



2nd

EDITION

TRANSPORT OF HIGH RISK NEONATES

WHEN SKILLS, EQUIPMENT AND
PROFESSIONALISM MAKE THE DIFFERENCE



COPENHAGEN



ABSTRACTBOOK

SEPTEMBER

1st - 2nd - 3rd 2016

President of the meeting:
Morten Breindahl, *Copenhagen*
*President of the European Society
for Neonatology*

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ABSTRACT BOOK

ID 003 - EQUIPMENT / PACKING THE BAGS

PDE3-INHIBITION AS FIRST-LINE THERAPY FOR SEVERE PERSISTENT PULMONARY HYPERTENSION OF THE NEWBORN DURING NEONATAL TRANSPORT: A CASE REPORT

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BACKGROUND:

PPHN unexpectedly occurring in a neonatal transport setting is relatively rare. iNO is not routinely installed on our transport incubator, only when PPHN is strongly suspected.

CASE:

We describe a case of a newborn unexpectedly presenting himself with severe PPHN on arrival of the neonatal transport team. In this regional hospital setting iNO, sildenafil and milrinone were not available, but enoximone (like milrinone a PDE3-inhibitor) was available from the adult ICU. Treatment with enoximone rapidly improved oxygen saturation and hemodynamic parameters. Neurodevelopmental outcome at 12 months is favourable.

CONCLUSIONS:

Ideally iNO is always available during transport of high risk neonates. Treatment of severe PPHN with a PDE3-inhibitor as first-line agent can be considered when iNO is not available.

ID 045 - EQUIPMENT / MONITORING

THE RELIABILITY OF END-TIDAL CARBON DIOXIDE MEASUREMENT IN THE TRANSPORT SETTING

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BACKGROUND:

Keeping arterial carbon dioxide (PaCO₂) values within range during transport is one of the key aims of Neonatal Transfer Services (NTS), and, in the UK, it is a nationally benchmarked data point. We previously examined the relationship between the readings of the Nellcor Oximax N-85 Handheld Capnograph and PaCO₂ values in preterm babies. They were found to be of poor correlation and there was no scope for us to alter ventilation based on end-tidal CO₂ (EtCO₂) values.

AIMS:

To assess whether EtCO₂ measured by Phillips Intellivue MP5 correlates to PaCO₂ levels; to establish if there is a correlation between the trend of change in PaCO₂ vs EtCO₂ in individual patients.

DESIGN:

Retrospective study of 36-42/40 infants, with no primary pulmonary pathology, who were mechanically ventilated and transferred by NTS London over 3 months; and who had two parallel PaCO₂/EtCO₂ levels recorded. We analysed term babies on this occasion as they had the highest rate of overventilation during transport in our most recent audit.

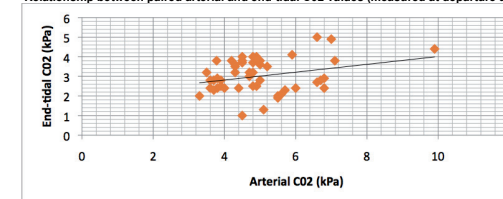
RESULTS:

25 infants fulfilled these criteria. EtCO₂ levels did not significantly correlate with PaCO₂ values (graph 1). However, the trend of change was reliable over time within individual patients (graph 2), i.e. if their PaCO₂ increased, so did their EtCO₂.

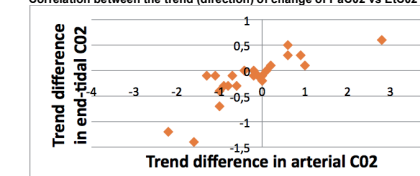
CONCLUSIONS:

The findings of this study suggest that it may be appropriate to trial guiding of in-transit adjustment of ventilation using capnography in selected patients. We aim to further evaluate this using a larger sample for this patient group, as well as analyse other patient groups.

Relationship between paired arterial and end-tidal CO₂ values (measured at departure and arrival for each baby)



Correlation between the trend (direction) of change of PaCO₂ vs EtCO₂ in individual patients



(trend difference was calculated by subtracting the arrival PaCO₂/EtCO₂ result from the departure PaCO₂/EtCO₂ result)

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ID 040 - EQUIPMENT / TELEMEDICINE

BEDSIDE TELEMEDICINE ROP SCREENING BASED ON A NEONATAL TRANSPORT SYSTEM: INCREASED COVERAGE, EFFICIENCY AND SAFETY WITH FEWER EXPENSES

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BACKGROUND AND AIMS:

The consequences of ROP may impair visual ability and deteriorate quality of life. Recognizing ROP in time is essential to ensure the best possible outcome. Peter Cerny Ambulance Service (PCA) which covers the central third of Hungary and transports 3,000 neonates annually aimed to organize bedside ROP screening in order to increase the screening coverage of and decrease the transport burden for premature infants.

METHODS:

Using PCA's facilities and 25 years of experience, a telemedicine system – "Premature Eye Rescue Program" (PERP) – has been operating since 2009 where bedside screening is performed by qualified transport-nurses using wide-angle retinal cameras to take images that are interpreted remotely by an ophthalmologist via the Internet.

RESULTS:

In the first 7 years of PERP, 4,777 bedside examinations were performed in 25 level II-III NICUs. Bedside screening made it possible to examine infants whose general condition interfered with transporting (increased coverage) and was carried out by nurses trained and qualified both in retinal imaging and supporting premature infants' life functions to ensure high image quality and high-level patient monitoring (increased safety). Remote interpretations decreased the workload of the ophthalmologist network (increased human resource efficiency) as well as baby transport requirements (increased financial saving). In the population screened in PERP and followed-up longitudinally, no blindness was diagnosed in the last 5 years (increased efficiency).

CONCLUSIONS:

It was concluded that bedside ROP screening with remote interpretation based on neonatal transport facilities is an efficient, safe and cost-saving method to improve early diagnosing and outcome of ROP.

ID 034 - EQUIPMENT / VEHICLE DEVELOPMENT

DEVELOPMENT OF A NEW PFCC BABYLANCE CONCEPT VEHICLE

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BACKGROUND AND AIMS:

The Neonatal and Paediatric Emergency Transport Service (NEO-PETS) in Copenhagen conducts 130 - 150 urgent up-scale transfers annually to highly specialized care at Rigshospitalet in Copenhagen. Ground transports from the regional hospitals in the eastern part of Denmark constitute the majority. We wanted to establish transportation with maximum emphasis on patient and staff safety and integrate patient-and-family-centered care (PFCC) even during transports. With financial support from the Capital Region we developed a completely new concept vehicle for emergency transports of critically ill newborn babies and infants up to the age of 2 years.

METHODS:

A task force was set up with representatives from NEO-PETS at the Department of Neonatology, and the Emergency Medical Services Copenhagen. The goal was to build an innovative, specialized vehicle with significantly improved safety, driving, working and relaxation conditions for the patient, the family and the transport team. The group members were inspired by their clinical, scientific, technical and leadership backgrounds, current national and international standardization work and regulations, and maintained a constructive dialogue with the chosen manufacturer (Profile, Finland).

RESULTS:

Within 1.5 years we succeeded in conceptualizing, creating, building and implementing a completely new PFCC "Babylance" concept that has been well accepted by parents, transport team personnel, as well as the media.

CONCLUSIONS:

The "Babylance" project is an example of innovation within a health care system, and the strength of combining different professions in order to increase safety and include patient-and-family-centered care.





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ID 038 - EQUIPMENT / VENTILATORS

EXPERIENCE OF HIGH FLOW NASAL CANNULA (HFNC) USING VAPOTHERM DEVICE DURING NEONATAL TRANSPORT

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BACKGROUND AND AIMS:

HFNC is now increasingly being used as a noninvasive mode of respiratory support in most neonatal units. Conventionally, Continuous positive airway pressure (CPAP) has been the preferred mode of respiratory support during transfer of those babies. There are reports of successful use of HFNC during transport using Optiflow Fisher Pykel system. Recently we have used an alternative device- Vapotherm Precision Flow USA and would like to share our experience. This has not been reported earlier to our knowledge.

METHODS:

This is a retrospective study of all babies transferred on Vapotherm during the study period from 01June 2015 to 31May 2016 by Kent NTS (Transport rig- Fig 1). Demographic details, reasons for transfer were recorded according to BAPM dataset. Any change in respiratory support and adverse events were monitored. Data were collected from Transport notes, Badgernet summaries. Respiratory status of babies at receiving unit 24 hours after completion of the transfer was collected.

RESULTS:

Total 36 babies were transferred during the study period. Median gestation and body weight at transfer were 32+2 (25+3 to 39) weeks and 1456 (845-3710) grams respectively. BAPM dataset were shown in Table 1.

Journey distance ranged between 17 to 75 miles with an average of 29 miles per transfer. There was no significant difference in Vapotherm flow at referral unit, during transport and at receiving unit (Mean flow were 5.09, 5.23, 5.23 L/min), similarly Mean FiO2 were 26, 27.6 and 28.3% respectively.

Two babies were changed to CPAP mode following UPS battery failure- no harm done to babies. All babies maintained their temperature well. Blood gases were checked on 3 babies with normal results. Within 24 hours of transfer, 2 babies were changed to CPAP for having multiple desaturations at receiving unit.

CONCLUSIONS:

Vapotherm provided an effective seamless HFNC support for babies during transport and was well tolerated. Two adverse events were related to battery failure.

Table 1. BAPM Dataset of all Vapotherm transferred babies:

BAPM Dataset (n=36)				
Clinical reasons		Operational reasons		Level of care
Medical	26	Repatriation	22	High Dependency
Surgical	6	Uplift	8	NICU
Cardiac	3	Resource/Capacity	5	
Neurological	1	Out-patient	1	
				34
				2



ID 031 - HUMAN RELATIONS & LOGISTICS / COOPERATION & COMMUNICATION

ASSESSMENT OF REFERRAL CALLS TO AN AUSTRALIAN NEONATAL EMERGENCY TRANSPORT SERVICE

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BACKGROUND:

Neonatal medical retrieval is a high risk process that starts with a telephone referral. The quality of initial neonatal retrieval handover and triage has not previously been evaluated. We aim to evaluate the existing referral process in order to develop educational objectives to inform a quality improvement initiative.

METHODS:

Prospective review of referral calls to PIPER Neonatal in Victoria, assessing both referrers' and PIPER consultants' performance. An ISoBAR (Identify, Situation, Observations, Background, Assessment, Request) structure adapted for neonatal referral was used to assess referrers. A 5-point Likert scale measuring 6 departmentally agreed clinical and professional behaviours was used to assess PIPER consultants' performance when receiving referral calls. Two PIPER Fellows independently assessed and scored each call. An electronic survey collected stakeholder views of the referral process.

RESULTS:

63 referral calls were analysed. PIPER Consultants performed at a satisfactory level or above on at least 86% of occasions for all 6 behaviours. Referrers provided essential Identity and Situation details on at least 80% of occasions. The Observations details provided were rated Unsatisfactory on 59% of occasions. A chi2 calculation demonstrated a statistically significant correlation between essential Identity and Situation details being provided in the first minute and subjective rating scores ($p < 0.00001$ -0.011).

