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Editorial

Ethical considerations in pandemic planning

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Toward the end of 2009, many countries around the world were heavily engaged in preparations for a potential H1N1 pandemic. Many regions went into high level preparedness, as local infection rates increased. Such preparations entailed planning for 'surges', the occurrence of significantly elevated rates of patients requiring assessment and treatment, commonly associated with staffing shortages resulting from health care professionals acquiring the infection themselves. Part of these preparations has included wide-scale vaccination programs to control the spread of the virus within populations. For many, this has brought back difficult memories of the SARS outbreak, only a few years ago.

Pandemic preparations have also given rise to complex ethical concerns. One of the most challenging of these is how to prioritize access to limited critical care services, when the demand exceeds available resources. This is a problem that low-resource societies face on a daily basis, that has only surfaced recently in 'wealthy' countries in the context of a potential pandemic.

Many centers have attempted to develop priority setting guidelines that could assist clinicians in 'triaging' patients during a pandemic (example, Utah Hospitals and Health Systems Association in the United States) (1). Attempts to develop such guidelines face some vexing ethical challenges. First, they attempt to determine which patients lives should be prioritized over others, commonly resulting in a form of *inverse triage*. Conventional triage aims to identify patients with the most urgent need for care, which in practical terms places the sickest patients as highest priority. Some pandemic planning guidelines, trying to find ways to manage limited resources, adopt 'exclusion criteria' whereby selected patients are either assigned lower priority or are excluded altogether from access to critical care. These commonly include patients with high projected rates of mortality or significant morbidity. Such strategies are commonplace in humanitarian relief missions.

However, such guidelines raise some significant ethical concerns that have been under-recognized. A major concern is that we do not have any adequate tools for accurately predicting mortality rates for individual patients on the basis of admission criteria. Although there are instruments for predicting risk of mortality (e.g., PRISM in pediatrics), these are designed solely to examine population statistics; e.g., for a unit to compare its pooled patient outcomes on the basis of admission acuity, in comparison to regional, national, or international aggregate outcomes for patients with similar acuity levels. There is a significant margin of error in trying to predict who will live or die on a case-by-case basis (most experienced clinicians have seen this in their practice as well).

Moreover, such exclusion criteria can sometimes express selected 'pre-judgments' over which patients are considered of greater worth by health care professionals or care delivery systems. Should a child with H1N1 that is severely disabled be prioritized differently from a child that had no disability prior to H1N1? Some believe they should be treated differently. However, many human rights advocates would argue that disability should not be the basis for discriminating whether one is entitled to life-sustaining therapies – they are both people.

In my personal opinion as a pediatric ethicist, having worked on such guidelines in Canada, I think it is very problematic to design such exclusion criteria; except for patients for whom treatment is either not medically required or would be physiologically futile.

Given the complexities involved with such prioritizations, it seems more important to put in place decision-making processes and groups, which would include some pediatric ethics expertise, that would assess the condition of the presenting children in relation to all available resources, to determine a most just course of action. Such processes would have to ensure 'transparent' mechanisms for reporting the basis of their assessments to patients and families as well as health care professionals and institutions, and possibly in the courts in selected instances.

The University of Toronto Joint Centre for Bioethics has published an impressive reference document for ethical considerations in the context of a pandemic that can be helpful, which has been recognized by the World Health Organization (2-3).

Preparing for pandemic also requires preparation for addressing the related complex ethical issues. As I have always said to my colleagues in working on such problems, I always hope that such preparations will be the greatest 'waste of time' – hoping that they will never need to be implemented!

Acknowledgements

I would like to thank my Montreal colleagues Beverly Fields, Kathleen Glass and Matthew Weiss for working with me on these challenging questions, although I assume sole responsibility for any limitations of this editorial.

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The efficacy of facilitated tucking of the neonate: a systematic review

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Abstract

Background: Most infants cared for in a Neonatal Intensive Care (NICU) receive mechanical ventilation for respiratory support. Consequently they undergo painful and stressful interventions, e.g., endotracheal suctioning (ETS) and heel stick punctures for blood sampling. Pain relief by analgesia is frequently discussed in the literature. Non-pharmacological interventions for pain management like sucrose in combination with non-nutritive sucking are well studied. Recently publications have reported studies of facilitated tucking (FT) to comfort infants undergoing short painful procedures. In the current practice nurses provide FT to infants, however the efficacy of FT towards the reduction of stress and pain is unclear.

Objective: This review describes the effectiveness of facilitated tucking with regard to procedural pain in premature infants.

Methods: We systematically searched electronic databases including PubMed, Cochrane library and CINAHL to identify literature published up to May 2009. Included were articles concerning premature infants from 24 to 36 weeks gestation.

Results: Five crossover studies were selected out of 91 generated hits.

Conclusion: There was little high-level evidence regarding neonatal facilitated tucking. The literature shows some mixed outcomes toward the efficacy of FT. These five studies conclude that facilitated tucking may be an effective non-pharmacological intervention during endotracheal suctioning, heel stick and nursing care to comfort infants undergoing short painful procedures.

Additional assessor blinded research is recommended.

Keywords: facilitated tucking, endotracheal suctioning, preterm infants, pain management

Introduction

Infants cared for in a Neonatal Intensive Care Unit (NICU) are exposed to many painful and uncomfortable interventions. The smaller for gestational age, the higher is the number of painful procedures. Up to 14 (\pm 4) painful procedures per day were measured in the first 2 weeks of their lives (1). In earlier studies, the most frequently identified procedures were heel stick followed by endotracheal suctioning (ETS) (2-4). Later research on the frequency of painful procedures showed that ETS has become more dominant (1). Simons et al concluded that ETS contribute at a rate of 63% as the most frequently performed painful procedure (1), followed by heel stick.

Endotracheal suction in ventilated infants is considered to be essential to prevent tube obstruction caused by the accumulation of secretions. Ventilated infants cannot clear the endotracheal tube themselves by coughing and the natural mucociliary function is impaired (5, 6). ETS is considered as an essential and frequently performed nursing intervention in ventilated infants. On the other hand studies of the adverse side effects of ETS showed that ETS is associated with a range of potentially serious complications. This includes bradycardia (7, 8),

increased blood pressure (8, 9), pulmonary vasoconstriction (8) and raised intracranial pressure (9, 10). It may also cause intraventricular haemorrhage (IVH) (7) and hypoxic-ischemic encephalopathy (11). Besides the above-mentioned possible complications, ETS in preterm infants is regarded as a common painful and uncomfortable procedure (1, 12).

The second most frequently performed painful procedure is capillary blood sampling by heel stick. Heel stick accounts for 56-87% of all painful procedures (3, 4, 13). To relieve pain during heel stick procedures the efficacy of the administration of sucrose has been studied extensively (14-16).

Authors reported that children have negative recollections due to intubation and adults described ETS as one of the most stressful experiences during their intensive care admission (17-19). Repeated and sustained pain is associated with long-term consequences of prolonged pain sensitivity. In turn, the pain sensitivity slows down the neurological and behavioural development of infants (20).

Pain management can be classified as either pharmacological or non-pharmacological. A study of the effect of continuous administration of morphine in ventilated preterm infants showed no beneficial analgesic effect (21). There was lack of a measurable analgesic effect on pain response and there was no improvement on neurological outcome (IVH and periventricular leukomalacia). The investigators concluded that there is no evidence to support the routine use for continuous morphine. In a state of the art review, Morrow and Argent suggested the administration of intermittent analgesics prior to ETS (22). The authors recommended avoiding routine suctioning and suggest suction initiated on clinical indications only. However, an optimal analgesic effect requires at least 6 minutes after administration (23). This delay is not preferable due to the urgent need to remove secretion by ETS. Morrow and Argent devoted less attention to the psychosocial aspects of infants' experience during ETS and did not propose non-pharmacological options.

In the last decades non-pharmacological analgesic interventions were developed and published with the objective to reduce minor short-term pain and discomfort after invasive interventions. These non-pharmacological analgesic interventions can be beneficial in minor pain and discomfort and may replace or be given in addition to analgesic pharmacological agents. Several intervention methods are tested in NICU settings, e.g., sucrose with or without non-nutritive sucking (24, 25) and swaddling (26, 27).

The administration of sucrose in combination with non-nutritive sucking is effective according a Cochrane review (14). Fearon et al (26) and Huang et al (27) examined the pain reducing effect of swaddling during painful procedures. Their outcome was inconclusive. Fearon et al reported no effect on pulse rate in preterm infants under 31 weeks gestation (26). This is in contrast with Huang et al who measured pain by the Premature Infant Pain Profile (PIPP) and found that swaddling was effective in preterm infants (27).

Recently published papers introduced facilitated tucking as an alternative to swaddling. Facilitated tucking (FT) or containment is defined as support of the infant by holding the infant in a fetal position, putting one hand on the infant's head and supporting the legs by holding them in a flexed position (28, 29) (Photo 1). The efficacy of FT is not well discussed in studies regarding minor short-term painful procedures during heel stick and ETS, although FT could be beneficial for pain reduction in ventilated infants who need to be suctioned.

The aim of this review is to assess the efficacy of facilitated tucking with regard to minor procedural pain in premature infants.

