ADAM STRAIN

SUPPLEMENTAL REPORT

Prepared by Sally G. Ramsay

1.0 Introduction

I have recently been given some of the Witness Statements prepared specifically for the Inquiry. These are listed at Appendix 2. In the following report I give my comments on information given in the statements.

2.0 Dialysis

S/N Sharratt, who was the Paediatric Renal Nurse Co-ordinator, stated that dialysis could have been performed by either Mrs. Slavin or ward nursing staff (WS102/1 p2) and that parents "*frequently continued their own child's care when admitted to hospital*" (WS-102/2 p2) S/N Murphy was unable to recall who managed Adam's dialysis and Mrs. Slavin was not aware of records made of the dialysis cycles overnight on 27th November, 1995. This suggests that she did not connect and monitor the dialysis that night (WS-001/2 p7).

Mrs. Slavin's records for dialysis at home show she recorded pre-dialysis weight, first drain, ultrafiltrate, manual drain and morning weight on every occasion (WS-001/2 p20-154). S/N Sharratt stated she would have expected accurate record-keeping to have continued on the ward. This included the amount of fluid removed during dialysis and the post-dialysis weight, whereas S/N Murphy could not recall whether a post-dialysis weight was usual at the time.

I have concluded that the dialysis cycles and post-dialysis weight were not recorded and consequently record-keeping fell below the standard Mrs. Slavin had maintained at home. There is no evidence to show information was documented in Adam's Parent Held Record. It is my opinion that even where parents maintain records, sufficient information to maintain a comprehensive

picture of the child's condition should be recorded in hospital records.

3.0 Care Plan

S/N Murphy stated that it would have been her usual practice to complete a care plan when admitting a patient (WS-005/4). However, sheets showing nursing problems, goals and actions required have not been made available to me. I have, therefore, concluded that they were either not written or have been lost.

4.0 Intravenous Therapy

S/N Murphy has explained her recollection that when Dr. Cartmill wrote the prescription the decision to go ahead with the transplant had not been made and that Dr. Savage and Taylor had planned that fluids of 75mls/hr should start when the feeds stopped at 5am (WS-005/4 p2). In my opinion, this is a reasonable explanation. However, none of the records i.e. Prescription Chart, nursing and medical records, made this intention clear, thus increasing the risk of confusion and possible error.

S/N Murphy also explained that the initial infusion, of which 18mls was delivered, could have resulted from a verbal instruction, with an intention to prescribe it later (WS-005/4). Again, this is a possible explanation. However, the infusion would have started when the cannula was inserted by the doctor. Consequently, there was the opportunity for the prescription to have been written at that time.

5.0 Gastrostomy Feeds

S/N Murphy has stated that "*clear fluids*" was a generic term, commonly used at the time (WS-005/4). I believe she is correct; indeed the term is still used. Current guidance describes clear fluids as meaning those through which news print can be read. This includes fruit squash, carbonated drinks and 5% glucose. It is possible that the term "*clear fluid*', when applied to patients on

Musgrave ward and in particular Adam, through custom and practice, meant Dioralyte. However, I consider "*clear fluids*", as a generic term, required that the specific fluid given was recorded.

Dioralyte is commonly used to replace fluids and electrolytes lost through diarrhoea and/or vomiting. I believe it can currently only be bought in pharmacies where its purchase can be supervised. My recollection is that in 1995, nurses in hospital could not administer any medicines to children without a prescription, even those that parents could buy "over the counter" e.g. Paracetamol. I, therefore, believe that Dioralyte required a medical prescription.

6.0 Measuring urine

S/N Murphy has described the need for measuring urinary output as a decision to be made by a doctor (WS-005/4). I do not believe this was always the case. Nurses working in specialist areas e.g. renal nursing, would, in my experience, have been able to initiate urinary measurement, or ask a doctor whether urine was to be measured. Whether the acceptance of an estimated urine output was appropriate for the purposes of an anaesthetic requires the opinion of an anaesthetist.

7.0 Vital signs

S/N Murphy stated that measuring vital signs was a decision made by doctors (WS-005/4 p3). In my experience nurses decided the observations to be recorded, with doctors contributing as necessary. However, in 2010 Oliver found that medical consultant preference in some wards influenced both the type and frequency of observations made. Therefore, it is possible that on Musgrave Ward the doctor initiated observation of vital signs.

