

Neonatal Transport in Central Region of Hungary

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The Neonatal Emergency and Transport Service of the Peter Cerny Foundation (NETS-PCA) covers the central region of Hungary including Budapest and 6 counties with all together 4 million inhabitants in a 120-140km radial surroundings with a driving distance of 60-70 minutes.



The NETS-PCA provides neonatal transportation between 11 NICUs of Level-III, and 31 referral hospitals with delivery rooms, and 10 diagnostic centres and 25 hospitals for bedside ROP telemetric screening. During a 26.5-year period **67,618** premature and sick newborns has been transported, **13,858** has got ventilatory support, 1,361 resuscitation was made with 90 per cent successfully outcome and 157 active controlled hypothermic treatment has started at the referral hospital and continued during the transport.



Yearly activity of the NETS-PCA – working as a mobil NICU Level III – includes about 3,000-4,000 neonatal transfer per year, (average 11-12 transports/day = between 0-43). There is about 600-1,000 emergency cases, many with acute interventions (iv access, intubation, ventilator support, umbilical canulation, chest drains), about 1,000-1,400 cases back or return transfers to lower level NICU-s. There is about 1,000 inter-hospital transports for diagnostic interventions: 320-360 ultrasound, CT, MRI, cardiac echo, 30-40 surgical, cardiac surgical, and neurosurgical cases.



Mechanical ventilations (700-1,000 per year) with measuring SAT, RR, HR, and 300-400 mobile blood-gas analysis, 35-50 resuscitations per year in delivery rooms (DR) of the referral hospitals (!), 40-50 Surfactant treatment at DR, 20-30 newly born baby per year from home deliveries and 30-40 active hypothermia treatment of asphyxiated newborns during transport.



Before 2010, the NETS-PCA dedicated only for special neonatal transport has got 150-200 calls per year to transfer premature for ROP examinations and laser-treatment. It is an enormous burden on the emergency and transport service, and poses significant risk to the fragile extremely low birth weight infants (ELBWI). In addition it incurs costs due to the mileage and the transport-time, decreasing significantly the PCA efficiency.



Solving this problem we developed a state-of-the-art modality for bed-side, portable, non-invasive ROP screening, treatment and follow-up telemedicine system, named “Premature Eye Rescue Program” (PERP) for avoiding transport of premature, which fit together the preexisting facilities of the PCA. The transport-based remote ROP screening, not only in the central region of Hungary, based on a collaboration between a nonprofit organization (PCA), and a University Department. PCA offers logistics (24/7 dispatch service), infrastructure (RetCamShuttle Clarity Co/USA), dedicated screening staff (4 transport nurses) and covers the cost of the project. Dept.

Ophthalmology of the Semmelweis University ensures ROP-expert, the scientific and educational backgrounds. ROP specialist on-call has given not only diagnosis via WFDI-telemicine, but as a "flying ROP specialist" can locally treats the ELBWIs with Laser for which PCA provides its own incubators.



Results of the PERP, as a regional "store and forward" telemetric ROP screening has got 5,726 retino-telemetric bedside ROP screening; 399 patients with bed-side Laser operation without transport; and 71,396 "spared" kms with telemetric screening.



Conclusions of the transport-based remote ROP screening as an "off label transport activity" is an unorthodox system utilizing the preexisting facilities of the neonatal transport service, with a reading center at the university hospital and continuous professional control and education from leading experts in ROP & non-ROP screening and treatment. Besides eliminating the avoidable transport of premature, and recording the objective status of the current ROP stages, telemedicine consultation, second medical opinion and quality control have also become available. The logistic system of Ambulance effectively provides the continuous availability of the remote eye screening system, while allows capacity to be focused on emergency neonatal care.

CORNER STONES OF THE NETS-PCA / BUDAPEST

Interfacility neonatal transport system with dedicated team:

7 vans equipped with mNICU Level III tools, 32 staff members

Multifunctional vans for twins and “off label” activities (telemetric ROP screening)

Dispatch Service

Outreach education (Delivery Room resuscitation in referral hospitals)

1x24/7 MD + RN + driver

1 x 24/7 RN (+NNP) + driver

1 x 8/5 RN + driver

1 x 8/5 RN (ROP) + driver

1 x 24/7 Dispatch Service

Family Centered Care

no-pain interventions (succhrose)

transport with minimized stress: antivibration tools; acceleration - speed limit

psychologically: emotional tasks; giving photos, early skin-skin contact

Methods-interventions:

to give surfactant on DR

to use PE sacs for ELBWI

to take pictures before leaving

active controlled hypothermia during transport

mobile blood gas analyzer - iSTAT

Neopuff/Neotee + non-invasive respirator (fabian-TV1)

To give different services:

mobile NICU Level-III care

NRP- on Delivery Room

NRP- on Referral Hospital Departments

NRP- in prehospital Care

prehospital emergency care for < 6kg, < 60 cm patients

reverse or back transport

Efforts to avoid or reduction of the ELBWI-transports

SUMMARY

For answering special neonatal emergency challenges of the Central Area of Hungary, the Peter Cerny Ambulance developed an **interfacility neonatal transport system with a dedicated team** for all babies, who are less than 6kg of bodyweight and/or 60cm of body length independently for their age. The nongovernmental organization solved problems of the very vulnerable population of sick babies, in the fields of **emergency care of the newly-born and neonates; mobile NICU Level-III; reverse transport; bedside diagnostics and interventions; post-discharge prehospital emergency care; outreach education** of medical staff, parents and lay people; for ensuring the welfare of prematures.