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Editorial

Pediatric Intensive Care Nursing: I just love this Journal!

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There are so many interesting things to do in this exciting field of ours. So, we have to continually make choices about our priorities. I hope that one of your priorities will be to read this and every issue of our Journal. I consider myself so fortunate to have the possibility of seeing each issue come to life, reading each manuscript, seeing the reviewers' comments – then, piece by piece each issue comes together to form a wonderful whole.

This issue is no exception. It exemplifies the extraordinary range of important concerns that we have as pediatric critical care nurses. The first paper by Onno Helder and colleagues is a scientific analysis of the merits of vibration therapy on CPAP need. The following paper by Vednidhi Mudhoo presents a moving account of the difficult conditions faced by nurses in Mauritius caring for critically ill children.

Next, Francoise Martens and colleagues report on an interesting study of parental participation in PICU care. Our usual Questions & Answers column outlines a number of the stimulating issues that have been discussed on our egroup PICU-Nurse-International. Finally, our colleague from South Africa, Minette Coetzee describes a PICU in Cape Town, South Africa.

What a wonderful opportunity to read about such a wide range of topics – truly from around the world – all about pediatric critical care nursing. This is a wonderful opportunity to be reminded of our impressive network of colleagues throughout the globe.

We hope you enjoy this issue!



Vibration Therapy Reduces CPAP Need in a Prospective Randomised Controlled Trial

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Abstract

Background: Increased mucus production is a common phenomena following ventilatory support, which might increase morbidity. In order to reduce airway obstruction we tested the effect of vibration therapy on the duration of ventilatory support.

Methodology: We conducted a randomised control study in a level IIIC NICU (28 beds) of a university hospital. Compared were non-active techniques to vibration therapy in preterm infants with a gestational age of 26 – 33 weeks. All infants were ventilated or receive respiratory support by nasal CPAP.

Results: 104 infants were enrolled, 49 in the vibration group and 55 in the control group. Demographic characters were in the vibration group compared to control group mean birth weight 1274 (\pm 335) gram vs. 1240 (\pm 351) gram and mean gestational age 29.8 (\pm 1.3) weeks vs. 29.9 (\pm 1.4) weeks. Vibration therapy did not reduce ventilation time (100

vs. 80 hours, $p = 0.88$) however duration of CPAP decreases significant (57 vs 157 hours, $p < 0.018$).

Conclusion: Vibration therapy reduced Mean Airway Pressure, oxygen requirements and CPAP need in preterm infants, but did not reduce the duration of mechanical ventilation.

Keywords: vibration therapy, ventilation, infants, CPAP, airway clearance

Abbreviations: CPAP: Continuous Positive Airway Pressure; IVH: Intracranial Ventricular Hemorrhage; MAP: Mean Airway Pressure.

Introduction

Endotracheal intubation and ventilatory support of preterm infants causes airway trauma and inflammation and increases mucus production (Flenady & Gray, 2002). An elevated mucus production could lead to respiratory disorders e.g. atelectasis, infection and hyperinflation, which cause decreased gas exchange (McCool & Rosen, 2006). Several interventions have been suggested to reduce airways obstruction by mucus, such as alternating positioning of the infant and frequent suctioning (Al-Alaiyan, Dyer, & Khan, 1996). An alternative airway clearance intervention is active chest physiotherapy by means of vibration. Vibration is a traditional intervention that is used in patients with respiratory disorders, but the existing literature is inconclusive with respect to its effectiveness (Finer et al., 1979; Flenady & Gray, 2002). Most published studies concerning vibration therapy were performed in young adults with cystic fibrosis (McCarren & Alison, 2006; McCarren, Alison, & Herbert, 2006; McCool & Rosen, 2006)

It was hypothesised that vibration therapy would decrease the time needed for respiratory support in premature newborns. Primary outcome was number of hours of ventilatory support by ventilation or nasal CPAP.

Methods

Design

The research design that we used was a prospective randomised and controlled study. The Erasmus MC Institutional Review Board approved the study and written informed consent was obtained from at least one of the parents.

Sample

We included neonates with gestational ages from 26 to 33 weeks, who were ventilated or received respiratory support by nasal Continuous Positive Airway Pressure (CPAP). Exclusion criteria were high frequency oscillation, and/ or nitric oxide-therapy, persistent pulmonary hypertension, pulmonary haemorrhage, thorax drains or rib fractures.

Subjects were randomly allocated to either of two groups. Included were all patients who were expected to need ventilatory support for

more than 24 hours. The administration of surfactant was not an exclusion criterion.

Setting

This study was performed at a 28 beds level IIIC Neonatal Intensive Care Unit (NICU) (Stark, 2004) in a teaching hospital equipped to provide care to extremely low birth weight infants, advanced respiratory support, e.g. high-frequency ventilation and inhaled nitric oxide, Extra Corporal Membrane Oxygenation (ECMO), and surgical repair of complex congenital cardiac malformations.

Procedures

The concise protocol of vibration therapy was as follows; the start was after randomisation within six hours after delivery. The vibration procedure took place approximately every six hours depending the state of the infant. As tool we used a non-rotating toothbrush (Blend-a-Dent, Mainz, Germany) whose brush had been replaced by a small pad from Mefix® (Mölnlycke Healthcare AB, Göteborg, Sweden). The dorsal and vertical side of the thorax were vibrated alternately for eight minutes. Without exerting too much pressure, the toothbrush was moved from lateral to sternal on a height just beneath and above the nipple. Afterwards, the standard suctioning procedure took place. Every 2 or 3 hours a suction was performed indicated following clinical assessment (Day, Farnell, & Wilson-Barnett, 2002). Standardised ventilation and weaning protocol was used for all infants based on clinical and laboratory parameters.

Outcome measures

Primary outcomes were: initial duration of ventilation and/or nasal CPAP.

Secondary outcome measures were: Mean Airway Pressure (MAP measured by the ventilator Babylog 8000 [Drägerwerk AG, Lubeck, Germany]), FiO₂ (measured by the Babylog 8000), occurrence of IVH (grade according to Papile et al. (Papile, Burstein, Burstein, & Koffler, 1978) and severe incidents (heart rate < 80 / minutes and oxygen saturation < 80% measured by the Philips Viridia CMS monitor (Philips Medical Systems, Boeblingen, Germany) and mortality rate, i.e. relating to patients who died within the study period.

Statistical analysis

A power calculation revealed that we needed 50 patients in each group to detect a difference of 0.6 SD in the primary outcomes with an α of 0.05 and $1-\beta = 0.80$. Statistical analysis was performed by Student's t-test. P-values of less than 0.05 were considered statistically significant. The Statistical Package for Social Science Software (SPSS version 11 for Windows, Chicago, IL, United States) was used for data processing and analysis.

Results

The control group consisted of 55 infants with mean birth weight 1240 (± 351) grams, and mean gestational age 29.9 (± 1.4) weeks [table 1]. The experimental group consisted of 49 infants with mean birth weight 1274 (± 335) grams, and mean gestational age 29.8 (± 1.3) weeks. Two infants in the control group and five in the experimental group died (NS $p=0.25$).

