PIPER

Paediatric Infant Perinatal Emergency Retrieval Service

Annual Report 2013–14

Authorship

This report has been prepared by the staff of PIPER Paediatric, Neonatal and Perinatal (PETS / NETS / PERS).

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Acknowledgements

We gratefully acknowledge the support of the paediatric, neonatal and perinatal staff of PIPER, Ambulance Victoria and associated stakeholders.

PIPER Hotline

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Website

www.rch.org.au/piper

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1. Paediatric Infant Perinatal Emergency Retrieval (PIPER) Service

1.1 Introduction and Overview

Welcome to the PIPER Annual Report. This report covers Perinatal, Neonatal and Paediatric emergency referral and retrieval activity for the financial year 2013-2014.

During 13/14 the PIPER 1300 Emergency number received 12,627 calls, and we provided 3,690 specialist consultations and 1,695 emergency transports. Sitting behind this service, we co-ordinated critical care bed access across 4 level 3 and 34 public/private level 2 special care nurseries.

The 1300 Non-emergency number received 7,305 calls, and we undertook 1,816 return neonatal transports, which as well as supporting families to receive care within their local community, assisted in relieving critical care bed access issues.

While we are now well established as an entity within the management structure of the Royal Children's Hospital, the integration of NETS, PETS & PERS has not been fully achieved. This has substantially been due to the complex nature of the historic 'PETS in PICU' model and the resultant connections between funding streams, which is proving challenging to differentiate.

Nevertheless we have begun to develop service efficiencies, common systems and processes. We have improved our responsiveness by taking up the offer from Ambulance Victoria to provide us with a 'rapid response' vehicle, which speeds deployment of both paediatric and neonatal teams. The corporate fund raisers 'Chain Reaction' generously donated the funds to enable introduction of a new purpose-built ambulance configured to meet the needs of both the paediatric and neonatal retrievals, and we look forward to future replacement ambulances being similarly configured.

We continue to provide outreach paediatric resuscitation seminars, conducted by our PETS Senior Nurse Clinician, as well as neonatal resuscitation education to 2312 Victorian clinicians (medical, midwifery, nursing & paramedic) conducted by our NETS Education team.

I wish to acknowledge the special contributions made by two of our staff who have recently left the service. Fay Presbury has been involved with NETS for 28 years, and has been instrumental in developing the role of neonatal retrieval nurses. One obvious legacy that she has left with us is the appointment of the first neonatal nurse practitioner to work beside the neonatal Fellows in our neonatal retrieval team. Dr Felix Oberender has led the PETS group for the past three years, and has been a major contributor to our strategic plans for cross-training and increased integration between the paediatric and neonatal retrieval teams. I wish them both well for the future.

PIPER continues to collaborate with our many partners and stakeholders, and I wish to acknowledge the support of the RCH executive, the Department of Health, clinical staff at the 4 tertiary hospitals as well as all the other Victorian public and private health services with whom we work on a daily basis. Ambulance Victoria continues to be a key partner in the provision of transport services, and we especially wish to acknowledge their contribution and collaboration. And finally I wish to acknowledge and thank the PIPER staff for their dedication, skill and hard work.

Ian Patrick
Director, PIPER

PETS Activity Report

2013-2014

PIPER Paediatric

ACKNOWLEDGEMENTS

PETS operates as an integral part of the Paediatric Intensive Care Unit of the Royal Children's Hospital Melbourne and is continuing the process of working towards amalgamation with the Newborn Emergency Transport Services (NETS) and the Perinatal Emergency Referral Service (PERS) as PIPER, the Paediatric Infant Perinatal Emergency Retrieval Service. We gratefully acknowledge the support of hospital management as well as of the Intensive Care Unit and the leadership of PIPER:

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List of Acronyms

AAV	Air Ambulance Victoria
APLS	Advanced Paediatric Life Support
ARV	Adult Retrieval Victoria
ECLS	Extracorporeal Life-Support
ED	Emergency Department
ICU	Intensive Care Unit
MICA	Mobile Intensive Care Ambulance
MMC	Monash Medical Centre, Melbourne
NETS	Newborn Emergency Transport Service, Victoria
NSW	New South Wales
PERS	Perinatal Emergency Referral Service
PETS	The Victorian Paediatric Emergency Transport Service
PICU	Paediatric Intensive Care Unit
PIPER	Paediatric Infant Perinatal Emergency Retrieval
RCH	The Royal Children's Hospital Melbourne
TAS	Tasmania
VIC	Victoria
WA	Western Australia

CONTENTS

1. Introduction

The Victorian Paediatric Emergency Transport Service (PETS) retrieves critically ill children from hospitals throughout Victoria, Tasmania, and southern New South Wales for life-saving treatment to the Royal Children's Hospital and to Monash Medical Centre in Melbourne.

Operating out of the Paediatric Intensive Care Unit of the Royal Children's Hospital Melbourne, PETS brings the highly specialized, world-class resources of paediatric intensive care to critically ill children in Victoria and beyond providing safe, expert, emergency inter-hospital retrieval to a paediatric intensive care unit.

An equally vital part of PETS activity is the provision of specialist telephone advice to doctors, nurses, and ambulance personnel on the resuscitation of severely ill children thus making a unique resource available to healthcare workers throughout all of Victoria.

PETS team is available 24 hours a day for advice and for retrieval of critically ill children in Victoria, Tasmania, and Southern New South Wales.

The financial year 2013/2014 was the busiest year for paediatric referrals and retrievals since PETS' inception in 1979. PETS handled 1117 referred cases and transported 507 patients.

Website

The PIPER website was launched in late June 2014

2. History of Paediatric Emergency Transport in Victoria, Australia

Victoria has an area of 227,600 square km (87,884 square miles, roughly the size of the United Kingdom) and a population of 5.4 million, of whom 4 million live in greater Melbourne. 1.2 million of the 5 million are children (<17years). Victorian PETS covers all of Victoria, southern New South Wales and northern Tasmania. The total population of this area is about 6 million (approx. 1.5 million children), living within 600 km of the base of operations. On occasion, PETS may also retrieve children from other paediatric ICUs in Australia for treatment available only at the RCH Melbourne.

Tertiary paediatric services in Victoria are located at the Royal Children's Hospital (RCH) and at Monash Medical Centre (MMC), both in Melbourne. Large general hospitals are located in regional cities and in central and suburban Melbourne. Many of these have paediatric departments and paediatric wards, with senior and junior paediatric medical staff, but not tertiary paediatric services. Smaller towns around the state usually lack specialist paediatric facilities; hospitals in these towns are staffed by general practitioners.

In 1976, a Neonatal Emergency Transport Service (NETS), based at the Royal Women's Hospital, began transporting ill newborn babies from hospitals around Victoria to tertiary neonatal intensive care units in the Royal Women's, Royal Children's, Mercy Maternity and Queen Victoria Hospitals in Melbourne, immediately reducing mortality and morbidity rates in Victorian newborns.

A paediatric emergency transport service, based at the Paediatric Intensive Care Unit of the Royal Children's Hospital, Melbourne, subsequently began operations in 1979, retrieving 46 patients in that year.

In 2013/2014, PETS received 1117 phone referrals and retrieved than 507 critically ill children.

3. PETS Team

PETS is staffed by the Paediatric Intensive Care Unit (PICU) of the Royal Children's Hospital Melbourne. This allows clinical advice and treatment during retrieval to be given by experienced and highly specialised teams. PICU thus comes to the child before the child can be moved to the PICU.

Organisation

PETS clinical operations are overseen by a medical director and a senior nurse clinician. They are supported by the PETS administrator. Service development and amalgamation with NETS and PETS are continuing under the leadership of the Director of PIPER, the Paediatric Infant Perinatal Emergency Retrieval Service.

Transport staff

All retrievals are performed by a PICU doctor and a PETS nurse. Medical staff are either experienced registrars (>4 years training in paediatrics, intensive care, anaesthesia or emergency medicine) with extra training in retrieval medicine or, in some highly complex retrievals such as transport on extracorporeal life-support (ECMO), they are senior ICU specialists from the RCH PICU.

PETS nurses are very experienced nursing staff with a strong background in looking after critically ill children as well as in retrieval nursing. They have undertaken a 1-year post-graduate specialist course in PICU nursing, attended a PETS Workshop, Air Ambulance Orientation, and completed a Competency Package. Many nurses have also completed the Introduction to Aeromedical Retrieval Course through Monash University and the Advanced Paediatric Life Support (APLS) Course.

4. Outreach Education

Victoria

The successful and sought-after PETS Outreach Education programme, organised by the PETS senior nurse clinician, continued in 2013/14. The programme is available to hospitals throughout Victoria, Tasmania and southern New South Wales.

In 2013/14, 7 full day seminars were attended by 167 medical and nursing staff at the following hospitals: John Fawkner (x3), The Royal Children's, Alfred, Goulburn Valley and Benalla. PETS nurses have been involved in Trauma Outreach Seminars which in 2013/14 were conducted in Wangaratta.

PETS have also provided education sessions to Monash University Paediatric Nursing Course and Critical Care Nursing Course, The Royal Children's Deteriorating Child Workshops, Melbourne University's Paediatric Intensive Care Nursing Course, and Latrobe regional Hospital.

Regularly recurring education events include PETS orientation and workshops for new PICU registrars and PICU nurses conducted each February and August. This also involves orientation to Air Ambulance, including tutorials and training sessions at Essendon airport. Full day update sessions were conducted for all PETS nurses.

5. Service Development

PETS continued to develop its operating procedures, working closely with the Newborn Emergency Transport Service, trialling and introducing a newborn/paediatric triage guideline, conducting a checklist quality initiative and streamlining data collection.

6. ECLS Retrievals

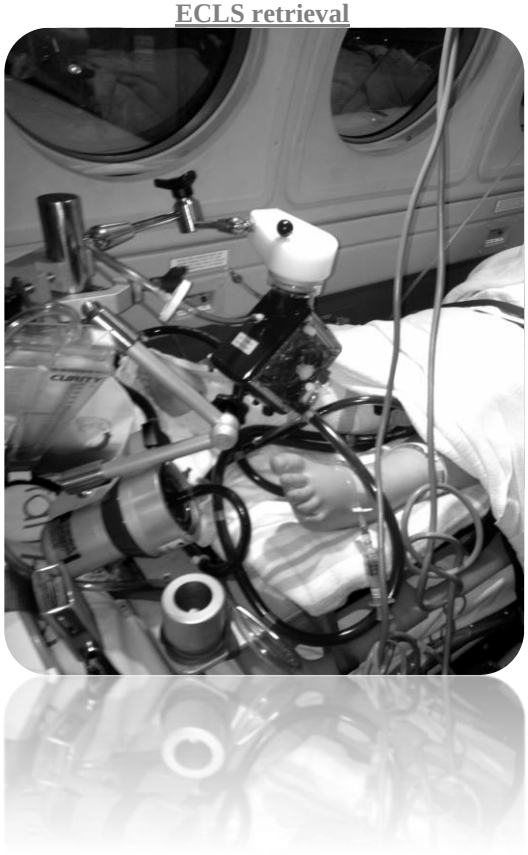
Transport of critically ill children on extracorporeal life-support (ECLS) - "heart-lung machines" - is a challenging undertaking of extreme complexity and only performed by a few selected centres worldwide. The Victorian Paediatric Emergency Transport Service, in cooperation with the RCH PICU and the RCH Department of Cardiac Surgery, have been able to offer this service to eligible patients in Victoria and throughout Australia. PETS is the only paediatric emergency retrieval service in Australia routinely offering ECMO capability.

A PETS ECMO team consists of a senior PETS nurse and a senior PETS doctor, a paediatric cardiac surgeon and a paediatric cardiac perfusionist. They travel to critically ill children, place or retrieve them on to mobile extracorporeal life support equipment and retrieve them the RCH PICU. ECMO transports are resource intensive and require a high level of medical, nursing and logistic expertise.

In 2013/14, two children were transported on ECLS and retrieved from the Austin Hospital and Monash Medical Centre. Patient diagnoses were anaphylaxis and septic shock. Both patients survived to discharge from the Royal Children's Hospital.

In total, 39 patients have been retrieved by PETS on ECLS since 2000.

ECLS retrieval



PETS Activity

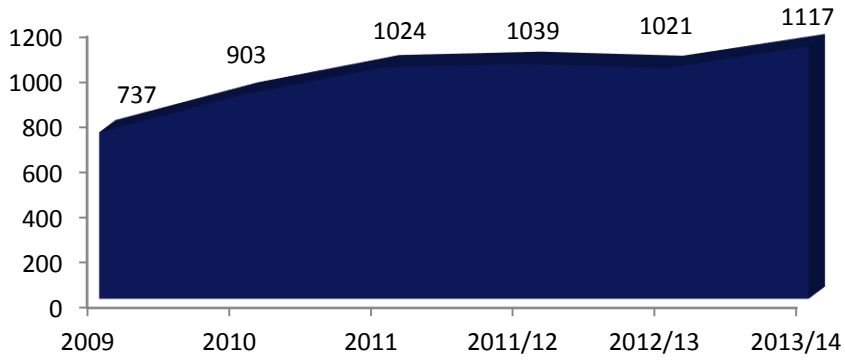
In 2013/14, PETS received 1117 referrals and retrieved 507 patients.

PETS activity - referral and retrieval trends

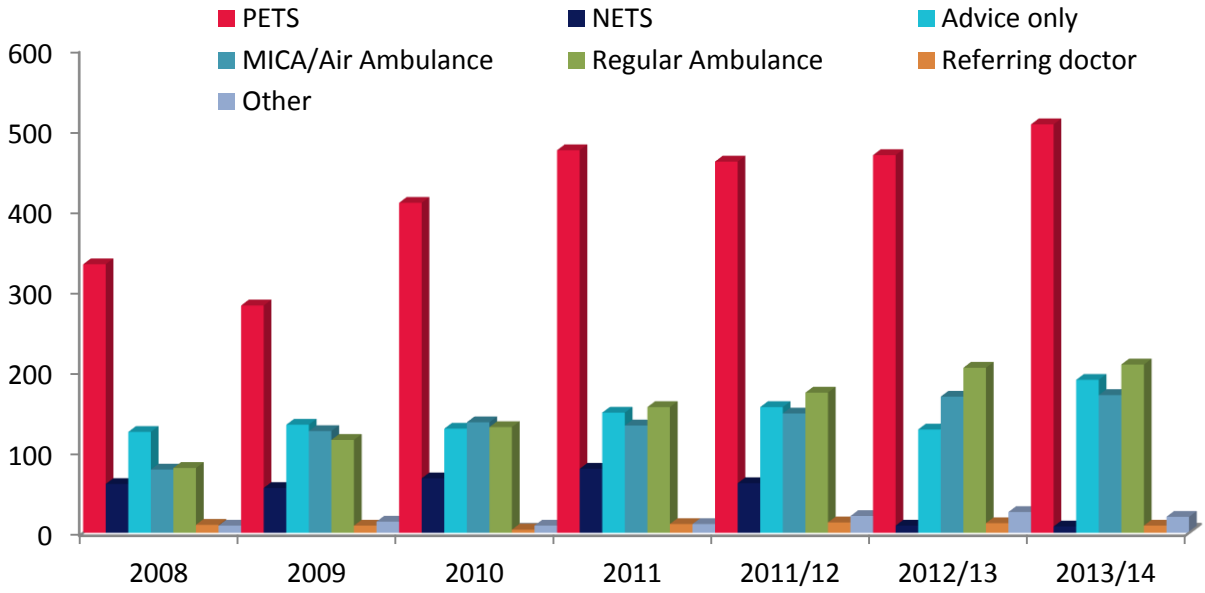
	2009	2010	2011	2011/12	2012/13	2013/14
Total Referrals	**737**	**903**	**1024**	**1039**	**1021**	**1117**
PETS	**283**	**410**	**475**	**461**	**469**	**507**
NETS	56	68	80	62	9	8
Advice only	135	130	150	157	129	191
MICA/AAV	127 *(MICA:76 AAV:51)*	138 *(MICA:94 AAV: 44)*	133 *(MICA:93 AAV: 41)*	149 *(MICA:119 AAV: 30)*	170 *(MICA:116 AAV: 54)*	172 *(MICA:129 AAV:43)*
Regular Ambulance	116	132	157	175	206	210
Referring doctor	9	4	11	13	12	9
Other	11	21	16	21	26	20

Other: refers to different transport services used to retrieve patients to hospitals throughout Australia. These services include the Tasmanian Retrieval Service, MedSTAR Kids (South Australia), and Adult Retrieval Victoria (ARV). It also includes patients who died or stayed at the referring hospital.

