Annual Report 2009

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 and beyond. We also provide a special care service for Brighton and Mid-Sussex. In 2009, there were 3,345 deliveries at the Royal Sussex County Hospital and 2,413 deliveries at the Princess Royal Hospital.

The aims of our service are:

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

There are now 27 cots on the TMBU. We are staffed for 9 intensive care cots, 8 high dependency care cots and 10 special care cots. Three new cots were opened in February 2010 and the final aim is to increase capacity by another 3 cots by the end of 2010. The process will be overseen by the PCTs and the completed expansion should provide sufficient intensive care facilities for Sussex babies and neonatal surgical capacity for a proportion of the Surrey and Sussex Neonatal Network. 2009 saw intensive care and high dependency activity rise again. Activity has now risen more than 50% in the last 3 years. We have noticed a significant rise in the care undertaken for babies born <24 weeks gestation.

A transitional care service operates on the postnatal ward at the RSCH and plans to improve this service will develop in 2010 with the opening of the 'Newborn Care Unit' in the Royal Alexandra Children's Hospital.

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. A transitional care service operates on the postnatal ward at PRH.

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.

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 counsellor 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 Centre provide multi-disciplinary care for those infants needing ongoing neurodevelopmental support.

Dr Paul Seddon and the Community Paediatric Nursing Team continue to coordinate the discharge and follow-up of infants requiring home oxygen. Work is underway to consider the development of a Neonatal Outreach Team for Brighton and Mid-Sussex.

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. Plans are well advanced to increase capacity for intensive and high dependency care to small infants referred to Brighton from around Sussex and the neonatal network.

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 now able to provide 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 counsellor.

Perinatal pathology is provided by 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 research programme is now well integrated with that of the Brighton and Sussex Medical School academic department of paediatrics led by Professor Somnath Mukhopadhyay.

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.

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 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 Khalid Khan, 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 Rob Bradley
Mr Des Holden
Mr Richard Howell
Mr Tony Kelly
Mr Jit Mitra
Ms Julia Montgomery
Ms Thikra Bashir
Mr Greg Kalu
Mr Onome Ogueh
Mr MacKenzie-Gray

Consultant Paediatric Surgeons:
Mr Varadarajan Kalidasan
Miss Ruth Hallows
Miss Anouk van der Avoirt
Mr Anies Mohammed
Mr Timothy Turnbull (Orthopaedics)
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

Advanced Neonatal Nurse Practitioners

Jamie Blades
Maggie Bloom
Dee Casselden
Lisa Chaters
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, Louise Barton, 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, Naomi Fells, Tracey Joyce, Sarah Quinton, Carly Taylor, Amanda Bensilum, Anna Hughes, Samantha Walters, Natalie Jestico, Alice Kavati, Belinda Coetzee.

Band 5

Leonora Enriquez, Iva Richardsova, Hui Chen Lin, Lauren Devoy, Jenna Jarvis, Tania White, Amie Cameron, Clare Watson, Katie Hogben, Nicola Ford, Sarah Randall, Beena George, Latha Alosius, Hannah Stanley, Elaine Markwick, Annika Laker, 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, Corrie Hoelters, Jayne Steer.

Band 4

Jackie Mason, Mavis Dawson, Amy Boreham

Band 2

Jenny Perry, Julie Munro

Neonatal Nurses (PRH)

Band 7
Sarah Stillwell, Judy Edwards

Band 6
Debbie Collen, Sarah Gray, Pauline Taylor, Kathi Wood, Jessica Stoffell, Dede Atkinson, Sarah Hampson, Sue Robinson, Michelle Wilmont, Avryl Way.

Band 5
Sue Nightingale, Irene Silander, Jenny Karkar, Francesca Mabesa, Katrina Page, Rhiain Gulwell.

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
Mr Mike Pettit

Physiotherapy
Melanie Smith

Dietician
Chris Smith

Counsellor
Sally Meyer

Secretarial support
Patricia Walker
Emma Morris

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**

Includes re-admissions

TMBU Admissions	2007	2008	2009
Total number of live births (RSCH)	3356	3516	3345
Total admissions (including re-admissions)	465	524	456
Inborn	359	376	356
Inborn booked RSCH	297	294	269
Inborn booked elsewhere	62	82	87
Outborn	106	127	76
Re-admissions	N/K	21	18
Admissions from home	5	6	4
Percentage live births admitted to TMBU	14	11	14

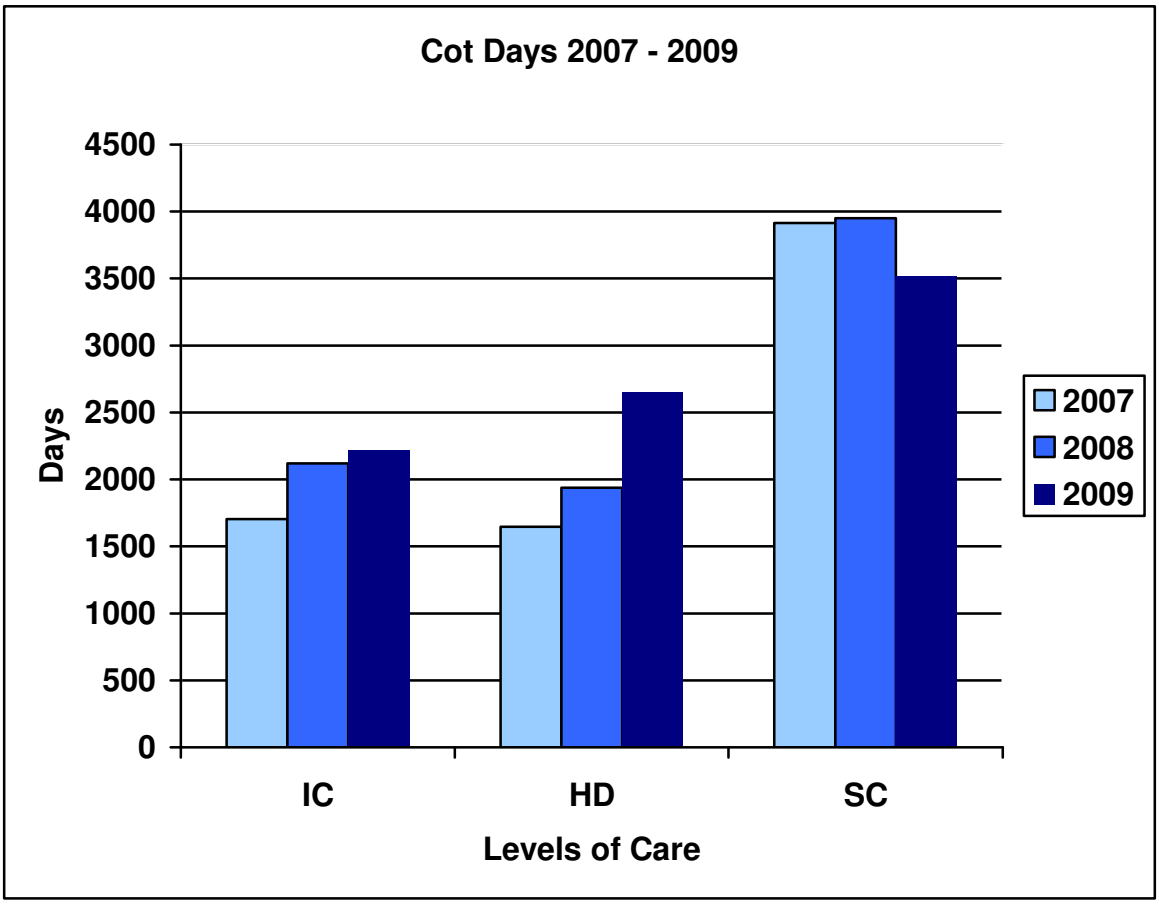
Admission details*	2007		2008		2009	
Gestation (weeks)	**Babies**	**%**	**Babies**	**%**	**Babies**	**%**
23	3	<1	2	<0.5	7	1.5
24	4	1	16	3	11	2
25	5	1	8	1.5	9	2
26	6	1	10	2	10	2
27	10	2	19	4	19	4
28	16	3	19	4	22	5
29	13	3	18	3.5	21	5
30	22	5	16	3	12	3
31	17	4	31	6	17	4
32	22	5	27	5	19	4
33-36	136	29	125	24	110	24
37-42	172	37	208	40	179	39
>42	0	0	1	<0.5	1	<0.5
Birthweight (g)						
<500	2	0.4	3	0.5	1	<1
<750	9	2	27	5	22	5
<1000	25	5	31	6	36	8
<1500	50	11	53	10	68	15
Multiple births (number of babies)						
Twins	77	16	98	19	63	14
Triplets	8	2	6	1	7	1.5