On postnatal day two the number of infants who needed ventilation was significantly lower in the experimental group as compared with the control group: 18 vs. 35 ($p=0.04$). MAP in the experimental group was significantly lower on days 2 (6.1 vs 6.7cm H2O), day 5 (5.3 vs 6.1), day 6 (5.0 vs 6.1), day 7 (5.2 vs 6.5) and day 8 (5.0 vs 6.1) compared with the control group. Vibration therapy had no statistically significant effect on ventilation duration [table 2]. However, there was a clear effect on CPAP duration, both on initial and secondary (CPAP after mechanical ventilation)[Table 2]. Mean percentages of supplied oxygen in the experimental group on days 1, 6, 7 and 8 were significantly lower than those in the control group [figure 1].

Mean oxygen saturation was higher in the vibration group.

The number of infants with IVH was 11 in the control and 10 in the vibration group ($p=0.80$). In one neonate we had to stop vibration therapy because of bradycardia and drops in saturation.

Discussion

Although vibration therapy did not result in a lowering of the mechanical ventilation duration, it decreases the CPAP duration and in addition the mean airway pressure and the FiO_2 whereas oxygen saturation was high.

Vibration therapy also lowered the duration of CPAP when primarily started in patients who did not require mechanical ventilation.

Although a study suggested chest physiotherapy to be associated with brain damage, we did not encounter higher incidences of intracranial ventricular haemorrhage or periventricular leucomalacy (Harding, Miles, Becroft, Allen, & Knight, 1998).

We did not find any adverse effects except for one patient with whom we had to stop the vibration therapy because of bradycardia and saturation drops. No increase of IVH was observed. Harding et al (Harding et al., 1998) reported that active physiotherapy might result in a higher incidence of encephaloclastic porencephaly. We did not find such a correlation, although the number of infants in our study was significantly lower.

The above-mentioned study of Harding was retrospective and the infants with brain damage had more prolonged and severe hypotension. All in all, a prospective randomised controlled study with a large number of infants is needed to determine precisely how safe chest physiotherapy is the way it was applied by us. Since the duration of CPAP decreased significantly we think that the method is effective in reducing the complication of mucus retention.

Conclusion

Vibration therapy reduced Mean Airway Pressure, oxygen requirements and CPAP need in preterm infants without notable side effects, but did not reduce the duration of mechanical ventilation.

Competing interests: none declared

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Table 1. Patient characteristics

| | Control (n=55) | Vibration (n=49) |
|-----------------------|-----------------------|-------------------------|
| Gestational age (wks) | 29,9 (± 1.4) | 29,8 (± 1.3) |
| Birth weight (grams) | 1240 (± 351) | 1274 (± 335) |
| Antenatal steroids | 39 (40%) | 32(33%) |
| Surfactant | 36 (37%) | 27 (27%) |
| m / f | 36 –19 (55) | 20-29 (49) |

NB: See Table 2 and Figure 1 on following page

Table 2. Total duration of ventilatory support

| | <i>Control (n=55)</i> | <i>Vibration (n=49)</i> | <i>p-value</i> |
|--|-----------------------|-------------------------|----------------|
| Mechanical ventilation (hours) | 80 | 100 | 0.88 |
| Ventilation followed by nasal CPAP (hours) | 179 | 137 | 0.27 |
| Initial nasal CPAP (hours) | 58 | 20 | 0.02* |
| Secondary CPAP (hours) | 99 | 37 | 0.049* |

* $p \leq 0.05$

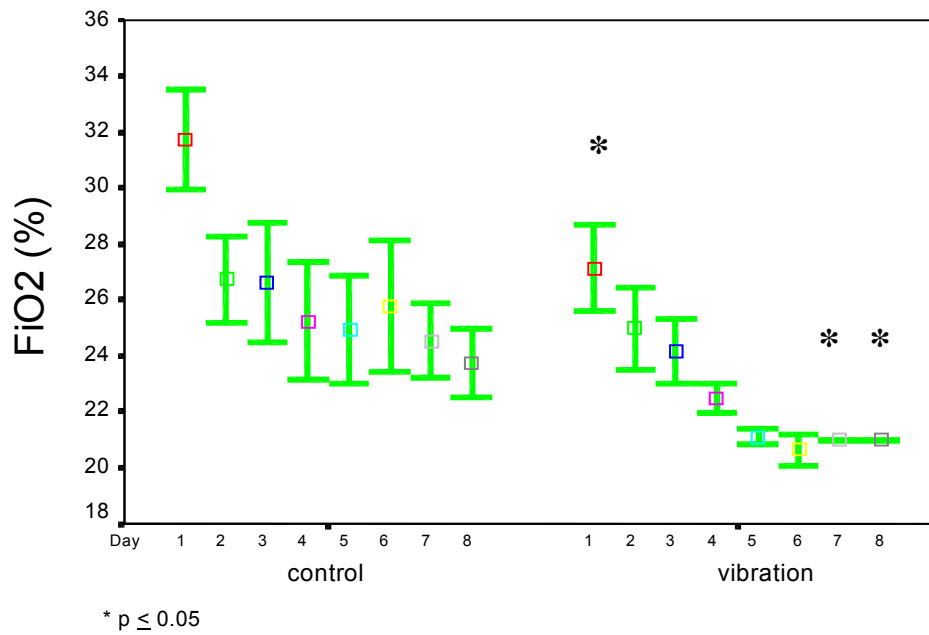


Figure 1. Fraction of inspired oxygen used during the first eight days in preterm infants



A Struggle to Upgrade Quality Critical Care Nursing and to Save Life in Mauritius

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Abstract

This paper describes the difficult conditions under which pediatric critical care nursing is practiced in Mauritius, outlining the challenges involved in adapting care to minimally acceptable international standards. Strategies for overcoming these challenges are discussed.

Victoria Hospital of Mauritius

Covering an area of 25 acres, the Victoria Hospital – PMOC complex is situated in Candos in the district of Plaine-Wilhems of Mauritius. It caters essentially to the district of Plaine-Wilhems and the lower half of Black River district, with a population of about 30% of the whole island. There are only five Regional Government hospitals in Mauritius. There are several specialty services which are found only in this hospital, so it caters to patients from the whole island with regard to these specific services, and also for populations on other islands of the Indian Ocean.

Initially a barrack, this institution was converted in July 1922 into a 400-bed hospital (Queen Victoria Hospital was the second General Hospital of Mauritius).

PMOC stands for Princess Margaret Orthopaedic Centre, this complex was inaugurated in 1956 and was annexed to Queen Victoria Hospital, and the whole complex was known as PMOC-Victoria hospital or simply Victoria Hospital.

Today, it is a 700-bed hospital which is the largest hospital on the island. Technological advancement is not hand in hand with developed countries but still there have been different specialty departments and services offered to the whole population.

