4(4)		0		**7(7)**	
29	4(4)		4(4)		**1(1)**	
30	7(4)		3(3)		**4(4)**	
31	6(4)		4(4)		**5(5)**	
32	12(8)		16(2)		**15(15)**	
33-36	68(19)		84(12)		**80(23)**	
37-42	115(2)		131(5)		**128(12)**	
>42	0		0		**0**	
Birthweight (g) ( ) = babies born elsewhere and transferred back to PRH						
<500	0		0		**0**	
<750	1(1)		1(1)		**2(2)**	
<1000	3(3)		3(3)		**9(9)**	
<1500	18(13)		10(9)		**17(17)**	
Multiple births (number of babies)						
Twins	45		43		**46**	
Triplets	9		0		**11**	

Does not include re-admissions

Transfers	2010	2011	2012
Ex-Utero			
Transfers out to Brighton	**35**	**29**	**36**
Transfers out to elsewhere	**4**	**4**	**7**
Transfers in from Brighton	**42**	**36**	**60**
Transfers in from elsewhere	**12**	**7**	**10**
Transfers in from home	**6**	**1**	**6**

Cot occupancy	2010		2011		2012	
Cots	**Days**	**% occ**	**Days**	**% occ**	**Days**	**% occ**
IC	90	-	95	-	92	-
HD	66	-	95	-	106	-
SC	2386	-	1765	-	2145	-
Total	**2542**	**87.1**	**1955**	**67**	**2343**	**80**

Mortality Statistics (PRH)	2009	2010	2011	2012
Total deliveries	2419	2474	2441	**2475**
Total livebirths	2413	2463	2431	**2466**
Total stillbirths	6	9	10	**9**
Early neonatal deaths*	1	0	1	**0**
Late neonatal deaths*	1	0	0	**0**
Post neonatal deaths (>28 days)*	0	0	0	**0**
Still birth rate	2.4	3.6	4.0	**3.6**
Perinatal mortality rate	2.9	3.6	4.5	**3.6**
Neonatal mortality rate*	0.8	0	0.4	**0**

Inborn (booked) excluding lethal congenital abnormalities
For mortality rate definitions see Appendix 2

PRH deaths 2012 (all transferred out and died at the TMBU)					
Delivered	**GA**	**BW**	**Age d**	**PM**	**Cause of death, related factors**
PRH	39	3575	2	Y	Hypoplastic left heart syndrome
PRH	37	3240	8	Y	Acute renal failure
PRH	40	3475	5	Y	Bilateral schizencephaly

Summary of Clinical Activity
Trevor Mann Baby Unit

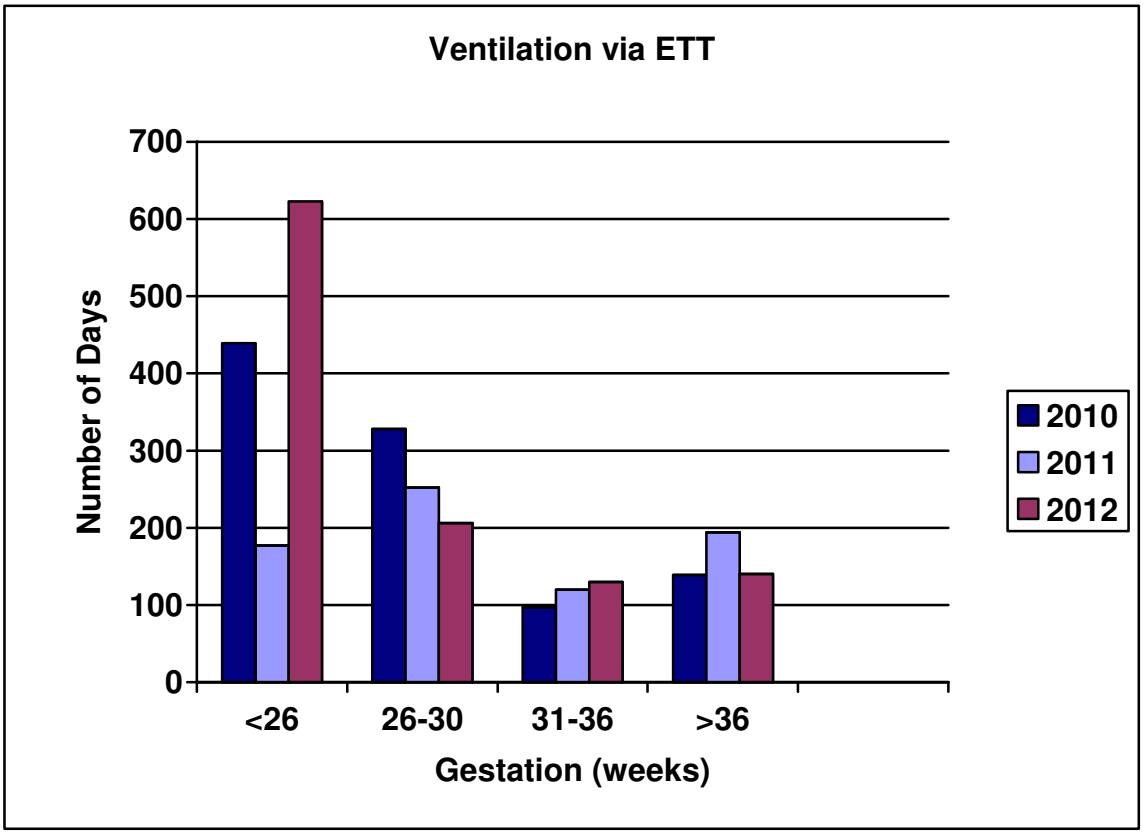
	2010		2011		2012	
	Days	Babies	Days	Babies	Days	Babies
Ventilation via ETT	1003	152	827	187	1208	240
CPAP and/or HFNC	2741	225	2580	258	2987	290
Oxygen therapy	1459	163	837	133	501	106
Surfactant		77		105		116
Nitric Oxide (days / babies)	53	16	55	15	43	19