Methods

In line with the aims, a comprehensive electronic literature search was conducted through PubMed, Cumulative Index of Nursing and Allied Health Literature (CINAHL), and The Cochrane Library. The references listed in the selected papers were also reviewed. The search was limited to English, French, German or Dutch papers and there were no limitations concerning the year of publication. The search was completed in May 2009.

Studies identified from the search needed to meet the inclusion criteria. To be included studies needed to: (1) have reported results of infants with a gestational age from 24 to 37 weeks, and to a maximum of three months after admission; (2) have infants admitted to a NICU; (3) have mechanical ventilation or continuous positive airway pressure (CPAP) and had to undergo endotracheal suctioning, heel stick or stressful interventions; (4) have used a quantitative design. Excluded were articles concerning pharmacological pain management, infants older than six months, and articles published in other languages.

The two MESH headings "Infant, Newborn" and "Neonatal Nursing" were entered in combination with the following keywords: "*pain*", "*suctioning*", "*trauma*", "*tracheal*", "*facilitated tucking*", and

“pain management”. The search strategy identified 91 publications (Figure 1). At first, the three reviewers (AvB, BB and OH) reviewed the identified publication titles and abstracts and excluded studies that examined pharmacological issues exclusively and other studies that did not meet the inclusion criteria. Secondly, relevant full reports were retrieved from all studies that fulfilled the inclusion criteria. Ninety-one papers were identified of which 70 were excluded because they did not evaluate the effect of facilitated tucking in preterm infants or were removed. In total, five studies were taken into consideration (2, 25, 28, 30, 31) and analysed in greater detail.

Quality appraisal of the studies selected

The methodological quality of the eligible studies were assessed by the Critical Review Form – Quantitative studies (32). This review assessment tool evaluates the internal and external validity of a study and its results. The 15 questions were scored as 1 when all criteria were met or were scored as 0 in cases that did not meet all criteria. The brief items of the Critical Review Form - Quantitative Studies were: (1) *study purpose*, was the purpose stated clearly; (2) *literature*, was relevant background literature reviewed; (3) *design*, was the design appropriate for the study question; (4) *sample*, was the sample described in detail; (5) was the *sample size* justified; (6) *outcomes*, were outcome measures *reliable*; (7) were the outcome measures *valid*; (8) *intervention*, was the intervention was described in detail; (9) *contamination*, was contamination avoided; (10) *co-intervention*, was co-intervention avoided; (11) *results*, results were reported in terms of statistical significance; (12) *analysis method(s)*, were the analysis method(s) appropriate; (13) *clinical importance* was clinical importance reported; (14) *dropouts*, were dropouts reported; (15) *conclusions and clinical implications*, conclusions were appropriate given study methods and results.

Each author individually assessed validity of the five selected articles. The results of the first round were discussed and agreement was reached during a second round. We summed all scores, and the maximum score of 15 indicates an excellent study (Table 2).

Results

Most excluded papers discussed the potential efficacy of all different kinds of pain reducing methods, e.g., non-nutritive sucking with or without the administration of sucrose, kangaroo care, massage or swaddling, respectively. Other papers were removed as they were from more than one database.

Finally five studies met the inclusion criteria (2, 25, 28, 30, 31). These papers were evaluated (Table 1). All studies used a crossover design, infants undergo ETS, heel stick or routine nursing care for clinical purposes using either the FT or control care without FT. So, infants acted as their own controls. The order in which a condition was introduced first, was randomised. The mean (SD) number of infants included was 24.4 (± 10.8). These infants can be generally characterised as: the mean (SD) gestational age was 28.6 (± 1.1) weeks and mean (SD) birth weight was 1198.1 (± 214.3) gram. Data are expressed as mean (SD) unless stated otherwise.

Scientific quality of the studies

The Critical Review Form score of the included studies showed that the methodological quality varied between poor and good with a mean of 9 (± 4) out of 15 (Table 2). Approximately 40 percent of the Critical Review Form was not met or not applicable. The earliest study showed a low score with 4 out of 15 (28) compared to the most recently performed study which had a score of 14 out of 15 (30). Moreover, all studies scored highly on criterion four, design; 11, significance reported; and 12, analysis methods appropriate. In contrast, very few studies fulfilled criterion 8, description of the intervention in detail was seldom in detail; 13, clinical importance was not reported, especially the sub-question were differences between groups clinically meaningful; and 14 rarely were drop-outs or the statement that there were no drop-outs was discussed.

Intervention

Facilitated tucking was performed by different professions and also by parents, two studies were performed by nurses (25, 28), parents (2, 30) or physical therapist (31).

Outcome parameters

Four out of the five studies used a validated multidimensional pain assessment tool to evaluate the efficacy of the intervention and co-intervention. Three studies used the Premature Infant Pain Profile (PIPP) pain assessment tool (25, 30, 31) and two studies used the Neonatal Infant Pain Scale (NIPS) (2, 30). The study of Corff et al measured physiological parameters, e.g., heart rate, saturation, crying time and sleep disruption time (28).

Different short-term procedural pain

The efficacy of FT was assessed during three different procedural pain sources: endotracheal suctioning (2, 25); pharyngeal suctioning (30); and heel stick (28, 30). Hill et al compared the stress responses of infants during routine nursing care, e.g., temperature checks, auscultation,

blood pressure checks, diaper changes, and initiation of nasogastric tube feedings (31).

Discussion

This systematic literature search finally retrieved five crossover studies, which provide evidence that FT could have a pain relieving effect among preterm infants.

In general the scientific quality of the studies was rather moderate. Due to the absence of power calculations, not well-described intervention and co-intervention and absence of discussion whether or not the statistical differences between control and experimental was clinically meaningful. Also the number of treated infants was small and effect sizes were not reported. On the other hand, there was an obvious trend that quality of the more recent studies had improved.

This review highlighted that a standard outcome was essential to compare different studies. One study used physiological outcome parameters (28). Unfortunately, these physiological parameters were not comparable to the pain assessment tools used.

The study of Hill et al was not readily comparable to the other studies. Hill et al studied the efficacy of FT in routine nursing care and this was in contrast with pain after a heel stick or endotracheal suctioning (31). The authors justified their choice to use the PIPP because this measures physiological activity, behavioural state and facial activity. They described that these three best reflect painful experiences in preterm infants. Although, the PIPP score is originally validated as a behavioral acute pain scale and designed to measure acute pain in premature infants, not to measure stress only.

For all observational studies there is a danger of introducing assessment bias. Due to the visual nature of the intervention, assessor blinding is not an option by using the PIPP. A more valid method to measure pain could be performed by near-infrared spectroscopy (NIRS) (33). NIRS can be used for non-invasive assessment of brain function through the intact skull in human subjects by detecting regional changes in oxygenated and deoxygenated hemoglobin concentrations associated with neural activity. This shows the functional activation of the brain. An increased tissue oxygenation represents an increased regional cerebral blood flow. This in turn is associated with increased neural activity. Slate et al and Bartocci et al studied the association between cortical hemodynamic activity and the components of a clinical pain assessment tool and the PIPP (33, 34). They

found that changes in brain activity in response to heel lance were related to the PIPP scores. Even pain could be measured by NIRS and could not be measured by PIPP (34). The expression of pain in premature infants is still unclear, despite the growing number of pain measurement tools, over 40 methods of pain assessments are available for infants (35). The efficacy of FT is studied during moderate acute procedural pain. Although not tested, FT could be beneficial for infants for other uncomfortable procedures like veni-punctures, inserting IV cannulas, introducing gastric tubes, and removing tape. Premature infants have 14 (\pm 4) pain moments a day (36), which indicates the importance of reducing these pain moments.

This comprehensive search strategy was based on three databases, which generated many duplicate studies, strengthened the current review. In addition, both manual search and reference search did not show any new papers. The independent assessment of the studies by the Critical Review Form improved the review. The results of all studies suggest that FT can reduce pain and stress and gives comfort to the preterm infant. Without FT it takes more time for the neonate to become relaxed again, with FT the neonate will be relaxed sooner.

The current review included only studies published in English, French, German, and Dutch. This inclusion criterion was a limitation because well-constructed studies published in another language might be missed. The intervention needs to be described in more detail to ensure a uniform guideline on how to perform effective FT. The description of the position: (1) spinal, prone or side lying position, the exact flexed pose of the legs; (2) elbows and arms, the exact midline position of the arms and legs near the mouth or on the face; (3) how to support if the hands cannot embrace infants' arms and legs at one time; and (4) the time needed to hold the flexed position after the intervention is ended had to be described.

Directions for further research are: FT in combination with the administration of sucrose. Till now most papers used a crossover design to measure the efficacy of FT, however for this purpose a randomised design could be utilised. Outcome could be measured with NIRS. Also more research is needed for valid information about the differences between tucking by parents or professional caretakers. Additionally, the experiences gained from earlier mentioned studies should be taken into account. Nursing staff shortages occur in most countries. A snuggle could be used instead of a nurse, which offers a possible alternative to manual FT (Photo

2). We practice this technique in our ward and observe good results, although evidence towards the effectiveness is not available.

In conclusion the five articles suggest that facilitated tucking can reduce moderate procedural pain. Several reviews which were not included support this conclusion. Pain measurement instruments are of great value although alternative measurements had to be tested. We think that FT could improve patient care and should be incorporated in daily practice.