PETS Referrals 2009 to FY 2013/14



Teams retrieving patients following PETS referral



Timeframes for patient retrieval

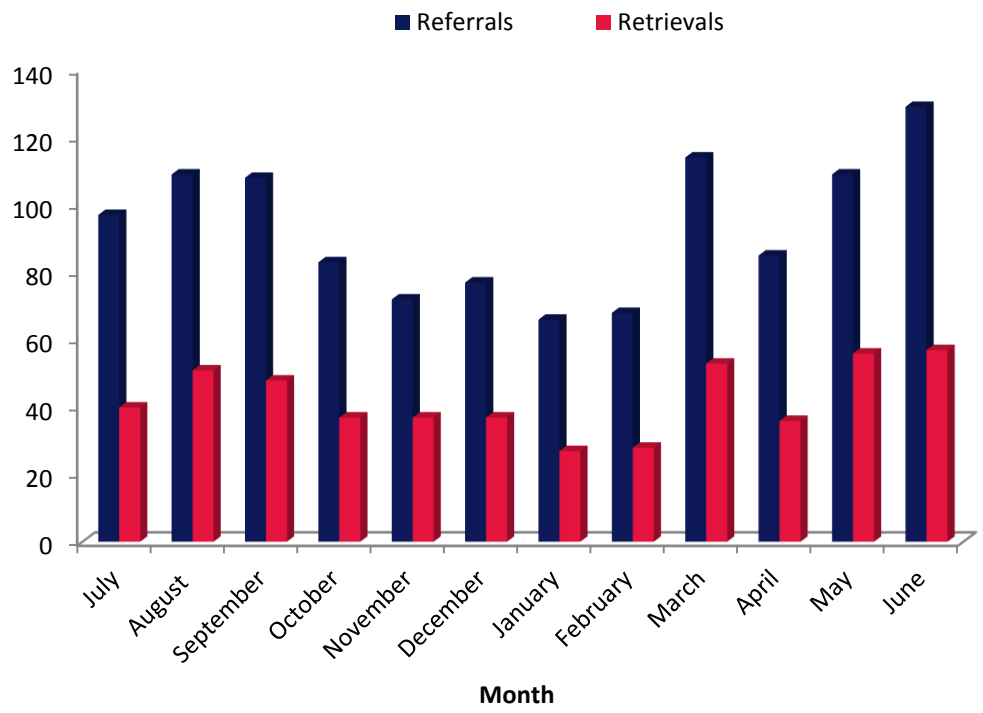
Median Activation Time **- hours -** (median time from referral phone call to departure from RCH)	**Median Response Time** **- hours -** (median time from referral call to arrival at referring hospital)
2009: 1.0 2010: 0.9 2011: 1.0 2011/12: 1.0 2012/13: 0.9 2013/14: 0.7	2009: 2.0 2010: 2.0 2011: 1.8 2011/12: 2.1 2012/13: 2.0 2013/14: 1.4

Median Retrieval Time
- hours -
(median time from referral to arrival of PETS team at receiving hospital)

2009	:	2.8
2010	:	2.9
2011	:	3.0
2011/12	:	2.7
2012/13	:	3.2
2013/14	:	3.2

PETS Referrals and Retrievals by Month 2013/14

Month	Referrals	Retrievals
July	97	40
August	109	51
September	108	48
October	83	37
November	72	37
December	77	37
January	66	27
February	68	28
March	114	53
April	85	36
May	109	56
June	129	57
Total	**1117**	**507**



PETS Referrals and Retrievals by Time 2013/14

Time	Cases	Retrievals (by time of referral)	Retrievals (by time of departure)
Nursing Shifts			
07:00-19:30	615	291	266
13:30-22:00	554	243	232
19:00-07:30	544	237	253
Medical Shifts			
08:00-20:30	655	308	304
20:00-08:30	502	218	252

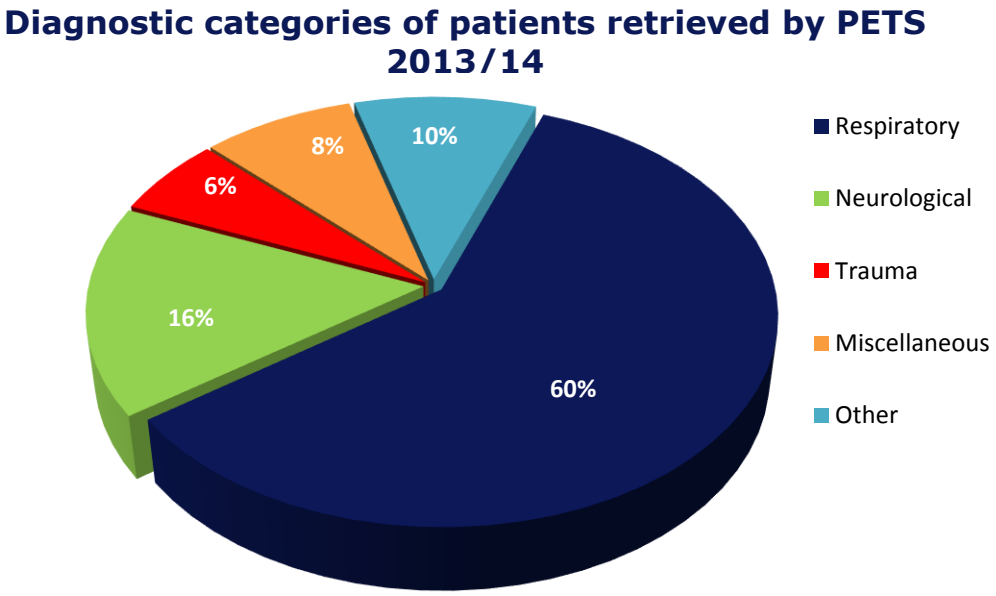
Staff Used for PETS Retrievals 2013/14

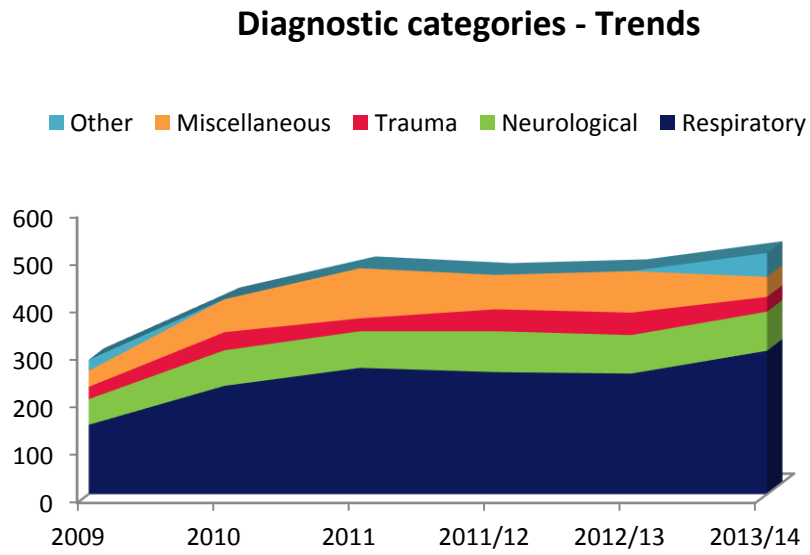
ICU Registrar	506
ICU Consultant	1
ICU Nurse	503
MICA Paramedic	1
Air Ambulance Paramedic	0
No ICU Nurse or Air Ambulance/MICA Paramedic	3

7. Patient Diagnoses

Diagnostic categories of patients retrieved by PETS

	2009	2010	2011	2011/12	2012/13	2013/14
Respiratory	146 (52%)	228 (56%)	266 (56%)	257 (56%)	254 (54%)	302 (60%)
Neurological	54 (19%)	75 (18%)	77 (16%)	86 (19%)	81 (17%)	82 (16%)
Trauma	26 (9%)	38 (9%)	27 (6%)	46 (10%)	47 (10%)	31 (6%)
Miscellaneous	34 (12%)	69 (17%)	105 (22%)	72 (15%)	87 (19%)	42 (8%)
Other: (Cardiac Gastro Renal)	23 (8%)	0	0	0	0	50 (10%)





8. Transport

Transport Out

Mode of transport used by PETS to reach referring hospital

	2009	2010	2011	2011/12	2012/13	2013/14
Taxi	165	242	294	298	295	185
PIPER Vehicle	n/a	n/a	n/a	n/a	n/a	158
Air Ambulance	67	96	90	98	97	83
Helicopter	34	58	78	46	49	46
Road Ambulance	15	11	10	14	15	21
Rapid Response car	0	0	0	2	2	7
Commercial Airline	2	3	3	2	1	0
Unknown	0	0	0	1	10	7
Total	**283**	**410**	**475**	**461**	**469**	**507**

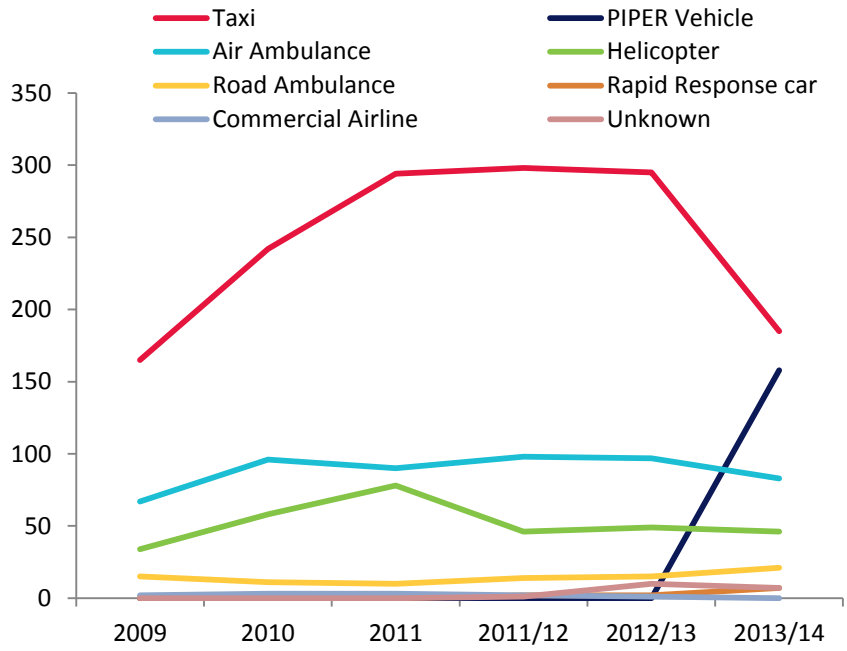
Transport Return

Mode of transport used by PETS to retrieve patient to the Royal Children's Hospital or Monash Medical Centre

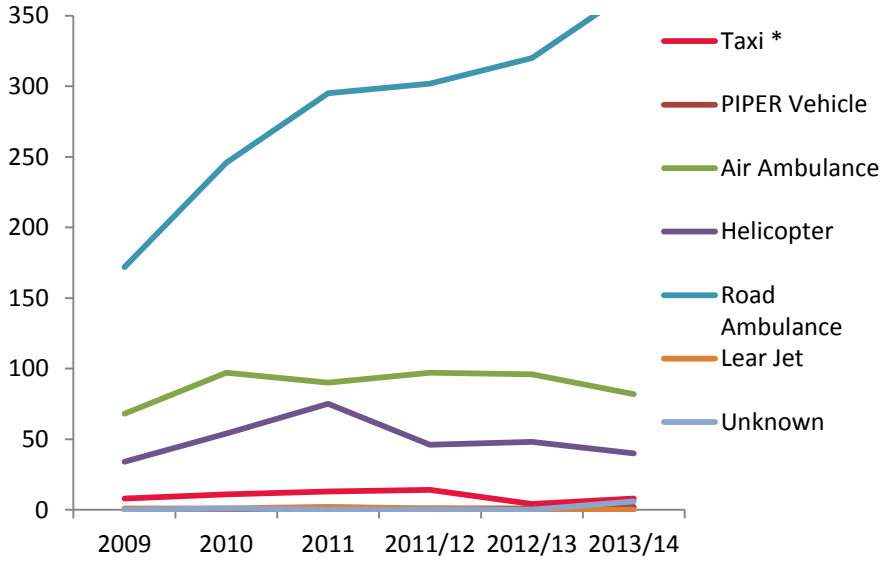
	2009	2010	2011	2011/12	2012/13	2013/14
Taxi *	8	11	13	14	4	8
PIPER Vehicle	n/a	n/a	n/a	n/a	n/a	2
HATS	0	0	0	1	1	0
Air Ambulance	68	97	90	97	96	82
Helicopter	34	54	75	46	48	40
Road Ambulance	172	246	295	302	320	369
Lear Jet	1	1	2	1	0	0
Unknown	0	1	0	0	0	6
Total	**283**	**410**	**475**	**461**	**469**	**507**

* Taxi is sometimes recorded on PETS forms when the patient was retrieved on specialised transport platform to another hospital and staff returned to RCH by taxi. Taxi is also recorded for patients that have remained at the referring hospital because they have improved or have died.

Transport Out - Trends



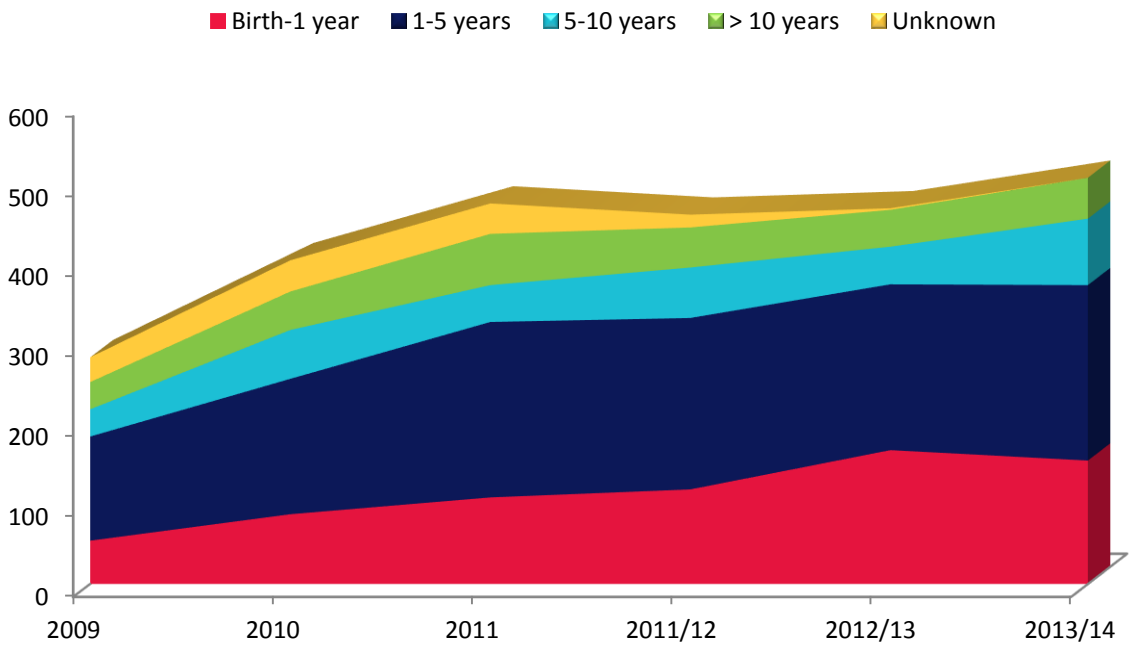
Transport Return – Trends



*see footnote on previous page

9. PETS - Age Distribution of Patients

	2009	2010	2011	2011/12	2012/13	2013/14
Birth-1 year	54 (19%)	87 (22%)	108 (23%)	118 (26%)	167 (36%)	154 (30%)
1-5 years	130 (46%)	169 (41%)	219 (46%)	214 (46%)	207 (44%)	219 (43%)
5-10 years	34 (12%)	61 (15%)	46 (10%)	63 (14%)	47 (10%)	83 (16%)
> 10 year	34 (12%)	48 (12%)	64 (13%)	50 (11%)	46 (9.5%)	51 (10%)
Unknown	31 (11%)	39 (10%)	38 (8%)	16 (3%)	2 (0.5%)	0 (0%)