Ministry of Health & Quality of Life of Mauritius

The mission of the Ministry of Health and Quality of Life is to enhance the health status of the population, improve the quality of health care delivery with a view to increasing patients' satisfaction and enhance social equity through the provision of a wider range of health services including specialised health care to the whole population. It also ensures that the health sector is consolidated and that the health services remain accessible to every citizen.

The overall management of the Ministry rests with the Senior Chief Executive who is assisted by officers in the grades of the Administrative Cadre, the Medical Cadre and other Technical Cadres comprising the Director of Pharmaceutical Services, the Chief Hospital Administrator and the Director of Nursing.

'Health services accessible for all' is one of the aims of the Ministry of Health and Quality of Life, so health services remain free of charge.

Though the hospital medical services have been progressively changed, the nursing system and quality care is still in a transitional phase but with a profound analysis it is at a standstill phase over the past 15 years.

Central School of Nursing of Mauritius

The Central School of Nursing of Mauritius was opened in 1958, and to date there is a 3-year nursing course leading to a Certificate in General Nursing. After successful completion, the nurse is registered automatically with the nursing council of Mauritius and is posted to work on any ward, Area Health Centre or any specialty departments. There have been no recent changes made to the syllabus.

High Dependency & Intensive Care Unit, Victoria Hospital of Mauritius

The Intensive Care Unit of Victoria Hospital is an 8 bed capacity unit. Previously, it was a Pediatric ward situated in the PMOC complex, and in the 1980s it was converted into a High Dependency Ward to care for seriously ill patients and to provide mechanical ventilation support, and so it became a High Dependency and Intensive Care Unit.

The Consultant Anesthetist is in-charge of the Unit. There is always a Medical & Health Officer in the ICU and an Anesthetist 'on call' in the ICU (24/24hr). There is only one nurse specialized in critical care nursing in the Unit and the other nurses are registered General Nurses of different grades.

The first proposals for innovative changes were made in 2006 by the critical care nurse supported by the Consultant Anesthetist and Anesthetists, Nursing Administrator, Regional Nursing Administrator and other Medical & Health Officers.

These proposals were made to the Ministry of Health and Quality of life with the aim of implementing nursing protocols, as there is not a single protocol in this unit.

Fist innovative project proposal

The main points of the innovative project are:

Documentation There is no ICU observation chart, so charts that are used on wards are used in this ICU. There is duplication of documentation and most of the time is spent just in documentation that is not specific or clear. There has never been the development of care plan for patients; and nurses act largely as clerical staff rather than spending much time involved in caring for the patient. Neither information about Anesthetic drugs (maintaining patients on mechanical ventilation) that are used with patients, or doses of inotropic drugs used are noted as administered, nor are ventilator settings noted. If a patient is on supplemental oxygen that too is not noted. Also, there are no care plans for changing urinary catheters, IV lines, and so on. With the proposed documentation method, nurses will have little to write, but it will be precise and will include development of care plan, no duplication, and all important observations and information would be noted.

Method of personnel assignment A proposal was made to move from a functional method to a case method as critically ill patients need

individualized care - then there would more likely be a development of a care plan for these patients and a reduction of cross infections.

Other proposals focused on:

Admission criteria

Weaning protocol

Nursing practice related to the prevention of ventilator associated pneumonia

Nursing practice in caring for central venous catheters (No safeguards are practiced to prevent catheter related infections)

Nursing practice related to tracheostomy care

Nursing practice related to the prevention of aspiration

Nursing practice contributing to rest and sleep of the patient

Handwashing

All the protocols and nursing practices proposed are evidence-based nursing practices that are widely used internationally.

A high death rate related to septicemia due to catheter related infections has been noted. Moreover, poor suctioning technique without maintaining aseptic technique resulting in mucus plug formation and pneumonia, and poor handwashing have also been noted. Seven out of 10 patients developed septicemia in a one-week stay in ICU; and 100% in those with a greater than one-week stay in ICU.

The trend that the microorganisms are developing resistance is increasing with a steeper slope gradient, according to the pathologist. Most of the blood cultures of patients show the presence of Coliforms, Acinetobacter, Pseudomonas, and Klebsiella. The presence of yeast has also been found.

There had been no response from the Ministry, but then at the end of 2006, the project proposal was sent again to the newly appointed Chief Medical Officer. In February 2007, the first hope appeared as a meeting had been called at the Ministry regarding this project work. There was much appreciation and the efforts were recognized. A decision was taken that in the coming month the project implementation would start up.

But, after that everybody has forgotten about the project and several times the reply from the Ministry is that it is still in consideration.

Second project proposal

In July 2007, a second project was again submitted as it was noted that the ministry was

encountering difficulties in implementing the project because of hierarchy issues - as the proposal was made by a nursing officer (a critical care nurse), though it was appreciated and supported by the consultant-in-charge of the department.

The second project was based on strategies that could facilitate the implementation of the first project proposal. This was done with a view that the problems that could be encountered were already being foreseen and that there would be facilitation in solving the problems and implementation of the protocols and nursing practices.

This too was much appreciated and fully supported by the consultant-in-charge anesthetist, consultant-in-charge neurosurgeon, anesthetists, and other doctors of different specialties. At the Ministry level too it was much appreciated and this time, it was more positive than before.

But again, the same.... Just awaiting the response of the Ministry... though having gotten so much appreciation and a letter from the Ministry that facilitation would be provided to implement the project. It is only on paper...

The project would have brought a high quality standard critical care, and would have contributed to saving lives. Critically ill patients would have received competent intensive care which would contribute to their welfare rather than contributing to the end of life. Critically ill children are treated in this Adult ICU, and these little angels need competent treatment and care. This project intended to equip nurses with specific specialized knowledge in critical care so as to be able to provide fair care and develop nursing care plans for critically ill patients.

The struggle to upgrade quality critical care, combating negligence and malpractice continues, but with a hope that one day there will be a change in nursing standards that will save lives. The contribution of Florence Nightingale toward making nursing a profession, and that of many other great personalities in upgrading this profession, is just being mentioned in great talks and conferences. In Mauritius, Nurses Day is celebrated on May 12th (birthday of Florence Nightingale), but still most nurses are reluctant to upgrade the quality of care, because they have never received Continuing Nursing Education in their long career and have already adapted to not learning, or have stopped growing in nursing education.

The light and hope through PICU-Nurse-International

Coming to know about the World Federation of Pediatric Intensive & Critical Care Societies, it has given us a hope to be equipped with more knowledge and skills to continue the struggle as exhaustion was seen at the horizon - if this struggle ended right now, the Mauritian population would not get good critical care nursing service, with particular concern for the population of critically ill children. A child is a future, happiness, and achievement for a family. So if fair, competent critical care is provided this will certainly be a noble action.

This project intended to provide cost effective high quality care that will be beneficial for the Ministry, as it will decrease unnecessary expenses.

