

Optimising Quality Care for Hospitalised Children

The Establishment & Development of a Paediatric Early Warning Assessment Tool

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Aim of Presentation

- # **Context of the Early Warning Assessment Tool /
Medical Emergency Team / Outreach Team Development**
- # **Development of the Bristol Paediatric Early Warning Tool**
 - Research Study
 - Implementation of Tool
 - Evaluation
- # **Critical Care Outreach Team**
- # **Current / Future Developments**

The Context

Clinical investigation

Clinical Intensive Care 1995; 6: 269-272

The Medical Emergency Team: a new strategy to identify and intervene in high-risk patients

F HOURIHAN, G BISHOP, K M HILLMAN, K DAFFURN, A LEE

Abstract

Objective: To describe the utilisation of an emergency team that employs standardised calling criteria to facilitate the early identification and resuscitation of patients who are at risk of cardiorespiratory arrest.

Design: A prospective study of all Medical Emergency Team calls over a six-month period in 1994.

Setting: A 460-bed university teaching hospital in Sydney, Australia.

Subjects: Inpatients and outpatients who required Medical Emergency Team intervention.

Key words:

Cardiopulmonary resuscitation (CPR)

Critical care

Heart arrest

Medical emergency treatment

Resuscitation

The Medical Emergency Team

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SUMMARY

The concept of a Medical Emergency Team was developed in order to rapidly identify and manage seriously ill patients at risk of cardiopulmonary arrest and other high-risk conditions. The aim of this study was to describe the utilization and outcome of Medical Emergency Team interventions over a one-year period at a teaching hospital in South Western Sydney. Data was collected prospectively using a standardized form. Cardiopulmonary resuscitation occurred in 148/522 (28%) calls. Alerting the team using the specific condition criteria occurred in 253/522 (48%) calls and on physiological/pathological abnormality criteria in 121/522 (23%) calls. Survival rate to hospital discharge following cardiopulmonary arrest was low (26%), compared with other medical emergencies (76%).

Key Words: COMPLICATIONS: cardiac arrest, apnoea, resuscitation, emergency treatment, cardiac arrest team

Clinical investigation

Medical Emergency Team (1995, 1, 23-36)

Identifying the general ward patient at high risk of cardiac arrest

K. M. HILLMAN, G. BISHOP, A. LEE, K. DAFFURN, A. BAUMAN, C. CRISPIN, E. INCE, J. BRISTOW, P. HOUJRIHAN

Abstract

Objective: A study was undertaken to determine the incidence of cardiac arrest on a general ward in a teaching hospital.

Design: Review of medical records over five randomly selected 24-hour periods to identify signs known to be antecedents to cardiac arrest.

Setting: General ward of a 400-bed Australian teaching hospital.

Interpretation: None.

Key results:

Cardiopulmonary arrest
Hospital mortality
Medical emergency system
Averaged 16 deaths
Resuscitation

Anaesthesia, 1999, 54, pages 853-860

The patient-at-risk team: identifying and managing seriously ill ward patients

D. R. Goldhill,¹ L. Worthington,² A. Mulcahy,² M. Tarling³ and A. Sumner⁴

¹ Senior Lecturer and Consultant Anaesthetist, ² Lecturer, ³ Research Nurse, and ⁴ Regional ICU Audit Coordinator, The Anaesthetics Unit, St Bartholomew's and the Royal London School of Medicine and Dentistry, The Royal London Hospital, Alexandra Wing, 4th Floor, Whitechapel, London E1 1BB, UK

Effects of a medical emergency team on reduction of incidence of and mortality from unexpected cardiac arrests in hospital: preliminary study

Michael D Buist, Gaye E Moore, Stephen A Bernard, Bruce P Waxman, Jeremy N Anderson, Tuan V Nguyen

Medical emergency teams

David Goldhill*

More and more evidence suggests that sick patients on British hospital wards are poorly cared for. The medical emergency team is one possible way of providing support for these patients. The recent Government report, Comprehensive Critical Care, supports the introduction of these teams. Little has been published on the effectiveness of such teams. What evidence there is suggests that there are many sick patients on hospital wards, they can usually be identified by abnormal physiological values, and that early intervention and appropriate support decreases their risk of dying or of having a cardiopulmonary arrest on the ward.