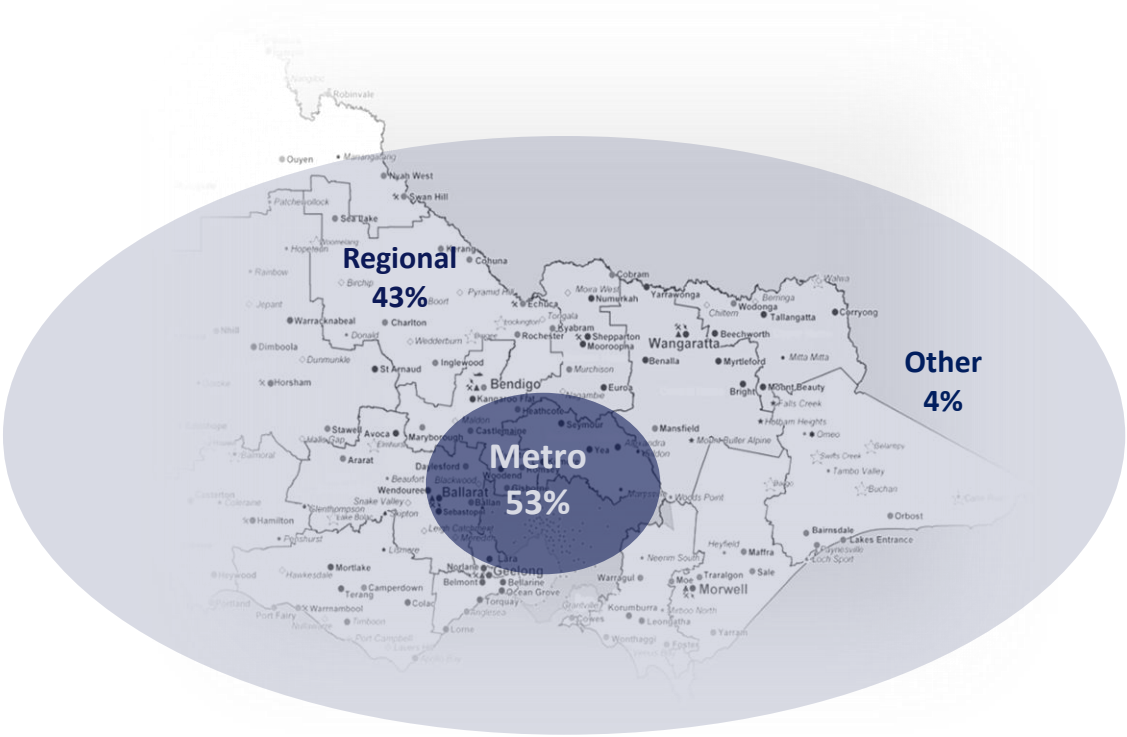
10. PETS Activity – Geographical Distribution

Activity by Victorian Health Care Region

Region	Number of PETS referrals 2013/14	%	Number of PETS retrievals 2013/14	%
Metropolitan	594	53	330	65
Barwon South West	115	10	34	7
Gippsland	106	9	29	6
Grampians	69	6	26	5
Hume	117	10	29	6
Loddon Mallee	69	6	39	8
Other*	47	4	20	4
Total	**1117**	**100**	**507**	**100**

*Please see interstate table in next section.

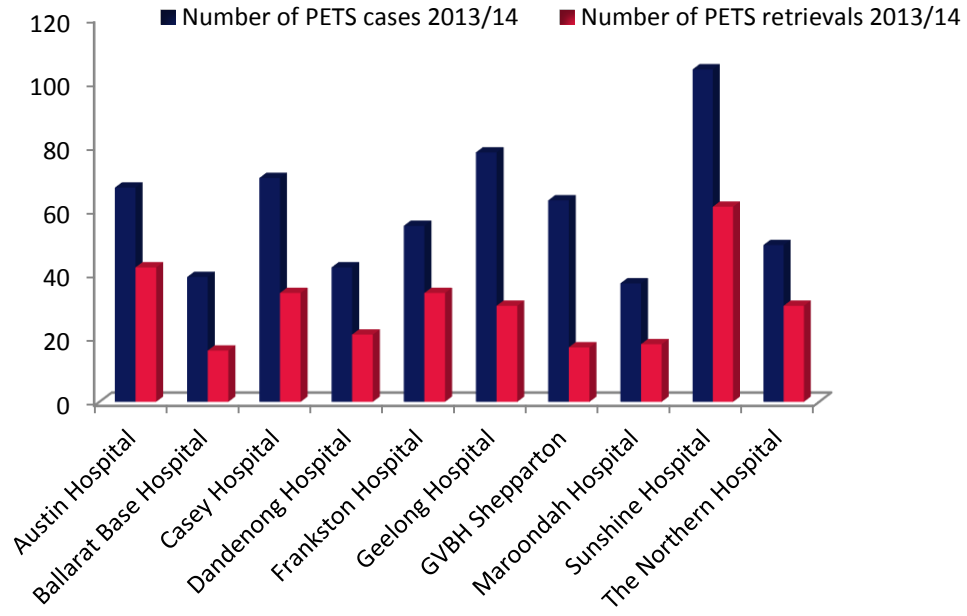
Referrals - Metropolitan and Regional



Referring Hospitals – Victoria		
Hospital	**Number of PETS referrals 2013/14**	**Number of PETS retrievals 2013/14**
Alexandra District Hospital	3	1
Alpine Health - Bright, Mt Beauty, Myrtleford	2	0
Angliss Hospital	23	15
Austin Health - Austin Hospital	67	42
Bairnsdale Regional Health Service	19	2
Ballarat Health Services – Ballarat Base Hospital	39	16
Barwon Health - The Geelong Hospital	78	30
Benalla and District Memorial Hospital	1	0
Bendigo Health Care Group	20	10
Box Hill Hospital	37	17
Cabrini	17	8
Casey Hospital	70	34
Central Gippsland Health Service - Sale	9	3
Cobram District Hospital	1	0
Cohuna District Hospital	1	1
Colac Area Health– Colac	8	0
Dandenong Hospital	42	21
Djerriwarrh Health Service - Bacchus Marsh	4	2
East Grampians Health Service – Ararat	5	2
East Wimmera Health Service - Donald	1	0
East Wimmera Health Service - St Arnaud	2	0
Echuca Regional Health	22	11
Epworth	2	0
Frankston Hospital	55	34
Geelong hospital SJOG	1	1
Gippsland Southern Health Service - Korumburra	2	1
Gippsland Southern Health Service - Leongatha	9	1
Goulburn Valley Health (GVBH) Shepparton	63	17
Hepburn Health Service - Daylesford	3	0
John Fawkner	1	1
Kerang and District Hospital	1	1
Kilmore and District Hospital	3	2
Knox Private	8	3
Kyabram and District Health Service	1	0
Kyneton District Health Service	3	1
Latrobe Private Hospital	1	1
Latrobe Regional Hospital	25	10
Lorne Community Hospital	1	0
Mallacoota Medical Centre	1	0
Mansfield District Hospital	5	0
Maroondah Hospital	37	18

Referring Hospitals – Victoria (contd.)		
Hospital	**Number of PETS referrals 2013/14**	**Number of PETS retrievals 2013/14**
Maryborough District Health Service	3	2
Mercy Hospital for Women	1	0
Monash Medical Centre, Clayton Campus	13	9
Mt Buller Medical Centre	1	0
New Mildura Base Hospital	9	5
Northeast Health Wangaratta	16	6
NorthPark Private	1	1
Orbost Regional Health	2	0
Otway Health and Community Service - Apollo Bay	2	0
Peninsula Private	1	0
Phillip Island	1	0
Portland and District Hospital	8	0
Rosebud Hospital	11	2
Royal Children's Hospital	9	9
Royal Melbourne Hospital - City Campus	2	2
Rural North West Health - Warracknabeal	1	0
Sandringham and District Memorial Hospital	7	4
Seymour District Memorial Hospital	7	0
South Gippsland Hospital - Foster	4	1
South West Health Care - Warrnambool	10	1
St Vincent's Private Hospital	5	4
Stawell Regional Health	3	1
Sunshine Hospital	104	61
Swan Hill District Hospital	14	10
The Alfred	2	2
The Northern Hospital	49	30
Timboon and District Health Care Service	1	1
Warringal Private	1	1
Werribee Mercy Hospital	17	5
West Gippsland Health Care Group - Warragul	15	7
West Wimmera Health Service - Nhil	10	4
Western District Health Service – Hamilton	7	1
Williamstown Hospital	2	2
Wimmera Health Care Group - Wimmera Base Hospital	5	3
Wodonga Regional Health Service	1	0
Wonthaggi and District Hospital	21	4
Yarram and District Health Service	2	0
Yarrawonga District Health Service	1	0

Referring Hospitals Victoria - Trends



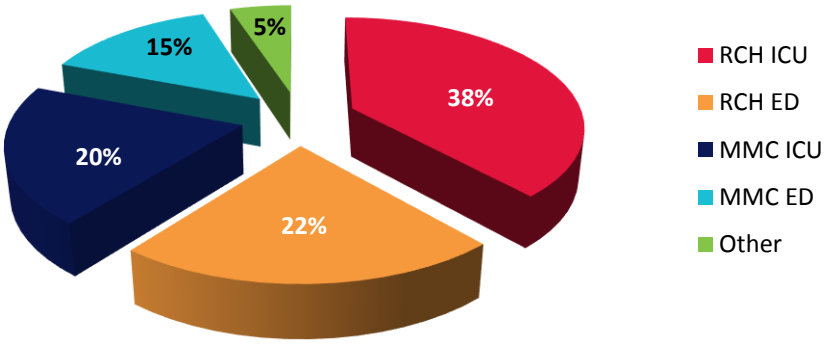
PETS Activity – Interstate Hospitals

Region	Hospital	Number of PETS referrals 2013/14	Number of PETS retrievals 2013/14
New South Wales	Albury Base*	31	17
	Barham Koondrook Soldiers Memorial	1	0
	Deniliquin	7	1
	Sydney Children's Hospital/Westmead/ NETS Sydney	1	0
Tasmania	Royal Hobart	2	1
	Launceston General	2	0
	Mersey Community	0	0
	North Western Regional- Burnie	0	0
Others	Queensland	0	0
	Northern Territory	1	0
	Adelaide, South Australia	2	1
	Western Australia	0	0
	Pacific	0	0

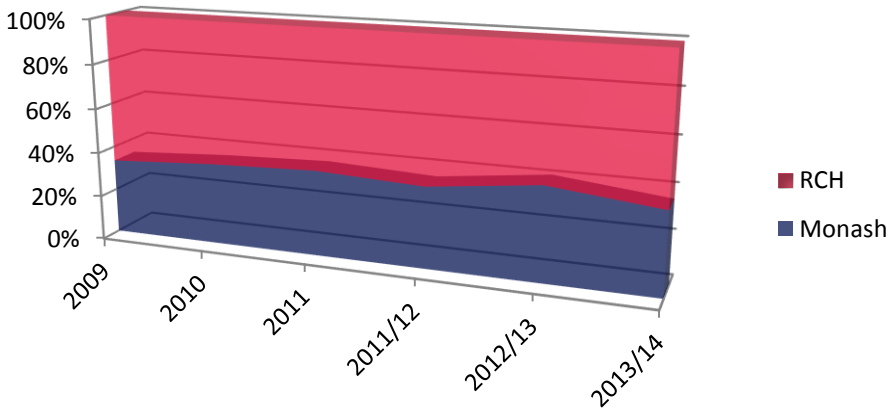
*Albury Base Hospital is located within the Victoria Hume Healthcare region

PETS Patient Disposition 2013/14

PETS Patient Disposition	Total	%
RCH ICU	193	38
RCH ED	113	22
Monash ICU	103	20
Monash Emergency	73	15
Other	25	5
Retrievals	507	100



PETS Patient Disposition – Trends



11. Conclusion

PETS delivers a crucial and highly specialised service to the children of Victoria and beyond. Giving clinicians throughout the state ready access to the expertise of PICU specialists at the Royal Children's Hospital and taking the skills, knowledge and resources of paediatric intensive care to critically ill paediatric patients, PETS makes a unique contribution to the healthcare of some of Victoria's sickest children.

Demand for PETS continued to be very high throughout 2013/14 with over a thousand referrals to the service. PETS continues to address the challenges of high demand and advancing paediatric retrieval medicine through improved procedures and through developing efficiencies in the process of working towards amalgamation with NETS and PERS.

Melbourne, July 2014

NETS
Annual Report 2013-2014

PIPER Neonatal

Table of Contents

1. PIPER Neonatal

1.1 Introduction and Overview

Welcome to the PIPER Neonatal section of the 2013/14 annual report. Some of the highlights of 2013/14 include:

- Continuing high levels of demand for emergency and non-emergency referrals
- The commencement of a dedicated Neonatal Nurse Practitioner
- Providing a diversified suite of learning opportunities to more than 2,300 clinicians
- Planning for the introduction of a high frequency oscillator
- Collaborating with the Department of Health and Ambulance Victoria in providing 16 hospital based incubators for use in low acuity inter-hospital transfers.
- Developing a model for the further integration of NETS/PERS and PETS.

20013/14 was the busiest year in our 37 year history with a total of 3397 clinical referrals of which 1190 resulted in emergency retrievals. Emergency retrievals spanned distances from as little as 500 metres to the 19,600 km return trip to Mumbai and back. The latter occurred over a 48 hour period and its successful completion was a testament to the clinical and logistic expertise of the teams involved with planning and undertaking the mission.

We were delighted when our first dedicated retrieval neonatal nurse practitioner, Catherine Fox, commenced with us in February 2014. This is an exciting role within neonatal transport and we look forward to developing this important career path option for retrieval nurses.

NETS Education continued its busy program offering a diverse range of learning opportunities across Victoria and interstate. The neoResus program is now the respective Department of Health designated neonatal resuscitation program in Queensland and Tasmania with ongoing interest from a number of other States.

The Department of Health, Ambulance Victoria, Parker Healthcare and PIPER partnered to provide 16 hospital based incubators to be distributed across the State. These incubators enable inter-hospital transfer of low acuity babies using paramedics and occasionally referring hospital staff. This will improve responsiveness and will ensure the clinical skill set better matches that required by the baby. The initiative provides a state of the art incubator for both in-hospital and out-of-hospital use and empowers the hosting health service, supported by PIPER, to take a lead role in managing low acuity transfers in their region.

PIPER Neonatal collaborates with many partners and acknowledges the support provided by the clinical staff of the 4 tertiary hospitals, and all Victorian public and private special care nurseries and their maternity units. Ambulance Victoria is a key partner in the provision of transport services and we acknowledge their collaboration. The Department of Health remain active in supporting us during this period of complex change.

As always I thank both the clinical and non-clinical staff of PIPER Neonatal. It takes a unique set of clinical and logistic expertise "to get the job done" with such sustained consistency. Retrieval is an intrusive choice of work with early starts and late finishes common. Dedicated staff are the key to any successful organisation and we are very proud of the service our people provide to the sick babies of Victoria.

Dr Michael Stewart FRACP MHlth Serv Mt
Medical Director
PIPER Neonatal

1.2 A tribute to Fay Presbury

After 28 years of service Fay finished up with PIPER/NETS/PERS in August 2014. A number of events were held to celebrate Fay's contribution over this period. The following is an excerpt from my tribute that was presented at Fay's main farewell function at the RACV club.

28 years is a long time, but in many ways I think it fits with characteristics that typify Fay – persistence, determination and loyalty. Fay often spoke of the passion she held for retrieval, and her tireless advocacy for NETS and like services is a testament to this.

