Annual Report 2010

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
CEMACH	Confidential Enquiry into Maternal and Child Health
CPAP	Continuous Positive Airway Pressure
CA	Corrected age
CVL	Central venous line
DEBM	Donor expressed breast milk
EBA	Early Birth Association
GA	Gestational age
HD	High dependency
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 SEND. 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.

As one of two level 3 units in the Surrey and Sussex Neonatal Network we provide a tertiary neonatal intensive care service and neonatal surgical service for Brighton, East and West Sussex. We also provide a special care service for Brighton and Mid-Sussex. In 2010, there were 3,412 deliveries at the Royal Sussex County Hospital and 2,474 deliveries at the Princess Royal Hospital.

Since 2009 there have been 27 cots on the TMBU. We are staffed for 9 intensive care cots, 8 high dependency care cots and 10 special care cots. Current capacity should provide sufficient intensive care facilities for Sussex babies. During 2010 96% of Sussex babies received their intensive care within network. We are however mindful that SC occupancy has remained very high for the TMBU during 2010 and unfortunately this has occasionally blocked intake of new IC cases. Work is needed to reduce SC occupancy by improving transitional care facilities, introducing community outreach services and working with level 1 units to facilitate efficient discharge back to local units.

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 the team of 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 before delivery. There are facilities at PRH for short term ventilation and stabilisation of infants prior to transfer. Infants requiring short periods of high dependency care on CPAP are routinely managed at PRH.

2010 figures for both survival and neonatal mortality rates have been very encouraging. The department of neonatology at the BSUH continues to work towards improving standards. We aim to:

- liaise closely with obstetric colleagues to enable the highest possible standard of perinatal care
- provide the highest possible standards of neonatal care for babies and their families
- operate a high quality, safe neonatal transport service
- improve the quality and safety of care through clinical governance, education and multidisciplinary working
- provide the highest possible standards of training for middle grade and junior medical staff, nursing staff and undergraduate students
- provide comprehensive follow-up of high risk infants until two years corrected age

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.

The relationship with the RACH continues to develop to mutual advantage. We benefit from the developing tertiary services in the ‘Alex’, 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.

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

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 and our own vehicle, and provide a dedicated consultant to the service during daytime hours. In 2010 we welcomed Dr Cathy Garland as a new transport consultant.

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.

There is a weekly neonatal follow-up clinic on both the RSCH and PRH sites. Monthly neurodevelopmental clinics at the RACH are used to follow preterm and birth asphyxiated babies. The Seaside View and Nightingale Child Development Centres provide multi-disciplinary care for those infants needing ongoing neurodevelopmental support.

The department has a full programme of research, clinical governance and education. Achievements in these areas during 2010 include our neonatal department being the first in the UK to be accredited as a European Training centre for Neonatology by the European Society for Neonatology and European Society for Paediatrics. A recent GMC survey of trainees rated our educational programme as outstanding and research on cord clamping in preterm infants has contributed to the up-dated European Guidelines on Neonatal Resuscitation.

Staffing

Medical Staff

Consultant Neonatologists

Dr Neil Aiton	Special interest in Neonatal Cardiology
Dr Philip Amess	Lead Clinician, Network Clinical Lead
Dr Robert Bomont	Paediatric College Tutor
Dr Ramon Fernandez	Lead for Clinical Governance
Dr Cathy Garland	Transport Consultant
Dr Cassie Lawn	Lead for Transport
PD Dr Heike Rabe	Lead for Research and Vice President of the European Society of Paediatric Research
Dr Paul Seddon	Special interest in Paediatric Respiratory Medicine
Dr Ryan Watkins	Clinical Director for Children's Services

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

Consultant Ophthalmologist: Mr Bruce McLeod, Mr Dominic Heath

Consultant Audiologist: Mr Rob Low

Consultant Pathologist: Dr Simi George (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

Consultant Paediatric Surgeons:
Mr Varadarajan Kalidasan
Miss Ruth Hallows
Miss Anouk van der Avoirt
Mr Anies Mohammed
Mr Timothy Turnbull (Orthopaedics)
Mr Simon Watts (ENT)
Mr Meredydd Harries (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
	3 Specialist Registrars (2 ST4, I ST5, 1 Grid)
	6 Trust Clinical Fellows
Tier 1:	6 ST3
	1 Trust Clinical Fellow

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

Neonatal Nurses (TMBU)

Senior Nursing Staff

Mrs Clare Child	Lead Nurse for Paediatric and Neonatal Nursing
Mrs Chris Dove	Matron Neonatology
Mrs Susanne Simmons	Lecturer Practitioner
Mrs Clare Morfoot	Clinical Practice Educator
Mrs Tracey Joyce	Clinical Facilitator

Advanced Neonatal Nurse Practitioners

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

Band 7

Liz Hewitt
Sandra Hobbs
Clare Baker
Jackie Cherry
Karen Marchant
Judith Simpson
Louise Barton (Transport Nurse)

Band 6

Linda Barrow, Liz Day, Marie Dudley-ward, Tina Evans, Chris Fearn, Cathy Garner, Belinda Gardner, Chrissie Leach, Teresa Wilkinson, Clare Dickinson, Hilary Sparkes, Nikki Clark, Gill Hobden, Susan McRae, Emma Binns, Julie Nalletamby, Val Potter, Alice Le Voi, Wen Chiu, Betina Jahnke, Francis Pante, Libby Emery, Mel Brittain, Sarah Quinton, Carly Taylor, Amanda Bensilum, Samantha Walters, Natalie Jestico, Alice Kavati, Belinda Coetzee, Lauren Devoy, Jenna Jarvis, Hannah Stanley, Nancy Dequila, Mel Parrott.

Band 5

Leonora Enriquez, Iva Richardsova, Hui Chen Lin, Tania White, Amie Cameron, Clare Watson, Katie Hogben, Nicola Ford, Sarah Randall, Beena George, Latha Alosius, Elaine Markwick, Rachel Beston, Nikki Perretta, Rachel Burton, Francesca Candiani, Charlotte Moore, Hannah Fraser-James, Louise Powell, Jo Makri, Lucy Green, Fiona Boxall, Zoe Hall, Rebecca Friedrich, Sarah Guy, Corie Hoelters, Claire Hunt, Germaine McElwaine, Alison Lawrence, Sylvia Walker-Spiers, Nikki Whiteley, Amanda Denyer, Dawn Ingham, Rebecca Brook, Jonathan O'Keeffe, Eva San Roman, Charlotte Taylor, Igone Sesma Mancisidor.

Band 4

Jackie Mason, Mavis Dawson, Sara Arief

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.

Band 5
Sue Nightingale, Irene Silander, Jenny Karkar, Katherina Page, Heather McAuley.

Band 4
Judy Chadd, Chris Pitt, Jo Cottington, Naylia Mogel.

Support Staff

Unit Technician
John Caisley

Speech and Language Therapists
Alex Lazell
Jane Pettigrew

Pharmacist
Mike Pettit

Physiotherapy
Melanie Smith

Dietician
Carole Davidson

Counsellor
Sally Meyer

Secretarial support
Marisa Barbieri
Emma Morris
Patricia Walker

Admissions, Activity and Mortality
Trevor Mann Baby Unit

TMBU Admissions	Total Admissions per year
2000	497
2001	424
2002	364
2003	450
2004	404
2005	444
2006	415
2007	465
2008	524
2009	456
2010	**525**

Includes re-admissions

TMBU Admissions	2008	2009	2010
Total number of live births (RSCH)	3516	3345	**3412**
Total admissions (including re-admissions)	524	456	**525**
Inborn	376	356	**361**
Inborn booked RSCH	294	269	**291**
Inborn booked elsewhere	82	87	**70**
Outborn	127	76	**128**
Re-admissions	21	18	**30**
Admissions from home	6	4	**4**
Percentage inborn births admitted to TMBU	9.3	10.6	**10.5**