Knowingly, Mrs. Pang Nguk Lan, Assistant Director Nursing of KK Women's and children's hospital of Singapore; and Mrs. Swee Fong Tan, Department of Pediatrics Faculty of Medicine University Kebangsaan in Malaysia, have given us the strength to continue the struggle to upgrade quality care and save the lives of critically ill children. Through discussions with Mrs. Pang, she advised me to join PICU-Nurse International. The eagerness to continue the struggle over the years has increased and so being accepted as a member of this organization, has given another turn and strength.

The Director Franco A. Carnevale of PICU-Nurse-International has shown keen interest to join this struggle to ensure that the critically ill children of Mauritius obtain competent care, by sending letters to the Honorable President, Honorable Prime Minister, Honorable Minister (Ministry of Health & Quality of Life) and several higher grade officers of Mauritius to bring to their attention the need for promotion of pediatric critical care standards and education and care consistent with internationally recognized standards.

Through this support, maybe innovations will emerge, to contribute to saving life and upgrading quality nursing care in Mauritius.

This struggle will continue with this new hope and light and will surely contribute in enhancing the nobility of our nursing profession.

You are invited to join in this struggle by providing your support and guidance, so this struggle does not end without meeting its goals...

Help us in this noble action....



Parental Participation in Care in the Pediatric Intensive Care Unit

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Abstract

Aim: Evaluate the attitude of the mothers of a critically ill child and of the nursing staff with respect to parental participation in a pediatric intensive care unit (PICU).

Methods: Data were collected by means of an anonymous questionnaire based on the Parent Participation Attitude Scale (PPAS) and Personal and Professional Characteristics Data (PPCD) between December 2003 and March 2004.

Findings: When comparing the mother's data with the PICU nurse's data, similarities were found. However, nursing staff seem to have a more reluctant attitude in parental care participation toward the more complicated aspects in care.

Conclusion: This study strongly suggests that both mothers and nursing staff have a positive to very positive attitude with respect to parent participation in a number of care aspects.

Keywords: Communication, Cooperation, Nursing, Participation, Pediatric Intensive Care,

Introduction

The hospitalisation of a child in the pediatric intensive care unit (PICU) is extremely stressful for the parents (1). Decreasing parental stress is necessary in order to reduce the risk of parental posttraumatic stress disorder and enhance parental participation in the quality of care for their critically ill child. Children are admitted to the PICU on medical grounds, usually because one or more of the body systems cannot maintain physiological homeostatic equilibrium without intensive therapeutic support. These conditions carry a greater risk of mortality (2).

From the parents' point of view intensive care units are busy and intimidating places, dominated by ill children, concerned staff

members and worried families. Intensive care units offer little privacy. The medical language may be confusing, but although the PICU may be a traumatic environment, it can also be a place of hope, sometimes the last hope. Some parents hold on to the belief that the PICU is a place where miracles still can happen. PICUs are filled with intense emotional situations, anxiety, sadness and anger are the predominant emotions that parents experience, especially when their child is in an unstable condition and the outcome is unpredictable.

Parents and stress

Parents experience increasing stress as they try to adjust to life in the hospital, try to define their new role as parents of a critically ill child admitted to the PICU (3). Parents feel extremely vulnerable and helpless. The PICU setting can undermine the sense of competence, control and stability of even the most dedicated and loving parents. The admission in the hospital may also be the first separation. Parental stress is increased when the illness is severe, the cause is unclear, and when the outcome is uncertain. Parents consider the changes in the parental role and the disruptions in the parent-child relationship as the most stressful aspects of the PICU environment.

Parent-identified needs

The child's needs remain the most important in the parent's thoughts and concerns. They usually put the child's needs above their own and may carry this to such a point that they do not adequately care for themselves.

Parental care participation in the PICU

Participation means getting involved or being 'allowed' to become involved in a decision-making process or the delivery of a service or

evaluation of a service or even simply to become one of a number of people consulted on an issue or matter (4, 10).

There can be collaboration between the nurse and the patient/parent when both parties share the same assumptions and value each other's contribution without fear of recrimination.

The reward for shared care is that it reduces the disruption that sick children and their parents experience during hospitalisation (5).

The aims of sharing the responsibility for care include: to reduce parents' anxiety, to improve communication between parents and health professionals, to facilitate a smoother transition from hospital to home and to empower parents to make family health care decisions (6).

Elements important in the concept of shared care include: sharing of responsibilities between parents and nurses, providing education and nursing care, identification of individual needs of children and their parents, negotiation between parents and nurses about the delivery of care and regular communication and updating of agreed-upon care plans (6-7).

Aims of the study

The attitudes of both nursing staff and of mothers of critically ill children were examined with regard to parental care participation in the PICU.

Methods

This quantitative study was conducted in two PICUs and one PIMCU (Paediatric Intensive Mid-Care Unit) in two University hospitals in Belgium. Data were collected between December 2003 and March 2004. Respondents were recruited from the entire nursing staff and mothers of critically ill children admitted to the PICU for at least 2 days. Mothers took part in the study on day 3 of admission. Mothers should have some knowledge in a number of care aspects in the PICU before they are able to have a certain attitude with respect to parental care participation. Moreover the mothers need some time to be able to handle the stress which results from a PICU admission.

An anonymous questionnaire was used based on the Parent Participation Questionnaire (PPQ). The PPQ consist of 2 parts; the Parent Participation Attitude Scale (PPAS) and the Personal and Professional Characteristics Data. The PPAS is a Likert scale with 24 items, developed by Seidl & Pillitteri and adapted by Gill (8). The PPAS is a reliable and valid measurement tool according to Gill (Cronbach's alpha score = 0.7464).

Ethical considerations

Ethical approval was obtained from the relevant institutions.

Pilot study

A pilot study was conducted to test the clarity of the questionnaire. Ten questionnaires were sent out, 5 in Dutch and 5 in French. The questionnaires were filled in by a member of staff and a mother. Some minor changes were applied after revision of the questionnaires.

Data analysis

The results were processed and analyzed with the statistical programme SPSS 11.0 Statistical Analysis Program Mac® OS X.

Procedure

Parental participation in care is a broad concept. Definition of the concept is difficult, but necessary in a quantitative research project. In this study parental participation care is conceived of in terms of active and passive forms.