S/N Murphy also considers that the entry of "6am" on the observation chart indicates an intention to perform observations and that other activities

associated with preparing Adam for theatre may have prevented this (WS-005/4 p3). This is a possible explanation.

8.0 Medicines

S/N Murphy is correct in stating that prescribing was a medical responsibility. She offers an explanation for the absence of a prescription for Adam's normal medicines. However, patient care, in my opinion, requires effective team work and I consider the best care was achieved when nurses, doctors and others worked together. Both doctors Cartmill and O'Neill were junior and probably lacked experience in caring for children. I consider that at times they may have needed advice from a nurse. I am unable to comment on whether the absence of a prescription was acceptable.

9.0 Transplant surgery

I understand that the Royal Belfast Hospital for Sick Children was, at the time, a designated transplant unit for young children. I note that only a small number of renal transplants were carried out at RBHSC each year. Indeed in 1993/4 there were none and in 1995 there were 3. It is possible; therefore, that few nurses had expertise in caring for a child before, during and after transplantation.

Nurses in hospitals where children receive specialist care, in my experience, are regularly faced with caring for children with rare and unusual conditions that they may not have seen before. The nursing skill is in adapting nursing care to unknown situations. I believe Adams's pre-operative care was straightforward, although peritoneal dialysis required expert knowledge.

10. Nurse education and training

I note that Staff Nurse Murphy had not undertaken a specific renal nursing course (WS-005/2). I would have expected a designated transplant unit to have some of the nurses who had undertaken a renal nursing course during which they would have acquired knowledge and skills in peritoneal dialysis, haemodialysis and the care of children undergoing transplantation. Although specific training in renal nursing was available in England, easy access to training may not have been available to nurses in Northern Ireland. The National Renal Review of 2002 showed reported that only 26% of nurses held a recognised certificate. It is likely, therefore, that few nurses had undergone specific renal training.

Signed.....S Ramsay..... **Date**.....26/3/12.....

Appendix 1

References

Oliver A. (2010) Observations and monitoring: routine practices on the ward Paediatric Nursing 22 (4)

Royal College of Nursing (undated) Peri-operative fasting in adults and children www.rcn.org.uk

National Renal Review: Summary report of adult and paediatric services 2002 www.renalreg.com

Appendix 2

ADDITIONAL INFORMATION MADE AVAILABLE TO ME

Document Name	Name	Number
Witness Statement	D. Slavin	WS-001/1 WS-001/2
Witness Statement	Prof. M. Savage	WS-002/1 WS-002/2 WS-002/3
Witness Statement	Dr. J. Cartmill	WS – 003/1 WS – 003/2 WS-003/3
Witness Statement	Dr. O'Neill	WS- 004/1 WS-004/2 WS-004/3
Witness Statement	C. Murphy	WS – 005/1 WS-005/2 WS-005/3 WS-005/4
Witness Statement	G. Popplestone	WS-010/1 WS-010/2 WS-010/3
Witness Statement	P. Conway	WS-060/1 WS-060/2 WS-060/3
Witness Statement	E. Donaghy	WS-100/1 WS-100/2 WS-100/3
Witness Statement	M. Mathewson	WS-101/1 WS-101/2 WS-101/3 WS-101/4
Witness Statement	J. Sharratt	WS-102/1 WS-102/2
Witness Statement	K. Knaggs	WS-103/1 WS-103/2
Witness Statement	C. Hall	WS-104/1 WS-104/2
Witness Statement	D. Dines	WS-112/1
Witness Statement	S. Beattie	WS-118/1
Witness Statement	D. McMullen	WS-182/1
Witness Statement	D. Martin	WS – 183/1

Perioperative fasting in adults and children

as safe, less thirst, better all round

Royal College of Nursing

The Royal College of Anaesthetists

Patient presents for planned or emergency surgery

Information provided on fasting regime
given by a health care professional with suitable training

Clear signage for each patient, indicating fasting regime
recorded in the multidisciplinary notes and clearly visible in the patient's bed space

For patients undergoing emergency surgery:

Treat as though the patient has a full stomach. If possible, follow normal fasting guidance to allow gastric emptying.

