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This report can be found on the BSUH Neonatal website.

Data used to compile this report has been collected from BadgerNet and Metavision. Thanks go to Patricia Walker for data management.

For enquiries please contact: p.amess@nhs.net

A big thank you goes to Forrest and his family for letting us use his very handsome photograph for the front page of our 2018 annual report!

Abbreviations	
AABR	Auditory Acoustic Brainstem Responses
ANNP	Advanced Neonatal Nurse Practitioner
ATAIN	Avoiding Term Admissions into Neonatal Units
BAPM	British Association of Perinatal Medicine
BSUH	Brighton and Sussex University Hospitals
CA	Corrected age
CDC	Child Development Centre
MBRRACE	Mothers and Babies - Reducing Risk through Audits and Confidential Enquiries across the UK
CLD	Chronic Lung Disease
CPAP	Continuous Positive Airway Pressure
CVL	Central venous line
EBA	Early Birth Association
ETT	Endotracheal tube
EUT	Ex-utero transfer
GA	Gestational age
HD	High dependency
HHFNC	Humidified High Flow Nasal Cannula
HFOV	High Frequency Oscillatory Ventilation
HIE	Hypoxic Ischaemic Encephalopathy
IC	Intensive care
IUGR	Intrauterine Growth Restriction
IVH	Intraventricular Haemorrhage
KSS	Kent, Surrey and Sussex
LW	Labour Ward
MRSA	Methicillin Resistant Staphylococcus Aureus
MSSA	Methacillin Sensitive Staphylococcus Aureus
NEC	Necrotising Enterocolitis
NIPE	Newborn & Infant Physical Examination Programme
N/K	Not Known
NNU	Neonatal Unit
NTS	Neonatal Transport Service
OAE	Otoacoustic emissions
OOPE	Out of Program Experience
PDA	Patent Ductus Arteriosus
PRH	Princess Royal Hospital
PROM	Premature Rupture of Membranes
RACH	Royal Alexandra Children's Hospital
ROP	Retinopathy of Prematurity
RSCH	Royal Sussex County Hospital
SLT	Speech and Language Therapy
SC	Special Care
SCBU	Special Care Baby Unit
TOF	Tracheo-Oesophageal Fistula
TMBU	Trevor Mann Baby Unit
WTE	Whole time equivalent

Introduction

2018 has been an important year for the neonatal unit and the BSUH Trust. The new hospital build on the Royal Sussex County site, known as the 3Ts, is advancing rapidly and will provide outstanding facilities for medical and surgical care. The helipad has been completed, which is part of the plan to establish full trauma and neurosurgical services. Building works for the TMBU were finally approved and have now commenced. These works will improve the clinical environment by opening a new nursery to provide much needed space to manage new admissions and improve the care of babies close to discharge. Parent facilities will be improved including provision of a dedicated quiet room. This project is funded in its entirety by charity donations to the sum of £350,000. The Early Birth Association has made a major contribution to this sum. Many thanks go to the EBA and to all our donors and fundraisers who have given so generously. The amazing support from parents, family and friends of babies we have cared for remains vital to our progress.

Special thanks go to Elaine Rowe, who has recently resigned as the Chairperson for the Early Birth Association. She has put an amazing amount of her time and effort into supporting parents and fundraising over more than twenty years. A very big thank you from us all.

There has been a change to the Department's neonatal matron. At the end of 2018 Claire Hunt was appointed to the Neonatal Matron post. Our thanks go to Judith Simpson for her contribution as Matron during 2017 and 2018. Claire has taken over as Matron for both the Trevor Mann Baby Unit and the Special Care Baby Unit at PRH from January 2019.

Improving the standard of care on the baby units is always the department's prime aim. This year we have seen further progress with revision of important clinical guidelines, research and development of human factors' work and education. The educational and training program has continued to receive excellent feedback from medical and nursing students, medical trainees and trainee advanced nurse practitioners.

The most recent MBRRACE report for data collected in 2016 showed the neonatal department at the BSUH to have a perinatal mortality rate more than 10% below the national average and the lowest neonatal and extended perinatal mortality rate for a Level 3 unit undertaking surgery. The neonatal dashboard and neurodevelopmental outcomes published in this report suggest that we are performing well when compared to national statistics. However we also recognise that this same data tells us where we should be improving. In 2019 the department hopes to sign up and start entering our data to the Vermont Oxford Neonatal Database. This will help us compare and track our local clinical outcomes for preterm babies with units around the world and focus our quality improvement plans. Hopefully we will be able to share some of this data in the annual report in the years to come.

The Department of Neonatology is based on the Trevor Mann Baby Unit at the Royal Sussex County Hospital and the Special Care Baby Unit at Princess Royal Hospital. In 2018, there were 2890 deliveries at the Royal Sussex County Hospital and 2290 deliveries at the Princess Royal Hospital.

The Trevor Mann Baby Unit, Brighton:

The TMBU is one of the intensive care units in the Kent, Surrey and Sussex Neonatal Network. It provides a tertiary, neonatal medical and surgical service for Brighton, East and West Sussex and a special care service for Brighton and Mid-Sussex. The Sussex Neonatal Transport Service is based at the TMBU. The units within the South East Coast Operational Delivery Network continue to strive to provide care as close to home

as possible, and we work with our colleagues in neighbouring transport services to ensure this can happen.

There are 27 cots on the TMBU of which 9 are staffed for intensive care, 8 for high dependency care and 10 for special care. Current cot levels in Brighton are set to provide sufficient medical and surgical intensive care facilities for Sussex babies. Transitional care is provided on the postnatal ward at RSCH. The Neonatal Outreach Service offers the opportunity for earlier and more supported discharge. A co-located midwifery led birthing unit in Brighton is awaited along with improvements to foeto-maternal services.

The Special Care Baby Unit, Haywards Heath:

The SCBU at Princess Royal Hospital is staffed for 8 special care cots. Transitional care is provided on the postnatal ward. The baby unit is one of two in the UK led by a team of Advanced Neonatal Nurse Practitioners, supported by consultant neonatologists. Women likely to deliver at less than 34 weeks gestation, or whose baby may require intensive or high dependency care, are transferred to the RSCH. There are facilities at PRH for short term ventilation and stabilisation of infants prior to transfer. Infants requiring short periods of care on CPAP or HHFNC are routinely managed at PRH. Plans are in place and charity funding has been pledged to improve facilities on the SCBU. It is hoped that delivery of more preterm babies might be possible once these changes are completed.

Further details can be found on the departmental website:

Maternity Service:

The neonatal and maternity teams work together to provide joint antenatal care for local mothers and in-utero transfers to the maternity department at RSCH. There is a monthly fetal medicine clinic with neonatal and surgical input. Individual counselling is provided for parents on the labour ward expecting preterm babies or babies with other complications.

The neonatal team deliver care and resuscitation to newborn babies on the labour ward as required. The team will routinely attend at-risk deliveries and those expected to need extra support such as preterm infants or those babies with complex antenatal diagnoses.

The neonatal department is responsible for NIPE screening for normal newborn infants and those on Transitional Care.

The maternity and neonatal teams are actively improving newborn pathways within the ATAIN programme. There are joint audit and clinical governance and perinatal meetings across RSCH and PRH sites.

Neonatal Surgery:

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

Support services and ongoing care:

We benefit from the developing tertiary services at the RACH, including respiratory

medicine, cardiology, gastroenterology and endocrinology. Infants with ongoing medical or surgical needs beyond the neonatal period are transferred to the 'Alex' as soon as possible and we have particularly close links with the paediatric HDU which

helps support the smooth transfer of babies with complex respiratory and surgical problems. Our department is supported by a team of paediatric radiologists providing a 24/7 on-call service. MRI, spiral CT and nuclear medicine investigations are all available on site. The neurophysiology department provides a mobile EEG service. We also have access to paediatric dietetics, physiotherapy, pharmacy, speech and language therapy, audiology, ophthalmology, breastfeeding advisor. The Respiratory and Community Paediatric Nursing Team help co-ordinate the discharge and follow-up of infants requiring home oxygen. There is a weekly multidisciplinary Family & Social Meeting. We have access to parent counselling and support from the Chaplaincy Team.

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

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

Staffing

Medical Staff

Consultant Neonatologists:

Dr Neil Aiton	Interest in perinatal substance misuse (One Stop Clinic)
Dr Philip Amess	Lead Clinician, interest in neurology and developmental outcome
Dr Prashanth Bhat	Interest in neonatal ventilation and IT
Dr Robert Bomont	Paediatric College Tutor, Training Programme Director, interest in infectious diseases
Dr Ramon Fernandez	Lead for Clinical Governance, interest in nutrition, Senior Lecturer
Dr Cathy Garland	Transport Lead, interest in simulation training
Dr Cassie Lawn	Transport Lead, interest in human factors
PD Dr Heike Rabe	Lead for Research, Reader
Dr Ryan Watkins	Clinical Director, Children and Women's Services and Honorary Clinical Senior Lecturer.
Dr Nikolay Drenchev	Consultant Neonatologist, interest in cardiology
Dr Bettina Reulecke	Consultant Neonatologist, interest in neonatal neurology

Consultant Obstetricians:

Mr Salah Abdu
Mr Tosin Ajala (Clinical Director Women's Health)
Miss Heather Brown (Deputy Medical Director)
Mr Ani Gayen
Mr Ehab Kelada
Mr Tony Kelly
Miss Jo Sinclair (Obstetric Lead)
Mr David Utting
Ms Win Khine (Fetal Medicine)

Consultant Paediatric Surgeons:

Miss Ruth Hallows (Clinical Lead)
Mr Varadarajan Kalidasan (Director of Medical Education)
Miss Anouk van der Avoirt
Mr Bommaya Narayanaswamy
Mr Saravanakumar Paramalingam
Miss Jigna Sheth

Mr Subramanyam Maripuri, Mr Thomas Crompton, Mr Stefano Bolongaro (Orthopaedics)

Mr Simon Watts, Mr Prodip Das (ENT)

Consultant Radiologists:

Dr Lorraine Moon, Dr Ima Moorthy, Dr Lavanya Vitta, Dr Kyriakos Iliadis (Clinical Lead), Dr Jacqueline DuToit, Dr Arlen Urquia

Consultant Ophthalmologists:

Mr Dominic Heath, Miss Victoria Barrett

Consultant Audiologist:

Mr Rob Low

Consultant Pathologist:

Dr Mudher Al-Adnani (St Thomas' Hospital)

HD Paediatric Consultant:

Dr Kamal Patel

Cardiology Consultant:

Dr P Venugopalan

Consultant Gastroenterologists:	Dr Assad Butt, Dr Michael Hii	
Respiratory Consultants:	Dr Paul Seddon, Dr Krishne Chetty, Dr Akshat Kapur, Professor Somnath Mukhopadhyay	
Endocrinology Consultants:	Dr Shankar Kanumakala, Dr Dunil Ismail	
Haematology Consultant:	Dr Catherine Wynne	
Oncology Consultant:	Dr Ann Davidson	
Neurology and Epilepsy Consultant:	Dr Nikil Sudarasan	
Visiting Consultants:	Dr Hannah Bellsham-Revell	Cardiology
	Dr Shelagh Mohammed	Genetics
	Dr Chris Reid	Nephrology
	Dr Tammy Hedderly	Neurology
	Dr Elaine Hughes	Epilepsy
	Dr Charles Buchanan	Endocrinology
	Dr Mike Champion	Metabolic medicine
	Dr Jonathan Hind	Gastroenterology

Junior and Middle Grade Medical Staff:

Tier 1 (8 wte):	6 ST2/3 trainees 1 Trust Clinical Fellow Physician's Assistant (Kirsty Douglas) Additional ANNP contribution
Tier 2 (11 wte):	Associate Specialist (Dr Michael Samaan) Specialist Doctors (Dr Fatou Wadda, Dr Sireesha Battenini) 4 Specialist Registrars 1 Grid Trainee 1 Trust Clinical Fellow 2 Research Fellows (1 wte clinical) 1 Human Factors OOPE (0.5 wte clinical) ANNP contribution (approximately 1.25 wte) Consultant contribution (approximately 2 wte)

Neonatal Nurses

Senior Nursing Staff

Lorraine Tinker	Head of Paediatrics and Neonatal Nursing
Judith Simpson	Matron, Neonatology
Mrs Susanne Simmons	Senior Lecturer Child Health/Graduate Certificate in Acute Clinical Practice course leader/Neonatal Pathway lead

Band 7

Clare Morfoot (Clinical Practice Educator)
Clare Baker (Senior Sister, PRH)
Louise Watts (Transport)
Chrissie Leach (Transport)
Jacqueline Cherry (Risk management)
Sandra Hobbs (Rota and Leave)
Karen Marchant (Surgery and Patient Information)
Betina Jahnke (Infection Control)
Judy Edwards (Neonatal Outreach and Family Care)

Advanced Neonatal Nurse Practitioners

Jamie Blades	Maggie Bloom
Rachel Burton	Naomi Decap
Karen Hoover	Caroline McFerran
Nicola McCarthy	Jonathan O'Keeffe
Sandra Summers	Simone van Eijck

In training: Alyx March, Eleana Gonzalez, Ellie Hampton

There is a large team of Advanced Neonatal Nurse Practitioners who deliver the neonatal service at the SCBU PRH and contribute significantly to the Tier 1 and Tier 2 rota at the TMBU. Each ANNP has a consultant mentor, they are line managed by Lorraine Tinker, Head of Paediatrics and Neonatal Nursing.