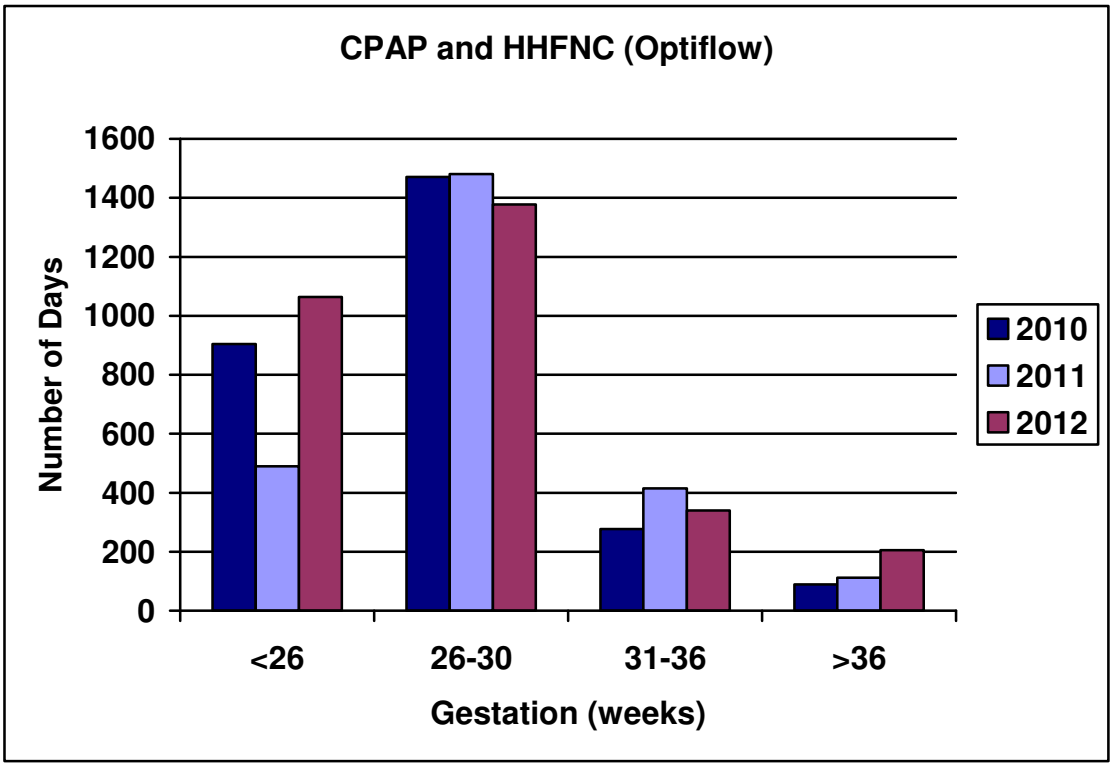
Respiratory diagnoses	Number of Babies		
	2010	2011	2012
Respiratory Distress Syndrome	187	195	**176**
Transient Tachypnoea	25	25	**17**
Persistent Pulmonary Hypertension	7	11	**6**
Pulmonary hypoplasia	2	1	**3**
Meconium aspiration	17	23	**15**
Cystic Fibrosis	0	0	**0**

Respiratory Complications	2010	2011	2012
Pulmonary haemorrhage	N/A	2	**8**
Pulmonary air leak requiring drain	10	15	**15**

Management of PDA	2010	2011	2012
Patent Ductus Arteriosus	38	30	**53**
PDA treated medically	23	11	**30**
PDA ligated	7	6	**8**

Infection	Positive Blood Cultures		
	2010	2011	2012
Group B streptococcus	2	3	1
Alpha haemolytic streptococcus	2	4	1
Coagulase-negative staphylococcus	51	26	34
MSSA	4	2	0
MRSA	0	0	1
Enterococcus faecalis	3	0	6
Listeria	0	0	0
Escherichia Coli	4	4	1
Klebsiella species	1	0	0
Serratia species	2	0	2
Enterobacter species	2	0	1
Pseudomonas species	1	1	0
Candida	0	0	0
TOTAL	**72**	**40**	**47**