For healthy patients without GI disorders

Adults

Water up to two hours before induction of anaesthesia.

Clear fluids*, including clear tea and black coffee also permitted up to 2 h before induction.

Food/milk/sweets/tea or coffee with milk, can be taken 6 h (minimum) before induction.

Chewing gum not permitted on day of surgery.

* Clear fluids – those through which newsprint can be read

Children (0 to 18 years)

Clear fluids* and water up to 2 h before induction of anaesthesia.

Breast milk up to 4 h before induction.

Formula/cows' milk up to 6 h before induction.

Food, including sweets, can be taken 6 h (minimum) before induction of anaesthesia.

Chewing gum not permitted on day of surgery.

* Clear fluids – those through which newsprint can be read

For higher risk patients

All higher risk patients

Includes those with obesity, diabetes and gastro-oesophageal reflux.

Follow same fasting regime as healthy patients, unless contraindicated.

The anaesthetic team should consider further interventions, as appropriate.

Regular medication continued, unless contraindicated; premedication (benzodiazepines) acceptable; taken with up to 30 ml fluid (children 0.5 ml/kg)

Postoperative recovery

Adults routine surgery

Encourage the patient to drink when they are ready, providing there are no complications.

Children (0 to 18 years) routine surgery

Oral fluids can be offered when the patient is fully awake following anaesthesia, providing there are no complications.

Consider clear fluids or breast milk first.

Not required to drink before discharge.

GI tract/major abdominal surgery (including Caesarean section)

Consult surgical team for postoperative recovery regimes.

See National Institute for Health and Clinical Excellence (NICE) and Scottish Intercollegiate Guidelines Network (SIGN) guidance.

Summary

Preop fasting – as easy as the 2-4-6 rule

2 hours water (clear fluid)

4 hours breast milk

6 hours formula/cows' milk/ solids

Postop intake in healthy patients – when the patient feels ready

APA Association of Paediatric Anaesthetists of Great Britain and Ireland

British Association of Day Surgery

The Preoperative Association

The Royal College of Midwives

Publication code: 002 778

Observations and monitoring: routine practices on the ward

Alison Oliver and colleagues found a lack of consistency in recording vital signs which needs to be addressed if early warning systems are to be implemented

Abstract

Aim To review routine observations on all children admitted to the Children's Hospital for Wales and the feasibility of implementing an early warning score for children developing critical illness.

Method Nursing staff, while performing their routine duties, recorded the physiological observations of temperature, heart rate, respiratory rate and blood pressure, as well as identifying airway threat, recording oxygen saturation levels, level of consciousness using the AVPU scale (alert, responds to voice, responds to pain, unresponsive) and identifying if they had concerns about a child on a new paediatric observation chart. The clinical care policy for each ward determined the frequency of recording observations.

Results Data were collected for 1,000 patients on whom 9,075 sets of observations were performed. Of those 9,075 sets, temperature was the most frequently recorded observation at 88.4% (95% confidence interval (CI) 87.7-89), followed by heart rate at 86.8% (95% CI 86.1-87.5), respiratory rate at 79.7% (95% CI 78.9-80.5), AVPU at 36.4% (95% CI 35.4-37.4) and blood pressure at 25.1% (95% CI 24.2-26.0). A complete set of observations needed for the Cardiff and Vale Paediatric Early Warning System to trigger effectively were only recorded in 52.7% (95% CI 52.4-53.1) of patients.

Conclusion There were variations in the frequency, type and recording of observations. This issue needs to be addressed if scoring systems are to be implemented. The findings of this observational study suggest that the required basic observations of acutely ill children are not being carried out.

Keywords
Critical illness, early warning scores, routine observations

THE CONFIDENTIAL ENQUIRY into Maternal and Child Health (2008) report Why Children Die and the National Institute for Health and Clinical Excellence (2007) guidelines on acutely ill patients in hospital recommend the use of early warning systems or scores to aid with the early identification of patients likely to develop critical illness. These bedside tools are simple to use and rely on the recording of 'routine observations'. It is impossible to predict those patients likely to develop critical illness. Therefore, an early warning tool should be used on all patients admitted to hospital, regardless of presentation.