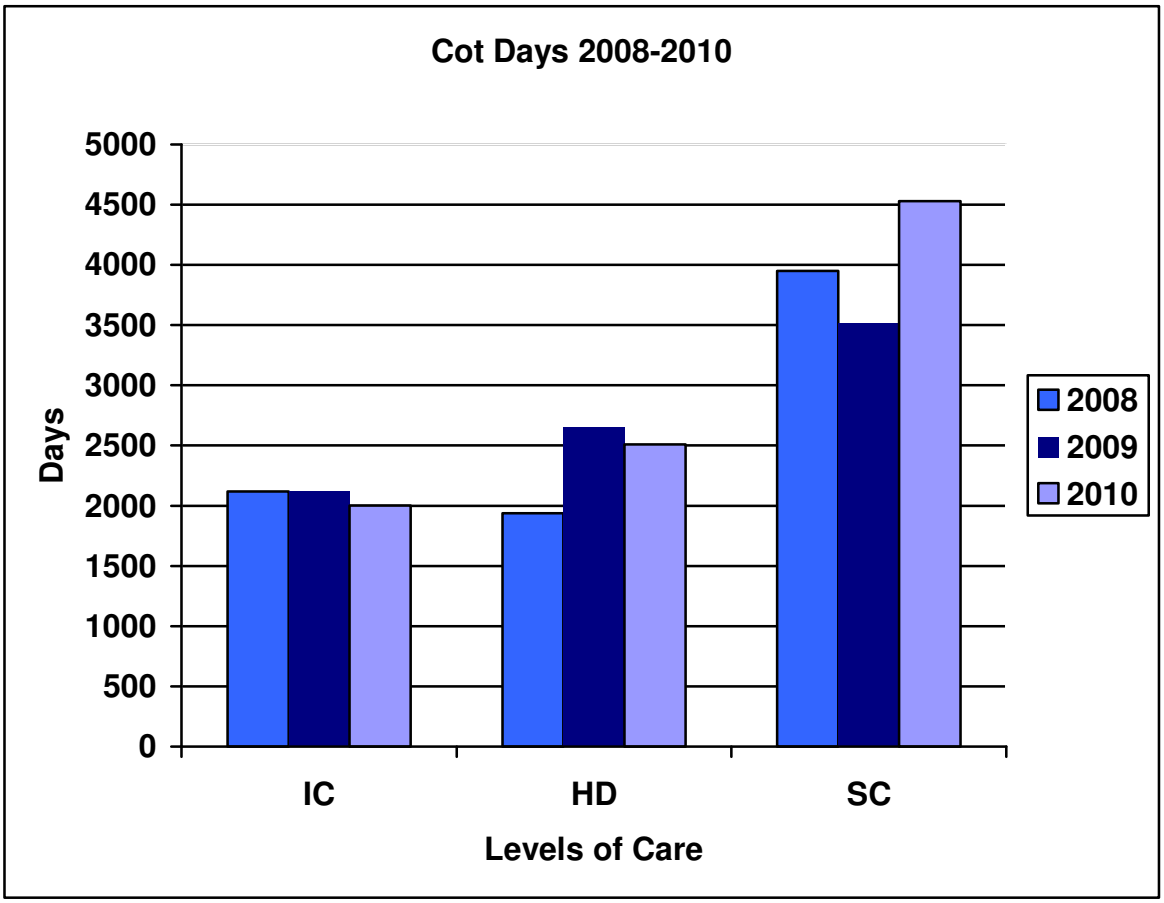
Admission details*	2008		2009		2010	
Gestation (weeks)	**Babies**	**%**	**Babies**	**%**	**Babies**	**%**
23	2	<0.5	7	1.5	**1**	<0.5
24	16	3	11	2	**12**	2
25	8	1.5	9	2	**10**	2
26	10	2	10	2	**10**	2
27	19	4	19	4	**16**	3
28	19	4	22	5	**19**	4
29	18	3.5	21	5	**14**	3
30	16	3	12	3	**23**	5
31	31	6	17	4	**21**	4
32	27	5	19	4	**36**	7
33-36	125	24	110	24	**155**	31
37-42	208	40	179	39	**178**	36
>42	1	<0.5	1	<0.5	**0**	0
Birthweight (g)						
<500	3	0.5	1	<1	**1**	<0.5
<750	27	5	22	5	**17**	3
<1000	31	6	36	8	**25**	5
<1500	53	10	68	15	**66**	13
Multiple births (number of babies)						
Twins	98	19	63	14	**100**	20
Triplets	6	1	7	1.5	**17**	3

Does not include re-admissions

Transfers in	2008	2009	2010
In-Utero	158	148	**143**
Babies delivered and admitted	82	87	**70**
Refused transfers in	120	192	**145**
Ex-Utero	124	75	**128**
Princess Royal Hospital	39	15	**35**
East Sussex Hospitals	36	24	**39**
West Sussex Hospitals	17	12	**24**
Other Network Hospitals	11	12	**11**
Outside Network	21	12	**46**
Refused transfers in	23	30 (9 surgery, 1 cooling)	**59** (3 surgery)
Delayed transfers in (days)	Not known	71	**105**

Does not include re-admissions or home births

Cot occupancy	2008		2009		2010	
Cots	**Days**	**% occ**	**Days**	**% occ**	**Days**	**% occ**
IC	2119	73	2218	76	**2001**	61
HD	1937	112	2652	121	**2510**	88
IC & HD (total)	4056	87	4870	95	**4511**	74
SC	3949	108	3514	96	**4529**	**124**
Total	**8005**	**96**	**8384**	**96**	**9040**	**93**



TMBU Care Categories 2010					(*2001 BAPM definition for care levels, see Appendix 1)*	
Gestation	**IC**		**HD**		**SC only**	
at birth (weeks)*	**Babies**	**Days**	**Babies**	**Days**	**Babies**	**Days**
< 23	0	0	0	0	0	0
23	3	98	2	66	0	0
24	14	485	10	298	0	0
25	9	268	8	220	0	0
26	8	179	13	294	0	0
27	15	224	18	515	3	24
28	15	106	18	379	0	0
29	11	47	14	135	1	7
30	19	69	16	172	3	22
31	14	40	8	32	7	192
32	24	75	14	156	10	161
33	18	42	3	19	18	259
34 – 36	52	140	113	113	68	718
37 - 41	74	228	30	111	84	312
> 41	1	1	0	0	8	27
Total	**277**	**2001**	**267**	**2510**	**202**	**1722**

***Includes all babies in the Unit during 2010 (may have delivered in 2009)**

Mean lengths of stay on TMBU (days)				
Gestation (weeks)	Discharged Home		Discharged to referring hospital	
	2009	2010	2009	2010
23	-	-	93	87
24	128	-	73	42
25	105	72	58	31
26	-	76	37	36
27	93	58	24	33
28	64	56	33	30
29	52	27	27	7
30	48	55	18	13
31	52	41	9.5	8
32	37	25	6	12
33	21	17	7.5	8
34-36	12	12	6	10
37-41	5	5	6	6
>41	4	4	9	0

Does not include babies who died whilst on TMBU or babies who were admitted during 2010 but are still inpatients

Transfers out	2008	2009	2010
Specialist medical care	9	5	**15**
Surgery	15	9	**9**
Cardiac care	3	4	**4**
Discharges			
Home	145	132	**163**
Postnatal ward	**131**	**135**	**115**
Local hospital care	170	152	**189**
Princess Royal Hospital	67	60	**72**
RACH	8	25	**37**
East Sussex Hospitals	39	27	**38**
West Sussex Hospitals	18	25	**33**
Other Network Hospitals	N/K	14	**10**
Delayed transfer out to local care (days)	N/K	147	**194**

Mortality Statistics (RSCH)	2006	2007	2008	2009	2010
Total deliveries	3295	3371	3528	3345	**3412**
Total livebirths	3282	3356	3516	3332	**3389**
Total stillbirths	13	15	12	13	**23**
Deaths before admission*	N/K	N/K	N/K	4	**3**
Total neonatal deaths on TMBU	20	17	29	21	**12**
Inborn	11	8	14	16	**7**
Outborn	9	9	15	5	**5**
Early neonatal deaths**	3	5	6	10	**4**
Late neonatal deaths**	4	3	4	4	**3**
Deaths >28 days**	4	0	4	3	**2**
Still birth rate	3.9	4.4	3.4	3.9	**6.7**
Perinatal mortality rate	4.9	5.9	5.1	6.9	**7.9**
Neonatal mortality rate**	2.1	2.1	2.8	5.4	**2.9**

**** Terminations and deaths <22 weeks gestation not included. Deaths before admission have been included into neonatal mortality rates for 2009 and 2010.***