I recall first meeting Fay in the pre-NETS days when she worked in the RCH PICU soon after completing the NICU course. She then moved on to NETS for what was to be the bulk of her career. She knew this business so well and I am sure it is only after she leaves that we will come to realise how much of the detail she was across. I can well recall when I started with NETS in 2000 how little I knew of how everything worked and how much I relied on Fay's input especially with regard to equipment and logistics.

Fay's contribution to NETS, and now PIPER, covered many areas. The running of the Return Service, developed by Ellen Bowman and Neil Roy, became very much her "baby" and she guided this part of the service into one which attracted both national and international attention.

Fay was a staunch supporter of NETS Education and particularly encouraged cross discipline sessions with our maternity education colleagues. She provided unerring professional support for the NETS Ed nurses…even when they were struggling to come up with the next topic for those bloody videoconferences!

Together with Andrew Berry from NSW NETS, Fay promoted the development of a national group on neonatal retrieval and this resulted in retrieval being recognized as one of the official Special Interest Groups for PSANZ. Hopefully this will lead to a greater sharing of both challenges and triumphs between services as well as opportunities to benchmark performance so we can enhance what is another one of her passions – quality and safety of care.

I am sure Fay leaves NETS with a host of memories and a raft of interesting stories of "NICU on the road". I thank her for the support she has provided to me over the past 14 years and more so on behalf of the thousands of babies and families whose lives have been touched by her caring and expertise.

We wish Fay well for the next phase of her career.

Michael Stewart

1.3 NETS Education

The mission of PIPER Neonatal Education is to provide a diverse range of learning resources to all clinicians involved in the care of the newborn particularly to clinicians in non-tertiary hospitals. We are committed to continuous adaptation and improvement in how we meet the needs of our stakeholders. We trust this report supports this mission and as always we welcome feedback on how we can best meet your needs.

In 2013 we welcomed Shradha Balia to our team. Shradha provides administration support to both PIPER Neonatal Education and PIPER Paediatric.

Highlights of 2013/14 include:

- More than 2,500 clinicians utilised our learning resources.
- Our staff travelled more than 13,313 km throughout Victoria to facilitate Metropolitan and Country programs.
- We have an explicit commitment to ensure we reach small maternity services. The number of programs delivered in these health services has increased by 70% with a 40% increase in level 1 hospitals that have hosted programs. Most of these are focused on resuscitation and stabilisation of the newborn.
- A Continuous Positive Airway Pressure (CPAP) learning package and competency assessment tool was completed and made available to all hospitals via the PIPER website. This complements an updated version of the nasal CPAP clinical guideline that had substantial input from PIPER Neonatal clinical staff and is now part of the Victorian Neonatal Handbook which has been transitioned to a Department of Health website.
- Led by Jenni Sokol our retrieval teams participate in retrieval based scenarios using the high fidelity simulation resources of RCH.
- In 2014/15 new and improved low fidelity mannequins together with some significant technology improvements will be available for use in our resuscitation training programs.

neoResus – State of the Art in Newborn Resuscitation Training

- The neoResus First Response Program and the neoResus Advanced Resuscitation program have been well attended in 2013/14. These multidisciplinary programs cover the principles of resuscitation of the newlyborn infant using web-based learning, scenario-based hands-on learning and opportunities to become familiar with newborn resuscitation equipment. Historically our resuscitation programs have almost exclusively involved nurses and midwives. A major focus in the past 3 years had been to encourage junior and senior medical staff participation so that we can better simulate the multidisciplinary team that attends resuscitations. The success of this intiative is evidenced by the fact that more than 320 medical staff participated in our programs in 2013/14, an increase of more than 40% compared to 2012/13.
- In 2013, we presented "**The Victorian neoResus Training Program: Feedback from participants**" at the 17th PSANZ meeting in Adelaide (Jacquie Whitelaw, Marta Thio et al). The program was highly rated. 88.5% of attendants had reviewed the online learning modules and 84% found them good or excellent. 96.3% of Advanced Resuscitation Course attendants would recommend it to others.

- The Health Departments in Queensland and Tasmania have identified neoResus as their preferred statewide program for newborn resuscitation. NETS Education staff have run the basic programs together with facilitator induction programs for key stakeholders in QLD and Tasmania to enable the roll out of the neoResus program across both States. More than 500 medical, nursing and midwifery staff in QLD and 270 from Tasmania have been through the program over the past 2 years. There is interest from other States in exploring a similar model – a testament to the initiative, expertise and effort expended by our neoResus team led by Rose Boland and Marta Thio.

Promoting learning across disciplines – Maternity and Newborn

- Nursing and Medical staff from PIPER Neonatal Education joined with the Maternity Services Education Program (MSEP) to run combined, multidisciplinary workshops in Victorian rural hospitals (Alpine Health, Bairnsdale, Echuca, Kyabram & Cobram). These workshops focus on the continuum of care from the management of the pregnant woman during the intrapartum period to the neonate in the newborn period, emphasising crisis resource management principles. The 2 day-workshops involve maternal obstetric care and neonatal resuscitation, combining high fidelity simulation (actress, paramedics) with low fidelity simulation (neonatal manikins). A multidisciplinary team, including local paramedics, attend these programs.

Award winning initiative—promoting culturally sensitive learning – working with our indigenous colleagues

- In 2013 & 2014 MSEP, the Victorian Aboriginal Community Controlled Health Organisation (VACCHO), Njernda and GEGAC (Gippsland & East Gippsland Aboriginal Cooperative), Koori Maternity Services, PIPER Neonatal Education and Ambulance Victoria in collaboration with Echuca and Bairnsdale Regional health Services, have facilitated two "Cultural safety in maternity care" workshops to enhance outcomes for Aboriginal families and build cultural safety on individual, organizational and inter-organisational levels.
- In 2014 MSEP presented the outcomes from these 2 programs at the SimHealth conference and received a research award for best education innovation. The collaboration was awarded a 'meritorious application' at the National Lead Clinicians Group (NLCG) 2014 Awards for Excellence.

Supporting pre-hospital care of the newborn – Partnering in Paramedic Education

- An important collaborative has seen PIPER Neonatal Education provide Neonatal Resuscitation education programs for undergraduate student paramedics studying at Monash University, as well as paramedics undertaking the MICA post graduate program at Monash. These programs are based on the 2013 Ambulance Victoria Newborn Clinical Practice Guidelines that were co-authored by PIPER Neonatal Education staff.

NETS Education Activity Report 2013-2014

From 1st July 2013 until 30th June 2014, NETS Education staff provided 530.5 contact hours of education for Victorian and interstate healthcare professionals involved with perinatal care.

Education formats – Supporting Diversity in Learning

Format	Contact hours
Continuing education programs	484.5
NETS Education Continuing Education Program in Newborn Nursing Care (CEPNNC)	36
Videoconferences	3
Neonatal competency assessments*	7
TOTAL:	**530.5**

Education Programs

131 programs (including 2 NETS Education CEPNNC, 3 videoconferences and 5 competency assessment sessions) were conducted in 2013/2014.

- 70 programs hosted by 29 Public Hospitals
- 28 programs hosted by 7 Private Hospitals
- 13 programs hosted by 10 Universities or other health care providers or stakeholders
- 14 programs were hosted by PIPER at RCH

A total of 46 country study days were held during 2013/14.

Participant Profile – Supporting Multidisciplinary Learning

Status	No. of participants
Nursing	1627
Medical	328
Student Paramedics/MICA Paramedics	98
Other	57
Not recorded	202
TOTAL:	**2312**

* It is not always possible to determine exact numbers or status of those attending programs, particularly those coordinated by other providers.

Nursing staff include Midwives, Registered Nurses, Graduate Diploma of Midwifery students, Bachelor of Midwifery students, Divisional 2 Nurses and Mothercraft Nurses. Midwives are the predominant group, with more than 917 attending sessions.

NETS Education Activity Report Comparison

Hospitals Visited	2010/2011	2011/12	2012/13	2013/14
Level I	11 hospitals 18 programs	14 hospitals 20 programs	13 hospitals 20 programs	18 hospitals 34 programs
Level II	27 hospitals 76 programs	21 hospitals 67 programs	24 hospitals 73 programs	17 hospitals 59 programs
Level III	4 hospitals 5 programs	5 hospitals 6 programs	5 hospitals 5 programs	5 hospitals 7 programs
Public:	23 hospitals 55 programs	25 hospitals 55 programs	28 hospitals 61 programs	29 hospitals 70 programs
Private:	16 hospitals 40 programs	11 hospitals 33 programs	11 hospitals 35 programs	7 hospitals 28 programs
Universities:	8 facilities 11 programs	9 facilities 12 programs	9 facilities 14 programs	3 facilities 5 programs
Others: Independent Practicing Midwives, Ramsay Healthcare, RANZCOG, Staffing Synergy, Victorian Newborn Resuscitation Project, MNCN conference	7 facilities 19 programs	9 facilities 20 programs	5 facilities 16 programs	7 facilities 22 programs
Doctor assisted sessions/programs		33*	46*	32**
Total sessions	**125**	**120**	**126**	**126**
Total hours	**411.5**	**436.5**	**488.5**	**484.5**
Total attendees	**2628**	**2346**	**2495**	**2312**

* Approximately. ** Some sessions facilitated by non-PIPER medical staff.

NETS Education Staff: (left to right)
Jacqui Whitelaw, Shradha Balia, Marta ThioLluch, Robyn Smith, Avril McLean, Rosemarie Boland

1.4 NETS Return Transport Service

"Moving babies closer to home"

The NETS Return Transport service (RTS) plays an important role in Victoria's perinatal system. The Return Service:

- Provides experienced and highly specialised nurses and equipment to enable transfer of higher acuity babies that could not be managed by other non-emergency patient transfer services
- Enables more than 1600 babies per year to spend part of their special care course closer to home. Family dislocation is very stressful for families when their baby is in NICU.
- Assists in optimizing neonatal cot management across both tertiary and non-tertiary services

In 2013/14 a record 1678 babies were transported by the return service. Some of the strategies that enable this demand to be met effectively and efficiently include:

- Monitoring nursing resources (EFT 3.3) to ensure we remain flexible, responsive and service oriented.
- The service now directly employs 4 drivers (pictured below) enabling better control and flexibility in managing demand.
- Maintaining a fleet of 3 customized ambulances, one of which is provided by GE Fleet, to ensure the very best of care can be provided for the babies in transport.
- Provision of phototherapy, monitoring and other vital equipment to ensure continuity of care during transport.

Rebecca Deacon

Leigh Davies

Brian Cluley

Shane Wills

1.5 NETS Research

The list of publications and presentations listed below reflect the diverse range of skills among clinicians who spend part of their time with PIPER Neonatal. We have included work directly related to retrieval, neonatal resuscitation and neonatal education as well as other areas of interest of our staff.

This diversity of interests and expertise ensures a stimulating environment within the service. A commitment to academic support is an integral component of all clinical services. We achieve this through research and audit directly related to retrieval, and by supporting staff while they pursue research in related areas. We are delighted to have assisted Rose Boland with her PhD studies and at present we have 2 medical staff enrolled in higher degrees while working part time for PIPER.

We acknowledge all staff who have contributed to this impressive achievement.

Papers

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Dawson JA, Bastrenta P, Cavigioli F, **Thio M**, Ong T, Siew ML, Hooper SB, Davis PG. ***The precision and accuracy of Nellcor and Masimo oximeters at low oxygen saturations (70%) in newborn lambs.*** Arch Dis Child Fetal Neonatal Ed. 2014 Jul;99(4):F278-81. Epub 2014 Mar 4.

Roehr CC, Schmölzer GM, **Thio M**, Dawson JA, Dold SK, Schmalisch G, Davis PG. ***How ABBA may help improve neonatal resuscitation training: Auditory prompts to enable coordination of manual inflations and chest compressions.*** J Paediatr Child Health. 2014 Jun;50(6):444-8. doi: 10.1111/jpc.12507. Epub 2014 Feb 26.

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Fox LM, Choo P, **Rogerson SR**, Spittle AJ, Anderson PJ, Doyle L, Cheong JL. ***The relationship between ventricular size at 1 month and outcome at 2 years in infants less than 30 weeks' gestation***. Arch Dis Child Fetal Neonatal Ed. 2014 Jan 9. doi: 10.1136/archdischild-2013-304374. [Epub ahead of print]

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Invited Speaker

Stewart M. ***Respiratory support in non-tertiary centres.*** Cool Topics 2013

Stewart M . ***Neonatal Retrieval,*** RCH Grand Rounds, July 2014

Smith J. ***Aeromedical retrieval.*** PSANZ Breakfast session 2014.

Thio M. ***Resuscitation of the preterm infant in the delivery room: case scenarios and debriefing*** (ESN pre-congress course) 2013

Thio M. ***DR-management of congenital diaphragmatic hernia: A need to change the current ap***. EAPS Porto, October 6-9th 2013

Roehr C. Key note lecture: ***Can we predict long term pulmonary outcome of VLBWI?*** EAPS Porto, October 6-9th 2013

Roberts C. ***High-flow nasal cannulae use in neonates: an example of the use of non-inferiority trials.*** Grand Round, Sykehuset Innlandet Lillehammer, Norway. June 13th, 2014.

Rosemarie A Boland. ***Looking back: 20 years of outborn births before 32 weeks' gestation in Victoria.*** Australian College of Neonatal Nurses Victoria Branch Inaugural Symposium, Melbourne. February 21, 2014.

Rosemarie A Boland. ***The tyranny of distance: Outcomes of infants <32 weeks born in non-tertiary hospitals.*** Cool Topics Neonatal Research Symposium, Melbourne. November 7 to November 8, 2013**.**

Roehr C. ***Transport ventilators: what to look out for, what to bear in mind.*** EAPS Porto, October 6-9th 2013

Roehr C. ***Initial lung aeration: Physiology and meaningful measures to provide support. A discussion of the evidence*****,** Monash Medical Centre Grand Round. July 26th 2013

Roehr C. ***Neonatal resuscitation – methods of recruiting the lung during the first breaths of life.*** GNPI-Tagung June 6-9th 2013

Roehr C. ***What's the evidence for using high-flow nasal cannulae for preterm infants?*** New Zealand Neonatal Study day, April 4th 2013

proach? 5th Symposium Delivery Room Management, Dresden, Germany, February 2013.

Abstracts – Poster presentations

Roberts CT, Jacobs SE, Stewart MJ. ***Initiation of Therapeutic Hypothermia by Referring Hospitals During Neonatal Transport – Experience in Victoria, Australia.*** Perinatal Society of Australia & New Zealand Annual Congress, Perth, Australia. April 2014.

Roberts CT, Kortekaas R, Dawson JA, Manley BJ, Owen LS, Davis PG. ***The effects of non-invasive respiratory support on oropharyngeal temperature and humidity: a manikin study.*** Perinatal Society of Australia & New Zealand Annual Congress (Poster Symposium), Perth, Australia. April 2014.

Roberts CT, Manley BJ, Dawson JA, Davis PG. ***Nursing perceptions of high-flow nasal cannulae and nasal CPAP treatment for preterm infants.*** Perinatal Society of Australia & New Zealand Annual Congress (Poster Symposium), Perth, Australia. April 2014.

Roberts CT, Jacobs SE, Stewart MJ. ***Initiation of Therapeutic Hypothermia by Referring Hospitals During Neonatal Transport – Experience in Victoria, Australia.*** Pediatric Academic Societies Annual Meeting, Vancouver, Canada. May 2014.

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Rosemarie A Boland, Mary-Ann Davey, Jennifer A Dawson, Peter G Davis & Lex W Doyle. ***Infant mortality associated with birth <32 weeks gestation in non-tertiary hospitals.*** Pediatric Academic Societies Annual Meeting, Vancouver, Canada. 2014.

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1.6 Innovations and Initiatives 2013-2014

State-wide, Hospital-based Transport Incubators

A collaborative involving the Department of Health, Ambulance Victoria, PIPER, Parker Healthcare and Health Services providing maternity care has resulted in 16 incubators being provided to hospitals around Victoria. Over the past 10 years incubators located at various ambulance bases around the State have been decommissioned as they were outdated and no longer serviceable. In recent years some smaller Health services such as Bairnsdale and Benalla purchased their own incubators and developed local processes with ambulance. This enabled low acuity babies requiring access to the regional Special Care Nursery (SCN) to be safely transported without a NETS team.