Does not include re-admissions

Transfers in	2007	2008	2009
In-Utero	135	158	148
Babies delivered and admitted	62	82	87
Refused transfers in	124	120	192 23 refused by maternity
Ex-Utero	94	124	75
Princess Royal Hospital	28	39	15
East Sussex Hospitals	26	36	24
West Sussex Hospitals	18	17	12
Other Network Hospitals	14	11	12
Outside Network	8	21	12
Refused transfers in	27	23	30 (9 surgery, 1 cooling)
Delayed transfers in (days)	Not known	Not known	71

Does not include re-admissions or home births

Cot occupancy	2007		2008		2009	
Cots	**Days**	**% occ**	**Days**	**% occ**	**Days**	**% occ**
IC	1703	59	2119	73	2218	76
HD	1647	151	1937	112	2652	121
IC & HD (total)	3350	83	4056	87	4870	95
SC	3914	98	3949	108	3514	96
Total	**7264**	**91**	**8005**	**96**	**8384**	**96**



TMBU Care Categories 2009						(*2001 BAPM definition for care levels, see Appendix 1)*
Gestation at birth (weeks)	IC		HD		SC only	
	Babies	Days	Babies	Days	Babies	Days
< 23	0	0	0	0	0	0
23	7	254	4	161	0	0
24	10	330	5	252	0	0
25	7	190	5	193	0	0
26	9	215	9	96	0	0
27	17	173	16	398	1	9
28	23	246	19	346	1	7
29	20	137	19	274	0	0
30	12	35	10	86	0	0
31	16	62	11	98	1	1
32	16	44	6	31	3	29
33	14	35	4	38	5	35
34 – 36	42	90	15	90	45	401
37 - 41	54	174	28	121	99	349
> 41	5	31	5	17	5	28
Total	**252**	**2016**	**154**	**2246**	**160**	**859**

Mean lengths of stay on TMBU (days)				
Gestation (weeks)	Discharged Home		Discharged to referring hospital	
	2008	2009	2008	2009
23	0	-	16	93
24	95	128	65	73
25	0	105	27	58
26	0	-	34	37
27	77	93	38	24
28	86	64	19	33
29	54	52	22	27
30	50	48	12	18
31	37	52	10	9.5
32	23	37	9	6
33	16	21	9	7.5
34-36	17	12	10	6
37-41	8	5	7	6
>41	2	4	0	9

Does not include babies who died whilst on TMBU or babies who were admitted during 2009 but are still inpatients

Transfers out	2007	2008	2009
Specialist medical care	N/K	9	5
Surgery	N/K	15	9
Cardiac care	N/K	3	4
Discharges			
Home	132	145	132
Postnatal ward	150	131	135
Local hospital care	141	170	152
Princess Royal Hospital	49	67	60
RACH	7	8	25
East Sussex Hospitals	14	39	27
West Sussex Hospitals	13	18	25
Other Network Hospitals	N/K	N/K	14
Delayed transfer out to local care (days)	N/K	N/K	147

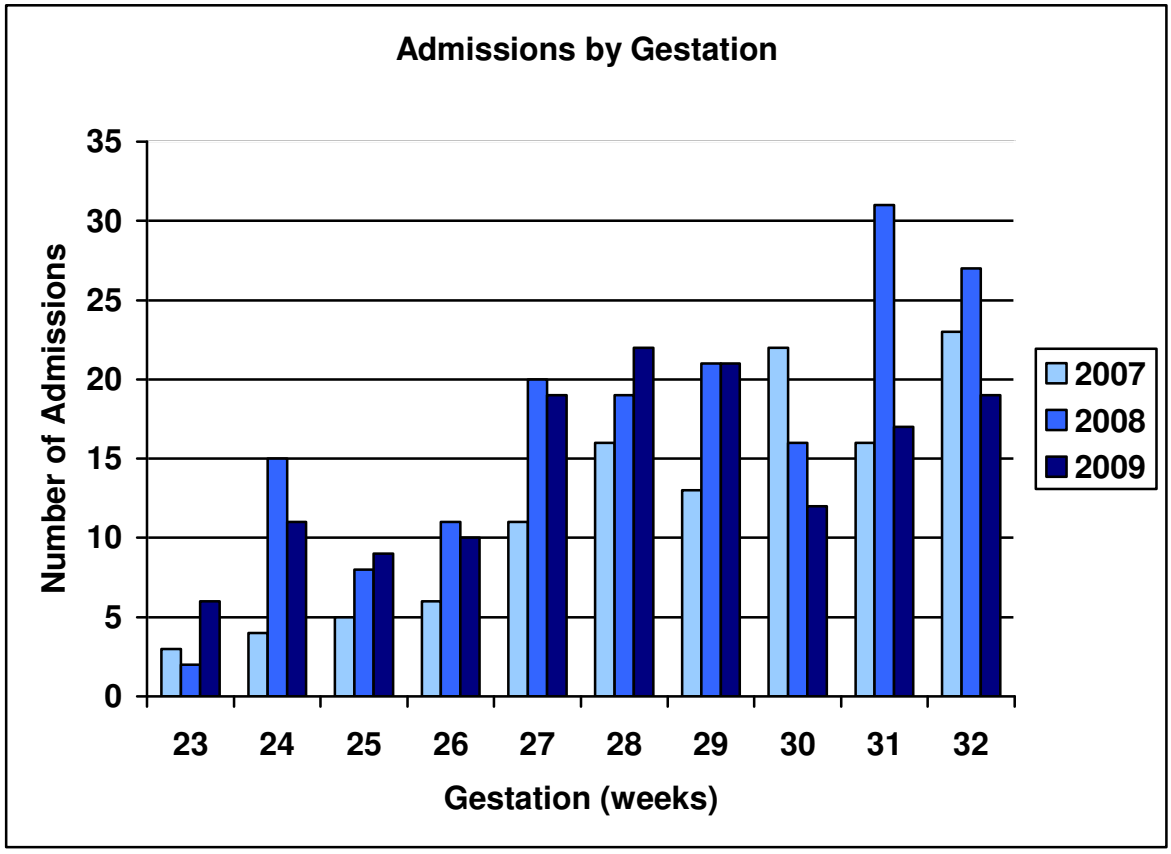
Mortality Statistics (RSCH)	2006	2007	2008	2009
Total deliveries	3295	3371	3528	3345
Total livebirths	3282	3356	3516	3332
Total stillbirths	13	15	12	13
Total neonatal deaths on TMBU	20	17	29	21
Inborn	11	8	14	16
Outborn	9	9	15	5
Early neonatal deaths*	3	5	6	6
Late neonatal deaths*	4	3	4	4
Post neonatal deaths (>28 days)*	4	0	4	3
Still birth rate	3.9	4.4	3.4	3.9
Perinatal mortality rate	4.9	5.9	5.1	6.8
Neonatal mortality rate*	2.1	2.1	2.8	3.0