CONCLUSIONS:

This study presents for the first time a quantifiable measure of performance of referrers and PIPER consultants against best practice criteria and an insight into users' perspectives of the referral process. Future educational initiatives could focus on providing essential details in the first minute of the referral.



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ID 025 - HUMAN RELATIONS & LOGISTICS / ETHICS, PALLIATIVE CARE, EOL

THE CHANGING FACE OF A NEONATAL TRANSPORT TEAM . SUPPORTING END OF LIFE CARE IN LOCAL UNITS

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BACKGROUND AND AIMS:

The Acute Neonatal Transfer Service (ANTS) provides 24-hour emergency transfers from the 17 hospitals across the East of England. The team undertakes around 650 emergency transfers each year and has increasingly been asked to provide support in decision-making regarding re-orientation to palliative care. Following discussion at a regional neonatal meeting, ANTS agreed to undertake a more detailed review to better understand the challenges faced and enable additional support to be tailored to training needs.

METHODS:

Retrospective review of all non-completed transfers between 1st Jan 2013 and 31st December 2015 with collection of clinical, demographic and logistical data.

RESULTS:

24 emergency transfers were aborted over the 3-year period. Underlying conditions included severe HIE (n=6), extreme prematurity <26wks (n=7) and hypoxic respiratory failure/PPHN (n=7). 3 infants died before the arrival of the ANTS team, 5 others died during active CPR attempts involving the team, 11 had intensive care withdrawn in the face of ongoing clinical deterioration and in 5 cases a decision was made to re-orientate care in view of fixed, dilated pupils.

CONCLUSIONS:

Joint decision-making regarding reorientation of care is a natural end-point of some of the highest risk referrals to ANTS. In a small but significant number of infants however, who had fixed dilated pupils, there was reluctance from the referring consultant to reorientate care without a 'second opinion' from the ANTS team. As neonatal intensive care services are centralised and smaller teams become less experienced, transport teams may be increasingly asked to provide support with these challenging cases.

ID 035 - HUMAN RELATIONS & LOGISTICS / ETHICS, PALLIATIVE CARE, EOL

PALLIATIVE CARE, THE EXPERIENCE OF THE ACUTE NEONATAL TRANSFER SERVICE FOR EAST OF ENGLAND (ANTS)

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BACKGROUND:

Palliative care transfers can play an important role in end of life care. We reviewed all the palliative care transfers undertaken by ANTS over the last 6 years. Identifying themes and sharing learning.

METHODS:

Retrospective review (2011 -2016) using the ANTS database and paper records.

RESULTS:

14 infants were transferred by ANTS for palliative care, aged between 1-77 days, with a gestational age of between 33 and 42 weeks. 4 infants were transferred home with the remainder to a hospice. Nearly half were transferred on the day of referral, with transfers to home being more complex in the planning. 50% of the children were ventilated during the transfer, including some of those transferred to home. A plan for extubation was discussed with all the parents, although in a small number of cases the choice was limited by the destination. In 5 out of the 7 ventilated transfers the transfer team took responsibility for extubation. There was a discussion documented with parents with respect to a deterioration in the ambulance in 13/14 transfers. In 13 cases infants were accompanied by a nurse who the family knew from the referring unit and in 11 out of 14 infants were accompanied by a parent.

CONCLUSIONS:

The transfer team can play a useful role in supporting end of life care. The plan of care should be individualized in line with the families wishes supported by guidance to ensure consistency of practice across different settings.



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ID 008 - HUMAN RELATIONS & LOGISTICS / NICU/PICU

INHALED NITRIC OXIDE IN NEONATAL RETRIEVALS – THE NSW NETS EXPERIENCE

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BACKGROUND:

Babies born with hypoxic respiratory failure (HRF) are often treated with iNO as a pulmonary vasodilator to facilitate adequate oxygenation.

METHODS:

A retrospective audit of newborns retrieved by NETS >35 weeks gestation with severe HRF: 2000-2014 inclusive. NETS database identified newborns with severe HRF at referral. The medical records were examined for clinical and operational data.

RESULTS:

130 neonatal retrievals identified. 82 (63%) were male, mean gestation 39 weeks (36-43), mean birthweight 3416g (1660-5160). Two babies died at the referring hospital. 57 newborns received iNO during retrieval. 32 transported via road and 25 via rotary wing aircraft. Of the remaining 71 babies 36 babies commenced iNO After admission to receiving Hospital (NOAH) and 35 were not (NONO group). 108 retrievals were from a SCN to a tertiary NICU/PICU. 20 retrievals occurred between tertiary units - 17 iNO, 1 NONO & 2 NOAH: 10 for ECMO, 5 with CHD, 2 for poor staffing/beds, 1 was surgical & 1 for multidisciplinary consult. The median OI of NONO group (9.9) was significantly lower than iNO or NOAH (adjusted $p < 0.001$). The median OI of NOAH (24.5) and iNO (32.5) ($p < 0.06$) ns. Travel time was 60minutes for NOAH, iNO - 90mins, NONO - 83mins (adjusted $p < 0.001$). Median OI on arrival at the destination was 25.8 iNO, 25.5 NOAH and 8.2 for NONO group ($p < 0.001$)

CONCLUSIONS:

iNO can enhance oxygenation in babies suffering HRF and needs to be available on retrievals in NSW. Future service improvement is working towards this aim.

ID 042 - HUMAN RELATIONS & LOGISTICS / NIDCAP & PARENTS ON BOARD

PARENTS ON BOARD: PATIENT-FAMILY-CENTERED CARE DURING EMERGENCY NEONATAL TRANSPORTS TO A LEVEL 4 HOSPITAL IN COPENHAGEN

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BACKGROUND:

Patient-Family-Centered Care (PFCC) highlights several benefits for families and professionals. A way to provide PFCC in neonatal transportation is to include parental presence during emergency transport. All transports performed by the Neonatal Transportation Team in Copenhagen is conducted with the "Babylance", an ambulance specially designed to have up to four family members accompany the child during emergency transport. The aim of the study was to investigate the parents experience of being present, or not being present during acute neonatal transport to Rigshospitalet, a level four hospital in Copenhagen.

METHODS:

16 parents of neonates transported with the Babylance completed a questionnaire consisting of quantitative questions, with a possibility to write comments. The questions included the parents experience of the transport regarding safety, level of information and accessibility to the staff during the transportation process. The last question was if they would recommend an other future parent to accompany their child during emergency transport.

RESULTS:

Of the 16 parents who answered the questionnaire 12 (75%) had participated during the transport. All of those 12 (100%) would recommend a future parent to accompany their child during emergency transport. From the 4 parents who did not participate 3 (75%), would recommend a future parent to accompany their child during emergency transport.

CONCLUSIONS:

A majority of the parents would like to accompany their child during emergency transport. An active approach from the transport organization in promoting PFCC during the acute transport process is of great value to the parents.



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ID 058 - PROFESSIONALISM / KEY PERFORMANCE INDICATORS

TEN YEARS PLUS OF NEONATAL TRANSPORT IN ROMANIA

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BACKGROUND:

Neonatal transport programs allow hospitals to extend critical care services into the community, so that newborns will benefit from early initiation of essential therapies that would ordinarily not be available until arrival at a tertiary center. Our region in Romania is characterized by the highest rate of prematurity and birth rate in the country. Although according to the National Transport Guidelines and regionalization legislation, three counties are assigned to our NICU, we provide service of neonatal transport to all the region.

AIMS:

The purpose of this study is to present a statistical evaluation of the entire neonatal transport activity of our center.

MATERIAL AND METHODS:

We collected data from the registries of transport, between 11.05.05 to 31.12.15. Over ten years, 1494 neonates were transported to our unit. None of them died during transfer or primary stabilization. The median response and retrieval times were 2 h.11 infants died during the first 24 hours after admission. The main conditions presented in studied lot were: respiratory diseases – 66.46%, congenital heart defects – 5.62%, neurological -14.19%, congenital infections- 1.47%, hemolytic disease – 2.14%, digestive malformations – 0.67%, IUGR- 1.47%. 20.28% were transported intubated. Transport complications were: 10% changes in arterial tension; 12% changes in heart activity; 23% hypoxemia, 21% accidental decanulation, 23% variations of body temperature.

CONCLUSIONS:

In all fields of neonatology, improvement and change is constant. Stabilization and transport of high risk neonate to a tertiary neonatal unit is essential for a good outcome.

ID 017 - PROFESSIONALISM / RISK ASSESSMENT

NEONATAL INFECTIOUS RISK ASSESSMENT IN PATIENTS REQUIRING THE NEWBORN EMERGENCY TRANSPORT SERVICE

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The Newborn Emergency Transport Service (NETS), provides expert clinical advice and coordination, emergency treatment and stabilization for very sick babies during inter-hospital transport. NETS is essential for newborns survival, but it could further expose them to infections. The aim of this study is to comprehensively define the infectious risk related to different steps of NETS and to establish the incidence of sepsis and mortality in newborns who benefited from NETS compared to born-in babies.

This prospective, longitudinal, multicenter case-control study enrolled 60 newborns aged 0-72 hours of life, hospitalized at NICU of Messina between April 2013 and February 2014. They were divided in 2 groups: Group A (infants undergoing NETS before admission) and Group B (infants admitted to the NICU without NETS).

The infectivological risk was evaluated in 40 newborns through CPR and blood cultures at T0 (admission), T1 (within one week of hospitalization) and T2 (within 15 days from admission); resulting in positive outcome only at T1 for one patient of each group. Patient in group A died of sepsis, conversely the patient in group B, affected by heart disease, resulted negative for above mentioned examinations at discharge. The MINT calculation showed a low risk of mortality with an average score of 3.6.

Our study indicates that NETS do not represent an additional risk for infections and mortality in newborns, since the procedure is performed by advanced trained neonatologists according to specific protocols in order to prevent infections in these patients.



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ID 032 - PROFESSIONALISM / RISK ASSESSMENT

NEONATAL TRANSPORT IN SOUTHERN BAVARIA. HIGH RISK! HIGH QUALITY?

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BACKGROUND AND AIMS:

Transport of high risk newborn infants with acute respiratory failure is characterized by a substantial risk and in-transport mortality. Therefore, close monitoring of transport quality is essential. The Transport Risk Index of Physiologic Stability Version II (TRIPS-II) has been suggested as a valuable tool for assessing infant illness severity at admission and quality of neonatal transport.

METHODS:

We evaluated 45 high risk neonatal transports retrospectively, including those requiring ECMO. Patients were transferred either air-bound (n=32, 71.1%) or ground-based (n=13, 28.9%) from peripheral hospitals to our NICU. All infants were accompanied by our specialized transport system. To evaluate transport quality, the TRIPS-II-Score was applied and subsequently compared to published data.