Outreach Team:

Judy Edwards
Sarah Arief

The Neonatal Outreach team works to support the discharge of infants from the TMBU and the SCBU at PRH. The team comprises of a sister who works full time and a nursery nurse who works 22.5 hours per week.

Transport Ambulance Team:

Andy Frame
Graham Bullimore

Support Staff

Directorate Manager:	Jonathan Brooks
Unit Technician:	John Caisley
Pharmacist:	David Annandale
SLT:	Amanda Harvey, Katie James
Physiotherapy:	Emma Pavitt
Dietician:	Carole Davidson
Counsellor:	Peter Wells and Julie Carroll
Secretarial support:	Jane Battersby, Emma Morris, Patricia Walker
Ward clerks:	Kim Baldry, Diana Ginn, Anthony Jackson-Leonard, Sasha Nye, Holly Hales-Marley

Admissions, Activity and Mortality Trevor Mann Baby Unit

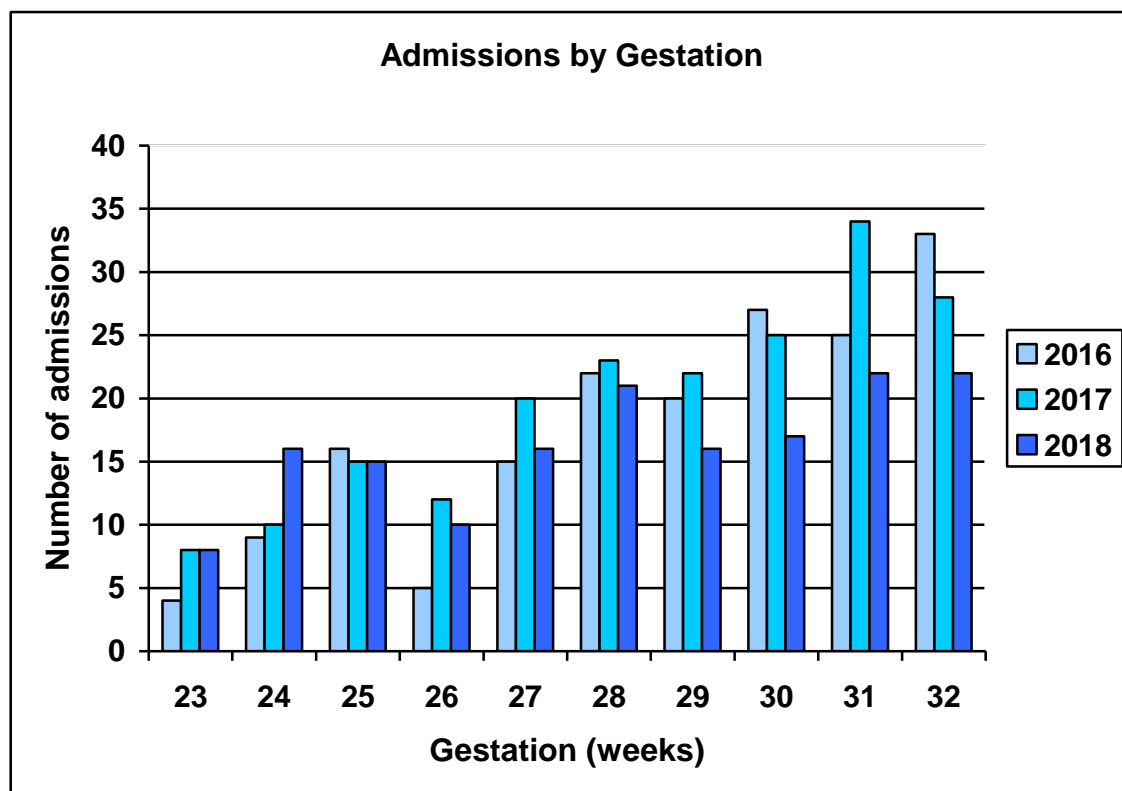
Admissions	Total Admissions per year
2008	524
2009	456
2010	525
2011	562
2012	567
2013	528
2014	516
2015	534
2016	524
2017	513
2018	529

Includes re-admissions

Admissions	2016	2017	2018
Total number of live births (RSCH)	3380	3110	2890
Total admissions (including re-admissions)	524	513	529
Inborn	356	369	335
Inborn booked RSCH	254	281	245
Inborn booked elsewhere	102	88	90
Outborn	141	126	151
Re-admissions	21	17	43
Admissions from home	6	1	2
Percentage of inborn births admitted to the TMBU	10	12	11

Admission details	2016		2017		2018	
Gestation (weeks)	Babies	%	Babies	%	Babies	%
23	4	1	8	2	8	2
24	9	2	10	2	16	3
25	16	3	15	3	15	3
26	5	1	12	2	10	2
27	15	3	20	4	16	3
28	22	4	23	5	21	4
29	20	4	22	4	16	3
30	27	5	25	5	17	3
31	25	5	34	7	22	4
32	33	6.5	28	6	22	4
33-36	144	29	119	24	130	27
37-41	180	36	175	35	197	40
>42	3	<1	5	2	9	2
<500	2	<1	3	<1	3	<1
<750	30	6	23	5	23	4
<1000	20	4	37	7	30	6
<1500	62	12	89	18	57	12
Twins	85	17	99	20	82	17
Triplets	3	<1	6	1	4	<1

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

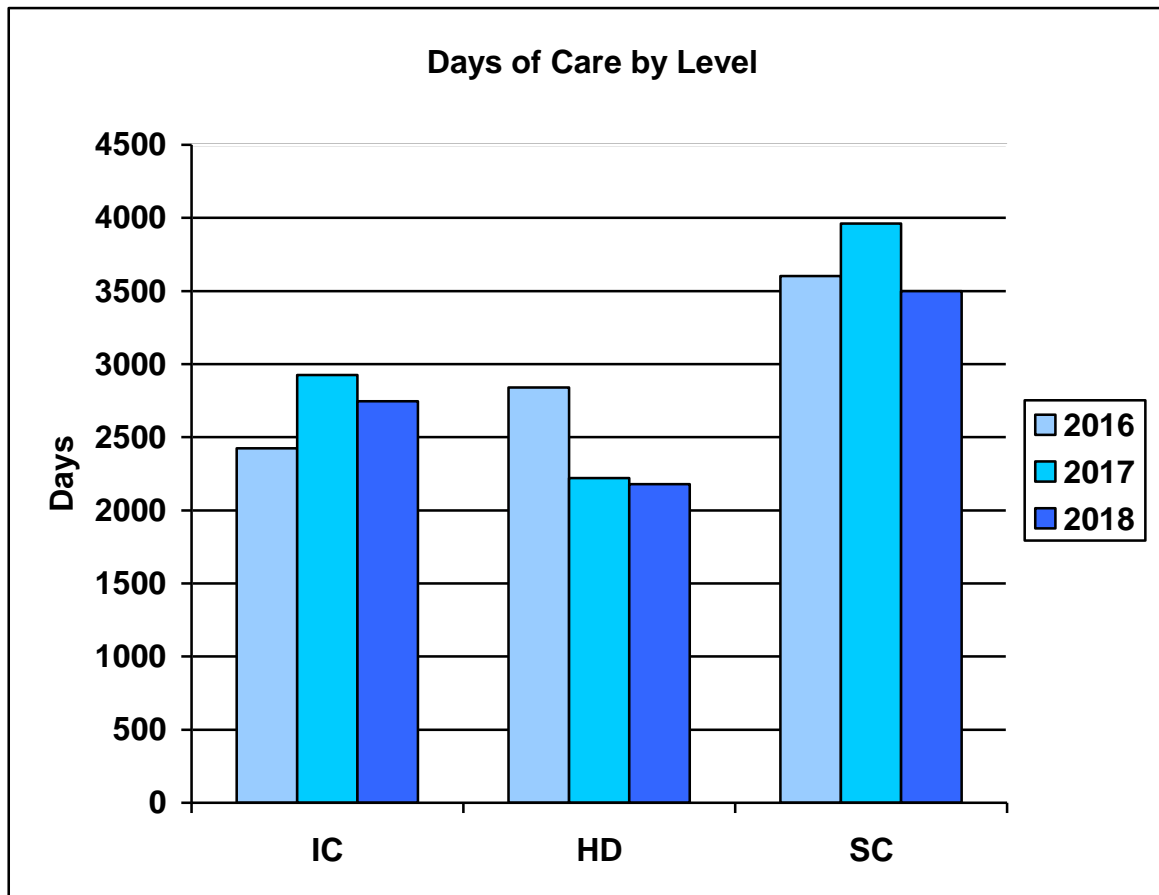


Transfers in	2016	2017	2018
In-Utero			
Babies booked elsewhere and admitted	102	88	89
Refused in-utero transfers	87	113	78
Refused by maternity	50	34	41
From outside KSS network	21	24	12
Ex-Utero			
Princess Royal Hospital	31	20	37
East Sussex Hospitals	32	30	32
West Sussex Hospitals	16	14	31
Other Network Hospitals	36	43	37
Outside Network	26	20	26
Refused ex-utero transfers	19	69	33

Does not include re-admissions or home births

Cot occupancy	2016		2017		2018	
Cots	Days	%	Days	%	Days	%
IC	2424	74	2925	89	2747	84
HD	2840	97	2221	76	2178	75
IC & HD (total)	5264	85	5146	83	4925	79
SC	3603	99	3962	109	3499	96
Total	8867	90	9108	92	8424	85
Transitional Care	1334		1869		1550	

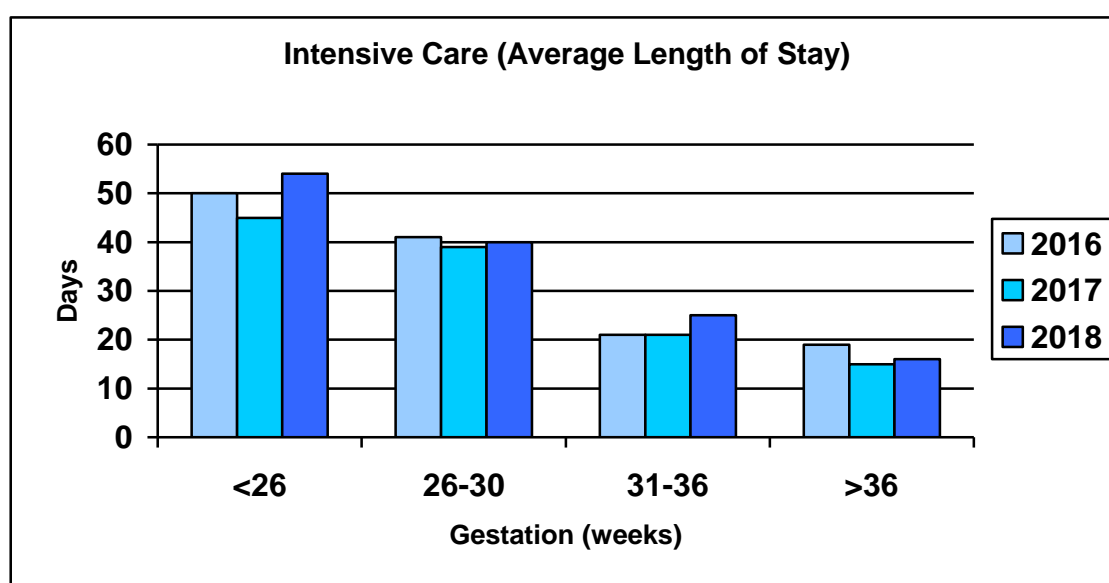
2011 BAPM definition for care levels (all babies receiving care during a 12 month period)



Care Categories for 2018						
Gestation at birth (weeks)	IC		HD		SC only	
	Babies	Days	Babies	Days	Babies	Days
< 23	0					
23	8	52	2	48	0	0
24	15	517	12	190	0	0
25	15	413	11	187	0	0
26	10	258	9	111	0	0
27	13	252	14	206	1	2
28	20	250	19	204	1	5
29	16	229	13	112	0	0
30	14	57	15	79	1	36
31	7	113	19	121	3	29
32	6	18	15	89	6	104
33-36	26	116	75	376	51	457
37-41	65	220	84	273	88	388
>41	4	10	4	4	5	50

*2011 BAPM definition for care levels
Includes ongoing care for babies born in 2017*