Active forms of parental participation consist of:

- a) Feeding
 - Oral feeding
 - Tube feeding
- b) Hygienic care
 - With infusion in-site
 - Without infusion
 - Mechanically ventilated child
- c) Wound care
 - Minor wound care
 - Post-surgical wound care
 - Major wound care
- d) Administration of medications
 - Oral
 - Sublingual
 - Intravenous
 - Subcutaneous
 - Intramuscular
 - Feeding tube
- e) Observation
 - Temperature
 - Infusions

Passive forms of parental participation consist of:

- Presence of the parent at the bedside
- Being updated on the child's evolution
- 24-hour open visiting policy
- Presence of the parent during painful procedures
- Helping to restrain the child during painful procedures
- Assisting the nurse during minor interventions

The PPAS (Parent Participation Attitude Scale) is based on Likert Scale items(9). The different response possibilities for each item are:

1. Entirely disagree (very negative attitude)
2. Disagree (negative attitude)
3. Neither agree or disagree (neutral attitude)
4. Agree (positive attitude)
5. Totally agree (very positive attitude)

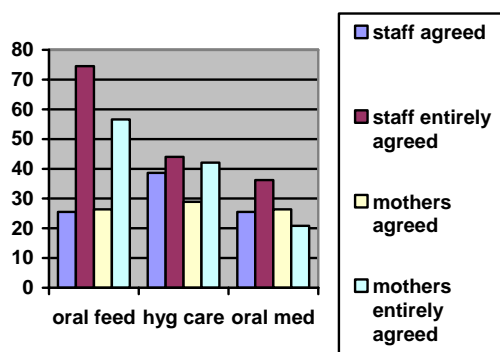
The 'descriptive statistics' in SPSS analyse each item of the attitude scale in which the number of valid perceptions, the number of missing data, the percentage by category, the mode and the median are stipulated.

Results

The response rate for the mothers was 93%. The response rate for the nurses was 76%.

Fifty-three mothers and 47 nurses took part in the study.

Figure 1

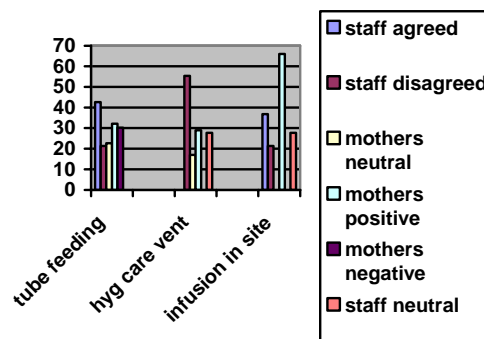


While all the nursing staff agreed or strongly agreed that the mothers can provide oral feeding, only 83% of the mothers agreed or strongly agreed that they felt capable of taking responsibility for this aspect of their child's care

Hygienic care: 38.6% of the staff agreed and 44% entirely agreed that mothers can take on this care. 28.9% of the mothers agreed and 42.1% entirely agreed.

Administration of oral medication: 25.5% of the staff agreed and 36.2% entirely agreed that mothers can take on this care. 26.4% of the mothers agreed and 20.8% entirely agreed, under the supervision of staff.

Figure 2

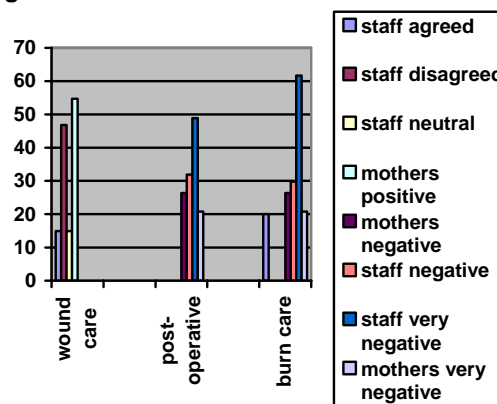


Tube feeding: 42.6% of the staff agreed that mothers can take on this aspect of care, while 21.3% disagreed. 22.6% of the mothers took a neutral position while 32.1% had a positive attitude and 30.2% a negative attitude.

Hygienic care of a mechanically ventilated child: 29% of the mothers thought were able to take on this aspect of care but under the supervision of a staff member. 17% had a negative attitude toward this care aspect. 55.3% of the nursing staff had a negative attitude, while 27.7% had a neutral attitude.

Care of child with an infusion in-site: 66% of the mothers responded in a positive way. 36.8% of the staff agreed mothers can take on this aspect of care, but 21.3% disagreed and 27.7% had a neutral attitude.

Figure 3: Wound Care

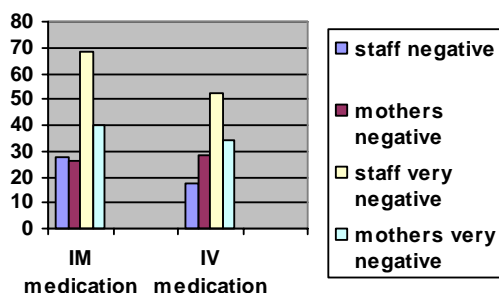


Wound care: 14.9% of the staff agreed that mothers can take on this aspect of care. 46.8% of the staff disagreed while 14.9% were neutral. 54.7% of the mothers had a positive attitude towards this aspect of care.

Post-Operative wound care: 26.4% of the mothers had a negative attitude and 20.8% had a very negative attitude. 31.9% of the staff had a negative attitude and 48.9% had a very negative attitude.

Burn care: 26.4% of the mothers were negative and 20.8% were very negative. 29.8% of the staff was negative and 61.7% very negative.

Figure 4: Administration of medication



Administration of IM medications: 27.7% of the staff were negative and 68.1% were very negative; also, 26.4% of the mothers were negative and 40% were very negative toward this aspect of care.

Administration of IV medications: 17.5% of the staff were negative and 52.5% very negative; also, 28.3% of the mothers were negative and 34% very negative toward this aspect of care.

Table 1: Respondent support for specific statements

1. Children can better handle a hospitalisation when a parent takes part in the care.

76.6% of the staff and 79.3% of the mothers agreed.

2. The presence of a parent comforts the child.

59.6% of the staff and 77.4% of the mothers agreed.

3. It is better that the parent feeds the child.

46.6% of the staff and mothers agreed.

Figure 5: Graphic presentation of data in Table 1

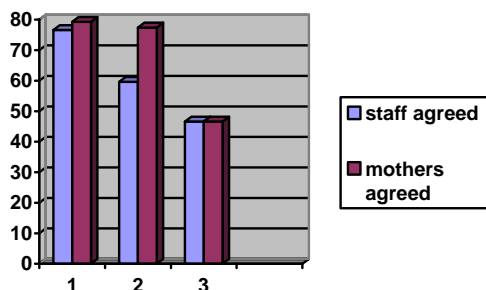


Table 2: Respondent support for specific statements

1. Parents should not be allowed to visit their child whenever they want.

23.4% of the staff agreed, 25.5% disagreed and 34% were neutral, 22.6% of the mothers agreed, 50.9% disagreed and 15.1% were neutral.

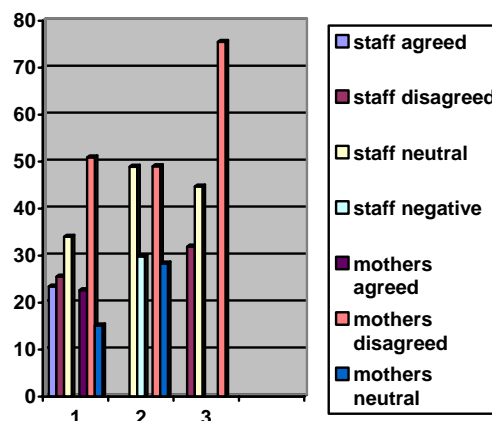
2. Nurses should always administer medication even if this is medication that parents are used to administering to their child at home.