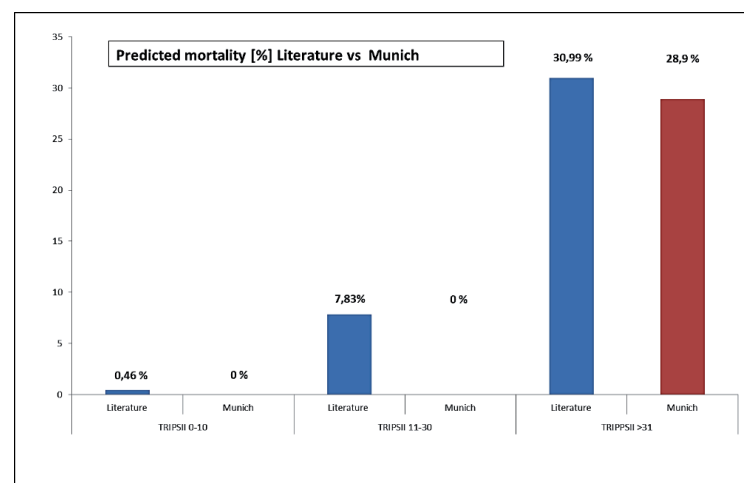
RESULTS:

Of 45 evaluated infants, 43 (95.6%) required invasive ventilation and 38 (84%) suffered from respiratory failure. Conventional ventilation was used in 31 patients (68.9%) and high frequency oscillation in 11 (26.7%). 23 Patients (51.1%) needed iNO during transport. The mean oxygenation index was 31.8 (SD \pm 22.7). Of 45 infants, 11 (24.4%) received ECMO after admission. During transport we observed two technical and two medical adverse events but no in-transport mortality.

The mean TRIPS-II Score at admission was 34.9 (SD \pm 8.5). The total mortality at hospital discharge in our cohort was 28.9% compared to a predicted TRIPS-II (TRIPS-II>31) mortality of 31%.

CONCLUSIONS:

Even in our high risk cohort the overall mortality correlated with the TRIPS-II score. High risk neonatal transport in southern Bavaria is not only high risk but also of high quality.



ID 036 - PROFESSIONALISM / RISK ASSESSMENT

TO TRANSFER OR NOT TO TRANSFER. CHARACTERISTICS OF AN ABORTED ELECTIVE TRANSFER

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BACKGROUND AND AIMS:

As part of the UK National Service Specifications(1), the Acute Neonatal Transfer Service (ANTS) is commissioned to deliver a variety of neonatal transfers, including approximately 600 'elective' transfers each year, usually from tertiary NICUs back to smaller units. Aborted elective transfers were reviewed to identify adverse events, any deviation from the guideline and possible risk factors for non-completion.

METHODS:

All aborted transfers between 1st January 2013 and 31st December 2015 were reviewed using the ANTS database and paper records to identify reasons for non-completion and whether these could have been predicted /avoided.

RESULTS:

44 out of the 1983 elective referrals were aborted (2.2%). Mean gestation at time of transfer was 33 weeks, mean weight was 1587g. 77% of aborted transfers were due to frequent and/or profound desaturations and bradycardia. 56% of infants had a history of desaturations and bradycardia in the previous 48hrs, 22% were in >30% FiO2 at the time of referral, 18% were receiving higher levels of respiratory support than recommended in the guideline. 30% of aborted transfers occurred overnight. 16% of all aborted transfers were due to communication issues.

CONCLUSIONS:

Overall numbers of aborted transfers were small and no baby came to serious harm as a consequence, but a significant proportion fell outside ANTS recommended guidance. Possible reasons for this include changes to team structure and increasing pressure on limited specialist NICU cots across the region. Further work is needed to improve communication; conference calling and clearly defined checklists may be beneficial.



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ID 021 - RESEARCH & DEVELOPMENT / BENCHMARKING

IDENTIFYING QUALITY INDICES FOR SERVO-CONTROLLED THERAPUTIC HYPOTHERMIA TO IMPROVE NATIONAL BENCHMARKING

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BACKGROUND AND AIMS:

The UK Neonatal Transport Group (NTG) dataset pre-dates the widespread implementation of servo-controlled therapeutic hypothermia during retrieval. Prior to this project the NTG dataset required temperature recording at following points: When the transfer team first assess the patient, when stabilisation is complete before transferring & on completion of transfer. Maximum benefit occurs in infants cooled less than 6 hours after birth, but transport data points do not directly address this. We aimed to investigate whether existing transport dataset data points offer adequate assessment of the efficacy of cooling transfers.

METHODS:

A detailed literature review was done looking at different data points that could influence the outcome of these infants. As an internal quality improvement project, we created a robust service registry of all infants needing cooling during transfer. Transport documentation of all 195 cooling infants moved between 2010-2015 by CenTre transport network was reviewed. In this data review we have used inference and non-NTG dataset measures to understand the relationship between transport practice and effective cooling outcomes.

CONCLUSIONS:

We noted that the current national neonatal NTG dataset did not address HIE specific data points. The data from the registry was presented at the National NTG meeting at Brighton in November 2015. Following this the NTG has included further data items to allow comparison for HIE infants of age of infant at referral, time of initiation of active cooling & age when target temperature is achieved.

ID 033 - RESEARCH & DEVELOPMENT / BENCHMARKING

FEASIBILITY OF TRIPS SCORE IN NICU/PICU TRANSPORT SETTING

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BACKGROUND AND AIMS:

The Transport Risk Index of Physiologic Stability (TRIPS) score has been validated by the Canadian Neonatal Network in a neonatal transport population. We speculated about the feasibility of TRIPS in an amalgamated NICU/PICU transport setting to predict 7-day and total NICU/PICU mortality risk.

METHODS:

From September 2014 - December 2015 we prospectively scored TRIPS before, during and after all neonatal and paediatric transports. We compared 7-day and total NICU/PICU mortality risk by Mann-Whitney U-test (non-parametric data) and chose a level of significance of < 0.05.

RESULTS:

A total of 145 patients were eligible, only 124 (85.5%) were included. Male/female ratio was (59/41) %. Distribution of patients showed 21% extremely premature, 13% premature, 6% late premature, 45% mature, and 15% PICU. Median [range] weight was 3407 [400-13,000] g. TRIPS score (median [range]) measured before, during and after transport was significantly related to 7-day mortality risk (14.4 [1.4-85.7] vs 1.7 [0.0-45.2] (before), $p < 0.0005$, 14.4 [2.1-85.7] vs 1.7 [1.0-69.0] (during), $p < 0.0005$, and 13.3 [1.4-74.9] vs 3.5 [0.0-50.1] (after), $p < 0.0005$. TRIPS score was also significantly related to total NICU/PICU mortality before, during and after transport: 15.7 [1.4-85.7] vs 1.7 [0.0-45.2] (before), $p < 0.0005$, 20.5 [2.1-85.7] vs 5.0 [0.0-45.2] (during), $p < 0.0005$, and 18.5 [1.4-74.9] vs 3.3 [0.0-50.1] (after), $p < 0.0005$.

CONCLUSIONS:

TRIPS score does predict 7-day and total NICU/PICU mortality in an amalgamated NICU/PICU transport setting and may be a useful benchmarking tool. The timing of the scoring during transport seems irrelevant.



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ID 015 - RESEARCH & DEVELOPMENT / DATABASES

THE EFFECT OF ANTENATAL STEROID COURSE ON INTRAVENTRICULAR HAEMORRHAGE IN PRETERM INFANTS TRANSPORTED IN EARLY LIFE

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BACKGROUND AND AIMS:

Antenatal steroids have been associated with a decreased incidence of intraventricular haemorrhage (IVH) in preterm infants. Several studies have attributed inter-hospital transport as a risk factor for developing IVH in preterm infants. We aimed to assess the association between early neonatal transport, administration of antenatal steroids and severity of IVH.

METHODS:

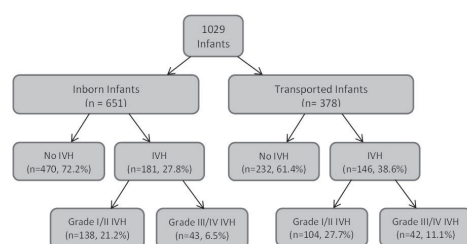
Retrospective data was collected on all preterm infants (< 32 weeks) to compare inborn infants with those either transported to or from Nottingham University Hospitals within the first 72 hours of life from 2007 to 2015. Multivariable analysis was performed including antenatal steroid course in the model and subsequent risk of IVH.

RESULTS:

1029 neonates were identified. Inborn infants (n=651) were significantly more likely to receive a full course of antenatal steroids (64.9% vs 48.2%, $p < 0.001$). Transported infants had a significantly greater risk of severe IVH (grade III/IV) despite a full course of antenatal steroids (OR 1.89, 95% CI 1.1-3.25, $p=0.02$) but not any grade of IVH (OR 1.24 95% CI 0.61- 2.55, $p=0.56$) compared to inborns. Overall, a full course of antenatal steroids decreased the risk of IVH (OR 0.72 95% CI 0.55-0.95, $p=0.019$ (see table).

CONCLUSIONS:

Transported infants had an increased incidence of severe IVH. This study has shown despite a full course of antenatal steroids providing an overall decrease IVH, as previously reported, this neuroprotective effect was not reduced in infants transferred in early life.



	Inborn (n=651)	Transported (n=378)	Odds Ratio (95% CI)
Gestation (weeks)	28.29 (26.29-29.71)	28.12 (26.14-29.71)	$p=0.45$
Sex	M=341 (52.4%)	M=217 (57.4%)	$P=0.12$
Antenatal steroids	No/incomplete (n=224, 35%)	No/incomplete (n=192, 51.7%)	$P < 0.001$
IVH	181 (27.8%)	146 (38.6%)	1.4 (0.79-2.47) $p=0.25$
Severe IVH	42 (6.5%)	42 (11.1)	1.94 (1.31-2.87) $p=0.001$
No/incomplete antenatal steroids & IVH	68 (30.3%)	71 (36.9%)	1.48 (0.95-2.32) $P=0.086$
Complete course steroids & IVH	108 (26%)	51 (28.4%)	1.24 (0.61-2.5) $p=0.558$
No/incomplete antenatal steroids & severe IVH	21 (9.3%)	28 (14.5%)	1.77 (1.07-2.93) $P=0.027$
Complete course steroids & severe IVH	18 (4.3%)	14 (7.8%)	1.89 (1.1-3.25) $p=0.021$

ID 023 - RESEARCH & DEVELOPMENT / DATABASES

SAFE AIRBORNE TRANSPORTS OF CRITICALLY ILL NEONATES – IS IT POSSIBLE?

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Uppsala Neonatal Intensive Care Transport Team, University Children's Hospital, Uppsala, Sweden

BACKGROUND:

The regionalization of neonatal care in Sweden necessitates transfer of ill neonates to a higher level care unit.