Average length of stay in days for all admissions by gestation			
	2016	2017	2018
Gestation	ITU		
<26	50	45	54
26-30	41	39	40
31-36	21	21	25
>36	19	15	16
Gestation	HDU		
<26	54	56	19
26-30	17	21	8
31-36	15	19	18
>36	8	10	9



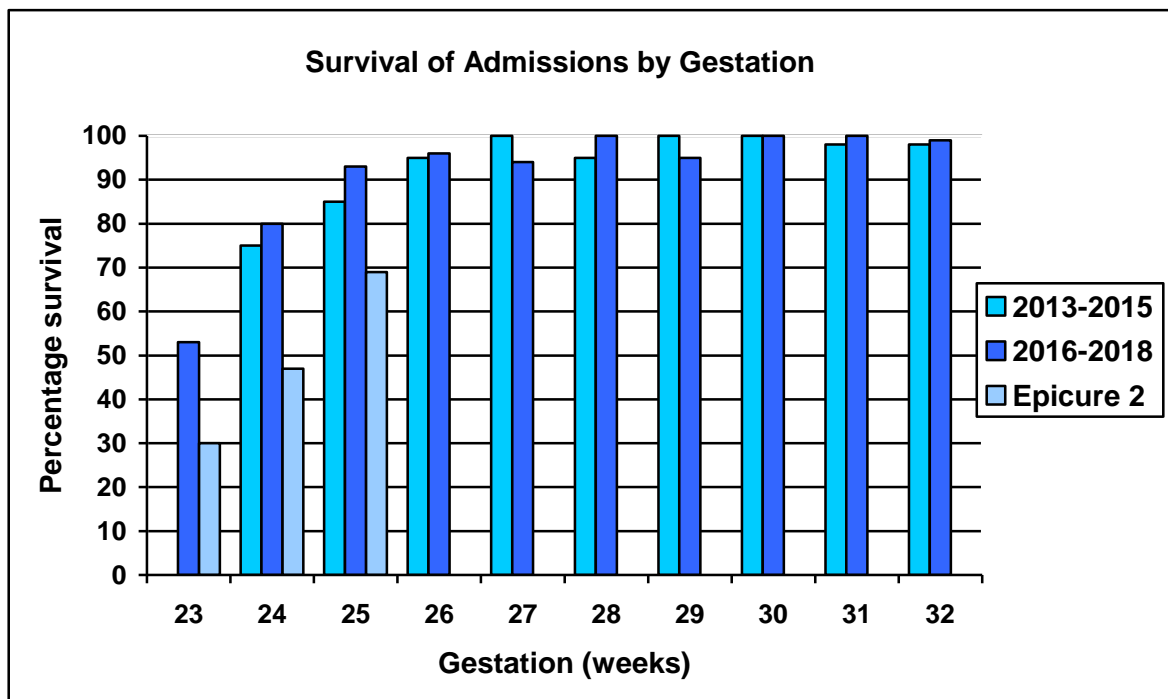
Transfers out	2016	2017	2018
Specialist medical care	18	13	23
Cardiac care (ECMO)	6 (1)	8 (1)	6(2)
Discharges			
Home/Foster care	201	185	209
Postnatal ward	105	101	118
Princess Royal Hospital	61	59	42
RACH	16	21	11
East Sussex Hospitals	34	29	31
West Sussex Hospitals	16	21	25
Other KSS Network hospitals	24	26	26
Other hospitals outside KSS Network	31	33	21

Survival of all inborn live births by gestation for 2018								
GA	Live births	Admitted to TMBU*	Died before admission	Died <7d	Died 7-28d	Died >28d	Total deaths	Admissions surviving to discharge
23	5	5		4			4	1
24	5	5		1	1		2	3
25	7	7			1		1	6
26	5	5						5
27	7	7						7
28	14	14		1			1	13
29	12	12						12
30	10	10						10
31	14	14						14
32	18	18						18
33-36	166	111						111
37-42	2567	139						139
>42	17	0						0
Total		347						339

*Inborn (booked and unbooked) excluding lethal congenital abnormalities admitted in 2018
Not including re-admissions

3 year rolling survival to discharge for extreme preterm admissions							
GA	2016		2017		2018		Survival to discharge %
	Admitted	Died	Admitted	Died	Admitted	Died	
23	4	1	8	3	7	5	53
24	9	2	10	2	11	2	80
25	16	1	14	1	11	1	93
26	5	1	12	0	9	0	96
27	15	0	19	3	15	0	94

Includes inborn and ex-utero transfers



Mortality Statistics (RSCH)	2012	2013	2014	2015	2016	2017	2018
Total deliveries	3582	3303	3410	3428	3390	3184	2902
Total livebirths	3569	3292	3400	3415	3380	3176	2890
Total stillbirths	13	11	10	12	10	8	12
Deaths before admission*	0	0	2	2	0	1	0
Total neonatal deaths	23	19	14	11	9	17	13
Inborn	17	11	11	6	4	6	9
Outborn	6	8	3	5	5	11	4
Early neonatal deaths**	8	5	3	1	1	5	6
Late neonatal deaths**	4	5	3	2	0	0	2
Deaths >28 days**	5	0	1	3	3	2	0
Still birth rate	3.6	3.3	2.9	3.5	2.9	2.5	4.1
Perinatal mortality rate	5.9	4.8	4.4	4.4	3.2	4.4	6.2
Neonatal mortality rate**	3.4	3.0	1.8	0.9	0.3	1.9	2.8
Mortality Statistics (BSUH = RSCH + PRH)	2012	2013	2014	2015	2016	2017	2018
Total deliveries	6057	5841	5851	5915	5838	5445	5192
Total livebirths	6035	5828	5729	5892	5823	5431	5174
Total stillbirths	22	13	22	22	15	14	18
Deaths before admission*	0	0	1	2	0	1	0
Early neonatal deaths**	8	6	5	1	1	6	7
Late neonatal deaths**	4	5	4	3	0	0	2
Deaths >28 days**	5	0	1	3	3	2	0
Still birth rate	3.6	2.2	3.8	3.7	2.6	2.6	3.5
Perinatal mortality rate	5.0	3.3	4.6	3.9	2.7	3.5	4.8
Neonatal mortality rate**	2.0	1.9	1.7	0.8	0.2	0.9	1.7

* *Terminations and deaths <23 weeks gestation not included.*

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

TMBU deaths (inborn and ex-utero transfers) 2018					
Delivered	GA	BW	Age d	PM	Cause of death, related factors
Deaths related to prematurity					
RSCH	23+6	485	<1	No	PPHN with cardiac dysfunction, severe APH, Twin 1
RSCH	23+6	565	<1	No	Extreme prematurity, severe APH, Twin 2
RSCH	23+2	490	4	No	RDS,Pneumothorax, chorioamnionitis, Twin1
RSCH	23+2	520	2	No	Hyperkalaemia, RDS, chorioamnionitis, Twin 2
RSCH	24+0	580	2	No	Bilateral IVH 4
RSCH	24+4	682	9	No	PPROM, pulmonary haemorrhage, IVH 4
Conquest	29+0	1250	15	Yes	Perinatal hypoxia, IVH 4
Sepsis					
RSCH	25+2	555	11	No	Pseudomonas
RSCH	28+2	1315	<1	No	E.Coli, PPRM, refractory hypotension
NEC					
Darent Valley	23+4	540	29	No	Fulminant NEC
Deaths related to perinatal asphyxia					
PRH	41	3295	<1	Yes	Severe HIE
Congenital abnormality					
RSCH (born in 2017)	27	1300	76	No	Cystic fibrosis, respiratory failure
Others					
Worthing	29+4	1410	<1	No	ROM at 24 weeks, pulmonary hypoplasia, PPHN

Post Mortems	2016	2017	2018
Total deaths	9	18	13
Post Mortems performed (% of deaths)	4(44)	6(33)	2(15)

All neonatal deaths within BSUH are routinely reported to the Coroner, logged on the Trust, Datix system and Perinatal Mortality Review Tool (PMRT). Cases are reviewed contemporaneously by the clinical team with further review is undertaken locally within Perinatal and Neonatal Clinical Governance Meetings and when appropriate at joint meetings with other baby units. Deaths are reported to the neonatal MBRRACE-UK database and the KSS Neonatal Network and are individually reviewed at the Sussex, Child Death Overview Panel.

4 year rolling mortality (all admissions)

4 year rolling mortality (all admissions)											
	Total Admissions:					Deaths					Survival to discharge
	2015	2016	2017	2018	Total	2015	2016	2017	2018	Total	(%)
Inborn	357	356	369	335	1417	6	3	7	8	24	98
Outborn	146	141	126	151	564	7	6	11	4	28	95
<26 weeks	23	29	33	39	124	7	4	6	8	25	80
<28 weeks	25	20	32	26	103	0	1	2	1	4	96
<31 weeks	62	69	70	54	255	0	1	4	3	8	97
31+ weeks	394	385	361	380	1520	5	3	5	1	14	99
<500g	2	2	3	3	10	1	0	3	2	6	40
<750g	19	30	23	23	95	5	5	3	6	19	80
<1000g	22	20	37	30	109	2	0	3	0	5	95
<1500g	66	62	89	57	274	0	1	1	4	6	98
>1500g	395	389	343	387	1514	5	3	7	1	16	99

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

Admissions	2016	2017	2018
Total number of livebirths	2443	2261	2284
Total number of stillbirths	5	6	6
Total admissions and re-admissions	261 (18)	242(23)	224(12)
Percentage of live births admitted	11%	11%	10%

Admission details	2016		2017		2018	
	Babies	%		%		%
Total admissions	243		219		224	
Inborn	167	69	157	72	171	76
Outborn	75	31	62	28	53	24
Gestation () = babies born elsewhere and back transferred to PRH						
23	1		0		0	
24	1 ⁽¹⁾		0		3 ⁽²⁾	
25	2 ⁽²⁾		0		0	
26	2 ⁽²⁾		3 ⁽³⁾		2 ⁽²⁾	
27	1 ⁽¹⁾		6 ⁽⁶⁾		2 ⁽²⁾	
28	4 ⁽⁴⁾		4 ⁽²⁾		4 ⁽³⁾	
29	6 ⁽⁶⁾		2 ⁽²⁾		3 ⁽³⁾	
30	10 ⁽¹⁰⁾		6 ⁽⁶⁾		3 ⁽³⁾	
31	7 ⁽⁵⁾		10 ⁽¹⁰⁾		5 ⁽⁴⁾	
32	11 ⁽¹⁰⁾		7 ⁽⁴⁾		11 ⁽⁹⁾	
33-36	91 ⁽²⁴⁾		75 ⁽¹⁵⁾		66 ⁽¹⁴⁾	
37-42	120 ⁽⁹⁾		112 ⁽¹⁷⁾		125 ⁽¹⁰⁾	
>42	0		0		0	
Birthweight (g)						
<500	0		0		0	
<750	4 ⁽³⁾		0		4 ⁽³⁾	
<1000	5 ⁽⁵⁾		7 ⁽⁷⁾		5 ⁽⁵⁾	
<1500	17 ⁽¹⁶⁾		16 ⁽²⁾		9 ⁽⁸⁾	
Multiple births (number of babies)						
Twins	36		35		38	
Triplets	3		3		0	

Does not include re-admissions

Ex-utero Transfers	2016	2017	2018
Transfers out to the TMBU	35	26	35
Transfers out to elsewhere	10	1	3
Transfers in from the TMBU	67	57	44
Transfers in from elsewhere	7	4	9
Transfers in from home	18	17	18*

* 11 transfers in from home went to transitional care

Cot occupancy	2016		2017		2018	
Cots	Days	% occ	Days	% occ	Days	% occ
IC	21		33		21	
HD	207		264		227	
SC	1778		1735		1533	
Total	2006	69	2032	70	1781	61

Mortality Statistics (PRH)	2015	2016	2017	2018
Total deliveries	2487	2448	2261	2290
Total livebirths	2477	2443	2255	2284
Total stillbirths	10	5	6	6
Early neonatal deaths*	0	0	1	1
Late neonatal deaths*	1	0	0	0
Post neonatal deaths (>28 days)*	0	0	0	0
Still birth rate	4.0	2.0	2.7	2.6
Perinatal mortality rate	4.0	2.0	3.1	3.1
Neonatal mortality rate*	0.4	0	0.4	0.4

*Inborn (booked) excluding lethal congenital abnormalities

Transport

The Sussex Neonatal Transport Service, together with similar services in Kent and Surrey, provide 24 hour cover across the KSS Neonatal Network. There is a small team of drivers, a dedicated ambulance and provision of consultant cover for the Sussex service. A doctor and nurse are provided for each shift except for the nurse only second on service.

The Sussex team undertook 430 transfers in 2018:
25 transfers were not completed (either handed to another team, care withdrawn or cancelled as no longer required).

There were 293 medical transfers (19 cardiac), 58 surgical and 41 neurological.

