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Early warning tools or scoring systems to identify the effectiveness of such a tool, i.e. PEWS (paediatric early warning scoring tool)

Resources searched

NHS Evidence; TRIP Database; Cochrane Library; BNI; CINAHL; EMBASE; MEDLINE; Google Scholar; Google Advanced Search

*Database search terms*: "early warning scor*"; "scoring system*"; "paediatric early warning"; "pediatric early warning"; PEW; PEWS; PAWS; "pediatric advanced warning score"; "paediatric advanced warning score"; "pediatric early warning score"; "paediatric early warning score"; paediatic*; pediatric*; child*; PEDIATRICS; exp EARLY DIAGNOSIS; effectiv*; efficac*; value; utility; evaluat*; assess*; measure*; valid*; sensitiv*; exp CLINICAL ASSESSMENT TOOLS; CLINICAL EFFECTIVENESS; "track and trigger"

*Google search string*: "early warning" (PEWS OR PAWS OR pediatric OR paediatric OR child OR children) (effectiveness OR efficacy OR validity OR sensitivity) -"physical activity workplace study" -book -books

Summary

There is a lot of research in this area. However there is more research into the validity and effectiveness of various early warning tools, such as PEWS than on details of a specific tool for measuring the effectiveness of these tools, although this may be included in the full-text of articles on validity and effectiveness. I have also included some research into the efficacy of track and trigger and early warning systems more generally as this may also be applicable to paediatric patients.

Guidelines

Health Foundation
Safe from harm 2008

By using the Early Warning Score system and outreach together, it’s possible to reduce avoidable deaths in hospital. “From our experience, the biggest gain has been the combination of critical care outreach with our improved early warning system and improved basic observations,” Stephen Ramsden says. “Together, we think these three things have reduced our mortality rates.”

National Patient Safety Agency

Laparoscopic surgery: Failure to recognise post-operative deterioration 2010

Modified Early Warning Score (MEWS) or Paediatric Early Warning Score (PEWS) during the recovery period is essential.

NICE

CG50 Acutely ill patients in hospital 2007

See section 2.1.

There were also two studies that evaluated aggregate scoring systems. One study (Subbe et al. 2001) evaluated the modified early warning system (MEWS) and found that a trigger score (of five or more) was associated with increased risk of death (odds ratio [OR] 5.4, 95% confidence interval [CI] 2.8 to 10.7), ICU admission (OR = 10.9, 95% CI 2.2 to 55.6) and high dependency unit (HDU) admission (OR = 3.3, 95% CI 1.2 to 9.2). However, diagnostic test accuracy data were not reported. The other study (Garcea et al. 2006) looked at the ability of the early warning score (EWS) to predict mortality in a sample of 110 patients admitted with acute pancreatitis. Sensitivities for the tool on days 1, 2 and 3 following admission were 85.7%, 71.4% and 100%. Specificities were 28.3%, 67.4% and 77.4% respectively.

National Coordinating Centre for the Service Delivery and Organisation (NCCSDO)

Evaluation of outreach services in critical care 2010

The low sensitivity of existing TTs means that a high number of patients with established critical illness requiring intervention were likely to be missed if ward staff relied solely on these for identifying deteriorating patients. It may be possible to increase the sensitivity, at the cost of increased workload, by reducing trigger thresholds. TTs will never provide 100% identification of critically ill patients (nor potentially critically ill patients) and should therefore always be used as an adjunct to clinical judgment and experience. Our results suggested that accurate use of a TT and response algorithm may improve the pathway of care for the recognition and management of the acutely ill patient on the ward, both prior to and post-admission to a critical care unit.

National Institute for Health Research

Embedding health research: National Institute for Health Research Annual Report 2009/10

Use of an early-warning score and better communication strategies have markedly reduced the risk of patients suffering a cardiac arrest at the hospital in the past year.

Resuscitation Council (UK)

Resuscitation Guidelines 2010

The sensitivity, specificity, and accuracy of EWS or calling-criteria systems to identify sick patients have been validated for death but not for other outcomes such as hospital length of stay, cardiac arrest, or need for higher care.69, 70 Several studies have identified abnormalities of heart rate, blood pressure, respiratory rate, and conscious level as possible markers of impending critical events. However, as not all important vital signs are, or can be, recorded continuously in general ward areas, the ability of these systems to predict cardiac arrest remains unconfirmed. Gaps in vital sign data recording are common; the use of EWS, calling-criteria and rapid response systems can increase the
Evidence-based reviews

Cochrane Database of Systematic Reviews

Outreach and Early Warning Systems (EWS) for the prevention of Intensive Care admission and death of critically ill adult patients on general hospital wards 2007

In this systematic review we found that the evidence to determine the effectiveness of critical care outreach and EWS on reducing hospital mortality, unplanned ICU admissions and readmissions, length of hospital stay and adverse events is inconclusive.

Database of Abstracts of Reviews of Effects

Systematic review and evaluation of physiological track and trigger warning systems for identifying at-risk patients on the ward 2008

The authors stated that, in view of the limited evidence about reliability, validity and utility, TTs should be used in conjunction with clinical judgement. Hospitals thinking about introducing TTs should take account of the latest evidence about the reliability and validity of systems, and should consider seeking a system that suits local conditions, is easy to use in practice and is acceptable to patients and staff.

Published research


Author(s): Kyriacos U, Jelsma J, Jordan S

Citation: Journal of Nursing Management, April 2011, vol./is. 19/3(311-30), 0966-0429;1365-2834 (2011 Apr)

Public Date: April 2011

Abstract: kyriacos u., jelsma j.&jordan s. (2011) Journal of Nursing Management19, 311-330 Monitoring vital signs using early warning scoring systems: a review of the literature Aim To evaluate the need for, and the development and utility of, pen-and-paper (Modified) Early Warning Scoring (MEWS/EWS) systems for adult inpatients outside critical care and emergency departments, by reviewing published literature. Background Serious adverse events can be prevented by recognizing and responding to early signs of clinical and physiological deterioration. Evaluation Of 534 papers reporting MEWS/EWS systems for adult inpatients identified, 14 contained useable data on development and utility of MEWS/EWS systems. Systems without aggregate weighted scores were excluded. Key issues MEWS/EWS systems facilitate recognition of abnormal physiological parameters in deteriorating patients, but have limitations. There is no single validated scoring tool across diagnoses. Evidence of prospective validation of MEWS/EWS systems is limited; neither is implementation based on clinical trials. There is no evidence that implementation of Westernized MEWS/EWS systems is appropriate in resource-poor locations. Conclusions Better monitoring implies better care, but there is a paucity of data on the validation, implementation, evaluation and clinical testing of vital signs’ monitoring systems in general wards. Implications for nursing management Recording vital signs is not enough. Patient safety continues to depend on nurses’ clinical judgment of deterioration. Resources are needed to validate and evaluate MEWS/EWS systems in context. Copyright 2011 The Authors. Journal compilation Copyright 2011 Blackwell Publishing Ltd.

Source: MEDLINE

2. Implementing and sustaining evidence-based nursing practice to reduce pediatric cardiopulmonary arrest.

Author(s): Randhawa S, Roberts-Turner R, Woronick K, DuVal J
Abstract: Rapid response teams (RRTs) improve outcomes for patients through early escalation of care. However, subtle signs of clinical deterioration in children may not be consistently recognized by the bedside acute care nurse and therefore the RRT may not be activated. The Pediatric Early Warning Score (PEWS), an evidence-based tool, provides nurses with a mechanism for early detection using quantitative data. We describe our process and outcomes of implementing and sustaining the use of PEWS at the unit and organizational level using the Plan-Do-Check-Act methodology for performance improvement. Our outcome data indicate that cardiopulmonary arrests were reduced by 31% at the pilot unit level and subsequently 23.4% at the organizational level. Data also suggest that bedside nurses effectively escalated patient care needs without activating RRTs (19.4% reduction in RRT activations after PEWS implementation). Strategies to sustain the positive outcomes of PEWS at the unit and organizational levels are also described.

Source: MEDLINE

3. An eight year audit before and after the introduction of modified early warning score (MEWS) charts, of patients admitted to a tertiary referral intensive care unit after CPR.

Author(s): Moon A, Cosgrove JF, Lea D, Fairs A, Cressey DM

Abstract: AIMS: To determine whether cardiac arrest calls, the proportion of adult patients admitted to intensive care after CPR and their associated mortalities were reduced, in a four year period after the introduction of a 24/7 Critical Care Outreach Service and MEWS (Modified Early Warning System) Charts.METHODS: A retrospective analysis of prospectively collected data during two four-year periods, (2002-05 and 2006-09) in a UK University Teaching Hospital Comparisons were via (2) test. A p value of <=0.05 was regarded as being significant.RESULTS: In the second audit period, compared to the first one, the number of cardiac arrest calls relative to adult hospital admissions decreased significantly (0.2% vs. 0.4%; p<0.0001), the proportion of patients admitted to intensive care having undergone in-hospital CPR fell significantly (2% vs. 3%; p=0.004) as did the in-hospital mortality of these patients (42% vs. 52%; p=0.05).CONCLUSION: The four years following the introduction of a 24/7 Critical Care Outreach Service and MEWS Charts were associated with significant reductions in the incidence of cardiac arrest calls, the proportion of patients admitted to intensive care having undergone in-hospital CPR and their in-hospital mortality. Copyright ACopyright 2010 Elsevier Ireland Ltd. All rights reserved.

Source: MEDLINE

4. Cohort study to test the predictability of the Melbourne criteria for activation of the medical emergency team.

Author(s): Edwards ED, Mason BW, Oliver A, Powell CV

Abstract: Objective To test the predictability of the Melbourne criteria for activation of the medical emergency team (MET) to identify children at risk of developing critical illness. Design Cohort study. Setting Admissions to all paediatric wards at the University Hospital of Wales. Outcome measures Paediatric high dependency unit admission, paediatric intensive care unit admission and death. Results Data were collected on 1000 patients. A single abnormal observation determined by the Melbourne Activation Criteria (MAC) had a sensitivity of 68.3% (95% CI 57.7 to 77.3), specificity 83.2% (95% CI 83.1 to 83.2), positive
predictive value (PPV) 3.6% (95% CI 3.0 to 4.0) and negative predictive value 99.7% (95% CI 99.5 to 99.8) for an adverse outcome. Seven of the 16 children (43.8%) would not have transgressed the MAC prior to the adverse outcomes. Four hundred and sixty-nine of the 984 children (47.7%) who did not have an adverse outcome would have transgressed the MAC at least once during the admission. Conclusion The MAC has a low PPV and its full implementation would result in a large number of false positive triggers. Further research is required to determine the relative contribution of the components of this complex intervention (Paediatric Early Warning System, education and MET) on patient outcome.

**Source:** CINAHL

**Full Text:**
Available in fulltext at [Highwire Press](#)

5. **On pediatric delirium and the use of the Pediatric Confusion Assessment Method for the Intensive Care Unit.**

**Author(s):** Schieveld JN

**Citation:** Critical Care Medicine, 01 January 2011, vol./is. 39/1(220-221), 00903493

**Publication Date:** 01 January 2011

**Source:** CINAHL

**Full Text:**
Available in fulltext at [Ovid](#)

6. **Early warning scores: effective use.**

**Author(s):** Smith S

**Citation:** Nursing Times, January 2011, vol./is. 107/3(16), 0954-7762;0954-7762 (2011 Jan 25-31)

**Publication Date:** January 2011

**Abstract:** In June 2008, North Tees and Hartlepool Trust signed up to Patient Safety First. Our objectives were to put patients first and to develop a culture of patient safety. We implemented the intervention discussed here with the aim of preventing harm and reducing in-hospital cardiac arrest and mortality through earlier recognition and treatment of deteriorating patients. Acute illness is exacerbated by "failure to act" on recognised changes (Hillman et al, 2001). Analysis of serious patient safety incidents revealed that 11% of deaths were related to "deterioration not recognised or not acted upon" (National Patient Safety Agency, 2007a). The process can fail by not taking observations, not recognising early signs of deterioration, not communicating observations causing concern and not responding to concerns appropriately (NPSA, 2007b). We focused on improving all these areas.

**Source:** MEDLINE

**Full Text:**
Available in print at [Lincoln County Hospital Professional Library](#)
Available in print at [Louth County Hospital Medical Library](#)
Available in print at [Pilgrim Hospital Staff Library](#)

7. **Distinguishing between bacterial and aseptic meningitis in children: European comparison of two clinical decision rules.**


**Citation:** Archives of Disease in Childhood, 01 December 2010, vol./is. 95/12(963-967), 00039888

**Publication Date:** 01 December 2010
Abstract: Background Clinical decision rules (CDRs) could be helpful to safely distinguish between bacterial and aseptic meningitis (AM). Objective To compare the performance of two of these CDRs for children: the Bacterial Meningitis Score (BMS) and the Meningitest. Design Secondary analysis of retrospective multicentre hospital-based cohort study. Setting Six paediatric emergency or intensive care units of tertiary care centres in five European countries. Patients Consecutive children aged 29 days to 18 years presenting with acute meningitis and procalcitonin (PCT) measurement. Intervention None. Main outcome measures The sensitivity and specificity of the BMS (start antibiotics in case of seizure, positive cerebrospinal fluid (CSF) Gram staining, blood neutrophil count >=10 x10(9)/l, CSF protein level >=80 mg/dl or CSF neutrophil count >=1000 x10(6)/l) and the Meningitest (start antibiotics in case of seizure, purpura, toxic appearance, PCT level >=0.5 ng/ml, positive CSF Gram staining or CSF protein level >=50 mg/dl) were compared using a McNemar test. Results 198 patients (mean age 4.8 years) from six centres in five European countries were included; 96 had bacterial meningitis. The BMS and Meningitest both showed 100% sensitivity (95% CI 96% to 100%). The BMS had a significantly higher specificity (52%, 95% CI 42% to 62%, vs 36%, 95% CI 27% to 46%; p<10(-8)). Conclusion The Meningitest and the BMS were both 100% sensitive. This result provides level II evidence for the sensitivity of both rules, which can be used cautiously. However, use of the BMS could safely avoid significantly more unnecessary antibiotic treatments for children with AM than can the Meningitest in this population.

Source: CINAHL

Full Text: Available in fulltext at Highwire Press

8. Validation of a laboratory risk index score for the identification of severe bacterial infection in children with fever without source.

Author(s): Galetto-Lacour A, Zamora SA, Andreola B, Bressan S, Lacroix L, Da Dalt L, Gervaix A

Citation: Archives of Disease in Childhood, 01 December 2010, vol./is. 95/12(968-973), 00039888

Publication Date: 01 December 2010

Abstract: Objective The identification of severe bacterial infection (SBI) in children with fever without source (FWS) remains a diagnostic problem. The authors previously developed in their Swiss population a risk index score, called the Lab-score, associating three independent predictors of SBI, namely C reactive protein (CRP), procalcitonin (PCT) and urinary dipstick. The objective of this study was to validate the Lab-score in a population of children with FWS different from the derivation model. Methods A prospective study, conducted in Padova, on 408 children aged 7 days to 36 months with FWS was recently published. PCT, CRP, white blood cell count (WBC) and urinary dipstick were determined in all children. The Lab-score was applied to this population and the diagnostic characteristics for the detection of SBI were calculated for the Lab-score and for any single variable used in the Italian study. Results For the identification of SBI, the sensitivity of a score >=3 was 86% (95% CI 77% to 92%) and the specificity 83% (95% CI 79% to 87%). The area under the receiver operating characteristic curve for the Lab-score (0.91) was significantly superior to that of any single variable: 0.71 for WBC, 0.86 for CRP and 0.84 for PCT. The Lab-score performed better than other laboratory markers, even when applied to children of different age groups (<3 months, 3-12 months and >12 months). The results obtained in this validation set population were comparable with those of the derivation set population. Conclusions This study validated the Lab-score as a valuable tool to identify SBI in children with FWS.