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See following pages for Tables, Figure and Photos.

Table 1. Description of studies concerning facilitated tucking

Authors	Design	Subjects	Intervention/ outcome	Results	Conclusion	Quality assessment
Axelin et al. 2009	Crossover	20 infants, GA* 28.1 (\pm 2.3) wk**, BW# 1123 (\pm 327) g###	Pharyngeal suction and heel stick with FTP [€] vs. glucose; water (placebo); opioid. Outcome assessed by PIPP and NIPS	Pharyngeal suction [heel stick]: PIPP [¥] 11.25 (\pm 2.47) [5.20 (\pm 1.70)] with FT vs. 12.40 (+ 2.06) water (placebo) p=0.034 [p=0.004]	FTP [€] reduce pain and had less short term side effect compared to oral glucose and opioid	14/15
Axelin et al. 2006	Crossover	20 infants, GA median 28 (24 – 33) wk, BW median 950 (690-1920) g	ETS with FTP [€] vs. without FT. Outcome assessed by NIPS	Median NIPS with FT 3 (range 3 – 7), without FT 5 (range 2-7). The infants till calm down with FT medial 5 vs. 17 s. (p=.024)	FT by parents is effective and safe in pain management ETS	12/15
Hill et al. 2005	Crossover	12 infants, GA 28.8 (\pm 2.8) wk, BW 1410 (\pm 473) g	Routine nursing care with FT vs. without FT. Outcome assessed by PIPP	PIPP score with FT 8,5 (\pm 0.8), PIPP without FT 11,3 (\pm 0.7)	FT during routine care may reduce stress	8/15
Ward-Larson et al 2004	Crossover	40 infants, GA 27.3 (\pm 2.4) wk, BW 932.3 (\pm 284.1) g	ETS with FT vs. without FT. Outcome assessed by PIPP	FT: PIPP 8.95 (\pm 2.1), without FT 13.8 (\pm 2.2) p<.001. Regression analysis: no significant effect on pain	FT can reduce procedural pain during ETS	7/15
Corff et al. 1995	Crossover	30 infants, GA 30 (range 25 – 35) wk, BW 1327 (range 660 – 2500) g	Heel stick with FT vs. without. Outcome assessed by physiological parameters (heart rate, oxygen saturation), crying time and sleep disruption time	Heart rate 6-10 min. after heel stick return to baseline 149.1 with FT vs. 154.9 (p<0.004), saturation no significant difference, crying time with FT 0.26 (\pm 0.5) vs 2.29 (\pm 3.0) s, sleep disruption time 1.86 (\pm 2.06) 9.345 (\pm 4.36) (p< 0,001)	FT can be an effective comfort measure in infants during minor procedural pain procedures	4/15

GA* indicates gestational age, wk** indicates week, BW# indicates Birthweight, g### indicates gram, PIPP[¥] indicates Premature Infant Pain Profile, FTP[€] indicates Facilitated tucking by parents

Table 2. Scientific quality of the included studies

Authors	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total score
Axelin et al 2009	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	14
Axelin et al 2006	1	1	1	1	1	1	1	0	1	1	1	1	0	0	1	12
Hill et al 2005	1	1	1	0	0	1	0	0	1	0	1	1	0	0	1	8
Ward Larson et al 2004	0	0	1	0	1	1	1	0	0	0	1	1	0	0	1	7
Corff et al 1995	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	4
Total	3	3	5	2	3	4	3	1	2	2	5	5	1	1	4	9 (± 4)*

*Mean (\pm SD) total quality score

Figure 1. Results of search strategy

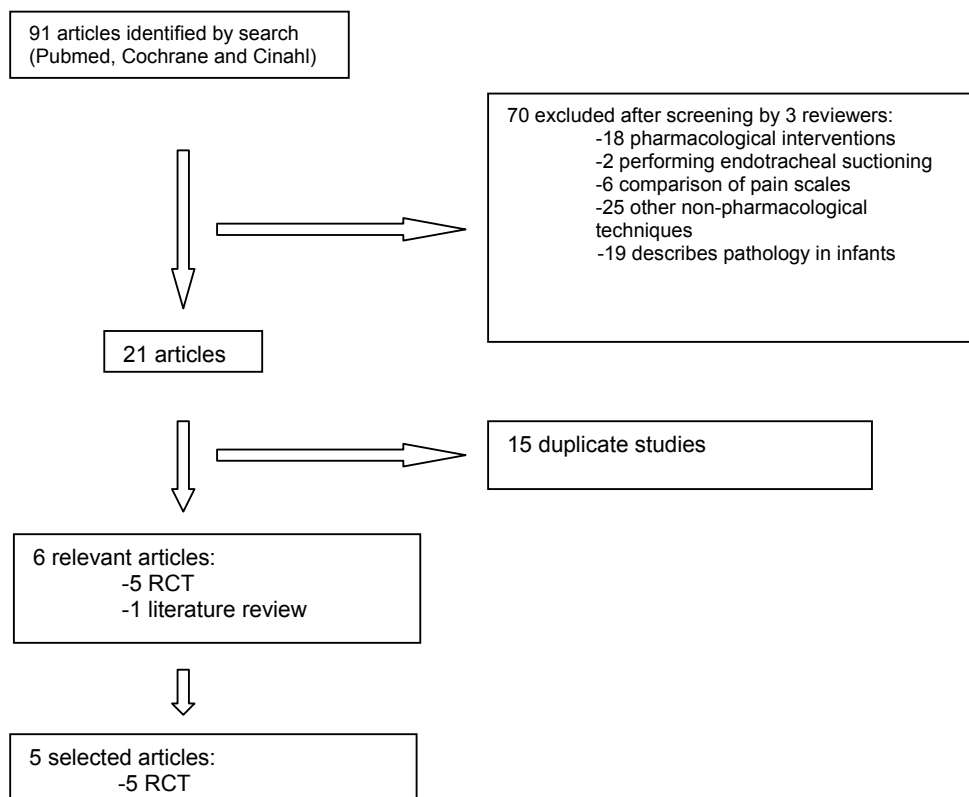




Photo 1

Facilitated tucking: a neonate is held in to the fetal position by the hands of the caretaker. One hand will support the head and the other hand will support the arms and/or feet of the neonate. A wall could support the legs of large infants. (Photo: Karin Schrage).



Photo 2

An infant cared for in a snuggle, without any manual facilitated tucking. This method can be used when there is no second caretaker to support (Photo: Monique Oude Rijmer-Van Kilsdonk).



Sharing Technical Expertise among Sister PICUs in the Region

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Abstract

Developing countries face many continual challenges in managing healthcare services as the working conditions can be overwhelming by the lack of sufficient skilled staff and absence of continuing education. Establishing basic healthcare provisions and simple hygiene awareness and infection control education could provide better benefit to the majority than the constructing or imparting of skills in state-of-the-art medical care.

Much technical cooperation among developing countries occurs within the framework of regional integration efforts. A multitude of approaches, including imparting the acquired knowledge and skills, disease and care management and skills development through structured training collaboration programs would help to respond to ongoing healthcare quality improvement needs. The assistance models through partnership with government, the corporate sectors, and both local and international non-governmental organizations foster opportunities in promoting exchange of ideas, experiences, knowledge, technical advances, skills and expertise across their usual boundaries. Besides, such a platform would provide both parties with an opportunity to exchange thoughts and ideas in healthcare issues.

Introduction

The healthcare infrastructure in developing countries faces many continual challenges as, most of the time, working conditions can be overwhelming with the lack of sufficient skilled staff, absence of continuing education, suboptimal physical facilities, and long distances between health centers. In rural settings where much of the population lives, poor roads make transportation and communication difficult. It is necessary to train healthcare providers with the skills that they need to appropriately support immediate need where patients can be stabilized

for a long transfer to a tertiary care centre.

On the contrary, developed countries have a wealth of knowledge and experience to share in terms of resource, skills and systems management that enhance the effectiveness and quality outcomes of healthcare. The expertise shared in the effective use of funding in establishing for more basic healthcare provisions and simple hygiene awareness and infection control education, could better benefit the majority than constructing or imparting skills in state-of-the-art medical care. Providing healthcare assistance to developing countries in monetary terms may not be the best viable option as often it does not assure successful outcomes as more often they require expertise in showing them the "know how".

Practical Approach

One way that can positively make an impact is the sharing of technical expertise through structured training collaboration programs to respond to ongoing healthcare quality improvement needs. These efforts encompass a multitude of approaches, including imparting the acquired knowledge and skills, disease and care management and skills development. Others include the sharing of quality improvement techniques in managing their care in the most cost effective way. The exciting common thread is that health care staff, even those working in conditions of isolation can form teams, analyze problems, test changes, and find solutions with enthusiasm and creativity if they are given the training, the time, and the support from their leaders to get the job done.

Sisters PICU Program

The Cans for Care/Sister PICU Project that was initiated by nurses at Boston Children's Hospital is an excellent example of how developed countries could contribute to the development of

nursing staff in improving quality care outcome for children in the National Pediatric Hospital (NPH) in Phnom Penh, Cambodia. The World Federation of Pediatric Intensive & Critical Care Societies in this instance serves as a bridge in linking up the communication channel between the nurses in the project team and Sister Pediatric Intensive Care Unit (PICU) in Phnom Penh. The work took off its flight in September 2008 where Cans for Care was able to make its first connection to start off the program with the nurses in the sister PICU of NPH.