Keywords: critical care; intensive care; medical emergency teams; resuscitation ward care

United Bristol Healthcare NHS Trust
Bristol Royal Hospital for Children

Confidential inquiry into quality of care before admission to intensive care

Peter McQuillan, Sally Pilkington, Alison Allan, Bruce Taylor, Alasdair Short, Giles Morgan, Mick Nielsen, David Barrett, Gary Smith

INTEGRATIVE LITERATURE REVIEWS AND META-ANALYSES

Critical care outreach services and early warning scoring systems: a review of the literature

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MCARTHUR-ROUSE F. (2001) *Journal of Advanced Nursing* 36(5), 696-704

Critical care outreach services and early warning scoring systems: a review of the literature

Integrated monitoring and analysis for early warning of patient deterioration

I. Xenasarakis, A. Hann, D. Young
British Journal of Anaesthesia, July 2006; 97, 1, 1; The Queen's Medical Library
DOI: 10.1093/bja/aek118

British Journal of Anaesthesia 97, 1, 1-11, 2006
doi:10.1093/bja/aek118 Advance Access publication May 17, 2006

BJA

Integrated monitoring and analysis for early warning of patient deterioration

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Identifying the need for MET / Calling Criteria & Assessment Systems / Outreach Services

- Recognition of inadequate assessment & treatment of ward based patients —→ cardiac arrest
- Suggested that early recognition & treatment —→ improve patient outcome & prevent cardiac arrest
- Achieved by:
 - Provision of support by calling criteria or assessment systems / direct care delivery, advice and/or guidance
- Purposes:
 - Improve patient outcome
 - Prevent cardiac arrest & averting admissions to critical care units
 - Enabling discharges from critical care units
 - Sharing and developing of critical care skills throughout the hospital

And in paediatrics ?

- # In early 2000, nothing published related to children and calling criteria, assessment tools or outreach services
- # Small pockets of work / interest in Melbourne & UK
- # Further investigation required

Acutely ill children within ward areas – care provision and possible development strategies

Report from a 2003 Nursing Travel Scholarship awarded by the Florence Nightingale Foundation through the generosity of The Nestlé Charitable Trust

Caroline Haines

ABSTRACT

This report presents the key findings of a travel scholarship to selected paediatric centres in the United Kingdom (UK), Australasia and the United States of America, where services provision for the care of acutely ill children within ward areas was investigated. In total, 15 centres were visited over a 5-month period, and comprehensive programs of information exchange were arranged in all locations. Key areas of interest discussed were the concepts of paediatric critical care outreach services and the use of paediatric early warning assessment tools. Information was collated and applied to the existing service provision within a tertiary children's hospital in the UK. It is hoped that the information gained during this professional study tour will add to the current available literature. It has helped to clarify the position of other key centres with regard to the care provision for acutely ill children in ward areas and confirmed the potential value of a support system and/or use of clinical assessment tool for staff caring for these children.

Key words: Multi-disciplinary • Nursing • Paediatric critical care outreach • Paediatric early warning assessment tools • Paediatric intensive care

Rationalising the needed for a improve safety, & quality care at the Children's Hospital in Bristol

- # Increasing technology available within health care
- # Increased acuity of children in wards areas
- # Reduced number of skilled (deskilled) nursing staff in ward areas
- # Reduced experience of junior medical staff in ward areas
- # More specifically..
 - Gap in service between PICU & ward areas
 - Complaints
 - Increase number of ward-based critical incident events
 - Anecdotal information

Map of Great Britain



	Total Resident Population	Resident Population of Children under 16
United Kingdom	59,756,000	19,540,212
England	49,997,000	16,299,022
Wales	2,946,000	989,856
South West	4,975,000	1,587,025

Bristol Royal Hospital for Children



Structure of Bristol Royal Hospital for Children (BRHC)

South West Regional Services

- Paediatric Intensive Care
- Cardiac (including South Wales)
- Renal
- Bone Marrow Transplant

Mixed speciality wards

- Paediatric surgery
- Neurology
- Respiratory / ENT
- Endocrinology

High dependency care provision for the local population

High Dependency Facilities at BRHC

- # **No dedicated high dependency area within the hospital**
- # **Significant amount of high dependency undertaken in PICU**
 - 21% of admissions to PICU – Level 1 (PIC Report 2004)
- # **High dependency patients currently cared for in virtually every area of the hospital**
 - Totalled 9% of all hospital admissions (CICS Data 2003)
- # **Exact enormity of the need unclear**