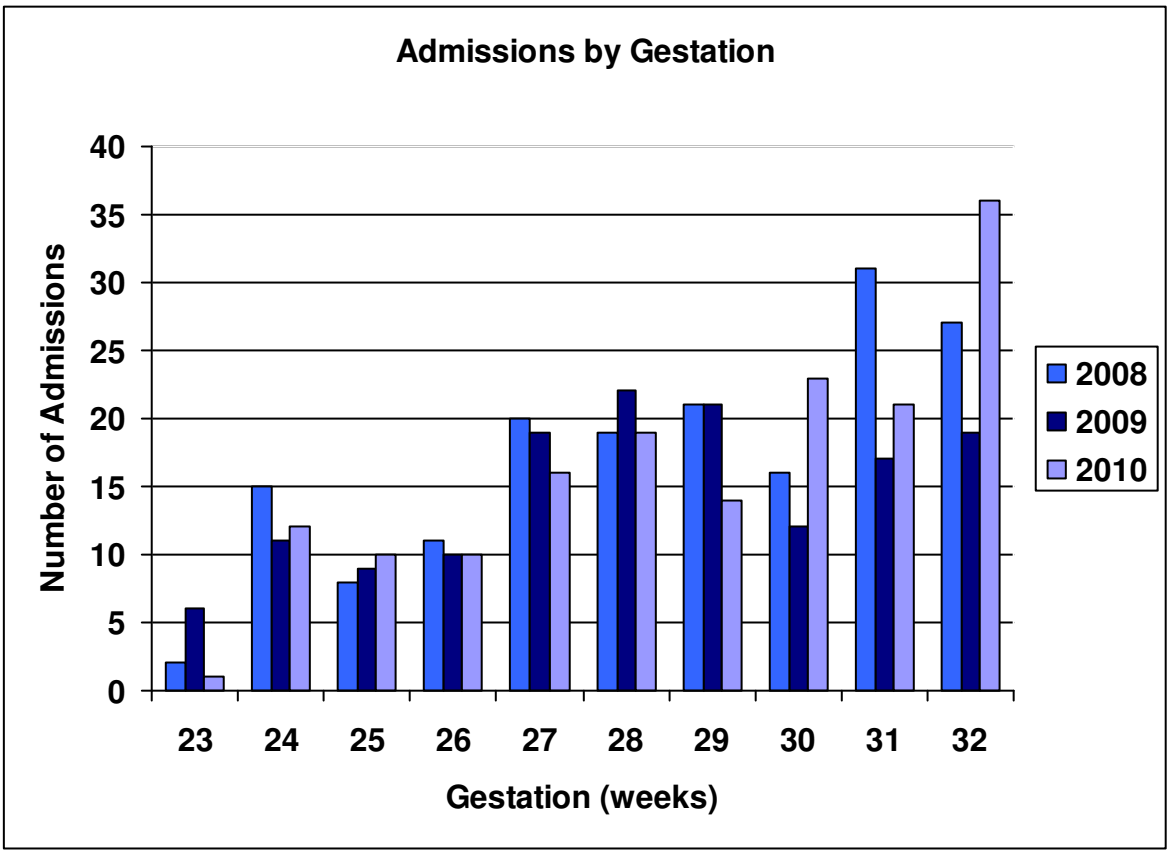
*****Inborn (booked and unbooked) excluding lethal congenital abnormalities***

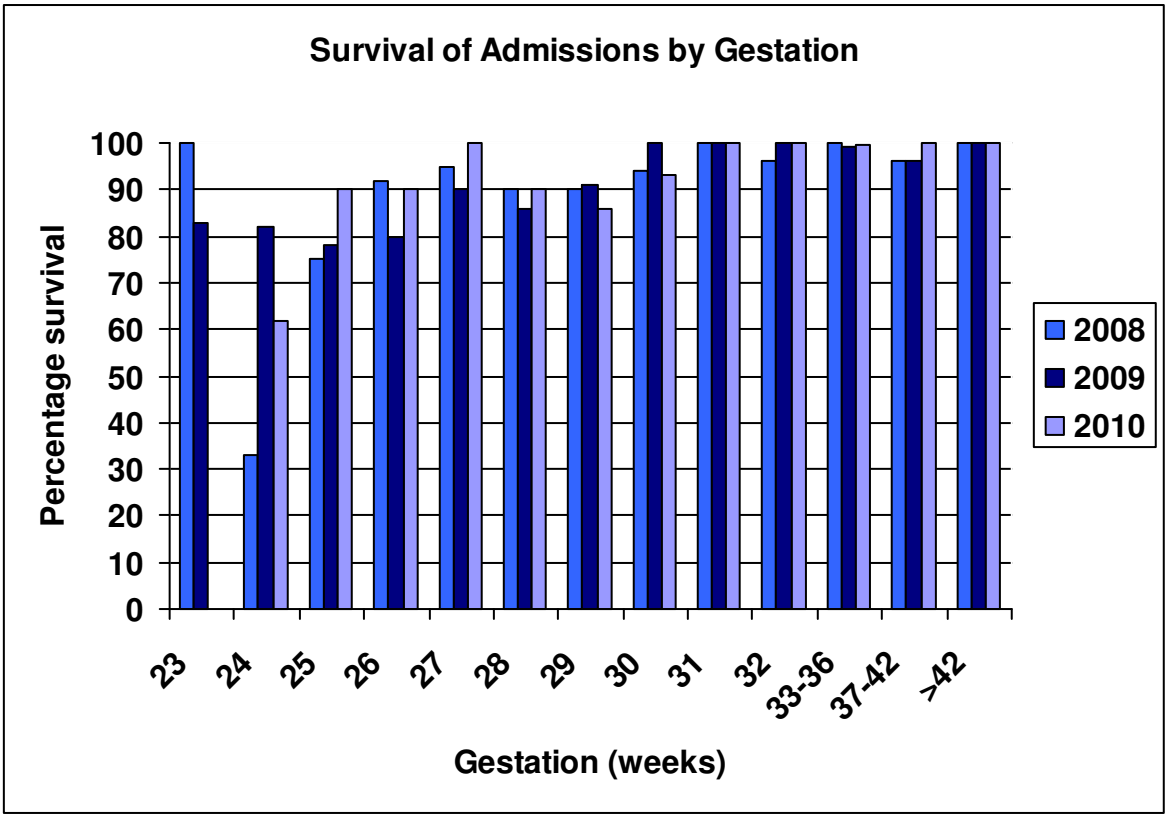
For mortality rate definitions see Appendix 2

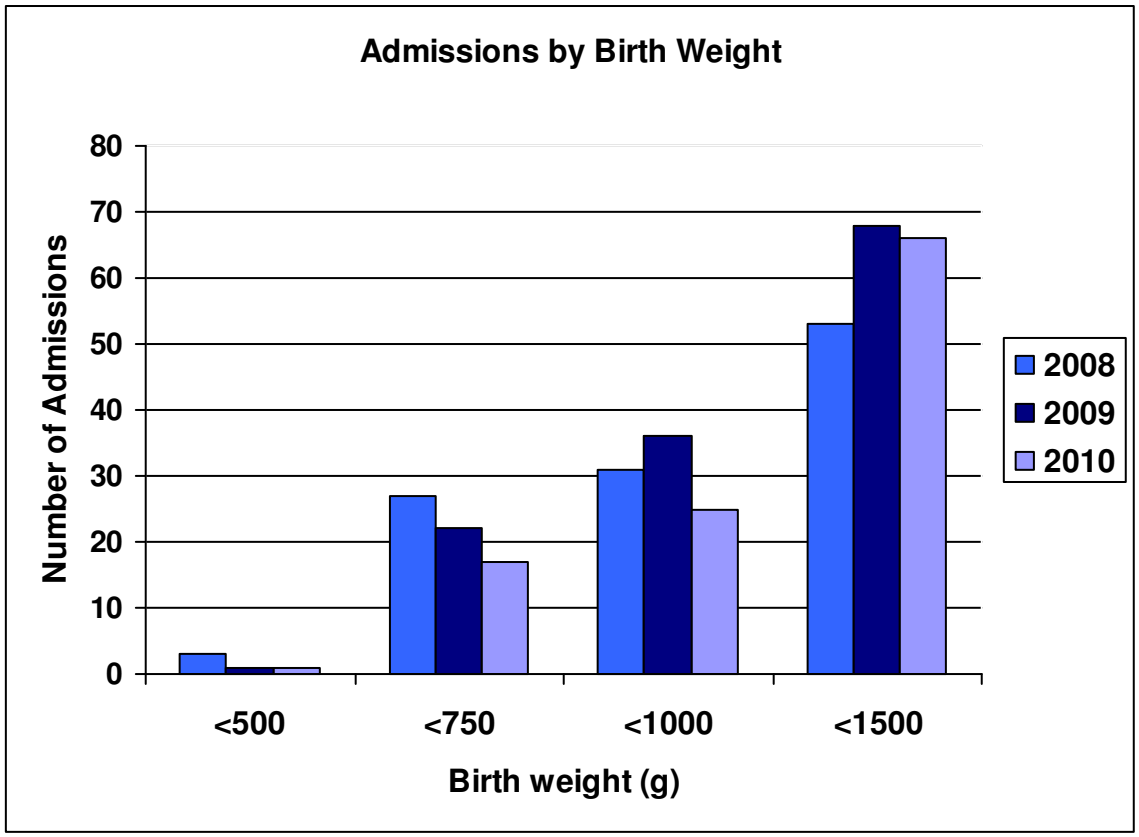
Survival of all live births by gestation 2010								
GA	**Live births**	**Admitted to TMBU***	**Died before admission**	**Died <7d**	**Died 7-28d**	**Died >28d**	**Total deaths**	**Live births surviving to discharge**
23	2	1	1		1		**2**	**0%**
24	12	11	1		1	2	**4**	**67%**
25	8	7	1	1			**2**	**75%**
26	4	4	0			1	**1**	**75%**
27	11	11	0				**0**	**100%**
28	10	10	0	1			**1**	**90%**
29	6	6	0				**0**	**100%**
30	14	14	0	1			**1**	**93%**
31	15	15	0				**0**	**100%**
32	26	23	0				**0**	**100%**
33-36	245	129	0	1			**1**	**99.6%**
37-42	3038	130	0	3			**3**	**99.9%**
>42	21	0	0				**0**	**100%**
Total	**3412**	**361**	**3**	**7**	**2**	**3**	**15**	