Other assistance that the Sisters' PICU can give would be having individual attaching to a professional voluntary body in the particular specialty need. For example, in Singapore, there are various non-government organizations such as the MSI Professional Services (MSI) and Singapore International Foundation (SIF) that actively help in facilitating international volunteerism through encouraging or sending professionals of various walks to share their technical skills with the developing world.

Assistance Model and Sustainability

The assistance model that SIF adopts is through partnership with government, the corporate sectors, and both local and international non-governmental organizations with the aim of bringing about active community service and fostering people-to-people relations. Whereas MSI Professional Services is a self-funded group where healthcare professionals form various specialty teams, moving out of their routine work taking their vacation leave to contribute their time in sharing their technical skill with a less developed healthcare setting.

One of the projects that KK Women's and Children's Hospital (KKH) collaborated with SIF and NPH is the PICU Train-the-Trainers program which initiated in 2007. The duration of the training collaboration took 3 years where the emphasis was on transferring skills and aiming at sustainability and beneficial outcomes. This was one of the Sisters PICU Programs that offers professionals an opportunity to share their experiences with people of less developed healthcare settings. Indeed, this work did allow KKH's teams to experience the way our counterparts in another culture cope or overcome challenging situations. Besides, such platforms provide both parties with an opportunity to exchange thoughts and ideas, and discuss the levels of care that would benefit their community. On the other hand, the MSI technical exchanges aim at improving care by providing structured multidisciplinary teams that usually consist of doctors, nurses and other allied healthcare professionals to share practices during clinical

rounds. Much of the work include sharing of best practices that they could possibly apply in their setting and providing exchange in refining processes that improve their work effectiveness and productivity. One of the hospitals which has progressed with good clinical outcomes is the Pediatric Unit in a county hospital in Huili, in Szechuan province, China. During the trips, the team also assisted the hospital in identifying the conditions that contributed to high mortality and death of infants. Recommendations were made on the facilities and clinical management of these conditions. Activities for training included discussion of medical cases and nursing care of neonates, lectures and hands-on training with the focus on basic ICU care and practices. One aspect of change made was the improvement of hand hygiene where more hand wash basins were installed in the wards and ICU, where doctors and nurses made a conscious effort to perform before and after patient care procedures.

Non-clinical Aspects

Good pediatric critical care environment, work systems, and basic essential equipment and facilities are considered critical to the care of ill children and neonates. As the hospitals attained a graduate level of competency in care, often there are requests made for advice on improving the ICU layout and facilities to meet patients with higher level of care demands. Generally, there is a need for sensitivity in understanding the limitation and constraint faced by Sister PICU counterparts in the developing/industrialized countries. Therefore, being mindful of optimizing the resources allocated would require that the team provides not only equipment and facilities, but also the day to day operational needs encompassed in financing the care that the hospital can provide.

In Summary

Much technical cooperation among developing countries occurs within the framework of regional integration efforts. Many assisting countries, non-governmental organizations and corporate bodies have increased funding and resource allocation for programs to provide technical assistance to partner countries, which in a way provide opportunities in promoting the exchange of ideas, experiences, knowledge, technical advances, skills and expertise across their usual boundaries. Such collaboration and cross transferability of skills and experience provide evidence that people from different communities, cultures and backgrounds can contribute and learn from one another in a spirit of mutual growth.



BRIEF RESEARCH REPORT

Factors which influence the development of health symptoms in pediatric and neonatal ICU nurses

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OBJECTIVES: To document correlative factors which influence pediatrics nurse's physical and moral integrity in ICU (PICU and NICU)

METHODS: A survey using the Clinical Symptom Self-reporting Inventory Analysis System (Symptom Checklist 90 by Dr. Leonard R. Derogatis) was conducted (Mental Measurements Yearbook). The survey used a 90-item questionnaire that examined symptoms such as: interpersonal relationships, sensitivity, melancholy, anxiety, hostility, and sadness. Each item was divided into five levels of grading from none to severe. The questionnaire was distributed to 30 general ward nurses and intensive care nurses of Shanghai Children's Hospital (Feng, Zhang, 2001).

RESULTS: The response to the questionnaire was 28/30 (93.3%). There were significant differences ($P < 0.05$) between the two groups of nurses. The ICU nurses reported about two times greater than the general ward nurses to become weak in both body and mind with clinical symptoms (see Table 5). The ICU nurses were more likely to become overly sensitive and experience abnormal thoughts, headache, chest pain, fever, and renal disease.

Table 1 shows the top 3 symptoms of all the nurses who completed the questionnaire either from the general ward or ICU ward. It also shows that ICU nurses were more than 5 times likely to exhibit these symptoms.

Table 1

Item	General		ICU	
	positive status > 2scores	%	positive status > 2scores	%
Obsessive-compulsive	1 person	7.1%	7 person	50%
Hostility	1 person	7.1%	5 person	35.7%
Sleep, Diet	1 person	0.0%	5 person	35.7%

If the score of any above items is > 2 scores, it means that the person who completed the form probably showed these symptoms, i.e., positive status.

Table 2

Comparing each group's highest scores of the ten kinds of symptoms. The higher the scores, the more likely the nurse became weak in both body and mind with clinical symptoms

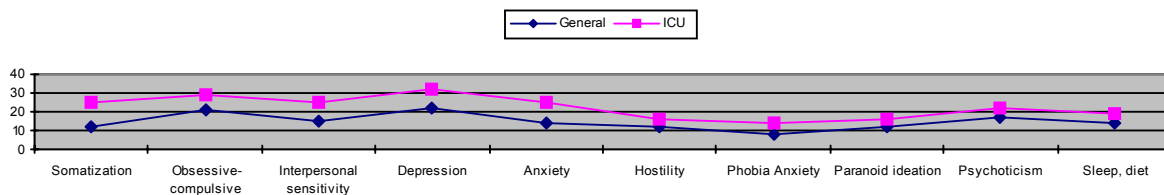


Table 3: Status in detail

Group	Somatization scores			Obsessive-compulsive scores			Interpersonal sensitivity scores			Depression scores		
	<12	12-24	>24	<10	10-20	>20	<9	9-18	>18	<13	13-26	>26
General person	2	12	0	0	13	1	0	14	0	2	12	0
ICU(person)	2	10	2	0	10	4	1	10	3	0	11	3

Table 4

Group	Anxiety scores			Hostility scores			Phobia Anxiety scores			Paranoid ideation scores			Psychoticism scores			Sleep, diet scores		
	<10	10-20	>20	<6	6-12	>12	<7	7-14	>14	<6	6-12	>12	<10	10-20	>20	<8	8-16	>16
General person	4	10	0	1	13	0	3	11	0	0	14	0	2	12	0	5	9	0
ICU (person)	0	12	2	1	9	4	0	14	0	0	11	3	0	13	1	2	11	1

Table 5: Comparing the results of the two groups

Table 5-a

Group	n	Total scores	somatization	obsessive-compulsive	Interpersonal sensitivity	depression
General	28	106.83±13.55	1.17±0.14	1.35±0.35	1.24±0.23	1.21±0.19
ICU	28	151.71±36.62	1.60±0.49	1.90±0.42	1.64±0.48	1.75±0.48
t status		4.49	2.89	3.44	2.79	4.41
P status		<0.05	<0.05	<0.05	<0.05	<0.05

Table 5-b

Group	n	anxiety	hostility	phobia anxiety	paranoid ideation	psychoticism	sleep, diet
general	28	1.16±0.24	1.34±0.28	0.98±0.10	1.21±0.11	1.16±0.24	1.20±0.21
ICU	28	1.54±0.50	1.99±0.67	1.25±0.36	1.19±0.41	1.54±0.25	1.70±0.44
t status		2.37	3.13	2.61	6.16	3.59	4.19
P status		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

CONCLUSION: Pediatric and neonatal ICU nurses are more likely to experience health symptoms than nurses on the general ward. Measures such as giving the nurse rest time to diminish feelings of exhaustion and frustration may decrease the emergence of physical and emotional symptoms. Reducing or eliminating the factors that negatively influence pediatric and neonatal ICU nurses' health is an important topic which urgently needs to be solved. Drawing attention to this issue may result in better recruitment and retention of PICU and NICU nurses.

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Feng Z-Z, Zhang D-J. Study on the validity of the Symptom Check-List-90 of Chinese version. *Acta Academiae Medicinae Militaris Tertiae* 2001;23(4):R195.1.



Spotlight on PICU

This regular column will provide readers with an opportunity to learn about fellow PICUs in various parts of the world.

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Children's Medical Center Dallas is a large private, not-for-profit, 483 bed pediatric institution. Likewise, the Critical Care Services comprise a large number of beds. The pediatric intensive care unit (PICU) is 44 beds housed on 2 floors and the neonatal intensive care unit (NICU) is an additional 36 beds. A 20 bed cardiac intensive care unit is governed under the Heart Center at Children's but shares faculty and nursing staff with the PICU. The PICU cares for infants and children with critical illness and injury outside the neonatal period. The PICU is divided into 3 medical management teams, with each caring for approximately 15 patients. Two of the teams are attending physician, critical care fellow and pediatric resident teams. The third team is managed by an attending physician, a critical care fellow and pediatric nurse practitioners trained in acute/critical care. The patient population includes all medical/surgical subspecialties except burn patients. The unit is very high acuity and provides standard services as well as advanced ventilatory strategies, extracorporeal membrane oxygenation (ECMO), continuous renal replacement therapy (CRRT).