48.9% of the staff were neutral and 29.8% had a negative attitude toward this item. 49% of the mothers disagreed and 28.3% were neutral.

3. In general parents should not be allowed to stay with their child during examinations or procedures.

31.9% of the staff disagreed and 44.7% were neutral while 75.5% of the mothers disagreed.

Figure 6: Graphic presentation of data in Table 2



Conclusion

Communication, participation and cooperation are key aspects of parental care participation in the PICU. This study's findings strongly suggest that both mothers and nursing staff in the study setting have a positive to very positive attitude with regard to parent participation in a number of care aspects. Changes in society have demonstrated that parents have greater expectations and wish to be informed and involved in decision making (10). The philosophy of parental participation and a partnership approach has been advocated by the 'Children's Act' (11) and the Audit Commission Children First - A Study of Hospital Services London HMSO (12) as the way forward. However, this goal can be achieved only with an increase in shared understanding of parental participation in pediatric care.

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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.

Families and Rounds in PICU

Question:

We would like to gather information regarding other PICUs' practices of family participation during rounds.

1. Do you allow family participation at all?
2. Do families participate during entire rounding process or just a particular time?

Atlanta, Georgia, United States

Answers:

Parents are welcome and encouraged to stay. Our visiting policy only allows 2 at the bedside, but we have made accommodations for more family members during rounds if we want to make sure that everyone hears the same thing.

Central Georgia, United States

Families are welcome on rounds, included in the discussion and notified when we are teaching a concept. When children have other specialty services involved in their care, we usually round with both teams so that the family understands the unification of group in the care participation of their child.

Chicago, United States

Closed-system Blood Sampling

Question:

We're currently looking into using a closed-system for blood sampling on our pressure lines and I was wondering if anyone uses it. If you have, what brand/manufacturer is it and do you like it?

Cleveland, Ohio, United States

Answer:

We have used the VAMP Jr. System by Edwards for arterial and CVL's for a couple of years and find they work well. They are available in various configurations and lengths.

Saskatoon, Canada

Admission

Question:

For your patients who have their tonsils and adenoids removed and also have obstructive sleep apnea, are they admitted post operatively to your PICU or to a monitored bed on the floor after recovery in the Pediatric Acute Care Unit.

Baltimore, United States

Answers:

It would be individually evaluated. For this type of patient, they would typically go to a monitored intermediate care bed unless there were other complications like bleeding or need for the ventilator.

United States

Each case would be reviewed on an individual basis. In our institution, they would go to the ENT ward with a naso-pharyngeal airway in situ and SpO₂ monitoring. In my experience I have only seen kids admitted to PICU if they have hemorrhaged and need ventilation.

Birmingham, United Kingdom

Our unit is similar to others in that patients are usually assessed by sleep study pre-operatively and booked for PICU as seen to be appropriate.

Western Australia

Our unit generally only admits patients with significant post-operative bleeds to PICU. We have an intermediate care environment or step-down area where kids needing post-operative monitoring can go if they don't have critical care needs.

Edmonton, Alberta, Canada

Usually to our step-down unit for monitoring, as we have had to place some patients on BIPAP if de-saturation occurs and some mild obstruction still exists.

United States

Shift Handovers**Question:**

Our current practice is to assemble the new shift at the beginning. The unit coordinator discusses issues pertaining to the whole unit thereafter split the shift members into two teams responsible for 10 patients. They then receive a comprehensive handover of each of the patients from the preceding shift team leader. After that, the new team leader then allocates nurses to patients, who subsequently receive a detail hand over from the bedside nurses. In meanwhile the unit coordinators have a detailed handover between themselves.

Any help would be appreciated.

Birmingham, United Kingdom

Answers:

Every PICU I have worked in the US, the bedside nurse gets report on his/her patients alone. The charge nurse gets report on all patients. My current hospital, the charge nurse for the shift is assigned when the schedule comes out. He/She arrives 30 minutes early to get check out. This enables them to look at assignments and make adjustments if necessary before all other nurses arrive.

Houston, Texas

At the PICU I recently worked, we would have a brief group report from the previous shift's charge nurse. Some people were great at keeping to just the important highlight, some would give a review of all the systems. The patient assignments were done by the previous shift charge nurse or the unit manager. After the brief group report, the staff would go to their bedside and get the detailed report from the bedside nurses.

Edmonton, Alberta, Canada

The charge nurse from the previous shift makes tentative nursing patient list assignments for the oncoming shift. The oncoming charge nurse comes in 15 minutes before the shift starts and meets with the off going charge nurse to go over the list assignments along with a brief overview of patients on the unit. Once the lists are finalized, the new charge nurse brings the patient list assignments to our report room, hands out assignments to the oncoming nurses and quickly briefs on any unit wide issues.

United States

Cell Phone Use in PICU

Question:

Our hospital is looking at revising our cell phone policy. I would like to get a sense of what other hospitals are doing regarding the use of cell phones.

1. What is your hospital cell phone policy?
2. Do you allow cell phone use in your ICU, other patient care areas and does actual practice match your policy?

Vancouver, Canada

Editor comment:

This particular question on use of cell phone in PICU generated lively discussions and numerous exchanges by our colleagues from United States, Canada, Netherlands, Philippines, Indonesia, Australia and Belgium

Summary of discussions:

Much questions were posed on the rationale for prohibition of cell phones, whether policy apply to every staff including families, the justification of allowing medical doctors to use their phones when families can't and providing of evidence that cell phone interferes with medical equipment. Other concerns were the noise level in the use of cell phone and the indiscriminant use of cameras on cell phones which has the potential to breach patients' confidentiality.

Responses to discussions:

A directive a couple of years ago from NSW Health stated mobile phones may not be used within 3 metres of patients as they interfere with infusion pumps. It is a blanket policy for all humans using mobiles.

Sydney, Australia

At ward cell phones are not allowed. The policy is for everyone. Research at the Academic Medical Center in Amsterdam showed that the latest generation cell phones still interferes with the new generation medical equipment. For safe use there should be at least a distance of 1 metre between the cell phone and the equipment.

Interference occurred during incoming or outgoing calls with cell phones of the 2nd and 3rd generation nearby medical equipment. The study concerned General Packet Radio Service and Universal Mobile Telecommunication System. Most frequent and most dangerous interference occurred when the distance between cell phone and equipment was 3 cm or less, but at greater distance serious events also occurred.

Netherlands

No cell phone use in patient care areas, and notices on all entrances to area where cell phone use is prohibited that cell phones and mobile communication devices are to be turned off.

Edmonton, Alberta, Canada

Check out the Mayo Clinic Proceedings, March 2007 Vol.82, No. 3 which comes to the opposite conclusion: that cell phones have little or no adverse effect on most common equipment used in critical care units. The authors did not include an oscillator.