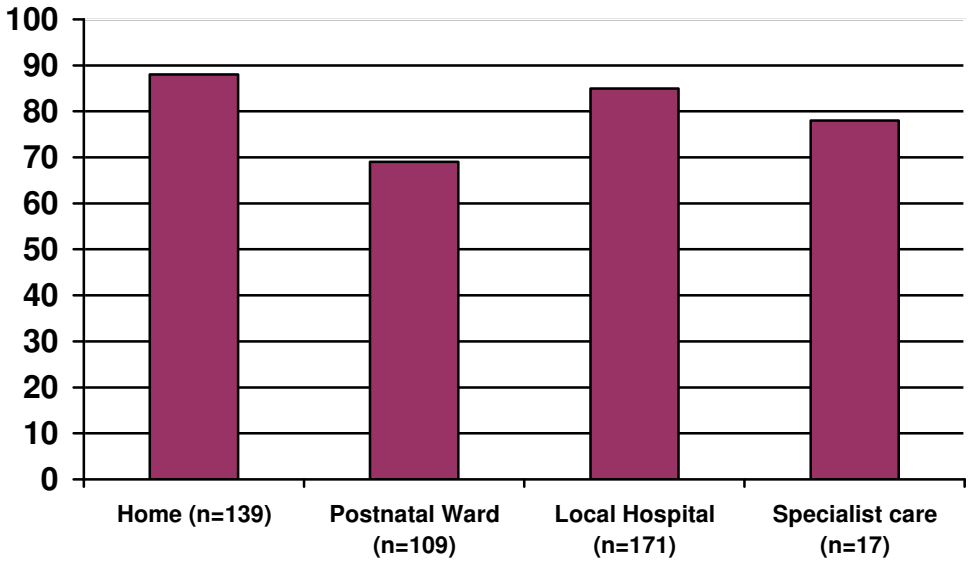

Ventilation via ETT
700
600
500
400
300
200
100
0
Number of Days
<26
26-30
31-36
>36
Gestation (weeks)
2010
2011
2012


CPAP and HHFNC (Optiflow)
1600
1400
1200
1000
800
600
400
200
0
Number of Days
<26
26-30
31-36
>36
Gestation (weeks)
2010
2011
2012

Necrotising Enterocolitis	2010	2011	2012
	Cases	Cases	Cases
NEC	19	26	18
Perforated NEC	1	2	4
NEC treated surgically	4	8	8

Neonatal Surgical Cases (not NEC)	2010	2011	2012
	Cases	Cases	Cases
Gastroschisis	5	3	5
Exomphalos	0	2	0
Hirschsprungs	0	4	3
Malrotation	1	0	0
Meconium ileus	0	1	2
Spontaneous perforation	2	1	3
Oesophageal Atresia / TOF	4	9	4
Intestinal atresia/obstruction	6	2	6
Inguinal hernia repair	1	4	4
Imperforate anus/rectal anomaly	4	9	3
Lung cyst/sequestration	0	2	2
Diaphragmatic eventration	0	1	1
Diaphragmatic hernia	0	3	2
Drainage of abscess	1	2	0
CVL insertion	3	5	5
Rectal biopsy	3	6	6
Drains/gastrostomy/vesicostomy	1	2	1
TOTAL	**31**	**55**	**47**

Percentage of discharged babies receiving breastmilk during their admissions in 2012



Discharge Destinations

Cranial Ultrasound Diagnoses	Number of Babies		
	2010	2011	2012
IVH with parenchymal involvement	3	7	9
Post haemorrhagic hydrocephalus requiring surgical intervention	1	1	0
Infarction without IVH	1	3	2
Periventricular ischaemic injury with cyst formation	3	2	2

All babies <32 weeks gestation have routine cranial ultrasound examination

Hypoxic Ischaemic Encephalopathy	2010	2011	2012
HIE grade 1	11	15	10
HIE grade 2	9	13	11
HIE grade 3	4	4	4
Hypothermia therapy	13	29	20
- *Inborn*	4	7	8
- *Outborn*	9	22	12

Retinopathy of Prematurity	2010	2011	2012
ROP grades 3/4	1	1	1
ROP treated with laser therapy	0	0	1

Screening as per recommendations from Royal College of Ophthalmologists

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
No discharge summary prepared causing delay in transfer.

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' leaflet.

Category	2008	2009	2010	2011	2012
Access, admission, transfer, discharge	10	9	8	5	**0**
Clinical assessment (including diagnosis, scans, tests, assessments)	10	7	12	5	**2**
Consent, communication, confidentiality	18	9	9	8	**7**
Documentation (including records, identification)	20	14	15	18	**9**
Implementation of care and ongoing monitoring / review	3	0	4	5	**5**
Infection Control Incident	1	0	1	1	**2**
Infrastructure (including staffing, facilities, environment)	17	4	7	4	**11**
Medical device / equipment	24	11	16	19	**9**
Drugs and prescribing	69	47	72	80	**53**
Patient accident	1	0	1	1	**0**
Treatment, procedure	44	30	28	19	**19**
Other Incident	3	0	2	5	**16**
Total	**223**	**131**	**175**	**170**	**133**

Grade	2008	2009	2010	2011	2012
No Harm: Impact Prevented	51	78	37	37	**20**
No Harm: Impact not Prevented	128	25	100	116	**108**
Low	37	25	35	16	**12**
Moderate	7	3	3	1	**0**
Severe	0	0	0	0	**0**
Total	**223**	**131**	**175**	**160**	**140**

Summary of Developmental Outcomes

Developmental follow-up takes place in baby clinic and at the Seaside View Children's Developmental Centre with Dr Yasmin Khan and the Specialist Health Visitors. For those babies cared for at PRH, Dr Fiona Weir and Dr Emma Gupta are the community contacts at the Nightingale Centre, Haywards Heath.

All babies who are likely to have developmental problems are referred to their local CDC.

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
- Hammersmith infant neurological examination
- Schedule of Growing Skills assessment
- Refer to specialist services as appropriate.

At 24 months' corrected age
- Bayley Scales of Infant Development III
- Thames Regional Perinatal Group Health Status Questionnaire
- Refer to specialist services as appropriate or discharge if no concerns.

Since September 2006 Bayley III assessments have been undertaken at 24 months corrected age for preterm infants born at <29 weeks gestation and/or <1000g. Results have been analysed for 116 Sussex born babies cared for on the TMBU within the first 24 hours of life.