Nurse: patient ratios are generally 1:1 or 1:2 depending on patient acuity. The nursing staff consists of experienced nurses as well as new graduate nurses. A comprehensive orientation program is in place to train new nurses in care of the critically ill or injured child. This program is managed by the two unit educators with support

from the hospital clinical education department; experienced staff and nurse practitioners also assist in education of the new staff members. Other education programs such as training for ECMO and CRRT are also in place and are managed by coordinators responsible for these technologies. The staff is encouraged to seek certification in their subspecialty practice such as CCRN certification through the American Association of Critical-Care Nurses or Trauma Nurse Core Curriculum by the Emergency Nurses' Association.

The unit is managed administratively by a senior director of critical care and director of critical care. A clinical manager and team leaders are responsible for the direct management of the units and staff on a daily basis.

Patient care in the PICU is a multi-disciplinary process involving the medical management team, nursing staff, respiratory care team, clinical support technicians, clinical pharmacists and dietitians. Other team members include social workers, chaplains, child life specialists as well as physical, occupational and speech therapists. This compilation of professionals allows us to meet the varied and individual needs of our patient population.

The nurse practitioner team in the PICU provides a bridge between medical and nursing staff. The team consists of 12 Master's educated pediatric

acute/critical care nurse practitioners. The primary daily responsibility of the group is patient management of one of the PICU teams, however the impact of the group is much broader. The group is involved in staff and patient education, education of students in nurse practitioner programs nationwide as well as education of peers and new graduate nurse practitioners. Members of the nurse practitioner group are also involved in multidisciplinary research projects,

quality initiatives, and local and national professional organizations. The nurse practitioners are part of Advanced Practice Services at Children's as a group of more than 150 nurse practitioners and physician's assistants who provide care across all subspecialties. The PICU at Children's is a robust, busy and challenging environment that encourages teamwork and demands quality.

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Questions & Answers from PICU-Nurse-International

Column Editor

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This column features particular dialogues that unfolded on the PICU-Nurse-International egroup that were particularly pertinent, stimulating, generated significant interest, and provided particularly informative replies.

January-June 2009

Nurse Education

Question:

We are dissatisfied with the methods and materials we are currently using to orient and educate nurses new to the care of children with congenital heart defects and surgical repair/palliation. I'd like to know what other institutions are currently using, whether 'home grown' or commercial products, classroom or self study, paper or computer, length of orientation, etc.

Portland, Maine

Answers:

Great question and would also love to see some of the information that you receive, but out of interest, what methods are you currently dissatisfied with so we don't send you information that you are already doing.

United States

We have huge binder of articles for the new learner to read, then quizzes following each module. There is a pre-test, and quizzes on various topics. We also direct the learner to various web sites. Once the self-study has been completed, we provide at least 4 precepted bedside experiences. We also provide continuing education in the form of didactic lectures. The biggest problem is self-study. It is time consuming to review, replace older articles with more recent literature, and assemble, and it is a huge waste of paper and space. I really want a more concise, comprehensive, streamlined process that will always be up to date. Of course, we also need to be budget-conscious, so balancing quality with cost is a challenge.

Portland, Maine

I would love to share with you my Clinical Orientation Program for the CICU I developed at Seattle Children's Hospital. It includes: Formal three staged clinical pathway, from simple to complex hearts and with activities such as Operating Room time and Cath. Lab. Visits.

Seattle, United States

Zingo or J-tip

Question:

We are in the process of revising our pain management protocols and are wondering if anyone uses J-tip or Zingo for venipunctures. We are currently using LMX4 and EMLA but need to find something that works faster: especially for those patients in the Emergency Department.

Florida, United States

Answers:

We were in the middle of a Zingo trial when we received word that it was no longer available as the company marketing and distributing it pulled out. It has not been taken off the market, per se, as there weren't safety issues. At that point our trial the results were mixed. We are currently trialing Synera patches; it is too soon to have any good data. I would like to hear more about J-tip.
Portland, Maine

Parents' Presence during Morning Rounds**Question:**

While we are on the subject of ward rounds, can I just ask which units allow parents to be present, and those that ask parents to leave. The unit I'm currently in has a policy that parents leave for nursing/medical handovers as well as during any procedure on any patient in the unit. Some days, parents only get to spend a couple of hours with their children, which I think needs to change.

Australia

Answers:

In my unit parents stay at bedside every day from 2.00 pm to 9.00 pm. We allow only mother and father. Rounds are usually in the morning, so parents aren't in the unit. During procedures usually we don't allow parents to remain in the room, but it depends very much on the age of child. These are the rules in general, but often we make exception, evaluating each case.

Padua, Italy

The PICU and Pediatric unit at Baptist Children's Hospital has totally open visitation. They are allowed to stay for change of shift as well as most procedures and resuscitation. A parent/family advocate is to be with the family during codes in order to support. They stay in for rounds but because we have private rooms, rounds are usually started outside the room and completed inside. Our next step is to have the family participate in rounds, hearing what is said between the team and being able to add their own report as needed. Family is defined by the parents.

Florida, United States

The parents of our patients are allowed to stay in the room during the rounds. They just have to leave when we talk about the child next to their own. We have up to three children in one room.

Landshut, Germany

We don't ask the parents to leave, we just close the doors and tell them that they have to stay in or stay out while we change shifts and while the doctors are rounding on that patient or in near vicinity.

Georgia, United States

Our PICU opens the door to parents 24 hour/day. The only restricted time is when the Cardio-vascular surgeons perform chest closure or someone is being crashed onto ECMO. The majority of parents do not stay 24 hours but go as they are able. We also open the bedside to another designated care provider, so if they want someone there 24 hours we can have the aunt or grandparent or sister at bedside. We do restrict the number of people as it is a small crowded unit.

Alberta, Canada

Morning Rounds Format**Question:**

In our unit, we have been looking at ways to improve our process and transfer of information during morning rounds. We have met some obstacles with our previous attempts and I am curious what other centers are doing.

Vancouver, Canada

Answers:

Why not invest in PDMS and full connectivity between intra-hospital databases, ICU equipment, manual input of non-equipment related parameters and a smart commercial tool. Several 'pages' of basic and advanced patient's history and all event logs can be displayed for third parties. Moreover, these tools are usually "made" by the own nurses and doctors so it is not a brainless commercial product. PDMS is not saving you time, on the contrary, but the amount of correct and automated data you achieve really makes it

worth considering.
Brussel, Belgium

We are required to address our reality to the best of our ability by testing versions of documentation, whether paper or electronic until we get it as close to "perfect" as possible. With any luck and coordination the paper versions will translate to the electronic version. However, documentation is only one form of communication and I fear there is no electronic or paper system that can replace proper verbal communication which continues to be a barrier for us.

Vancouver, Canada

More reports and more computer data do not necessarily translate to better hands on care or better outcomes. It does generate a false security that the machine knows best even if it is a child who has pulled off their leads or held their breath. Complex integrated reports are like every piece of equipment we use, only as good as the person using them, analyzing them, and making them "user-friendly".

Alberta, Canada

The "machines" shall support and ease our daily documentation work. That's what patient data management systems are made for. As all data is available at the bedside it may also help in quicker decision making in the interest of the patient so a complete, structured documentation theoretically may lead to better. You are totally right, the computers are only good as the person using them, and therefore one should know how to use the advantages of these systems.

Denmark

I'm interested to see how documentation informatics will eventually affect nursing responsibility. There will be cases in the near future where the electronic record will have documented proof of early deterioration in a patient's condition, whose seriousness was not appreciated by the bedside nurse. In the past, the written record was only as good as the judgment and thoroughness of the bedside nurse.

Montreal, Canada.

Nitric Oxide

Question:

We are in the process of implementing a nitric oxide program. Do any of you have policies, procedures, competencies, and/or order sets to share?

Florida, United States

Answer:

We've used nitric oxide for at least 13 years for a range of patient conditions, and have used the Inovent delivery system for the last 8 years which has streamlined its use and safety greatly. We consider its use an advanced ventilatory support criteria so senior staff are ideally supposed to care for those children. Although there is limited information on nitric oxide from fetal development perspective, we scavenge and continue to limit exposure to pregnant staff. We have a protocol and self-directed learning package that staff are to complete before caring for these children.

Australia

Near Infrared Spectroscopy (NIRS)

Question:

I'm searching data for NIRS use/monitoring in the PICU/NICU setting. I would appreciate any feedback you have about your experience with this type of clinical monitoring, particularly outcomes for morbidity/mortality.

Washington, United States

Answer:

We use them in our post-op hearts. I developed a specific nursing standard of care and have plenty of information on NIRS. We currently use the Somanetics INVOS 4-Channel systems and monitor cerebral as well as somatic trends. I am more than happy to share information.