Annual Unplanned Admissions from BRHC Wards to PICU 2002 & 2003

Ward Area	Total in 2002	Total 2003
BMT – Bone Marrow Transplant	6	3
Surgical Ward	3	5
Cardiac Ward	24	36
Medical Ward	27	25
Oncology ward	7	8
Adolescent Ward	5	4
Short Stay Surgical Ward	0	1
Renal Ward	6	7
Observation Ward	0	1
Totals	78	90

Clinical Scenario

- # 6/12 old infant – bronchiolitis – Day 2 of admission
- # Increasing respiratory distress documented on observation chart for 4-6 hrs
 - ? resps & resection, ?HR, in headbox 50% O₂, pale in colour
- # Being orally fed ... child out of oxygen SpO₂ not picking up
- # Child became floppy, mottled, prolonged apnoea
- # Cardiac arrest team called....
- # Intubated & transferred to PICU



Research – Bristol Royal Hospital for Children

Intensive and Critical Care Nursing (2006) 22, 73–81



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ORIGINAL ARTICLE

Promoting care for acutely ill children—Development and evaluation of a Paediatric Early Warning Tool

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KEYWORDS

Nursing care of acutely ill children;
Paediatric Early Warning Tool;
Paediatric critical care outreach;
Paediatric intensive care

Summary The primary purpose of this paper was to develop and evaluate a physiologically based system for the identification of acutely ill children in hospital environments. The dependency of children in hospital is increasing and ensuring the appropriate and timely intervention by a team of health personnel experienced in the care of these children is paramount to ensure their optimal outcome.

A paediatric early warning (PEW) tool was designed and demographic and physiological data collected on all children ($n=360$) who triggered the tool over a 6-month period, between September 2003 and February 2004.

Analysis of the data was undertaken on each criterion within the tool and by reviewing it against patient outcome, the decision for its retention or removal was made. The modified tool showed a 99% sensitivity and a 66% specificity.

The resultant Paediatric Early Warning Tool has been validated for use in a tertiary children's hospital in the United Kingdom (UK). The use of such a tool by all staff caring for acutely ill children in hospital environments can help to ensure their early recognition and timely treatment. The tool together with an action plan must, however, be appropriate for use in individual ward or hospital areas.

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Research Study

Sample

- Convenient sample
- 6-months – September 2003 - February 2004
- Those children who met a predetermined criteria, n=360

Data Collection

- x3 days/wk – research nurse
- All in-patient areas (excluding A&E)
- Demographic and physiological data was collected

Data Collection Tool – Paediatric Early Warning (PEW)Tool

Useful discriminators ✓
Criteria that needed modification ②
Poor discriminator ✗
Project group decision ?

Piloted Bristol Paediatric Early Warning Tool

A ACUTE AIRWAY OBSTRUCTION

- 1) Child has required nebulised Adrenaline ✓
- 2) Clinically firing or impending complete airway obstruction ✗ ?
- 3) Child has suspected epiglottitis ✗

B BREATHING

- 1) Status asthmaticus not responding to steroids or bronchodilators ✗
- 2) $\text{SaO}_2 < 93\%$ in any amount of oxygen ✓
- 3) $\text{SaO}_2 < 75\%$ in any amount of oxygen (cyanotic heart disease) ✓
- 4) Persistent tachypnoea (RR > 70 under 6 mo, > 60 6–12 mo, > 40 1–5 yrs, > 25 over 5 yrs) ✓
- 5) Apnoea / Bradycardia ✓ ②
- 6) Exhaustion and depressed mental status with respiratory distress ✗
- 7) Blood gas with pH < 7.25 or $\text{pCO}_2 > 60$ mmHg ✗

C CIRCULATION

- 1) Persistent tachycardia / shock following 2 x 20ml/kg fluid boluses ✓ ②
(normal HR $< 1\text{yr } 100-160$, $1-5\text{yr } 100-150$, $5-12\text{yr } 80-120$, $> 12\text{yr } 60-100$)
- 2) Bradycardia – below normal range ✗
- 3) Shock (decreased BP or prolonged capillary refill) despite fluid boluses ✗ ②
- 4) pH < 7.2 or BE > -6 mmol on 2 occasions or associated with signs of shock ✓ ②

D DISABILITY

- 1) Acute deterioration in conscious level ✗ ②
- 2) Convulsion unresponsive to Lorazepam / Diazepam and second line anticonvulsant (lasting > 30 mins) ✗ ②
- 3) GCS < 11 or responding only to pain ✓ ②

E OTHERS

- 1) Abnormal lab values INR > 4 K $^{+}$ > 6.0 or < 2.5 ✓ ②
- 2) Any child with suspected meningococcus ✗ ?
- 3) Any child whose condition is worrying ✓

Research Study

Analysis

- Undertaken on each criterion and reviewing it against the patient outcome

Table 2 Categorisation of patient outcome.