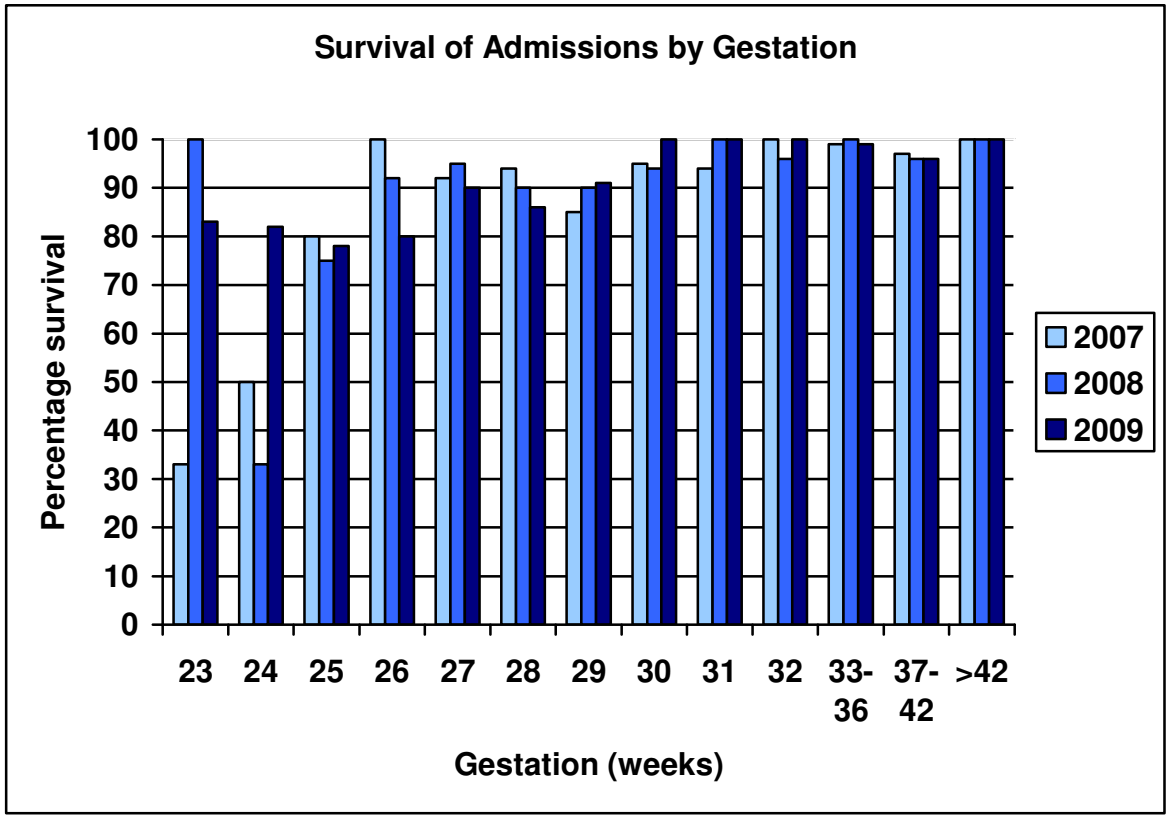
Inborn (booked and unbooked) excluding lethal congenital abnormalities
For definitions see Appendix 2

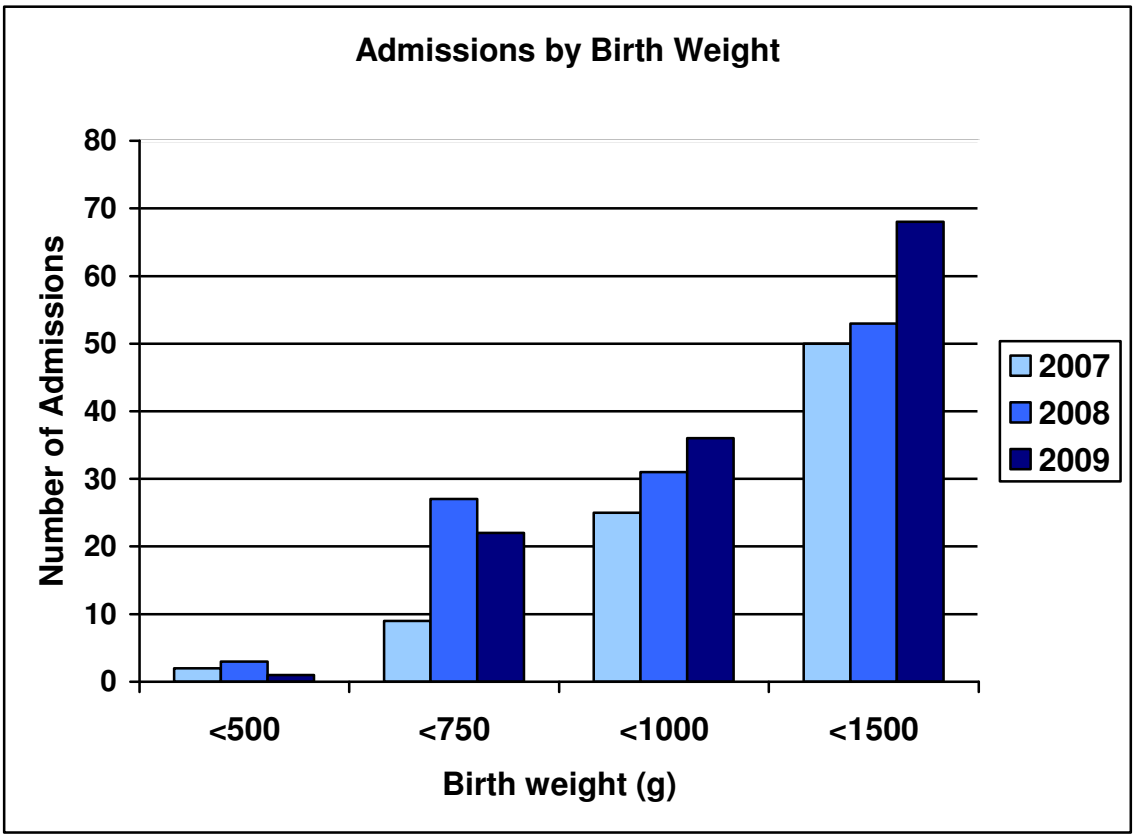
Survival of all live births by gestation 2009								
GA	**Live births**	**Admitted***	**Died before admission**	**Died <7d**	**Died 7-28d**	**Died >28d**	**Total deaths**	**Live births surviving to discharge**
23	8	6	2	1			3	63%
24	12	11	1	1	1	1	4	66%
25	9	9	0	2			2	78%
26	11	10	1		1		2	82%
27	19	19	0	1	1		2	89%
28	22	22	0	1	1	1	3	86%
29	21	21	0			1	1	91%
30	12	12	0					100%
31	17	17	0					100%
32	19	19	0					100%
33-36	112	112	0	1			1	99%
37-42	178	178	0	6	1		7	96%
>42	2	2	0					100%
Total	**442**	**438**	**4**	**13**	**5**	**3**	**25**	**94%**