Cleveland, United States

DNR Band Policy

Question:

Can anyone tell me if you put DNR armbands on kids that have a Do Not Resuscitate Order?
Marshfield, United States

Answers:

No, we neither apply armbands nor put signs on doors for children with DNR orders.
Portland, Maine

We do not put armbands on the DNR patients; it is on their chart only.
Atlanta, Georgia, United States

Yes. They are purple bands that don't say anything.
Rochester, United States

Peer Learning

Question:

I am wondering if anyone has any experience with using peer learning as a strategy to integrate new nurses into the PICU. We are in the beginning phase of exploring this possibility. Any suggestions about what works best, or what doesn't work?
Montreal, Canada

Answers:

I designed a 4-hour group meeting for our ICU new graduates during their orientation in which one of them presents an actual clinical case to the group and they work through and discuss it together. This helps them learn from each other, without intimidation from an 'expert'.
Seattle, United States

We tried the concept of a senior RN/two orientees during last year's orientation session and it did not work well. We had one orientee that caught on very quickly, she was 'aggressive' in her learning styles and wanted to be very hands on. The other orientee was methodical and meek; she liked to watch, then read, then do the task. This made a very lopsided orientation as the first RN grasped the tasks very quickly and the second RN grasped the concept. Not well balanced. Neither of them was pleased with this situation, so we abandoned the pairing and split the orientees into a traditional 1:1 preceptor/orient. Once we did that, it was smooth sailing for both orientees.
Rockford, United States

Central Venous line – Blood Draws

Question:

Does your facility allow blood draws for laboratory work from a temporary central line? If yes, do you use a closed system? If so, what system is that? Have you ever tried using an arterial line set up as a method to draw from your central lines? If yes, what was the outcome?
Memphis, United States

Answer:

Yes, we use a double stopcock system and re-infuse the "waste", just as we do with arterial lines. We don't use an arterial line set up. If we have nothing infusing through the lumen, we often keep the line open via a Sorenson flush system and have had no issues with increased occlusion or infection.
Portland, Maine

Potassium Replacement

Question:

At what serum level would you consider replacement of potassium in your cardiac and non-cardiac patients? If you do replace potassium, is this via a continuous infusion or IV/oral bolus?
London, United Kingdom

Answers:

We generally replace potassium below 3.2 in our cardiac kids, 1 mEq/kg over 1 hour. We don't worry as much about hypokalemia in our cardiac kids who are feeding.

Portland, Maine

We generally keep our potassium at 4 for our cardiac surgical kids.

Birmingham, United Kingdom

We keep the cardiac patients' potassium levels at 4.0 or above with KCL usually 0.5 to 1mEq/kg/dose over 1 to 2 hours by Central Venous Line. If they can tolerate orally, that would be our preferred route. The general PICU keeps their potassium levels at 3.5 or higher.

United States

Naso-gastric Tube Placement**Question:**

What is your policy or guideline regarding confirming placement of a naso-gastric tube with an x-ray in pediatric patients?

Chicago, United States

Answer:

By policy, we don't have to. But if there's any doubt at all, we do get a bedside flat plate.

Rochester, United States.

New ICU Chart: Documentation Evaluation Feedback Questionnaire**Question:**

We are working on a pilot study of New ICU Documentation System: ICU Observation Chart. The chart has already been approved by the authority and now will be in use for one month and then will be evaluated through feedback that will be obtained from all the nurses and ICU doctors.

Have anyone worked on a survey feedback questionnaire or been involved in designing a questionnaire for evaluating a new documentation system in the ICU or any related questionnaires?

Mauritius

Answer:

With regards to the request for an evaluation/survey feedback form, is it a template you are looking to use?

An easy and free source is on www.surveymonkey.com. We use this online site to create many surveys and collect feedback. You can also create a survey, then print out the survey, and collect in paper format if others cannot enter the feedback via computer. It used to be free to collect up to 100 responses to a survey and it will analyze the date.

Seattle, United States

Pediatric Transport Service**Question:**

Just wondering if any of your units staff a Pediatric Transport Service and if so, what staffing model is utilized? Are nurses supernumerary to unit staffing? Are nurses specially hired for this role? What qualifications? How do they ensure critical care skills maintained? What other duties/responsibilities are assigned when not out on transport?

Saskatoon, Canada

Answer:

We have a transport program. Our models in the NICU and PICU are quite different. The NICU transport team consists of a RN, a RT and a Neonatal Nurse Practitioner. The transport nurse is not in a patient assignment. Nurses are not specifically hired as transport-only nurses; one of the staff nurses is designated as the transport nurses for the shift, and when not on transport they assist the rest of the staff. They are NALS certified. Our PICU transport team consists of a RN, RT and a senior resident. The RN is in a patient assignment; if we need to go out on transport, we adjust assignments to accommodate the transport. We also have several nurses living nearby who are willing to come in extra to do the transport. Transport nurses must be PALS certified. Many of us have pediatrics CCRN certification. All transport

nurses have extensive PICU experience.
Portland, Maine

Changing Vasopressors Infusion Bag/Syringe

Question:

I was wondering if anybody is willing to share either practice or policy for the changing of vasopressor drips. This practice seems to vary from nurse to nurse and I want to make it consistent amongst our nurses.

Orlando, United States

Answer:

Hang time is 24 hours, so we change bags/syringes at that point whether or not they are empty. In our very tenuous cardiac kids, who are on multiple vasoactives, we keep 2 sets of pumps; we prime new tubing and run the drips for an hour on the spare pumps before switching over the entire set. Dopamine is mixed in the TPN, so we switch everything over at the time the new TPN is hung.

Portland, Maine

July-December 2009

Potassium Chloride

Question:

I would like to know your current practice on potassium bolus for hypokalemia. Our protocol says: 0.5-1.0 mEq KCL/kg of a KCL solution of 0.5 mEq/ml given over 60 min in a central line only. Then, this line should not be used for infusion of a solution at a rate greater than the rate of the potassium bolus for the following 2 hours. E.g.: For a 3 kg patient, 3 mEq over an hour. Solution is 0.5 mEq/kg, the 6 ml over 1 hour, then 6 ml/hr to a central line. After the hour, the rate of the infusion of the new solution should not exceed 6 ml/hr for the following 2 hrs.

- We are questioning if that 2 hrs could be reduced to 1 hour?
- Are there any other criteria that you follow?
- Are you giving the bolus to the closer stopcock to the patient?

Montreal, Canada

Answers:

We would use the dosage you indicated over 2 hour, mixing the KCL solution to a concentration maximum of 200 mEq/L for CVL or 80 mEq/L for peripheral intravenous (PIV). If only have PIV, this is sometimes quite a significant volume for patient, so if needing to do this frequently, a CVL may need to be inserted. Following, we would run a volume of saline 2 times the line lumen volume at the same rate the KCL run to clear the line, usually this is only 1-2 ml then could use either CVL or PIV for whatever else is needed. We, of course, have labels indicating concentrated solution affixed to the KCL infusion. I know there are always concerns about 'flushing' in the remaining KCL in line lumen too fast competing with need for vascular access. We would use these same guidelines for potassium phosphate, basing concentrations on the K+ component.

Saskatoon, Canada

Our protocol is to run an infusion of 0.5 mEq/ml solutions until the hypokalemia is corrected rather than bolus.

Canada

Bubble CPAP Policies/Procedures

Question:

Does anyone have PICU bubble CPAP policy they would be willing to share?
Rockford, United States

Answer:

We do use bubble CPAP and have guidance for setting it up, but no policy.
Birmingham, United Kingdom

Operative Procedures Outside Operating Room

Question:

Does anyone do some operative procedures outside of the operating rooms at your institution such as tonsillectomies and adenoidectomies? These would not be emergency cases but regularly scheduled cases. Is so, what kind of training is provided to the nursing staff caring for these patients?
Baltimore, United States

Answers:

No, this is not something we have come across.
Vancouver, Canada

Routinely, we only do chest closures out o the Operating Room.
Birmingham, United Kingdom

The only true operative procedure we do in our PICU is sternal closures and we have a specific policy that must be followed. We do have a Pediatric Procedure area that does outpatient bronchoscopes, endoscopies, T&As, bone marrow biopsies, etc. It was created to address the overflow issues that I think you are dealing with and also to provide this care in a more pediatrics “friendly” atmosphere. We had to go through a lengthy procedure for approval by our state Department of Health that included ventilation/air flow requirements, which procedures could be done in which rooms, how to transport contaminated equipment to central sterile, etc.
New York, United States

It has never a scheduled operative procedure in PICU. Emergent abdominal surgery is the extent of what we have done in PICU.
Rockford, United States

Peripheral Intravenous Therapy

Question:

We have many questions about PIV’s and their life-span. Anything you can offer would be greatly appreciated.

- What brand of PIV do you currently use?
 - Do you have any data concerning the life-span following insertion?
 - What do you consider an “infiltrate”?
 - Do you have infiltration rates that you are willing to share?
 - What do you use to “lock” your non-running PIVs? Heparin or Saline?
- Washington, United States

Answers:

Just changed from Insyte to Jelco Protect IV Plus Safety

- Few days, a week would be long, and we don’t routinely change.
 - Anything not running well and we include clotted ones, red, tender, increased pressure, change noted by child/parent or not flushing perfectly.
 - Will forward to our data base person and see if we have them.
 - Saline to lock if in use and relocked q8h and Heparin if over 24 hours – seems to be the positive pressure lock that is more important than what you lock with.
 - Apparently our IV team thinks it would be a good idea for us to monitor all infiltrations – at this point, they are a small program.
- Washington, United States

Actually we use Jelco Catheter. To lock non-running PIV we use heparin solution 10 unit/ml of saline.
Italy

The majority of unintended PIV removals in the PICU are related to infiltrations. We have very few unintended removals. We use a product called StatLock to secure the IV sites. Our hospital policy mirrors the CDC recommendations of not having a "required" timeframe for our PIV site duration for pediatric patients.