The State-wide incubator initiative will enable more efficient inter-hospital transfer of these babies as well as relatively well babies (e.g. the "well" term baby with bile stained vomiting) who require time critical transfer to a tertiary hospital. Return transfer from SCNs to the referring health service can also utilise these incubators.

To ensure these transfers are safe and appropriate the referrals will be triaged by a PIPER Consultant Neonatologist and involve referring and receiving clinicians, as well as ambulance staff agreeing on transfer plans via a PIPER facilitated conference call.

The transport incubators:

- Have an infant restraint harness that meets the standard for inter-hospital transfer.
- Have an inbuilt pulse oximeter to enable appropriate monitoring of a baby's oxygenation
- Have an inbuilt oxygen analyser to enable titration of supplemental oxygen if required
- Can be used for inter or intra hospital transfers

Supporting Nursing Research

NETS have supported many neonatal trainees with part time employment while they undertake research as part of higher degree studies. We were delighted to be able to support Rose Boland, NETS Education nurse, with a part time appointment while she pursued her PhD studies. Her thesis was accepted in early 2014 and the PhD was conferred at a graduation ceremony in August 2014.

Originally from Sydney, Rose joined NETS in September 1998 as a Neonatal Transport Nurse. In December 2000, she moved to NETS Education as a full time Nurse Educator providing outreach education for perinatal healthcare providers throughout Victoria. Rose was accepted into Melbourne University as a PhD candidate in the Faculty of Medicine, Dentistry and Health Sciences in 2010. The focus of her PhD research was to investigate risk factors for mortality and serious morbidity in extremely preterm infants born in non-tertiary hospitals in Victoria. Her research has shown that there has been an increase in outborn extremely low birthweight babies in Victoria. Rose plans to continue this research, with the aim of improving outcomes for these infants.

Rose's achievement demonstrates that an academic career path is a viable option for neonatal transport nurses in this service.

Left to Right: Professor Peter Davis, Dr Rosemarie Boland, Dr Jennifer Dawson and Professor Lex Doyle

Catherine Fox – Neonatal Nurse Practitioner – Retrieval

Catherine was appointed as an NNP with PIPER Neonatal in February 2014. She is the first NNP in Australia to be appointed exclusively to a retrieval post. From a clinical perspective she works an identical roster to the Medical retrieval senior registrars. A prerequisite for applicants was that the NNP had to have identical or superior neonatal clinical skills to our medical staff so there is no separate triage process that distinguishes retrievals that the NNP goes on compared to the medical staff.

This initiative provides another career path option for retrieval nurses who have undertaken nurse practitioner training. The clinical role improves continuity of retrieval staff with advanced skills. It assists with management of changeover periods of medical staff both from a rostering perspective and in assisting with orientation.

Catherine provides an important professional support resource for our retrieval nurses. She has an ongoing education role – both internally as well through outreach activities with NETS Education. Once the role is established rotations with the RCH Neonatal unit will be explored.

Catherine had previously undertaken more than 500 retrievals with NETS as a transport nurse before going to Townsville to undertake NNP training. She returned to Melbourne where she consolidated and further developed her skills in the demanding environment of the RCH neonatal unit.

So far Catherine has undertaken more than 80 retrievals. Her procedural competence is similar to medical retrieval clinicians. The feedback from supervising Consultant staff has been positive with a number assessing her performance as equal to or superior to that of medical clinicians. Her role has been well received by referring and receiving unit clinicians.

Catherine Fox – Neonatal Nurse Practitioner

Hong Kong Nurses

Following the successful training of six Hong Kong nurses in neonatal retrieval in early 2013, a further Hong Kong nurse will visit NETS in November 2014 for four weeks neonatal retrieval training and two further Hong Kong nurses will visit PETS in January 2015 for four weeks for paediatric retrieval training.

Included here is feedback from the last two Hong Kong nurses trained in 2013.

"Our dreams came true when we first walked into RCH. The place is like a wonderland to us with play areas for kids everywhere. The aquarium and the meerkat zoo are really eye catching and stunning. We always wanted to transport two babies back to the referring hospitals together in Hong Kong; it can really happen here, not just two but three!! We really appreciate the uniqueness, multi-role expertise, team work and communication among PIPER staff. These will be our most memorable experiences for days to come. Lastly, we must thank you all for your support and guidance.

With best wishes from Kwan & Wai Kuen (Joyce)"

Post-Graduate Student Visits to NETS

Each year, commencing in February through to December, one day per week, NETS is host to post-graduate nursing students undertaking the Neonatal Intensive Care Courses conducted at the four Melbourne Tertiary Hospitals as well as from Sunshine, Dandenong and Geelong Hospitals. The student is buddied with the retrieval team on roster to participate in a "day at NETS" and all that this entails. Some students are lucky enough to join a helicopter or fixed-wing transfer and most will participate in at least one road transfer for an emergency or return transport. Students also gain an understanding of the crucial role of staff in the clinical coordination centre as well as the logistics involved in each transport.

1.7 NETS Performance Indicators

Clinical Quality Indicators

The PIPER accountability framework stipulates 2 neonatal clinical quality indicators as part of its mandatory reporting. The results for these indicators are presented.

A. Proportion of high risk babies who meet the agreed temperature target.

Rationale: Hypo and hyperthermia are associated with increased mortality and morbidity in extremely low birthweight babies. Effective temperature management is one of cornerstones of high quality neonatal care.

Patient group: Babies transferred by NETS who are <7 days of age and <1500g birthweight.

Measure: Patients have a temperature at the end of the transport ≥ to 36^{o} and ≤37.5^{o}

Target: 100%

Reporting format: Annual; percentage and raw numbers

	2010	2011	2012	2013	Target
Total Number	56	38	67	76	
Missing data	2	1	4	10	0
Temperature ≥36	50/54	33/37	58/63	57 / 66	
	93%	**89%**	**92%**	**86%**	**100%**

Comment

The 2013 result of 86% was the lowest since 2008 (80%). There were also more of these high risk babies transferred during 2013 as well as a missing data rate of 13%. This result emphasizes the need for continuing vigilance in managing the thermal environment of the high risk newborn. Data from the first 7 months of 2014 has seen the result improve to 92% (44/48).

Benchmarking

Benchmarking performance against similar retrieval services is accepted as an important quality improvement tool. PIPER Neonatal is working with Australian retrieval services to collaboratively develop as suite of indicators for benchmarking purposes.

The table below shows some initial results on the temperature indicator for South Australia's retrieval service, MedSTAR and PIPER Neonatal.

	MedSTAR	PIPER Neonatal
2010	56% (14/29)	93% (50/54)
2011	75% (12/19)	89% (33/37)
2012	88% (15/18)	92% (58/63)
2013	73% (16/25)	86% (57/66)
2014 (31/7/14)	100% (11/11)	92% (44/48)

B. Proportion of babies who meet the agreed blood glucose management target

Rationale: Hypoglycaemia is common in the sick newborn and is associated with significant adverse outcomes if not effectively managed.

Patient group: All NETS retrievals where the initial blood glucose is ≤ 2.6

Measure: Percentage of these babies where a subsequent blood glucose is > the initial measurement

Target: 100%

Reporting format: Annual; percentage and raw numbers

	2010	2011	2012	2013	Target
Total Number:	1268	1161	1324	1285	
Glucose less than 2.6 at First Assessment:	74	43	62	78	
Subsequent Glucose not recorded (where initial <2.6)	11	7	12	15	0%
Subsequent Glucose increased:	53/63	34/36	41/50	52 / 63	
	84%	**94%**	**82%**	**83%**	**100%**

Comment

These data again reflect the relatively low incidence of hypoglycaemia at referral, a reflection of the high quality of care provided by the referring team.

PIPER Neonatal's performance in effectively managing hypoglycaemia in terms of this indicator remains steady at 83%. A new hypoglycaemia management guideline specifically relevant to the retrieval context was finalised in June 2014. This was developed as part of the hypoglycaemia quality improvement initiative.

Consumer satisfaction

Determining the level of parent satisfaction is critical to providing patient and family centred care consistent with the National Standard around consumer involvement. Historically the response rate for parent questionnaires, distributed at the time of the transfer, has been poor. In May 2014 we undertook a time-limited parent feedback survey targeting parents of babies who had been transferred to Butterfly Ward (NICU) at the Royal Children's Hospital.

A short questionnaire was distributed to parents by Manjri Raval, a final year medical student undertaking her elective with NETS.

Key outcomes:

- Response rate for completed surveys 89% (24/27).
- 67% of parents reported receiving the parent information booklet about NETS.
- 92% of parents reported the NETS team told them what was happening to their baby in a way they could understand.
- 88% of parents reported they were given the opportunity to ask questions about their baby.
- 38% travelled with their baby. Of the parents unable to travel with their baby only half understood why this was the case.

Conclusions

- The method of time limited and targeted consumer feedback resulted in a high response rate.
- Parents were very positive in their comments about the team.
- Areas identified for improvement include understanding the restrictions on parents travelling with their baby, and feedback to parents of their baby's condition on arrival at the receiving hospital.

Response Indicators

Emergency Transfers – Time Parameters

Mobilisation Median Time (mins)					
		2010/11	2011/12	2012/13	2013/14
Road	Time Critical	33	37	39	35
	Urgent	45	47	53	51
Fixed Wing	Time Critical	33	31	30	32
	Urgent	37	49	60	52
Rotary Wing	Time Critical	29	24	23	24
	Urgent	28	43	60	32
Average		**34**	**39**	**44**	**38**
Mobilisation Time: Time from decision to retrieve to departure on mission.					

- There has been a marginal improvement in overall mobilisation times from a median of 44 minutes in 2012/13 to 38 minutes in 2013/14. 39 minutes to mobilize for time critical retrievals by road is too long.
- The most common rate limiting factor is the time taken for the off site, oncall contracted driver to arrive.
- It is anticipated that a new model that includes onsite drivers for part or all of the time will be in place before the end of 2014.
- We continue to monitor time to arrive at Air Ambulance for retrievals undertaken by air in an effort to improve efficiency. Air ambulance and NETS have targeted this parameter as a priority as reserving an aircraft for >1hour can encroach on other AAV demand.

Response Median Time (mins)					
		2010/11	2011/12	2012/13	2013/14
Road	Time Critical	61	68	67	64
	Urgent	82	89	95	95
Fixed Wing	Time Critical	145	142	145	153
	Urgent	159	170	183	180
Rotary Wing	Time Critical	106	101	123	107
	Urgent	102	132	148	125
Average		**109**	**117**	**127**	**121**
Response Time: Time from decision to retrieve to arrival at referring hospital.					

- Response times are also slightly better than last year although this needs to be interpreted with an understanding of the distribution of referring hospital location for any given time period.

- It is reassuring that the increased response time noted in 12/13 for retrievals by helicopter has been reversed.

Stabilisation Median Time (mins)					
		2010/11	2011/12	2012/13	2013/14
Road	Time Critical	95	83	103	102
	Urgent	63	67	74	72
Fixed Wing	Time Critical	110	170	156	121
	Urgent	77	88	80	93
Rotary Wing	Time Critical	104	128	100	112
	Urgent	86	78	87	66
Average		**89**	**102**	**100**	**94**
Stabilisation Time: Time from first look to departure from referring hospital.					

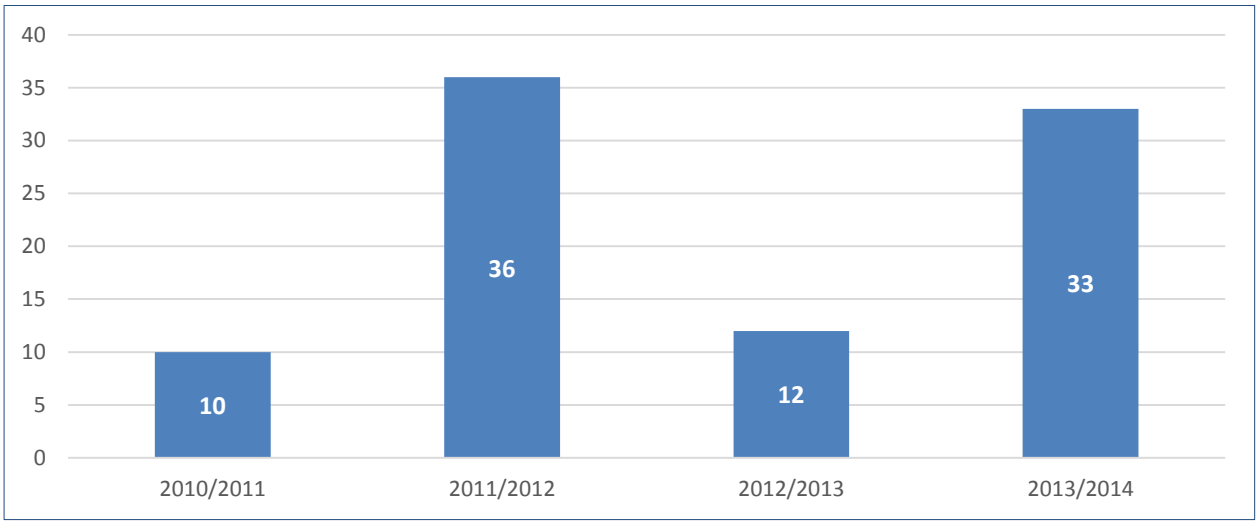
- Stabilisation time closely tracks patient acuity and the need for stabilisation procedures.
- There has been a 35% reduction in the stabilisation time for the sickest babies we move by fixed wing aircraft.

Total Mission Duration Median Time (min)					
		2010/11	2011/12	2012/13	2013/14
Road	Time Critical	251	261	281	265
	Urgent	245	260	272	281
Fixed Wing	Time Critical	432	494	480	416
	Urgent	422	440	460	471
Rotary Wing	Time Critical	339	380	365	361
	Urgent	311	388	352	322
Average		**333**	**371**	**368**	**353**
Mission Duration: Time from decision to retrieve to arrival at receiving hospital.					

System Performance Indicators

The indicators below are reported quarterly at the Perinatal Services Advisory Committee meeting (PSAC). PSAC reports directly to the Minister for Health on various aspects of the State's Perinatal System.

NETS Overflow Intertertiary Transfers



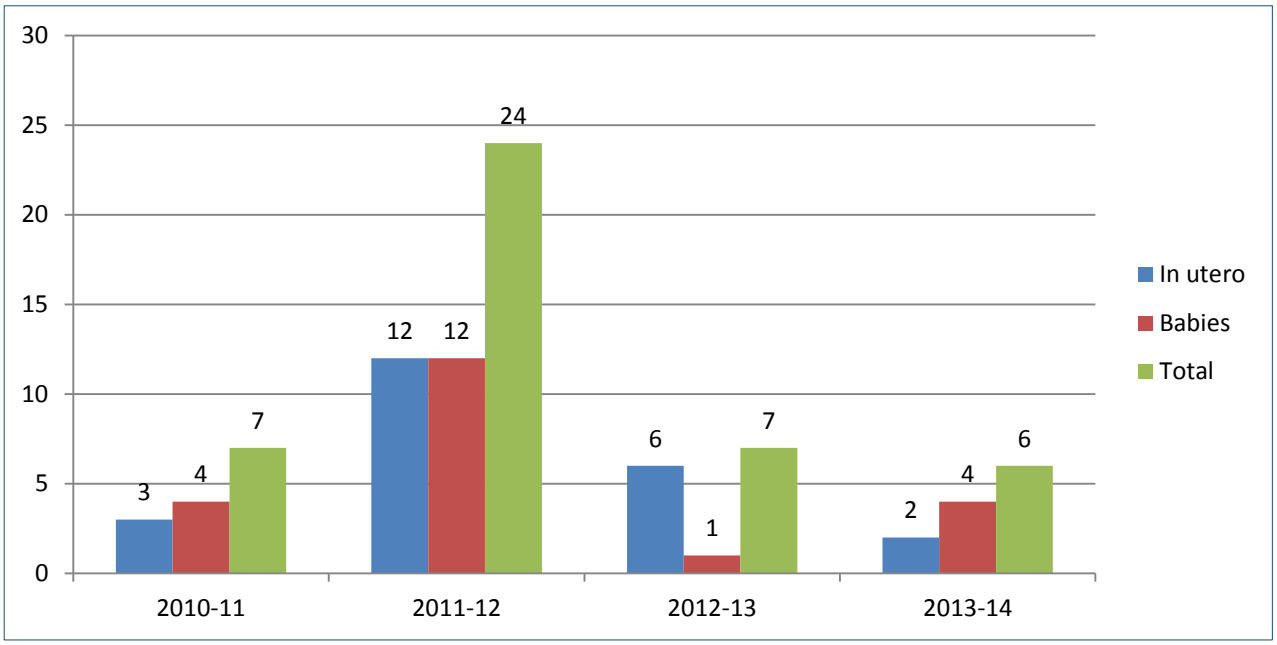
"Overflow" transfers are defined as the inter-hospital transfer of babies due to the referring hospital having inadequate resources to provide continuing care for the baby. It does not include transfers undertaken to access a level of care (e.g. surgery) that is not usually available at the referring hospital.