Vancouver, Canada

Uses of Cell phones are not allowed in PICU area, especially near the patients, because they can disturb the other electronic instruments.

Yogyakarta, Indonesia/Philippines

The rationale is that some phones might interfere with telemetry but there was a study done right at Mayo Clinic which showed no evidence that cell phones of any type currently in use interfered with telemetry, ventilators, or any other equipment. But still won't change the policy.

Rochester, United States

Our unit asks that all phones are to be turned off at the main door to the unit. Families are generally very good at this, health professionals are not. All ward areas have designated areas for families to use call phones at all times. We did have a suspected issue with a syringe driver and a mobile phone a number of years ago.

Western Australia

We allow use of unit cell phones in all areas of our PICU and have no interference with any of our monitors, HFOV, etc. Our nurses and Respiratory Therapists actually now have been given cell phones to utilize in order for contact, however use of personal cell phones or the unit cell phones for personal calls in the patient rooms are not allowed.

Atlanta, Georgia, United States

We never had a problem with our equipment and use of cell phones. When the newer phones came out, we began to relax our policy – we don't even have a policy now. Allowing families to use their cell phones had cuts down on calls to our desk from other family members. We want cell phone number close by for emergencies. The families, staff, and physicians really like the ability to immediately contact each other.

Rockford, United State.

Personal Development Reviews

Question:

We are currently reviewing the mechanism of ensuring staff have a yearly appraisal on time. At the moment individuals are identifying the dates their appraisals are due, unfortunately this means a large number are being done beyond the year or missed entirely. We plan to look at an electronic system that highlights the date well in advance allowing time for organization of a review date within the year. I would like to hear from everyone who has experiences with such problems as motivating staff to ensure their appraisals are achieved on time.

Birmingham, United Kingdom

Answer:

We have a common appraisal date, this means all employees receive their annual review prior to the end of March; self appraisals and peer evaluations are due prior to the end of December. This gives each manager three months to write the appraisals and deliver the feedback.

It is done electronically. The software we use is called Halogen.

Rockford, United States

ECMO Machines

Question:

For those PICUs that offer ECMO as therapy, what brand of pump are you using? We are looking to replace our existing ECMO pumps in advance of moving to our new 10-bed PICU.

Denver, United States

Answer:

We use Levitronic Centrimag centrifugal pump. In the hospital of Leicester which is doing about 65 neonates/pediatrics per year, they are using the same pump.

Dublin, Ireland

Medical Response Team (MRT) or Rapid Response Team (RRT)

Question:

Does anyone have model already developed for parents being able to call MRT/RRT? I would greatly any models or implementation ideas you are willing to share.

Memphis, Tennessee, United States

Answer:

Our Pediatric RRT was started at our hospital about a year ago and we are also considering parent-activated RRT. I believe Minnesota Children's has the policy in place with no significant increase in the number of inappropriate deployments of RRT.

Denver, United States

We have had a Medical Emergency Team (MET) system for about 5 years at our hospital. The first criterion to call MET was "staff member" and after a couple of years this was change to "staff member or parent". The main reason for the change was related to issues where sometimes the parents concerns has not been taken seriously by treating staff – this was particularly more difficult when caring for chronically ill child with a severe disability and whose baseline condition was not well known by the staff.

Although, the MET criteria are displayed in many places around the hospital, the reality is that the parents rarely make the MET call but they may certainly raise the possibility of calling MET with the staff.
Melbourne, Australia

Goals Sheet

Question:

Do you use goal sheets in your PICU or CTICU? If you do, can you please tell me who fills out those sheets and how does the information get communicated.
Columbus, Ohio, United States

Answer:

We have the sheets and they are hit and miss as to when they are used. The “goal” is that they are used daily with morning rounds. The problem has been getting someone to own the responsibility to fill it out. One attending brought them into existence, and neither the residents nor nursing seems to be anxious to own them. When they do get completed, the “goal” is for them to be readily accessible by the families to see what the plans for the day are. I expect that if they remain in existence they will be completed by nursing and a copy will be given to the family. They are not a part of the patient chart.
Minneapolis, Minnesota, United States

Prismaflex

Question:

We went through a Prismaflex presentation today with a representative over the warning sticker which states: Not intended for use for patients less than 20kg. The discussion with the representative was that this was at direction from FDA similar to many drug warnings for drug approval for pediatric patients even with promotion of the pump as one of the most “accurate” and better supports safe use in our small patients.

The warning sticker is on the front ledge just below the interface screen and while getting the mandate from the FDA for the warning, my view on the warning through a parent’s eye would be the inclination of the company did not intend this for use on <20 kg patients and is not safe.

I do think it might be helpful to all of us delivering this therapy to pediatric populations, regionally or perhaps across centers nationally to develop a consistent response or dialogue when the question with families or bedside practitioners arises.

Rhode Island, United States

Answer:

We have fairly recently obtained a new Prismaflex, however we are fortunate as it does not have the sign on it. We have also been told that it is not yet approved for use less than 12kg. Apparently this approval and software upgrade should happen before the end of the year.

We still have our old Prisma, which we intend to use for the smaller infants until Prismaflex is upgraded.
Sydney, Australia

Pressure Measurement from Infusion Pumps

Question:

We are looking within my Trust to change the intravenous infusion pumps used throughout the hospital. The main difference in the pumps we are reviewing is the way in which pressure needed to infuse drugs given is measured. Which method of pressure measurement do other units use; is it a pressure dome within the line of the infusion set or is the pressure measured by the pump from the syringe via the driver system? Do other units find problems with either method of pressure measurement?
Sydney, Australia

Answer:

We use Alaris syringe drivers which measure the pressure via the driver. They work well for us – but you have to be clear as around what settings are programmed for pressure limits. The machine will engage in “Backoff” mode if the pressure exceeds the set limit which literally takes the infusion back into the syringe to prevent pressure build-up. This became an issue for us when administering bolus doses via the syringe driver especially when through specialist giving sets as the pressure often exceeded the set limit.

However, we are able to overcome by changing the bolus delivery rate to a slower rate which limits the occurrence of pressure build-up.
Auckland, New Zealand

Standardization Patient Care

Questions:

We are in the process of determining to what extent we standardize patient care. As we move forward, we were wondering what other units were doing. It would be helpful to know the following:

1. To what extent is standardization a priority in your unit and hospital?
2. Please indicate to what extent the following are standardized: Medications, equipment, treatment algorithms, others?
3. Did your institution create and establish the standardization or are you using another system?
4. Have you used the Broselow system? If so, which components, the Broselow cart or does anyone use the Colour Coding Kids system?

Hamilton, Ontario, Canada

We are in the process of standardizing care across a large system so I am very interested in these replies as well.

Miami, Florida, United States

Answer:

We generally go in the direction of individualizing patient care to optimize each patient outcome and family experience. The only time standardization becomes an issue is when children are cared for in other units, and we want to be sure that they received the same services.

