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**A roadmap for Paediatric and Neonatal Critical Care Nursing Science in Europe:
Engage, Action and Impact**

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Paediatric and neonatal intensive care nursing are both distinct and at times quite different from adult intensive care nursing. An example of the discrepancy between critically ill children and adults in intensive care units is the unique relationship with the parents of critically ill infants and children (Latour and Haines 2007). Unlike carers, partners and spouses of adult intensive care patients, parents are the primary caregiver and are fundamental to the child's existence and recovery. Additionally, for the last 30 years most Paediatric Intensive Care Units (PICUs) and Neonatal Intensive Care Units (NICUs) in north-western European countries and in the USA have allowed and indeed encouraged 24 hour parental visitation and participation in the care of their critically ill child. This standard practice is still under debate in adult intensive care (Giannini et al. 2014). Other documented differences relate to registered nurse staffing levels and the academic level of education nurses receive to work in these specialities (Baktoft et al. 2001; Aitken et al. 2014, Gill et al. 2011). But even within paediatrics, differences exist between and among PICUs and NICUs in care delivery and organisation (Nipshagen et al. 2002). The NICUs are designed for critically ill preterm neonates and newborns while most PICUs are focussing on a more heterogeneous group of children up to 18 year of age. Beside the implication of difference in treatments in the NICUs and PICUs, generally the care models differ also. The NICUs are mostly directed to the NICAP model (Newborn Individualised Developmental Care and Assessment Program) that was implemented almost two decades ago (Wallin and Erikson, 2009). At the same time the family-centred care model became apparent in the PICUs (Latour, 2005). Thus even though PICU and NICU are distinct from adult intensive care, considerable diversity in PICU and NICU nursing exists across Europe.

The European Society of Pediatric and Neonatal Intensive care (ESPNIC) is a well-known and respected nurse and physician society for more than 20 years. They revised their structure in 2011 and established themed 'sections' to assist in progressing the society's future. One of these newly created sections is the Nurse Science Section. The aim of this section is to promote and disseminate nursing research in PICU and NICU and engage nurses in the research process across Europe

(<http://espniconline.org/affairs/Pages/Sections.aspx>). The membership of this section includes both research-active nurses, nurse scientists and clinical nurses who are interested in research.

The first step in establishing future activities of this section was to define the research priorities for PICU and NICU nurses across Europe. This was undertaken by two Delphi studies in 2012-2013 (Tume et al. 2014, Wielenga et al. 2014). Although there are individual research active PICU and NICU nurses across Europe, undertaking research in areas including pain assessment and scoring , sedation assessment and scoring , withdrawal syndrome, delirium, enteral nutrition, parent satisfaction and safety (Ramelet et al. 2012,2014; Ista et al. 2013,2014; Latour et al. 2007,2011,2013; van Dijk et al. 2001,2009; Tume et al. 2011,2012) there are, however, no groups working collaboratively across Europe. In terms of developing nursing science across Europe, researchers and their research may be strengthened if they work collaboratively and across disciplines. It may also enhance their chances of funding success, in agreed priority research areas. This is what the nurse science section is seeking to promote. However, to develop and promote collaborative paediatric and neonatal nursing research across Europe poses a number of challenges. We believe, the diversity in nursing academic education, language barriers, the lack of established research networks and the lack of dedicated nursing academic roles (which allow time for nurses to undertake such work) are the most significant challenges. A recent systematic review has highlighted the generalised poor quality of many European nursing research publications (Richards et al 2014) and a goal of the nurse science section is to improve this within paediatric critical care.

After reaching consensus on priority research topics for PICU and NICU nursing across Europe in 2014 (Tume et al 2014; Wielenga et al 2014), the ESPNIC Nursing Science section has established a five year roadmap to provide focused directions to achieve the goal of achieving collaborative nursing research initiatives. A roadmap is essentially a specific plan, with targets and timelines, with a clear endpoint or goal and is

standard in project management and business, allowing you to regularly assess your progress and targets (Kappel 2001), and can be used to align organizations in times of predictable change. The key aspects of the ESPNIC nursing science roadmap relate to education, networking, mentoring and enhancing multidisciplinary collaboration within ESPNIC sections, with a view to using more electronic and virtual communications to add to the annual face to face congresses and meetings (<http://espnice.org/affairs/Pages/Sections.aspx>; Table 1).