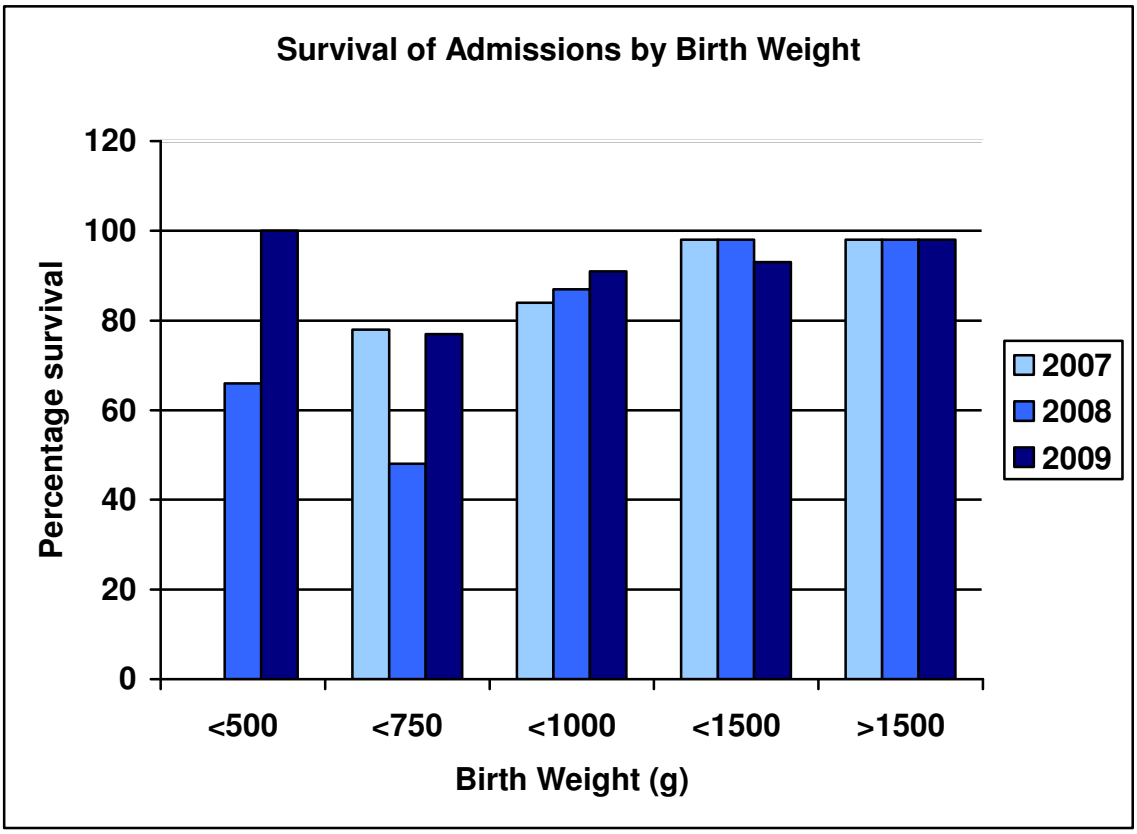
Not including re-admissions

TMBU, 3 year rolling survival to discharge for extreme preterm admissions							
GA	**2007**		**2008**		**2009**		**survival to discharge**
	admitted	**died**	**admitted**	**died**	**admitted**	**died**	
23	3	2	2	0	6	1	73%
24	4	2	15	10	11	3	50%
25	5	1	8	2	9	2	77%
26	6	0	11	2	10	1	88%
27	11	1	20	2	19	2	90%


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


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
33-36
37-42
>42
Gestation (weeks)
2007
2008
2009


Admissions by Birth Weight
Number of Admissions
80
70
60
50
40
30
20
10
0
<500
<750
<1000
<1500
Birth weight (g)
2007
2008
2009


Survival of Admissions by Birth Weight
Percentage survival
120
100
80
60
40
20
0
<500
<750
<1000
<1500
>1500
Birth Weight (g)
2007
2008
2009

TMBU deaths (inborn and ex-utero transfers) 2009						
Booked	**Delivered**	**GA**	**BW**	**Age d**	**PM**	**Cause of death, related factors**
Preterm Infants (deaths related to bacterial sepsis)						
Eastbourne	RSCH	23	500	23	N	Suspected sepsis, profound hypotension, care withdrawn
RSCH	RSCH	28	1360	2	N	Suspected sepsis, PROM, profound hypotension, care withdrawn
PRH	PRH	24	390	30	Y	Septic shock, extreme prematurity
Preterm Infants (deaths related to NEC)						
RSCH	RSCH	27	770	7	N	NEC
RSCH	RSCH	29	740	30	Y	Perforated NEC, E.Coli sepsis, IUGR
PRH	RSCH	28	1390	17	N	NEC
Eastbourne	Eastbourne	24	660	12	Y	Perforated NEC, Enterococcal sepsis, Twin 2, care withdrawn
Preterm Infants (deaths related to other causes)						
RSCH	RSCH	28	1310	32	N	Perinatal hypoxic ischaemic brain injury, grade III IVH, Group B streptococcal sepsis
RSCH	RSCH	25	700	1	Y	Pulmonary hypoplasia and congenital myopathy
RSCH	RSCH	33	1240	1	N	Pulmonary hypoplasia, multicystic dysplastic kidneys, arthrogryphosis
RSCH	RSCH	27	1280	1	Y	Simpson-Golabi-Behmel, bronchopneumonia
RSCH	RSCH	25	850	1	Y	Umbilical artery perforation
RSCH	RSCH	24	542	2	Y	Polyuric syndrome, profound hypotension, pulmonary hypoplasia, Grade IV IVH, E.Coli sepsis
RSCH	RSCH	26	800	29	Y	CMV pneumonitis
Term infants (deaths related to perinatal HIE)						
RSCH	RSCH	38	2749	1	N	Grade 3 HIE, care withdrawn
RSCH	RSCH	40	4160	2	Y	Grade 3 HIE, bronchopneumonia, care withdrawn
Eastbourne	Eastbourne	40	3600	2	Y	Grade 3 HIE, care withdrawn
RSCH	RSCH	40	3480	3	Y	Grade 3 HIE, subgaleal haematoma, care withdrawn
PRH	PRH	40	2510	3	Y	Grade 3 HIE, IUGR, care withdrawn
RSCH	RSCH	38	2870	14	N	Grade 3 HIE, placental abruption, care withdrawn
RSCH	Home	40	4160	2	N	Grade 3 HIE, shoulder dystocia

TMBU, 3 year rolling mortality									
	Total Admissions:				Deaths				Survival to discharge
	2007	2008	2009	Total	2007	2008	2009	Total	(%)
Inborn	359	376	358	1093	8	14	16	38	97
Outborn	106	127	79	312	10	16	5	31	90
<26 weeks	12	25	31	68	5	13	6	24	66
<28 weeks	17	31	33	81	1	3	3	7	91
<31 weeks	51	56	57	164	4	5	4	13	92
31+ weeks	368	391	316	1075	8	9	8	25	98
<500g	2	3	1	6	2	1	1	4	33
<750g	9	27	22	58	2	15	5	22	62
<1000g	25	31	36	92	4	4	3	11	88
<1500g	50	53	68	263	1	1	5	7	97
>1500g	362	389	310	1061	9	9	7	25	98