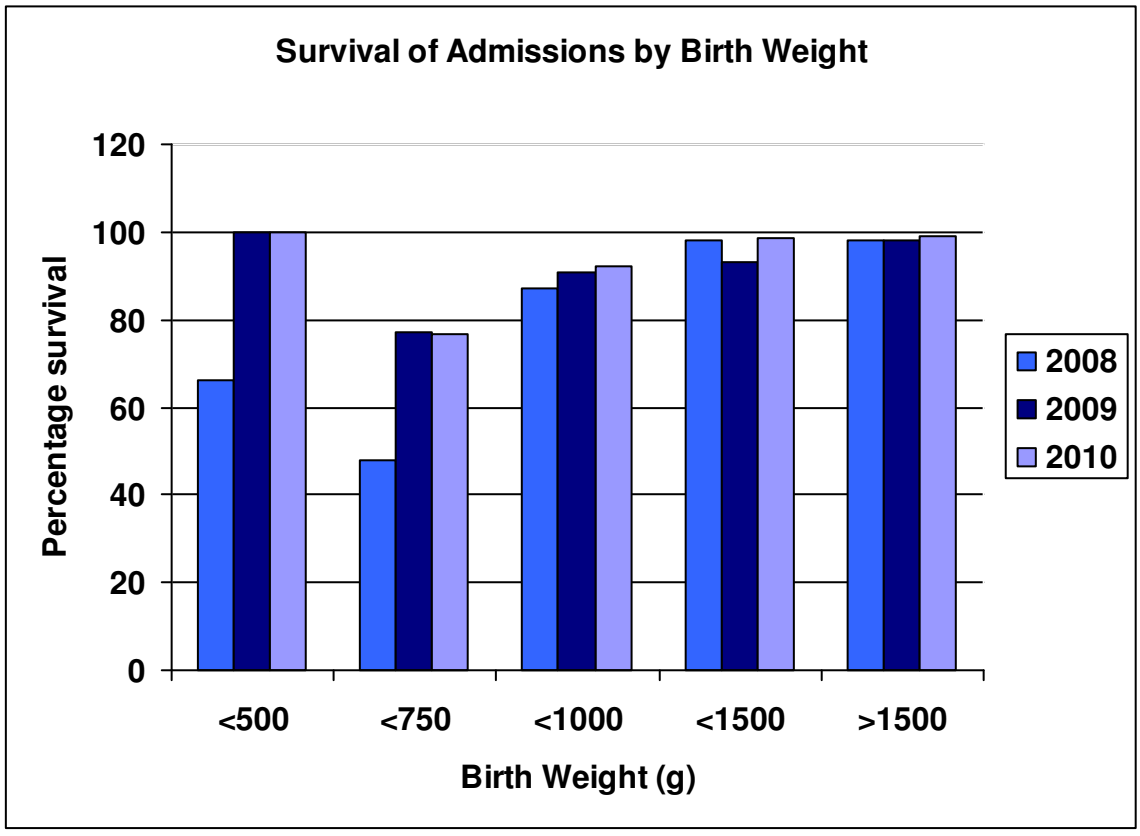
Booked and inutero births admitted in 2010 *Not including re-admissions

TMBU, 3 year rolling survival to discharge for extreme preterm admissions							
GA	**2008**		**2009**		**2010**		**Survival to discharge**
	admitted	**died**	**admitted**	**died**	**admitted**	**died**	
23	2	0	6	1	**1**	**1**	**78%**
24	15	10	11	3	**12**	**3**	**58%**
25	8	2	9	2	**10**	**1**	**82%**
26	11	2	10	1	**10**	**1**	**87%**
27	20	2	19	2	**16**	**0**	**93%**


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


Survival of Admissions by Gestation
Percentage survival
0
10
20
30
40
50
60
70
80
90
100
23
24
25
26
27
28
29
30
31
32
33-36
37-42
>42
Gestation (weeks)
2008
2009
2010


Admissions by Birth Weight
Number of Admissions
80
70
60
50
40
30
20
10
0
<500
<750
<1000
<1500
Birth weight (g)
2008
2009
2010


Survival of Admissions by Birth Weight
Percentage survival
120
100
80
60
40
20
0
<500
<750
<1000
<1500
>1500
Birth Weight (g)
2008
2009
2010

TMBU deaths (inborn and ex-utero transfers) 2010					
Delivered	**GA**	**BW**	**Age d**	**PM**	**Cause of death, related factors**
Preterm Infants (deaths related to bacterial sepsis)					
RSCH	23	604	13	No	Chorioamnionitis, coagulase negative staphylococcal sepsis
Worthing	36	2500	<1	Yes	GBS septicaemia
RSCH	24	650	19	Yes	GBS septicaemia
RSCH	25	787	<1	No	PROM, chorioamnitis
Preterm Infants (deaths related to NEC)					
Conquest	26	1055	31	No	NEC
RSCH	24	655	45	Yes	NEC, perforated
RSCH	24	651	58	No	NEC
Preterm Infants (deaths related to other causes)					
Worthing	30	2000	1	Yes	Haemochromatosis
RSCH	28	984	12	No	Arthogryposis, neuromuscular disease
Term infants (deaths related to perinatal HIE)					
RSCH	40	2900	7	No	HIE Grade 3
Chelmsford	39	3480	3	Yes	HIE Grade 3
Conquest	40	3970	5	No	HIE Grade 3

TMBU, 4 year rolling mortality											
	Total Admissions:					Deaths					Survival to discharge
	2007	2008	2009	2010	Total	2007	2008	2009	2010	Total	(%)
Inborn	359	376	358	361	1454	8	14	16	7	45	**96%**
Outborn	106	127	79	128	440	10	16	5	5	36	**92%**
<26 weeks	12	25	31	23	91	5	13	6	5	29	**68%**
<28 weeks	17	31	33	25	107	1	3	3	2	8	**93%**
<31 weeks	51	56	57	56	220	4	5	4	2	15	**93%**
31+ weeks	368	391	316	390	1465	8	9	8	4	29	**98%**
<500g	2	3	1	1	7	2	1	1	0	4	**43%**
<750g	9	27	22	17	75	2	15	5	4	26	**65%**
<1000g	25	31	36	25	117	4	4	3	2	13	**89%**
<1500g	50	53	68	66	237	1	1	5	1	8	**97%**
>1500g	362	389	310	386	1447	9	9	7	5	30	**98%**

Special Care Baby Unit, Princess Royal Hospital

SCBU Admissions	2008	2009	2010
Total number of livebirths (PRH)	2451	2413	2474
Total number of stillbirths	11	6	9
Total admissions (re-admissions)	299 (27)	255 (24)	286 (30)
Percentage of live births admitted	11%	10.5%	11.5%

Admission details	2008		2009		2010	
	Babies	%	Babies	%	**Babies**	**%**
Total admissions	272		231		**256**	
Inborn	207	76	173	75	**198**	**77**
Outborn	65	24	58	25	**58**	**23**
Gestation ( ) = babies born elsewhere and transferred back to PRH						
23	0		1(1)		**0**	
24	3(3)		1(0)		**2(2)**	
25	0		3(3)		**1(1)**	
26	1(1)		1(1)		**0**	
27	5(4)		2(2)		**5(4)**	
28	6(6)		4(3)		**4(4)**	
29	5(5)		9(9)		**4(4)**	
30	8(8)		8(7)		**7(4)**	
31	10(9)		5(4)		**6(4)**	
32	10(8)		10(10)		**12(8)**	
33-36	79		72		**68(19)**	
37-42	144		115		**115(2)**	
>42	0		0		**0**	
Birthweight (g) ( ) = babies born elsewhere and transferred back to PRH						
<500	0		1		**0**	
<750	4(1)		2(2)		**1(1)**	
<1000	2(2)		8		**3(3)**	
<1500	20(19)		18(16)		**18(13)**	
Multiple births (number of babies)						
Twins	60		44		**45**	
Triplets	0		0		**9**	

Does not include re-admissions

Transfers	2008	2009	2010
In-Utero			
Transfers out	N/K	55	**N/K**
Transfers to Brighton	N/K	45	**N/K**
Transfers elsewhere	N/K	10	**11**
Ex-Utero*			
Transfers out to Brighton	33	20	**35**
Transfers out to elsewhere	7	10	**4**
Transfers in from Brighton	56	58	**42**
Transfers in from elsewhere	2	7	**12**
Transfers in from home	12	9	**6**

Cot occupancy	2008		2009		2010	
Cots	**Days**	**% occ**	**Days**	**% occ**	**Days**	**% occ**
IC	89	-	89	-	90	-
HD	94	-	94	-	66	-
SC	2491	-	2491	-	2386	-
Total	**2674**	**91.7**	**2674**	**91.7**	**2542**	**87.1**