Medical	Surgical	Neuro	Cardiac
293	58	41	19

The Sussex NTS carried out 135 intensive care transfers, 72 high dependency transfers and 223 low dependency transfers in 2018. These were categorised as follows:

Uplift of care	Repatriation	Outpatient Appointments	Resources/ Capacity
185	200	8	12

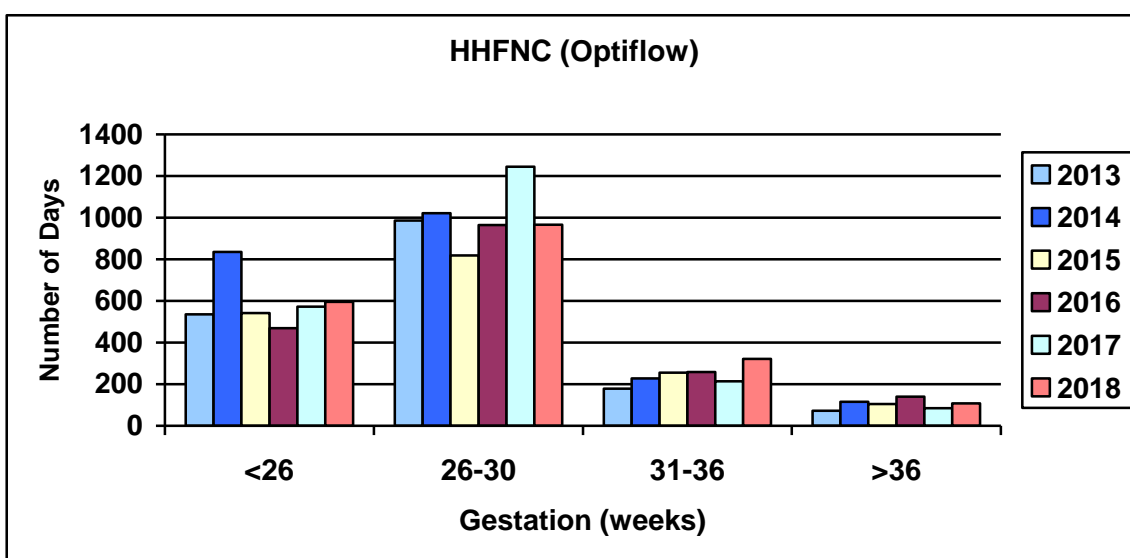
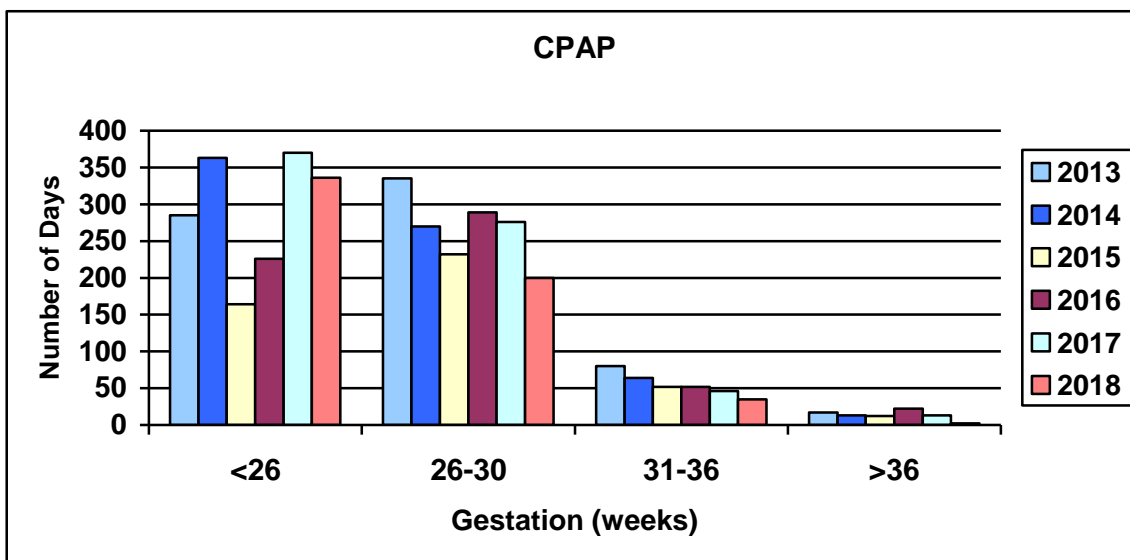
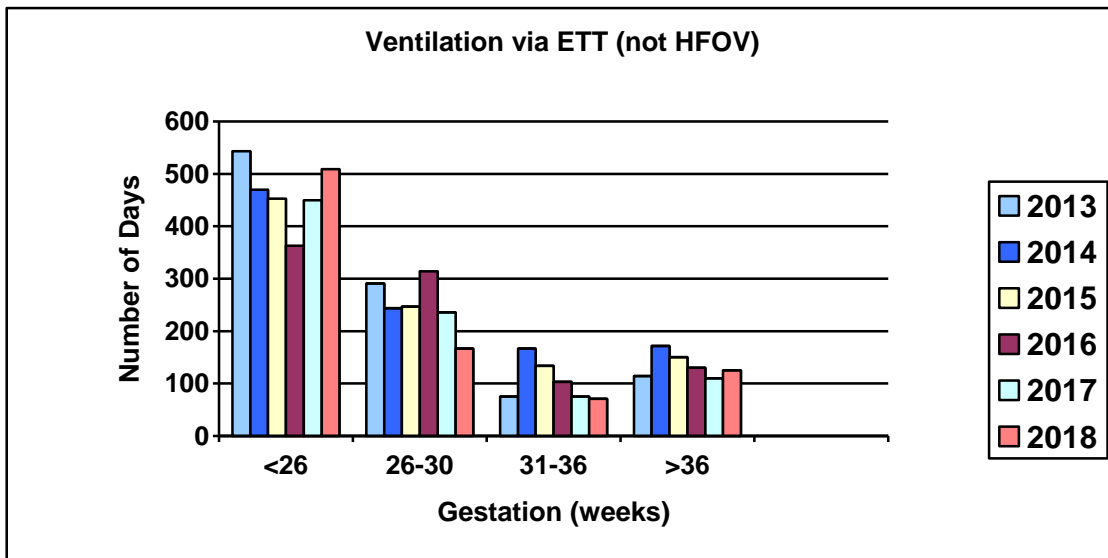
Summary of Clinical Activity Trevor Mann Baby Unit

Respiratory Support	2016		2017		2018	
	Days	Babies	Days	Babies	Days	Babies
Conventional ventilation	868	175	871	164	872	144
HFOV	42	17	30	14	26	18
CPAP	589	114	705	127	573	97
HHFNC	1832	280	2116	240	1992	244
Surfactant (doses)		83 (102)		66 (76)		67 (97)
Nitric Oxide	86	23	112	27	73	24

Respiratory diagnoses	Number of Babies		
	2016	2017	2018
Respiratory Distress Syndrome	158	194	146
Transient Tachypnoea	13	15	20
Signs of respiratory distress of the newborn	204	230	165
Persistent Pulmonary Hypertension	15	15	12
Meconium aspiration	13	10	12
Cystic Fibrosis	2	1	

Respiratory Complications	2016	2017	2018
Pulmonary haemorrhage	7	3	13
Pulmonary air leak (drained)	33	33 (5)	24 (10)
Oxygen at 36 weeks CA	35	33	26
Oxygen at 28 days	70	73	59
Discharged with home oxygen	8	11	6

Management of PDA	2016	2017	2018
Patent Ductus Arteriosus	49	65	40
Indomethacin / Ibuprofen / both	17	21	12 / 4 / 4
PDA ligated	6	5	8



Infection	Positive Blood Cultures (episodes)		
	2016	2017	2018
Group B streptococcus	3	0	0
Non-haemolytic streptococcus	3	2	0
Alpha haemolytic streptococcus	0	0	0
Haemophilus	0	0	0
Staphylococcus Coagulase negative	31	32 (27)	43 (39) 3 mixed growth
MSSA	3	4	0
MRSA	0	0	0
<i>Enterococcus faecalis</i>	6	0	5 (2)
Listeria	0	0	2 (1)
<i>Escherichia coli</i>	4	3 (3)	2 (2)
<i>Bacillus cereus</i>	2	0	0
Klebsiella species	2	1	0
Serratia species	0	1	3 (2)
Enterobacter species	2	4 (3)	3 (3)
Pseudomonas species	0	0	2 (1)
Acinetobacter species	0	1	0
Corynebacterium	1	0	1
Diphtheroid	1	0	0
Micrococcus lutens	1	0	0
Actinomyces	0	0	1
Candida species	2	2 (1)	0
Total	61	50 (43)	62 (52)

Necrotising Enterocolitis	2016	2017	2018
NEC confirmed cases including perforations (EUT)	14 (5)	18 (10)	7 (4)
NEC suspected cases (EUT)	15 (8)	19 (9)	12 (6)
Confirmed NEC perforated (EUT)	6 (3)	7 (4)	4 (2)
NEC treated surgically (EUT)	11 (7)	13 (7)	5 (2)

Neonatal Surgical Cases (not NEC)	2016	2017	2018
	Cases	Cases	Cases
Gastroschisis	4	3	4
Exomphalos	2	0	0
Hirschsprungs	1	0	2
Malrotation confirmed	5	8	1
Meconium ileus (surgery)	7 (3)	5 (2)	4 (0)
Gut perforation (not NEC)	2	2	1
Oesophageal Atresia / TOF	6	3	3
Intestinal atresia/obstruction	2	4	8
Inguinal hernia repair	6	3	3
Imperforate anus/rectal anomaly	0	6	5
Lung cyst/sequestration	0	1	1
Diaphragmatic eventration	0	0	0
Diaphragmatic hernia	1	1	1
Total	36	37	33

Cranial Ultrasound Diagnoses	Number of Babies		
	2016	2017	2018
IVH with parenchymal involvement (EUT)	8 (4)	8 (3)	6 (4)
Post haemorrhagic hydrocephalus (requiring surgical intervention)	5 (0)	4 (0)	5 (1)
Infarction without IVH	2	0	1 (1)
Periventricular ischaemic injury with cyst formation (EUT)	3 (1)	1	2 (2)

All babies <32 weeks gestation have routine cranial ultrasound examinations

Hypoxic Ischaemic Encephalopathy	2016	2017	2018
HIE grade 1 (EUT)	16 (9)	11 (9)	17 (12)
HIE grade 2 (EUT)	15 (12)	12 (8)	13(10)
HIE grade 3 (EUT)	3 (1)	5 (4)	5(4)
Hypothermia therapy	23	15	28
- Inborn (BSUH)	11	7	8
- Outborn	12	8	21

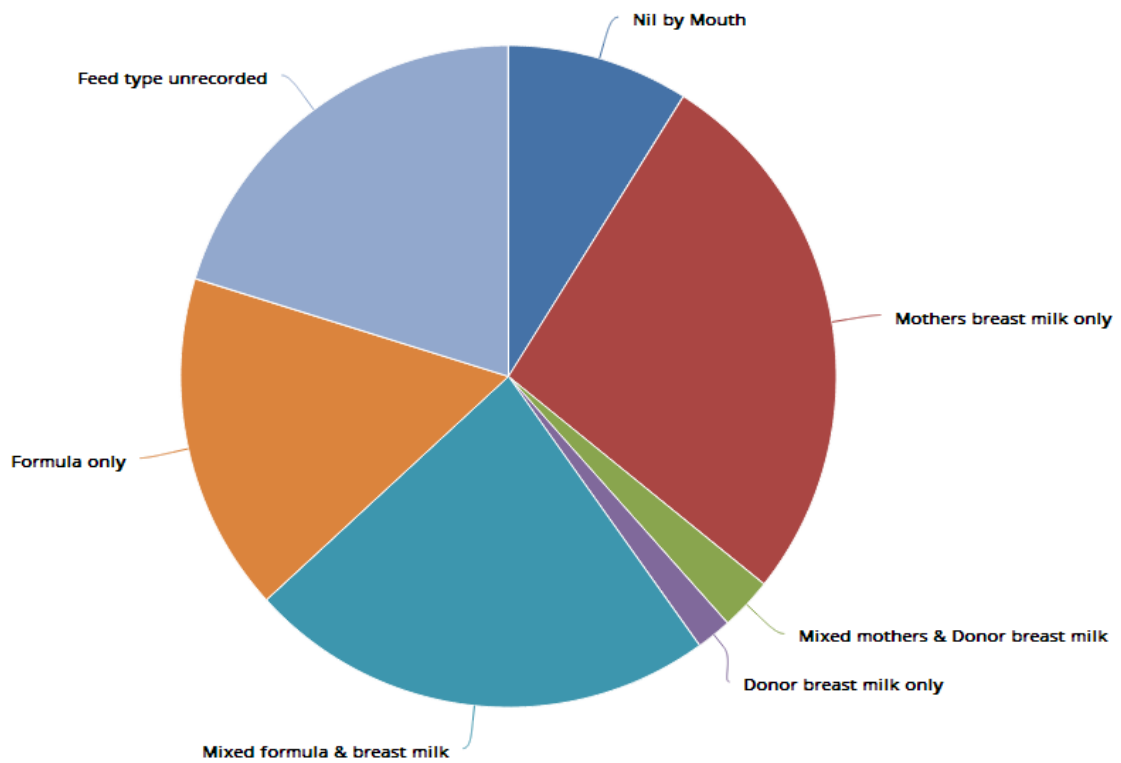
Retinopathy of Prematurity	2016	2017	2018
ROP grades 3/4	2	3	5
ROP treated with laser therapy	1	3	5