Overflow transfer numbers directly mirror system demand for neonatal intensive care.

Given the effect on continuity of care, effectiveness of care and patient centred care the target for overflow transfers is zero.

Overflow transfer data should be incorporated into system planning for perinatal services.

NETS/PERS Interstate Transfers



The transfer of a high acuity baby or high risk pregnant woman to an interstate perinatal hospital is undertaken to assist with demand management in extreme circumstances.

In general these transfers occur from "border" areas of the State.

Interstate transfers now require tertiary hospital CEO and DH executive authorisation.

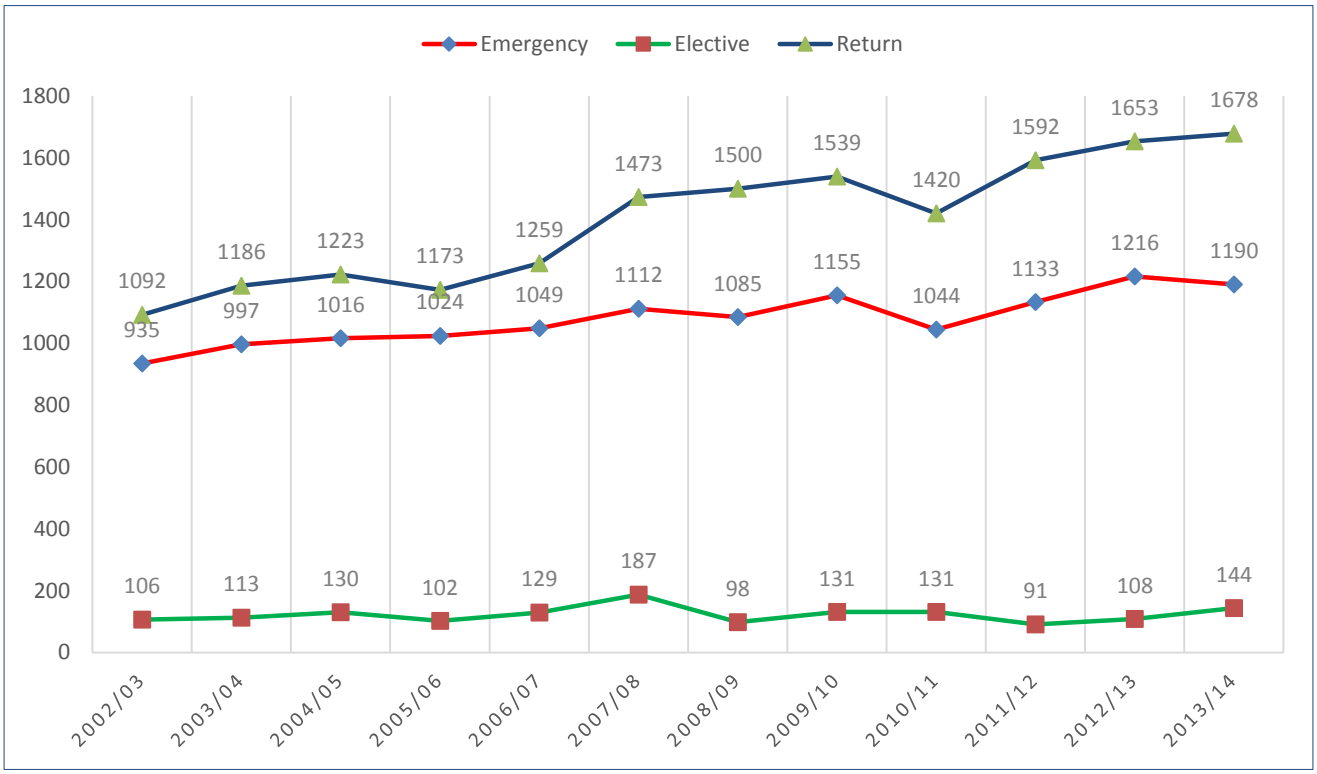
2. Clinical Activity

2.1 Clinical Activity

Comment regarding the Data Source:
Numeric data in the following sections are sourced from the NETS/PERS database. While there have been extensive efforts to clean and confirm the accuracy of the data there are issues with the current data management systems that produce some discrepancies. The data discrepancies are not of a magnitude that preclude their use for analysing trends in workload but those of you inclined to cross check data and compare totals will note there are some discrepancies. A new database is under development.

In 2013/14, NETS received 3397 referrals and transferred 3012 babies.

NETS Transfers from 2002/03 to 2013/14



Overview—Emergency, Elective and Return Transfers

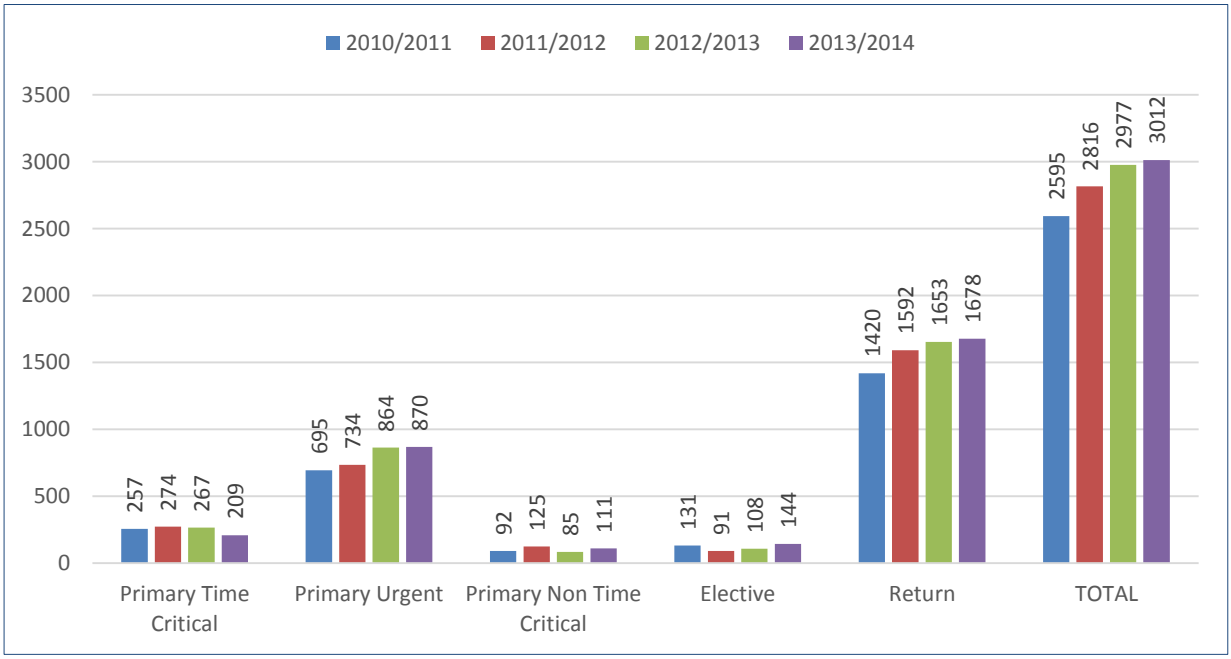
Emergency Transfers				
	2010/11	**2011/12**	**2012/13**	**2013/14**
Metropolitan				
Road	678	783	825	785
Fixed Wing	0	0	0	0
Rotary Wing	9	1	2	1
Country				
Road	147	169	189	221
Fixed Wing	143	127	155	146
Rotary Wing	57	44	45	35
Interstate				
Road	2	1	0	0
Fixed Wing	8	8	0	2
Rotary Wing	0	0	0	0
Sub Total	**1044**	**1133**	**1216**	**1190**

Elective Transfers				
	2010/11	**2011/12**	**2012/13**	**2013/14**
Metropolitan				
Road	113	82	93	128
Fixed Wing	0	0	0	1
Rotary Wing	0	0	0	0
Country				
Road	8	6	8	7
Fixed Wing	7	2	6	5
Rotary Wing	0	0	0	0
Interstate				
Road	2	1	1	2
Rotary Wing	1	0	0	1
Sub Total	**131**	**91**	**108**	**144**

Return Transfers				
	2010/11	**2011/12**	**2012/13**	**2013/14**
Road	1298	1477	1530	1565
Fixed Wing	122	115	123	113
Rotary Wing	0	0	0	0
Sub Total	**1420**	**1592**	**1653**	**1678**
Total	**2595**	**2816**	**2977**	**3012**

NETS Consultations				
	2010/2011	**2011/2012**	**2012/2013**	**2013/14**
Neonatal	266	313	331	385

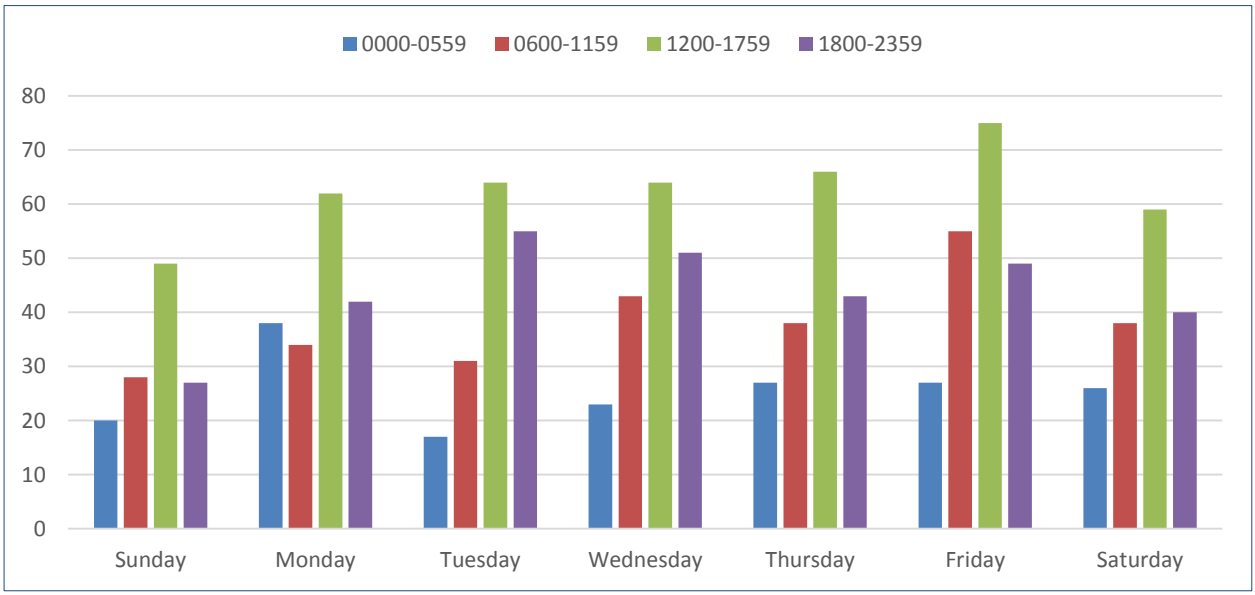
NETS Transfers by Level of Acuity



Interventions on Emergency Transfers

	2010/11	2011/12	2012/13	2013/14
Ventilation	293	308	385	385
Nasal CPAP	**282**	**314**	**367**	**373**
Prostaglandin	106	92	134	172
Surfactant	**64**	**99**	**99**	**114**

Emergency Transfers by Day and Time of referral in 2013/14



Emergency Transfers– Referring Hospital

Location	2010/11	2011/12	2012/13	2013/14
Metropolitan				
Alfred	0	0	2	0
Angliss	23	24	28	33
Austin	12	15	17	19
Berwick	14	15	21	13
Box Hill	29	34	37	35
Cabrini	15	17	19	24
Dandenong	44	43	40	43
Casey	26	38	38	32
Epworth	0	4	2	2
Frances Perry House	3	14	9	11
Frankston	34	52	65	42
Frankston Peninsula Private	4	5	3	5
Epworth Freemasons	36	32	31	18
Hawthorn	0	1	0	0
Jessie McPherson	0	1	0	0
Knox	9	11	8	3
Maroondah	3	4	5	9
Masada	7	0	0	0
Mercy Hospital for Women	39	60	63	56
Mitcham	16	18	21	22
Monash Medical Centre	32	23	20	29
North Park	10	10	11	5
Northern	24	35	48	39
Royal Children's Hospital	16	17	4	14
Royal Melbourne Hospital	3	0	0	1
Royal Women's Hospital	110	128	129	151
Sandringham	18	17	23	19
South Eastern	8	8	1	0
St Vincent's Private	25	29	29	13
Sunshine	78	94	95	99
Waverley	12	11	17	14
Werribee Mercy	36	24	41	35
Western General	1	0	0	0
Sub-Total	**687**	**784**	**827**	**786**

Emergency Transfers – Referring Hospital (cont'd)

Location	2010/11	2011/12	2012/13	2013/14
Country				
Ararat & District Hospital	2	0	3	4
Bacchus Marsh	7	12	19	17
Bairnsdale	2	10	6	8
Ballarat Health	29	42	31	38
Ballarat SJOG	4	6	9	9
Benalla	2	2	1	0
Bendigo Health	29	15	21	23
Bendigo SJOG	1	3	9	5
Birchip	0	0	1	0
Bright	1	0	0	0
Camperdown	3	1	0	2
Castlemaine	0	3	3	0
Cohuna	1	0	2	0
Colac	5	7	5	7
Donald	0	1	0	0
Echuca	12	4	16	9
Foster	3	2	2	2
Geelong Bellarine	25	34	39	48
Geelong SJOG	12	5	8	11
Hamilton	5	2	4	2
Horsham	8	7	6	9
Kerang	3	5	3	0
Kilmore	6	7	6	8
Kyabram	3	1	0	2
Kyneton	0	2	0	2
Leongatha	11	10	4	9
Mansfield	1	2	2	0
Maryborough	3	2	3	0
Mildura Base	4	6	7	17
Mornington	11	6	8	9
Nhill	0	0	0	2
Omeo	0	0	1	0
Orbost	0	1	1	1
Portland	3	2	1	1
Rosebud	1	0	1	1
Sale	9	12	12	6
Seymour	2	1	3	4
Shepparton Goulburn	21	30	29	20
St Arnaud	0	2	0	0

Emergency Transfers – Referring Hospital (cont'd)

Location	2010/11	2011/12	2012/13	2013/14
Country (cont'd)				
Stawell	1	0	0	2
Swan Hill	6	9	12	8
Terang	0	2	1	0
Traralgon	34	21	19	19
Wangaratta	10	9	9	17
Warragul	20	26	26	21
Warrnambool Base	10	7	10	9
Warrnambool SJOG	1	0	0	0
Wodonga	22	15	32	29
Wonthaggi	14	8	12	14
Yarrawonga	0	0	1	0
Sub-Total	**347**	**342**	**288**	**295**
Interstate				
Albury Base	7	4	5	5
Burnie	0	0	1	0
Canberra Hospital	0	0	0	1
Deniliquin	1	2	2	2
Finley	0	0	1	0
Hobart	0	1	1	0
Launceston Queen	0	0	1	0
Royal Darwin	0	0	0	1
Townsville	0	1	0	0
Wagga Base	1	1	0	0
Prima Medika (Bali)	1	0	0	0
Sub-Total	**10**	**9**	**11**	**9**
Total	**1044**	**1135**	**1226**	**1190**