AIMS:

To evaluate the quality of acute airborne transports carried out by the Uppsala Neonatal Transport Team to the NICU at Uppsala University Hospital during 2012-2015. Methods: Background infant characteristics, transport indication, heart rate, SaO₂, FiO₂, blood pressure, body temperature, blood glucose, blood gas, Transport Risk Index of Physiologic Stability (TRIPS), and settings of respiratory support prior to and after transport were collected from transport and medical records.

RESULTS:

Of total 717 transports, 187 were acute (need of transport within 6h). The indication for acute transports were: hypothermia treatment (22%), prematurity (22%) and respiratory failure (16%). No deaths occurred during transport and none of the deaths (n=5) occurring within 24 hours were caused by transport itself. No differences were found in vital parameters or ventilator settings before and after transport, except for an improvement in blood pH (7.22 ± 0.02 vs 7.27 ± 0.01 ; $p=0.002$) as a result of decreased base deficit (BD; 7.99 ± 0.83 vs 5.41 ± 0.76 ; $p < 0.001$) but no change in blood pCO₂. No buffer was administered.

CONCLUSIONS:

Air transport of critically ill neonates can be conducted without negatively affecting vital parameters. Blood gas sampling before and after transport might be a useful measure for evaluating the impact of transport on clinical status. The high number of extremely preterm infants transported indicates a failure to organize in utero-transports.



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ID 029 - RESEARCH & DEVELOPMENT / DATABASES

EMERGENCY TRANSPORTATION OF CRITICALLY ILL NEWBORNS, DO THEY DIFFER FROM OLDER CHILDREN?

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BACKGROUND:

In a recent study (ref.) we showed that critically ill children admitted to a pediatric intensive care unit (PICU) after emergency transfer by a specialized pediatric transport team were younger, sicker, had longer PICU length-of-stay (PICU LOS) and needed more PICU specific therapies than other acute PICU admissions. Survival rates were not affected by the mode of transport or the distance.

AIMS:

To compare if children 0-28 days and children > 28 days, all admitted to a single PICU following emergency transfer by a specialized pediatric transport team, differed in outcomes or resource use during transfer.

METHODS:

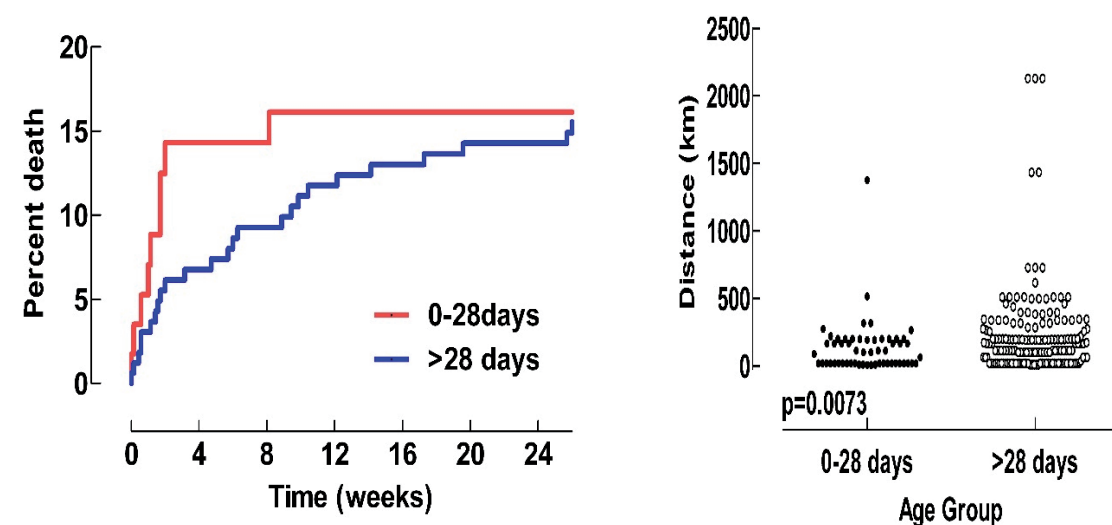
A retrospective register-based study of consecutive admissions to a tertiary PICU in Sweden from 1 January 2008 to 31 December 2013. We compared the two cohorts regarding predicted death rates (P.D.R), PICU-mortality, PICU LOS, complications, transport distance and resource use during transfer.

RESULTS:

Of 221 critically ill, acutely transported patients, 57(25%) children were 0-28 days and 164 were > 28 days old. We found no statistically significant difference in P.D.R, PICU-mortality, PICU LOS, complications, resource use during transport or survival after 1, 2, 3 or 4 weeks between cohorts. The average transport distance was longer for children > 28 days ($p < 0.0073$).

CONCLUSIONS:

Emergency transport of critically ill newborns is as safe as that of older children if performed by a specialized pediatric transport team. Further study is needed to investigate if there are certain diagnostic groups or disease severity where transport should be avoided.



ID 057 - RESEARCH & DEVELOPMENT / IGNORANCE IN NEONATAL TRANSPORT

THE EFFECT OF RESUSCITATION AND TRANSPORT OF PRETERM INFANTS IN AN INCUBATOR ON ADMISSION TEMPERATURE

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BACKGROUND:

After a prospective risk assessment of the in-hospital transportation process of premature newborns at the Radboudumc, the department of Neonatology decided to change from open table to incubator resuscitation to prevent multiple transfers and to reduce the incidence of hypothermia. To evaluate this measure, we analyzed admission temperature and the course of body temperature, incubator temperature and incubator humidity from the start of resuscitation until arrival at the NICU.

METHODS:

We analyzed admission temperature of 215 preterm infants <32 weeks gestation born in the Radboudumc by comparing table-resuscitated infants (75) with incubator-resuscitated infants (140). In 73 incubator-resuscitated infants data were collected retrospectively and in 67 infants data were collected prospectively by continuous measurement of body temperature from the start of resuscitation until admission to the NICU.

RESULTS:

In the retrospective cohort, incubator resuscitation led to a non-significant reduction of hypothermia from 70.7% to 60.3% ($p = 0.183$). Compared to table resuscitation, the prospective cohort showed a significant reduction of hypothermia (46.3% vs 70.7%, $p = 0.003$). The course of incubator humidity and temperature showed a significant drop during transport of 14.3% ($p = 0.000$) and 1.92°C ($p = 0.000$) respectively, leading to a decrease in body temperature of 0.06°C ($p = 0.040$). Duration of transport had no influence on admission temperature.

CONCLUSIONS:

Resuscitating and transporting preterm infants <32 weeks gestation in an incubator is a promising strategy to prevent hypothermia. Continuous body temperature measurement is a great tool to raise awareness of body temperature during resuscitation and transport, and contributes to prevention of hypothermia.



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ID 005 - RESEARCH & DEVELOPMENT / INNOVATION

THE LUNG ULTRASOUND IN INTERFACILITY TRANSPORT OF NEONATES WITH RESPIRATORY FAILURE

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AIMS:

The aim of this study was to evaluate the diagnostic accuracy of lung ultrasound (LUS) during interfacility transport of neonates with respiratory failure.

METHODS:

The study group consisted of neonates who were transferred to our unit over a 2015. LUS was done routinely in all of the patients with respiratory failure. We evaluated the accuracy of LUS in diagnosis of respiratory failure and the impact of LUS results on decision-making during transport.

RESULTS:

Fifty neonates were included in the analysis (GA33,6±5,1;weight 2233±1062g). The most common etiologies were: RDS n=23(46%), pneumonia n=8(16%), PTX n=6(12%), and atelectasis n=4(8%). In 9 infants less common causes were found: CDH (n=3), MAS (n=2), TTN (n=2), CCAM (n=1), and PM (n=1). In terms of PTX and RDS the diagnostic value of LUS was higher than chest X-ray(CXR)—pneumothorax AUC LUS 0,92(95%CI0,80-0,98) vs AUC CRX0,57(95%CI0,42-0,71),p=0, 001; respiratory distress syndrome AUC LUS 0,92(95%CI0,81-0,98) vs AUC CRX0,77(95%CI0,63-0,88),p=0, 029. LUS diagnosis had a good agreement with CXR diagnosis (κ=0,66;0,49-0,83) and very good agreement with the final diagnosis (κ=0,918;95%CI 0,83-1,0). The results of LUS affected decision-making in 21 neonates (42%), e.g. the decision of chest tube placement.

CONCLUSIONS:

LUS is a reliable diagnostic tool for the diagnosis of respiratory failure during interfacility transport of neonates. The diagnostic value of LUS in diagnosis of pneumothorax and respiratory distress syndrome is higher than CXR. The results of LUS have an impact on decision-making.

ID 020 - RESEARCH & DEVELOPMENT / INNOVATION

HYPOXIC-ISCHEMIC ENCEPHALOPATHY THERAPY OPTIMIZATION IN NEONATES FOR BETTER NEUROPROTECTION WITH INHALATIVE CO₂ (HENRIC)

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1st Department of Paediatrics, Semmelweis University, Budapest, Hungary

Hypocapnia is common in asphyxiated infants due to spontaneous hyperventilation driven by metabolic acidosis or vigorous mechanical ventilation. Hypocapnia is detrimental to the injured immature brain and is strongly associated with adverse neurodevelopmental outcome. Hypocapnia may be a modifiable risk factor, currently there is no known method for hypocapnia avoidance in asphyxiated infants.

Our aim is to test the feasibility and safety of low concentration inhalative CO₂ gas mixture (5%CO₂+95%air) in maintaining pCO₂ levels in 40-60 mmHg range in asphyxiated, cooled, mechanically ventilated newborns.

Term asphyxiated infants undergoing hypothermia treatment with a pCO₂ value lower than 40 mmHg at any time within 6 hours of life will be enrolled. The 5%CO₂ gas mixture is administered through patient circuits in conventional ventilators. The end point of inhalation is determined by metabolic acidosis recovery, CO₂ is stopped when BE > -5 mmol/L, with a maximum duration of 12 hours.

Preliminary results of the first 3 enrolled patients will be presented as part of data safety monitoring. The primary outcome is the percentage of time spent in the desired pCO₂ range (40-60 mmHg) during inhalation. The study would be considered successful, if in the intent-to-treat analysis the combined time spent in desired pCO₂ range reached 70% and no serious adverse events were noted.

Inhalative CO₂ administration is a physiologically plausible intervention for hypocapnia avoidance. If safety is proven, inhalative CO₂ may be used to optimize neuroprotection in asphyxiated newborns.



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ID 028 - RESEARCH & DEVELOPMENT / INNOVATION

KANGAROO MOTHER CARE VERSUS INCUBATOR CARE DURING GROUND AMBULANCE NEONATAL TRANSPORTS IN SWEDEN – PARENTS' EXPERIENCES

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BACKGROUND:

During neonatal ground ambulance transports in Sweden the infant is usually cared for in a transport incubator. The transport often implies a separation of the infant from the parents, a separation that might be associated with stress.

AIMS:

To describe parents' experiences of two different means of neonatal transportation by ground ambulance, Kangaroo Mother Care (KMC) position versus incubator care.