Educational directions are important to support the inconsistency of academic education (for nurses) around clinical research that exists in many European countries. Thus the section has initiated annual clinical research summer schools and runs annual pre-congress nurse science workshops. In the future this may be extended to web based platforms.

Networking and establishing nurse research support systems are crucial, as many researchers are working on their own, or in silos within their own organisation or country. Having a database of nurse contacts within specific clinical areas and within the field of PICU and NICU is vital for nurse researchers to feel part of a wider group and to be able to extend their research or collaborate in others research in the same area. Research networks have been shown to increase the scholarly activity of nurse researchers (Megel et al. 1998). Effective networks may also assist in the implementation and dissemination of research findings, an increasingly recognised issue in clinical research.

Combined with educational input, **mentoring** or guidance from senior nurse scientists is vital to the development of effective and confident nurse researchers and in the small field of PICU and NICU nursing, this may not be possible within the individual nurse researchers own institution. E-mentorship across vast geographical locations is now possible and entirely feasible and there are a number of examples of effective international PhD supervisions, and these relationships can be established through research networks (Byrne & Keefe 2004). Mentorship is a complex psychosocial process, but can be highly effective. However, in the narrow field of PICU and NICU nursing, establishing a team of 'expert' nurse

mentors is vitally important to facilitate the development of less experienced nurse researchers, achieved through working on collaborative projects, ideally on agreed priority research topics.

Multidisciplinary research in the field of PICU and NICU is essential. Nurses do not work in isolation from other disciplines in the clinical environment and researchers too, must look to develop an 'ideal team' best suited to their research topic. This is rarely unidisciplinary. Across Europe hierarchical barriers still remain in healthcare, predominantly due to the inequality in nursing academic education compared to medical and other disciplines, but at times also related to gender and the societal value of nursing in different societies. However, as more nurses achieve doctoral level education and take on the leadership for successful research projects and involving other disciplines, these views will change. Nurses need to become active members of multidisciplinary research projects and to demonstrate their unique contribution to these projects (as nurses). Societies, such as ESPNIC, have the ability to promote multidisciplinary collaboration within their sections and this must be encouraged, whilst still maintaining the uniqueness of nursing, and a support network, through a specific nursing section.

We have outlined a roadmap for paediatric and neonatal critical care nursing across Europe achieved through the active engagement of many nursing colleagues and stakeholders. The actions described in the roadmap are our current challenges. A report into nursing research across Europe (Moreno-Casbas 2005), reported that research on nursing issues and the development of nurses researchers remained the preserve of just a few European countries. Ten years on, we believe this is changing as more nurses are educated to doctoral level. With the support of ESPNIC these actions are not challenges but privileges to engage and connect all colleagues around Europe to drive nursing research forward. After all, it will be our critically ill infants, children and their families that benefit from the impact of a European network and collaborative research actions. Engagement, action and impact will be the flow of conducting clinical research to inform evidence-based clinical practice. Join our journey; our PICU and NICU patients and families value the effort and the outcomes.

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Table 1 Roadmap of the ESPNIC Nurse Science Section, 2015-2020

Timeframe	Strategy
0-2 years by 2017	<ul style="list-style-type: none"> • Continue PICU and NICU Research Summer School • Continue pre-congress Nurse Science workshops to promote nursing engagement • Formalise links between ESPNIC Nurse Science Section and other sections to facilitate more multidisciplinary research • Electronic access to nurse science meetings • Database of research active nurses within Europe • Implement consensus statement on pain, sedation and withdrawal in PICU and NICUs across Europe (including translations)
2 – 4 years by 2019	<ul style="list-style-type: none"> • Establish a process of mentorship for individual nurse researchers • Develop and link into educational resources to promote research knowledge • Formalise links with other research organisations • Establish a multidisciplinary database of research-active individuals with topic areas
By 5 years by 2020	<ul style="list-style-type: none"> • Establish effective and sustainable research collaborations and working on collaborative • Research to target priority areas identified by European Delphi studies in 2013 • Measure effectiveness of implementation of pain, sedation and withdrawal consensus statement across European PICUs and NICUs • Produce ESPNIC section publications achieved through collaborative studies.