Rockford, United States

Patient Assignments

Question:

We are trying to benchmark with other PICUs in terms of how patient assignments are made. Please respond to the following:

- Who decides how patients are singled, paired etc (e.g. off going charge nurse, or on coming charge nurse, staff preference)?
- What is the rationale behind the system that you use?
- Does nursing staff have any input in to what assignment they have for the day?
- Have you recently changed how patient assignments are made? If so what was the reason a change was made and did it meet your goals?

United States

Answers:

In our PICU the Team Leader (TL) allocates 1-2 shifts ahead and changes are updated or changed as needed by the next TL. Requests for education/training purposes are made by the education team and any individual staff requests are also considered.

Recently the staff allocation book was changed so that all staff names are at the top of the page. Staff on for retrievals, ECMO etc is highlighted making allocations easier to plan. There is a little space to write notes (e.g. who they are preceptoring, if they are having a clinical assessment etc.) next to their name, which all informs the TL when allocating. Patient allocations are at the bottom of the page.

With regard to pairing patients, we nurse all intubated patients on a 1:1 ratio. The TL will generally make the decision on pairing based on patient stability, infection control and skill mix. However we do not have any firm criteria for this.

Brisbane, Australia

We have looked at how we complete patient assignments here over the last few years; the issue arose because of complaints from staff regarding fairness, consistency, development opportunities, etc. There were concerns coming from families of our long term kids as part of a Unit Based Council developed to address healthy environment concerns, we asked for input from staff to develop the attached guidelines. We have staff work on assignments with the charge nurse so they can help and become aware of complexities. Staffs are also encouraged to call in if they have special requests. One of the issues that came up with doubled assignments (usually more stable, non-intubated children) is that this should not be automatically given to the more junior or less experienced nurse as it can be more difficult to manage timing and priority setting.

We have profiles for each nurse regarding their competencies, certifications, restrictions, etc – these are more or less easy to use depending on how currently they are maintained.

Vancouver, Canada

In our PICU, the charge nurses make the next day's assignment (i.e. the day shift charge nurse would make the next day's assignment and the night shift charge nurse makes the next night's assignment). This way the charge nurse is making assignments based on the experience level of the people they are most familiar with. The charge nurse makes changes to the next shift's assignment as needed (if kids get sicker or better and then can be paired).

The nurses are encouraged to call ahead if they are in need of particular assignment. We always try to put nurses that may have just taken a class or competency in those assignments while things are fresh for them. It is also the preceptor's responsibility to call ahead for assignments that they are in need of for teaching.

Having said all that, we strongly promote consistency and continuity of care and try to put the same nurses in the same assignments when possible.

At the beginning of the year we implemented a new tool to measure patient acuity and are trying to use that for pairing patients and keeping them 1:1. We also were having nurses complain on their assignments not always being appropriate. It has been a useful tool, but we are experiencing some issues with all of the charge nurses utilizing the numbers.

We also have put an index card box at the charge nurse desk that each nurse is responsible for filling out on what experience they need and already have. The charge nurses are also supposed to view those cards when possible on making assignments offering growing opportunities for all the nurses.

It is a very complex task to please everyone, especially since we have expanded our unit and our routine operating with 18-20 nurses per shift.

Georgia, United States

Intra-abdominal Pressure Monitoring

Question:

I am currently working on developing a protocol on intra-abdominal pressure monitoring. It is well described and studied in adult but not much in children. My questions are:

- The World Society of the Abdominal Compartment syndrome recommends instillation of 1 ml/kg for children (max 25 ml) of saline. A recent study by Ejike in critically ill children showed that, irrespective of the patient's weight, the minimal volume should be 3 ml. What do you do?
- I am also wondering at what level do you zero your pressure line at.
- What do you consider normal IAP in children?

Montreal, Canada

Answer:

We use the abViser and AutoValve Intra-abdominal pressure monitoring kit in our ICU. For measurement our policy states:

- Performing measurement – Place the patient in a supine position, if the patient will not tolerate a supine position, position as flat as possible and re-measure bladder pressure on the patient position every time.
- Level and zero the transducer at the level of the mid-axillary's line.
- Using the syringe set in kit and normal saline, inject the bladder briskly with ordered volume of normal saline
- Usual volumes – maximum of 20ml depending on patient sizes
- Pediatric fluid infusion volume = 1ml/kg + 2 ml additional to prime up to 18 kg. Beyond 18 kg use 20 ml.

Seattle, United States

Pediatric Advanced Life Support (PALS)

Question:

Does your employer at your facility require and/or fund PALS certification for PICU nurses?

Victoria, British Columbia

Answers:

In the UK there are no rules. In our unit we put all our nurses through the one day PALS course. As they become more senior they have the opportunity to do ELPS or APLS. We like all our senior staff and retrieval team to have APLS. We pay for all these courses and give them the time.

Birmingham, United Kingdom

At Mayo, PALS and ACLS are required for all PICU nurses, and the cost is covered, and nurses are paid for the time in class, but not the preparation time.

United States

Yes, it is a requirement for all of our Pediatrics, PICU, Outpatient Surgery, Recovery Room, and Emergency Room staff RN's to maintain current PALS certification. It is funded by the hospital.

Rockford, United States

In my unit, it is not a requirement for nurses, even if it's strongly suggested. It was funded by the hospital in the past, now nurses have to pay for it.

Padua, Italy

We put nurses through PALS following orientation and it is funded.
British Columbia

Yes, PALS certification is required for all PICU and pediatric nurses. The Children's Hospital also pays for the course.
Oregon, United States.

It is provide at Saint Louis Children's Hospital and is required after 6 months to 1 year of employment, Re-certifications are also covered unless it is allowed to lapse, then the employee is responsible for paying of it,
Missouri, United States

Continuous Albuterol Nebulization

Question:

Do any of your general pediatric units allow a patient to be on continuous albuterol nebulization or would that patient be admitted to PICU? I am referring to those borderline kids who got put onto continuous in your Emergency Department and are not working too hard but don't get weaned prior to being ready to transfer to the inpatient side. If so, how long can they be on continuous prior to transferring to PICU?
Rockford, United States

Answers:

At Mayo clinic in Rochester, children on continuous albuterol can be admitted to the general pediatric floor. As a parent of a child with severe asthma, I must admit I didn't think much of this. Since there was no one but me continuously visualizing my child, I didn't feel I could leave for a minute as he frequently threw up when he was on continuous nebulization. He would choke and turn blue from the effort of breathing and puking, and needed constant vigilance to suction and keep him calm during these episodes. Considering that these are tachycardic children with tenuous airways, I can't see how admitting them to general care is justified.
Seattle, United States

Our patients on continuous nebulizers would definitely be in PICU. Only go to ward when they can be managed on a Puffer or Spacer,
Melbourne, Australia

If our kids need continuous, they go to the PICU. We usually send to the floor when their treatments are q2hr.
Ohio, United States

At Doernbecher you can stay on the regular floor for up to 2 hours of continuous treatments and then depending on how you are doing, may be a point where you will be transferred to the intermediate unit.
Oregon, United States

We keep kids in PICU until treatments are at least 2 hours.
Marshfield, United States

Continuous treatments are only in the PICU. Ours are admitted to the PICU – they may spend several hours under observation if they are borderline. They only transfer to general ward once they are weaned to q4h nebulizers.
Portland, Maine

Our patients can be in our Pediatric Intermediate Unit with continuous nebulizers as long as they are stable. They generally can be transferred to the general floor at q2hr
Illinois, United States

We have two units that can accommodate these patients. They are transferred to the PICU unless they are in impending respiratory distress.
United States

In the Children's Hospital of New Jersey they stay in the PICU for their treatments and are at least q4hr apart.
New Jersey, United States

At St. Joseph's Children's Hospital in Tampa we require all receiving continuous nebulization to be in the PICU.
Florida, United States

Patients requiring continuous aerosols are monitored in the PICU, generally transfer patients to the floor once they required aerosol treatments at q3hr or greater.
Miami, United States

All of our patients requiring continuous nebulizers automatically come to the PICU.
Atlanta, United States

We do not have this luxury in our PICU. If the child's airway was at risk then we would have them in PICU if there is beds, otherwise they would go to medical HDU.
Birmingham, United Kingdom

We can do q1h nebulizers X 3 in Pediatrics prior to required transfer and continuous in PICU only. Of course, if condition deteriorated they get transfer to PICU. Currently considering continuous in Pediatrics before auto-transferring to PICU if condition stable.
Rockford, United States

Drug and Fluid Charts

Question:

We are currently reviewing our drug and fluid charts and would be really interested in having a look at the charts that you are using.
Auckland, New Zealand

Answer:

Actually I've been working since years on innovative charts, including drug and fluid chart in recent but need a little change after evaluation. If you want I can post it or send you a scan photo of the chart and give you a brief explanation about its use.
Mauritius

IV Pump and Tubing Labeling

Question:

At Le Bonheur Children's, we currently have policy concerning the labeling of IV tubing as well as labeling of infusion pumps based on what is infusing. The tubing is labeled so that we can easily identify what needs to be changed out each shift based on what is infusing, For the pumps, we have a policy to label if an enteral feeding is being infused via syringe pump for patient safety.