Source: CINAHL

Full Text: Available in fulltext at Highwire Press

9. Parameters associated with active caries lesions assessed by two different visual scoring systems on occlusal surfaces of primary molars - a multilevel approach.
Abstract: The aim of this in vivo study was to evaluate the association between several parameters related to children and to their teeth, and the presence of active carious lesions assessed by two different visual indices on occlusal surfaces of primary molars. Occlusal surfaces of 757 primary molars in 139 children (3-12 years old) were classified as sound, or having inactive or active carious lesions using the Nyvad criteria (NY) and the International Caries Detection and Assessment System (ICDAS-II) and a supplemental lesion activity assessment system (ICDAS-LAA). Several parameters related to the tooth and to the child were recorded. Associations between these parameters and the presence of active carious lesions on occlusal surfaces were evaluated using logistic multilevel analysis. Second primary molar teeth and children with high caries experience were more frequently with active occlusal carious lesions compared to sound and inactive occlusal carious lesions classified by both visual scoring systems. Teeth with a mature dental plaque on the occlusal surface and younger children had more active caries than inactive occlusal carious lesions (excluding sound teeth in the analysis). A previous visit to a dentist was related to a lower frequency of active occlusal carious lesions classified by NY only, and upper primary molars presented with higher numbers of active occlusal carious lesions classified by ICDAS-LAA. Presence of mature dental plaque and tooth type are tooth-related variables associated with active carious lesions on occlusal surfaces of primary teeth, as well as anterior caries experience and age are variables related to the child.

Source: CINAHL

10. Evaluation of modified early warning scores as a predictor of outcome in obstetric admissions to critical care units: Secondary analysis of the Intensive Care National Audit and Research Centre (ICNARC) Case Mix Program (CMP) database

Author(s): Carle C., Johal J., Columb M., Alexander P.

Citation: British Journal of Anaesthesia, November 2010, vol./is. 105/5(707P), 0007-0912 (November 2010)

Publication Date: November 2010

Abstract: The latest CEMACH report recommends the use of modified early warning scores (MEWS) to assist in identifying the obstetric patient at risk of deterioration. By using critically ill obstetric patients from the Case Mix Program (CMP) data set and examining their unit mortality, we aim to evaluate the ability of various pre-existing MEWS to identify the obstetric patient at risk. After ethical approval, all female admissions (aged 16-50 yr) during the 13 yr study period were extracted from the CMP database. The data (n=71 107) were randomly split into two sets. All analyses have been carried out on set 1. Set 2 was reserved for future analysis. Cases with an obstetric cause as their primary or secondary reason for admission (direct obstetric admissions) were identified. A variety of MEWS scores were selected for evaluation. These included published, unpublished, general, and obstetric specific scores. Using physiological data collected within the first 24 h of admission, we calculated nine different MEWS for each direct obstetric admission. The ability of the nine MEWS to predict outcome (unit mortality) was evaluated. Discrimination was assessed using area under ROC curves. Within 'set 1', 2240 direct obstetric admissions were identified. Unit mortality was 1.7%. ROC curve analysis (Table 1) showed that all nine MEWS were able to distinguish, with varying degrees of discrimination, intensive care survivors from non-survivors within the study group. The 'obstetric' MEWS did not confer any additional benefit. Our obstetric data set (n=2240) comprises parameters measured after admission to critical care. Ideally, to evaluate a MEWS, the parameters in the period before admission should be used. An estimated 0.06% of maternities require critical care. (Table presented) Prospective data collection of a similarly sized data set is unfeasible as it would require participation by all the CMP units over a 6 yr period. Our findings confirm that the MEWS studied can be used to predict unit mortality among obstetric admissions and identify the at risk obstetric patient.

Source: EMBASE

Author(s): Tait D

Citation: Nursing Management (Harrow), October 2010, vol./is. 17/6(31-5), 1354-5760;1354-5760 (2010 Oct)

Publication Date: October 2010

Abstract: The suboptimal assessment of patients for signs of clinical deterioration and the subsequent response has led to the development of national guidelines and tools for tracking and responding to these situations. Such tools can provide guidance but ultimately the clinical skill, decision making and collaboration of professional practitioners determine optimal care. The use of track-and-trigger tools is insufficient to provide optimal care due to the many factors that affect patient journeys. The clinical knowledge and skill of nurses are important to this process and in achieving safe patient care. This article focuses on the clinical implications of the knowledge and experience of nurses, as well as their role in team working when recognising and responding to clinical deterioration.

Source: MEDLINE

Full Text:
Available in fulltext at Ovid
Available in fulltext at EBSCO Host


Author(s): Morris A, Davies K

Citation: British Journal of Nursing, October 2010, vol./is. 19/18(1180-4), 0966-0461;0966-0461 (2010 Oct 14-27)

Publication Date: October 2010

Abstract: This article describes the outcomes of an observation of care in an acute setting undertaken as part of the Royal College of Nursing Clinical Leadership Programme. Positive responses of staff and managers to the findings and a subsequent education programme have ensured that the use of early warning scores, and indeed early interventions, have been implemented with consequent improvements in patient care.

Source: MEDLINE

Full Text:
Available in fulltext at EBSCO Host

13. Do chronic liver disease scoring systems predict outcomes in trauma patients with liver disease? A comparison of MELD and CTP.


Citation: Journal of Trauma, 01 September 2010, vol./is. 69/3(568-573), 00225282

Publication Date: 01 September 2010

Abstract: BACKGROUND: Although the Child-Turcotte-Pugh (CTP) score is an established outcome prediction tool for patients with liver disease, the Model for End-Stage Liver Disease (MELD) score has recently supplanted CTP for patients awaiting transplantation. Currently, data regarding the use of CTP in trauma is limited, whereas
MELD remains unstudied. We compared MELD and CTP to determine which scoring system is a better clinical outcome predictor after trauma. METHODS: A review of trauma admissions during 2003-2008 revealed 68 patients with chronic liver disease. Single and multiple variable analyses determined predictors of hepatic complications and survival. MELD and CTP were compared using odds ratios and area under the receiver operating curve (AUC) analyses. A p value <=0.05 was significant. RESULTS: The mean MELD and CTP scores of the population were 13.1 - 6.0 and 8.3 - 1.8, respectively (mean - SD). Overall, 73.5% had one or more complications and 29.4% died. When survivors were compared with nonsurvivors, no difference in mean MELD scores was found, although mean CTP score (survivors, 7.7 - 1.5; nonsurvivors, 9.4 - 1.9; p = 0.001) and class ("C" survivors, 12.1%; "C" nonsurvivors, 56.3%; p = 0.002) were different, with survival relating to liver disease severity. Odds ratios and AUC determined that MELD was not predictive of hepatic complications or hospital survival (p > 0.05), although both CTP score and class were predictive (p < 0.05; AUC > 0.70). CONCLUSION: Trauma patients suffering from cirrhosis can be expected to have poorer than predicted outcomes using traditional trauma scoring systems, regardless of injury severity. Scoring systems for chronic liver disease offer a more effective alternative. We compared two scoring systems, MELD and CTP, and determined that CTP was the better predictor of hepatic complications and survival in our study population.

Source: CINAHL

14. Validation of a clinical score to predict skull fracture in head-injured infants.

Author(s): Bin SS, Schutzman SA, Greenes DS

Citation: Pediatric Emergency Care, 01 September 2010, vol./is. 26/9(633-639), 07495161

Publication Date: 01 September 2010

Abstract: OBJECTIVES: To validate a previously derived clinical score that uses clinical signs to determine which head-injured infants are at risk of skull fracture. The clinical score is calculated on the basis of the patient's age, the scalp hematoma size, and the location of the hematoma, with a total value between 0 and 8. METHODS: We performed a prospective observational study of children younger than 2 years with blunt head trauma presenting to an urban pediatric emergency department. Among subjects who had head imaging performed (validation set), we assessed the utility of our clinical score to detect skull fracture and intracranial injury. RESULTS: In the 203 patients with imaging, 51 (25%) were diagnosed with skull fracture and 29 (14%) with intracranial injury. A clinical score of 4 or greater identified 90% (46/51) of patients with skull fracture with a sensitivity of 0.90 (95% confidence interval [CI], 0.78-0.96) and a specificity of 0.78 (95% CI, 0.70-0.84). A clinical score of 3 or greater identified 93% (27/29) of those with an intracranial injury with a sensitivity of 0.93 (95% CI, 0.76-0.99) and a specificity of 0.42 (95% CI, 0.35-0.50). A score of 3 or greater identified 100% of intracranial injury among asymptomatic patients. CONCLUSIONS: We have validated our clinical scoring system as an accurate way of determining an infant's risk of skull fracture. Whereas a clinical score of 4 or greater maximizes the trade-off between sensitivity and specificity for identifying skull fracture, a clinical score of 3 or greater may be preferable for detecting intracranial injury.

Source: CINAHL

15. Pragmatic scoring system for pharyngitis in low-resource settings.

Author(s): Joachim L, Campos D Jr, Smeesters PR

Citation: Pediatrics, 01 September 2010, vol./is. 126/3(0-), 00314005

Publication Date: 01 September 2010

Abstract: OBJECTIVE: Our objective was to develop an easy, safe, pragmatic, clinical scoring system that would allow decreases in unnecessary treatment with antimicrobial agents in low-resource settings. METHODS: Children with pharyngitis were enrolled prospectively from 2 public hospitals and 1 medical unit in Brasilia, Brazil, over 17 months. Attending clinicians completed a questionnaire and a previously published scoring system for pharyngitis before performing throat swabs and group A streptococcus (GAS) rapid antigen-detection tests. Data from this study were added to those collected in 2004, to assess the performance of each item of the scoring system. The performance of the new
clinical decision rule was determined with a receiver operating characteristic curve. The final outcome of the model was assessed on the basis of sensitivity, specificity, and positive likelihood ratio for non-GAS infections with the clinical approach, compared with throat culture or rapid antigen-detection test results. RESULTS: A total of 576 children were included, among whom 400 had non-GAS pharyngitis. The use of our new clinical decision rule would allow for 35% to 55% antibiotic reduction, with 88% specificity. CONCLUSIONS: This clinical decision rule could reduce unnecessary antibiotic treatment significantly in low-resource settings.

Source: CINAHL

Full Text:
Available in fulltext at American Academy of Pediatrics


Author(s): Adde L, Helbostad JL, Jensenius AR, Taraldsen G, Grunewaldt KH, Stoen R

Citation: Developmental Medicine & Child Neurology, 01 August 2010, vol./is. 52/8(773-778), 00121622

Publication Date: 01 August 2010

Abstract: Aim The aim of this study was to investigate the predictive value of a computer-based video analysis of the development of cerebral palsy (CP) in young infants. Method A prospective study of general movements used recordings from 30 high-risk infants (13 males, 17 females; mean gestational age 31wks, SD 6wks; range 23-42wks) between 10 and 15 weeks post term when fidgety movements should be present. Recordings were analysed using computer vision software. Movement variables, derived from differences between subsequent video frames, were used for quantitative analyses. CP status was reported at 5 years. Results Thirteen infants developed CP (eight hemiparetic, four quadriplegic, one dyskinetic; seven ambulatory, three non-ambulatory, and three unknown function), of whom one had fidgety movements. Variability of the centroid of motion had a sensitivity of 85% and a specificity of 71% in identifying CP. By combining this with variables reflecting the amount of motion, specificity increased to 88%. Nine out of 10 children with CP, and for whom information about functional level was available, were correctly predicted with regard to ambulatory and non-ambulatory function. Interpretation Prediction of CP can be provided by computer-based video analysis in young infants. The method may serve as an objective and feasible tool for early prediction of CP in high-risk infants.

Source: CINAHL

Full Text:
Available in fulltext at EBSCO Host

17. Better VIeWS ahead? It is high time to improve patient safety by standardizing Early Warning Scores.

Author(s): Subbe CP

Citation: Resuscitation, August 2010, vol./is. 81/8(923-4), 0300-9572;1873-1570 (2010 Aug)

Publication Date: August 2010

Source: MEDLINE

18. Validation of a physiological track and trigger score to identify developing critical illness in haematology patients

Author(s): Mulligan A.

Citation: Intensive and Critical Care Nursing, August 2010, vol./is. 26/4(196-206), 0964-3397 (August 2010)

Publication Date: August 2010
Abstract: Objective: To validate two physiological track and trigger systems; the early warning score (Morgan et al., 1997) and the trust observation chart on a haematology unit. The study aimed to determine whether either of these systems could be used to identify developing critical illness in haematology. Research design: A prospective validation study where all patients' physiological observations were recorded, the level of care they were receiving assessed and after data collection finished, the triggers and EWS calculated. Setting: A haematology unit in an inner London hospital. Results: 71 patients took part in the study; 17 of these became critically ill. The sensitivity of both systems compared favourably with other studies. However, specificity was lower. This will mean a number of false negative results within this patient group. Conclusion: The study concluded that the systems are useful adjuncts to identify developing critical illness in haematology patients but cannot be used in isolation due to the high number of false negative results that occur. Any plan to introduce either system should acknowledge the increase in workload that will result. 2010 Elsevier Ltd.

Source: EMBASE

19. Track and trigger system for use in community hospitals.

Author(s): Wolfenden J, Dunn A, Holmes A, Davies C, Buchan J

Citation: Nursing Standard, July 2010, vol./is. 24/45(35-9), 0029-6570;0029-6570 (2010 Jul 14-20)

Publication Date: July 2010

Abstract: AIM: To adapt and promote a relevant track and trigger system based on modified early warning systems (MEWS) for use in rural community hospitals in Powys, Wales. METHOD: Track and trigger systems, including MEWS, were reviewed, compared and developed by senior nursing and medical staff using PDSA (Plan Do Study Act) cycles. RESULTS: A track and trigger system was developed, piloted and rolled out to all ten community hospitals in Powys. The system is not only used to monitor inpatients, but is also useful in determining appropriateness of patient transfer to district general hospitals. CONCLUSION: The track and trigger scoring system has proved useful in assessing patients and alerting staff if their condition is deteriorating. It has ensured, when necessary, timely, appropriate and safe transfer of patients to the district general hospital. The scoring system has been extended to determine appropriateness of accepting patients from the district general hospital to the community hospital.

Source: MEDLINE

Full Text: Available in fulltext at EBSCO Host

Available in print at Louth County Hospital Medical Library


Author(s): Braga MM, Ekstrand KR, Martignon S, Imparato JC, Ricketts DN, Mendes FM

Citation: Caries Research, 01 July 2010, vol./is. 44/3(300-308), 00086568

Publication Date: 01 July 2010

Abstract: This study aimed to compare the clinical performance of two sets of visual scoring criteria for detecting caries severity and assessing caries activity status in occlusal surfaces. Two visual scoring systems--the Nyvad criteria (NY) and the ICDAS-II including an adjunct system for lesion activity assessment (ICDAS-LAA)--were compared using 763 primary molars of 139 children aged 3-12 years. The examinations were performed by 2 calibrated examiners. A subsample (n = 50) was collected after extraction and histology with 0.1% red methyl dye was performed to validate lesion depth and activity. The reproducibility of the indices was calculated (kappa test) and ROC analysis was performed to assess their validity and related parameters were compared using McNemar's test. The association between the indices and with the histological examination was evaluated using Spearman's correlation coefficient (r(s)). Visual criteria showed excellent reproducibility both regarding severity (NY: 0.94; ICDAS-II: 0.91) and activity (NY: 0.90; LAA: 0.91). The NY and LAA showed good association in caries activity assessment (r(s) = 0.88; 95% CI =
0.86-0.89; p < 0.001). Nevertheless, considering only cavitated lesions, this association was not significant (p > 0.05). Concerning the severity, both indices presented similar validity parameters. At D2 threshold, the sensitivity was higher for NY (NY = 0.87; ICDAS = 0.61, p < 0.05). Regarding activity status, NY showed higher specificities and accuracies. In conclusion, NY and ICDAS-II criteria are comparable and present good reproducibility and validity to detect caries lesions and estimate their severities, but the LAA seems to overestimate the caries activity assessment of cavitated lesions compared to NY.