Patient outcome

1. Remained on ward without a problem
2. Required enhanced level of care
 - (a) additional monitoring on the ward
 - (b) required high dependency/specialling
 - (c) required transfer to PICU

If PICU, maximum dependency level (1–4)

3. Respiratory/cardiac arrest or emergency call
4. Death
 - (a) expected
 - (b) unexpected
 - (c) palliative care

- Decision made whether to retain or remove

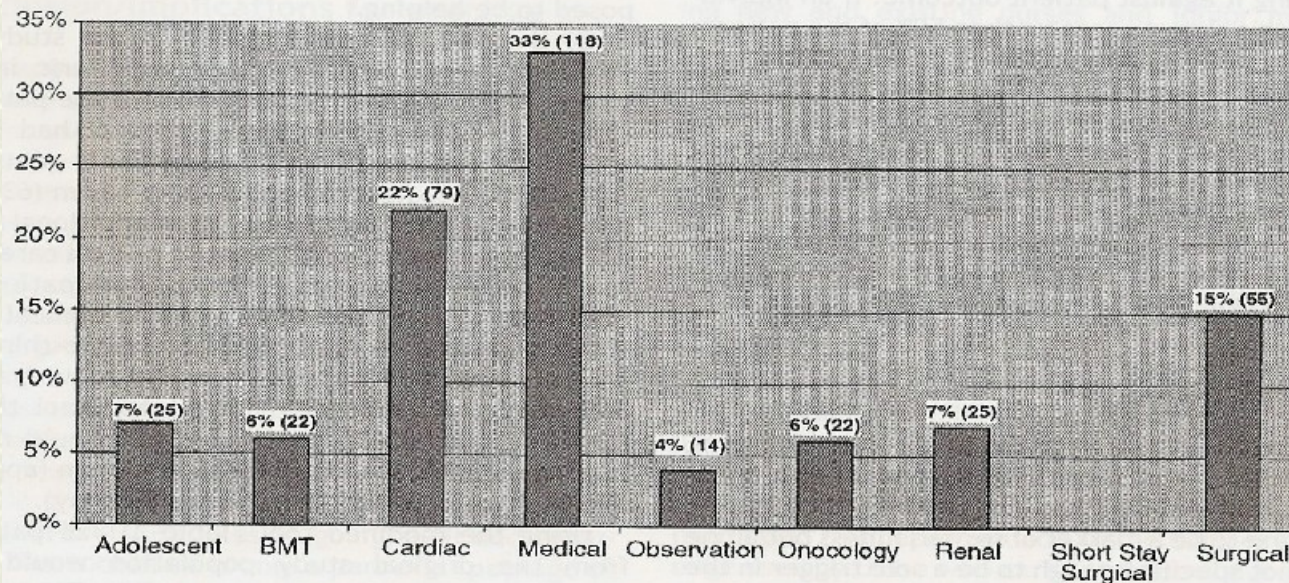


Figure 2 Total number of patient triggers by ward (n = 360).

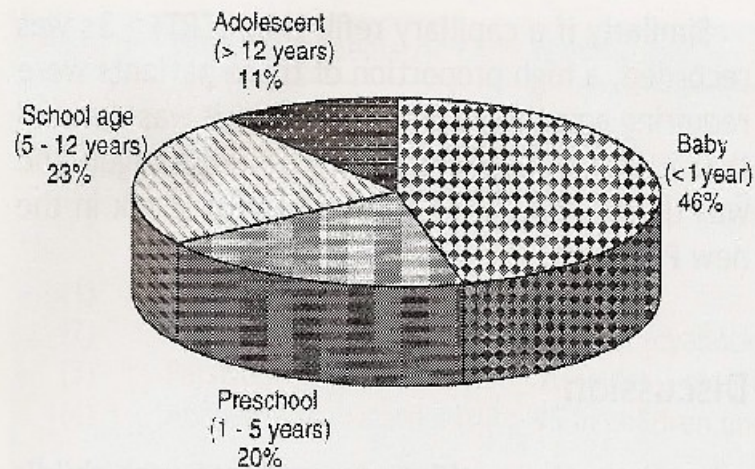


Figure 1 Distribution of age categories.