My questions are these:

- Does your facility have a labeling policy for IV tubing?
- Does your facility have a labeling policy for external feedings being infused by syringe pump?
- Does your facility have a labeling policy for the IV pumps?
- If you have smart pump technology for your syringe pumps, do you still label those?

Memphis, United States

Answer:

Yes, we have a very strict labeling policy. We have colored, preprinted labels for most of our drips that are placed on the pump, the tubing as it exits the pump, each connection, and the end of the tubing closed to the patient. We also have labels for "PIV", "central line", arterial line" etc. to put on the tubing, so that it is obvious where each line is going, and on the line, so that the wrong tubing won't be put to the line. Yes, we label even our smart pumps.

Seattle, United States

Vasoactive Medications

Question:

We are reviewing our policy on vasoactive medications and would like to know how vasoactive drugs often pumps are cleared for vasoactive drugs every hour, every 2 hours, etc.
Memphis, United States

Answers:

We clear all IV pumps hourly, irregardless of type of infusion. This gives us accurate intake for the hour and cumulative fluid status hourly.
Saskatoon, Canada

We clear feed pump volumes every 24 hours and for syringes we read the actual volume infused each hour, by reading the measure on the syringe. Fluid pumps we put in the volume to be infused. When that volume has gone in, we then clear it.
Birmingham, United Kingdom

In our unit we never reset the pumps. We calculate fluid balance every 2 or 4 hours and it depends on patient's stability of vital signs, and once a day we do fluid balance of the day.
Padua, Italy

In our unit we reset the pumps at midnight, for the fluid balance chart the amount the infusion pump is set at is what is recorded. The infusion pump rates are checked and signed for handover to ensure the prescription matches the rate set. We do measure all drain and IDC losses hourly. Standard replacement for post cardiac patients is ml for ml replacement in the 1st 12-24 hours and then is assessed on a daily basis.
West mead, Australia

We are trying to move to clearing all pumps regardless of medication q2h. This has been a challenge for us, as it has not been in our culture in PICU. Our Pediatrics unit routinely does clear q4h.
Rockford, United States.

We routinely do a 12 hourly fluid balance and so clear total volume infused for all infusions each 12 hours. We don't treat vasoactive drugs differently in that regard.
Curtin, Australia.

We do not routinely clear pumps in the critical areas.
Miami, Florida, United States.

Every 12 hours our pumps are zeroed for totals to begin for net shift.
Vancouver, Canada.

Central Venous Line Insertion

Question:

Does anyone have protocols or best practice standards for confirmation of that placement of CVL in the event the line was inserted for fluid administration only and not monitoring?
Miami, Florida, United States.

Answers:

By attaching a transducer and displaying a waveform you will have instant confirmation of the vessel, i.e. venous waveform versus arterial waveform. Then we would x-ray for tip confirmation, only then would we administer any fluid or drug.
Australia

Central Venous or arterial, we always combine pressure and ABG in case of deep line placement. X-ray is more like 'global' routine for checking lungs, tube(s) and catheters.
Brussels, Belgium

Gastric Tube

Question

We are curious to know your policies related to frequency of replacing gastric tubing. What frequency in changing for PVC tubing versus the silicone or polyurethane tubes.

British Columbia

Answers:

The hard plastic NG tubes (PVC) we change every 7 days. The softer plastic we change every 30 days. We did this after contacting the manufacturing recommended. It may be different for your manufacturer. Cleveland, Ohio, United States.

We use the Polyurethane ones for feeding and replaced them every 7 days. The PVC tubes get replaced if accidentally removed. Usually are not in for extended periods of time.

Memphis, United States

Urinary Retention and Bladder Scanning

Question:

I am working on a protocol on urinary retention and bladder scanning. I was wondering how often you scan your patient and at what point do you consider doing a catheterization?

We are going by the calculated time to void; predicted bladder volume divided by hourly IV rate and scan q1h if the child has not voided by the calculated time. What do you think?

Montreal, Canada.

Answer:

Sounds rather cumbersome and not really responsive to patient condition as how much a child makes isn't directly dependent on IV rate, after all; many other factors are involved. The rule I've always used is, scan whenever the child appears distended, or complaining of being unable to void. "Complains" meaning any expression of discomfort that is appropriate for the child age and mental status, or he/she hasn't voided in 6 hours. I've never had a missed distention problem using these guidelines.

Seattle, United States.



Instructions for Authors

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Pediatric Intensive Care Nursing is an international journal which promotes excellence in clinical practice, research, education and management, and provides a forum for the exchange of knowledge and ideas. The editors welcome articles on any topic of interest to pediatric or neonatal intensive and critical care nurses.

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Format

Manuscripts must be written in English; either American or British spelling may be used but must be consistent throughout. Manuscripts should be typed double-spaced, using Arial or Times New Roman font in at least 11-point, with margins of at least 2 cm or 1 inch. Number pages consecutively beginning with the title page. The preferred length for research, clinical and review papers is 1000-2500 words, excluding references. Submissions to Spotlight on PICU should not exceed 1500 words. The sections of the manuscript should be in the following order.

Title page

- Title should be concise and informative, and typed in bold capitals.
- Names (first name, initial(s) and family names) of authors in the order in which they are to appear. Include a maximum of 4 qualifications for each author
- Institutional affiliation(s) of each author
- Address, telephone and fax numbers and email address of corresponding author

Abstract

An abstract not exceeding 250 words is required for all submissions except those for Spotlight on PICU. For research studies, the abstract should be structured under the following headings: Background, Methodology, Results (or Findings), Conclusions.

Body of text

Use headings to structure the paper. The type of paper will determine the headings, eg for research papers the main headings will be Introduction, Background, Methodology/Methods, Results/Findings, Discussion, Conclusion. Up to 2 levels of headings may be used. Papers reporting research conducted in humans or animals should include a statement that the study was approved by the relevant body or bodies.

References

The list of references should only include works that are cited in the text and that have been published or accepted for publication. References such as "personal communications" or "unpublished data" cannot be included in the reference list, but can be mentioned in the text in parentheses.

References should start on a separate page following the text. They must be numbered in the order in which they appear in the text and listed in numerical order. In the text, designate reference numbers on the line (i.e., in normal text, not superscript) in parentheses. If using Endnote or Reference Manager, references should be formatted using the style *Intensive Care Medicine*.

Examples

Journal article: Tan AM, Gomez JM, Mathews J, Williams M, Paratz J, Rajadurai VS (2005) Closed versus partially ventilated endotracheal suction in extremely preterm neonates: physiologic consequences. *Intensive and Critical Care Nursing* 21:234-242

Journal article published on-line ahead of print: Duff JP, Rosychuk RJ, Joffe AR (2007) The safety and efficacy of sustained inflations as a lung recruitment maneuver in pediatric intensive care unit patients. *Intensive Care Medicine* 10.1007/s00134-007-0764-2

Book: McHaffie H (2001) *Crucial decisions at the beginning of life: parents' experiences of treatment withdrawal from infants* Radcliffe Medical Press, Abingdon

Book chapter: Cordery C (1995) Doing more with less: nursing and the politics of economic rationalism in the 1990s. In: Gray G, Pratt, R. (ed) *Issues in Australian Nursing* 4. Churchill Livingstone, Melbourne, p 355-374

Conference paper: Copnell B, Tingay DG, Kiraly NJ, Sourial M, Gordon MJ, Mills JF, Morley CJ, Dargaville PA Comparison of the effectiveness of open and closed endotracheal suction. Proceedings of the Pediatric Academic Societies' Annual Meeting, San Francisco, May 2006. E-PAS2006:2059:5560.2342.

Electronic source: National Institutes of Health (2004) Program announcement: Improving care for dying children and their families. <http://grants1.nih.gov/grants/guide/pa-files/PA-04-057.html> Accessed: July 20, 2004

Figures and Tables

All figures (graphs, photographs, diagrams) and tables should be numbered consecutively and cited in the text. Each figure and table should be on a separate page at the end of the manuscript. Tables should have a title above and, if needed, a legend at the bottom explaining any abbreviations used.

Figure legends should be typed on a separate page. They should be concise but self-sufficient explanations of the illustrations.

Illustrations should be supplied in electronic format.

Written permission must be obtained to reproduce illustrations and tables that have appeared elsewhere, even if the work of the author(s). Borrowed material should be acknowledged in the legends. Identifiable clinical photographs must be accompanied by written permission from the persons in the photograph, or parent or guardian for children.

Manuscript submission

Electronic submission is required. Manuscripts should be saved as a Word document and emailed to the editor Franco Carnevale (franco.carnevale@mcgill.ca).

Submissions to Spotlight on PICU can be emailed directly to the column editor, Dr Bev Copnell, at Beverley.Copnell@med.monash.edu.au