Source: CINAHL

21. Implementation of the pediatric early warning scoring system on a pediatric hematology/oncology unit.

Author(s): Demmel KM, Williams L, Flesch L

Citation: Journal of Pediatric Oncology Nursing, 01 July 2010, vol./is. 27/4(229-240), 10434542

Publication Date: 01 July 2010

Abstract: Despite improved outcomes for pediatric Hematology/Oncology patients over the past 15-20 years, sepsis and other acute events continue to cause serious illness in these children. Implementing a pediatric early warning scoring tool (PEWS) with an associated multi-disciplinary action algorithm in a pediatric Hematology/Oncology unit helped to remove barriers that prevented timely referral of children who are clinically deteriorating and requiring immediate help, enhanced multi-disciplinary team communication, and has led to a more than 3-fold increase in days between codes on the Hematology/Oncology unit. Copyright CO 2010 by Association of Pediatric Hematology/Oncology Nurses

Source: CINAHL

22. Physiological scoring: an aid to emergency medical services transport decisions?

Author(s): Challen K., Walter D.

Citation: Prehospital and disaster medicine : the official journal of the National Association of EMS Physicians and the World Association for Emergency and Disaster Medicine in association with the Acute Care Foundation, July 2010, vol./is. 25/4(320-323), 1049-023X (2010 Jul-Aug)

Publication Date: July 2010

Abstract: INTRODUCTION: Attendance at UK emergency departments is rising steadily despite the proliferation of alternative unscheduled care providers. Evidence is mixed on the willingness of emergency medical services (EMS) providers to decline to transport patients and the safety of incorporating such an option into EMS provision. Physiologically based Early Warning Scores are in use in many hospitals and emergency departments, but not yet have been proven to be of benefit in the prehospital arena. HYPOTHESIS: The use of a physiological-social scoring system could safely identify patients calling EMS who might be diverted from the emergency department to an alternative, unscheduled, care provider. METHODS: This was a retrospective, cohort study of patients with a presenting complaint of "shortness of breath" or "difficulty breathing" transported to the emergency department by EMS. Retrospective calculation of a physiological social score (PMEWS) based on first recorded data from EMS records was performed. Outcome measures of hospital admission and need for physiologically stabilizing treatment in the emergency department also were performed. RESULTS: A total of 215 records were analyzed. One hundred thirty-nine (65%) patients were admitted from the emergency department or received physiologically stabilizing treatment in the emergency department. Area Under the Receiver Operating Characteristic Curve (AUROC) for hospital admission was 0.697 and for admission or physiologically stabilizing treatment was 0.710. No patient scoring<2 was admitted or received stabilizing treatment. CONCLUSIONS: Despite significant over-triage, this system could have diverted 79 patients safely from the emergency department to alternative, unscheduled, care providers.

Source: EMBASE
23. Detecting critical illness outside the ICU: the role of track and trigger systems.

Author(s): Jansen JO, Cuthbertson BH

Citation: Current Opinion in Critical Care, June 2010, vol./is. 16/3(184-90), 1070-5295;1531-7072 (2010 Jun)

Publication Date: June 2010

Abstract: PURPOSE OF REVIEW: Critical illness is often preceded by physiological deterioration. Track and trigger systems are intended to facilitate the timely recognition of patients with potential or established critical illness outside critical care areas. The aim of this article is to review the evidence for the use of such systems.RECENT FINDINGS: Existing track and trigger systems have low sensitivity, low positive predictive values, and high specificity. They often fail to identify patients who need additional care and have not been shown to improve outcomes. The development of such systems must be based on robust methodological and statistical principles. At present, few track and trigger systems meet these standards.SUMMARY: Although track and trigger systems, combined with appropriate response algorithms, have the potential to improve the recognition and management of critical illness, further work is required to validate their utility.

Source: MEDLINE


Author(s): Oliver A, Powell C, Edwards D, Mason B

Citation: Paediatric Nursing, 01 May 2010, vol./is. 22/4(28-32), 09629513

Publication Date: 01 May 2010

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.

Source: CINAHL

25. Sensitivity of the Pediatric Early Warning Score to identify patient deterioration.

Author(s): Akre M, Finkelstein M, Erickson M, Liu M, Vanderbilt L, Billman G

Citation: Pediatrics, 01 April 2010, vol./is. 125/4(0-), 00314005

Publication Date: 01 April 2010

Abstract: OBJECTIVE: We evaluated the Pediatric Early Warning Score (PEWS) sensitivity as an early indicator of patients deterioration leading to a Rapid Response Team
(RRT)/code event. We hypothesized that at least 80% of patients had a critical PEWS preceding the event. We determined staff awareness of deterioration in patient status prior to the event as evidenced by consults, addition of monitoring equipment or increased frequency of assessment. The timing of these events was compared to critical PEWS times. METHODS: One hundred and seventy non-ICU RRT and 16 code events were identified between October 2006 and February 2008. We completed retrospective PEWS at four-hour intervals or less for twenty-four hours preceding the event. The PEWS algorithm, guiding staff to consult at a critical score >/=4 or a single domain score equal to 3, was applied. RESULTS: For 85.5% of patients the earliest indicator of deterioration, evidenced by a critical PEWS, was a median of 11 hours 36 minutes and the earliest preceding the event was 30 minutes. For 97.1% of patients the earliest median time to a consult was 80 minutes. Oximetry was added 6.9 hours for 43.5% of patients. 7% of patients had increased nursing assessment. A sub-group of patients had 1) critical PEWS, 2) consult and 3) addition of a monitor. The median time for earliest critical PEWS for these was significant (P < 0.001). CONCLUSION: PEWS can potentially provide a forewarning time >11 hours, alerting the team to adapt the care plan and possibly averting an RRT or code.

Source: CINAHL

Full Text:
Available in fulltext at American Academy of Pediatrics
Available in fulltext at Highwire Press

26. Expanded MEWS is more predictive.

Author(s): anonymous

Citation: ED Management, April 2010, vol./is. 22/4(46-7), 1044-9167;1044-9167 (2010 Apr)

Publication Date: April 2010

Abstract: Researchers studying the modified early warning score (MEWS) found several areas of weakness that led them to modify the tool, which is used to assess risk levels in ED patients. Their recommended modifications took into account a number of variables they thought would provide a more accurate prediction, and their research seems to confirm their approach. Those variables include: whether the patient was brought to the ED via ambulance; patients who received intravenous antibiotics in the ED or who had infectious illness; the patient's length of stay.

Source: MEDLINE

27. Further evidence of validity of the Gait Deviation Index

Author(s): Molloy M., McDowell B.C., Kerr C., Cosgrove A.P.

Citation: Gait and Posture, April 2010, vol./is. 31/4(479-482), 0966-6362 (April 2010)

Publication Date: April 2010

Abstract: In this paper, the relationship of the Gait Deviation Index (GDI) to gross motor function and its ability to distinguish between different Gross Motor Function Classification System (GMFCS) levels was determined. A representative sample of 184 ambulant children with CP in GMFCS levels I (n=57), II (n=91), III (n=22) and IV (n=14) were recruited as part of a population-based study. Representative gait cycles were selected following a 3D gait analysis and gross motor function was assessed using the Gross Motor Function Measure (GMFM). GDI scores were calculated in Matlab. Valid 3D kinematic data were obtained for 173 participants and both kinematic and GMFM data were obtained for 150 participants. A substantial relationship between mean GDI and GMFM-66 scores was demonstrated (r=0.70, p<0.001) with significant differences in mean GDI scores between GMFCS levels (p<0.001) indicating increasing levels of gait deviation in subjects less functionally able. The relationship between the GDI, GMFM and GMFCS in a representative sample of ambulators, lends further weight to the validity of the GDI scoring system. Furthermore it suggests that the subtleties of gait may not be wholly accounted for by gross motor function evaluation alone. Gait specific tools such as the GDI more likely capture both the functional and aesthetic components of walking. 2010 Elsevier B.V.
28. Preoperative early warning scores can predict in-hospital mortality and critical care admission following emergency surgery.

**Author(s):** Garcea G, Ganga R, Neal CP, Ong SL, Dennison AR, Berry DP

**Citation:** Journal of Surgical Research, April 2010, vol./is. 159/2(729-34), 0022-4804;1095-8673 (2010 Apr)

**Publication Date:** April 2010

**Abstract:** BACKGROUND: EWS is frequently used to monitor acute admissions requiring emergency surgery. This study examined preoperative early warning scoring (EWS) and its ability to predict mortality and critical care admission. Postoperative EWS was also evaluated as a predictor of mortality. METHODS: Preoperative EWS, age, physiologic and operative severity (POSSUM) scores, ASA grade, and serology were compared in 280 patients undergoing emergency surgery. RESULTS: Two hundred eighty patients were identified with a mortality of 15%. Among the physiological scoring systems, ASA grade and POSSUM scores were the best predictors of mortality (AUC values of 0.81). EWS, APACHE II, and age were the next best predictors (AUC values of 0.70). Postoperative APACHE II and EWS both predicted mortality. EWS on day 2 postoperatively was the best overall predictor of mortality of all the variables studied (AUC value of 0.83). Survival between patients with "improving or stable" EWS and those with "deteriorating or failing to improve" EWS was also found to be significantly different (P < 0.001). In addition, both EWS on admission and EWS 1 h preoperatively were found to predict critical care requirement postoperatively (AUC value of 0.78). CONCLUSIONS: EWS can predict the need for critical care admission and mortality following emergency surgery. In particular, the progression of EWS preoperatively, that is, whether scores improve or deteriorate, is a highly significant factor in predicting survival following emergency surgery. These findings support the use of EWS in monitoring the acute surgical patient.

**Source:** MEDLINE

29. Expanded MEWS is more predictive

**Citation:** ED management : the monthly update on emergency department management, April 2010, vol./is. 22/4(46-47), 1044-9167 (Apr 2010)

**Publication Date:** April 2010

**Abstract:** Researchers studying the modified early warning score (MEWS) found several areas of weakness that led them to modify the tool, which is used to assess risk levels in ED patients. Their recommended modifications took into account a number of variables they thought would provide a more accurate prediction, and their research seems to confirm their approach. Those variables include: whether the patient was brought to the ED via ambulance; patients who received intravenous antibiotics in the ED or who had infectious illness; the patient's length of stay.

**Source:** EMBASE

30. The use of early warning scores in the emergency department.

**Author(s):** Day A, Oldroyd C

**Citation:** Journal of Emergency Nursing, March 2010, vol./is. 36/2(154-5), 0099-1767;1527-2966 (2010 Mar)

**Publication Date:** March 2010

**Source:** MEDLINE

31. Are early warning scores the only way to rapidly detect and manage deterioration?.

**Author(s):** Odell M

**Citation:** Nursing Times, March 2010, vol./is. 106/8(24-6), 0954-7762;0954-7762 (2010 Mar 2-8)
**Publication Date:** March 2010

**Abstract:** A systematic literature review recently highlighted the complexity of nursing practice in terms of detecting and managing deteriorating ward patients (Odell et al, 2009). The findings suggest that rapid response systems, including early warning scores, may not be the only solution to the problems of detecting and managing signs of deterioration. This article summarises the findings of this review.

**Source:** MEDLINE

**Full Text:**
Available in print at Lincoln County Hospital Professional Library
Available in print at Pilgrim Hospital Staff Library

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32. **Does a standardised scoring system of clinical signs reduce variability between doctors' assessments of the potentially dehydrated child?**

**Author(s):** Roland D, Clarke C, Borland ML, Pascoe EM

**Citation:** Journal of Paediatrics & Child Health, 01 March 2010, vol./is. 46/3(103-107), 10344810

**Publication Date:** 01 March 2010

**Source:** CINAHL

**Full Text:**
Available in fulltext at EBSCO Host

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33. **Infants and toddlers with autism spectrum disorder: early identification and early intervention.**

**Author(s):** Boyd BA, Odom SL, Humphreys BP, Sam AM

**Citation:** Journal of Early Intervention, 01 March 2010, vol./is. 32/2(75-98), 10538151

**Publication Date:** 01 March 2010

**Abstract:** The increased prevalence of autism spectrum disorder (ASD) and its detection during the first 3 years of life have substantial relevance for early intervention. The purpose of this article is to summarize current scientific and policy information on early identification and early intervention for infants and toddlers with ASD and their families. Following a brief overview that provides basic information about ASD, the authors discuss early warning signs of the disorder and available screening and diagnostic tools. Finally, they highlight focused intervention practices and comprehensive treatment models appropriate for infants and toddlers with ASD, as well as issues affecting the delivery of effective early intervention services to children and families.

**Source:** CINAHL

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34. **The early warning score implementation reduced the number of unexpected deaths**

**Author(s):** Do Campo J., Anderson M., Shennan C., Goss K., Roberts M., Owen S., Dent L., Showell P., Woodcock P., MacDonald A.

**Citation:** Internal Medicine Journal, March 2010, vol./is. 40/(14), 1444-0903 (March 2010)

**Publication Date:** March 2010

**Abstract:** Introduction: Early recognition of the deteriorating patient (ERDP) has been a challenge in the medical and surgical wards. In August 2009 at the Launceston General Hospital (LGH) the Early Warning Score (EWS) was introduced in all the adult patient wards. The EWS is a simple physiological scoring system that can be calculated at the patient's bedside. Method: The EWS is a score based on conscious level, blood pressure, heart rate, respiratory rate and urine output. If the score was three points or more the ward nurses were able to trigger the sequence of calls first to the home team registrar and after 15 min if there was delay they could contact the Consultant or the ICU team. If the patient's clinical condition deteriorates the nurse can activate code blue (CB). During July 2009...
there was a period of EWS training directed by the ward nurse educators. The junior doctors were informed and educated about the EWS, the doctor's pager communication system was modified using the text message for the EWS. Results: From January to July 2009 there were 70 CB at LGH (53 survive the event and 17 deaths). Since the implementation of the EWS August 2009-October 2009 there were 21 CB (18 survive and 3 deaths). The EWS has opened an education pathway for bedside ward nurses, as they now incorporate basic intensive care nursing skills. This has improved the ERDP and reduced delay in intervention. The nurses were able to contact the Consultant directly, resulting in better communication. The junior doctors participate in the process giving priority to the EWS ward calls. Conclusion: The EWS is a very useful tool to detect patients deteriorating their clinical condition and during the period it was implemented reduced the total number of unexpected deaths.