Emergency Transfers – Receiving Hospital

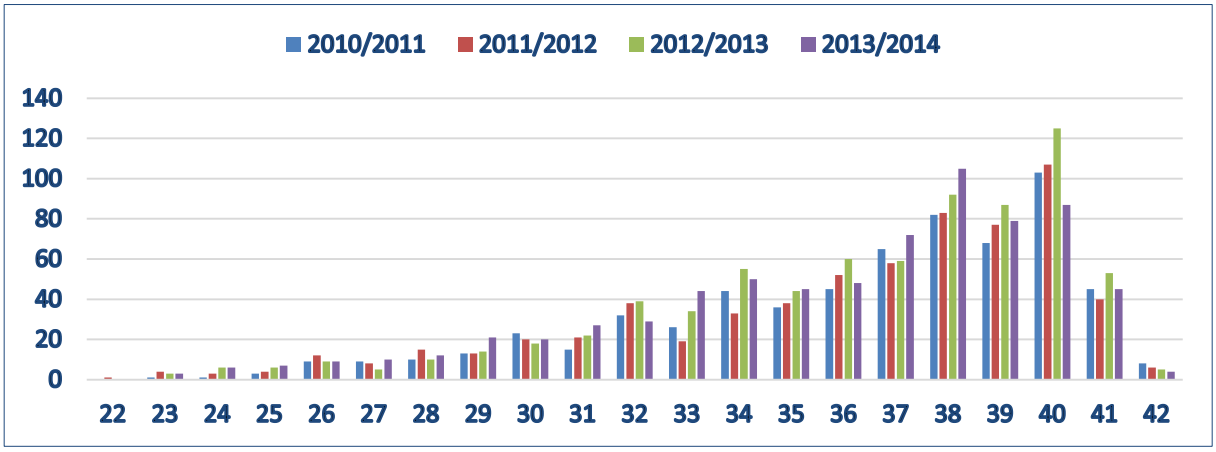
Hospital Level	2010/11	2011/12	2012/13	2013/14
Tertiary				
Adelaide Women & Children's	0	3	0	0
Canberra Hospital	2	1	1	1
Flinders Medical Centre	0	0	0	2
Monash Medical Centre				
MMC	58	62	95	56
MMC – Monash Newborn	72	61	95	92
MMC - Emerg	23	34	25	29
MMC - PICU	19	34	25	33
Mercy Hospital for Women	164	149	142	145
Royal Children's Hospital				
RCH - not specified	32	49	47	18
RCH – Butterfly	326	346	298	408
RCH – Emerg	26	22	17	19
RCH – Koala	22	16	18	26
RCH – Platypus	0	0	0	1
RCH – Possum	0	0	0	1
RCH – Rosella	72	81	100	110
RCH – Sugar Glider	0	0	0	1
Royal Women's Hospital	166	184	284	144
Sub-Total	**982**	**1042**	**1147**	**1086**
Non-Tertiary				
Angliss	0	0	0	2
Ballarat Health	1	2	5	5
Bendigo Health	4	9	9	5
Berwick	0	0	1	0
Box Hill	2	6	5	3
Casey	1	0	1	6
Dandenong	11	14	7	4
FPH	0	0	0	1
Frankston	4	2	4	3
Geelong Bellarine	3	5	4	5
Hamilton	0	0	1	0
Kilmore	0	1	0	0
North Park	0	1	0	0
Northern	4	4	5	12
RMH	3	0	0	1
Sale	0	0	1	1
Sandringham	0	2	1	0
Shepparton Goulburn	3	1	1	3

Emergency Transfers – Receiving Hospital (cont'd)

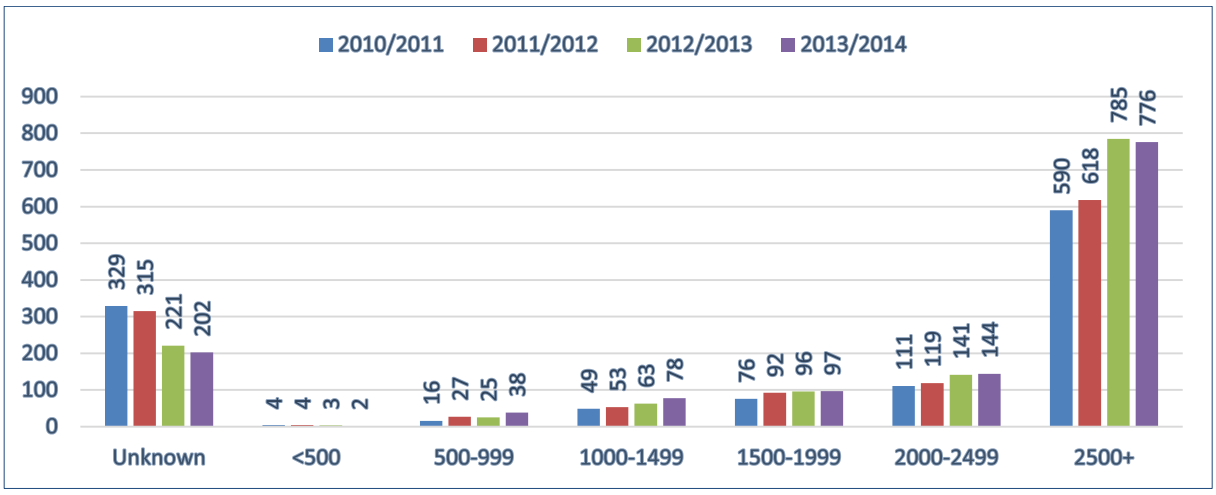
Hospital Level	2010/11	2011/12	2012/13	2013/14
Non-Tertiary (cont'd)				
Sunshine	6	14	7	12
Traralgon	0	0	3	1
Very Special Kids (Palliative Care)	1	0	0	0
Wangaratta	1	1	1	0
Warragul	0	2	0	1
Warrnambool Base	1	2	0	1
Waverley	0	0	2	0
Werribee Mercy	4	4	1	11
Wodonga	0	2	2	1
Sub-Total	**49**	**72**	**61**	**78**
TOTAL	**1031***	**1114***	**1208***	**1164***

*Receiving hospital totals are less than referring hospital totals as some babies are not transported after the retrieval team arrives.

Emergency Transfers – Gestational Age at Transfer



Emergency Transfers – Weight at Transfer



Elective Transfers – Referring Hospital

Location	2010/11	2011/12	2012/13	2013/14
Metropolitan				
Angliss	3	1	0	1
Austin	0	0	0	1
Box Hill	1	0	2	0
Cabrini	0	1	0	0
Casey	1	1	0	1
Dandenong	6	4	4	1
Epworth Freemasons	0	1	0	1
Frances Perry House	2	0	3	1
Frankston	2	2	2	0
Knox	1	0	0	1
Mercy Hospital for Women	15	9	27	22
Mitcham	0	0	1	0
Monash Medical Centre				
MMC - Other	8	14	12	14
Monash Newborn	2	3	5	6
North Park	0	0	0	2
Northern	3	12	9	16
Royal Children's Hospital				
RCH - Butterfly	8	3	1	10
RCH - Emerg	0	0	2	0
RCH – Koala	0	0	0	1
RCH - Rosella	1	1	1	1
RCH - Other	12	4	2	7
Royal Melbourne Hospital	5	1	0	1
Royal Women’s Hospital	22	16	17	30
Sandringham	2	3	2	1
South Eastern	0	1	0	0
St Vincent's Private	0	1	0	0
Sunshine	6	4	1	3
Waverley	1	0	0	0
Werribee Mercy	12	0	2	8
Sub-Total	**113**	**82**	**93**	**129**

Elective Transfers – Referring Hospital (cont'd)

Location	2010/2011	2011/2012	2012/2013	2013/2014
Country				
Ballarat Health	0	2	1	3
Bendigo Health	0	0	1	0
Geelong Bellarine	3	3	3	1
Horsham	0	0	0	2
Mildura Base	1	0	0	0
Mornington	0	0	0	1
Sale	2	0	1	0
Shepparton Goulburn	3	1	1	1
Traralgon	2	1	2	1
Warragul	0	0	1	1
Warrnambool Base	1	0	1	0
Wodonga	3	1	3	2
Sub-Total	**15**	**8**	**14**	**12**
Interstate				
Adelaide Women & Children's Hospital	2	0	0	0
Brisbane	0	0	0	2
Canberra Hospital	1	0	0	0
Darwin Private	0	1	0	0
Hobart	0	0	0	1
Launceston Queen	0	0	1	1
Non- Australian Hospital	0	0	0	1
Sub-Total	**3**	**1**	**1**	**5**
TOTAL	**131**	**91**	**108**	**146**

Elective Transfers – Receiving Hospital

Hospital Level	2010/11	2011/12	2012/13	2013/14
Tertiary				
Flinders Medical Centre	0	0	0	1
Mercy Hospital for Women	1	11	6	11
Monash Medical Centre				
MMC – Other	15	9	13	8
MMC – Monash Newborn	5	3	1	4
MMC – Emerg	0	0	1	0
Royal Children's Hospital				
RCH – Other	25	14	25	8
RCH – Rosella	2	5	3	3
RCH – Emerg	0	1	0	0
RCH – Butterfly	38	24	35	47
RCH – Koala	13	10	14	11
RCH – Sugar Glider	0	0	0	1
RCH – Platypus	0	0	0	2
Royal Women's Hospital	16	10	6	20
Sydney North Shore Public Hospital	0	0	0	1
Sub-Total	**115**	**87**	**104**	**117**
Non-Tertiary				
Alice Springs	0	0	0	1
Angliss	1	0	0	0
Austin	0	1	0	0
Ballarat Health	0	0	0	2
Box Hill	1	0	0	0
Dandenong	1	0	0	1
Epworth Freemasons	0	0	1	1
Geelong Bellarine	0	0	0	2
Northern	0	0	0	11
Royal Melbourne Hospital	6	1	0	1
Shepparton Goulburn	0	0	0	1
St Vincent's Private	0	0	0	1
Sunshine	1	0	2	5
Werribee Mercy	3	1	0	2
Very Special Kids (Palliative Care)	1	0	0	0
Sub-Total	**14**	**3**	**3**	**28**
TOTAL	**129**	**90**	**107**	**145**

Return Transfers — Referring Hospital

Hospital Level	2010/11	2011/12	2012/13	2013/14
Tertiary				
Adelaide Women & Children's	1	2	1	0
Brisbane	0	0	1	0
Canberra Hospital	1	0	1	0
Flinders Medical Centre	4	0	0	0
Hobart	0	0	0	1
Mercy Hospital for Women	273	299	252	331
Monash Medical Centre	501	456	476	500
Royal Women's Hospital	385	496	607	491
Royal Children's Hospital	183	238	228	255
Royal Hospital for Women	0	1	0	0
Sydney North Shore	1	0	0	0
Sub-Total	**1349**	**1492**	**1566**	**1578**
Non-Tertiary				
Adelaide Lyell	1	0	0	0
Alfred	0	0	5	0
Angliss	0	1	0	0
Ballarat Health	0	0	5	3
Ballarat SJOG	0	1	1	0
Bendigo Health	0	0	0	1
Bendigo SJOG formerly Mt Alvernia (Bendigo)	0	1	0	0
Box Hill	10	11	12	23
Cabrini	0	2	0	0
Casey	1	2	1	3
Dandenong	11	17	4	12
Frances Perry House	5	6	1	9
Frankston	2	3	2	3
Epworth Freemasons	3	2	1	1
Geelong Bellarine	5	11	5	8
Jessie McPherson	3	4	5	1
Knox	1	0	0	0
Mitcham	0	0	1	0
North Park	1	1	0	0
Northern	5	12	12	7
Sandringham	1	1	5	0
Shepparton Goulburn	2	0	3	3
St Vincent's Private	2	4	4	1
Sunshine	14	16	12	15
Traralgon	0	0	1	0
Warragul	2	1	0	1

Hospital Level	2010/11	2011/12	2012/13	2013/14
Non-Tertiary (cont'd)				
Waverley	0	0	2	0
Werribee Mercy	2	3	5	9
Wodonga	0	1	0	0
Sub-Total	**71**	**100**	**87**	**100**
TOTAL	**1420**	**1592**	**1653**	**1678**

Return Transfers – Receiving Hospital

Location	2010/11	2011/12	2012/13	2013/14
Metropolitan				
Alfred	0	0	4	0
Angliss	55	59	66	65
Austin	0	1	1	0
Berwick	9	10	9	14
Box Hill	47	70	51	63
Cabrini	20	26	15	24
Casey	80	99	80	106
Dandenong	213	212	179	176
Epworth	1	1	1	0
FPH	5	11	7	8
Frankston	84	93	100	89
Frankston Peninsula Private	8	0	1	1
Epworth Freemasons	25	33	29	25
Hawthorn	0	1	0	0
Jessie McPherson	0	1	3	0
Knox	7	6	4	5
Masada	6	0	0	0
Mitcham	26	27	30	30
Mercy Hospital for Women	13	19	23	31
Monash Medical Centre	20	10	18	22
MMC – Monash Newborn	1	0	2	2
North Park	27	23	21	31
Northern	73	106	116	125
Not known (Metropolitan)	1	0	0	0
Royal Children's Hospital	0	0	0	3
Royal Children's Hospital – Butterfly	0	0	0	1
Royal Children's Hospital - Koala	1	0	0	0
Royal Women's Hospital	18	18	15	18
Sandringham	46	55	80	62
South Eastern	7	7	0	0
St Vincent's Private	15	37	27	16
Sunshine	134	128	146	161
Waverley	20	15	20	17
Werribee Mercy	93	123	130	105
Sub-Total	**1054**	**1191**	**1176**	**1200**

Return Transfers – Receiving Hospital (cont'd)

Location	2010/11	2011/12	2012/13	2013/14
Country				
Ararat & District Hospital	0	0	1	0
Bacchus Marsh	0	6	5	0
Bairnsdale	1	0	0	0
Ballarat Health	34	42	65	67
Ballarat SJOG	12	9	18	12
Bellarine	0	0	1	0
Benalla	1	0	0	0
Bendigo Health	46	37	79	67
Bendigo SJOG	3	7	5	4
Camperdown	1	0	0	0
Castlemaine	0	1	2	0
Cohuna	0	0	1	0
Echuca	0	2	0	0
Geelong Bellarine	39	62	50	68
Geelong SJOG	10	8	12	23
Healesville	0	1	0	0
Horsham	1	3	1	4
Kerang	1	0	0	0
Kilmore	0	1	1	1
Leongatha	0	3	1	2
Maryborough	1	0	0	0
Mildura Base	8	8	9	21
Mornington	1	4	4	4
Not Known (Country)	0	1	0	0
Sale	19	34	24	21
Seymour	7	5	9	1
Shepparton Goulburn	39	36	27	40
Shepparton Private	0	0	1	0
Sunbury	0	0	0	1
Swan Hill	4	4	1	1
Terang	0	1	0	0
Traralgon	33	30	29	31
Wangaratta	15	20	31	24
Warragul	18	18	21	16
Warrnambool Base	20	10	21	18
Wodonga	41	36	43	40
Wonthaggi	6	1	1	0
Sub-Total	**361**	**390**	**463**	**468**

Return Transfers – Receiving Hospital (cont'd)

Location	2010/11	2011/12	2012/13	2013/14
Interstate				
Adelaide Women & Children's Hospital	0	1	0	0
Albury Base	1	3	5	2
Brisbane	0	0	1	1
Canberra Hospital	0	0	1	0
Deniliquin	0	0	1	2
Launceston QV Maternity Hospital	1	0	0	0
Launceston Queen	0	1	0	0
Mt Gambia	0	0	0	1
Newcastle - NSW	0	0	1	0
Sydney North Shore Private Hospital	0	1	0	0
Sydney North Shore Public Hospital	0	0	0	1
Wagga Base	0	0	1	0
Wagga Calvary	0	0	1	0
Sub-Total	**2**	**6**	**11**	**7**
TOTAL	**1417***	**1587***	**1650***	**1673***

Receiving hospital totals are less than referring due to a small number of babies where the transfer is not undertaken after the team has arrived or who deteriorate early in the transport and returned to the referring unit.