Assessment, measurement and monitoring of vital signs are important basic skills for all practitioners working with infants, children and young people (Royal College of Nursing (RCN) 2007). Failure to recognise or respond appropriately to clinical deterioration can lead to life-threatening events, including cardiopulmonary arrest (Tibballs *et al* 2005, Duncan *et al* 2006, Haines *et al* 2006, McCabe *et al* 2009).

Given that the outcome for children after cardiac arrest is poor (Schindler *et al* 1996), early recognition and management of the deteriorating child is essential (Advanced Life Support Group 2005). The biggest problem for the acutely ill child arises if the healthcare professional performing any task does not recognise the importance of the results obtained, misinterprets the results and takes an inappropriate action in consequence, or does not act on them at all (Department of Health 2003).

The RCN's (2007) Standards for Assessing, Measuring and Monitoring Vital Signs in Infants, Children and Young People state that the following should be assessed, measured and recorded initially on attending hospital and then at varying frequencies:

- Temperature.
- Heart rate.
- Respiratory rate.
- Respiratory effort.
- Blood pressure.

These signs can contribute important information to the clinical condition and potential deterioration of the acutely ill child.

The Nursing and Midwifery Council's (NMC's) (2009) guidelines on record keeping state that good record keeping is 'essential to the provision of safe

and effective care'. Furthermore, the RCN (2007) standards state that good record keeping is essential for effective monitoring and interpretation of vital signs.

This observational study looked at the types and frequency of routine observations carried out on the paediatric wards of the Children's Hospital for Wales. It is a secondary study resulting from a collection of observations that were carried out to test the predictability of a new early warning system – the Cardiff and Vale Paediatric Early Warning System (C&VPEWS) (Edwards *et al* 2009) (see Research digest on page 10). Observations appear to be carried out in an unsystematic manner, depending on the nurse's experience, medical consultant's preference and clinical specialty. This would potentially have consequences for the successful completion and application of any early warning tool.

Aim

To review the practice of routine observations on all children admitted to the Children's Hospital for Wales and the feasibility of implementing an early warning score for children developing critical illness.

Method

The Children's Hospital for Wales is based on the University Hospital of Wales's site and is part of the Cardiff and Vale NHS Trust. It is a tertiary centre for paediatric care, with 50 medical, 34 surgical, 16 oncology, seven paediatric intensive care, four paediatric high dependency, four cardiac and four renal beds.

A prospective cohort study began in Cardiff and Vale NHS Trust in 2005 with the aim of designing a tool that would help identify those children at risk of developing critical illness. It is difficult to design a sensitive tool fit for purpose because normal physiological parameters change throughout childhood. A new standardised observation chart was therefore designed to meet the requirements of the proposed tool. Additional observations were added to the chart, such as the neurological assessment scale of AVPU (alert, responds to voice, responds to pain or unresponsive) recording of oxygen saturation levels and space for comments if the nurse or doctor tending the sick child had any worries. Education workshops were provided on day and night shifts to ensure that staff understood the alterations to the observation chart and what was required of them.

The physiological observations of all paediatric emergency admissions to areas excluding the paediatric intensive care unit and the paediatric high dependency unit were recorded four hourly as was usual practice. During the education sessions the research team requested, for the purposes of the study, two full sets of physiological observations were required in each 24 hours to trigger the newly designed C&VPEWS. The two full sets of observations were required to enable the research team to assess the sensitivity and specificity of the C&VPEWS. A research nurse collected then stored these observations in an Excel database and data were analysed using STATA 10.0.

Ethical considerations Ethical approval was granted by the South East Wales Local Research Ethics Committee for the original study and the analysis of the observations. The research was conducted in 2005.

Results

Data were collected from 1,000 children on whom 9,075 sets of observations were performed. Table 1 shows the total number and percentage of observations carried out in the Children's Hospital for Wales on these 1,000 children. Table 2 shows the percentage of different observations recorded in each ward area.

Discussion

This observational study came about following the prospective cohort study designed to validate the C&VPEWS which identified the variation in observation recording in the clinical areas in the Children's Hospital for Wales. During the C&VPEWS study period the research nurse consistently requested that staff record at least two full sets of observations. Despite this, only half of the required parameters were recorded.