We don't use Broselow tapes, because as soon as a child is admitted, we print up a profile based on his/her weight that has all their drug dosages on it and it goes with them wherever they go.

Chemotherapy, asthma, diabetic ketoacidosis protocols and etc, are all in the computer and come up as check boxes when the physician puts in orders, however physicians are expected to modify the protocols based on individual patient history and needs.

I am grateful that standardization is not emphasized, even though it can be frustrating when we switch consultants and everything changes. Medicine, like nursing is an art, as well as a science. In many places medical and nursing judgment have been standardized right out of practice. A lot of the job satisfaction for physicians and nurses, is the ability and right to use their judgment in caring for patients.

Rochester, United States



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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Red Cross War Memorial Children's Hospital, Cape Town Paediatric Intensive Care on Africa's Tip

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The Red Cross War Memorial Children's Hospital in Cape Town, South Africa, has served children since 1956 when it was established as a living memorial for soldiers who died in World War II [1]. Although there are now more children's hospitals and centres being established, it is still the only specialist referral children's hospital in the sub-Saharan region. The hospital provides comprehensive dedicated paediatric services with a full range of sub-specialities at quaternary, tertiary and secondary levels of care. 200,000 children are seen annually; of these about 20,000 require admission and between 1,200 and 1,400 are admitted to the paediatric intensive care unit (PICU) [1].

The PICU offers a beautiful vantage of the majestic Table mountain range to the west. The city of Cape Town that is nestled here has a reputation for sophistication and remains a top international travel destination. To the east lies the urban sprawl of rapid urbanization, formal and informal housing settlements reminding the observer of the reality of poverty and a child population that comprises 32% of the country's 47.9 million population.

This geographic location does, however, place us with a unique position in the arena of paediatric critical care. Our experience of and continued access to critical care in European and North American settings, as well as our position and relationships with colleagues in

health care in both emerging and fractured economies, offers unique challenges and responsibilities. Our main challenge is actively to engage the expertise of sophisticated paediatric critical care practice and utilize the latest scientific evidence in order to bring simple elegant solutions to resource-constrained contexts.

The Red Cross Children's Hospital has an impressive list of firsts, from pioneering the mechanical ventilation of infants with tetanus in the 1950s to the first child heart transplant performed in 1990. The PICU hosts the only African liver transplant program, which has performed double transplants and living related donor liver transplants. The surgical team has international acclaim for its pioneering work in the management of conjoined twins and in 2001 performed the first autologous epithelial autograft on a severely burned child [1]. All these accolades would not have been possible without resourcing and extensive and committed teams in the whole spectrum of interdisciplinary care required by extremely ill children.

Shifts in national health policy and resources in the last 10–14 years from a focus on tertiary to primary level care and therefore primary care facilities have, however, significantly affected health care provision, research and academic training in the country. One response to managing these challenges at the Red Cross

Children's Hospital was to amalgamate the four separate specialist-driven intensive care units into one multidisciplinary PICU under the directorship of a paediatric intensivist in 1990.

The children cared for in the PICU range from critically ill neonates to teenagers. Children with conditions that require post-surgical care include: major surgery, liver and kidney transplantation, cardiac surgery, neoplasms and multiple trauma. The remaining children require mechanical ventilation, dialysis and intensive cardiac, neurological, nutritional and metabolic support. Admissions include children with severe burns, sepsis, cardiac and respiratory compromise/failure, infectious diseases and long-term conditions like Guillain-Barré Syndrome. The increasing incidence of AIDS has added to the challenge of care of the children in the PICU. There is a delicate balance between energetic intervention and maintenance in a setting which has access to antiretroviral therapy (ART) but continuing resource constraints in health care provision.

The director of the PICU is an energetic paediatric intensivist, committed to consistent high standards of critical care within the context of significant human and other resource constraints. He actively leads and supports innovative practice improvement initiatives and elicits debates around rational and evidence based care interventions. Some of the recent publications from the unit bear witness to this clear leadership. These include a retrospective study published in 2007, exploring the still controversial treatment of hypernatremic dehydration in a setting where gastroenteritis remains an important clinical entity [2].

The 18-bed PICU is staffed by a complement of 80 nursing staff led by an Assistant Director of Nursing, an operations manager and a clinical mentor. The patient-to-nursing staff ratio is 2 patients to 1 RN plus 1 auxiliary nurse. There has been a significant loss of skilled and expert nurse clinicians due to migration out of the country and voluntary severance packages offered in response to budgetary constraints in the late '90s. This has left fewer experienced registered nurses in the unit, and many are recent graduates from basic degree or diploma programs. This necessitates continual training from novice nurses to mentors and preceptors. We have developed and are offering a postgraduate diploma in Child Critical Care Nursing with the University of Cape Town. In the absence of similar programs in the country and no paediatric-specific guidelines from the national regulatory body, we undertook a participative process of curriculum design and

are offering the program with the PICU as the clinical training base [3].

Some innovative practice development initiatives support nursing practice: these include practice shifts to family friendly care and utilising the Toyota model to streamline administration of medications. A partnership with Children's HeartLink, a US based paediatric cardiac charity and Lucille Packard Children's Hospital in California, USA, is supporting the development of resources and in-service training in the PICU.

Paediatric critical care in the hospital is augmented by two specialist units. One is the nephrology ward with high care facilities where children receive both haemo- and peritoneal dialysis from a dedicated team with the indispensable assistance of two clinical technologists trained in the PICU. The other is a tracheostomy and home ventilator care program directed by a Nurse Specialist who oversees care aimed at discharge planning for these children. This successful program has enabled and supports about 80 families with children either with a tracheostomy or requiring long-term home ventilation. Care of these children is maintained entirely by their families at home in their own communities. A recent retrospective study with a cohort from this group concluded that tracheostomy in children who tested HIV positive and are on ART was not associated with high mortality, as has been reported in adult populations [4].

The supportive multidisciplinary team in the PICU has encouraged developments in clinical practice and innovative research. One such project is a randomised, controlled study considering the basis of performing recruitment maneuver after endotracheal suction in paediatric patients [5]. The principal investigator in this study, a PhD prepared physical therapist, is currently a research fellow in the PICU and working with staff in the areas of effective airway clearance and ventilator associated pneumonia in our setting.

In recent years we have been able to welcome paediatric fellows, both medical and nursing, from other African centres and across the world for training. The research agenda is driven by common paediatric critical care issues. Research opportunities within this paediatric critical care population allow us not only to contribute to outcomes, but also to test and use methods of measurement that can guide practice. This can be illustrated in a recent study looking at the effects of epinephrine nebulisation [6]. The design included correlating more complex methods of airway pressure assessment with

simpler measures that can be utilised in clinical care.

In the PICU at Red Cross Children's Hospital we remain committed to relevant and appropriate research and clinical practice. In methods and design, in teaching and learning principles we have been seeking innovative methods to improve quality outcomes for critically ill children here on Africa's tip.

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Instructions for Authors

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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

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