Source: EMBASE

Full Text:
Available in fulltext at EBSCO Host

35. Development and initial validation of a radiographic scoring system for the hip in juvenile idiopathic arthritis.


Citation: Journal of Rheumatology, 01 February 2010, vol./is. 37/2(432-439), 0315162X

Publication Date: 01 February 2010

Abstract: OBJECTIVE: To develop and validate a radiographic scoring system for the assessment of radiographic damage in the hip joint in patients with juvenile idiopathic arthritis (JIA). METHODS: The Childhood Arthritis Radiographic Score of the Hip (CARSH) assesses and scores these radiographic abnormalities: joint space narrowing (JSN), erosion, growth abnormalities, subchondral cysts, malalignment, sclerosis of the acetabulum, and avascular necrosis of the femoral head. Score validation was accomplished by evaluating reliability and correlational, construct, and predictive validity in 148 JIA patients with hip disease who had a total of 381 hip radiographs available for study. RESULTS: JSN was the most frequently observed radiographic abnormality, followed by erosion and sclerosis of the acetabulum. The least common abnormalities were avascular necrosis, growth abnormalities, and malalignment. Interobserver and intraobserver reliability on baseline and longitudinal score values and on score changes was good, with intraclass correlation coefficients ranging from 0.76 to 0.98. Early score changes, but not absolute baseline score values, were moderately correlated (r(s) > 0.4) with clinical indicators of disease damage at last followup observation, thereby demonstrating that the CARSH has good construct and predictive validity. The amount of structural damage in the hip radiograph at last followup observation was predicted better by baseline to 1-year score change (r(s) = 0.66; p < 0.0001) than by absolute baseline score values (r(s) = 0.40; p = 0.002). CONCLUSION: Our results show that the CARSH is reliable and valid for the assessment of radiographic hip damage and its progression in patients with JIA.

Source: CINAHL

36. Track, trigger and teamwork: communication of deterioration in acute medical and surgical wards.

Author(s): Donohue LA, Endacott R

Citation: Intensive & Critical Care Nursing, February 2010, vol./is. 26/1(10-7), 0964-3397;1532-4036 (2010 Feb)

Publication Date: February 2010

Abstract: BACKGROUND: The majority of hospitals in the United Kingdom (UK) use some form of track and trigger scoring system, such as early warning scores, to identify deteriorating patients; however, response by the multi-professional team is not always timely and problems with recognition of deterioration persist. AIM: To examine ward nurse and critical care outreach staff perceptions of the management of patients who deteriorate
METHODS: A qualitative design was used with critical incident (CI) technique employed to structure data collection. Semi-structured interviews were undertaken with nurses who had managed a patient who was referred to the outreach team (n=11) and members of the outreach team (n=3). RESULTS: Registered nurses in this study looked at trends when assessing their patients visually. However, early warning scoring was not a key component of patient assessment and was used more commonly to quantify deterioration once the patient's changing condition had been recognised. Findings demonstrated some tensions in team communication. CONCLUSIONS: The results of this study suggest that clinicians need a better understanding of the value of track and trigger scoring systems in identifying trends in the patient's condition. Further, our data suggest that steps need to be taken in acute hospital wards to improve team members' understanding of each others' roles and capabilities. Copyright (c) 2009 Elsevier Ltd. All rights reserved.

Source: MEDLINE

37. Construct validity of a continuous metabolic syndrome score in children

Author(s): Eisenmann J.C., Laurson K.R., Dubose K.D., Smith B.K., Donnelly J.E.

Citation: Diabetology and Metabolic Syndrome, 2010, vol./is. 2/1, 1758-5996 (2010)

Publication Date: 2010

Abstract: Objective: The primary purpose of this study was to examine the construct validity of a continuous metabolic syndrome score (cMetS) in children. The secondary purpose was to identify a cutpoint value(s) for an adverse cMetS based on receiver operating characteristic (ROC) curve analysis. Methods. 378 children aged 7 to 9 years were assessed for the metabolic syndrome which was determined by age-modified cutpoints. High-density-lipoprotein cholesterol, triglycerides, the homeostasis assessment model of insulin resistance, mean arterial pressure, and waist circumference were used to create a cMetS for each subject. Results. About half of the subjects did not possess any risk factors while about 5% possessed the metabolic syndrome. There was a graded relationship between the cMetS and the number of adverse risk factors. The cMetS was lowest in the group with no adverse risk factors (-1.59 +/- 1.76) and highest in those possessing the metabolic syndrome (>=3 risk factors) (7.05 +/- 2.73). The cutoff level yielding the maximal sensitivity and specificity for predicting the presence of the metabolic syndrome was a cMetS of 3.72 (sensitivity = 100%, specificity = 93.9%, and the area of the curve = 0.978 (0.957-0.990, 95% confidence intervals). Conclusion. The results demonstrate the construct validity for the cMetS in children. Since there are several drawbacks to identifying a single cut-point value for the cMetS based on this sample, we urge researchers to use the approach herein to validate and create a cMetS that is specific to their study population. 2010 Eisenmann et al; licensee BioMed Central Ltd.

Source: EMBASE

Full Text:
Available in fulltext at BioMedCentral
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38. Performance of the maximum modified early warning score to predict the need for higher care utilization among admitted emergency department patients.

Author(s): Heitz CR, Gaillard JP, Blumstein H, Case D, Messick C, Miller CD

Citation: Journal of Hospital Medicine (Online), January 2010, vol./is. 5/1(E46-52), 1553-5592;1553-5606 (2010 Jan)

Publication Date: January 2010

Abstract: BACKGROUND: It is uncertain whether ED-calculated risk scores can predict required intensity of care upon hospital admission. This investigation examines whether versions of the Modified Early Warning Score (MEWS) predict high level of care utilization among patients admitted from the ED. METHODS: A retrospective chart review of 299 admissions was implemented. Exclusions prior to abstraction included pediatrics, cardiology, or trauma admissions. Using a data-gathering instrument, abstractors recorded physiologic parameters and clinical variables. Risk scores were calculated electronically. In
contrast to the original MEWS, the MEWS Max was calculated using data from the entire ED visit. The primary outcome composite included all-cause mortality and higher care utilization within 24 hours. RESULTS: The final analysis contained 280 participants. 76 (27%) met the composite endpoint of death (n = 1) or higher care utilization (n = 76). The MEWS Max was associated with the composite outcome (OR=l.6 [95% CI 1.3-1.8] for each one point increase). The MEWS Max had moderate predictive ability (C statistic: MEWS Max 0.73 [0.66-0.79]) but classified 82% of participants as intermediate (10-40%) risk. Inclusion of additional variables slightly improved the predictive ability (C statistic 0.76 [0.69-0.82]) and correctly reclassified 17% of patients as <10% risk. CONCLUSIONS: The MEWS Max has moderate ability to predict the need for higher level of care. Addition of ED length of stay and other variables to MEWS Max may identify patients at both low and high risk of requiring a higher level of care. (c) 2010 Society of Hospital Medicine.

Source: MEDLINE

39. Validation of "Signs of Inflammation in Children that Kill" (SICK) score for immediate non-invasive assessment of severity of illness


Citation: Italian journal of pediatrics, 2010, vol./is. 36/(35), 1824-7288 (2010)

Publication Date: 2010

Abstract: OBJECTIVE: To validate the SICK scoring system’s ability to differentiate between individuals with higher and lower probabilities of death METHOD: We performed a one year two-centre prospective evaluation of all children aged between one month and 12 years referred to the Paediatric team at St Stephens Hospital in Delhi and admitted to the Paediatric Department at West Middlesex University Hospital in London. We calculated SICK scores at presentation and correlated them with subsequent in-hospital mortality. We used discrimination by areas under receiver operating characteristic (ROC) curves to measure performance. RESULTS: We prospectively evaluated 3895 children in Delhi and 1473 children in London. The areas under the ROC curves were 84.8% in Delhi, 81.0% in London and 84.1% (95% CI 77.4-90.8%) for combined data. Hosmer-Lemeshow goodness of fit for the combined data was good (Hosmer-Lemeshow Chi-square=2.13 (p=0.345). CONCLUSIONS: We propose the SICK score as a useful triage tool at initial presentation and highlight its particular suitability for resource poor settings.

Source: EMBASE

Full Text:

Available in fulltext at BioMedCentral
Available in fulltext at National Library of Medicine

40. The use of combined physiological parameters in the early recognition of the deteriorating acute medical patient

Author(s): Cuthbertson B.H., Boroujerdi M., Prescott G.

Citation: Journal of the Royal College of Physicians of Edinburgh, 2010, vol./is. 40/1(19-25), 1478-2715 (2010)

Publication Date: 2010

Abstract: Background: Early warning scores (EWS) are widely used to allow early recognition of the deteriorating patient. We aimed to test their ability to predict major deterioration in medical patients. Methods: Two cohorts were prospectively identified who were admitted to an acute medical admissions unit and to the respiratory unit but not admitted to the intensive care unit (ICU): medical-non ICU and respiratory-non ICU groups. Two further cohorts were retrospectively identified that required ICU admission from these units (medical-ICU and respiratory-ICU groups). Discriminant analysis and receiver operating characteristic curves were used to discriminate between groups, and time relationships were analysed. Results: Heart rate (HR), respiratory rate (RR) and oxygen saturation (SaO2) were significantly higher in the medical-ICU group than the medical-non ICU group and significantly higher in the respiratory-ICU group than in the respiratory-non ICU group. Discriminant functions incorporating HR, RR and SaO2 performed at least as
well as existing EWS systems in predicting ICU admission. Conclusions: Commonly used physiological parameters and existing EWS systems are useful at identifying sick patients. The discriminant functions described here appear to have a role in this setting but require validation in future studies. 2010 Royal College of Physicians of Edinburgh.

**Source:** EMBASE

**Full Text:**

*Available in print at Lincoln County Hospital Professional Library*

41. Impact of a systematic MEWS introduction on preoperative and postoperative evaluation in urgent/emergency surgery

**Author(s):** Maccaroni N., Guerri I., Franchi M., Fricelli C., Perretta L., Zagli G., Spina R., Linden M., Bonizzoli M., Peris A.

**Citation:** Critical Care, 2010, vol./is. 14/(S87-S88), 1364-8535 (2010)

**Publication Date:** 2010

**Abstract:** Introduction: The Modified Early Warning Score (MEWS) has been used in medical wards as a decision-making instrument. Here we show a pilot study on MEWS introduction as a routine method for care improvement in urgency/emergency surgical patients. Methods: Patients enrolled underwent urgent/emergency surgery due to trauma, appendicitis, cholecystitis, gut perforation or ischemia. Data collection with MEWS involved patients admitted for between April and October 2009. It was measured during preoperative evaluation and within 24 hours after surgery. To evaluate the role of MEWS utilization we use as outcome criteria: hospital length of stay (LOS), mortality, ICU or subintensive care unit (SCU) need. The MEWS group was compared with a control historical group (January 2008 to March 2009). Results: Groups were similar in surgical diagnosis and demographic characteristics. Patients of the control group showed a higher mortality rate compared with the MEWS group (6.7 vs 3.7). The number of SCU admissions after surgery passed from 9.6% to 15.4% after MEWS (Table presented) introduction, whereas need for an ICU bed decreased from 12.9% to 10.6% (Table 1). Linear regression between high MEWS score and hospital LOS resulted significant (P <0.001). Conclusions: These preliminary results indicate that MEWS, used in preoperative evaluation and follow-up in urgent/emergency surgical patients, can have an important impact on patient care and mortality.

**Source:** EMBASE

**Full Text:**

*Available in selected fulltext at BioMedCentral*  
*Available in fulltext at National Library of Medicine*

42. Modified Early Warning Scores: Inaccurate summation or inaccurate assignment of score?

**Author(s):** Edwards M., McKay H., Van Leuvan C., Mitchell I.

**Citation:** Critical Care, 2010, vol./is. 14/(S88), 1364-8535 (2010)

**Publication Date:** 2010

**Abstract:** Introduction: Modified Early Warning Scores (MEWS) have been utilised to improve the recognition and medical response to patient deterioration. Their usefulness is, in part, dependent upon their accuracy and to date only small datasets have been analysed to determine the accuracy of MEWS [1]. The aim of our study was to determine the accuracy of MEWS and the reasons for any inaccuracies found in a large dataset. Methods: A prospective observational study of 9,672 vital sign sets and MEWS recordings in 315 adult medical and surgical patients admitted to four wards in both a tertiary and a metropolitan hospital over a 4-month period. Individual vital sign MEWS and total MEWS was assessed for accuracy against a computer-generated individual vital sign MEWS and total MEWS using the vital sign dataset and a modified MEWS algorithm. Results: Of the 9,672 total MEWS recorded, 3,504 (3,504/9,672, 36%) had discrepancies between the nurse-recorded and computer-generated total MEWS. Of these, 3,029 (3,029/3,504, 86%) underestimated the computergenerated total MEWS. In the majority of the total MEWS
inaccuracies (2,443/3,504, 69.7%), the summation of the total MEWS from the individual MEWS was correct but the individual vital sign MEWS assignment was inaccurate. In 711 (711/3,504, 20.3%) cases the individual vital sign MEWS assignment was correct but the summation for a total MEWS was incorrect, and in 350 (350/3,504, 10%) cases both the individual vital sign MEWS assignment and summation for a total MEWS was incorrect. Conclusions: The underscoring between nurse-recorded and computergenerated MEWS indicates that the paper-based MEWS system is less likely to trigger a timely medical review and appropriate treatment of a deteriorating patient. Further education and regular auditing on the assignment of the individual vital sign MEWS may improve the accuracy of the score given that the summation of the score was not the predominant issue. Equally, an electronic system to calculate and summate the individual vital sign MEWS may reduce the total MEWS error.

Source: EMBASE

Full Text:
Available in selected fulltext at BioMedCentral
Available in fulltext at National Library of Medicine

43. Analysis of Modified Early Warning System scores and intraoperative factors on the incidence of sepsis and septic shock after elective major surgery

Author(s): Hampshire P.A., Guha A., Strong A., Parsons D., Rowan P.
Citation: Critical Care, 2010, vol./is. 14/(S88), 1364-8535 (2010)
Publication Date: 2010

Abstract: Introduction: Severe sepsis is an important cause of morbidity and mortality following major surgery. Factors that are associated with an increased risk of sepsis following surgery include emergency surgery, patient co-morbidities, allogeneic blood transfusion and degree of surgical insult [1]. Physiological track-and-trigger systems are widely used to identify deteriorating patients. The Modified Early Warning System (MEWS) is one such system, but has not been studied in regard to predicting the development of sepsis after surgery. Although high MEWS scores are associated with increased hospital mortality, the sensitivity of MEWS and other physiological track and trigger scores for predicting death or admission to intensive care is low [2]. Methods: We carried out a prospective cohort study on 101 patients undergoing elective major surgery in a large university teaching hospital. The patients were followed up for 10 days, and the incidence of sepsis and septic shock was documented. MEWS scores were recorded daily for each patient. Admissions to critical care were documented, along with critical care length of stay. Results: Twenty-seven (27%) patients developed sepsis and nine (9%) developed septic shock. Factors associated with the development of sepsis were intraoperative blood transfusion (P = 0.013), duration of operation (P = 0.004) and a postoperative MEWS score greater than 3 (P = 0.0003). Using multivariate logistic regression analysis, a MEWS score greater than 3 after surgery was the only factor that remained significantly associated with sepsis (odds ratio 4.89, P = 0.003). Although a high MEWS score was associated with sepsis after surgery, only five (19%) patients who developed sepsis had an abnormal MEWS score prior to (mean 4.6 days) sepsis being diagnosed. Conclusions: The routine use of MEWS scores in postoperative elective surgical patients may help to identify those patients at risk of developing sepsis.