Screening as per recommendations from Royal College of Ophthalmologists

Neonatal Dashboard	2018			
	Eligible babies	Result	%	National Ave %
Antenatal steroids given (24 – 34 weeks gestation at birth)	107	97	90.7	89.9
Magnesium sulphate given	50	43	87.8	71.9
Temperature 36.5 to 37.5 on admission from LW. (<32 weeks gestation at birth)	68	52	76.5	67.1
Parent seen within first 24 hours of admission. (first admission to the TMBU)	318	317	99.7	94.7
Parents present on ward round	489	405	83	77.9
TPN commenced by day 2 (<29 weeks and or <1000g at birth)	66	61	92.4	
ROP screening completed on time (<32 weeks and or <1500g at birth)	66	63	95.5	93.9
Breast milk (all or some) at discharge home. (<33 weeks and first admission)	36	23 (all 9)	63.9 (25%)	59.3
NEC (<32 weeks gestation at birth)	101	3	3	5.5
Catheter related sepsis, per 1000 line days (125 eligible babies)	2567 line days	8 +ve BCs	3.12 per 1000	5.09 per 1000
BPD (<32 weeks gestation at birth)	61	BPD 20	32.8	31.1

Feeding at Discharge	Babies
Breast	222
Breast/full-term formula	58
Breast/pre-term formula	45
Breast other	18
Full-term formula	80
Pre-term formula	53
Not recorded	22
Died	12

Milk Feeding at Discharge



Note: Feed type unrecorded includes transitional care babies where feeding is not recorded.

Summary of Developmental Outcomes

Developmental follow-up takes place in baby clinic.

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

Follow-up schedule for pre-term babies:

Prior to discharge / at term corrected age

- Physiotherapy and / or speech and language therapy assessment
- Audiology screening
- Screening for Retinopathy of Prematurity

At 3 months' corrected age

- Review of development and neurological assessment by consultant in baby clinic.
- Refer to specialist services as appropriate.

At 12 months' corrected age

- Review of development and neurological assessment by consultant in baby clinic.
- Refer to specialist services as appropriate.

At 24 months' corrected age

- Schedule of Growing Skills (2002 until 2006)
- Bayley Scales of Infant Development III (from September 2006 onwards)
- Health Status Questionnaire
- Refer to specialist services as appropriate or discharge if no concerns.

All preterm infants born within the Brighton catchment area at <30 weeks gestation (and/or <1000g) are offered a formal Bayley III assessment as part of our neurodevelopmental follow-up programme.

Gestation at birth	23	24	25	26	27	28	>28	Total
Total admitted	24	75	74	75	101	127	25	501
Survived to discharge	9	33	55	56	87	103	31	374

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

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

Of the 356 babies eligible for follow-up, 308 infants have had 24 month developmental assessments completed. 73 babies did not receive 24 month assessments. Of these 40 did not attend, 15 families had moved out of area, 10 attended for appointment but were too complex/difficult to assess, 3 had only TRPG assessments, 3 follow-ups were missed, 4 follow-ups were undertaken at other hospitals, 1 parent cancelled as child had numerous problems, 2 were undertaken by the health visitor.

Outcome	23	24	25	26	27	28	>29	Total (%)
Cognitive								
Normal	4	14	25	33	46	74	19	215 (70)
Mild	2	5	8	5	13	15	3	51 (16)
Moderate	1	4	5	4	5	3	2	24 (8)
Severe	0	4	3	3	7	1	0	18 (6)
Communication								
Normal	2	12	21	17	30	63	15	160 (52)
Mild	3	5	8	19	16	17	6	74 (24)
Moderate	1	4	8	4	11	8	2	38 (12)
Severe	1	6	4	5	14	5	1	36 (12)
Motor								
Normal	3	16	25	23	33	64	18	182 (59)
Mild	3	2	9	13	21	15	4	67 (22)
Moderate	1	4	3	2	7	7	1	25 (8)
Severe	0	5	4	7	10	7	1	34 (11)
Combined outcomes								
Normal	2	12	18	13	25	50	15	135 (44)
Mild	3	4	9	20	16	26	6	84 (27)
Moderate	1	6	8	4	15	6	1	41 (13)
Severe	1	5	6	8	15	11	2	48 (16)
Total assessed	7	27	41	45	71	93	24	308

Outcomes according to gestation were as follows:

23 and 24 weeks gestation (n=34)

Outcome (%)	Cognitive	Communication	Motor
Normal	18 (53)	14 (41)	19 (55)
Mild impairment	7 (21)	8 (23)	5 (15)
Moderate impairment	5 (15)	5 (15)	5 (15)
Severe disability	4 (11)	7 (21)	5 (15)

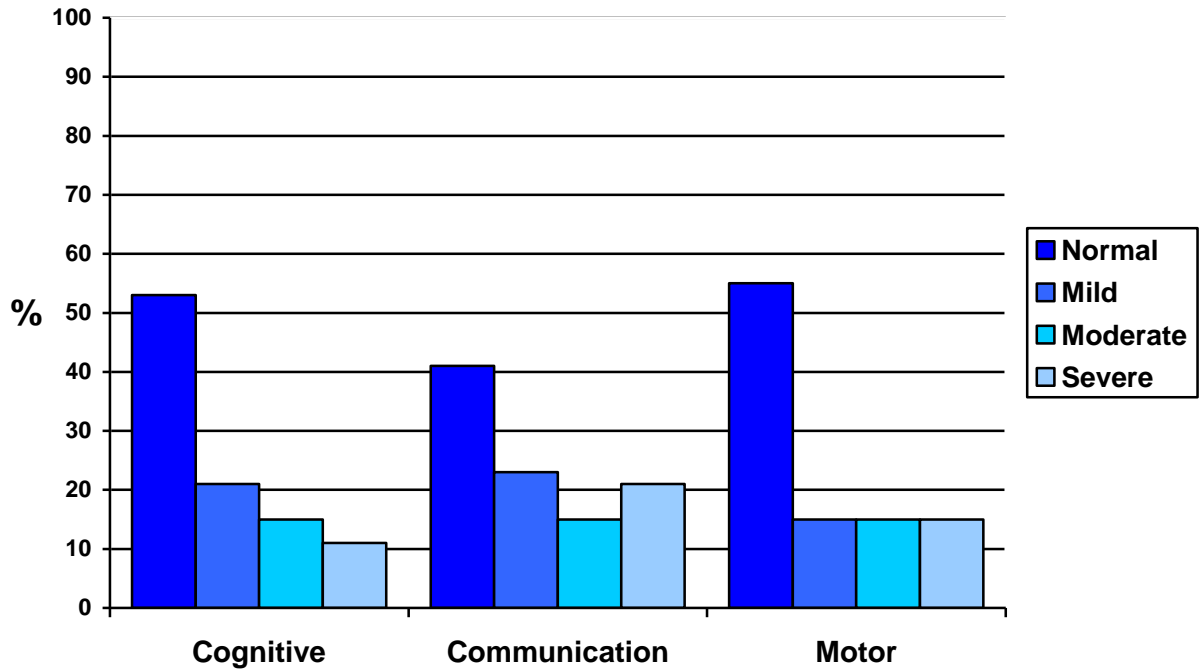
25 and 26 weeks gestation (n=86)

Outcome (%)	Cognitive	Communication	Motor
Normal	58 (67)	38 (44)	48 (56)
Mild impairment	13 (15)	27 (31)	22 (25)
Moderate impairment	9 (11)	12 (14)	5 (6)
Severe disability	6 (7)	9 (11)	11 (13)

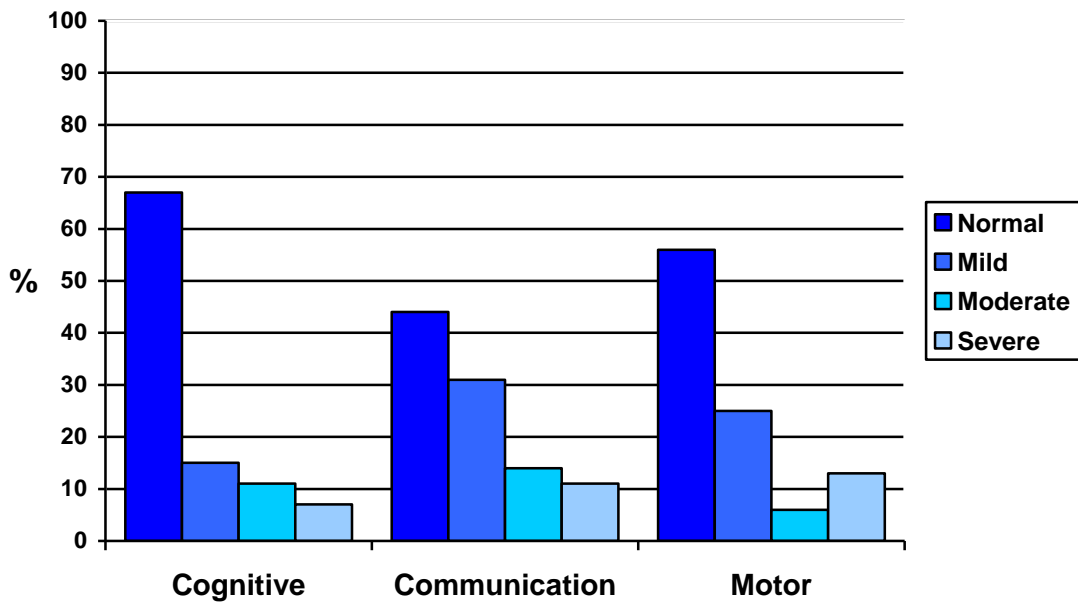
27 weeks gestation and above (n=188)

Outcome (%)	Cognitive	Communication	Motor
Normal	139 (74)	108 (57)	115 (61)
Mild impairment	31 (17)	39 (21)	40 (21)
Moderate impairment	10 (5)	21 (11)	15 (8)
Severe disability	8 (4)	20 (11)	18 (10)

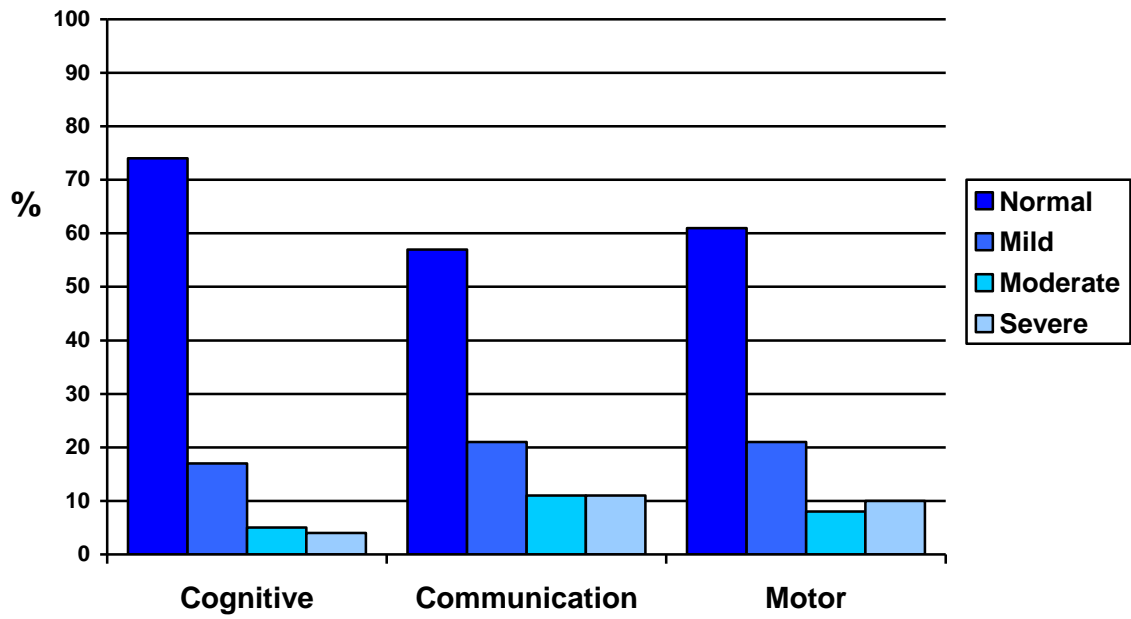
**Neurodevelopmental Outcome of Pre-term Infants
23 & 24 weeks at 24 months CA
(n = 32)**