Special Care Baby Unit, Princess Royal Hospital

SCBU Admissions	2007	2008	2009
Total number of livebirths (PRH)	2349	2451	2413
Total number of stillbirths	8	11	6
Total admissions (re-admissions)	249	299 (27)	255 (24)
Percentage of live births admitted	11%	11%	10.5%

Admission details	2007		2008		2009	
	Babies	%	Babies	%	Babies	%
Total admissions	212		272		231	
Inborn	155	73	207	76	173	75
Outborn	57	27	65	24	58	25
Gestation ( ) = babies born elsewhere and transferred back to PRH						
23	1(0)		0		1(1)	
24	0		3(3)		1(0)	
25	0		0		3(3)	
26	0		1(1)		1(1)	
27	2(1)		5(4)		2(2)	
28	1(1)		6(6)		4(3)	
29	6(6)		5(5)		9(9)	
30	5(1)		8(8)		8(7)	
31	10(10)		10(9)		5(4)	
32	5(5)		10(8)		10(10)	
33-36	85	40.1	79	29.0	72	31.2
37-42	97	45.8	144	52.9	115	49.8
>42	0	-	0	-	0	-
Birthweight						
<500g	0	-	0	-	1	0.4
<750g	2	0.9	3	1.1	2	0.9
<1000g	3	1.4	2	0.7	8	3.5
<1500g	15	7.0	18	6.6	12	5.2
Multiple births (number of babies)						
Twins	39	18	60	22	44	19
Triplets	3	1.4	0	-	0	-

Does not include re-admissions

Transfers	2007	2008	2009
In-Utero			
Transfers out	N/K	N/K	55
Transfers to Brighton	N/K	N/K	45
Transfers elsewhere	N/K	N/K	10
Ex-Utero*			
Transfers out to Brighton	27	33	20
Transfers out to elsewhere	13	7	10
Transfers in from Brighton	65	56	58
Transfers in from elsewhere	11	2	7
Transfers in from home	16	12	9

Cot occupancy	2007		2008		2009	
Cots	**Days**	**% occ**	**Days**	**% occ**	**Days**	**% occ**
IC	73	-	89	-	80	-
HD	108	-	94	-	95	-
SC	1904	-	2491	-	2271	-
Total	**2085**	**71.4**	**2674**	**91.7**	**2446**	**84.0**

Mortality Statistics (PRH)	2006	2007	2008	2009
Total deliveries	2197	2357	2451	2419
Total livebirths	2196	2349	2440	2413
Total stillbirths	1	8	11	6
Early neonatal deaths*	4	3	2	1
Late neonatal deaths*	0	0	2	1
Post neonatal deaths (>28 days)*	1	0	0	0
Still birth rate	0.5	3.4	4.5	2.4
Perinatal mortality rate	0.2	4.7	5.3	2.9
Neonatal mortality rate*	1.8	1.3	1.6	0.8

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

Summary of Clinical Activity (TMBU)

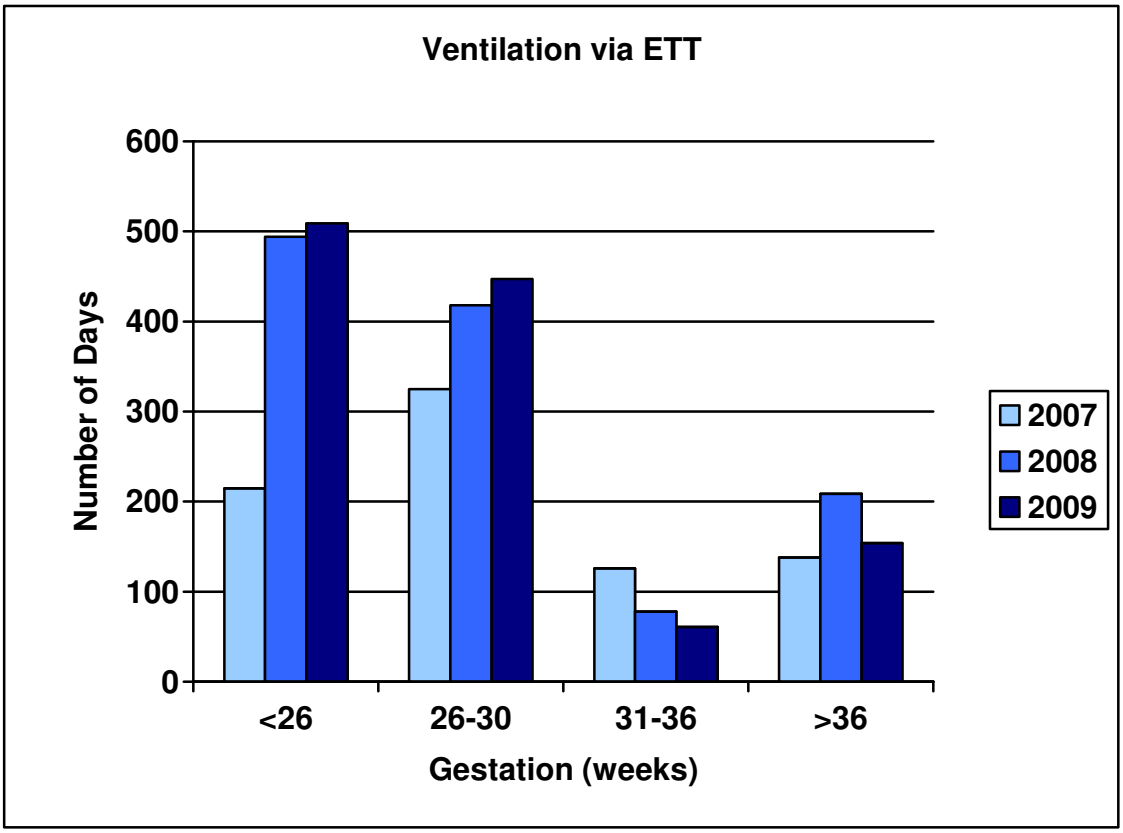
Respiratory support	2007	2008	2009	
	Days	Days	Days	Babies
Ventilation via ETT	804	1199	1171	126
CPAP and or Optiflow	1311	2113	2503	217
CPAP and Optiflow	N/K	N/K	N/K	97
CPAP alone	N/K	N/K	N/K	105
Optiflow alone	N/K	N/K	N/K	15
Oxygen therapy	1084	1048	1383	102
Surfactant (doses / babies)	50/44	66/57	81/63	
Nitric Oxide (days / babies)		71/16	40/18	