Mortality Statistics (PRH)	2007	2008	2009	2010
Total deliveries	2357	2451	2419	**2474**
Total livebirths	2349	2440	2413	**2463**
Total stillbirths	8	11	6	**9**
Early neonatal deaths*	3	2	1	**0**
Late neonatal deaths*	0	2	1	**0**
Post neonatal deaths (>28 days)*	0	0	0	**0**
Still birth rate	3.4	4.5	2.4	**3.6**
Perinatal mortality rate	4.7	5.3	2.9	**3.6**
Neonatal mortality rate*	1.3	1.6	0.8	**0**

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

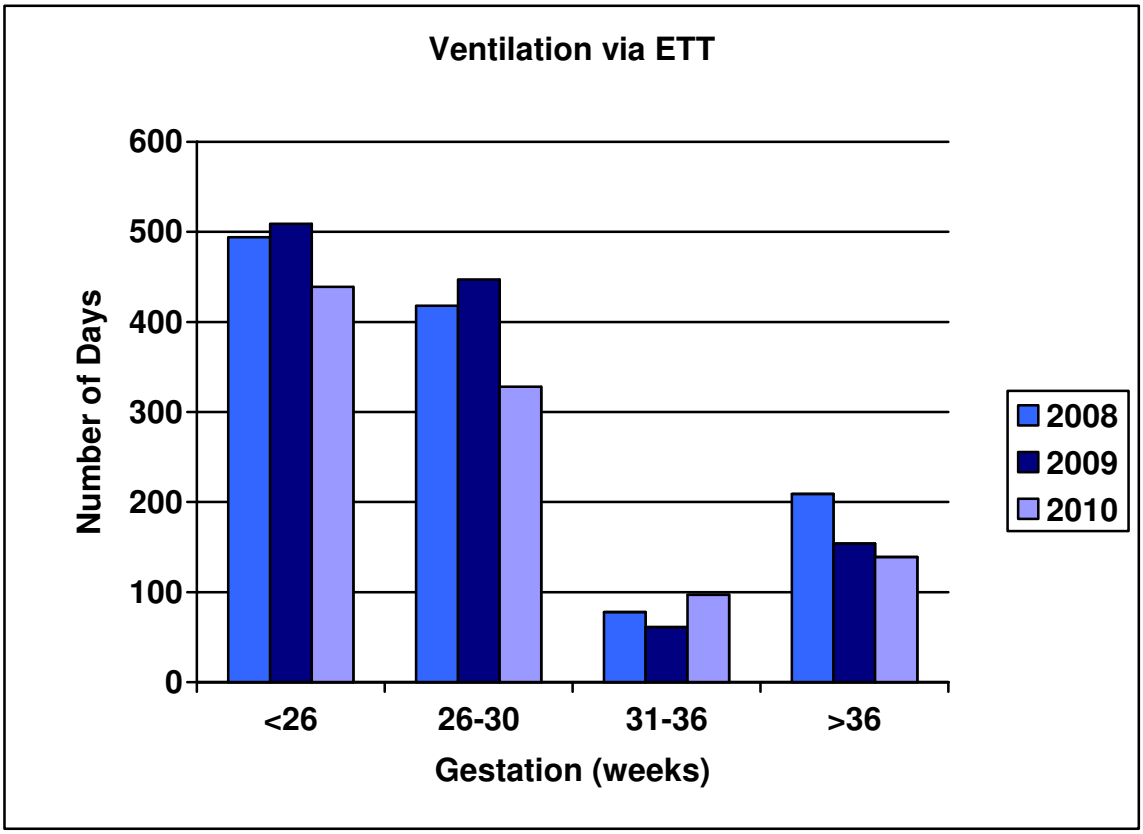
Summary of Clinical Activity (TMBU)

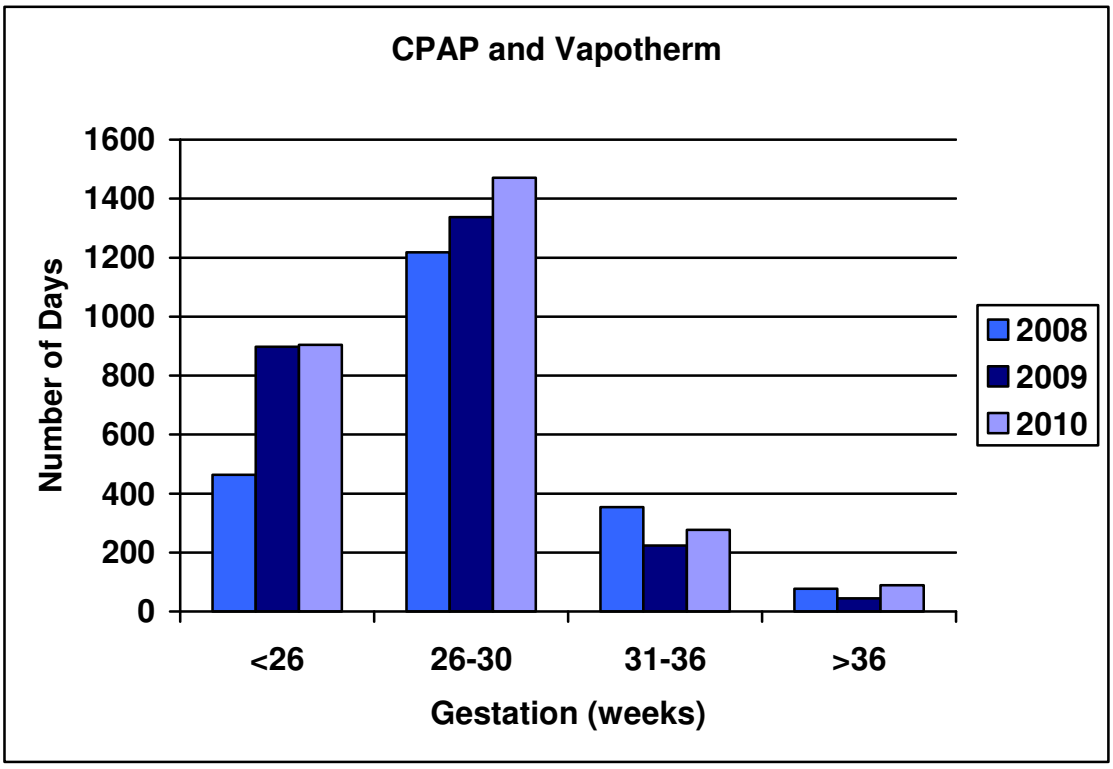
Respiratory support	2008	2009	2010	
	Days	Days	Days	Babies
Ventilation via ETT	1199	1171	1003	152
CPAP and or Optiflow	2113	2503	2741	225
Oxygen therapy	1048	1383	1459	163
Surfactant (doses / babies)	66/57	81/63	84 doses	77
Nitric Oxide (days / babies)	71/16	40/18	53	16

Respiratory diagnoses	Number of Babies	
	2009	2010
Respiratory Distress Syndrome	302	187
Transient Tachypnoea	30	25
Persistent Pulmonary Hypertension	13	7
Pulmonary hypoplasia	3	2
Meconium aspiration	16	17
Cystic Fibrosis	2	0
Congenital pneumonia	15	11
Acquired pneumonia	21	18

Respiratory Complications	2009	2010
Pulmonary haemorrhage	5	N/A
Pulmonary air leak requiring drain	14	10

Management of PDA	2009	2010
Patent Ductus Arteriosus (PDA)	49	38
PDA treated with Indomethacin	42	23
PDA ligated	4	7





Infection	Positive Blood Cultures	
	2009	2010
Beta Haemolytic Streptococcus group B	4	2
Alpha haemolytic strep	0	2
Coagulase-negative Staphylococcus	77	49
MSSA	1	4
MRSA	0	0
Enterococcus	10	3
Micrococcus species	0	2
Listeria	1	0
Escherichia Coli	3	4
Klebsiella species	5	2
Serratia species	5	2
Enterobacter species	5	2
Pseudomonas aeruginosa	0	1
Candida	1	0
Bacillus	0	2
TOTAL	**112**	**75**
	Babies Screening Positive	
MRSA	5	1
VRE	0	0

Necrotising Enterocolitis	2009	2010
	Cases	Cases
NEC	29	19
Perforated NEC	7	1
NEC treated surgically	12	4