Outcome (%)	Locomotor	Fine Motor	Receptive Language	Expressive Language	Cognitive
Normal	60 (52)	88 (76)	73 (63)	73 (63)	95 (82)
Mild impairment	38 (33)	17 (15)	20 (17)	18 (16)	11 (9)
Moderate impairment	11 (9)	3 (4)	10 (9)	13 (11)	4 (4)
Severe disability	7 (6)	7 (6)	13 (11)	12 (10)	6 (5)

* 4 babies not assessed, 14 did not attend, 11 moved away

Outcome according to gestation was as follows:

23 and 24 weeks gestation (n=16)

Outcome (%)	Locomotor	Fine Motor	Receptive Language	Expressive Language	Cognitive
Normal	7 (44)	9 (56)	8 (50)	7 (44)	10 (63)
Mild impairment	3 (19)	3 (19)	3 (19)	2 (12)	3 (19)
Moderate impairment	4 (25)	2 (12)	2 (12)	3 (19)	2 (12)
Severe disability	2 (12)	2 (12)	3 (19)	4 (25)	1 (6)

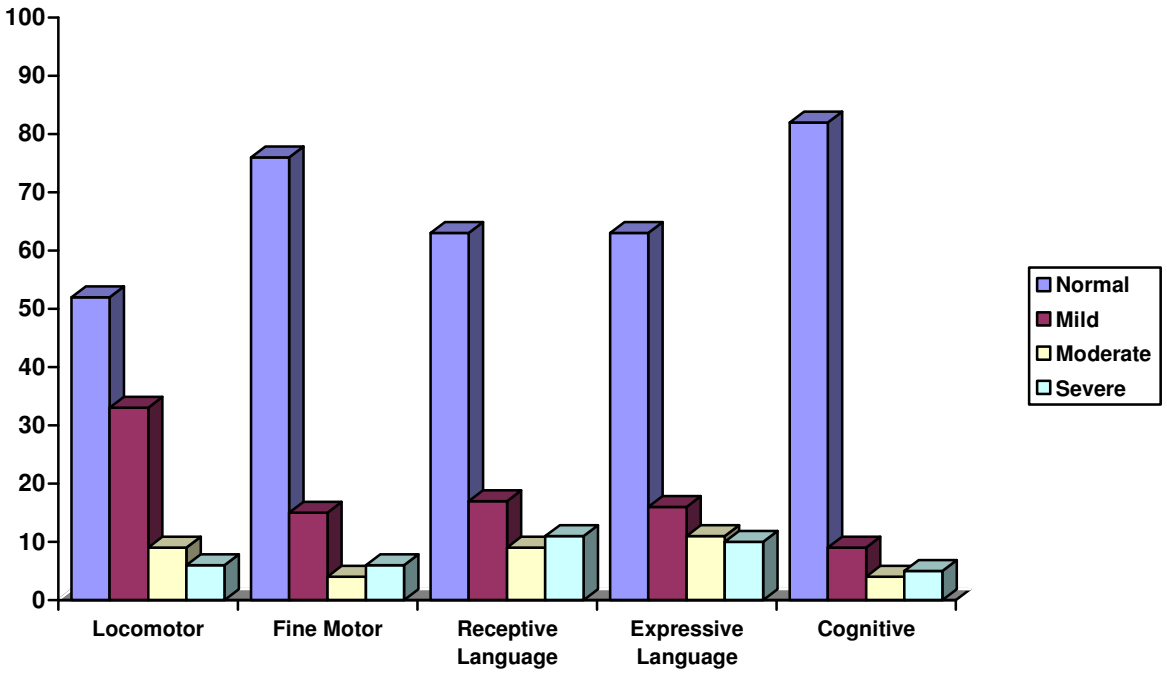
25 and 26 weeks gestation (n=19)

Outcome (%)	Locomotor	Fine Motor	Receptive Language	Expressive Language	Cognitive
Normal	7 (37)	13 (68)	8 (42)	9 (47)	14 (74)
Mild impairment	8 (42)	4 (21)	7 (37)	4 (21)	3 (16)
Moderate impairment	2 (11)	0	1 (5)	4 (21)	0
Severe disability	2 (11)	2 (11)	3 (16)	2 (11)	2 (11)

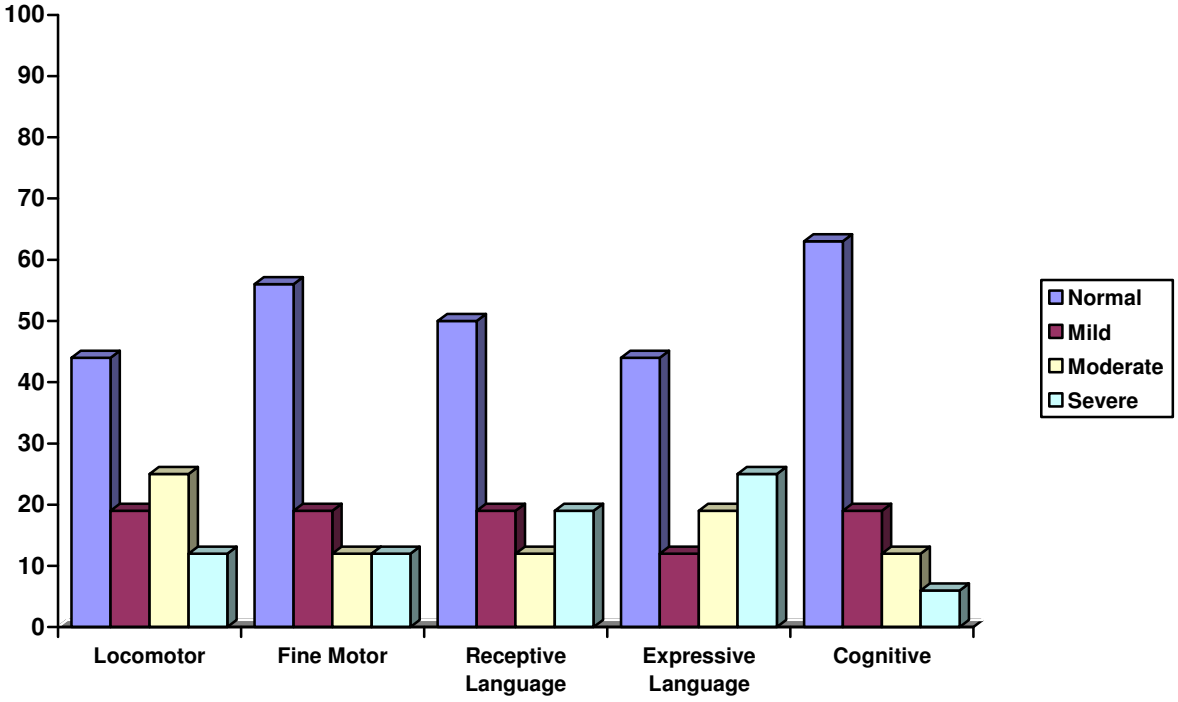
27 and 28 weeks gestation (n=81)