METHODS:

Parents to infants at two NICUS's, each focusing on either KMC position or incubator care during transportation of infants with a current weight over 1500 g, current gestational age above 31+0 weeks, no central venous catheter or ongoing infusion, no respiratory support and not exposed to painful interventions during the 48 hour follow up period participated in the study. Open interviews were performed post transport and analysed using a qualitative content analysis. Primarily findings: The mothers in the KMC group were satisfied being close to their infant during the transport. It reduced their level of stress. They felt important as a parent; they were the expert and could communicate their infant's need to the accompanying staff. They sensed they were able to protect their infant by holding it close to their own body. The mothers in the incubator transport group were concerned before and during the transport and found it stressful to be separated from their infant. It was expressed as "it felt like a hole opened".

CONCLUSIONS:

KMC during transport seems to support parents' parental role and a family centred approach and be less stressful.

ID 037 - RESEARCH & DEVELOPMENT / INNOVATION

AMBULANCE TRANSPORTATION: ARE NEONATES STRESSED?

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². Clinic of Neonatology – Lausanne University Hospital,

³. University of Lausanne

BACKGROUND:

Environmental stimuli due to transportation cause stress in neonates with consequences on health outcomes, but it has not been investigated during ambulance transports. This feasibility study aimed to identify stress in stable neonates during ambulance retransfer, from a level III tertiary referral hospital to secondary referral hospitals (level II).

METHODS:

Neonates who fulfilled the stability criteria for transfer were transported by ambulance from a tertiary referral hospital to a secondary referral hospital. Exclusion criteria were emergency transports and infants over 44 weeks of age. The first objective was to assess the feasibility of the recruitment and data collection of saliva for cortisol measures. Stress measures were performed during the transfer procedure: salivary cortisol, physiological measures, and behavioral measures of comfort with the Comfort Behavior and the Premature Infant Pain Profile-Revised scales.

RESULTS:

Out of 93 screened, 20 neonates were included. The feasibility of saliva test was poor with difficulties collecting sufficient amount of saliva and collection time had to be extended from 90 to 300 seconds. Physiological parameters and salivary cortisol did not demonstrate stress. Behavioral scores indicated that all neonates experienced some discomfort or stress at some point during the transfer procedure.

CONCLUSIONS:

This feasibility study demonstrated an excellent rate of participation but high logistical constraints. Collection of saliva was not appropriate in this specific population and should be developed and improved with new data collection device. Behavior's scales identify both pain and discomfort during neonatal transportation. The research protocol was feasible except for the collection of salivary cortisol.



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ID 046 - RESEARCH & DEVELOPMENT / INNOVATION

CLINICAL AND HEALTH CARE RESOURCE IMPLICATIONS ASSOCIATED WITH ELECTIVE TRANSFER OF STABLE NEONATES ON NCPAP FROM LEVEL 3 TO LEVEL 2 NICUS WITHIN AN ESTABLISHED CLINICAL NETWORK H. Zein

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INTRODUCTION:

The use of Nasal Continuous Airway Pressure (NCPAP) is well established in neonatal practice for providing non-invasive respiratory support in spontaneously breathing infants. Neonatal Transport on NCPAP has been increasingly utilized with success for inter-facility transfer of neonates not requiring invasive respiratory support.

OBJECTIVES:

Our study aimed to evaluate the economic, resource implications and safety with transfer of stable neonates on NCPAP from Level 3 to Level 2 neonatal units (NICU) for ongoing care within an established clinical network. The primary objective was to determine the reduction in time spent in Level 3 NICU and cost savings associated with the elective transfer of stable infants requiring NCPAP from level 3 to level 2 NICUs. Assessing the safety of elective transport on NCPAP was a secondary objective.

METHODS:

Retrospective chart review of Infants transferred on NCPAP between June 2014 and June 2015 within the context of a large Canadian perinatal center with 39 Neonatal cots and over 1200 Level 3 NICU admissions annually.

RESULTS:

35 infants were transferred from Level 3 to Level 2 NICUs during the study period. Median gestational age at birth was 28 weeks [24-32]. 282 Level 3 NICU days were recovered with actual cost savings of \$988868 Canadian Dollars. There were no significant adverse events during the transports.

CONCLUSIONS:

Elective transport on NCPAP from level 3 to Level 2 NICUs within an established clinical network is cost effective, safe and increases accessibility to Level 3 NICU beds in a busy perinatal center.

NICU beds in a busy perinatal center.

35 Infants Transported from L3 to L2	15 Infants Transported from L3* to L3 or from L2* to L3
---	--

Table 1. Criteria for transport

CGA > 30 weeks.

Current weight > 1250g.

Infant on NCPAP for apnea of prematurity/mild to moderate chronic lung disease. Blood gas with a pH > 7.28 for at least 48 hours prior to transport.

Stable on NCPAP for at least 24 hours prior to transport.

Stable O2 saturation histogram of time below target saturation being < 10% of total time. Documented at least 12 hours prior to transport.

FiO2 requirement <30%.

NCPAP pressure requirement < 6 cmH2O prior to transport.

Infant off NCPAP - at discretion of neonatologist.

Agreement of referring and accepting neonatologist.

ID 052 - RESEARCH & DEVELOPMENT / INNOVATION

DIFFERENCES IN MORTALITY AND SERIOUS MORBIDITY WHEN A DEDICATED NEONATAL RETRIEVAL TEAM ATTENDS BIRTHS AT 23-28 WEEKS' GESTATION IN NON-TERTIARY HOSPITALS

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4. Department of Newborn Research, Royal Women's Hospital, Melbourne, Australia

BACKGROUND:

In Victoria, Australia, a dedicated retrieval team (PIPER) attends "outborn" births <29 weeks in non-tertiary hospitals whenever feasible. The effectiveness of this strategy in reducing serious morbidity and infant mortality has not been investigated.

METHODS:

We conducted a prospective study of all 23-28-week gestation livebirths retrieved by PIPER in 2010-2011. Serious morbidity to hospital discharge and infant mortality data were compared for births PIPER attended with births PIPER did not attend. Outcome data were analysed by logistic regression, adjusted for gestational age, birthweight and sex.

RESULTS:

Of 92 outborn livebirths, 60 were referred to PIPER for retrieval. PIPER was present at 21/60 (35%) births. By one year, 2/21 (10%) infants whose births were attended died, compared with 8/39 (21%) unattended (adjusted odds ratio [aOR] 0.36, 95% CI 0.05, 2.71, p=0.32). There were no significant differences in rates of necrotising enterocolitis (aOR 1.14, 95% CI 0.17, 7.64, p=0.89), intraventricular haemorrhage (aOR 1.19, 95% CI 0.37, 3.89, p=0.77), bronchopulmonary dysplasia (BPD), (aOR 0.48, 0.08, 2.97, p=0.43) or the combined outcome of death or BPD (aOR 0.39, 95% CI 0.08, 1.99, p=0.26). The risk of retinopathy of prematurity (ROP) was lower (aOR 0.13, 95% CI 0.02, 0.70, p=0.02) as was the combined outcome of death or ROP (aOR 0.15, 95% CI 0.04, 0.61, p=0.008) if PIPER attended the birth.

CONCLUSIONS:

Infant mortality risk was not significantly lower in births attended by PIPER, compared with those retrieved after birth, but rates of ROP and the combined outcome of death or ROP were lower.



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ID 056 - RESEARCH & DEVELOPMENT / INNOVATION

DOES INHALED NITRIC OXIDE IMPROVE TRANSFERABILITY OF PRETERM INFANTS WITH SEVERE HYPOXIC RESPIRATORY FAILURE?

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Acute Neonatal Transfer Service (ANTS) for the East of England, Cambridge, CB2 1QQ, UK.

BACKGROUND AND AIMS:

Administration of inhaled nitric oxide (iNO) to preterm infants with severe hypoxic respiratory failure (SHRF) remains controversial, despite increasing evidence of benefit in those with proven PPHN. This retrospective study aims to report the impact of iNO use on improving 'transferability' (stabilising the infant to enable safe transfer to a tertiary NICU).

METHODS:

All transfer requests completed by ANTS between 01/01/2011 and 31/12/2015 were reviewed. Data from 21 eligible iNO patients were collected from ANTS transfer notes and relevant hospital records. A cohort of 14 controls from the same period were matched according to severity of respiratory failure and demographics. The primary outcomes were defined as transferability and survival to discharge.

Fisher's exact and independent t-tests were used to analyse the categorical and continuous data respectively.

RESULTS:

Analyses showed no statistical differences between the two groups with regard to birth gestation, administration of antenatal steroids, mode of delivery, chorioamnionitis and surfactant replacement. Transferability ($p=0.015$) and survival to discharge ($p=0.018$) were significantly higher in the iNO group. The incidence of severe IVH and BPD was lower in the iNO group although this was not statistically significant ($p=1.00$).

CONCLUSIONS:

iNO use improved transferability and survival to discharge of preterm infants with SHRF. ANTS and many UK transport teams now routinely considers a trial of iNO in these patients once other factors (alveolar recruitment, blood pressure support, sedation) have been optimised. Thus, a larger prospective study is warranted to evaluate this approach for all preterm infants with SHRF requiring transfer.

ID 014 - RESEARCH & DEVELOPMENT / UNSOLVED PROBLEMS

MORE STUDIES REQUIRED OR JUST IMPLEMENT EAR MUFFS FOR PREMATURE NEONATES DURING TRANSPORT. RESULTS OF A SYSTEMATIC REVIEW

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BACKGROUND AND AIMS:

Premature infants are especially sensitive to high-pitched and loud noises. As early as the 1970s, the American Academy of Pediatrics issued recommendations on sound exposure in NICUs. Since then, however, sound reducing interventions, in NICUs and transport situations have received little attention. We aimed to assess the evidence for the wearing of earmuffs by premature infants during transport.

METHODS:

A systematic review was conducted on studies reporting the effectiveness of earmuffs to reduce the noise level. In Embase, Cinahl and Pubmed the search terms were: neonates, ear protection and transport. Two researchers independently selected eligible studies.

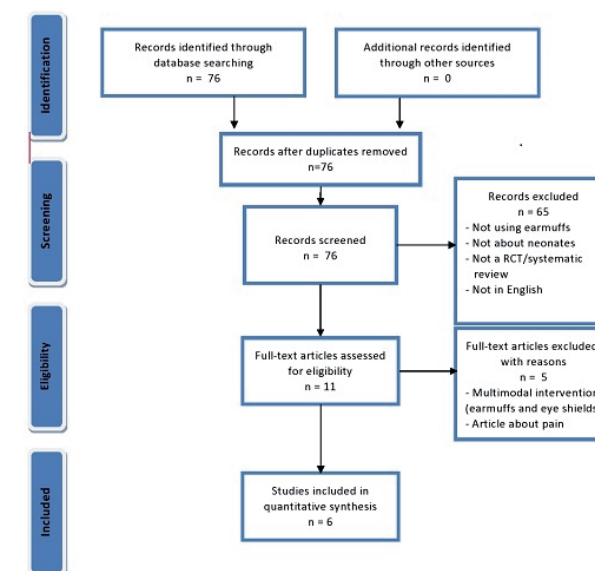
RESULTS:

Out of 76 articles retrieved (see flowchart), 6 studies partly met inclusion criteria but only one addressed the use of earmuffs during transport in an ambulance or airplane. Wearing earmuffs for 2 hours and 30 minutes during transport reduced noise levels by minimally of 7 dB. The observed greater heart rate variability, suggests that the preterm neonate is more stable. Four other studies in the NICU setting showed a significant improvement in vital signs with the use of earmuffs in terms of decreased heart rate and higher arterial saturations. The sixth study found more stable and deeper sleep during 2 days of wearing earmuffs. None of the above studies described skin adverse effects of earmuff use.