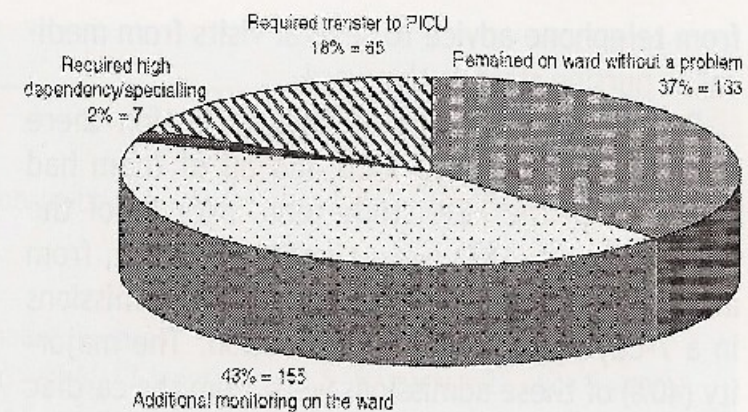


Figure 3 Highest level of care reached by each of the 360 patients.

Research Study

Analysis

Table 1 Ward by ward review of admissions, bed occupancy and patients entered into the study.

Ward	Number of admissions	Number of patients who triggered	Bed occupancy (bed days/6 months)
Adolescent	247	24	2342
BMT	30	22	774
Cardiac	371	78	1980
Medical	456	118	2859
Observation	672	14	280
Oncology	110	22	1521
Renal	160	25	1272
Short stay	538	2	444
Surgery	681	55	2888
PICU	393	n/a	2169
Total	3658	360	16529

- Modified Tool 99% sensitivity & 66% specificity

Bristol Paediatric Early Warning (PEW) Tool

Table 3 The Bristol Paediatric Early Warning Tool

A	Acute airway obstruction
(1)	Child has required nebulised adrenaline
(2)	Clinically tiring or impending complete airway obstruction
B	Breathing
(1)	$\text{SaO}_2 \geq 92\%$ in any amount of oxygen
(2)	$\text{SaO}_2 \geq 75\%$ in any amount of oxygen (cyanotic heart disease)
(3)	Persistent tachypnoea (RR ≥ 70 under 6 months; ≥ 60 6–12 months; ≥ 40 1–5 years; ≥ 25 over 5 years)
(4)	Apnoea \pm bradycardia (HR ≥ 95 in children under 5 years)
C	Circulation
(1)	Persistent tachycardia following one bolus of 10mls/kg fluid (HR ≥ 150 under 5 years; HR ≥ 120 5–12 years; HR ≥ 100 over 12 years)
(2)	Signs of shock: e.g. prolonged capillary refill (3s); poor perfusion; \pm low BP
D	Disability
(1)	GCS ≥ 11 or unresponsive or responding only to pain
(2)	Convulsion unresponsive to anticonvulsant therapy (lasting ≥ 30 min)
E	Others
(1)	Hyperkalaemia $-\text{K}^+ \geq 6.0$ mmol/L
(2)	Any child with suspected meningococcus
(3)	Any child with diabetic ketoacidosis (DKA)
(4)	Any child whose condition is worrying

Implementation...

- # New paediatric observation chart
- # Multi-professional staff education
- # Establishment of a 'Paediatric Critical Care Outreach Team'

UNITED BRISTOL HEALTHCARE NHS TRUST
BRISTOL ROYAL HOSPITAL FOR CHILDREN

PAEDIATRIC OBSERVATION CHART

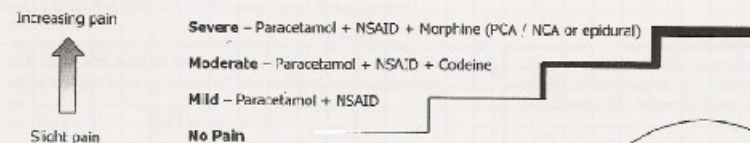
ADDRESSOGRAPH LABEL		Ward Area: <u>Ward 33</u>	Date: <u>3.5.07</u>
Name: <u>MILLIE HENDERSON</u>		Patient's Weight: <u>10.4</u>	in kilograms (kg)
Date of Birth: <u>9.3.06</u>		Patient's Height: <u>104</u>	in centimetres (cm)
Hospital No: <u>12345932M</u>		PAIN ASSESSMENT TOOLS USED (Please tick)	
Ward / Hospital: <u>33 / BRHC</u>		<input type="checkbox"/> FLACC (Face, Legs, Activity, Cry, Consolability) <input type="checkbox"/> Wong and Baker (Faces) <input type="checkbox"/> Visual Analogue Scale (0-10)	