**Neurodevelopmental Outcome of Pre-term Infants
25 & 26 weeks at 24 months CA
(n = 82)**



**Neurodevelopmental Outcome of Pre-term Infants
27 weeks and above at 24 months CA
(n = 175)**



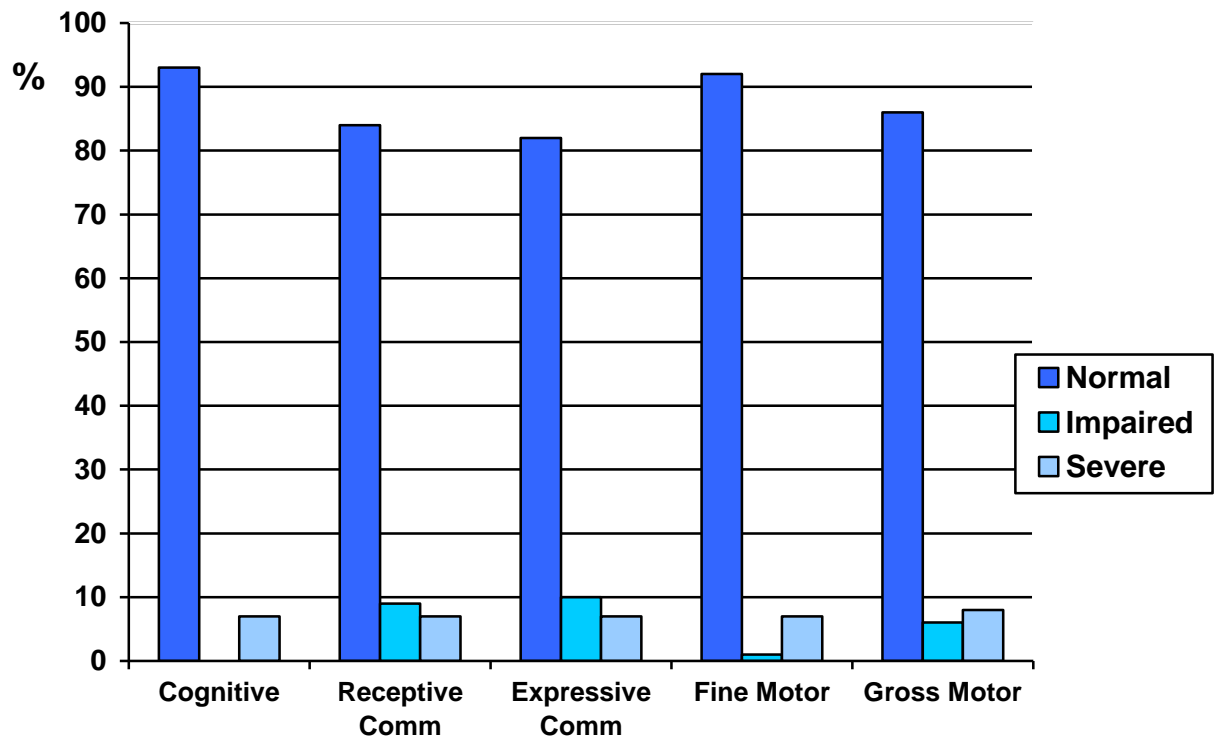
Neurodevelopmental Outcome for Babies with Hypoxic Ischaemic Encephalopathy

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

Cooled babies from 2009	198
Assessments performed	108
Died	31
Did Not Attend	24
Referred back to local hospital/moved away	27
Serious impairment, assessment not offered	1

Neurodevelopmental Outcome of Cooled Babies (n=108)

Outcome (%)	Cognitive	Receptive Communication	Expressive Communication	Fine Motor	Gross Motor
Normal	100 (93)	91 (84)	89 (82)	99 (92)	93 (86)
Impaired	0	10 (9)	11 (10)	1 (1)	6 (6)
Severe disability	8 (7)	7 (7)	8 (7)	8 (7)	9 (8)



Clinical Governance

Risk Management

Staff members are encouraged to report clinical incidents on the Trust, Datix system. There are safety, clinical and transport triggers to guide reporting. The transport team reports incidents to the National Risk Register.

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

Safety triggers:

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

Clinical Incident triggers:

Accidental extubation
 Extravasation injury
 Facial/nasal damage related to CPAP
 Failure of infection policy
 Cross infection
 Medication and prescribing errors

Transport triggers:

Low temperature on arrival (<36 °C)
 Accidental extubation
 Delay – no discharge summary ready

Summary of Clinical Incidents (TMBU and SCBU):

Incident Category	2011	2012	2013	2014	2015	2016	2017	2018
Access, admission, transfer, discharge	5	0	8	3	1	4	9	3
Clinical assessment (diagnosis, scans, tests, assessments)	5	2	6	6	21	22	10	19
Consent, communication, confidentiality	8	7	7	12	9	5	14	10
Documentation (records, identification)	18	9	11	15	30	19	13	13
Implementation of care and ongoing monitoring / review	5	5	12	8	10	15	6	12
Infection Control Incident	1	2	1	4	2	2	5	1
Infrastructure (staffing, facilities, environment)	4	11	16	16	16	4	11	9
Medical device / equipment	19	9	11	11	15	10	12	9
Drugs and prescribing	80	53	58	59	56	51	42	54
Patient accident	1	0	1	0	1	2	0	2
Treatment, procedure	19	19	12	10	17	15	17	16
Other Incident	5	16	42	31	18	6	31	12
Total	170	133	185	175	196	155	170	160

Incident Grade	2011	2012	2013	2014	2015	2016	2017	2018
No Harm: Impact Prevented	37	20	12	11	21	14	16	23
No Harm: Impact not Prevented	116	108	150	141	153	122	128	110
Low	16	12	18	18	19	18	26	27
Moderate	1	0	5	2	1	1	0	0
Severe	0	0	0	3	0	0	0	0
Total	160	140	185	175	192	155	170	160

Human Factors

The Human Factors workstream was started in 2017 and is led by Dr Lawn. Two registrars (Out of Program Experience) have been appointed with a remit to 'Human Factors' work. New innovations have been daily, morning safety meetings, after event safety pauses and introduction of a safety prompt for intubation and extubation. There has been an in-depth systematic review and improvement of resuscitation equipment and postnatal ward work patterns. Obstetric theatre temperature has been targeted as a way of ensuring improved admission temperatures for pre-term babies. A review of medical education is underway and the departmental simulation programme continues to be supported by the human factors team.

Multi-Disciplinary Meetings

- Morning safety meeting (daily)
- Monday clinical handover (weekly)
- Nutrition meeting (weekly)
- Xray review (weekly)
- Tuesday and Thursday Teaching and Journal Club (weekly)
- Respiratory review and planning (monthly and as needed)
- Wednesday Clinical Grand Round or Mortality Review (weekly)
- Consultant meeting (weekly, Business Meeting monthly)
- Echo peer review (monthly)
- Neonatal Risk Panel (every 2 weeks)
- Perinatal meeting (monthly)
- Neonatal and maternity matrons (monthly)
- Children's Directorate meeting (monthly)
- Children's Patient Safety and Quality Committee (monthly)
- Neonatal Clinical Governance (3 monthly and additional joint meetings with maternity and surgical/anaesthetic teams)
- Consultant outreach visits to Worthing and Hastings neonatal units (3 monthly to each site)
- Sussex Network Meeting (two meetings per year in Brighton)
- KSS Neonatal Network Meetings and Clinical Forum (3 monthly)

Attendance is recorded for meetings and minutes made where appropriate.

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 with a rolling programme of guideline review. Guidelines are available on the departmental website.

We have a well developed audit programme under the supervision of Dr Fernandez. The department complies with national and neonatal network audit programmes including NNAP, ATAIN, NHSE Dashboards and MBRRACE. The transport team provides data for the UK Neonatal Transport Dataset.

Screening Programmes

The department complies with national neonatal screening programmes including:

Newborn examination, NIPE

Newborn Blood Spot

Newborn Hearing

Retinopathy of Prematurity: Ophthalmologists attend weekly to examine babies according to national guidelines. On the TMBU there is a small team of nurses who are training to use RetCam for ROP screening. The theatre at the RACH is fully equipped to undertake laser treatments when necessary.

Information and Technology

Departmental information and all clinical and pharmacy guidelines are accessible on the Trust Intranet. The department has an electronic patient record system (Metavision) which includes facilities for prescribing and automatic collection of data from ventilators, monitors, blood gas machine and from the laboratory. Laboratory results are also available electronically on ICE and imaging on PACS. Badger.net collects data for summary production, the National Neonatal Audit Program, Dashboards and occupancy. Daily data is automatically downloaded from Metavision to Badger.net. Newborn examinations are recorded electronically on the NIPE system.

Research (See appendix 4)

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

There is an active team which supports the research portfolio:

Rebecca Ramsay	Lead research nurse
Cathy Olden	Research nurse
Vivien Richmond	Research nurse
Sonia Sobowiec Kouman	Research nurse
Christine Laycock	Data Officer
Paul Frattarolli	Data officer
Hector Rojas	FP7 Project Manager

Liz Symes left the team and we wish her well for her future.

In the past year we have continued to participate in multi-center studies as well as locally initiated projects. Dr Rabe, Dr Rojas, Dr Fernandez and the whole team have concluded the work on the Research Project NEOCIRCULATION (NEO-CIRC, funded

by EC FP7 Health €5.99m) (www.neocirculation.eu). The consortium has developed an age appropriate formulation of Dobutamine tested in animal and human Phase II studies. A large cohort study has identified mutations in Dobutamine receptors which could be used for individualized treatment. Together with the FP7 HIP trial we have developed a new definition of neonatal circulatory failure for future trials.

Dr Rabe started a new collaboration with Dr Rendon Morales from the University of Sussex Institute for Sensor Technology. The NEOSENSE project aims at testing a new non-stick sensor for detecting babies' heart rate after birth within a few seconds. The clinical research fellow Dr Oana Anton is kindly supported by grant from Rockinghorse Appeal and the Early Birth Association. Dr Anton received a start-up research grant from the European Society for Paediatric Research.

Dr Aiton is UK PI for the multi-center study on FAS Fetal alcohol syndrome and brain development: corpus callosum measurements, funded by the NIH in USA which is currently recruiting.

Dr Bomont acted as local PI for the study testing Tapendalol in postoperative pain of newborn babies sponsored by Grünenthal and for the national multicenter OPTIPREM study looking into optimising neonatal care provision. Dr Bhat acted as local PI for the national SPRING study which examines the relationship between genetics of preterm birth and later neurodevelopment. Prof Seddon and Dr Fernandez are Co-PI for the MEDIMMUNE study (RCT on RSV vaccinations) which is currently following up the recruited patients.

The Department has been involved in several other studies which have completed recruitment. The Go-Child Study is in follow-up phase. The CMV registry has opened for recruitment again in 2018. We are continuing care site for SIFT and BabyOSCAR. Recruitment for neurodevelopmental follow-up studies led by Dr Phil Amess of pre-term infants is ongoing.

Joint multidisciplinary research meetings are held and links continued with various groups such as the Paediatric Respiratory Research Group at the RACH, the Obstetric team, the Department of Clinical Pathology, Department of Psychology (University of Sussex, City University of London) and with the School of Pharmacy & Biomolecular Sciences (University of Brighton). We are undertaking studies with Dr Bhavik Patel on the safety of medicines. ANNP Lisa Kaiser has completed her MSc Research thesis with this team and we congratulate her on her achievement.

The research team has a track record in studying the benefits of enhanced placental transfusion at the birth of babies. BSMS Global health students Kjersti Midtbo, Rachel Higgins and Aisling Ahluwalia have completed field studies at hospitals in Tanzania and Zambia together with local collaborators.

BSMS year 4 students were involved in our studies as part of the Independent Research Project module in BSMS 404.

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

The department is an active member of the Surrey & Sussex Paediatric and Neonatal Research Network and hosted the Annual KSS Paediatric and Neonatal Research Day 2018. The planning for the research day in 2019 is ongoing and the date will be published shortly.

Education

Neonatal Nurse Pathway

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

The pathway is held at the University of Brighton and led by Senior Lecturer Susanne Simmons. It comprises two modules: a 20 credit work based learning module: Foundations in Neonatal Practice and a 30 credit taught module: Neonatal High Dependency and Intensive care. Mentors (approved by the unit manager and pathway leader) support, supervise and assess students in practice. They meet with the student at the beginning of each module; supervise the student's completion of skills; meet with the student mid-way through the module to discuss progress; liaise with the pathway leader on the student's progress; and meet with the student at the end of the module to check completion of clinical skills.

Practice is assessed using clinical skills inventories. Students from level 1 and 2 units have a practice placement in a level 3 unit to gain experience in neonatal high dependency and intensive care. Students on completion of the two neonatal modules receive a neonatal pathway certificate. They then have the opportunity to continue their studies to gain a degree in Acute Clinical Practice.