CONCLUSIONS:

The study results are promising but limited. The question is whether it is necessary to do more research or to just let every neonate wear earmuffs during transport?

More studies required or just implement ear muffs for premature neonates during transport? Results of a systematic review.





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ID 041 - RESEARCH & DEVELOPMENT / UNSOLVED PROBLEMS

NEONATAL RETRIEVAL IN JOHANNESBURG, SOUTH AFRICA: AN ANALYSIS OF CASES COMPLETED IN A SINGLE RETRIEVAL SERVICE

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BACKGROUND AND AIMS:

The South African neonatal mortality rate is 10 times that of Europe. Locally, lack of neonatal care services frequently necessitates transfer of high risk neonates to tertiary centres. In our service, neonatal transfers are undertaken by a two-man team consisting of an Emergency Care Practitioner (degree paramedic) and an intermediate ambulance technician as assistant and driver. This case series describes the population of neonates transported by this Johannesburg-based Critical Care Retrieval (CCR) service.

METHODS:

We retrospectively reviewed the transport records of neonates presenting between 1 August 2015 and 31 May 2016. The gestational age (GA), weight, diagnosis, and distance and duration of transfer were extracted from each record. Finally, we described the need for respiratory support.

RESULTS:

A total of 100 neonates with a median GA of 36/40 and an average weight of 2230g were transferred. The most prevalent diagnoses were respiratory pathology (79%), prematurity (67%), and congenital cardiac defect (24%). Of these 70% were ventilated; in 10% of cases the transport team initiated nCPAP and in 8% conventional ventilation. Average scene and transport times were 50.6 and 56.3 minutes respectively.

CONCLUSIONS:

In South Africa, CCR teams experience high volumes of neonates with complicated pathologies. These patients are transferred with small paramedic teams who lack specialist training. Further research should aim at investigating adverse event and outcome data, and the impact of specialised training for transport teams.

ID 044 - RESEARCH & DEVELOPMENT / UNSOLVED PROBLEMS

CUMULATIVE INDEX OF EXPOSURE TO HYPOCARBIA DURING TRANSPORT IN NEONATES WITH HYPOXIC ISCHEMIC ENCEPHALOPATHY RECEIVING THERAPEUTIC HYPOTHERMIA

R. Nallianan; N. Banu Shaik; A. Le Poidevin; R. Thwaites; M. Johnson; N. Gupta

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BACKGROUND AND AIMS:

Early periods of hypocarbia in hypoxic ischemic encephalopathy (HIE) have been associated with adverse neurodevelopment outcomes. Avoidance of hypocarbia in these neonates during transfer to cooling centres can be challenging.

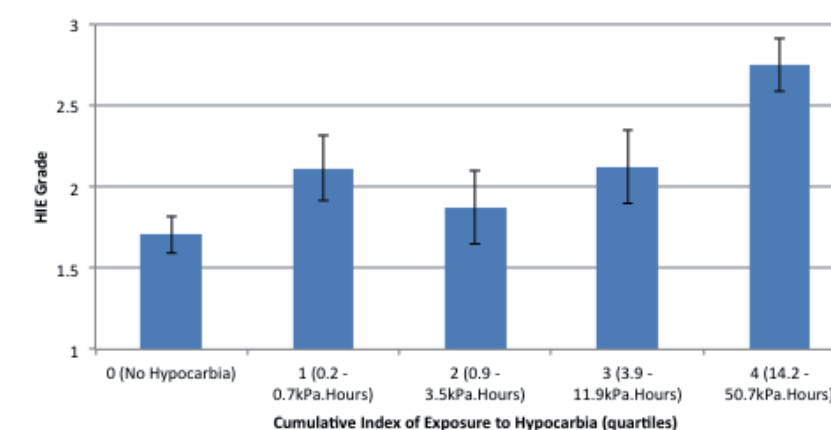
The aim of the study was to determine the cumulative index of exposure (CIE) to hypocarbia during transfer of neonates with HIE requiring therapeutic hypothermia (TH) and its correlation to clinical outcome

METHODS:

Retrospective study over a 4-year period including neonates with HIE requiring TH who were transferred to a cooling centre. Ventilation, blood gas and transport details were collected. Hypocarbia was defined as pCO₂14.2kPa.hours) was significantly associated with grade of HIE (p=0.002, figure 1). There were no significant associations between CIE with ventilation mode.

CONCLUSIONS:

increase CIE to hypocarbia was associated with severity of HIE. Avoidance of hypocarbia poses challenge not only due to ventilatory support but also due to severity of clinical condition.





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ID 053 - RESEARCH & DEVELOPMENT / UNSOLVED PROBLEMS

MATERNAL RISK FACTORS ASSOCIATED WITH BIRTH BEFORE 32 WEEKS IN NON-TERTIARY HOSPITALS

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BACKGROUND:

Over the past decade, the proportion of births <32 weeks' gestation in non-tertiary hospitals in Victoria, Australia has increased. Reducing rates of preterm birth in non-tertiary hospitals is contingent on early recognition and prompt in-utero transfer of high-risk women to a tertiary perinatal centre. The aim of this study was to investigate maternal risk factors associated with birth <32 weeks' gestation in non-tertiary hospitals.

METHODS:

Data were analysed for a population-based cohort of all livebirths, 22 to 31 weeks' gestation born in Victoria, Australia between 1990 and 2009. Maternal data for non-tertiary ("outborn") compared with tertiary ("inborn") births were analysed as covariates in a logistic regression model, with "outborn" as the dependent variable.

RESULTS:

13,760 livebirths were recorded. 1,985 (14%) were outborn and 11,775 were inborn. Compared with mothers of inborn livebirths, a significantly higher ($p < 0.001$) proportion of the mothers of outborn livebirths were multigravidas (OR 1.37; 95% CI 1.24, 1.51) and were teenagers (OR 2.02; 95% CI 1.67, 2.45). They had a higher rate of spontaneous preterm labour (OR 4.42, 95% CI 3.86, 5.07) and were more likely to deliver vaginally (OR 3.21; 95% CI 2.89, 3.56). A higher proportion of outborn births were associated with an antepartum haemorrhage. Women with hypertensive disorders of pregnancy, pre-labour rupture of membranes and multiples were more likely to give birth in a tertiary centre.

CONCLUSIONS:

This study has identified obstetric risk factors associated with preterm birth in non-tertiary hospitals. Further strategies to facilitate timely in-utero transfer of high-risk women are required.

ID 004 - SKILLS / IN - VS EX-UTERO TRANSPORT

WRONG TIME, WRONG PLACE: RISK FACTORS AND OUTCOME OF VERY PRETERM NEONATES BORN OUTSIDE A TERTIARY CARE SYSTEM

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BACKGROUND AND AIMS:

Mortality and morbidity is reported higher for very preterm neonates born outside a tertiary care center. Our aim was to identify risk factors for preterm delivery outside a tertiary care center and determine neonatal outcome.

METHODS:

In a historical cohort (2000-2013) of very preterm born neonates between (< 32 weeks of gestation) were compared to inborn controls regarding both obstetrical management and neonatal outcome.

RESULTS:

A total of 481 very preterm deliveries were included, 149 (31.0%) outborn and 332 (69.0%) inborn deliveries. The main reason for outborn delivery was advanced labor (advanced cervical dilation) (34.2%). We identified 2 risk factors, smoking (aOR 3.2, 1.3-7.9) and multiparity (aOR 2.0, 1.2-3.3). Multiple gestation (aOR 0.4, 0.2-0.7), fetal indications (aOR 0.3, 0.1-0.6), comorbidity requiring medication (aOR 0.2, 0.09-0.6) and PPROM (aOR 0.2, 0.06-0.4) were identified as protective factors. Only two women (1.3%) gave birth during transport. No difference was found in neonatal mortality (15.8% vs. 14.4%). Outborn neonates had a significantly higher risk of severe intraventricular hemorrhage, (aOR 2.6, 1.3-5.1).

CONCLUSIONS:

Very preterm outborn neonates were at increased risk of severe IVH compared to inborn neonates. Smoking and parity were associated with a higher probability of being born outside a tertiary care center. To improve neonatal outcome, women at risk of very preterm delivery should be transferred to a tertiary care center before delivery. Probability of delivery during transport was extremely low in this cohort ($n=2$, 1.3%).

ID 007 - SKILLS / PRE TRANSPORT STABILISATION

NOVEL APPROACH FOR LEARNING PRACTICAL SKILLS AND DECISION MAKING IN NEONATAL PRE-TRANSPORT STABILIZATION: LITHUANIAN EXPERIENCE

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BACKGROUND AND AIMS:

Perinatal regionalisation program started in Lithuania in 1992. Neonatal transports in Kaunas Perinatal center area dropped from 383 in 1994 to 131 in 2015. The critical care skills of healthcare workers are difficult to maintain in well baby nurseries. Standardized protocols and education are key to improve care of the sick baby, patient safety and better communication with neonatal transport team.

METHODS:

Crises Research Center developed a combined e - learning, simulation, and peer-to-peer teaching model for practicing medical skills. Using this model we created a unified assessment-decision making flowchart for sick newborns. The flowchart includes respiratory/airway, cardiovascular, glucose/intravenous fluids, temperature and laboratory tests/sepsis evaluation. Before teaching flowchart was tested with patients in tertiary level NICU. 50 different clinical scenarios, based on actual patients data, were made. The peer-teaching checklists were used to guide the learner the correct pathway. For special skills or decision making learners could use additional flowcharts, tables and calculation formulas, based on new Lithuanian national clinical guidelines.

RESULTS:

During 7 months more than 250 neonatologists, pediatricians and neonatal nurses took the course. All the materials used for teaching are available for learners online. They can use them later for in-hospital training and practical work.

CONCLUSIONS:

This combined teaching model is easy and effective. It can be useful for teaching healthcare workers with limited skills and experience.

ID 016 - SKILLS / PRE TRANSPORT STABILISATION

IS CPAP FOR MANAGEMENT OF RDS CORRECTLY APPLIED IN PRETERM NEONATES BORN IN 2nd AND 1st LEVEL PERINATAL CENTERS

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AIM AND OBJECTIVES:

Outcome of outborn premature newborns is generally considered worst than that of inborn babies. This is probably multifactorial and appropriate management from the delivery room to the transfer in the NICU is crucial. The aim of this study is to evaluate retrospectively if first guideline (early CPAP) to manage preterm neonates (gestational age ≤ 32 weeks) in non-tertiary perinatal centres and transferred by our mobile NICUs in South Paris area were applied.