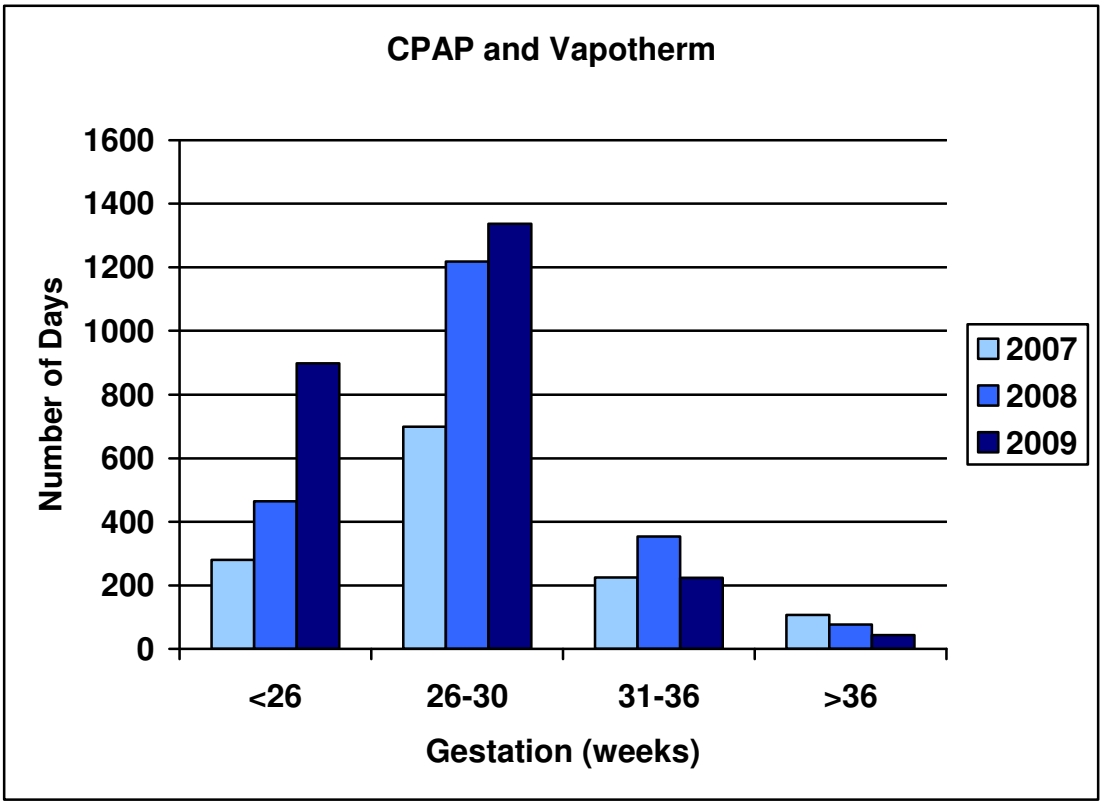
Respiratory diagnoses	Number of Babies	
	2008	2009
Respiratory Distress Syndrome	219	302
Transient Tachypnoea	25	30
Persistent Pulmonary Hypertension	15	13
Pulmonary hypoplasia	0	3
Meconium aspiration	22	16
Cystic Fibrosis	0	2
Congenital pneumonia	23	15
Acquired pneumonia	6	21

Respiratory Complications	2008	2009
Pulmonary haemorrhage	4	5
Pulmonary air leak requiring drain	16	14

Management of PDA	2008	2009
Patent Ductus Arteriosus (PDA)	54	49
PDA treated with indomethacin	33	42
PDA ligated	7	4

Infection	Positive Blood Cultures	
	2008	2009
Beta Haemolytic Streptococcus group B	2	4
Streptococcus (not GBS)	1	0
Coagulase-negative Staphylococcus	67	77
MSSA	4	1
MRSA	0	0
Enterococcus	3	10
Micrococcus species	1	0
Listeria	0	1
Escherichia Coli	3	3
Klebsiella species	8	5
Serratia species	0	5
Enterobacter species	5	5
Pseudomonas aeruginosa	1	0
Candida	0	1
TOTAL	**95**	**112**
	Babies Screening Positive	
MRSA (* only ex-utero transfers screened)	2*	5
VRE	0	0


Ventilation via ETT
600
500
400
300
200
100
0
Number of Days
<26
26-30
31-36
>36
Gestation (weeks)
2007
2008
2009


CPAP and Vapotherm
1600
1400
1200
1000
800
600
400
200
0
Number of Days
<26
26-30
31-36
>36
Gestation (weeks)
2007
2008
2009

Necrotising Enterocolitis	2008		2009	
	Cases	IC/HD cot days	Cases	IC/HD cot days
NEC	35	-	29	-
Perforated NEC	4	-	7	-
NEC treated surgically	8	298	12	856

Neonatal Surgical Cases (not NEC)	2008		2009	
	Cases	IC/HD cot days	Cases	IC/HD cot days
Gastroschisis	3	63	2	29
Exomphalos	4	59	2	7
Hirschsprungs	1	7	1	12
Malrotation	0	0	3	18
Meconium ileus	2	0	4	82
Spontaneous perforation	2	35	3	81
Oesophageal Atresia / TOF	3	32	5	41
Intestinal atresia/obstruction	4	76	4	18
Inguinal hernia repair	7	14	9	18
Imperforate anus/rectal anomaly	3	11	1	14
Lung cyst/sequestration	1	24	1	3
Diaphragmatic eventration	3	25	0	0
Diaphragmatic hernia	0	0	2	18
Drainage of abscess	3	7	2	4
CVL insertion	8	8	10	10
Rectal biopsy	4	4	4	4
Drains/gastrostomy/vesicostomy	2	15	4	8
TOTAL	**50**	**380**	**56**	**322**

Cranial Ultrasound Diagnoses	Number of Babies	
	2008	2009
IVH with parenchymal involvement	8	3
Post haemorrhagic hydrocephalus requiring surgical intervention	4	0
Infarction without IVH	1	1
Periventricular ischaemic injury with cyst formation	1	0

All babies <32 weeks gestation have routine cranial ultrasound examination

Hypoxic Ischaemic Encephalopathy	2007	2008	2009
HIE grade 1	5	13	5
HIE grade 2	5	19	6
HIE grade 3	4	9	6
Hypothermia therapy	5	14	13
Inborn	3	5	7
Outborn	2	9	6

Retinopathy of Prematurity	2007	2008	2009
ROP grade 2	2	7	7
ROP grades 3/4	0	2	1
ROP treated with laser therapy	0	2	1

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		
	2007	2008	2009
PDA ligated	3	7	4
Operated on for NEC	5	5	12
Chest drain for pulmonary air leak	5	16	14
Surgical intervention for post haemorrhagic hydrocephalus	1	4	0
Laser treatment for ROP	0	2	1

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	2005	2006	2007	2008	2009
Access, admission, transfer, discharge	13	5	8	10	9
Clinical assessment (including diagnosis, scans, tests, assessments)	6	7	3	10	7
Consent, communication, confidentiality	8	8	5	18	9
Documentation (including records, identification)	11	9	9	20	14
Implementation of care and ongoing monitoring / review	13	3	1	3	0
Infection Control Incident	3	3	5	1	0
Infrastructure (including staffing, facilities, environment)	22	18	21	17	4
Medical device / equipment	13	9	12	24	11
Medication	43	34	25	69	47
Other Incident	0	1	1	3	0
Patient accident	2	3	0	1	0
Treatment, procedure	12	14	17	44	30
Total	**146**	**115**	**107**	**223**	**131**

Grade	2005	2006	2007	2008	2009
No Harm: Impact Prevented	55	21	36	51	78
No Harm: Impact not Prevented	49	65	51	128	25
Low	42	29	20	37	25
Moderate	0	0	0	7	3
Severe	0	0	0	0	0
Death	0	0	0	0	0
Total	**146**	**115**	**107**	**223**	**131**

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 Ian Male 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 has been analysed at 24 months CA for a cohort of 99 preterm infants born at <29 weeks gestation and or <1000g and cared for within the first 24 hours of life on the TMBU. The babies were born in the five years spanning October 2002 to September 2007.
The TRPG Health Status Questionnaire assesses both developmental and general health outcomes.