The study highlighted several interesting points about the selection and frequency of the physiological observations recorded, especially with the current recommendations for the use of early warning tools.

Airway threat was a newly identified observation that was introduced because it was one of the parameters for the C&VPEWS. Nurses were requested to identify any threat to airway through selection of the parameters given to them. This observation was consistently poorly recorded in all clinical areas despite airway threat symptoms being logged in the

Nurses were requested to identify any threat to airway through selection of the parameters given to them

medical notes. It was hoped by the research team that, with the frequent use of the pulse oximeter, oxygen saturation would be better recorded. This appeared to be most frequently noted on general medical and cardiac/renal wards. In the authors' clinical experience blood pressure is recorded less frequently in children than in adults. Blood pressure is a poor indicator of shock in children as it is maintained until the child has advanced circulatory collapse (Advanced Life Support Group 2005).

Equipment is needed to measure blood pressure which can cause distress to the already miserable infant so nurses may be reluctant to record it as part of routine observations. Significantly, blood pressure was only recorded in 58 per cent of patients on the surgical ward despite the benefits of monitoring these patients post-operatively. Blood pressure was consistently recorded more frequently in the specialist wards than in the medical wards.

Critical illness in a child can lead to a reduction in consciousness caused by hypoxia. This can be simply recorded using the AVPU scale but, despite being such a simple observation to record, AVPU was only noted in 36 per cent of patients. Temperature was the most frequently recorded of all the observations.

This study also raised the concern that, even with extra education to record the observations specifically to aid the identification of acutely ill children, the percentages of observations recorded were less than desirable. The observations that were carried out varied between ward areas. Some essential observations, such as respiratory rate, were often omitted. Medical consultant preference in some ward areas influenced not only the frequency of recording observations but also which observations were carried out. It was also evident from medical notes that who makes the decision about frequency of observations varies.

The new observation chart is still in use throughout the Children's Hospital for Wales. This standardisation ensures that nurses and clinicians working in any clinical area are familiar with the format of the chart.

The findings of the prospective cohort study have now been published (Edwards *et al* 2009) and fed back to the nursing management team in the children's hospital and local pre-registration educators. Problems for the children's hospital management group concern which groups of nurses are recording the observations and whether they are interpreting the findings. Ever reducing numbers of qualified nurses in clinical areas results in fewer nurses able to perform the observations or to monitor those observations carried out by healthcare assistants. If children are hospitalised they should have their vital signs recorded otherwise they could be given care at home.

The pressure on bed occupancy has meant that staff are consequently trying to increase throughput by decreasing patients' length of stay. This may have caused staff to carry out observations that they feel are appropriate for the clinical situation rather than the full basic essential observations.

These results suggest that the RCN standards for a minimum set of observations are not being followed. Ideally AVPU and oxygen saturations should be added to the RCN recommendations for the early identification of those children who could go on to develop critical illness.

Aggregate scoring systems, such as that developed by Duncan *et al* (2006), require a full set

Table 1 Total number and percentage of observations carried out in the Children's Hospital for Wales

Type of observations	Total number of observations	Percentage of observations completed (95% confidence interval (CI))
Airway threat	762	8.1 (7.5-8.7)
Oxygen saturation levels	7,229	76.7 (75.9-77.6)
Respiratory rate	7,511	79.7 (78.9-80.5)
Heart rate	8,181	86.8 (86.1-87.5)
Blood pressure	2,363	25.1 (24.2-26.0)
Alert, voice, pain, unresponsive scale (AVPU)	3,428	36.4 (35.4-37.4)
Nurse/doctor worried	1,950	20.7 (19.9-21.5)
Temperature	8,325	88.4 (87.7–89.0)

Table 2 Percentage of observations recorded in specific ward areas in the Children's Hospital for Wales