MATERIALS AND METHODS:

Data were extracted from data sheets filled by Mobile NICU team and confirmed with following hospitalization reports. Basic demographics and clinical data are recorded. Descriptive statistics were applied.

RESULTS:

Ninety-five neonates were transferred in 2015, five were excluded due to the lack of informations. Basic population details are described in Table1.

Majority of babies received early CPAP but 43% (39) were intubated in the delivery suite.

Table 1

Reasons for intubation without CPAP attempt were classified in 5 classes

Results are described in Table 2

Table 2

ANOVA shows a statistical difference for "support of transition" at 1 minute vs each class ($p < 0,01$ to 0,0004). Early intubation (before 12 minutes) with a good transition, before any attempt of CPAP seems to be inadequate attitude.

CONCLUSIONS:

In roughly 30% of the total population intubation was used in first line treatment. Effort should be instituted to increase use of early prophylactic CPAP.

TABLE 1

	n = 90 (total)		n= 39 (MV)
Gestational Age	29,6 (2,1)		28,8 (2,3)
Birth Weight	1359 (413)		1227 (443)
Males	48 (54%)		21 (54%)
Twins	14 (16%)		8 (21%)
Antenatal steroids	Incomplete	42 (47%)	20 (51%)
	Complete	15 (17%)	6 (16%)
Cesarean Section	49 (54%)		24 (62%)
5' Apgar Score	8 [7-10]		7 [5-9]

TABLE 2

	n (Total 39)	Apgar 1	Time for intubation
Support of transition	6	0,8 (1,0)	4'10 (4'00)
Need for supplementary O ₂	9	4,3 (2,6)	11'20 (9'06)
Apneas	3	5,3 (3,5)	5'40 (2'30)
Respiratory distress	6	4,2 (2,3)	25'20 (17'50)
None	15	5,1 (2,1)	6'10 (5'06)



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ID 054 - SKILLS / TEMPERATURE CONTROL

TEMPERATURE CONTROL OF THE EXTREMELY PRETERM INFANT DURING EMERGENCY RETRIEVAL

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BACKGROUND AND AIMS:

Despite interventions from highly skilled neonatal retrieval staff, many outborn extremely preterm neonates arrive to the receiving hospital with suboptimal temperatures. Hypothermia and hyperthermia are known to contribute to an increased risk of morbidity and mortality. A retrospective audit will provide PIPER with thermoregulatory data for performance monitoring on a vulnerable patient cohort. Furthermore, it will provide initial data on the effectiveness of exothermic mattress (EM) use, an intervention implemented in 2011 and not yet audited.

METHODS:

Data from January 2012 to December 2014 were extracted from the PIPER Neonatal database. Eligible infants were those transferred at <24 hours of age as a primary emergency retrieval, at <28 weeks' gestation and weighing <1500g (n=68). Temperature outcomes at three points of retrieval (initial, stabilisation and at the receiving hospital) along with EM use were specifically sought. An axillary temperature 36.5-37.5°C was considered optimal.

RESULTS:

At arrival to receiving hospitals, 56% of infants had an optimal temperature while 24% were hypothermic and 21% hyperthermic. Infants <28 weeks gestation had an odds ratio of 4.2 of having an abnormal temperature at the receiving hospital (p=0.006). EM use resulted in a wider range of temperatures, and 6 of the 9 hyperthermic infants had an EM provided despite normal or high temperatures recorded at stabilisation.

CONCLUSIONS:

Thermoregulation remains a challenge during retrieval of extremely preterm neonates. As hyperthermia is noted as an emerging theme, continued performance review regarding temperature control should include further auditing of exothermic mattress use and timing.

ID 018 - SKILLS / THE CARDIAC NEONATE

ECHOCARDIOGRAPHY IN PEDIATRIC MOBILE INTENSIVE CARE UNIT (SMUR)

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Less than 14% of French SMUR have an ultrasound equipment (US), but no pediatric team is equipped nor trained. We aimed to determine feasibility and usefulness for hemodynamic evaluation of echocardiography in pediatric SMUR following a training program.

First we enrolled prospectively 30 infants during 2 months excluding ones with malformations. US exams were performed by the same trained operator with M-Turbo® (FUJIFILM). Heart morphology was analyzed and stroke volume (SV) estimates using aortic velocity-time integral before, during and after ride. Second, a national survey was performed involving pediatric SMUR practitioners. They were asked about their skill and expectations in US.

30 patients were included (21D, 2.41kg). Transfer mean time was 31±19min. 577 SV assessments were performed. Feasibility of echocardiography was 100% with no side effect nor infant move. SV assessment mean time during ride was 1.5min(1.4-1.8). Coefficient of variability was 64% with no difference in SV values (fig.1). Usefulness of US was considered in 33.3%. Low cardiac output was observed in 4 cases. 2 congenital heart defects were diagnosed leading to changing hospital destination. Hemodynamic management was made easier in 1 case. In 3 cases of respiratory distress, viral myocarditis was searched. Survey results are summarized in tab1, focusing heterogeneity of SMUR population. They are ready to use US on condition of specific training, without waste of time.

*Echocardiography is feasible and useful in Pediatric SMUR.
A dedicated training program is needed and is under development*

Table 1: National survey responses concerning medical population characteristics and experience.

Participation						
n responses	71 practitioners			19/26 teams		
n part time practitioners	48			65% in PICU/NICU		
Practitioners experience	5 years (median)			[2-10] (interquartile)		
Resident experience						
NICU/PICU	69					
Pediatric cardiology	15					
Fellowship experience						
NICU/PICU	46					
Pediatric cardiology	4					
None US experience	16 practitioners					
Echocardiography experience: 0(none)-5(strong)						
Hemodynamic	25 (35%)	10 (14%)	7 (10%)	10 (14%)	11 (15%)	7 (10%)
Malformation	33 (46%)	8 (11%)	13 (18%)	7 (10%)	5 (7%)	3 (4%)
Vascular	26 (37%)	15 (21%)	4 (5%)	8 (11%)	11 (15%)	4 (5%)
Main expected indications						
	Heart failure, refractory hypoxemia, shock and fluid management, tamponade, and newborn pulmonary hypertension					

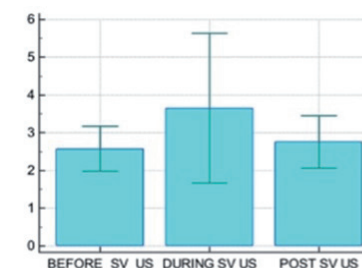


Figure 1: SV values: 2.62±1.41ml before/after vs. 2.85±1.85ml during ride, p>0.05, repeated measures ANOVA



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ID 043

SERVICE REVIEW OF CYANOTIC CARDIAC DISEASE TRANSFERS AT CENTRE TRANSPORT: CONDITION AT END OF TRANSFER AND OUTCOMES

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BACKGROUND:

Neonates in the Central Newborn and Trent networks with cyanotic cardiac conditions are born in hospitals without a cardiac centre as there are no maternity services at these.

METHODS:

A retrospective review of transfers for neonates with known or suspected cyanotic cardiac disease was carried out covering a three year period. All neonates started on prostin were included. Parameters examined were despatch times for time critical transfers – matched against the national standard of less than 1 hours, response times, condition on arrival at receiving unit and final outcomes.

RESULTS:

A total of 116 neonates were transferred. Data from the transfer is shown in table 1. Outcome data was available from the 89 neonates transferred to the regional cardiac centre only, these included numbers who required surgery on this admission and survival to discharge (table 2).

Table 1: Transport parameters

Table 2: Outcome parameters

CONCLUSIONS:

Despatch and response times did not meet targets – mainly due to logistical reasons such as team or cot availability. All clinical parameters were not recorded at the end of every transfer, but of those that were, parameters were within range between 64% (temperature and systolic BP) and 95% (blood glucose) of the time.

The majority of neonates were transferred in a safe and timely manner but there are actions that could be taken to improve the service such as recording all observations post transfer and a review of resources.

TABLE 1

Parameter	Total number	Result (of those recorded) No (%)
Time critical – despatch time (from referral to leaving base) < 1hr	12 (10.34)	8 (66.67%)
Time critical – response time (from referral to arriving at referring unit) < 3hr	12 (10.34)	11 (91.67%)
Non-time critical – response time < 3hr	104 (89.66%)	66 (63.46%)
Arrival temperature in range (36.5-37.3 °C)	112 recorded (96.55%)	72 (64.29%)
Arrival blood glucose in range (2.6 -10)	41 recorded (35.34%)	39 (95.12%)
Arrival systolic blood pressure in range (50-85)	72 recorded (62.07%)	50 (69.44%)

TABLE 2

Outcome parameter	No	Result No (%)
Surgery on 1 st admission	89	50 (56.18%)
Survival to discharge – those who had surgery	50	45 (90%)
Survival to discharge – those without surgery on 1 st admission	49	44 (89.80%)

ID 010 - SKILLS / THE ENCEPHALOPATHIC NEONATE

EFFECTIVENESS OF THERAPEUTIC HYPOTHERMIA ON TRANSPORT WITHIN A LARGE GEOGRAPHICAL AREA

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BACKGROUND

Therapeutic hypothermia (TH) is now considered the standard of care for infants with moderate to severe HIE, with a recommendation it be initiated within 6 hours of life. Within Canada, TH can only be provided in level 3 NICU's. There are no current evidence-based clinical guidelines for the provision of TH on neonatal transport. Given our large catchment area (440,000 km²), initiation by conventional passive methods has to be considered at the referral hospital prior to or immediately upon arrival of the neonatal transport team (NNTT).

OBJECTIVE:

To review our approach and determine the effectiveness of our current guidelines for initiating TH within our region.

DESIGN/METHODS:

Retrospective cohort study of all cases accepted for TH, between October 2009 and December 2013 at CHEO, a university-affiliated level 3 NICU, transported by our NNTT. All infants had moderate to severe encephalopathy and met NICHD criteria for TH.

RESULTS:

60 infants were included. The median time to initiation of TH was 2.1 hrs (1-4) and to target temperature 5.5hrs (4.7-7.9). 3 were <32C when cooled. No infant had temperatures <30C.

CONCLUSIONS:

Meeting the current CPS time target for TH using passive cooling in such a large geographical catchment area is challenging. Cooling by passive means was, however, found to be safe, without a considerable risk of over cooling. We have since revised our guidelines for transport with the provision of further outreach education, highlighting key strategies to ensure prompt case identification, referral and earlier initiation with guidance.



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ID 022 - SKILLS / THE ENCEPHALOPATHIC NEONATE

CHANGES IN THE MANAGEMENT OF HYPOXIC – ISCHEMIC ENCEPHALOPATHY AFTER IMPLEMENTING SERVO-CONTROLLED COOLING IN A NEONATAL TRANSPORT UNIT

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BACKGROUND:

Hypothermia treatment is a standard of care for hypoxic–ischemic encephalopathy being servo-controlled active cooling the gold standard. Due to the fact that the implementation of this treatment in transport is challenging, passive cooling was commonly apply. Aim: Comparison of passive and servo-controlled active cooling during neonatal transfers.