Neonatal Surgical Cases (not NEC)	2009		2010	
	Cases	IC/HD cot days	Cases	IC/HD cot days
Gastroschisis	2	29	5	26
Exomphalos	2	7	0	0
Hirschsprungs	1	12	0	0
Malrotation	3	18	1	0
Meconium ileus	4	82	0	0
Spontaneous perforation	3	81	2	53
Oesophageal Atresia / TOF	5	41	4	140
Intestinal atresia/obstruction	4	18	6	67
Inguinal hernia repair	9	18	1	1
Imperforate anus/rectal anomaly	1	14	4	11
Lung cyst/sequestration	1	3	0	0
Diaphragmatic eventration	0	0	0	0
Diaphragmatic hernia	2	18	0	0
Drainage of abscess	2	4	1	5
CVL insertion	10	10	3	3
Rectal biopsy	4	4	3	0
Drains/gastrostomy/vesicostomy	4	8	1	0
TOTAL	**56**	**322**	**31**	**306**

Cranial Ultrasound Diagnoses	Number of Babies	
	2009	2010
IVH with parenchymal involvement	3	3
Post haemorrhagic hydrocephalus requiring surgical intervention	0	1
Infarction without IVH	1	1
Periventricular ischaemic injury with cyst formation	0	3

All babies <32 weeks gestation have routine cranial ultrasound examination

Hypoxic Ischaemic Encephalopathy	2008	2009	2010
HIE grade 1	13	5	11
HIE grade 2	19	6	9
HIE grade 3	9	6	4
Hypothermia therapy	14	13	13
Inborn	5	7	9
Outborn	9	6	4

Retinopathy of Prematurity	2008	2009	2010
ROP grades 3/4	2	1	1
ROP treated with laser therapy	2	1	0

Screening as per recommendations from Royal College of Ophthalmologists

The British Association of Perinatal Medicine (BAPM) have suggested collecting data on the following indicators of morbidity:

BAPM Dataset	Number of Babies		
	2008	2009	2010
PDA ligated	7	4	7
Operated on for NEC	5	12	4
Chest drain for pulmonary air leak	16	14	10
Surgical intervention for post haemorrhagic hydrocephalus	4	0	1
Laser treatment for ROP	2	1	0

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

Sub-optimal resuscitation
IV extravasation
Admission of infant with encephalopathy
Pneumothorax
Cross Infection
Medication errors
Accidental extubation
Birth injury
Longline infection
Stage 3/4 ROP

Since 2005 a departmental risk profile has been compiled annually. Clinical incidents are reviewed by the Neonatal Risk Panel every 3 months with the aim of identifying common themes or trends and addressing issues of clinical risk. Information on clinical risk is disseminated at clinical governance meetings and via the 'Baby Watch' leaflet which is produced every 3 months.

Category	2006	2007	2008	2009	2010
Access, admission, transfer, discharge	5	8	10	9	**8**
Clinical assessment (including diagnosis, scans, tests, assessments)	7	3	10	7	**12**
Consent, communication, confidentiality	8	5	18	9	**9**
Documentation (including records, identification)	9	9	20	14	**15**
Implementation of care and ongoing monitoring / review	3	1	3	0	**4**
Infection Control Incident	3	5	1	0	**1**
Infrastructure (including staffing, facilities, environment)	18	21	17	4	**7**
Medical device / equipment	9	12	24	11	**16**
Medication	34	25	69	47	**72**
Other Incident	1	1	3	0	**2**
Patient accident	3	0	1	0	**1**
Treatment, procedure	14	17	44	30	**28**
Total	**115**	**107**	**223**	**131**	**175**

Grade	2006	2007	2008	2009	2010
No Harm: Impact Prevented	21	36	51	78	**37**
No Harm: Impact not Prevented	65	51	128	25	**100**
Low	29	20	37	25	**35**
Moderate	0	0	7	3	**3**
Severe	0	0	0	0	**0**
Death	0	0	0	0	**0**
Total	**115**	**107**	**223**	**131**	**175**

Summary of Developmental Outcomes

Developmental follow-up takes place in baby clinic and in the Joint Neonatal and Community clinic held 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 early for developmental follow-up. Term babies diagnosed as having grade 2 or 3 hypoxic ischaemic encephalopathy are reviewed formally at 2 years in line with the TOBY Cooling Register recommendations.

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
- Prechtl movement study
- Physiotherapy and / or speech and language therapy assessment
- Audiology screening
- Screening for Retinopathy of Prematurity
- Arrange Joint Developmental Clinic follow-up.

At 3 months' corrected age
- Repeat movement study
- Hammersmith neurological examination and review of development 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
- Thames Regional Perinatal Group (TRPG) Health Status Questionnaire
- Refer to specialist services as appropriate or discharge if no concerns.

Outcome was analysed at 24 months CGA in a cohort of 152 preterm infants born at <29 weeks gestation and/or <1000g. All babies were cared for within the first 24 hours of life on the TMBU, born between October 2002 and December 2008, and lived in Sussex.

The TRPG Health Status Questionnaire assesses both developmental and general health outcomes.

Outcome according to TRPG Health Status Questionnaire at 24 months CGA

Outcome	<26 weeks (%)	26-28 weeks (%)	Total (%)
Normal	10 (24%)	62 (56%)	72 (47%)
Impaired	13 (32%)	23 (21%)	36 (24%)
Severe disability	8 (20%)	9 (8%)	17 (11%)
Lost to follow-up	10 (24%)	17 (15%)	27 (18%)
TOTAL	**41**	**111**	**152**

Two year outcome according to the Schedule of Growing Skills assessment (babies born between October 2002 and March 2007)

	Locomotor			Speech and Language			Cognitive		
	Normal	Impaired	Severe disability	Normal	Impaired	Severe disability	Normal	Impaired	Severe disability
Babies	64	9	4	61	12	4	47	27	3
%	83%	12%	5%	79%	16%	5%	61%	35%	4%

Amess P, Young T, Burley H, Khan Y. Developmental outcome of very preterm babies using an assessment tool deliverable by health visitors. Eur J Paediatr Neurol: 2009 Jul 15

Two year outcome according to the Bayley Skills Assessment (babies born between August 2006 and December 2008)*

	Locomotor			Speech and Language			Cognitive		
	Normal	Impaired	Severe disability	Normal	Impaired	Severe disability	Normal	Impaired	Severe disability
Babies	31	11	3	28	13	4	40	3	2
%	69%	24%	7%	62%	29%	9%	89%	7%	4%

*Based on a study of 45 babies from the original cohort of 58. 12 babies were lost to follow-up, and one died.

Transport

The Sussex Neonatal Transport Service operated 12 hours a day, 7 days a week until October 2009 when we launched a 24 hour service. This service is provided in rotation with Kent and Surrey to provide 24 hour cover for Kent, Surrey and Sussex.

Planned & Unplanned Transfers within Kent Surrey & Sussex 01/01/2010-31/12/2010 by KSS Teams

Transfer	Kent	Surrey	Sussex
Unplanned	134	105	182
Planned	176	144	207
Total	**310**	**249**	**389**

The Neonatal Transport Service continues to be staffed on a daily basis by a middle grade doctor, senior trainee, dedicated transfer nurse and transfer consultant.

Team availability	% availability
Full team available	94%
No team available	2%
Doctor only	3%
Nurse only	1%

In Sussex there were 121 postnatal transfers for medical IC: 66.1% stayed within Sussex.

Postnatal transfers for medical intensive care within 2010 for Kent, Surrey & Sussex showing proportions of those receiving care within region or outside region

	Kent	Surrey	Sussex
Total postnatal referrals for medical IC	90	66	121
Required medical IC and received within region	64 (71.1%)	52 (78.8%)	80 (66.1%)
Required medical IC and received out of region	26 (28.9%)	14 (21.2%)	41 (33.9%)

There is no surgical service in Kent or Surrey so many new surgical postnatal referrals are transferred out of region. Of the 120 surgical transfers referred postnatally, 99 originated in Kent and Surrey. 10 of these received surgical care in Sussex. Of the 25 referrals for postnatal transfer originating in Sussex, 21 stayed in Sussex for surgery.

	Kent	Surrey	Sussex
Out to London or other for surgery	44	41	4
Into Sussex for surgery	2	8	21

For further information, please see the Transport Annual Report to be published in July 2011.

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. There are common medical, nursing and drug protocols for both units. There is a rolling programme of guideline review and a multidisciplinary standards group meets four times a year to discuss and write new guidelines. Guidelines are now available on the new 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. Denise Stilton leads the Paediatric and Neonatal research nurses. We have currently six research nurses on our team and hope to re-appoint two new colleagues very soon.

Monthly 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) and with the School of Pharmacy & Biomolecular Sciences (University of Brighton).

The international collaboration with Dr Holger Jungmann, Research Laboratories, MBR Optical Systems, Germany continues. The joint project on anaemia and nutrition in preterm infants with chronic lung disease at the Kangoroo Project in Bogota, Columbia, run by Dr Nathalie Charpak has continued. 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 follow-up study of the babies enrolled into the cord clamping trial (supported by the Research for Patient Benefit scheme (National Institute for Health Research)) is going on well. The industry sponsored projects on white light spectroscopy measurements of haemoglobin and bilirubin in the skin continue.