NORMAL RESPIRATORY / BP / PULSE RATES IF RECEIVING O₂ OBSERVATIONS SHOULD BE RECORDED A MINIMUM OF 3 HRLY
UNLESS EXCEPTIONAL CIRCUMSTANCES AND RATIONALE DOCUMENTED IN CARE PLAN / PATIENT NOTES

Age (yrs)	Respiratory rate	Heart rate	Systolic Blood Pressure	Method of Oxygen administration		Neurology Assessment - AVPU	
<1	30-40	110-160	70-90	M	Mask	A	Alert
1-2	25-35	100-150	80-95	NC	Nasal Cannulae	V	Responds to Voice
2-5	25-30	95-140	80-100	HB	Head Box	P	Responds to Pain
5-12	20-25	80-120	90-110	CPAP	Continuous Positive Airway Pressure	L	Unresponsive
>12	15-20	60-100	100-120				

ANALGESIA

Consider the following:



In cases of increasing or severe pain, please contact any of the Pain Service Team through switchboard:

- Clinical Nurse Specialist - Paediatric Pain - Bleep No.
- Consultant Paediatric Anaesthetist - Paediatric Pain - Bleep No.
- SpR Paediatric Anaesthesia - Bleep No.

Support Information / Guidelines
Pain Service Website, BRHC Intranet

MONITORING

Whilst on Patient Controlled Analgesia (PCA), IV Morphine or an epidural, monitor BP, pulse, respiratory rate, sedation and pain scores:

- 1/2 hourly for first hour
- 1/2 hourly for second hour
- then hourly for 24 hours - following this please refer to the 'paediatric acute pain service guidelines'

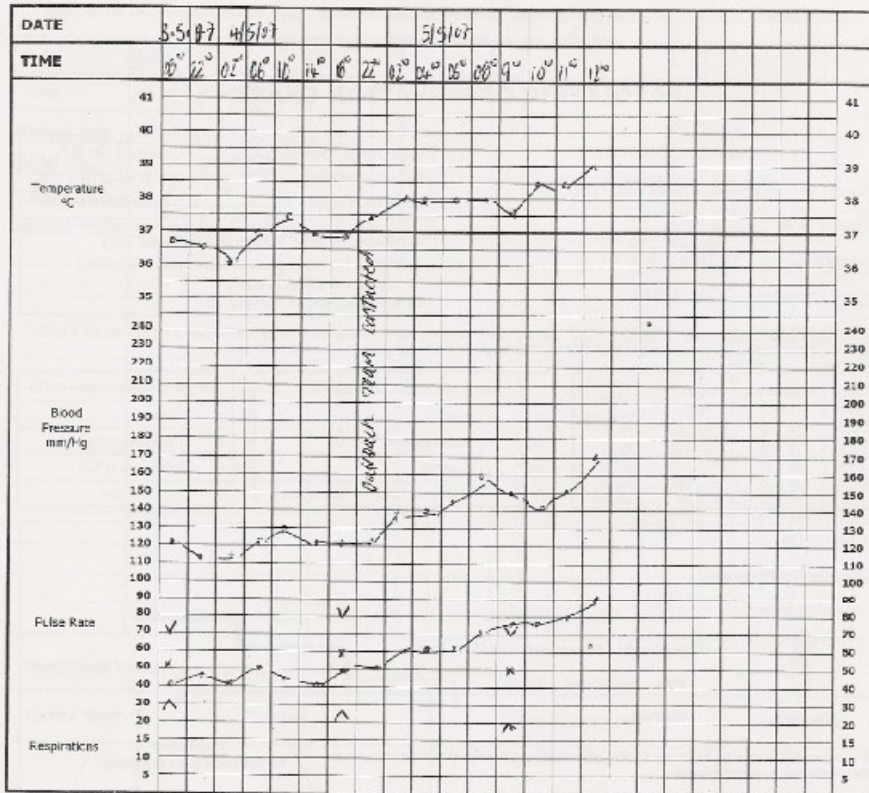
Remember to reassess pain regularly:

Has the severity of pain changed?