METHODS:

Retrospective observational study comparison babies with passive and servo-controlled hypothermia (January 15-May 16), following introduction of servo-controlled cooling mattress.

RESULTS:

53 patients were treated with hypothermia (32 passive, 21 servo-controlled). The median GA was 40w (p25-75:39-40.5), mean BW 3380g (SD600g); there was no differences between groups. Although is not statistically significant, more babies achieved the target temperature within the first 6 hours of life in servo-control cooling (passive 56.2% vs 61.9%, p0.352). More babies were in the target temperature at the time of the departure and at the end of the transfer (table 1). The target temperature was easily maintain in the servo-controlled cooling (56.2% vs 90.4%, p0.008). Babies under passive cooling present more overcooling (53% vs 9.5%, p0.034). The time of the total mission was similar between groups.

CONCLUSIONS:

The use of servo-controlled cooling during neonatal transfer improves the temperature at departure, during and at the end of the transport. Babies with passive hypothermia show more overcooling. Despite the fact to introduce a new technique, the time of stabilisation and the time of the total mission do not change.

ID 048 - SKILLS / THE ENCEPHALOPATHIC NEONATE

CHALLENGES FOR KEEPING THE TEMPERATURE IN TARGET RANGE: PASSIVE COOLING DURING NEONATAL TRANSPORT OF HYPOXIC-ISCHEMIC ENCEPHALOPATHY AFFECTED NEWBORNS

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BACKGROUND AN

Therapeutic hypothermia (TH) is an effective therapy for infants affected of hypoxic ischemic encephalopat (HIE). Active cooling during transport seems to be superior to passive cooling, but the latter is the choice in many transports programs, like the specialized neonatal transport program in Madrid. We aimed to evaluate the frequency of temperature in target range at arrival to tertiary hospital of newborns transported for TH.

METHODS:

Retrospective review of clinical transport data of infants transferred for TH (January 2008 - December 2014). Patients were divided into two groups: those that arrived to tertiary care hospitals in temperature target range (33.5-34.5°C) (ITTR) and those out of temperature target range (OTTR) (34,5°C).

RESULTS:

Only 30,8% (42/141) of the neonatal patients transported for therapeutic hypothermia, arrived ITTR. Baseline demographics did not differ between both groups with the exception of Apgar score at 5 minutes. There were no differences between the two groups in time of referral or in the hospital assistance level. Patients were more likely to be in ITTR if they had rectal temperature monitoring (OR 6,2; CI 95% 2,7-14,2), ventilator support (OR 63,16; CI 8,32-479,2), or temperature in target range at retrieval (OR 12,7; CI 6,1-26,4).

CONCLUSIONS:

Failure to achieve temperature in target range in transported newborns affected of HIE is a frequent issue in passive cooling during transport. Identification of improvement areas is key to increase the efficacy of passive cooling during newborn transport.



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ID 047 - SKILLS / TRANSPORTING THE IMMATURE/PREMATURE INFANT

NON-INVASIVE VENTILATION OF NEWBORNS WITH RESPIRATORY DISTRESS DURING TRANSPORTATION TO INTENSIVE CARE UNIT

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BACKGROUNDS AND AIMS:

Nasal continuous positive airway pressure (NCPAP) through a nasal mask is an established practice of treatment of newborns with mild respiratory distress. For safety and simplicity of NCPAP use, many medical teams started to use NCPAP also during transportation of newborns in mild respiratory distress. Last few years the transportation team of Paediatric intensive care unit (PICU), which is part of the Department of Paediatric Surgery and Intensive Care began to use NCPAP during transportation of newborns from 14 regional maternities in Slovenia to PICU in University Medical Centre Ljubljana.

The aim of the retrospective study was to demonstrate the efficacy and safety of NCPAP treatment methods during transportation of newborns in mild respiratory distress to the PICU.

METHODS:

A retrospective study based on a review of 170 transport records (January – December 2015).

RESULTS:

21 of 170 newborns were transported while receiving NCPAP (9 newborns and 12 neonates). Mean gestation age was 33 weeks, mean Apgar score 8 and mean birth weight 2,243 grams.

6 newborns were later intubated and mechanically ventilated and 15 newborns were breathing spontaneously after average 35 hours on NCPAP. No complications occurred during transportation and first gas analysis after newborns admission to the PICU showed good oxygenation.

CONCLUSIONS:

NCPAP appears to be a safe and reliable method of respiratory support for newborns during transportation. However, we need a more transportations with NCPAP to get additional experience.

ID 002 - SKILLS / TRIAGE

PEDIATRIC TRANSPORT TEAM DISPATCH – DECISION MAKING OF TRANSPORT MEDICAL DIRECTORS

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BACKGROUND:

Pediatric interfacility transport can be performed by various team types, evidence shows specialized teams have improved outcomes and that non-physician teams are equivalent in outcomes to physician-led teams. Little is known regarding the clinical reasoning of team dispatch.

HYPOTHESIS:

There will be concordance between critical care physicians regarding transport team dispatch and specific patient or transport variables which influence clinical reasoning can be identified.

METHODS:

Script Concordance Testing (SCT) was used to develop a 45 question survey illustrating 19 common transport dispatch situations. SurveyMonkey was used to distribute the survey to ACGME accredited critical care programs. Transport Medical Directors (TMDs) were the expert group. Survey was scored per SCT guidelines.

RESULTS:

Respondents included 63 fellows, 87 PIs, 14 TMDs. No significant difference in the mean SCT percentage scores amongst the senior fellows and PIs ($p = 0.825$) against the TMDs score. On simple concordance assessment, TMDs were concordant with each other in only 8 of 45 scenarios. TMDs were more concordant on reasoning based on intrinsic patient related factors/clinical scenarios rather than extrinsic transport factors (7/21 vs. 1/24). Discordance did not correlate with the presence of physician-led transport model at their program.

CONCLUSIONS:

Our study suggests there is discordance in clinical reasoning for transport team dispatch with the exception of certain intrinsic patient factors/clinical situations. Factors associated with these differences require further study.



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ID 049 - SKILLS / TRIAGE

DISPATCH TIME IN RELATION TO ACTUAL SEVERITY OF ILLNESS IN INTERHOSPITAL NEWBORN TRANSFERS

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BACKGROUND AND OBJECTIVES:

Transfers of critically ill newborns begin by triage, which estimates degree of emergency. Dispatch time (DT) is the time from receiving the call for triage to the start of the ambulance from its base and it has to be performed in a "reasonable time". The aim of this study is to see if the initial perception of the emergency level when receiving the call can influence the DT, and if it correlates with the effective patient severity

METHODS:

Retrospective study performed from January to June 2015.

All neonates transferred for urgent medical reasons between two hospitals were included. The call triage classification is in Table 1.

Clinical severity was assessed by TRIPS score during transfer. Descriptive statistics were applied.

RESULTS:

323 transfers were performed, 47 of which were excluded because of assumed delay by local teams, and 12 because of missing TRIPS evaluation. The studied population consists in 264 transfers summarized in table 2.

There is a significant difference in DT between AE and RE1 or RE2 ($p=0,016$ and $p=0,001$) and for TRIPS between AE and RE1 and RE2 ($p<0,0001$), and between RE1 and RE2 ($p=0,0001$). Spearman's test shows a correlation between DT and TRIPS ($p=0,0008$).

CONCLUSIONS:

Our estimation of degree of emergency during triage seems to be suitable with clinical evaluation of the newborn, and DT correlates with the actual severity as estimated by TRIPS.

	n = 264	Dispatch Time (SD)	TRIPS (SD)
AE	72	14'40 (7'40)	29,4 (12,8)
RE1	148	22'24 (17')	19,1 (9,2)
RE2	34	28'12 (20')	10,7 (13,7)
NU	10	29'12 (39')	15,2 (16,9)

Table 1

Absolute emergency (AE)	Acute life-threatening situation requiring immediate intensive care support, or potentially life-threatening situation without specifically trained local teams Transfer without delay is requested, e.g.: <ul style="list-style-type: none"> Perinatal hypoxia Newborn refractory hypoxemia Severe neonatal anemia Life-threatening neonatal cardiac arrhythmias Very preterm newborn with inadequate perinatal center level
Grade 1 relative emergency (RE1)	-Severe and potentially life-threatening situation requiring rapid intensive care support that local teams may properly deliver. Transfer as soon as possible is requested, e.g.: <ul style="list-style-type: none"> Newborn's respiratory distress with ventilatory support Neonatal cardiac or visceral surgical emergency
Grade 2 relative emergency (RE2)	Stable but still potentially severe situation requiring rapid medical or intensive care Rapid transfer to or next to a specialised unit (intensive care, surgery) is requested, but delays may be acceptable, e.g.: <ul style="list-style-type: none"> Newborn's respiratory distress without ventilatory support, Congenital heart disease or intraventricular hemorrhage or other neonatal disease with stable condition of the newborn
Non urgent (NU)	-Potentially severe but stable intensive care situation, managed by adequate local teams Transfer when possible, from an intensive care unit to another for reasons of convenience, or to a surgery unit, with important delays being acceptable



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ID 049 - SKILLS / TRIAGE

PERFORMANCE OF A SPECIALIZED NEWBORN TRANSPORT PROGRAM AND BENCHMARKING: PROPOSAL OF QUALITY INDICATORS

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BACKGROUND AND OBJECTIVES:

Specialized neonatal transport provides continuous intensive care to newborns. Due to transport system design variability, and the lack consensus on quality indicators for neonatal transport, benchmarking is difficult. The aim of the study is to evaluate the performance of the specialized neonatal retrieval service of Madrid through the proposal of quality indicators.

METHODS:

A transversal, descriptive study of neonatal transports was carried out between January 2009 and December 2015. The quality indicators defined were classified according to the 6 dimensions of quality of American Institute of Medicine.

RESULTS:

A total of 2917 newborn transports were performed (4,2 newborn transports/1000 habitants), 75,9% of them urgent. Baseline demographics did not vary through time. The 27 indicators of quality defined revealed a correct performance in matters of efficacy (stabilization time, total transport time, patient's condition and prevalence of arterial hypotension), of efficiency (triage errors and back-transports), of equity (bed availability) and of patient-centered care (informed consent fulfillment, family presence and pain management). The risk of patient security related incidents were 12,8% with a trend to diminish through time. There was a significant increase in the response time ($p<0,005$), and it was associated to adverse events. The prevalence of non-therapeutic hypothermia was 50,1%, and related to prematurity, patient-complexity and the use of respiratory support (non-heated gas); it presented a significant descent throughout the period of study ($p<0,02$).

CONCLUSIONS:

The evaluation of the performance of neonatal transport through quality indicators allow identifying improvement areas and benchmarking with other programs.



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