The department is an active member of the new Kent, Surrey & Sussex Paediatric and Neonatal Research Network. On behalf of the network and this year in collaboration with the BSMS Research Day we organized the fourth Regional Paediatric and Neonatal Research Day, which was very well attended. A further similar event is planned for September 2011.

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 serious 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 307. During this module they learn about the clinical course of one baby and how to complete a structured literature search and appraisal on a focused topic related to that baby.

The Department also supervises 5th year students during their Paediatric module to develop further their understanding of newborn 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.

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 the Network Neonatal Club and Deanery Registrar Days. We host and direct the ALSG Neonatal Life Support and PaNSTAR courses. We are one of the Deanery host centres for simulation training.

We have a well established Local Faculty Group which overseas educational governance.

We are the first UK-based centre to be granted European Accreditation for Neonatal Training.

Maternal Substance Misuse Clinic (One-Stop Clinic)

The One-Stop clinic is a multidisciplinary, multi-agency clinic at The Royal Sussex County Hospital. 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
- Charge Nurse from the Substance Misuse service
- Liaison Health Visitor
- Social Worker from Dept, Social Care & Health
- 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 was extended to include 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.

In 2009 a new monthly clinic was started at Princess Royal Hospital to deal with the increasing number of referrals from the Mid-Sussex area (Crawley, Horsham, East Grinstead).

One of our Neonatal Nurse Practitioners, Jamie Blades, has also become part of the team.

The clinics now 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 2010 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 for 14 hours/week on TMBU and approximately 3.5 hours per week in various outpatient clinics (e.g. SLT clinics, BPD clinics). In February 2010, Alex Lazell, Highly Specialist Speech and Language Therapist was joined by Jane Pettigrew, Senior Specialist Speech & Language Therapist and replacement for Rachelle Mayo who had left the service in November 2009.

The service provides assessment and management of feeding difficulties for all babies admitted to TMBU. Difficulties may occur due to;

- neurological anomalies; e.g. HIE
- anatomical anomalies; e.g. TOF, Cleft palate
- babies with syndromes; e.g. Down Syndrome
- slow/difficult to feed because of prematurity/ non-specific reasons
- Neonatal Abstinence Syndrome

Other services provided include:

- Videofluoroscopic swallowing studies
- Teaching for new staff
- Involvement with neurodevelopment team
- Liaison/advice for dysphagia therapists in neighbouring trusts for babies from outside the Brighton and Hove catchment area.

There is currently no cover by a speech and language therapist for babies that are transferred to PRH. Babies transferred to the RACH will continue to be seen by the service, as will babies discharged home with feeding difficulties who live in Brighton and Hove or those who attend the BPD Clinic. Babies from outside of Brighton and Hove who continue to have significant feeding difficulties and are seen by two or more professionals at the hospital, may be seen as an outpatient if there is no appropriate local service for them to be transferred to.

Below is a breakdown of the numbers of babies referred and the primary reason for their feeding difficulties:

Case Mix	Numbers of babies 2010
Neurological causes	19
Surgical	3
Syndromic	2
Prematurity (27 weeks or less)	20
Slow to feed/non specific cause	27
Total	**71**

This represents an 18% increase in referrals from 2009 (60 referrals). Additionally, many of the babies referred are now staying on the speech and language therapy caseload for longer with the seemingly increasing number of transfers to the Royal Alexandra Children's Hospital. An increase in referral rates and caseload numbers is currently being seen in all areas of the speech and language therapy service. Senior management within the Speech and Language Therapy Service, Community and the Royal Alexandra Children's Hospital are aware of this trend.

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 counseling services for maternity, gynaecology and parents on TMBU.

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 Room provides health promotion information leaflets on a variety of baby, maternal and family health issues. There is also travel information for parents whose baby is transferred to London and Social Security benefits information. Information on consent and how to access the hospital Patients Advocacy and Liaison Service (PALS) is displayed in the information room alongside parent support group information. Planned future developments for the Information Room 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 this is available on the TMBU website.

Parent Forum

The Parent Forum meets regularly on the TMBU. It aims to provide an opportunity for parents to have an input into the development of the neonatal service by sharing the experiences of parents at the meetings. The use of parent questionnaires has also become well established.

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.

Appendix 3

CLINICAL GOVERNANCE PERFORMANCE 2010

AUDIT OR GUIDELINE	COMPLETED	PRESENTED	DATE	COMMENTS & ACTIONS	ACTIONS COMPLETED
Nationally Commissioned Audits					
National Neonatal Audit Database	Ongoing	Circulated via e-mail + discussed at senior staff meeting	Report 2009 available online at NNAP	• Overall good reporting quality • Remind all members of staff in Neonatology and Obstetrics about the importance of antenatal steroids • Facilitate use of collected data for service improvements	√ In progress
National Targets and Projects					
Essence of Care Benchmarking by Nursing Staff	Ongoing	Yes, at nursing staff away days	Throughout 2010	• No change	
Neurodevelopmental Outcome	Ongoing	Yes, published in peer-reviewed journals	Acta Paediatr. 2009 Mar;98(3):448-53	• Follow-up continued • Planning to extend neurodevelopmental follow-up to Neonatal Network (Surrey, Sussex and Kent) • Bayley's Developmental assessment becoming standard	In progress In progress
Neonatal Hearing Screening	Ongoing	No, but quarterly reports available online	Throughout 2010	• Change of NICU practice requires amendment of guideline • Local audit/research project looking at current practice	In progress

Neonatal Transport Service: Regional Activity	Ongoing	Circulated via e-mail + discussed at senior staff meeting	10/2010	• Since September 2009 a 24/7 regional neonatal transport service is running, shared between the teams from Surrey, Kent and Sussex • For more details see separate report • Improve dispatch time as worse than for the Kent and Surrey team, but still above national average	In progress
Nationally Produced Guidance					
CEMACE - Perinatal Mortality 2009	Yes	Circulated via e-mail + discussed at senior staff meeting	12/2010	• Mortality below national average for surgical level 3 units • Continue work on improving survival	√
CEMACH - Diabetes in Pregnancy – Caring for the Baby after Birth	Yes	Circulated via e-mail + discussed at senior staff meeting	Throughout 2010	• All requirements fulfilled • Guideline revised to meet BFI standards	√
NICE Guidance – Postnatal Care CG37	Yes	Circulated via e-mail + discussed at senior staff meeting	1/2010	• All requirements fulfilled • Guideline revised to meet BFI and NICE standards • Audit of updated guideline once implemented	√ Required
Early Neonatal Sepsis Guideline/NICE Guidance Intrapartum Care CG55	Yes	Circulated via e-mail + discussed at senior staff meeting	2009	• All requirements fulfilled • Audit of updated guideline	In progress
Hypoglycaemia Guideline/NICE Guidance Diabetes in Pregnancy CG63	Yes	Circulated via e-mail + discussed at senior staff meeting	Throughout 2010	• All requirements fulfilled • Guideline revised to meet BFI standards	√

				• Audit of updated guideline	Required
Neonatal Jaundice/CG 98	Yes	Circulated via e-mail + discussed at senior staff meeting	10/2010	• All requirements fulfilled • Audit of guideline	 Required
Therapeutic Hypothermia IPG347	Yes	Circulated via e-mail + discussed at senior staff meeting	11/2010	• In line with recommendations • All patients entered into TOBY register	 √
Trust Identified Projects					
Audit of Perinatal Management of Infants Born to HIV Pos. mothers	Ongoing	Circulated via e-mail + discussed at senior staff meeting	2009	• Good compliance with protocol • Re-audit of guideline	 In progress
Infection Control Environmental Audit	Ongoing	Circulated via e-mail + discussed at senior staff meeting	Throughout 2010	• Good compliance 2010	
Parent Satisfaction Survey	Ongoing	Circulated via e-mail + discussed at senior staff meeting	Throughout 2010	• Quarterly questionnaire changed with focus to particular areas • Overall high degree of patient satisfaction • Patients would welcome neonatal specialist support after discharge in the community	 In progress
Review of risks, incidents, complaints & claims	Ongoing	Circulated via e-mail + discussed at senior staff meeting	2010	• 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 – move over to electronic (paperless) records and patient management (Metavision®)	
Educational Audit	Ongoing	Circulated via e-mail + discussed at senior staff meeting	11/2010	• Overall high degree of trainee satisfaction	
Specialty Identified Projects					
Audit of Delivery Care Pathway	Ongoing	Not presented	Throughout 2010	• No changes required	
Audit of Indication, Use and Cost of Nitric Oxide	Ongoing	Not presented	Throughout 2010	• No changes required	
Audit of performance against BLISS Baby Charter Standards	Completed	Circulated via e-mail + discussed at senior staff meeting	1/2010	• Most standards met • Improved communication requires some attention by all members of staff	√
Transitional Care Guideline	Completed	Circulated via e-mail + discussed at senior staff meeting	1/2010	• Implement, once new transitional care plans go ahead	In progress
Audit of Management of Late-onset Sepsis	Completed	Circulated via e-mail + discussed at senior staff meeting	1/2010	• Compliance with guidance good • Re-audit antibiotic use with focus on length of treatment	√
Audit of X-ray referral by ANNPs	Completed	Circulated via e-mail + discussed at senior staff meeting	1/2010	• Confirming good clinical practice of ANNPs • Good agreement between ANNP and Consultant interpretation • Continue current practice	√