Emergency Transfers – Main Diagnoses

		2010/11	2011/12	2012/13	2013/14
1	Respiratory Distress	138	158	164	148
2	Bowel Obstruction	64	102	81	72
3	Prematurity	68	86	74	138
4	Bronchiolitis	44	53	66	71
5	Sepsis	38	42	58	51
6	Congenital Heart Disease	40	53	52	102
7	Hypoxic Ischaemic Encephalopathy	42	29	50	38
8	Meconium Aspiration Syndrome	16	15	32	25
9	Convulsions	21	33	32	20
10	Jaundice	18	11	25	14
11	Pneumothorax	12	9	22	23
12	Hypoglycaemia	17	25	21	38
13	Apnoea	10	15	19	24
14	Gastroschisis	10	12	16	12
15	Oesophageal atresia +/- fistula	11	15	15	9
16	Necrotising enterocolitis	7	15	15	14
17	Congenital Diaphragmatic Hernia	7	12	12	13
18	Upper airway Obstruction	12	14	9	7
19	Exomphalos	3	5	5	7

The new Sophie transport ventilator has synchronised modes of ventilation, allows volume targeting and has a robust oscillator capability.

know your transport

— CLASSIFICATION —

✸ Primary Time Critical: depart within **15** minutes — **PRIORITY 1**

for:

- Ongoing resuscitation
  - collapse or shock
  - severe asphyxia
  - cyanosis or bradycardia
- Extreme prematurely
  - < 32 weeks in level 1 hospital
  - ≤ 28 weeks in level 2 hospital
- Ventilated in
  - any nursery without mechanical ventilator
  - level 1 hospital
  - low dependency level 2 hospital
  - greater than 60% oxygen
- Infant in hospital without staff or equipment to deal with clinical situation
- bile stained vomiting – rule out malrotation

➢ *Consider helicopters*

➢ *Consider rapid response vehicle*

✸ Primary Urgent: depart within **25** minutes — **PRIORITY 2**

for:

- all other transports except those classified under non-time critical below

✸ Primary Non-Time Critical: depart within **60** minutes — **PRIORITY 3**

for:

- Overflow transfers (some)
- Other acute transfers from level 3 hospitals (some)
- Other non-elective transfers (e.g. special investigations, MRI)
- All 'returns' on respiratory support (booked)

✸ Elective & Return: booked time — **PRIORITY 4**

for:

- Non-ventilated, booked, transports (e.g. CT/MRI, special investigations)
- Back transfer of infants who are **NOT** on respiratory support

✸ Consultation – neonatal:

for:

- Contact with NETS in which the infant is **NOT** transported within 24 hours of initial call

✸ Consultation – perinatal:

for:

- In-utero bed finding
- Perinatal advice
- Does **NOT** result in mobilisation of transport team

List of Acronyms

AV	Ambulance Victoria
AAV	Air Ambulance Victoria
ARV	Adult Retrieval Victoria
DH	Department of Health
ICU	Intensive Care Unit
MMC	Monash Medical Centre, Melbourne
NETS	Newborn Emergency Transport Service, Victoria
NSW	New South Wales
PERS	Perinatal Emergency Referral Service
PETS	The Victorian Paediatric Emergency Transport Service
PICU	Paediatric Intensive Care Unit
RCH	The Royal Children's Hospital, Melbourne
TAS	Tasmania
VIC	Victoria
WA	Western Australia

PERS
Annual Report 2013-2014

PIPER Perinatal

Table of Contents

Perinatal Emergency Referral Service (PERS)

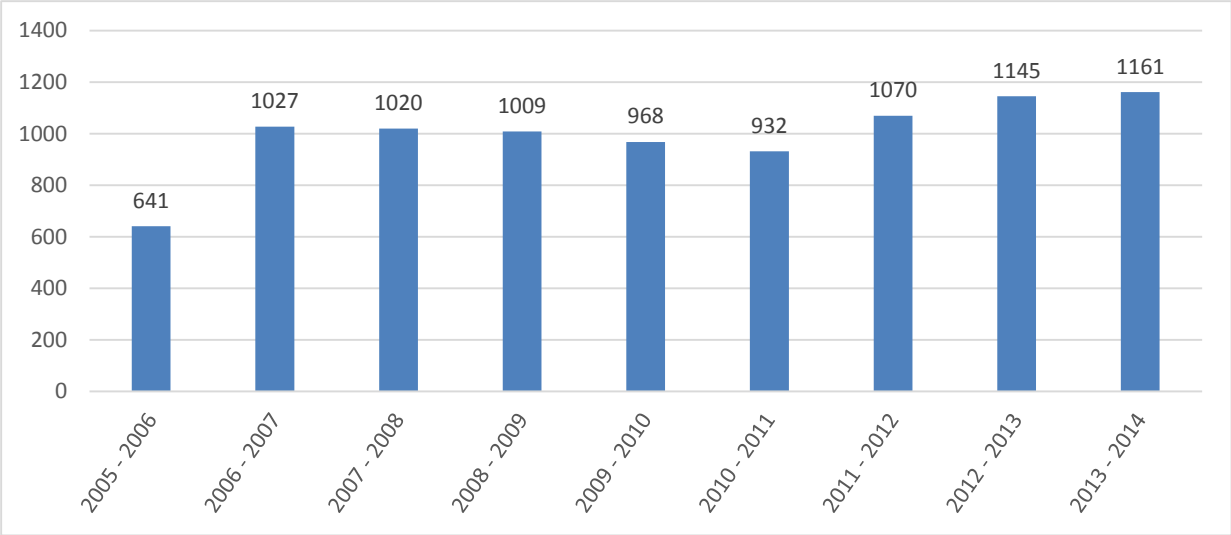
Perinatal Emergency Referral Service (PERS)

PERS Medical Director's Report

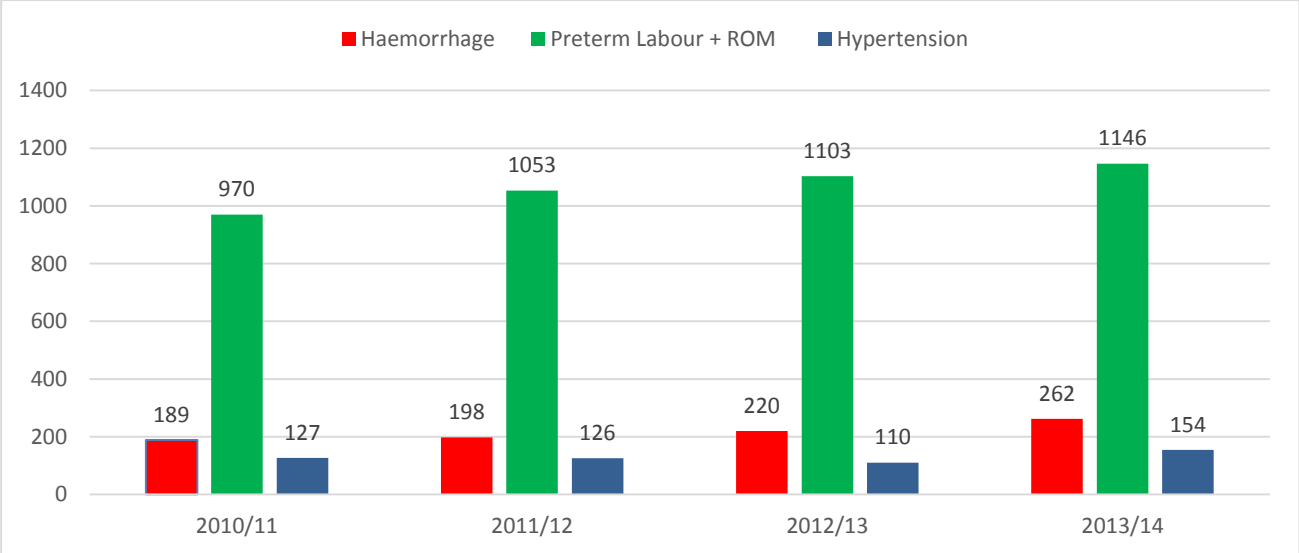
The past year has continued to show a steady increase in workload, paralleling the increase in birth rate across the state. The principal indication for contacting the Perinatal Emergency Referral Service remains threatened preterm labour, as would be expected when it is remembered that in most cases it is the lack of sophisticated on-site neonatal facilities rather than obstetric expertise that determines the need to transfer women between maternity services to access optimal care.

Clinical Activity – PERS

Total PERS Referrals from 1 July 2005 to 30 June 2014

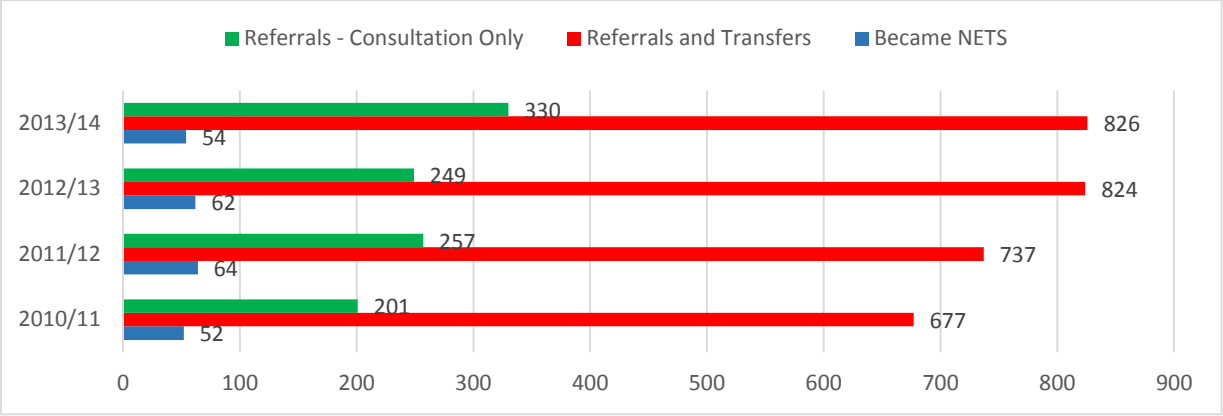


PERS Consultations by Clinical Details – 01/07/2010 to 30/06/2014



*Some patients have more than 1 diagnosis

Breakdown of Total PERS Referrals from 2010/11 to 2013/14



While the numbers of *in utero* transfers has remained the same, and the number of outborn babies requiring NETS retrieval reduced slightly, the growth in referrals has been entirely accommodated by an increased number of patients being advised to remain at their referring hospital. In part, this has been facilitated by the development of improved facilities at a number of the larger metropolitan and rural base hospital nurseries, and on-site availability of materno-fetal medicine consultants at several of these sites. An increasing number of referrals result in transfers into the larger metropolitan level 2 services, as they are able to accommodate cases of increasing complexity and earlier gestation. However, 'bed finding' is still becoming increasingly problematic as the tertiary maternity services commonly now run at full occupancy for extended periods. With the assistance of the Department of Health, more robust escalation procedures have been put in place to ensure women needing urgent but non-'time critical' transfer can be accommodated without undue delay.

Origin Of PERS Referrals

	2010/11	*2011/12*	*2012/13*	*2013/14*
Level 3 to Level 3	2	10	4	1
Interstate Requests	**4**	**4**	**5**	**2**
Metro Level 2	408	454	428	480
Rural Level 2	**278**	**320**	**363**	**354**
Metro Level 3	6	21	6	10
Ref Hospitals Lower than level 2	**227**	**244**	**300**	**282**
Unclassified	5	5	29	89
Total	**930**	**1058**	**1135**	**1210**

Destination of PERS Transfers

	2010/11	*2011/12*	*2012/13*	*2013/14*
Interstate	3	15	7	5
Level 3	**573**	**613**	**682**	**621**
Metro Level 2	68	98	96	122
Rural Level 2	**51**	**69**	**86**	**89**
Hospitals Lower than level 2	6	2	11	11

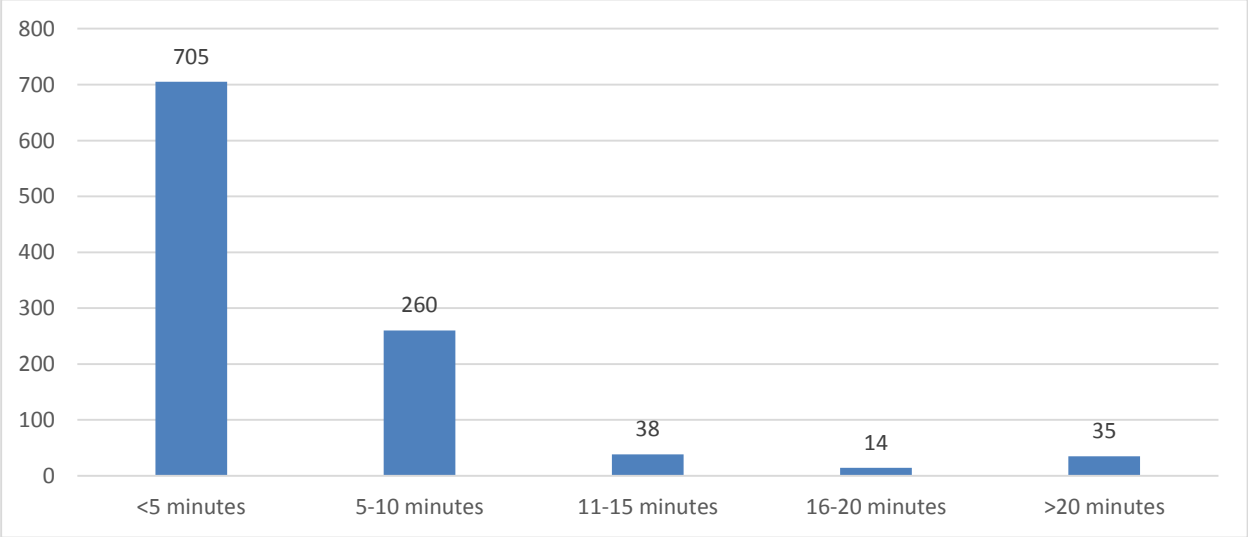
To support continuity of care as well as to minimize travel for the women and their families, where possible women are placed in the nearest maternity service able to provide the level of care that they need. Unfortunately because of the high maternity and neonatal occupancy levels, this is often not achieved, and some women end up having consecutive admissions to two or even three tertiary maternity units before they eventually birth. Information regarding transfers within and across regions is now provided regularly to the Department of Health and to the three tertiary hospitals, and we look forward to working with them to develop strategies to enhance continuity of care and carer.

PERS Transfers by Regions between 01-Jul-2013 and 30-Jun-2014

Referring Hospitals \ Receiving Hospitals	Barwon	Grampians	Loddon Mallee	NorthWest Metro	RWH	Hume	Eastern Metro	MHW	Gippsland	Southern Metro	MMC	Other / Interstate
Barwon	6			6	32			32		1	9	
Grampians	2	11	4	11	24		1	16			7	
Loddon Mallee		19	16	16	24	8	1	20		2	7	4
NorthWest Metro	1			10	66			64		2	17	
RWH				1				1				
Hume			1	12	19	9	7	25			11	
Eastern Metro				1	16		4	32		2	21	
MHW												
Gippsland				2	12		3	14	9	14	31	
Southern Metro				5	28		1	15		16	54	
MMC												
Other / Interstate			2			1		1				
Unknown		1										

We have consistently been able to provide telephone access to our on-call consultant obstetrician within 10 minutes in >90% of calls, but we are now aiming to achieve this within 5 minutes, and have developed a more extensive 'second on-call' consultant roster over the past year, recognizing that the duty consultant may be unable to respond intermittently during the day when engaged in clinical procedures.

Time from commencement of call to consultant joining the call - 2013/14



We continue to provide regular follow-up data to both referring and receiving hospitals, and in many units this is incorporated into their regular perinatal audit processes. We have also assisted in a number of hospital reviews of adverse clinical events and contributed to their quality improvement activities.

Dr Jacqui Smith
Medical Director
PERS

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