Outcome (%)	Locomotor	Fine Motor	Receptive Language	Expressive Language	Cognitive
Normal	46 (57)	66 (81)	57 (70)	57 (70)	71 (88)
Mild impairment	27 (33)	10 (12)	10 (12)	12 (15)	5 (6)
Moderate impairment	5 (6)	1 (1)	7 (9)	6 (7)	2 (2)
Severe disability	3 (4)	3 (4)	7 (9)	6 (7)	3 (4)

Neurodevelopmental Outcome of Pre-term Infants
<29 wks at 24 months' CGA
(n = 116)



Neurodevelopmental Outcome of Pre-term Infants
23 & 24 weeks at 24 months' CGA
(n = 16)

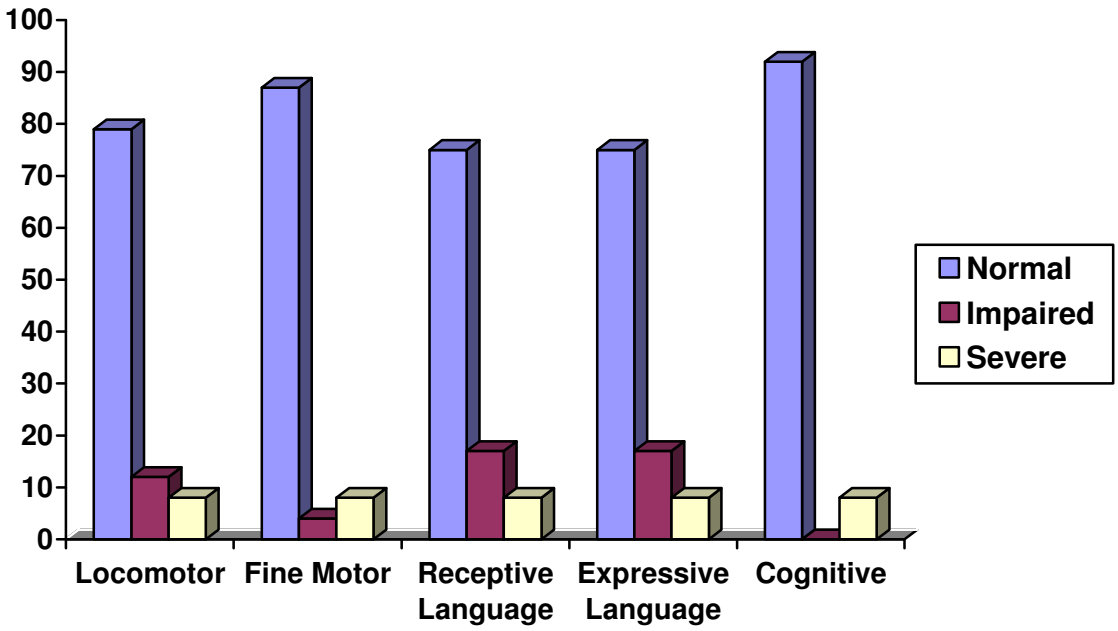


Since 2009 term babies who have received cooling therapy on the TMBU for hypoxic ischaemic encephalopathy have been assessed using Bayley III scales at 24 months.

Cooled babies	46
Assessments performed	24
Died	15
Did Not Attend	1
Out of area (referred for assessment locally)	3
Moved away	3

Neurodevelopmental Outcome of Cooled Babies (n=24)

Outcome (%)	Locomotor	Fine Motor	Receptive Language	Expressive Language	Cognitive
Normal	19 (79)	21 (87)	18 (75)	18 (75)	22 (92)
Impaired	3 (12)	1 (4)	4 (17)	4 (17)	0
Severe disability	2 (8)	2 (8)	2 (8)	2 (8)	2 (8)



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	221	155	164	540
Planned	232	137	220	589
Grand Total	453	292	384	1129

Team Availability	% Availability
Full Team Available	95.27%
No Team Available	0.95%
Doctor Only	1.46%
Nurse Only	2.32%

In 2012 there were 88 Sussex unplanned postnatal transfers for medical IC. 72.7% stayed within Sussex.