What action is needed?

Document findings, actions and re-evaluate

PAIN SCORE	SEDATION	NAUSEA / VOMITING	PRURITIS	MOTOR BLOCK
0 = No Pain	0 = Wide awake	0 = None	0 = None	1 = Free movement hips, legs & feet
1-3 = Mild Pain	1 = Drowsy	1 = Nausea	1 = Mild	2 = Able to flex hip, knees with free movement of feet
4-7 = Moderate Pain	2 = Asleep but easy to arouse	2 = Vomiting	2 = Moderate	3 = Weakness in hips, knees, unable to lift heels, moves toes
8-10 = Severe Pain	3 = Somnolent and difficult to arouse	3 = Severe nausea or vomiting	3 = Severe	4 = Unable to move legs or feet
	S = Normal sleep			



Capillary refill time:sec	<2	<2	<2	<2	<2	<2	<2	<2	2-3	2-3	3	3	2	2	3
-> saturation %	96!	95!	96!	94!	97!	92!	95!	93!	94!	93!	88!	90!	91!	88	90!
Administered O ₂ , litres / min or %	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Method of Administration	--	--	--	--	--	--	NC	NC	NC	NC	NC	NC	NC	NC	NC
Blood Glucose	4.2					4.5								8.7	
Pain triggered	X	X	X	X	X	X	E4	B1	S1	S1	E4	C4	E4	E4	E4

Pain Monitor																			
Infusion Rate Change																			
Sedation		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pruritis		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nausea / Vomiting		0	0	0	0	0	0	0	1	1	1	0	0	0	1	1			
Pain Score	Rest 3-10	0	0	0	0	0	0	3	1-3	1-3	1-3	1-3	0	0	0	0	0	0	0
Score	Movement: 3-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1-3	
Motor Block																			
Practitioners Initials		NH	JW	YB	MM	TC	TC	BC	MP	MP	KJ	AP	MP	WP	HJ	HL	HW	RW	

PAEDIATRIC EARLY WARNING (PEW) TOOL

A	ACUTE AIRWAY OBSTRUCTION
---	--------------------------

- 1) Child has required nebulised Adrenaline
- 2) Clinically triing or impending complete airway obstruction

B	BREATHING
---	-----------

- 1) $\text{SaO}_2 \leq 92\%$ in any amount of oxygen
- 2) $\text{SaO}_2 \leq 75\%$ in any amount of oxygen (cyanotic heart disease)
- 3) Persistent tachypnoea
(RR ≥ 70 under 6 months; ≥ 60 6 - 12 months; ≥ 40 1 - 5 yrs; ≥ 25 over 5 yrs)
- 4) Apnoea +/- bradycardia (HR ≤ 95 in children under 5 yrs)

C	CIRCULATION
---	-------------

- 1) Persistent tachycardia following one bolus of 10mls / kg fluid
(HR ≥ 150 under 5 yrs; HR ≥ 120 5 – 12 years; HR ≥ 100 over 12 yrs)
- 2) Sgns of shock: e.g. prolonged capillary refill (≥ 3 secs); poor perfusion; + / - low BP

D	DISABILITY
---	------------

- 1) GCS ≤ 11 or unresponsive or responding only to pain
- 2) Convulsions unresponsive to anticonvulsant therapy (lasting ≥ 30 mins)

E	OTHERS
---	--------

- 1) Hyperkalaemia - $K^+ \geq 6.0$ mmol/litre
- 2) Any child with suspected meningococcus
- 3) Any child with Diabetic Ketoacidosis (DKA)
- 4) Any child whose condition is worrying

Action to be taken if above tool triggered:

If a child fits any of the above criteria, seek Immediate advice from one or more of the following personnel:

- Senior Nursing Staff* on the Ward
- SHO / SpR or Consultant of the child's medical team
- RMO
- ✧ Nursing Outreach Team
- ✧ Senior Medical or Nursing Staff on Paediatric Intensive Care
- ✧ Emergency Call / Cardiac Arrest Call - 2222

If there is any delay in obtaining assistance or the child is deteriorating, immediately call one of the **G** groups above.