Draft of End of Life Care Pathway	Completed	Circulated via e-mail + discussed at senior staff meeting	4/2010	• Pathway to be completed this year	In progress
Audit of all-in-one vs. two-compartment TPN	Completed	Circulated via e-mail + discussed at senior staff meeting	4/2010	• Less infections since introduction of two-compartment TPN • Continue current approach	√
Audit of Microbiological Data	Completed	Circulated via e-mail + discussed at senior staff meeting	7/2010	• Less Gentamicin resistance • Less Enterobacter • Review 2nd line antibiotic regime	√
Audit of Inotrope Use on TMBU	Completed	Circulated via e-mail + discussed at senior staff meeting	7/2010	• Insufficient scientific data exist regarding the use of inotropes in neonates and dosing schemes leading to varying practice • Review current arterial hypotension guideline	√
Audit of the "First Day Check" in Comparison to NIPE Guidance	Completed	Circulated via e-mail + discussed at senior staff meeting	7/2010	• Overall good compliance with NIPE guidance already • Improve referral and F/U process for DDH and cardiac murmurs	In progress – TMBU now pilot site for NIPE
Audit of Blood Transfusions in Multiple Births	Completed	Circulated via e-mail + discussed at senior staff meeting	7/2010	• Many preterm twins need blood transfusions • Documentation of blood transfusions needs improving • Amend current blood transfusion prescription sheet	√

Re-Audit of Late-Onset Sepsis Management	Completed	Circulated via e-mail + discussed at senior staff meeting	10/2010	• First and second line antibiotic guidance is followed well • Investigations for sepsis are performed inconsistently • Encourage consistent approach in septic investigations	√
NICE Jaundice Guideline	Completed	Circulated via e-mail + discussed at senior staff meeting	10/2010	• Practical adaptation of published NICE guideline presented with exercises for enhancement of understanding ○ Audit required after implementation	See above
New Enteral Feeding Guideline Draft	Completed	Circulated via e-mail + discussed at senior staff meeting	10/2010	• Completely revised and partly new guidance for enteral feeding aiming to improve nutrition and growth whilst reducing NEC risk • Amend and finalise draft based on comments	In progress
Audit of Patients with HIE	Completed	Presented at Obstetric Governance Meeting	6/2010	• No clearly modifiable/avoidable patterns in the care identified	
HIE MRI Review and Care Pathway	Completed	Not presented	9/2010	• Implementation into Metavision® system	In progress
Audit of Respiratory Outcome at 32-34 weeks Gestation at PRH	Completed	Not presented	2010	• To be presented and discussed in 2011	In progress
Audit of Neonatal skin Infections	Completed	Not presented	2010	• To be presented and discussed in 2011	In progress

Appendix 4

RESEARCH

Studies initiated locally

Neurology

Standardized Follow-up of preterm infants (inborns, less than 29 weeks or less than 1000g)

Contact person: Dr P Amess

Pulse Oximetry

New waveform analysis of pulse oxymetry and Mediscan in babies with non-invasive lung function monitoring Contact persons: Dr P Seddon, Dr H Rabe, Cathy Olden

NIRS

Which is the most effective method of providing non-invasive respiratory support (NIRS) to preterm neonates with lung disease?

Contact persons: Dr P Seddon, Dr H Rabe, Suzanne Paginton

Solid vs. breastfed

The association between the age of introduction of solid foods to breastfed infants, iron status and diet composition at ages 8 to 18 months

Contact persons: Dr H Rabe, Antiopi Ntouva, Denise Stilton

CORD CLAMPING TRIAL FOLLOW-UP PROGRAMME

Neurodevelopmental Follow-up of Preterm Infants enrolled into the study on slight delay of cord clamping time versus milking of the cord

Contact persons: Dr H Rabe, Denise Stilton

Kangaroo

Nutrition, anaemia, growth, and oxygen weaning in low Birth Weight oxygen-dependant infants in a Kangaroo Clinic

Contact persons: Dr H Rabe, Denise Stilton

BILIRUBIN STUDY

Comparison of Bilirubin Measurements by laboratory Dumas Method with non-invasive white light spectroscopic Method in preterm and term neonates

Contact persons: Dr H Rabe, Denise Stilton, Robert Delacour

Prechtl Movement Study

To compare the use of infant movements, cranial ultrasound and neurological examination in the prediction of motor outcome in a cohort of pre-term infants

Contact person: Dr P Amess, Libby Emery

Multicentre Trials

EPICURE II Follow-up study

Structured follow-up of all surviving Epicure babies of the 2006 cohort in Sussex.

Contact persons: Dr P Amess, Caroline McFerran

OPPTIMUM

Progesterone prophylaxis to prevent pre-term labour

Contact persons: Dr H Rabe, Suzanne Lee, Denise Stilton, Dr Tony Kelly

VICC

Viral Load immunity in congenital cytomegalovirus infection study

Contact persons: Dr H Rabe, Denise Stilton

RESEARCH MEETING 4th Thursday of the month at 2 pm

Papers

Amess P, Young T, Burley H, Khan: Developmental outcome of very preterm babies using an assessment tool deliverable by health visitors. Eur J Paediatr Neurol 2010; 14:219-23

Rabe H, Whitfield T, Fernandez Alvarez JR, Lawson F, Jungmann H: Spectroscopic non-invasive measurement of hemoglobin compared with capillary and venous values in neonates. Neonatology 2010; 98:1-5

Gandhi R, Fernandez Alvarez JR, Rabe H: Management of Congenital Cytomegalovirus Infection: An Evidence Based Approach. Acta Paediatr 2010; 99:509-515

Walter K, Rabe H: Genital oedema associated with femoral central venous access in a premature baby. BMJ Casereports 2010 (www.casereports.bmj.com)

Gandhi R, Fernandez Alvarez JR, Rabe H: Diagnostic tests for congenital cytomegalovirus infection. Acta Paediatr 2010; 99(10):1444-5

Olden C, Symes E, Seddon P: Measuring tidal breathing parameters using a volumetric vest in neonates with and without lung disease. Pediatric Pulmonol 2010; 45:1070-75

Book Chapter

Lawn C, Aiton N: The baby of a substance abusing mother.
In Rennie JM (Ed): Roberton's Textbook of Neonatology, 5th edition, Elsevier Churchill Livingston Edinburgh 2010

Rabe H. Ringholz F: Anaemia in very-low-birth-weight infants.
In Preedy VR (Ed): Handbook of Growth and Growth Monitoring in Health and Disease. Springer New York 2010

Letter

Gandhi R, Fernandez Alvarez JR, Rabe H. Diagnostic tests for congenital cytomegalovirus infection. Acta Paediatr 2010;

Editorial

Rabe H: Cord clamping and neurodevelopmental outcome in very low birth weight infants. J Perinatol 2010; 30:1

List of recent and current Grants

NIHR portfolio

2008-2009 RfPB-NIHR (Seddon, Rabe) Which is the most effective method of providing non-invasive respiratory support (NIRS) to preterm infants with lung disease? (£ 49,921)

2007-2008 RfPB-NIHR (Seddon, Wertheim, Rabe) Non-invasive assessment of respiratory mechanics from pulse oximetry waveform (£ 47,335)

2009-2010 CLRN-NIHR (Rabe): personal grant for research activity Flexibility and Sustainability Funding (FSF) (£ 12,046)

2010-2011 RfPB-NIHR (Rabe, Amess, McFerran, Ayers, Horst, Rowe) What is the neurodevelopmental outcome of preterm infants at 2 years of age, who received placento-fetal transfusion at delivery? (£ 49,849)

2010-2011 CLRN-NIHR (Rabe): personal grant for research activity Flexibility and Sustainability Funding (FSF) (£ 26,103)

Other sources

2008-2011 SPARKS (Mukhopadhyay, Palmer, Rabe, Seddon) Do filaggrin gene defects cause atopic dermatitis in young children? (£ 200,000)

2008-2009 Nestle Foundation (Charpak, Ruiz, Rabe, Otalora; Colombia and UK) Nutrition, anemia, growth and oxygen weaning in Low Birth Weight oxygen-dependent infants in a Kangaroo Clinic. (€ 30,000; £ 24,000)

2008-2009 Industrial Grant (MBR Optical Systems, Germany) Developing the Mediscan into a monitoring tool. (€ 47,500; £ 38,000)

2007-2008 BSUH R&D: Randomised controlled trial on milking of the cord versus slight delay in cord clamping time of preterm infants and parents perception of informed consent before preterm delivery. (£ 20,000)