	Referring Network			Grand Total
	Kent	Surrey	Sussex	
Required medical IC and received outside region	18 (16.9%)	10 (17.9%)	24 (27.3%)	52 (20.7%)
Required medical IC and received within region	89 (83.2%)	46 (82.1%)	64 (72.7%)	199 (79.3%)
Total postnatal referrals for medical IC	107	56	88	251

Of the 110 unplanned surgical transfers referred postnatally, 90 originated in Kent & Surrey. 15 of these received surgical care in Sussex. Of the 20 referrals for postnatal transfers originating in Sussex, 18 stayed in Sussex for surgery

Receiving Network	Referring Network			Grand Total
	Kent	Surrey	Sussex	
Sussex	5	10	18	33
London	41	24	2	67
Out of Region	0	10	0	10
Grand Total	46	44	20	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 led by PD Dr. Rabe. Dr Rabe started her new position as Senior Clinical Lecturer and continues as Honorary Consultant Neonatologist. This arrangement has strengthened the 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
Libby Emery	Research nurse
Suzanne Lee	Research midwife
Cathy Olden	Research nurse
Sonia Sobowiec Kouman	Research nurse
Liz Symes	Research nurse
Hector Rojas	FP7 Project Manager

Overall 2012 proved very active for neonatal research.
Dr Rabe and Dr Rojas have worked intensively on the first stages of the European Commission's FP7 Health Research Project NEOCIRCULATION (NEO-CIRC €5.99m, 18 partners in 8 countries).

The Department has been involved in several other studies: Prechtl movement observational study, solids v breastfeeding and the 3.5 year follow-up programme of the cord clamping trial have now been completed. The paediatric and neonatal respiratory research team have secured NIHR-RfPB funding for a new study of pulse oximetry and a non-invasive respiratory support study (NIRS). Recruitment for the Go-Child Study and neurodevelopmental follow-up studies of pre-term infants are ongoing. The comparison of bilirubin measurements study is currently recruiting to the second phase.

Recruitment to multi-centre trials has been active. The OPPTIMUM Trial will close recruitment on 31 March 2013, the viral load immunity in congenital cytomegalovirus infection study is still open. The Neomero II Trial (Meropenem for meningitis in babies <3 months of age) has recently commenced and recruitment into the PiPS Trial (trial of probiotic administered early to prevent infection and necrotising entercolitis) continues.

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 Psychology, University of Sussex (Dr Susan Ayers). We have successfully completed the second stage of our Workpackage in which parents were interviewed about the care of their pre-term infant. As part of this Workpackage a parent questionnaire on the care of their preterm infant at delivery has been developed and piloted.

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).

All studies are performed in close collaboration with the BSUH Research and Development department and we express our thanks to Scott Harfield and Dr David Crook 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, we organized the sixth Regional Paediatric and Neonatal Research Day, which was very well attended. A further similar event is planned for 12th September 2013.

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 new role of Senior Clinical Lecturer, has taken over the module 305 lead for Paediatrics and Neonatology.

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.

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

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:

- Specialist midwife 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 Obstetrician
- 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 normal 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/postnatal

Week 3 RSCH One Stop Clinic – baby appointments only

Week 4 RSCH One Stop Clinic – antenatal/postnatal

In 2012 twelve babies were admitted to Trevor Mann Baby Unit with Neonatal Abstinence Syndrome.

Speech & Language Therapy Service (SLT)

This service is 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 in the Royal Alexandra Children's Hospital. Cover is also provided to various inpatient and outpatient clinics, including the Nutrition Round and the BPD Clinic. Support for Neonatal follow up clinics can be arranged as required by contacting Jane Pettigrew. Referrals are made to the team by phoning (ext 2527), emailing or writing to Jane Pettigrew (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 maybe 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.

Satellite Breast Milk Bank

The essential elements of a satellite donor expressed breast milk bank service are that donors are recruited locally and the breast milk is pasteurised by the Breast Milk Bank in Southampton. Southampton then retains a small percentage of the milk as 'payment' and the remainder is returned, free of charge, to BSUH for use.

Purpose
The purpose of providing a regular cost effective supply of donor breast milk is to promote infant health. The objectives of the DEBM Bank Service are:-

- To supplement and or complement maternal breast milk in the new-born period.
- To make available DEBM for preterm and sick babies on the TMBU and SCBU PRH, when maternal breast milk is not available, so that feeding may be established at the optimum time in the baby's management.
- To make DEBM available for the introduction of feeding post-neonatal surgery when maternal breast milk is not available.
- To make available DEBM to babies whose mother wishes to breastfeed where there is a short-term interruption in maternal supply e.g. if mother undergoing an operation.

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'.

Early Birth Association and Fundraising

The Early Birth Association is a group of parents who have had premature or sick babies in special care units. It was formed on TMBU 24 years ago and offers help and support to new parents who are facing the same worrying experiences that they once faced.

EBA is a registered charity. Money raised is spent on items for TMBU, ranging from winceyette sheets for the incubators, wool for blankets and shawls (some of these are for bereaved parents so they will have a keepsake), incubator bonnets, triangular pillows and the fabric for covers, to vital lifesaving equipment.

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

Outreach

The Neonatal Outreach team has been running since August 2012. It consists of a Sister who works full time, and a Nursery nurse who works 22.5 hours per week. Both play key roles in the discharge and support of the premature babies from TMBU and PRH SCBU. The nurses work with families and support them in feeding and caring for their baby prior to going home. Families can choose to NG tube feed babies at home if they wish: there is a higher success rate in breast feeding if this happens. The service supports the babies and their families for approximately 4 weeks post discharge or the expected due date, whichever comes first and most suits the needs of the baby. The Outreach team covers a wide area around both RSCH and PRH hospitals. The service not only saves the unit special care days, more importantly it enables families to have their babies at home with them earlier.

Parent Forum

The Parent Forum has now been established for over 5 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 questionnaires which are sent to all parents who have experienced the service. 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.