If the child already transgresses the above criteria, please document altered acceptable Paediatric Early Warning parameters.

$$BI = \text{SaO}_2 \geq 80\% \text{ in any } \text{O}_2$$

Medical signature, date & time:

Contact Details:

- SHO / SpR: Name: Bleep No:
- Consultant: Name: Pager / Bleep No
• RMO: Bleep No:
- Outreach Nurse / Team: Ext: Bleep No:
- Paediatric Intensive Care Unit Ext: 8546 / 8437 Emergency phone number / Cardiac arrest call: 2222

Paediatric Critical Care Outreach Team

- Commenced September 2004
- 5.3wte until April 2005 – then review (permanent team 2.2wte)
- Team comprises senior paediatric nurses with acute paediatric background (primarily PIC)
- Initial cover 0730-2130 (some transient night cover – flexible to demand)
- Winter cover 24hr/day – 7 days/wk

Paediatric Critical Care Outreach Team – Achievements to date.....

■ Key work:

- Implementation / Education around PEW
- Provide direct clinical assessment / support for ward areas
- CPAP / NIV / Sleep Studies / LTV children to ward areas
- Children requiring low dose inotropes to cardiac ward
- Development of local high dependency guidelines for practice
 - Insitilation of Urokinase into chest drains
 - Use of CPAP drivers / Vapotherm system
 - 12 lead ECG's
- Education for ward areas – study modules / direct clinical support for staff
- Follow-up of all children discharged from PIC for 48 hrs
 - Transitional care issues

Can Paediatric Outreach Contribute to the Delivery of HDU Services ?

Pro's

- Enhance quality of care for acutely ill children in ward areas
- Support staff on wards
- Enhanced confidence of staff when caring for acutely ill children
- Enhance knowledge and skills of ward based staff
- Reduce PICU admissions
- Reduce child & family stress from being discharged from PICU
- Reduce hospital stay for children

Con's

- Needless resource – expertise of staff should already be present
- Deskillling of staff
- Perception of PICU wanting to 'rule the world'!

Evaluation....

- # Anecdotal
- # Type of children now admitted to ward areas
- # More timely admissions to PIC – audit
- # Cost issues
- # Evidence needed – proving difficult to obtain in adults, assume same in children
 - Staff attitudes
 - Critical Incident monitoring
 - Reduced cardiac arrests
 - Monitor use of team
 - Reduced admissions to PICU

Current & Future Development. . .

- # Database ...1st July 2007
- # Extended links between medical & nursing personnel – day & night

September 2007

- # Combining Critical Care Outreach & Clinical Co-ordinating Team = Clinical Site Team
- # x2 senior paediatric nurses – 24hrs/day x 7days/wk + medical cover
- # Develop advanced skills of nursing staff
- # Involve multi-professionals in Team

Conclusion...

1 system does not work for all

- Tertiary Children's Hospital's without HDU
- Tertiary centres with HDU
- District General Hospitals
 - With dedicated HDUs
 - With HDU in ward areas

Each hospital needs to focus on their own service, need, existing facilities & support services, & develop a system that addresses their own safety & quality challenges ..



Clinical Research—Pediatric

The pediatric early warning system score: A severity of illness score to predict urgent medical need in hospitalized children ☆☆☆

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ORIGINAL ARTICLE

The deterioration of children in ward areas in a specialist children's hospital

Lyvonne Tume

ABSTRACT

Research in adult patients, in the last decade, has highlighted suboptimal care and failures, in the recognition of sick adults in ward areas. In addition, many of these patients (at least 50%) demonstrated documented evidence, on observation charts, of clinical deterioration in the 24–48 h preceding cardiopulmonary arrest or emergency intensive care unit admission. However, there is little published data on whether these findings apply to children (0–17 years). The aim of the study was to examine the extent of inpatient deterioration and critical care unit admission within a children's hospital based in the North West of England, during a 4-month period. The design included a prospective chart review of clinical observations. As noted in adult patients, there is considerable documented evidence (in terms of abnormal vital signs) of physiological deterioration in the 24 h preceding intensive care or high-dependency unit admission. The use of a Pediatric Early Warning (PEW) tool could potentially have identified 87% of these children of being 'at risk' of deterioration. It is recommended that a PEW tool be incorporated into the routine paediatric ward observation charts and practice to identify children 'at risk' of deterioration.

Key words: Intensive care unit admission • Paediatric deterioration • Paediatric early warning tools

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Integrated monitoring and analysis for early warning of patient deterioration

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ORIGINAL ARTICLE

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Can Paediatric Early Warning Assessment Tools Assist in Delivering Quality Care for Hospitalised Children ?

WE BELIEVE SO !



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