Outcome according to TRPG Health Status Questionnaire at 24 months CA

Outcome	<26 weeks (%)	26-28 weeks (%)	Total (%)
Normal	9 (29)	39 (57)	48 (48)
Impaired	10 (32)	16 (24)	26 (26)
Severe disability	6 (19)	6 (9)	12 (12)
Lost to follow-up	6 (19)	7 (10)	13 (13)
TOTAL	**31**	**68**	**99**

Bayley Scales replaced SGS assessments in June 2007. The cohort for SGS assessments therefore totals 85 rather than 99. Full year results of Bayley Scale assessments are awaited.

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

8 babies from 85 were not assessed

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 [E pub ahead of Print]

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 01/01/2009-31/12/2009 by KSS Teams

Transfer	Kent	Surrey	Sussex
Unplanned	193	120	163
Planned	187	132	143
Total	380	252	306

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	81%
No team available	5%
Doctor only	3.5%
Nurse only	11%

In Sussex there were 54 postnatal transfers for medical IC: 54% were kept within Surrey & Sussex Neonatal Network and 46% were transferred out, either to Kent or London.

Postnatal transfers for medical intensive care within 2009 for Kent, Surrey & Sussex showing proportions of those receiving care within region or outside region

	Kent	Surrey	Sussex
Total postnatal referrals for medical IC	64	42	70
Required medical IC and received within region	38 (59.38%)	12 (28.57%)	38 (54.29%)
Required medical IC and received out of region	26 (40.63%)	30 (71.43%)	32 (45.71%)

There is no surgical service in Kent or Surrey so many new surgical postnatal referrals are transferred out of region. Of the 100 surgical transfers, referred postnatally, in Kent and Surrey, 92 went to London or regions other than Sussex in 2009. In Sussex 10 out of 31 patients, who were referred postnatally via the transfer service, received their surgical care outside of Sussex.

	Kent	Surrey	Sussex
Out to London or other for surgery	51	41	10
Into Sussex for surgery	0	8	21

For further information, please see the Transport Annual Report (1.3.09-31.3.10) to be published in April 2010.

Guidelines and Audit
(Appendix 3)

There is an active programme of clinical governance within the department including 3 monthly multidisciplinary clinical governance 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. Several research nurses have joined our team during 2009.

Monthly multidisciplinary research meetings are held and links have been made 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.

Funding has been secured from the Research for Patient Benefit scheme (National Institute for Health Research) for follow-up of the babies enrolled into the cord clamping trial. The industry sponsored projects on white light spectroscopy measurements of microcirculation 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 we organized the third Regional Paediatric and Neonatal Research Day, which was very well attended. A further similar event is planned for 2010.

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 and tutorials, ward rounds and they learn to carry out newborn examination. 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 attend the student selected module (SSC) BSMS 307. During this module they learned 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 delivered the first ST1 – ST3 KSS Deanery Study Day in June 2009.

A Local Faculty Group has now been established to oversee Education Governance.

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

Week 3 RSCH One Stop Clinic – baby appointments only

Week 4 RSCH One Stop Clinic - antenatal

Speech & Language Therapy Service (SALT)

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. SALT clinics, BPD clinics). In November, Rachelle Mayo, Senior Specialist Speech & Language Therapist, left the Trust to return home to New Zealand. Rachelle set up the Service to TMBU in April 2000. Alex Lazell, Highly Specialist Speech & Language Therapist has continued to support the unit and is awaiting the arrival of Jane Pettigrew, who will be the new Senior Specialist Speech & Language Therapist.

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 for babies that are transferred to PRH, or for babies that are discharged home and live outside of the Brighton and Hove area. Babies transferred to the RACH will continue to be seen by the department. Increasing numbers of infants requiring speech and language therapy input have been transferred to the RACH this year.

Outpatient follow-up is provided on an 'as needed' basis for those babies who reside in the Brighton and Hove area.

Case Mix	Numbers of babies 2009
Neurological causes	7
Anatomical	3
Syndromic / dysmorphic	1
Prematurity (28 weeks or less)	26
Slow to feed/non specific cause	15
NAS	3
Other	5
Total	**60**

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 23 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.

For 2009 all efforts continued to be concentrated on furnishing the new parents accommodation including beds, seating, lighting and televisions. The environment for families has been much improved by this work and we are already receiving good feedback.

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.

We continue to be fortunate in receiving donations from parents, friends and businesses which have allowed purchase of equipment. Thank you for your generosity and support.

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 2009

AUDIT OR GUIDELINE	COMPLETED	PRESENTED	DATE	COMMENTS & ACTIONS	ACTIONS COMPLETED
Nationally Commissioned Audits					
National Neonatal Audit Database	Ongoing	Regular reports circulated via e-mail + discussed at senior staff meeting	Throughout 2009, full report in May 2010 expected	• 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 process
National Targets and Projects					
Essence of Care benchmarking by nursing staff	Ongoing	Yes, at nursing staff away days	Throughout 2009	• No change	√
Neurodevelopmental outcome	Ongoing	Yes, published in peer-reviewed journals	Epub. 2009	• Follow-up continued • Plans for extending neurodevelopmental follow-up to Neonatal Network (Surrey, Sussex and Kent)	√ In process
Neonatal hearing screening	Ongoing	No		• Organise presentation • Change of NICU practice requires amendment of guideline – audit of current practice planned	In process In process
Neonatal Transport Service: Regional Activity	Ongoing	Reports circulated via e-mail + discussed at senior staff meeting	10/2009	• Since September a 24/7 regional neonatal transport service is running, shared between the teams from Surrey, Kent and Sussex • Majority of emergency transfers done by Sussex team.	

				• Improve dispatch time and temperature on arrival as worse than for the Kent and Surrey team, but still above national average • Modify/devise audit tool for change in transport service	√ In process
Nationally Produced Guidance					
CEMACH – Guidance (27/28 project, diabetes in pregnancy)	Ongoing	Circulated via e-mail + discussed at senior staff meeting	Throughout 2009	• All requirements fulfilled • Update hypoglycaemia guideline and implement (see below)	√ In process
Early Neonatal Sepsis/Intrapartum Care (NICE)	Yes	Yes	2008	• Audit of updated guideline	Required
Diabetes in pregnancy: management of diabetes and its complications from pre-conception to the postnatal period (NICE)	Yes	Circulated via e-mail + discussed at senior staff meeting	2009	• Local guideline more strict than NICE to increase patient safety • Modifications to meet BFI standards required • Audit of updated guideline	In process Required
Trust Identified Projects					
Audit of Perinatal Management of Infants Born to HIV Pos. mothers	Yes	Circulated via e-mail + discussed at senior staff meeting	7/2009	• Good compliance with protocol • Protocol updated • Information about chickenpox and measles for parents included	 √ √
Infection Control Environmental Audit	Ongoing	Regular reports circulated via e-mail + discussed at senior staff meeting	Throughout 2009	• Overall good performance 2009 • New central care and peripheral line care bundle as well as phlebitis score discussed, amended and implemented 2008	 √
Parent Satisfaction Survey	Ongoing	Circulated via e-mail +	4/2009	• Overall very good response – > 90 % of parents feel unit is organised, safe, respects	