Source: EMBASE

Full Text:
Available in selected fulltext at BioMedCentral
Available in fulltext at National Library of Medicine

44. Association of pediatric early warning system score with icu intervention and hospital outcome

Author(s): Rubin S., Bart R., Khemani R.
Citation: Critical Care Medicine, December 2009, vol./is. 37/12 SUPPL.(A15), 0090-3493 (December 2009)
**Publication Date:** December 2009

**Abstract:** Introduction: The validated pediatric early warning system (PEWS; Duncan et al. 2006) score preemptively identifies hospitalized children with unrecognized symptoms of a worsening medical condition. The score is based on objective criteria identifying patients who may benefit from a higher level of care. Hypothesis: This study evaluates PEWS' ability to detect patients requiring ICU intervention and the association between PEWS score and outcome. Methods: IRB approved, retrospective review of 1180 consecutive children admitted to the ICU from general care floors in a large pediatric hospital from 1/03 to 12/08. PEWS scores were calculated upon ICU admission and ICU discharge. Results: Higher admission PEWS scores were associated with need for inotropes or mechanical ventilation (OR 1.35, CI 1.29, 1.42) and mortality (OR 1.19, CI 1.14, 1.24). Of patients who survived to ICU discharge, odds of in-hospital death increased by 1.1 (CI 1.02, 1.19) for each point above admit PEWS score (P=0.01). Within this group, 26% patients with discharge PEWS scores >= 8 died during hospitalization, whereas 6.7% died if discharge PEWS score was <= 7 (PPV=0.26, NPV=0.93). Conclusions: PEWS score was associated with need for ICU intervention and mortality. Of patients with admit PEWS scores >= 8, 77% required ICU intervention and 22% died in the ICU. While clinical criteria are used for ICU discharge; children discharged with a PEWS score >= 8 or without resolution of their admission PEWS score had a significant risk of hospital death. Using PEWS score as an objective tool at ICU discharge may identify children at an unacceptably high risk for hospital mortality. This should be validated in a multicenter prospective study.

**Source:** EMBASE

**Full Text:**

Available in fulltext at Ovid [5]

45. The pediatric early warning score (PEWS) predicts the need for critical care following a rapid response call

**Author(s):** Rotta A., Gowda K., Taladaku M., Rivera R., Siddappa R.

**Citation:** Critical Care Medicine, December 2009, vol./is. 37/12 SUPPL.(A295), 0090-3493 (December 2009)

**Publication Date:** December 2009

**Abstract:** Introduction: The Pediatric Early Warning Score (PEWS) is a clinical tool designed to assess the likelihood of future clinical deterioration in children. Previous studies have shown that a PEWS of 5 or higher can successfully identify 75% of all arrests outside of the PICU with at least one hour to spare, when applied to patients admitted to a general care unit. Hypothesis: We hypothesized that the PEWS could be used to identify patients who will require critical care monitoring or treatment following a rapid response call. Methods: We reviewed the records of all patients evaluated or treated by the Rapid Response Team while inpatients at our institution between 01/01/08 and 01/01/09. Patients received a modified PEWS assessment on admission, transfer between units and as dictated by changes in clinical condition. The modified PEWS includes an assessment of the patient's behavior, cardiovascular and respiratory performance. Severity of illness is directly proportional to the score. The lowest possible PEWS is 0 and the highest is 9. Data were analyzed with descriptive statistics, T-test and Mann-Whitney Rank Sum test. Results: During the study period there were 6558 admissions to the hospital, with 5475 routine admissions (excluding PICU and NICU admissions) and 65 Rapid Response calls. The mean patient age was 4.8 years, the mean PEWS was 5.17 and the mean time elapsed from admission to the Rapid Response call was 74.69 hours. Thirty nine patients (60%) required transfer to the PICU following a Rapid Response call and 10 of those patients (25.6%) required endotracheal intubation. The PEWS for patients who required subsequent critical care was higher than for those who remained in the general care unit after the call (6.03 +/- 2.70 vs 3.88 +/- 1.94, p<0.001). A PEWS of 6 or higher predicted the need for subsequent critical care with a sensitivity of 0.64, specificity of 0.81 and an area under the Receiver Operating Characteristic curve of 0.78. Conclusions: The PEWS can be used as an aid in predicting which patients should be cared for in a Pediatric Intensive Care Unit environment after a Rapid Response call in the general care unit.

**Source:** EMBASE
46. Use of the Modified Early Warning Score decreases code blue events.

Author(s): Maupin JM, Roth DJ, Krapes JM

Citation: Joint Commission Journal on Quality & Patient Safety, December 2009, vol./is. 35/12(598-603), 1553-7250;1553-7250 (2009 Dec)

Publication Date: December 2009

Source: MEDLINE

47. Assessment of symptoms reported by 10- to 18-year-old cancer patients in Taiwan.

Author(s): Yeh CH, Wang CH, Chiang YC, Lin L, Chien LC

Citation: Journal of Pain & Symptom Management, 01 November 2009, vol./is. 38/5(738-746), 08853924

Publication Date: 01 November 2009

Abstract: The purposes of this study were 1) to assess and describe the occurrence, frequency, severity, and distress of symptoms reported by Taiwanese pediatric cancer patients who were between 10 and 18 years of age, and 2) to use statistical analysis to determine whether the multiple dimensions (i.e., frequency, severity, or distress) of the Memorial Symptom Assessment Scale (MSAS) 10-18 alone can provide sufficient useful information for the assessment of symptoms that patients report as distressing. A total of 144 Taiwanese pediatric cancer patients and their mothers participated in this cross-sectional study. The frequency of symptoms for all patients ranged from 52% for "lack of energy" to 10% for "feeling nervous." The most common symptoms (occurrence >40%) were "lack of energy," "lack of appetite," "feeling drowsy," "sweating," "worrying," "nausea," "dry mouth," "pain," and "lack of concentration." Patients in the "on-treatment group" had more distressing symptoms than those in the "off-treatment group." The severity and distress subscales did provide the most information for symptom assessment and were the two best subscales to represent the impact of symptoms on quality of life, fatigue, and internalizing behaviors. The findings of this study suggest that revising the current format of the MSAS 10-18 into three separate instruments (one for each of the subscales) might provide more accurate data for assessments. Such a modification would change the scoring system and provide for more accurate data analysis.

Source: CINAHL

48. Advances in early warning score and its clinical application

Author(s): Xiao H.-L., Sun F.-F., Qi H.-Y.

Citation: Chinese Critical Care Medicine, November 2009, vol./is. 21/11(697-699), 1003-0603 (November 2009)

Publication Date: November 2009

Source: EMBASE

49. Routine pain scoring does not improve analgesia provision for children in the emergency department.

Author(s): Jadav, M, Lloyd, G, McLaughlan, C

Citation: Emergency Medicine J, October 2009, vol./is. 26/10(695-7), 1472-0205 (2009 Oct)

Publication Date: October 2009
Abstract: Audit of the introduction of a mandatory pain scoring system for use by nurses with child patients during triage at the Royal Devon and Exeter Hospital. Records of children admitted with burns or long-bone fractures were checked to see if use of pain scoring improved their analgesic needs. 10 refs.

Source: BNI

Full Text:
Available in fulltext at Highwire Press

50. A new scoring system for the evaluation of clubfoot: the IMAR-Clubfoot scale.

Author(s): Ramanathan AK, Herd F, Macnicol M, Abboud RJ

Citation: Foot, 01 September 2009, vol./is. 19/3(156-160), 09582592

Publication Date: 01 September 2009

Abstract: Background Recently much interest has been shown regarding the biomechanical techniques for the assessment of clubfoot but as yet their specific role in such an endeavour is unclear. Several scoring systems have been designed but none have been adopted as a standard. The ideal system should be simple, modular, reliable, repeatable and be able to assess functional deformity objectively. Objective This study was aimed to develop a comprehensive scoring system and to demonstrate the potential of such an assessment tool in evaluating clubfoot. Methods A new innovative scoring system, the IMAR-Clubfoot scale, was designed, which incorporated clinical and biomechanical data. Clinical assessment was performed using a questionnaire and standard clinical criteria while the biomechanical evaluation was undertaken using the PodotrackRG, the optical dynamic pedobarograph and the GAITRiteRG systems. Thirteen children (16 clubfeet) were recruited for assessment using the IMAR-Clubfoot scale. Results The model can detect abnormalities related to talipes equinovarus and quantify them objectively. The results also emphasise the need for such a comprehensive system, which combines clinical and biomechanical data as there was no statistical correlation between these data. Conclusion The scoring system would be helpful in assessing the deformity, deciding upon appropriate management and objectively defining the success/failure of treatment at patient follow-up.

Source: CINAHL

51. Impact of a new track and trigger system on outcome of ICU admissions

Author(s): Saxena S., Jafrey S., Zwaal J.

Citation: Intensive Care Medicine, September 2009, vol./is. 35/(S99), 0342-4642 (September 2009)

Publication Date: September 2009

Abstract: BACKGROUND: Published data suggests that the patient group with the highest mortality in ICUs comprises those patients admitted from the hospital wards [1]. Studies have shown that in-hospital cardiac arrests are commonly preceded by physiological abnormalities [2]. If admission to ICU, is preceded by specific physiological derangement, then early identification of these high risk hospital in-patients may be possible. This may improve survival of patients. OBJECTIVES: To determine 1. The effectiveness of new track and trigger pathway in identifying patients requiring ICU admissions. 2. The impact of new system on outcome of ICU admissions METHOD: 1. Retrospective case notes survey of all ICU admissions from the ward over a 4 month period. 2. The pathway is triggered when abnormalities are present in two or more of the following parameters: response to painful stimuli, respiratory rate, oxygen saturation, systolic blood pressure, and heart rate. 3. Triggering steps progress through involvement of junior medical staff and outreach teams at step 1, to more senior staff at step 2, to consultant involvement at step 3, depending on the level of deterioration of the patient. RESULTS: 30 forms were collected over a period of 4 months. ICU mortality: patients with 1 abnormality at any time prior to ICU admission: 2/10 (20%) ICU mortality: patients with C2 abnormalities any time prior to ICU admission: 10/19 (52.6%) Mortality of patients who were pathway followers: 2/5 (40%) Mortality of patients who were pathway non-followers: 10/24 (41.6%) Average length of stay in ICU
who were survivors from pathway followers: 25 days Average length of stay in ICU who were survivors from pathway non-followers: 3.6 days Discussion: 1. There was low sensitivity of pathway for identifying ICU admissions. 2. Poor documentation of triggering events 3. Pathway followed inadequately in majority of patients due to combinations of delay in, or absence, of triggering when indicated 4. Lack of consultant involvement at step 3 5. No evidence in this audit for improved outcome in ICU patients post introduction of the new system. CONCLUSION: Recommendations 1. Improve triggering compliance through education of junior medical and nursing staff. 2. Electronic triggering devices may improve compliance. 3. Improve consultant involvement in management of the sick patient through education at registrar level. 4. Lowering of trigger thresholds and/or incorporation of additional parameters such as urine output may improve sensitivity of the system. 5. To be reaudited after six months when recommendations have been achieved.

Source: EMBASE

Full Text:
Available in fulltext at EBSCO Host

☐ 52. Clinical characteristics of unplanned admissions to intensive care unit (ICU) in a district general hospital and predictive value of modified early warning scores (MEWS)

Author(s): Matsa R., Al-Mrayat M., Prager M., Taylor G., Webb L., Cramer O.

Citation: Intensive Care Medicine, September 2009, vol./is. 35/(S100), 0342-4642 (September 2009)

Publication Date: September 2009

Abstract: INTRODUCTION: St Mary's Hospital is a small District General Hospital based on the Isle of Wight off the South Coast of England comprising 396 acute beds and a seven bedded General ICU. The ICU has an throughput of around 400 patients/annum with the majority being non-elective admissions. AIM: The quality of care prior to ICU admission has been a focus of attention [1]. MEWS had been chosen by the trust as a trigger device to identify deteriorating (sick) patients in the General Wards. This retrospective study looked at the clinical characteristics of unplanned admissions to our ICU and assessed the MEWS as a predictive tool to trigger early intervention in such cases. METHODOLOGY: All patients who were non-electively admitted to our ICU from the medical wards were included in the study (January-March 2009). The case notes were retrospectively examined. MEWS score at the time of ICU referral and the last MEWS taken immediately prior to review by ICU team were noted from designated MEWS chart, or where the latter was not available, MEWS were calculated based on the variables documented on the observations chart. The demographics, diagnosis at admission, degree of organ failure, reason for referral to ICU, the outcomes i.e. death and length of stay in the hospital were also noted. RESULTS: There were 20 unplanned admissions to ICU from Medical wards in the 3-month period, January-March 2009. The notes of three patients were not available at time of analysis, thus 17 patients' data were analysed (n = 17).Mean age was 68.5 years, 65% of patients were female. 23.5% of the unplanned admissions were immediately post cardiorespiratory arrest. At the time of referral to ICU, 58.8% of patients had a MEWS>=4. At immediate prior review, 52.9% had a MEWS>4 and 35.3% had a MEWS of 3. Respiratory support was provided for 58.8% of the patients. COPD exacerbation remained the most common cause for unplanned ICU admission (29.4%). Of the patients admitted 70.5% of the patients had two-organ failure and 23.5% had three-organ failure. Mortality among this cohort was 41.1%. The mean duration of ICU stay was 9.8 days. 41.2% stayed more than 10 days, the maximum being 30 days. CONCLUSION: This study describes the clinical characteristics of unplanned ICU admissions on the island. It is noted that decompensating respiratory pathology remains the most common reason requiring ICU admission. Majority of non-electively admitted patients showed deranged physiological variables, as highlighted by their MEWS scores, at an earlier stage prior to ICU admission. Therefore, MEWS appears to be a tool of good predictive value that can track and trigger an early intervention in deteriorating patients.

Source: EMBASE

Full Text:
53. A new scoring system for the evaluation of clubfoot: the IMAR-Clubfoot scale.

Author(s): Ramanathan AK, Herd F, Macnicol M, Abboud RJ

Citation: Foot, 01 September 2009, vol./is. 19/3(156-160), 09582592

Publication Date: 01 September 2009

Abstract: Background Recently much interest has been shown regarding the biomechanical techniques for the assessment of clubfoot but as yet their specific role in such an endeavour is unclear. Several scoring systems have been designed but none have been adopted as a standard. The ideal system should be simple, modular, reliable, repeatable and be able to assess functional deformity objectively. Objective This study was aimed to develop a comprehensive scoring system and to demonstrate the potential of such an assessment tool in evaluating clubfoot. Methods A new innovative scoring system, the IMAR-Clubfoot scale, was designed, which incorporated clinical and biomechanical data. Clinical assessment was performed using a questionnaire and standard clinical criteria while the biomechanical evaluation was undertaken using the PodotrackRG, the optical dynamic pedobarograph and the GAITRiteRG systems. Thirteen children (16 clubfeet) were recruited for assessment using the IMAR-Clubfoot scale. Results The model can detect abnormalities related to talipes equinovarus and quantify them objectively. The results also emphasise the need for such a comprehensive system, which combines clinical and biomechanical data as there was no statistical correlation between these data. Conclusion The scoring system would be helpful in assessing the deformity, deciding upon appropriate management and objectively defining the success/failure of treatment at patient follow-up.

Source: CINAHL

54. Derivation of a prognostic score for identifying critically ill patients in an emergency department resuscitation room.