Undergraduate Medical Education

The Department has continued its involvement in the delivery of module BSMS 402 Paediatrics and Child Health. During their time with us students learn to carry out a structured newborn examination. Online learning tools are available to complement this training. Consultants and registrars are involved in end of year OSCE's.

A number of students choose to undertake the independent research project in BSMS 404 in year 4 in Neonatology. During this module they learn research related skills e.g. how to complete a structured literature search and an appraisal on a focused topic or join in one of the ongoing research projects. Individual consultants support the Medical School in other tasks such as admission interviews, designing exam questions and online learning modules, organising and supervising elective placements and tutoring small groups. Dr Rabe, in her role of Reader in Neonatal Medicine continues as module leader for the module BSMS 404.

We offer opportunities for nursing and medical work experience on the TMBU.

Postgraduate Medical Education

The department continues its commitment to providing a high quality, structured training, assessment and appraisal programme for Neonatal Medical Staff. In addition staff organise, host and deliver many additional educational sessions including Deanery simulation and PLEAT days. We host and direct the ALSG Neonatal Life Support and PaNSTAR courses and also the Resuscitation Council's ARNI course.

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

The TMBU offers fellow posts in Human Factors which are proving very popular with doctors in training.

Support Services

Speech & Language Therapy (SLT)

There are 2 speech and language therapists (1.2 wte).

The service is provided on a needs basis, with priority given to inpatients both on the Trevor Mann Baby Unit and at the Royal Alexandra Children's Hospital. Cover is also provided to various inpatient and outpatient clinics, including joint dietetics/SLT clinics and the Chronic Lung Disease Clinic. Support for neonatal follow up clinics can be arranged as required by contacting the department. Referrals are made to the team by phoning (ext 2527), emailing or writing to Amanda Harvey (Level 5 RACH).

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

Other services provided include:

- videofluoroscopy swallow studies
- teaching for new staff
- liaison and advice for dysphagia therapists across Sussex.

Babies discharged home with feeding difficulties who live in Brighton and Hove or attend the Chronic Lung Disease Clinic will have ongoing input. Babies from outside of Brighton and Hove who continue to have significant feeding difficulties are referred on to local services or may be seen as an outpatient in Brighton if no appropriate local service is available.

Physiotherapy

TMBU has input from Emma Pavitt a band 7 physiotherapist for 8 hours per week.

She has provided support for the team for children with a variety of conditions from chest infections to orthopaedic issues and neurodevelopmental problems.

The service has improved patient care by increasing the clinical decision making in regards to chest physiotherapy. There are opportunities for doctors and nurses to request training as they feel necessary, and she is about to start a project alongside doctors and nurses for helping develop a neurodevelopmental pathway. Study days are regularly attended with other neonatal physiotherapists ensuring that the team is kept up-to-date with the latest evidence.

Dietetic Service

The dietitian is funded to provide 0.2 wte to the neonatal service. This includes providing input to the weekly multidisciplinary Nutrition Meeting on the TMBU where nutritional management of more complex infants is discussed. There are weekly outpatient clinics for follow up of babies discharged from the TMBU and SCBU at PRH. This clinic runs alongside the neonatal clinic at RACH to allow joint consultations. dietetic assessment and input is provided for infants attending the chronic lung disease clinic and those supported by the outreach neonatal nursing team. The service continues to provide input to infants who are transferred to the gastroenterology team at RACH. The dietitian attends regular meetings of the National Neonatal Nutrition Network and is involved in teaching on the neonatal unit and around the KSS neonatal network.

Donor Breast Milk

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

Outreach

The Neonatal Outreach team continues to work to support the discharge of infants from TMBU and the SCBU at PRH. The team comprises of a sister who works full time and a nursery nurse who works 13 hours per week. The nurses work with families and support them in feeding and caring for their baby prior to discharge home. Families may choose to feed babies by nasogastric tube at home.

Maternal Substance Misuse Clinic (One-Stop Clinic)

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

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

The aims of the clinic are:

- to offer an open-access service for advice on the wide variety of issues surrounding substance misuse in pregnancy
- to provide the level and degree of care and support appropriate to the client during their pregnancy and to the newborn baby

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

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

Clinics run on Thursday afternoons, week 1 at PRH and weeks 2, 3 and 4 at RSCH.

In 2018 ten babies were admitted to the TMBU and SCBU with Neonatal Abstinence Syndrome and a further ten were cared for on transitional care.

Counselling

Counselling is currently available from the Trust Chaplaincy Service at both the TMBU and SCBU at PRH. The Rev Peter Wells, is a qualified psychotherapist and relationship counsellor providing 5 hours per week to the department. He also attends staff meetings to give support. A new trained psychotherapist (Julie Carroll) has recently joined the chaplaincy team and she has provided counselling hours from mid-October 2017. The Early Birth Association has kindly funded The Mind Clinic since 2015. The Mind Clinic is a non-NHS organization that comes into the work place to help staff.

Two members of nursing staff have recently completed counselling courses.

Parent Information

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

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

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

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

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

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

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

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

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

Parent Forum

The Parent Forum has now been established for over 9 years and meets quarterly. The group represents parents of babies who have been on the TMBU and Special Care Baby Unit at Princess Royal Hospital.

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

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

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

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

Early Birth Association

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

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

More information about the EBA is available on their website (<http://www.earlybirth.co.uk/>).

Rockinghorse Children's Charity

The Rockinghorse Charity celebrated its 50th anniversary in 2017. Established in 1967 by Dr Trevor Mann, the charity continues to support the TMBU and SCBU at PRH generously. For the 50th anniversary, it kindly agreed to sponsor a major refurbishment on the SCBU at PRH. It has also agreed to purchase a digital imaging facility for the TMBU. Rockinghorse continues to fund counselling for staff and a wide range of equipment purchases. We are very grateful to the team at Rockinghorse for all their support and look forward to more success in 2019.

Appendix 1

BAPM Categories of Care 2011

INTENSIVE CARE

General principle

This is care provided for babies who are the most unwell or unstable and have the greatest needs in relation to staff skills and staff to patient ratios.

Definition of Intensive Care Day

- Any day where a baby receives any form of mechanical respiratory support via a tracheal tube
- **BOTH** non-invasive ventilation (e.g. nasal CPAP, SIPAP, BIPAP, vapotherm) and PN
- Day of surgery (including laser therapy for ROP)
- Day of death
- Any day receiving any of the following
 - o Presence of an umbilical arterial line
 - o Presence of an umbilical venous line
 - o Presence of a peripheral arterial line
 - o Insulin infusion
 - o Presence of a chest drain
 - o Exchange transfusion
 - o Therapeutic hypothermia
 - o Prostaglandin infusion
 - o Presence of repleg tube
 - o Presence of epidural catheter
 - o Presence of silo for gastroschisis
 - o Presence of external ventricular drain
 - o Dialysis (any type)

HIGH DEPENDENCY CARE

General principle

This is care provided for babies who require highly skilled staff but where the ratio of nurse to patient is less than intensive care.

Definition of High Dependency Care Day

Any day where a baby does not fulfill the criteria for intensive care where any of the following apply:

- Any day where a baby receives any form of non invasive respiratory support (e.g. nasal CPAP, SIPAP, BIPAP, HHFNC)
 - Any day receiving any of the following:
 - o parenteral nutrition
 - o continuous infusion of drugs (except prostaglandin &/or insulin)
 - o presence of a central venous or long line (PICC)
 - o presence of a tracheostomy
 - o presence of a urethral or suprapubic catheter
- BAPM - Categories of Care August 2011
- o presence of trans-anastomotic tube following oesophageal atresia repair
 - o presence of NP airway/nasal stent
 - o observation of seizures / CF monitoring
 - o barrier nursing
 - o ventricular tap

SPECIAL CARE

General principle

Special care is provided for babies who require additional care delivered by the neonatal service but do not require either Intensive or High Dependency care.

Definition of Special Care Day

- Any day where a baby does not fulfill the criteria for intensive or high dependency care and requires any of the following:
 - o oxygen by nasal cannula
 - o feeding by nasogastric, jejunal tube or gastrostomy
 - o continuous physiological monitoring (excluding apnoea monitors only)
 - o care of a stoma
 - o presence of IV cannula
 - o baby receiving phototherapy
 - o special observation of physiological variables at least 4 hourly

TRANSITIONAL CARE

General principle

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

Appendix 2



Definitions according to MBRRACE	
Stillbirth	A baby delivered at or after 24+0 weeks gestational age showing no signs of life, irrespective of when the death occurred.
Early neonatal death	A liveborn baby (born at 20+0 weeks gestational age or later, or with a birthweight of 400g or more where an accurate estimate of gestation is not available) who died before 7 completed days after birth.
Late neonatal death	A liveborn baby (born at 20+0 weeks gestational age or later, or with a birthweight of 400g or more where an accurate estimate of gestation is not available) who died after 7 completed days but before 28 completed days after birth.
Stillbirth rate	Number of stillbirths per 1000 livebirths and stillbirths.
Perinatal mortality rate	Number of stillbirths and early neonatal deaths per 1000 livebirths and stillbirths.
Neonatal mortality rate	Number of neonatal deaths per 1000 livebirths.


Appendix 3

CLINICAL GOVERNANCE PERFORMANCE FOR NEONATOLOGY 2018

CLINICAL GOVERNANCE ELEMENT	COMPLETED/IMPLEMENTED	PRESENTED	DATE	COMMENTS & ACTIONS	ACTIONS COMPLETED
International & National Guidance					
NICE Guidance Postnatal Care CG 37/NIPE Guidance	Yes	No new presentation last year.		<ul style="list-style-type: none"> • Site for NIPE • Guidelines revised to meet BFI and NICE standards • Saturation screening implemented as standard • All requirements according to NIPE fulfilled except for DDH screening (KP2) – process review with Paediatric Orthopaedic Team and Sonographers required • Midwife led NIPE clinic in place and plan to increase number of trained MW 	Complete In progress
NICE Guidance Intrapartum Care CG 55/Antibiotics for Early-onset Neonatal Infection CG 149	Yes	No new presentation last year.		<ul style="list-style-type: none"> • All requirements fulfilled • Local guideline updated in line with the Obstetrics Department • Audit of Gentamicin dosing schedule 	Required

<u>Hypoglycaemia Guideline/NICE Guidance Diabetes in Pregnancy CG 63</u>	Yes	No new presentation last year.		<ul style="list-style-type: none"> Guideline amended for new WHO-UK growth charts Guideline revised to meet BFI standards Update of guideline 	Required
Identification and Management of Neonatal Hypoglycaemia in the Full Term Infant – A Framework for Practice (2017)	No	No, internal review of guidance awaited		<ul style="list-style-type: none"> Guideline suggests lowering glucose cut-off to 2mmol/l. This is controversial and not supported by international guidance Update guideline (see above) 	Required
NICE Guidance Neonatal Jaundice CG 98	Yes	No new presentation last year.		<ul style="list-style-type: none"> All requirements fulfilled Compliance with guideline generally good Audit of updated guideline 	Required
Therapeutic Hypothermia IPG 347	Yes	No, report awaited from Badgernet		<ul style="list-style-type: none"> All requirements fulfilled TOBY register data entry now included in NNAP database (Badgernet) Audit of Network Guidance Time=Brain Local audit of practice 	Completed Completed
NCEPOD – “A Mixed Bag”	Yes	No new presentation last year.		<ul style="list-style-type: none"> Local standard to give TPN all babies < 1500 g Local audit of TPN practice Adjustment of inclusion criteria required based on local audit 	Completed In progress

The Provision of Parenteral Nutrition within Neonatal Services - A Framework for Practice (2016)	Yes	No new presentation last year.		<ul style="list-style-type: none"> Guidance suggests cut-off for TPN at 1250 g birthweight Update guideline 	Completed
NICE Guidance Developmental follow-up of children and young people born preterm NG72	No	No, internal review of guidance awaited		<ul style="list-style-type: none"> Current practice almost completely in line with NICE guidance Update guideline (minor) Implement practice change 	Completed In progress
National Audits					
Maternal, Newborn and Infant Clinical Outcome Review Programme	Continuous	No new presentation last year.  Adobe Acrobat Document		<ul style="list-style-type: none"> Our adjusted neonatal mortality rate was the lowest amongst all surgical units in the UK in the last report. Our overall mortality rate is 10% lower than the national average. Continue work on improving survival at limit of viability 	In progress
National Neonatal Audit Programme	Continuous	Yes, circulated via e-mail + discussed at senior staff meeting  Adobe Acrobat Document		<ul style="list-style-type: none"> Overall good performance and reporting quality – improved further since last year 	
ATAIN - Avoiding Term Admissions Into Neonatal Units	Continuous	Yes, circulated via e-mail + discussed at senior staff meeting		<p>Conditions to be audited:</p> <ul style="list-style-type: none"> respiratory conditions hypoglycaemia jaundice 	