Type of observation	Percentage of observations completed for each ward area (95% confidence interval (CI))					
	Infant medical 0-1 year (n = 4,959)	Medical 1-16 years (n = 2,753)	Adolescent 14-16 years (n = 532)	Surgical 0-16 years (n = 219)	Renal and cardiac 0-16 years (n = 555)	Oncology 0-16 years (n = 388)
Airway threat	10.1 (9.3-11.0)	8.2 (7.2-9.3)	1.9 (0.9-3.4)	10.5 (6.7-15.3)	0.2 (0.0-1.0)	0.0 (0.0-1.0)
Saturations	84.2 (83.2-85.2)	81.3 (79.8-82.7)	26.5 (22.8-30.5)	38.4 (31.9-45.1)	84.2 (77.2-83.9)	33.0 (28.3-37.9)
Respiratory rate	83.4 (82.4-84.5)	77.4 (75.8-79.0)	79.3 (75.6-82.7)	78.1 (72.0-83.4)	81.6 (74.5-81.6)	49 (43.9-54.1)
Heart rate	87.2 (82.1-84.2)	86.2 (84.8-87.4)	91.4 (88.7-93.6)	90.0 (85.2-93.6)	85.7 (78.7-85.3)	85.1(81.1-88.4)
Blood pressure	8.3 (7.6-9.1)	23.0 (21.4-24.6)	85.5 (82.2-88.4)	58.0 (51.1-64.6)	77.8 (70.8-78.2)	80.4 (76.1-84.2)
Alert, voice, pain, unresponsive scale (AVPU)	39.5 (38.1-40.8)	36.3 (34.5-38.1)	15.0 (12.1-18.4)	37.0 (30.6-43.8)	52.4 (46.0-54.5)	8.2 (5.7-11.4)
Nurse/doctor worried	20.2 (19.1-21.4)	17.6 (16.2-19.1)	13.0 (10.2-16.1)	31.5 (25.4-38.1)	58.8 (52.2-60.6)	3.1(1.6-5.3)
Temperature	91.9 (91.9-92.7)	92 (91.0-93.0)	76.0 (73.1-80.4)	77.6 (71.5-83.0)	52.1 (45.7-54.2)	96.6 (94.3-98.2)

of observations to be carried out. Education pre- and post-registration is paramount so that nursing staff have a better understanding of the importance and rationale behind the RCN monitoring standards. Failure to do this will lead to early signs of critical illness remaining unnoticed. Ward managers and practice educators need to ensure in general paediatric areas that staff know which observations to carry out and understand what they mean.

The RCN standards (2007) recommend that nurses, students and healthcare assistants who assess, measure and monitor vital signs in infants, children and young people are competent in observing their physiological status. Additionally, healthcare staff should take appropriate action in response to changes in vital sign assessment and measurement. However, abnormal parameters are difficult to assess. Wallis *et al* (2005) stated that there is a wide range in variation of normal parameters and therefore uncertainty about where the baseline is. Therefore a change in physiological parameters should trigger an increase in frequency of observation.

The RCN (2007) guidance on frequency of observation is vague as it states that vital signs should be recorded on admission and further observations should then be recorded at varying frequencies. Variations in the Children's Hospital for Wales concerning who makes the decision about the frequency of recording vital signs are evident from examining the medical notes. The instruction 'routine observations' is frequently used but, without a policy identifying what this actually means, it is unclear which observations should be carried out or how frequently.

Pre-registration educators need to consider the findings when preparing nurses for the future. It is essential that nurses understand the necessity

of recording observations and the significance of those observations when assessing sick children. It is important to get the basics right. If observations are not being carried out then even the most perfect early warning system will fail to identify vulnerable children.

Limitations

This study is secondary to the original research proposal and was carried out during implementation of a documentation change in the Children's Hospital for Wales. This may have influenced which observations were recorded. Not all staff will have attended educational workshops that were held and may not have used the observation charts as required for the study.

Conclusion

Physiological observations identify children whose condition may be deteriorating and may go on to develop critical illness. However, in this study children hospitalised for observation did not get the recommended observations of vital signs recorded. There is also variation in observations recorded in different clinical specialities in this hospital. Current early warning scores developed for paediatric practice require a full set of observations to be recorded. Therefore the successful implementation of such scores will require an improvement in compliance of observation recording.

Implications for practice

- Pre-registration education should include the relevance and importance of observations of vital signs.
- Education for health care support workers and pre-registered nurses recording vital sign observations in normal parameters.
- There should be observation policies in clinical areas to which all staff adhere.
- Multidisciplinary refreshers in recognition of acutely ill children and the signs and symptoms of deterioration should be held regularly.

This article has been subject to open peer review and has been checked using anti-plagiarism software

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