Author(s): Cattermole GN, Mak SK, Liow CH, Ho MF, Hung KY, Keung KM, Li HM, Graham CA, Rainer TH

Citation: Resuscitation, September 2009, vol./is. 80/9(1000-5), 0300-9572;1873-1570 (2009 Sep)

Publication Date: September 2009

Abstract: INTRODUCTION: Several prognostic scores exist for critically ill patients, including APACHE II, Revised Trauma Score (RTS), Rapid Emergency Medicine Score (REMS) and Modified Early Warning Score (MEWS). However, there is no widely used score specifically designed to predict the likelihood of early intensive care unit (ICU) admission or death in undifferentiated emergency department (ED) resuscitation room patients. We aimed to derive such a score and compare it with other similar scores.METHODS: This was a single centre study of consecutive adult resuscitation room patients over one month. Physiological and blood test variables were compared according to the composite primary outcome: admission to ICU or death within 7 days of attendance. Multivariate logistic regression was used to derive a prediction score which was compared with other scores using ROC (receiver operating characteristic) analysis.RESULTS: 330 patients were included in the study, of whom 77 were admitted to ICU or died within 7 days. A prediction score was derived using the following parameters: systolic blood pressure; Glasgow coma score; blood glucose; bicarbonate; white cell count; and a history of metastases. This score significantly out-performed APACHE II, RTS, REMS and MEWS with an area under the ROC curve of 0.909 (95% CI 0.872-0.938).CONCLUSION: The Prince of Wales Emergency Department Score (PEDS) is a new prognostic score to predict the likelihood of early ICU admission or death in undifferentiated resuscitation room patients. Further studies are needed to validate and refine this potentially useful tool.

Source: MEDLINE

55. Prospective cohort study to test the predictability of the Cardiff and Vale paediatric early warning system.
OBJECTIVE: To develop and test the predictability of a paediatric early warning score to identify children at risk of developing critical illness. DESIGN: Prospective cohort study. SETTING: Admissions to all paediatric wards at the University Hospital of Wales. OUTCOME MEASURES: Respiratory arrest, cardiac arrest, paediatric high-dependency unit admission, paediatric intensive care unit admission and death. RESULTS: Data were collected on 1000 patients. A single abnormal observation determined by the Cardiff and Vale paediatric early warning system (C&VPEWS) had a 89.0% sensitivity (95% CI 80.5 to 94.1), 63.9% specificity (95% CI 63.8 to 63.9), 2.2% positive predictive value (95% CI 2.0 to 2.3) and a 99.8% negative predictive value (95% CI 99.7 to 99.9) for identifying children who subsequently had an adverse outcome. The area under the receiver operating characteristic curve for the C&VPEWS score was 0.86 (95% CI 0.82 to 0.91).

CONCLUSION: Identifying children likely to develop critical illness can be difficult. The assessment tool developed from the advanced paediatric life support guidelines on identifying sick children appears to be sensitive but not specific. If the C&VPEWS was used as a trigger to activate a rapid response team to assess the child, the majority of calls would be unnecessary.

Source: CINAHL

Full Text: Available in fulltext at Highwire Press

56. Prospective validation of The Pediatric Appendicitis Score in a Canadian pediatric emergency department.

OBJECTIVES: Clinical scoring systems attempt to improve the diagnostic accuracy of pediatric appendicitis. The Pediatric Appendicitis Score (PAS) was the first score created specifically for children and showed excellent performance in the derivation study when administered by pediatric surgeons. The objective was to validate the score in a nonreferred population by emergency physicians (EPs). METHODS: A convenience sample of children, 4-18 years old presenting to a pediatric emergency department (ED) with abdominal pain of less than 3 days' duration and in whom the treating physician suspected appendicitis, was prospectively evaluated. Children who were nonverbal, had a previous appendectomy, or had chronic abdominal pathology were excluded. Score components (right lower quadrant and hop tenderness, anorexia, pyrexia, emesis, pain migration, leukocytosis, and neutrophilia) were collected on standardized forms by EPs who were blinded to the scoring system. Interobserver assessments were completed when possible. Appendicitis was defined as appendectomy with positive histology. Outcomes were ascertained by review of the pathology reports from the surgery specimens for children undergoing surgery and by telephone follow-up for children who were discharged home. Sensitivity, specificity, negative predictive value (NPV), and positive predictive value (PPV) were calculated. The overall performance of the score was assessed by a receiver operator characteristic (ROC) curve. RESULTS: Of the enrolled children who met inclusion criteria (n = 246), 83 (34%) had pathology-proven appendicitis. Using the single cut-point suggested in the derivation study (PAS 5) resulted in an unacceptably high number of false positives (37.6%). The score's performance improved when two cut-points were used. When children with a PAS of or=8 determined the need for appendectomy, the score's specificity was 95.1% with a PPV of 85.2%. Using this strategy, the negative appendectomy rate would have been 8.8%, the missed appendicitis rate would have been 2.4%, and 41% of imaging investigations would have been avoided. CONCLUSIONS: The PAS is a useful tool in the evaluation of children with possible appendicitis. Scores of or=8 help predict appendicitis. Patients with a PAS of 5-7 may need further radiologic evaluation.
57. Early warning scores: are they needed in emergency care?

Author(s): Windle J, Williams J

Citation: Emergency Nurse, May 2009, vol./is. 17/2(22-6), 1354-5752;1354-5752 (2009 May)

Publication Date: May 2009

Abstract: This article reviews an audit to assess how adequately emergency department (ED) staff can use with little training a modified Patient At Risk (mPAR) early warning score, and then identifies whether mPAR scores can be used in an ED to improve outcomes for 'GP lodgers' by alerting specialty doctors of their clinical priority earlier.

58. Impact of early warning scoring system and ITU outreach teams on outcomes of haematology patients requiring admission to intensive care unit

Author(s): Bokhari S.W.I., Munir T., Memon S., Byrne J.L., Russell N.H.

Citation: British Journal of Haematology, April 2009, vol./is. 145/(53), 0007-1048 (April 2009)

Publication Date: April 2009

Abstract: Patients with haematological disorders have previously been considered to have rather poor outcomes if they end up in intensive care units. A number of haematology centres outside UK have more recently published encouraging outcomes of their patients admitted to ITU, but an up-to-date review of outcomes on a large number of patients from UK is lacking. This study in a large haematology unit was done to assess outcomes and the impact of an early warning scoring system (EWS) and early involvement of ITU outreach teams. 105 haematology patients (BMT or non-BMT) were admitted to ITU between April 2006 and August 2008 which coincided with hospital-wide implementation of EWS. Median age was 60 years (17-84). The commonest reason for admission was respiratory failure and 49% patients required mechanical ventilation. Of the 66 non-BMT patients, about half were in complete or partial remission. The rest were either new/untreated or post first course of treatment. The in-ITU deaths of the whole cohort was 49(47%), and 47(45%) patients were discharged from the hospital. 42(40%) and 33(33%) patients were alive at 3 months and 6 months respectively giving a 1-year survival of 31%. Of the 39 BMT patients, 9 were post-autologous and rest post-allogeneic transplant. Half of the BMT patients were within 3 months of transplant and 40% had graft-vs-host disease. The in-ITU deaths were 17(44%) with 16(41%) and 14(36%) patients alive at 3 months and 6 months respectively. 1-year survival was 36%. On multivariate analysis, failure of >2 organs proved to be a significant factor adversely affecting survival (P=0.002). BMT patients had equally good outcome with no difference in myeloablative versus non-myeloablative conditioning. Prior to the introduction of EWS, the in-ITU death rate in our centre was 71%(2004) which has come down to 47%(2006-2008). Hence, the outcomes of haematology patients has improved significantly especially since the introduction of EWS.
Implementing an early warning system to identify deterioration can help adult-trained nurses accurately assess children's needs and interventions, say Nicola Adshead and Raynie Thomson.

**Abstract:** PURPOSE. The present study evaluated the use of the Pediatric Early Warning Score (PEWS) for detecting clinical deterioration among hospitalized children.

**DESIGN/METHODS.** A prospective, descriptive study design was used. The tool was used to score 2,979 patients admitted to a single medical unit of a pediatric hospital over a 12-month period.

**RESULTS.** PEWS discriminated between children who required transfer to the pediatric intensive care unit and those who did not require transfer (area under the curve = 0.89, 95% CI = 0.84-0.94, p < .001).

**IMPLICATIONS.** The PEWS tool was found to be a reliable and valid scoring system to identify children at risk for clinical deterioration.

**Source:** CINAHL

**Full Text:**
Available in fulltext at EBSCO Host
Available in print at Pilgrim Hospital Staff Library

**Prospective evaluation of a pediatric inpatient early warning scoring system.**

**Author(s):** Tucker KM, Brewer TL, Baker RB, Demeritt B, Vossmeier MT

**Citation:** Journal for Specialists in Pediatric Nursing, 01 April 2009, vol./is. 14/2(79-85), 15390136

**Abstract:** PURPOSE. The present study evaluated the use of the Pediatric Early Warning Score (PEWS) for detecting clinical deterioration among hospitalized children. A significant proportion of children admitted to a hospital develop physiologic instability and some of them progress to respiratory or cardiopulmonary arrest. In spite of well-trained resuscitation teams, cardiopulmonary arrest leads to significant morbidity and mortality. Several other measures have been recently adapted to recognize and stabilize unstable patients in non-ICU areas and prevent respiratory and cardiopulmonary arrests. Rapid Response Teams and Pediatric Early Warning System (PEWS) scores are two such initiatives. We describe the evolution and implementation of PEWS in our hospital. Up to 3% of children admitted to a hospital eventually require cardiopulmonary resuscitation (1). Cardiopulmonary arrest in children, whether in an in-hospital or out of hospital setting, is associated with a high mortality and morbidity (2,3,4). It has been reported that physiologic instability exists in many patients for several hours before catastrophic deterioration occurs. This window of time provides an opportunity to intervene early, in patients whose deterioration may be detected prior to cardiopulmonary arrest, thereby improving outcomes.

**Source:** EMBASE

**Nurses' critical event risk assessments: A judgement analysis**

**Author(s):** Thompson C., Bucknall T., Estabrookes C.A., Hutchinson A., Fraser K., De Vos R., Binne cade J., Barrat G., Saunders J.

**Citation:** Journal of Clinical Nursing, February 2009, vol./is. 18/4(601-612), 0962-
Aims. To explore and explain nurses' use of readily available clinical information when deciding whether a patient is at risk of a critical event. Background. Half of inpatients who suffer a cardiac arrest have documented but unacted upon clinical signs of deterioration in the 24 hours prior to the event. Nurses appear to be both misinterpreting and mismanaging the nursing-knowledge 'basics' such as heart rate, respiratory rate and oxygenation. Whilst many medical interventions originate from nurses, up to 26% of nurses' responses to abnormal signs result in delays of between one and three hours.

Methods. A double system judgement analysis using Brunswik's lens model of cognition was undertaken with 245 Dutch, UK, Canadian and Australian acute care nurses. Nurses were asked to judge the likelihood of a critical event, 'at-risk' status, and whether they would intervene in response to 50 computer-presented clinical scenarios in which data on heart rate, systolic blood pressure, urine output, oxygen saturation, conscious level and oxygenation support were varied. Nurses were also presented with a protocol recommendation and also placed under time pressure for some of the scenarios. The ecological criterion was the predicted level of risk from the Modified Early Warning Score assessments of 232 UK acute care inpatients. Results. Despite receiving identical information, nurses varied considerably in their risk assessments. The differences can be partly explained by variability in weightings given to information. Time and protocol recommendations were given more weighting than clinical information for key dichotomous choices such as classifying a patient as 'at risk' and deciding to intervene. Nurses' weighting of cues did not mirror the same information's contribution to risk in real patients. Nurses synthesized information in non-linear ways that contributed little to decisional accuracy. The low-moderate achievement (R²) statistics suggests that nurses' assessments of risk were largely inaccurate; these assessments were applied consistently among 'patients' (scenarios). Critical care experience was statistically associated with estimates of risk, but not with the decision to intervene. Conclusion. Nurses overestimated the risk and the need to intervene in simulated paper patients at risk of a critical event. This average response masked considerable variation in risk predictions, the need for action and the weighting afforded to the information they had available to them. Nurses did not make use of the linear reasoning required for accurate risk predictions in this task. They also failed to employ any unique knowledge that could be shown to make them more accurate. The influence of time pressure and protocol recommendations depended on the kind of judgement faced suggesting then that knowing more about the types of decisions nurses face may influence information use. Relevance to clinical practice. Practice developers and educators need to pay attention to the quality of nurses' clinical experience as well as the quantity when developing judgement expertise in nurses. Intuitive unaided decision making in the assessment of risk may not be as accurate as supported decision making. Practice developers and educators should consider teaching nurses normative rules for revising probabilities (even subjective ones) such as Bayes' rule for diagnostic or assessment judgements and also that linear ways of thinking, in which decision support may help, may be useful for many choices that nurses face. Nursing needs to separate the rhetoric of 'holism' and 'expertise' from the science of predictive validity, accuracy and competence in judgement and decision making. 2007 The Authors.

Source: EMBASE

Full Text:
Available in fulltext at EBSCO Host

63. Evaluation of a modified early warning system for acute medical admissions and comparison with C-reactive protein/albumin ratio as a predictor of patient outcome.

Author(s): Fairclough E, Cairns E, Hamilton J, Kelly C

Citation: Clinical Medicine, February 2009, vol./is. 9/1(30-3), 1470-2118;1470-2118 (2009 Feb)

Abstract: The modified early warning score (MEWS) was developed as a track and trigger tool for the prompt identification of seriously ill patients on an acute medical ward. This
paper examines its value in the setting of an acute medical admissions unit (MAU) and compares it to biochemical markers of acute and chronic disease. Three hundred unselected acute admissions to the MAU of the Queen Elizabeth Hospital, Gateshead, were assessed. Correlations between MEWS score and C-reactive protein (CRP) and albumin separately were assessed, and then the relationship between MEWS and the CRP/albumin ratio across the age spectrum was examined. The findings demonstrated a strong correlation between the MEWS score and CRP/albumin ratio ($r=0.88$, $p<0.001$) across the whole age spectrum. Length of stay correlated poorly with MEWS ($r=0.08$) and CRP/albumin ratio ($r=0.15$). Overall mortality was 5% and was predicted by both tools, with a MEWS score of $>4$ (relative risk (RR)=7.8) outperforming a CRP/albumin of $>2$ (RR=2.6). MEWS remains the gold standard for assessing outcome in acute medical admissions, but does have limitations in the elderly (those aged over 70 years). A raised CRP/albumin ratio was less sensitive for overall mortality than MEWS. It did, however, appear to be of greater value in the elderly, especially in those with acute exacerbations of chronic disease. Neither test accurately predicted length of stay.

Source: MEDLINE

64. Recognizing and responding to acute illness: using early warning scores.

Author(s): Hancock A, Hulse C

Citation: British Journal of Midwifery, 01 February 2009, vol./is. 17/2(111-117), 09694900

Publication Date: 01 February 2009

Abstract: The reports on the Confidential Enquiries into Maternal and Child Health (CEMACH) (Lewis, 2004; 2007) have recommended using early warning scores (EWS) in conjunction with vital signs monitoring, similar to those commonly used in the general adult inpatient population. This is a challenging process for midwives, obstetricians and critical care staff. Collaborative planning, working and multi-disciplinary training at Mid Cheshire Hospitals NHS Foundation Trust (MCHFT) led to the successful implementation of EWS alongside a structured and graded response algorithm. All obstetric inpatients at MCHFT now have a standardized approach to vital signs monitoring using EWS.