				<ul style="list-style-type: none"> • asphyxia (perinatal hypoxia–ischaemia) • low rate of admissions at moment 	
NIPE Pilot Saturation Screening for Congenital Heart Diseases	Completed	Yes, circulated via e-mail + discussed at senior staff meeting		<ul style="list-style-type: none"> • In response to evolving research evidence in support of this tool • Pilot site for NIPE screening for congenital heart diseases • Implement screening as standard locally 	Completed
National Training Survey	Continuous	No new presentation last year.  Adobe Acrobat Document		<ul style="list-style-type: none"> • Overall satisfaction highest in KSS Deanery • Continue efforts to improve in all areas of trainee education 	In progress
BLISS Survey of Parental Experiences 2010 - 2011	Completed	No new presentation last year.		<ul style="list-style-type: none"> • TMBU scored in most areas above national average and in 5/7 areas above national average for similar units. • TMBU was never lower than national average in any area • Facilitate unit visits before delivery • Provide written/visual information about TMBU before birth • Provide written/visual network information about preterm birth 	Completed Completed Completed
National Programmes & Projects					

Neonatal Hearing Screening	Continuous	No, reported separately by Audiology		<ul style="list-style-type: none"> Compliant with national requirements 	
Neurodevelopmental Outcome	Continuous	No, reported separately in departmental annual report		<ul style="list-style-type: none"> Follow-up continued for preterm infants < 29 weeks gestation: <ul style="list-style-type: none"> Schedule of Growing Skills at 12 months CGA Bayley III Developmental Assessment at 24 months CGA Term newborns after cooling treatment: <ul style="list-style-type: none"> Bayley III Developmental Assessment at 24 months CGA 	
Neonatal Transport Service	Continuous	No, reported separately in departmental annual report		<ul style="list-style-type: none"> Since September 2009 a 24/7 regional neonatal transport service in place, shared between the teams from Surrey, Kent and Sussex Develop standard electronic activity database Develop standard risk reporting system for KSS Develop standard national incident reporting system 	<p>Completed</p> <p>Completed</p> <p>Completed</p>
National HIV and Syphilis Surveillance	Continuous	No, reported separately by GUM		<ul style="list-style-type: none"> Top antenatal screening centre in the UK 	
Trust Identified Projects					
Perinatal Mortality & Morbidity Meeting	Ongoing	Yes, Circulated via e-mail + discussed at senior staff meeting	Monthly	<ul style="list-style-type: none"> Joint mortality and morbidity meeting with Obstetrics & Gynaecology 	In progress

				<ul style="list-style-type: none"> • Format under review 	
Neonatal Mortality & Morbidity Review	Ongoing	Yes, circulated via e-mail + discussed at senior staff meeting	Quarterly	<ul style="list-style-type: none"> • Presentation at Neonatal Clinical Governance Meeting • Summary report available in departmental annual report 	
Audit of Blood Cultures (Microbiology)	Ongoing	No, circulated via e-mail + discussed at senior staff meeting		<ul style="list-style-type: none"> • 6 monthly review not continued due to Microbiology staffing issues • Resume regular reviews • More detailed audit of available data • Audit of new infection prevention measures 	<p>In progress</p> <p>In progress</p> <p>In progress</p>
Audit: Infection Control	Ongoing	No, circulated via intranet infection control dashboard		<ul style="list-style-type: none"> • Very good compliance generally including hand hygiene and care bundles • Documentation needs improvement 	In progress
The Safety Thermometer	Ongoing	No, awaiting report		<ul style="list-style-type: none"> • National audit on nursing safety metrics, e.g. catheter care and pressure sores 	
Review of Risks, Incidents, Complaints & Claims	Ongoing	Yes, circulated via e-mail + discussed at senior staff meeting		<ul style="list-style-type: none"> • Medication errors still featuring high, but static • No major incidents otherwise • Review risk panel structure and risk review process • Explore new ways of improving medication errors and communication 	<p>Completed</p> <p>In progress</p>
Survey: Parent Satisfaction	Ongoing	Yes, circulated via e-mail + discussed at senior staff meeting		<ul style="list-style-type: none"> • Bespoke wireless real-time feedback system discontinued in 2018 • Develop Google Survey 	In progress

Specialty Identified Projects					
Audits					
Dopamine Audit	Completed	Yes, circulated via e-mail + discussed at senior staff meeting		<ul style="list-style-type: none"> • Delaying administration of dopamine by 30 minutes after preparation combined with changing infusions 12 hourly reduces MAP fluctuations • Dopamine is more stable in Glucose 5% than in Sodium-Chloride 0.9% • Dobutamine seems to be more stable than Dopamine in preliminary data • Change infusion practice and prescribing in formulary 	Completed
Admissions of Infants ≥ 37 Weeks to SCBU – the Impact of a Respiratory Support Decision Making Tool	Completed	Yes, circulated via e-mail + discussed at senior staff meeting		<ul style="list-style-type: none"> • Rate of term admissions below SEC Target of 60% • Rate of overall term admissions has dropped from an estimated 115/year to 104/year based on the two audits – 1 less per month approximately • Distribution of reason for admission has remained the same with respiratory causes being the main cause • Current presentation of data is flawed as it is presented in percentage of total admissions and not of total births at term in the respective Trust 	
Update on Safety Pauses and	Ongoing	Yes, circulated via		<ul style="list-style-type: none"> • Develop Risk Board 	In progress

Human Factors Projects		e-mail + discussed at senior staff meeting		<ul style="list-style-type: none"> • Explore options to combine Baby Watch and Safety Pause Communication • Develop more STEPP cards and also PROMPT cards 	In progress In progress
Guidelines					
Enteral Nutrition Guideline Update	Completed	Yes, circulated via e-mail + discussed at senior staff meeting		<ul style="list-style-type: none"> • Introduce protein fortifier • Purchase milk analyser to allow individualized protein fortification • Update guideline 	In progress Completed Completed
Powdered Infant Formula Preparation	Completed	Yes, circulated via e-mail + discussed at senior staff meeting		<ul style="list-style-type: none"> • Explore options to ensure safe preparation without having to use cooled down boiled water • Develop preparation guidance 	Completed Completed
Kangaroo Guideline	Completed	No		<ul style="list-style-type: none"> • Currently under review 	Completed
Thyroid Disorder Guideline	In progress	Yes, circulated via e-mail + discussed at senior staff meeting		<ul style="list-style-type: none"> • In response to varying practices affecting overall management • Currently for editing and ratification 	 In progress
Red Cell Guideline	In progress	No		<ul style="list-style-type: none"> • Currently under review 	In progress
HSV and VZV Guideline	In progress	No		<ul style="list-style-type: none"> • Currently under review 	In progress
Other					
Management of Preterm Infants at the Edge of Viability	In progress	Yes, circulated via e-mail + discussed at senior joint staff meeting with O&G Department		<ul style="list-style-type: none"> • Plans to improve management through joint efforts with O&G Department – guideline development, parent information and documentation 	In progress

Appendix 4

List of Publications 2018

Peer reviewed papers

Seaton SE, Barker L, Draper ES, Abrams KR, Modi N, Manktelow BN; UK Neonatal Collaborative. Estimating neonatal length of stay for babies born very preterm. *Arch Dis Child Fetal Neonatal Ed.* 2019 Mar;104(2):F182-F186. doi: 10.1136/archdischild-2017-314405. Epub 2018 Mar 27

Mahoney L, Fernandez-Alvarez JR, Rojas-Anaya H, Aiton N, Wertheim D, Seddon P, Rabe H. Intra- and inter-rater agreement of superior vena cava flow and right ventricular outflow measurements in late preterm and term infants. *J Ultrasound Med.* 2018 37(9):2181-2190. doi: 10.1002/jum.14568. Epub 2018 Feb 24.

Anton O, Jordan H, Rabe H. Strategies for implementing placental transfusion at birth: a systematic review. *Birth.* 2018 Sep 27. doi: 10.1111/birt.12398. [Epub ahead of print]

Rabe H. Commentary Packed red cell transfusion changes cerebral oxygenation and cardiac output. *Pediatr Res* 2019 Jan 15. doi: 10.1038/s41390-019-0294-y. [Epub ahead of print]

Soul JS, Pressler R, Allen M, Boylan G, Rabe H, Portman R, Hardy P, Zohar S, Tseng B, Bhatt-Mehta V, Hahn C, Denne S, Auvin S, Vinks A, Lantos J, Marlow N, Davis JM, for the International Neonatal Consortium. Recommendations for the Design of Therapeutic Trials for Neonatal Seizures. *Pediatr Res.* 2018 Dec 24. doi: 10.1038/s41390-018-0242-2. [Epub ahead of print]

Germovsek E, Lutsar I, Kipper K, Karlsson MO, Planche T, Chazallon C, Meyer L, Trafojer UMT, Metsvaht T, Fournier I, Sharland M, Heath P, Standing JF; NeoMero Consortium . Plasma and CSF pharmacokinetics of meropenem in neonates and young infants: results from the NeoMero studies. *J Antimicrob Chemother.* 2018 Jul 1;73(7):1908-1916. doi: 10.1093/jac/dky128.

Rabe H. Gasteditorial: Verzögertes Abnabeln von Frühgeborenen sollte Routine werden.[Guest editorial: Delayed cord clamping should be routine for preterm infants.] *Neonatologie Scan* 2018; 07:1-2

Presentations at national and international meetings

Hockey J, Andersson O, Kc A, Rabe H. Changing behaviours using video teaching: Delayed cord clamping and cord milking in Nepal. Annual Meeting of the Pediatric Academic Societies, Toronto, Canada, 5.-8.5.2018

De Sousa P, Kirupakan K, Patel B, Rabe H. A successful quality improvement project to reduce blood pressure fluctuations in neonates undergoing Dopamine infusions.

Annual Meeting of the Pediatric Academic Societies, Toronto, Canada, 5.-8.5.2018

Hockey J, Andersson O, Jones C, Kc A, Rabe H. A field study of using video teaching to change knowledge on delayed cord clamping and cord milking in Nepal. 7th Congress of the European Academy of Paediatric Societies (EAPS 2018) Paris, France | October 30-November 3, 2018

Sakmann S, Bremner S, Drencheva P, Rabe H. Economic benefits of reducing anaemia in term babies during the first year of life in low and middle income countries through placental transfusion at birth. 7th Congress of the European Academy of Paediatric Societies (EAPS 2018) Paris, France | October 30-November 3, 2018

De Sousa P, Kirupakan K, Patel B, Rabe H. A successful quality improvement project to reduce blood pressure fluctuations in neonates undergoing Dopamine infusions. 7th Congress of the European Academy of Paediatric Societies (EAPS 2018) Paris, France | October 30-November 3, 2018

Anton O, Drencheva P, Jordan H, Rabe H. How can placental transfusion (PT) at birth be implemented? 7th Congress of the European Academy of Paediatric Societies (EAPS 2018) Paris, France | October 30-November 3, 2018

Burnett S, Reulecke B, Bhat P, Rabe H, Mahoney L, Fernandez R . Observational study of intraventricular haemorrhage (IVH) in newborns with pulmonary haemorrhage (PH). 8th International Congress UENPS Bucharest, Romania, 3.-5.10.2018

Journal of Pediatric and Neonatal Individualized Medicine 2018;7(2):e070230

Rabe H: Latest Developments on Providing Placental Blood to Babies at Birth. Forum Perinatologia, Bucharest, Romania, 24.3.2018

Rabe H: EXPLAIN project: EXtra PLAcental Blood benefits Newborn Babies Annual Meeting of the Pediatric Academic Societies, Toronto, Canada, 5.-8.5.2018

Rabe H. Implementing Placental Transfusion in Kent, Surrey and Sussex: A quality improvement project. Sussex Operational Delivery Network meeting, Brighton 27.6.2018

Rabe H: Can NEO-CIRC and SafeboosC III join forces? The way forward. European Neonatal Brain Club, El Escorial, Spain, 31.8.-2.9.2018

Young L, Embleton N, McGuire W. Nutrient-enriched formula versus standard term formula for preterm infants following hospital discharge: systematic review. 1st prize presentation at REASON Conference, July 3rd 2018, Warwick.

Oddie SJ, Young L, McGuire W. Slow advancement of enteral feed volumes to prevent necrotising enterocolitis in very low birth weight infants: review. Presented at 32nd Annual Paediatric Intensive Care Society Conference, Sep 21st 2018, Bristol

Oddie SJ, Young L, McGuire W. Slow advancement of enteral feed volumes to prevent necrotising enterocolitis in very low birth weight infants: review. Presented at 7th Congress of the European Academy of Paediatric Societies, Paris, October 30th 2018

Guideline

Reiss I, Zimmermann L, Hellström-Westas L, Buonocore G, Greenough A, Rabe H, Villamor E. *Topic Expert Group: Medical care & clinical practice*
Title. Management of persistent pulmonary hypertension of the newborn infant (PPHN). www.efcni.org 2018