In 2012, the group led the development of a DVD which introduces parents and families to the two neonatal units. Members of the group were involved in filming the DVD for which we are grateful.

Members of the group have provided regular coffee morning for parents on the Special Care Baby Unit at Princess Royal Hospital.

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 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.

Appendices

Appendix 1

BAPM Categories of Neonatal Care 2001

In this new edition only babies that are so sick or have a high likelihood of acute deterioration such that they need 1:1 care by a nurse with a neonatal qualification and the immediate presence of a competent doctor have been classified as receiving *intensive care*. In the absence of prospectively collected data the new 'Categories of Neonatal Care' are based upon clinical experience. Wide consultation amongst the members of BAPM and the NNA has taken place which has resulted in these new designations.

The major change has been to move babies five days old, who are clinically stable but still receiving nasal CPAP (NCPAP), from the intensive to the high dependency category. This will have impact upon the number of days of intensive and high dependency care activity recorded by a unit and it is important that departments record when they begin to use the new definitions.

These categories reflect the care a baby receives on any part of the day in question irrespective of whether or not the hospital aims normally to provide care at that level. Babies requiring **transport** inevitably need at least 1:1 nursing and will often need medical support. Transport activity should be recorded separately and has been excluded from the 'Categories'.

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.

CLINICAL GOVERNANCE PERFORMANCE FOR NEONATOLOGY 2012 APPENDIX 3

CLINICAL GOVERNANCE ELEMENT	COMPLETED/ IMPLEMENTED	COMMENTS & ACTIONS
International & National Guidance		
European Consensus Guidelines on the Management of Neonatal RDS in Preterm Infants – 2010 Update	Yes	• Currently being audited/proforma piloted
NICE Guidance Intrapartum Care CG 55/Antibiotics for Early-onset Neonatal Infection CG 149	Yes	• New guideline CG149 implemented and adherence audited • All requirements fulfilled • Compliance with guideline generally good • Improve blood culture reporting system • Improve follow-up CRP checks • Consider modification of Gentamicin dosing schedule • Present results at national or regional meeting/publish in peer-reviewed journal
NICE Guidance Postnatal Care CG 37/NIPE Guidance	Yes	• Currently pilot site for NIPE • Guidelines revised to meet BFI and NICE standards • All requirements according to NIPE fulfilled except for DDH screening • Introduce selective DDH screening
Hypoglycaemia Guideline/NICE Guidance Diabetes in Pregnancy CG 63	Yes	• Guideline amended for new WHO-UK growth charts • Guideline revised to meet BFI standards • All requirements fulfilled • Audit of updated guideline
NICE Guidance Neonatal Jaundice CG 98	Yes	• All requirements fulfilled • Compliance with guideline generally good • Improve standard of frequency of bilirubin checks and phototherapy documentation
Therapeutic Hypothermia IPG 347	Yes	• All requirements fulfilled • TOBY register data entry now included in NNAP database (Badgernet)
National Audits		
Maternal & Perinatal Mortality Notifications	Ongoing	• CEMACE was replaced by MPMN in April 2011. From the 1st January 2013, data collection will be the responsibility of MBRRACE-UK (to be launched in February) and will no longer be collected via the MPMN portal • 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
National Neonatal Audit Programme	Ongoing	• Overall good reporting quality • Remind all members of staff in Neonatology and Obstetrics about the importance of antenatal steroids • Improve ROP checks documentation through electronic transfer of information from Metavision to Badgernet
National Training Survey	Ongoing	• Overall trainee satisfaction average • Local teaching above average • Continue efforts to excel in all areas of trainee education
BLISS Survey of Parental Experiences 2010 - 2011	Completed	• 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
National Programmes & Projects		
Neonatal Hearing Screening	Ongoing	• KPI target is 95% - Brighton & Hove PCT 96.4% • Local audit/research project looking at current practice completed and presented at ESPR meeting • Information will be submitted for publication
Neurodevelopmental Outcome	Ongoing	• 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
Essence of Care Benchmarking by Nursing Staff	Ongoing	• No change
Neonatal Transport Service	Ongoing	• 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
Trust Identified Projects		
Perinatal Mortality & Morbidity Meeting	Ongoing	• Monthly joint meeting with Obstetrics & Gynaecology mortality and morbidity meetings
Neonatal Mortality & Morbidity Review	Ongoing	• Quarterly presentation at Neonatal Clinical Governance Meeting
Audit of Perinatal Management of Infants Born to Mothers with HIV	Ongoing	• Overall adherence to guideline good • Re-audit yearly • Documentation could be improved • Consider designing joint antenatal and postnatal consultations and management document
Audit of Blood Cultures (Microbiology)	Ongoing	• Antibiotic guidance changed • Rate of positive gr+ and gr- blood cultures has significantly decreased • Trend towards a rise in CONS pos. blood cultures • Continue work on improving infection rates
Audit: Infection Control	Ongoing	• Good compliance generally (including hand hygiene and care bundles) - 5 moments of hand hygiene 94%
Survey: Parent Satisfaction	Ongoing	• Overall high degree of patient satisfaction • Patients would welcome neonatal specialist support after discharge in the community • Explore ways to improve communication
Review of Risks, Incidents, Complaints & Claims	Ongoing	• There is slight reduction in medication errors – still two main areas for improvement are medication errors and communication failure • Virtually all incidents are minor • Explore new ways of improving medication errors and communication
Specialty Identified Projects		
Audit of ANNP X-ray Interpretation and Documentation	Completed	• High level of performance amongst ANNPs • Improve documentation of gastric tubes amongst ANNPs • Improve hand-over of findings from patients transferred out • Consider extending the scope of audit
Audit of Antenatal Steroid Use	Completed	• Antenatal steroid rate well below national standard • Change O&G protocol to improve antenatal steroid rate • Introduce different measures to improve identification of mothers needing antenatal steroids (notes sticker, fibronectin) • Extend antenatal steroids to 23 weeks gestation • Consider repeat steroid course in very premature babies or mulitples
Audit of Parents on Neonatal Transfers	Completed	• Overall very positive feedback from parents reinforcing current approach • Consider producing laminated sheets with some set guidance and rules that can be shown to parents before accompanying their baby on a transport • To look into formalizing the system of accompanying parents in the KSS transport service
Guideline for Infection Control and Toys	Completed	• Practical guidance on how to deal with general infection control questions as well as use of toys
Guideline for RSV Vaccination	Completed	• General update on international and national guidance as well as funding issues
Audit of Postnatal Ward Care	Completed	• Transitional care is not well developed affecting overall care • Improve equipment, IT and notes filing • Provide a second bleep to postnatal trainee so that labour ward bleep can be carried by a different person to ease workload • Develop Transitional Care