Source: CINAHL

Full Text:
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Available in print at Pilgrim Hospital Staff Library

65. Paediatric early warning systems: where do we go from here?

Author(s): McCabe A, Duncan H, Heward Y

Citation: Paediatric Nursing, 01 February 2009, vol./is. 21/1(14-17), 09629513

Publication Date: 01 February 2009

Abstract: The Confidential Enquiry into Maternal and Child Health report published in 2008 recommended that there should be a standardised monitoring system with embedded early identification systems for children at risk of critical Illness or deterioration. Recent studies have demonstrated improvement in patient outcomes following the implementation of paediatric early warning scores and response teams in children's units and hospitals. However, it is not enough to use an early warning score in isolation; it needs to be embedded into a paediatric early warning system, with a rationalised approach to the observation and monitoring of hospitalised children. Lessons can be learnt from the adult experience of implementing early warning systems. A national, multidisciplinary, collaborative approach to the development, implementation and evaluation of paediatric early warning systems is recommended.

Source: CINAHL

Full Text:
Available in fulltext at EBSCO Host
66. Development and initial validation of the Bedside Paediatric Early Warning System score

Author(s): Parshuram C.S., Hutchison J., Middaugh K.

Citation: Critical care (London, England), 2009, vol./is. 13/4(R135), 1466-609X (2009)

Publication Date: 2009

Abstract: INTRODUCTION: Adverse outcomes following clinical deterioration in children admitted to hospital wards is frequently preventable. Identification of children for referral to critical care experts remains problematic. Our objective was to develop and validate a simple bedside score to quantify severity of illness in hospitalized children. METHODS: A case-control design was used to evaluate 11 candidate items and identify a pragmatic score for routine bedside use. Case-patients were urgently admitted to the intensive care unit (ICU). Control-patients had no 'code blue', ICU admission or care restrictions. Validation was performed using two prospectively collected datasets. RESULTS: Data from 60 case and 120 control-patients was obtained. Four out of eleven candidate-items were removed. The seven-item Bedside Paediatric Early Warning System (PEWS) score ranges from 0-26. The mean maximum scores were 10.1 in case-patients and 3.4 in control-patients. The area under the receiver operating characteristics curve was 0.91, compared with 0.84 for the retrospective nurse-rating of patient risk for near or actual cardiopulmonary arrest. At a score of 8 the sensitivity and specificity were 82% and 93%, respectively. The score increased over 24 hours preceding urgent paediatric intensive care unit (PICU) admission (P < 0.0001). In 436 urgent consultations, the Bedside PEWS score was higher in patients admitted to the ICU than patients who were not admitted (P < 0.0001). CONCLUSIONS: We developed and performed the initial validation of the Bedside PEWS score. This 7-item score can quantify severity of illness in hospitalized children and identify critically ill children with at least one hours notice. Prospective validation in other populations is required before clinical application.

Source: EMBASE

Full Text:
Available in selected fulltext at BioMedCentral
Available in fulltext at National Library of Medicine

67. Improving accuracy and efficiency of early warning scores in acute care.

Author(s): Mohammed M, Hayton R, Clements G, Smith G, Prytherch D

Citation: British Journal of Nursing, January 2009, vol./is. 18/1(18-24), 0966-0461;0966-0461 (2009 Jan 8-21)

Publication Date: January 2009

Abstract: BACKGROUND: Early warning scores (EWS) are an integral part of the care of acutely ill patients. Unfortunately, in the few studies where the accuracy of EWS has been tested it has been found to be lacking, with serious implications for quality of care.AIM: To determine if the provision of computer-aided scoring could increase the accuracy and efficiency of EWS calculations, when compared with the traditional pen-and-paper method, and to determine if it was acceptable to users.DESIGN: 26 nurses from two surgical assessment wards in two hospitals were studied. The study was conducted in three phases. Phase 1--a classroom-based exercise where nurses were given ten patient vignettes and asked to derive EWS using traditional pen-and-paper methods; Phase 2--the same as phase 1, but using a hand-held computer to derive EWS; Phase 3--the same as phase 2, but was a follow-up exercise undertaken in the ward environment, 4 weeks after computer-aided scoring was implemented in the two wards. Each phase closed with a user perception/attitudes questionnaire.RESULTS: Accuracy and efficiency--phase 1 was associated with a significantly lower overall accuracy (152/260, 58%) compared with phase 2 (96%; difference in proportions 38%, 95% confidence interval 31-44%, P < 0.0001). There was a small but significant reduction in accuracy from phase 2 (96%) to phase 3 (88%) (8% difference, P=0.006). The mean time to derive an EWS reduced from 37.9
seconds in phase 1 to 35.1 seconds in phase 2 (P=0.016), down to 24.0 seconds in phase 3 (P<0.0001). User acceptability: in phase 1, nurses favoured the pen-and-paper method in all respects except accuracy. In phase 2, nurses’ views shifted significantly in favour of the hand-held computer, with little deterioration in the follow-up phase 3.CONCLUSIONS: A hand-held computer helps to improve the accuracy and efficiency of EWS in acute hospital care and is acceptable to nurses.

Source: MEDLINE

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68. Use of an admission early warning score to predict patient morbidity and mortality and treatment success.

Author(s): Groarke JD, Gallagher J, Stack J, Aftab A, Dwyer C, McGovern R, Courtney G
Citation: Emergency Medicine Journal, December 2008, vol./is. 25/12(803-6), 1472-0205;1472-0213 (2008 Dec)
Publication Date: December 2008
Abstract: BACKGROUND: Early warning scores (EWS) are used to identify physiological deterioration in patients. Studies to date have primarily focused on the correlation between trends in serially recorded EWS of inpatients and clinical outcomes. This study examined the predictive value of an EWS calculated immediately on presentation to hospital for acute medical patients.METHOD: A prospective study of 225 consecutive medical admissions. Pulse, systolic blood pressure, respiratory rate, oxygen saturation and neurological status were used to calculate an EWS. Patients were divided into four score categories based on their EWS. The primary endpoints examined were intensive care unit (ICU)/coronary care unit (CCU) admission, death, cardiac arrest and length of hospital stay.RESULTS: For each rise in score category there was an increased risk of admission to ICU (odds ratio (OR) 3.35, CI 1.52 to 7.40, p = 0.003), admission to CCU (OR 1.82, CI 1.07 to 3.09, p = 0.027), death (OR 2.19, CI 1.41 to 3.39, p = 0.000) and reaching the combined endpoint of CCU/ICU admission or death (OR 2.19, CI 1.41 to 3.39, p = 0.000). The higher the score the longer the length of hospital admission (p = 0.04). A decrease in EWS between first presentation to hospital and transfer to the ward was associated with a decreased risk of reaching the combined endpoint of CCU or ICU admission or death (OR 2.56, CI 1.11 to 5.89, p = 0.028).DISCUSSION: Higher admission EWS correlate with increased risk of CCU/ICU admission, death and longer hospital stays independent of patient age. An improvement in serial EWS within 4 h of presentation to hospital predicts improved clinical outcomes. The EWS is a potential triage tool in the emergency department for acute medical patients.

Source: MEDLINE

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Available in print at Grantham Hospital Staff Library

69. Can paediatric early warning score be used as a triage tool in paediatric accident and emergency?

Author(s): Bradman K., Maconochie I.
Citation: European journal of emergency medicine : official journal of the European Society for Emergency Medicine, December 2008, vol./is. 15/6(359-360), 1473-5695 (Dec 2008)
Publication Date: December 2008
Abstract: The UK paediatric early warning score (PEWS) was developed for inpatients,
looking at admission to the HDU and PICU and trying to produce a system which would recognize those children at risk of admission. Since the introduction of the '4-h wait', accident and emergency (A&E) departments have been under increasing strain to assess, treat and admit patients (if required) as quickly as possible. We designed this study with the view of identifying if the PEWS score could be used as a triage tool, to detect those patients who will need admission and therefore speed up the process of admitting children to the ward. All patients who visited A&E from 1st October-16th October 2006 were audited. The PEWS scores were collated after the study period. 774 children attended A&E during the study period. 316 patients were sent home from triage following nurse-led treatment or sent to another facility. Of the 458 patients remaining, 424 (93%) were included in the study - the only exclusion criterion was the failure of complete documentation of observations. The sensitivity [the probability of a child being admitted with a score of (n)] and the specificity (the probability of a patient not being admitted with a score of 0) were calculated. For all children aged 0-16 years, a PEWS score of >or=4 had a sensitivity of 24% and a specificity of 96%. A PEWS score of >or=2 had a sensitivity of 37% and a specificity of 88%. PEWS is of limited value in predicting admission (in a triage setting) in a population of undifferentiated disease. However, a low PEWS score has a high specificity, that is, a patient scoring <2 is unlikely to need admission.

Source: EMBASE

70. Computerized scoring system for the diagnosis of foreign body aspiration in children.

Author(s): Kadmon T, Stern Y, Bron-Harlev E, Nahum E, Battat E, Schonfeld T

Citation: Annals of Otology, Rhinology & Laryngology, 01 November 2008, vol./is. 117/11(839-843), 00034894

Publication Date: 01 November 2008

Abstract: Objectives: Foreign body aspiration (FBA) is a life-threatening event in children. The gold standard for diagnosis is bronchoscopy, but there is no consensus regarding indications for the procedure. The aim of this study was to formulate a predictive model for assessing the probability of FBA in suspected cases as an aid in the decision to perform diagnostic bronchoscopy.Methods: The files of 150 patients who underwent bronchoscopy for suspected FBA at our center between 1996 and 2004 were reviewed for medical history, physical examination, and radiologic studies. The findings were analyzed by logistic regression. Results: Using the file data, we formulated a predictive model wherein each parameter received a numeric coefficient representing its significance in evaluating suspected FBA. The most significant parameters were age 10 to 24 months, foreign body in the child's mouth and severe respiratory complaints during the choking episode, hypoxemia, dyspnea or stridor following the acute event, unilateral signs on lung auscultation, abnormal tracheal radiogram, unilateral infiltrate or atelectasis, and local hyperinflation or obstructive emphysema on chest radiogram. Conclusions: In our predictive model, every case of suspected FBA can be assigned a score based on the specific parameters present, which is then entered into a probability formula to determine the likelihood of a positive diagnosis. This model may serve as a useful tool for deciding on the use of bronchoscopy in all children with suspected FBA.

Source: CINAHL

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Author(s): Carel K, Bratton DL, Miyazawa N, Gyorkos E, Kelsay K, Bender B, Strand M, Atkins D, Gelfand EW, Klinnert MD

Citation: Annals of Allergy, Asthma & Immunology, 01 November 2008, vol./is. 101/5(500-507), 10811206

Publication Date: 01 November 2008
Abstract: BACKGROUND: Atopic dermatitis (AD) severity is assessed using relatively elaborate scoring systems administered by health care practitioners; modification for parent assessment or self-assessment is limited. For ongoing home-based evaluation of pediatric AD treatment and outcomes, a quick, easy-to-use, parent-administered scoring tool is essential. OBJECTIVE: To evaluate the validity and responsiveness to change of the Atopic Dermatitis Quickscore (ADQ) compared with the established, widely used Scoring Atopic Dermatitis Severity Index (SCORAD). METHODS: The ADQ was developed for parent report and was validated against the SCORAD. The SCORAD assesses percentage of body surface area involved, intensity of a "representative area," pruritus, and insomnia. The ADQ assesses involvement and pruritus of 7 body parts. Sixty-eight children entering a pediatric day treatment program for moderate to severe AD were recruited. Skin severity was scored at admission by a physician assistant using the SCORAD and by a parent using the ADQ. Pearson correlations of the 2 scales were assessed. RESULTS: The ADQ total score correlates with the SCORAD total score (r = 0.64, P < .001). The ADQ pruritus score correlates with the SCORAD pruritus score (r = 0.62, P < .001). Correlation at the end of treatment was also seen for ADQ and SCORAD total and pruritus scores (r = 0.39, P = .02, and r = 0.66, P < .001, respectively). Responsiveness of both scales to change in skin condition was demonstrated, with significant decreases in total and pruritus scores (P < .001). CONCLUSIONS: The parent-administered ADQ takes 5 minutes to complete. Scores from the ADQ and the SCORAD are well correlated and are responsive to changes in skin condition, supporting the validity of the ADQ.

Source: CINAHL

72. The PAWS score: validation of an early warning scoring system for the initial assessment of children in the emergency department.

Author(s): Egdell P, Finlay L, Pedley DK

Citation: Emergency Medicine Journal, 01 November 2008, vol./is. 25/11(745-749), 14720205

Publication Date: 01 November 2008

Abstract: OBJECTIVE: To devise a physiology-based scoring system for assessment of children presenting to the emergency department (ED) and to validate the system retrospectively. STUDY DESIGN: Age-dependent physiological parameters designed to reflect the cardiovascular, respiratory and neurological status of patients presenting to the ED were included in a scoring system called the Paediatric Advanced Warning Score (PAWS). A retrospective pilot evaluation was performed to validate PAWS. SETTING AND PATIENTS: PAWS scores were calculated retrospectively for 46 consecutive children who required admission from the ED to the paediatric intensive care unit (PICU) and for 49 control children who were admitted from the ED to the general paediatric ward. MAIN OUTCOME MEASURES: To validate the PAWS score, we determined if this score was able to identify patients who require admission to the PICU and were therefore significantly unwell. RESULTS: The PAWS score area under the receiver operating characteristic curve was 0.86. Using a trigger score of 3 or above, PAWS was able to identify patients requiring PICU admission with a sensitivity of 70% and a specificity of 90%. CONCLUSIONS: This pilot study has shown that a physiology-based scoring system can help to identify children in the ED requiring PICU admission. Future prospective validation of PAWS is necessary to assess its ability to identify all children in need of urgent assessment in the ED.

Source: CINAHL

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73. Modified early warning score predicts the need for hospital admission and inhospital mortality.

Author(s): Burch VC, Tarr G, Morrone C

Citation: Emergency Medicine Journal, October 2008, vol./is. 25/10(674-8), 1472-0205;1472-0213 (2008 Oct)
Publication Date: October 2008

Abstract: BACKGROUND: The modified early warning score (MEWS) is a useful tool for identifying hospitalised patients in need of a higher level of care and those at risk of inhospital death. Use of the MEWS as a triage tool to identify patients needing hospital admission and those at increased risk of inhospital death has been evaluated only to a limited extent. AIM: To evaluate the use of the MEWS as a triage tool to identify medical patients presenting to the emergency department who require admission to hospital and those at increased risk of inhospital death. METHODS: Physiological parameters were collected from 790 medical patients presenting to the emergency department of a public hospital in Cape Town, South Africa. MEW scores were calculated from the data and multivariate regression analysis was performed to identify independent predictors of hospital admission and inhospital mortality. RESULTS: The proportion of patients admitted and those who died in hospital increased significantly as the MEW score increased (p<0.001). Multivariate regression analysis identified five independent predictors of hospital admission: systolic blood pressure ≤100 mm Hg, pulse rate >130 beats per minute, respiratory rate ≥30 breaths per minute, temperature ≥38.5 degrees C and an impaired level of consciousness. Independent predictors of inhospital death were: abnormal systolic blood pressure (< or =100 or > or =200 mm Hg), respiratory rate > or =30 breaths per minute and an impaired level of consciousness. CONCLUSION: The MEWS, specifically five selected parameters, may be used as a rapid, simple triage method to identify medical patients in need of hospital admission and those at increased risk of inhospital death.

Source: MEDLINE

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74. Predictors of severity and survival in acute pancreatitis: validation of the efficacy of early warning scores.