		discussed at senior staff meeting		patient privacy and confidentiality • Modifications to improve concerns raised in questionnaire required • Refine questionnaire with focus to particular areas	 In process In process
Review of risks, incidents, complaints & claims	Ongoing	Circulated via e-mail + discussed at senior staff meeting	2009	• 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®)	 √
Specialty Identified Projects					
Hepatitis C Guideline	Yes	Circulated via e-mail + discussed at senior staff meeting	2/2009	• Revised, more user-friendly and up to date guideline implemented	√
Baseline study for guideline on the use of Vapotherm®	Yes	Circulated via e-mail + discussed at senior staff meeting	2/2009	• To formalize and increase the use of HHFNC (Vapotherm® or Optiflow®)	√
Audit of adherence to RSV guideline	Yes	Circulated via e-mail + discussed at senior staff meeting	2/2009	• Adherence is not 100 %, but this does not relate to an increase number of admissions to PICU/HDU – reinforce adherence to guidance	√
ROP guideline	Yes	Circulated via e-mail + discussed at	2/2009	• Revised, more user-friendly and up to date guideline implemented	√

		senior staff meeting			
Review of deaths 2008	Yes	Circulated via e-mail + discussed at senior staff meeting	2/2009	• Overall death rate (2005-2007) below national average despite overall increase in admissions. • Relative increase in deaths in 2008 of more mature newborns, mostly ex-utero referrals with HIE • Focus for the future should be the care of the ELBW, infection control and NEC as well as management of HIE	√ In process
Evaluation of HHFNC devices	Yes	Circulated via e-mail + discussed at senior staff meeting	4/2009	• Optiflow® seems to be more user-friendly, less prone to faults and more cost-effective, while being equally clinically effective • In view of concerns around safety of Vapotherm® decision made to switch to Optiflow®	 √
Non-invasive respiratory support guideline	Yes	Circulated via e-mail + discussed at senior staff meeting	7/2009	• Effectiveness of new practice confirmed through retrospective study • Guideline implemented	 √
TPN Guideline	Yes	Circulated via e-mail + discussed at senior staff meeting	7/2009	• New more cost-effective practice introduced	√
Patient radiation dose audit	Yes	Circulated via e-mail + discussed at senior staff meeting	10/2009	• No difference in radiation exposure between on the patient and on the incubator shielding • Introduce lead shielding on incubator as standard practice	 √

Audit of filing notes	Yes	Circulated via e-mail + discussed at senior staff meeting	10/2009	• Front portion: PMI front sheet, admission documentation, family and social record as well as meeting, ophthalmology results, consent for surgery filed correctly in no more than 50-70% • Rear portion overall worse than front portion; care bundles and TPN prescription worst • Microbiology sheets and summary of stay only filled in 50% • Explore new ways of improving documentation order and entries allowing rapid access to key areas that require regular access of information with regular entries	In process
Introduction to enteral feeding guideline	Yes	Circulated via e-mail + discussed at senior staff meeting	10/2009	• Outline of current evidence with regard to enteral nutrition of preterm infants • Develop new guideline, including surgical patients	√

Appendix 4

RESEARCH

List of Studies 2009

Studies initiated locally

Neurology

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

Randomised trial: Slight delay in cord clamping time (30 s) versus milking of the cord (4 times)
[Randomised trial in preterm infants < 33 weeks gestation, singletons, inborns at RSCH]
Contact persons: Dr H Rabe, Research Nurse Denise Stilton

Parent's perception of randomised trials
Parental perceptions of their baby's participation in randomised controlled trials in neonatal medicine (Parent interviews).
Contact person: Dr H Rabe, Dr S Ayers

Microcirculation/Non-invasive methods

Non-invasive transcutaneous spectroscopic measurements with the Mediscan 2000 in infants
Contact person: Dr H Rabe, Research Nurse Denise Stilton

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

Non-invasive comparative lung function measurements in infants on NCPAP versus Bubble CPAP versus Vapotherm versus Medijet, start in Dec 2008
Contact persons: Dr P Seddon, Dr H Rabe

Prospective birth cohort study of filaggrin receptor mutations on cord bloods in newborn infants, start April 2009

Contact persons: Prof S Mukhopadyay, Dr H Rabe, Dr A Roueche

Multicentre trials

ADEPT

Randomised controlled trial on early versus late enteral feeding in infants < 35 0/7 weeks GA with IUGR and absent or reversed end diastolic flow antenatally

Contact person: Dr H Rabe, Dr JR Fernandez Alvarez

CMV Database and viral load and immunology study

Register and follow-up treatment of babies with congenital cytomegaly infection

Contact person: Dr H Rabe, Dr JR Fernandez Alvarez

EPICURE II Follow-up study

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

Contact person: Dr P Amess, C McFerran

RESEARCH MEETING 4th Thursday of the month at 2 pm

Papers

Rabe H, Fernandez Alvarez JR, Seddon P, Lawn C, Amess PN: A management guideline to reduce the frequency of blood transfusion in very low birth weight infants. Am J Perinat 2008; Dec 15 (epub ahead of print)

Wertheim D, Olden C, Savage E, Seddon P. Respiratory data from pulse oximetry in newborns. Arch Dis Child Fetal Neonatal Ed. 2008 Nov 17. (Epub ahead of print)

Amess P, McFerran C, Khan Y, Rabe H: Early prediction of neurological outcome by Term Neurological Examination and cranial ultrasound in very preterm infants. Acta Paediatr 2008; Oct 22 (epub ahead of print)

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 [E pub ahead of Print]

Brand PL, Baraldi E, Bisgaard H, Boner AL, Castro-Rodriguez JA, Custovic A, de Blic J, de Jongste JC, Eber E, Everard ML, Frey U, Gappa M, Garcia-Marcos L, Grigg J, Lenney W, Le Souëf P, McKenzie S, Merkus PJ, Midulla F, Paton JY, Piacentini G, Pohunek P, Rossi GA, Seddon P, Silverman M, Sly PD, Stick S, Valiulis A, van Aalderen WM, Wildhaber JH, Wennergren G, Wilson N, Zivkovic Z, Bush A. Definition, assessment and treatment of wheezing disorders in preschool children: an evidence-based approach. Eur Respir J. 2008 Oct;32(4):1096-110

Rabe H, Reynolds G, Diaz-Rossello J. A systematic review and meta-analysis of a brief delay in clamping the umbilical cord of preterm infants. Neonatology. 2008; 93:138-44

Letter

Alvarez JRF, Aiton N, Amess P, Bomont R, Lawn C, Seddon P, Watkins R, Rabe H: Concerns about the new NICE guidelines on intrapartum care and diabetes in pregnancy. Arch Dis Child Fetal Neonatal Ed 2008; 93:F474-5

Book Chapter

Rabe H: Ethical aspects of the new Paediatric Drug Regulation in the European Union. In Griffin JP, O'Grady J: Textbook of Pharmaceutical Medicine, 6th ed. BMJ Blackwell Publ. Oxford, UK 2009

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)

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)

2006-2007 BSUH R&D: Prospective pilot study of non-invasive transcutaneous spectroscopic measurements (Mediscan 2000) and bedside IL-6 in neonates with suspected infection. (£ 10,000)

2003 - 2005 Sussex R&D BSUH and BSMS: Study on measuring haemoglobin non-invasively by white light spectroscopy (Mediscan 2000) (£ 25,000)