Appendix 4

Research

Local Studies

Neurology
Standardized Follow-up of preterm infants (inborns, less than 29 weeks or less than 1000g)
Contact: Dr P Amess, Caroline McFerran

Cord Clamping Trial Follow-Up Programme 3.5 years
Neurodevelopmental Follow-up of Preterm Infants enrolled into the study on slight delay of cord clamping time versus milking of the cord
Contact: Dr H Rabe, Libby Emery

Go-Child
Influence of Genetic and Environmental factors on Childhood Diseases
Contact: Prof S. Mukhopadyay, Becky Allen

Bilirubin Study: Bilispect device
Comparison of Bilirubin Measurements by laboratory Dumas Method with non-invasive white light spectroscopic Method in preterm and term neonates
Contact: Dr H Rabe, Sonia Sobowiec, Kate Moscovici

New waveform analysis of lung function and pulse oxymetry in children with wheeziness
Contact: Dr P Seddon, Dr H Rabe, Cathy Olden

Multicentre Trials

Neomero II
Meropenem for meningitis in babies < 3 months of age.
Contact: Dr H Rabe, Dr K Bevan, Libby Emery

PiPS
Trial of probiotic administered early to prevent infection and necrotizing enterocolitis.
Contact: Dr R Fernandez

OPPTIMUM
Progesterone prophylaxis to prevent pre-term labour
Contact: Mr Tony Kelly, Suzanne Lee, Dr H Rabe

VICC
Viral Load immunity in congenital cytomegalovirus infection study
Contact: Dr H Rabe, Sonia SobowiecKouman

NIHR-Programme Grant (Duley et al)
Improving quality of care and outcome at very preterm birth
Contact persons: Dr H Rabe, Liz Lance, Susan Ayers

Peer reviewed Papers

ETTNO investigators: The 'effects of transfusion thresholds on neurocognitive outcome of extremely low birth-weight infants (ETTNO)' study: Background, aims, and study protocol. Neonatology 2012; 101:301-305

Fernandez Alvarez JR, Moorthy I, Kenney I, Rabe H: Diagnosis of grey matter heterotopia on cerebral ultrasound in a newborn: lessons from a case report for daily clinical practice. Ultrasound 2012; 20:54-57

Walter K, Montgomery J, Amess P, Rabe H: Hyponatraemia and brain oedema in newborns following oral water intoxication during prolonged labour. [Hyponatriämie und Hirnödem bei Neugeborenen nach intrapartaler oraler Wasserintoxikation] Klin Paediatr 2012; March 22 [epub ahead of print]

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Leaf A, Dorling J, Kempley S, McCormick K, Mannix P, Linsell L, Juszczak E, Brocklehurst P; Abnormal Doppler Enteral Prescription Trial Collaborative Group: Early or delayed enteral feeding for preterm growth-restricted infants: a randomized trial. Pediatrics. 2012 May;129(5):e1260-8.

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Rabe H, Saint-Raymond A: Paediatric Drug Regulation. In: Griffin JP(Ed.): The Textbook of Pharmaceutical Medicine. 7th Edition Wiley Blackwell Oxford 2012 (in print)

Lillitos P, Rabe H: On the Use of Placental Blood in Preterm and Term Newborns. In: Gotsiridze-Columbus N (Ed) Childbirth Research: New Developments. Nova Science New York 2012 (in print)

Other invited publications

Rabe H. The children of our future. Public Service Review: European Union: issue 23; 1 March 2012

Presentations at national and international meetings

Rabe H, Stilton D, Borbely T,Amess P, McFerran C, Horst J, Ayers S: 2 year neurodevelopmental outcome of preterm infants randomized to delayed cord clamping (DCC) or milking of the cord (MC) at birth. PAS Annual Meeting, 28.4.-1.5.2012, Boston, USA
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Thorup K, Monk V, Gourlay E, Aiton N: Feasibility study using facial analysis software to document facial features associated with fetal alcohol syndrome in newborn infants. British Neonatal Society Summer meeting, Canterbury 21.-22.6.2013
http://www.neonatalsociety.ac.uk/abstracts/thorupk_2012_fetalalcoholfacies.shtml

Rabe H, Borbely T, Amess P, McFerran C, Ayers S: Neurologische Entwicklungsuntersuchung von ehemaligen Fruhgeborenen der randomisierten Studie zur plazentaren Transfusion durch verzogerte Abnabelung (VA) oder Ausstreichen der Nabelschnur (AN). GNPI, 12.-16.9.2012, Hamburg, Germany
Monatsschr Kinderheilkd 2012; 160: Suppl1

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