Author(s): Garcea G, Gouda M, Hebbes C, Ong SL, Neal CP, Dennison AR, Berry DP

Citation: Pancreas, October 2008, vol./is. 37/3(e54-61), 0885-3177;1536-4828 (2008 Oct)

Publication Date: October 2008

Abstract: OBJECTIVES: Early Warning Scores (EWS) is a widely used scoring system monitoring patient progress, which we have previously shown to predict outcome from acute pancreatitis. This study examined EWS from a larger group of patients to confirm if this predictive value held true. METHODS: The EWS scores were compared with the Acute Physiology and Chronic Health Evaluation II (APACHE II) scores, modified organ dysfunction scores, Imrie scores, computed tomography grading scores, and Ranson criteria for 181 admissions with acute pancreatitis. The accuracy of EWS in predicting outcome was determined by receiver operator characteristics. RESULTS: A total of 181 patients were identified with acute pancreatitis. On day 1 of admission, APACHE II scores were the most accurate predictor of mortality with an area under curve (AUC) values of 0.876, closely followed by EWS (AUC, 0.827). By day 2 and 3 after admission, the EWS was the most accurate predictor of mortality (AUC, 0.910 and 0.934, respectively). The APACHE II was the second most accurate scoring system at 48 and 72 hours (AUC, 0.892 and 0.911, respectively). CONCLUSIONS: The EWSs on days 2 and 3 after admission are sensitive and specific in predicting mortality from acute pancreatitis. It is as accurate as the APACHE II scores and easier to implement in daily practice.

Source: MEDLINE

75. A review, and performance evaluation, of single-parameter "track and trigger" systems.

Author(s): Smith GB, Prytherch DR, Schmidt PE, Featherstone PI, Higgins B

Citation: Resuscitation, October 2008, vol./is. 79/1(11-21), 0300-9572;0300-9572 (2008 Oct)
Abstract: OBJECTIVES: There is no up-to-date literature review of physiologically-based, single-parameter weighted “track and trigger” systems (SPTTS) and little data on their sensitivity and specificity to predict adverse outcomes. The aim of this study was to describe the SPTTS in clinical use and measure their sensitivity and specificity when using admission vital signs data for predicting in-hospital mortality. MATERIALS AND METHODS: We performed a systematic review of the literature to describe the SPTTS, their components and their differences. We measured their sensitivity and specificity for predicting in-hospital mortality when using a database of 9987 admission vital signs datasets. RESULTS: We identified 39 unique classes of SPTTS, of which 30 were evaluated. There was considerable variation in the physiological variables used, together with significant variation in the physiological values used to trigger a medical emergency or critical care outreach team. There was marked variation in sensitivity (7.3-52.8%), specificity (69.1-98.1%), positive predictive values (13.5-26.1%), negative predictive values (92.1-94.2%) and the potential number of calls triggered (234-3271). CONCLUSIONS: There is a wide range of unique, but very similar, SPTTS in clinical use. Although specificities were high, sensitivities were too low to provide institutions with confidence that these SPTTS could identify patients at risk of in-hospital death using admission vital signs. Institutions may wish to consider these data when selecting which, if any, single-parameter track and trigger systems to introduce.

Source: MEDLINE

76. Validation of the clinical dehydration scale for children with acute gastroenteritis.

Author(s): Goldman RD, Friedman JN, Parkin PC

Citation: Pediatrics, 01 September 2008, vol./is. 122/3(545-549), 00314005

Abstract: OBJECTIVE. We previously created a clinical dehydration scale. Our objective was to validate the clinical dehydration scale with a new cohort of patients with acute gastroenteritis who were assessed in a tertiary emergency department in a developed country. METHODS. A prospective observational study was performed in an emergency department at a large pediatric tertiary center in Canada. Children 1 month to 5 years of age with symptoms of acute gastroenteritis who were assessed in the emergency department were enrolled consecutively during a 4-month period. The main outcome measures were length of stay, proportion of children receiving intravenous fluid rehydration, and proportions of children with abnormal serum pH values or bicarbonate levels. RESULTS. A total of 205 children were enrolled, with a mean age of 22.4 +/- 14.9 months; 103 (50%) were male. The distribution of severity categories was as follows: no dehydration (score of 0), n = 117 (57%); some dehydration (score of 1-4), n = 83 (41%); moderate/severe dehydration (score of 5-8), n = 5 (2%). The 3 dehydration categories were significantly different with respect to the validation hypotheses (length of stay, mean +/- SD: none, 245 +/- 181 minutes; some, 397 +/- 302 minutes; moderate/severe, 501 +/- 389 minutes; treatment with intravenous fluids: none, n = 17, 15%; some, n = 41, 49%; moderate/severe, n = 4, 80%; number of vomiting episodes in the 7 days before the emergency department visit: none, 8.4 +/- 7.7 episodes; some, 13 +/- 10.7 episodes; moderate/severe, 30.2 +/- 14.8 episodes). CONCLUSION. The clinical dehydration scale and the 3 severity categories were valid for a prospectively enrolled cohort of patients who were assessed in our tertiary emergency department. The scoring system was valuable in predicting a longer length of stay and the need for intravenous fluid rehydration for children with symptoms of acute gastroenteritis.

Source: CINAHL

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77. Should age be included as a component of track and trigger systems used
to identify sick adult patients?

Author(s): Smith GB, Prytherch DR, Schmidt PE, Featherstone PI, Kellett J, Deane B, Higgins B

Citation: Resuscitation, August 2008, vol./is. 78/2(109-15), 0300-9572;0300-9572 (2008 Aug)

Publication Date: August 2008

Abstract: AIM OF STUDY: Few published "track and trigger systems" used to identify sick adult patients incorporate patient age as a variable. We investigated the relationship between vital signs, patient age and in-hospital mortality and investigated the impact of patient age on the function as predictors of in-hospital mortality of the two most commonly used track and trigger systems.MATERIALS AND METHODS: Using a database of 9987 vital signs datasets, we studied the relationship between admission vital signs and in-hospital mortality for a range of selected vital signs, grouped by patient age. We also used the vital signs data set to study the impact of patient age on the relationship between patient triggers using the "MET criteria" and "MEWS", and in-hospital mortality.RESULTS: At hospital discharge, there were 9152 (91.6%) survivors and 835 (8.4%) non-survivors. As admission vital signs worsened, mortality increased for each age range. Where groups of patients had triggered a certain MET criterion, mortality was higher as patient age increased. Mortality varied significantly with age (p<0.05; Fishers exact test) for breathing rate >36breathsmin(-1), systolic BP<90mmHg and decreased conscious level. For each age group, mortality also increased as total MEWS score increased. As the number of simultaneously occurring MEWS abnormalities, or simultaneously occurring MET criteria, increased, mortality increased for each age range.CONCLUSIONS: Age has a significant impact on in-hospital mortality. Our data suggest that the inclusion of age as a component of these systems could be advantageous in improving their function.

Source: MEDLINE

78. Promoting patient safety using an early warning scoring system.

Author(s): Higgins Y, Maries-Tillott C, Quinton S, Richmond J

Citation: Nursing Standard, July 2008, vol./is. 22/44(35-40), 0029-6570;0029-6570 (2008 Jul 9-15)

Publication Date: July 2008

Abstract: Recognising when a patient's condition is deteriorating is a key aspect of patient safety and the use of early warning scoring systems is integral to this. Compliance with such systems can often be poor. Through the introduction of a competency framework and audit system, the Heart of England NHS Foundation Trust has demonstrated improvements in compliance with a modified early warning scoring tool, which has had significant benefits in terms of patient safety.

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79. Pediatric illness severity measures predict delirium in a pediatric intensive care unit.

Author(s): Schieveld JNM, Lousberg R, Berghmans E, Smeets I, Leroy PLJ, Vos GD, Nicolai J, Leentjens AFG, van Os J

Citation: Critical Care Medicine, 01 June 2008, vol./is. 36/6(1933-1936), 00903493

Publication Date: 01 June 2008
Abstract: CONTEXT: Delirium in children is a serious but understudied neuropsychiatric disorder. So there is little to guide the clinician in terms of identifying those at risk. OBJECTIVE: To study, in a pediatric intensive care unit (PICU), the predictive power of widely used generic pediatric mortality scoring systems in relation to the occurrence of pediatric delirium (PD). DESIGN AND METHODS: Four-year prospective observational study, 2002-2005. Predictors used were the Pediatric Index of Mortality (PIM) and Pediatric Risk of Mortality (PRISM II). SETTING: A tertiary 8-bed PICU in The Netherlands. PATIENTS: 877 critically ill children who were acutely, nonelectively, and consecutively admitted. MAIN OUTCOME MEASURE: Pediatric delirium. MAIN RESULTS: Out of 877 children with mean age 4.4 yrs, 40 were diagnosed with PD (Cumulative incidence: 4.5%), 85% of whom (versus 40% with nondelirium) were mechanically ventilated. The area under the curve was 0.74 for PRISM II and 0.71 for the PIM, with optimal cut-off points at the 60th centile (PRISM: sensitivity: 76%; specificity: 62%; PIM: sensitivity: 82%; specificity: 62%). A PRISM II or PIM score above the 60th centile was strongly associated with later PD in terms of relative risk (PRISM II: risk ratio = 4.9; 95% confidence interval: 2.3-10.1; PIM: RR = 6.7; 95% confidence interval: 3.0-15.0). Given the low incidence of PD, values for positive predictive value were lower (PRISM II: 8.3%; PIM: 8.9%, rising to, respectively, 10.1% and 10.6% in mechanically ventilated patients) and values for negative predictive value were higher (PRISM II: 98.3%; PIM: 98.7%). LIMITATIONS: Given the relatively low incidence of delirium, a low detection rate biased toward the most severe cases cannot be excluded. CONCLUSIONS: Given the fact that PIM and PRISM II are widely used mortality scoring instruments, prospective associations with PD suggest additional value for ruling in, or out, patients at risk of PD.

Source: CINAHL

Full Text:
Available in fulltext at Ovid


Author(s): Waller D

Citation: Dynamics, 01 June 2008, vol./is. 19/2(32-35), 14973715

Publication Date: 01 June 2008

Source: CINAHL

Full Text:
Available in fulltext at EBSCO Host


Author(s): Kolovos NS, Bratton SL, Levy FH

Citation: Journal for Healthcare Quality: Promoting Excellence in Healthcare, 01 May 2008, vol./is. 30/3(43-50), 10622551

Publication Date: 01 May 2008

Abstract: Patient safety is a critical component of the U.S. healthcare system: thousands of people, including children, die or are injured yearly as a result of medical error. We designed and implemented a novel error-reporting tool for the pediatric intensive care unit. More errors were reported with the use of this paper-based tool than with the existing computerized error-reporting system. We also developed a scoring system to assess potential harm to the patient. The tool provided information about frequent and high-risk errors that guided successful improvements in patient care and safety and the achievement of measurable success.

Source: CINAHL

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82. Optimising early warning scoring systems.
83. Review and performance evaluation of aggregate weighted 'track and trigger' systems.

Author(s): Smith GB, Prytherch DR, Schmidt PE, Featherstone PI

Citation: Resuscitation, May 2008, vol./is. 77/2(170-9), 0300-9572;0300-9572 (2008 May)

Publication Date: May 2008

Abstract: OBJECTIVES: There is no up-to-date literature review of physiologically based, aggregate weighted 'track and trigger' systems (AWTTS) and few data on their predictive ability for serious adverse outcomes. The aim of this study was to describe the AWTTS in clinical use and assess their ability to discriminate between survivors and non-survivors of hospital admission, based on an initial set of vital signs. MATERIALS AND METHODS: A systematic review of the literature was performed, to describe the AWTTS, their components and their differences. Their ability to discriminate between survivors and non-survivors was evaluated using the area under the receiver-operating characteristics (AUROC) curve, and a database of 9987 vital signs datasets. RESULTS: A total of 33 unique AWTTS were identified with AUROC (+/-95% CI) ranging from 0.657 (0.636-0.678) to 0.782 (0.767-0.797). 12 AWTTS (36%) discriminated reasonably well between survivors and non-survivors, the top four performing AWTTS incorporated age as a component (AUROCs ranging from 0.722 to 0.782). The top two systems also incorporated temperature. CONCLUSIONS: There is a wide range of unique, but very similar, AWTTS in clinical use. There is no consistency regarding their physiological components, but the majority differ only in minor variations in the weightings for physiological derangement and/or the cut-off points between physiological weighting bands. The performance of most systems tested was poor when used to discriminate between survivors and non-survivors, although 36% discriminated reasonably well. Our results suggest that physiology can be used to predict outcome, but that further work is required to improve the AWTTS models.

Source: MEDLINE

84. Predictors of mortality and length of stay for neonates admitted to children's hospital neonatal intensive care units.

Author(s): Berry MA, Shah PS, Brouillette RT, Hellmann J

Citation: Journal of Perinatology, 01 April 2008, vol./is. 28/4(297-302), 07438346

Publication Date: 01 April 2008

Abstract: Objective: Current scoring systems, which adjust prediction for severity of illness, do not account for higher observed mortality in neonatal intensive care units (NICUs) of children's hospitals than that of perinatal centers. We hypothesized that three potential predictors, (a) admission from another NICU, (b) presence of congenital anomalies and (c) need for surgery, would modify expected mortality and/or length of stay for infants admitted to NICUs in children's hospitals. Study Design: We reviewed consecutive admissions to two NICUs in children's hospitals in Canada. We performed regression analyses to evaluate these potential predictors and severity-of-illness indices for the outcomes of mortality and length of stay. Result: Of 625 neonatal admissions, transfer from another NICU, congenital anomalies requiring admission and surgery were identified in 371 (59%). Using logistic regression, mortality was predicted based on admission from another NICU (odds ratio (OR) 1.92; 95% confidence interval (CI) 1.04, 3.57), congenital anomalies (OR 7.28; 95% CI 3.69, 14.36) and a validated severity-of-illness score, the Score for Neonatal Acute Physiology Perinatal Extension Version II (SNAPPE-II; OR 1.07; 95% CI 1.05, 1.09 per point). By contrast, surgical intervention was predictive of survival (OR 0.35; 95% CI 0.18, 0.67). Length of stay >/=21 days was predicted by SNAPPE-II (OR 1.02; 95% CI 1.01, 1.03 per point), congenital anomalies (OR 2.47; 95% CI 1.60, 3.79) and surgery (OR 2.73; 95% CI 1.77, 4.21). Conclusion: Fair performance comparisons of NICUs with different case-mixes, such as children's hospital and perinatal NICUs, in addition to severity-of-illness
indices, should account for admissions from another NICU, congenital anomalies and surgery.

Source: CINAHL

85. CAMHS dependency scoring: clarity and clinical relevance of the CAMHS-AID.

Author(s): Abeles, P, Holmes, E, Wadge, M

Citation: Paediatric Nursing, March 2008, vol./is. 20/2(30-2), 0962-9513 (2008 Mar)

Publication Date: March 2008

Abstract: Research in Manchester, Birmingham and London into the content and face validity of the CAMHS-AID. The development of a computerised scoring system for decisions about whether a young person can be accommodated on a child and adolescent mental health services inpatient unit is described and its relevance and clarity to nurses using it are evaluated, with examples of dependency scores. 4 refs.

Source: BNI

Full Text:
Available in fulltext at EBSCO Host
Available in print at Grantham Hospital Staff Library
Available in print at Lincoln County Hospital Professional Library
Available in print at Pilgrim Hospital Staff Library

86. Evaluation of a simplified therapeutic intervention scoring system (TISS-28) and the modified early warning score (MEWS) in predicting physiological deterioration during inter-facility transport.

Author(s): Lee LL, Yeung KL, Lo WY, Lau YS, Tang SY, Chan JT

Citation: Resuscitation, January 2008, vol./is. 76/1(47-51), 0300-9572;0300-9572 (2008 Jan)

Publication Date: January 2008

Abstract: INTRODUCTION: There is an emerging demand for inter-facility transport (IFT) of patients in recent years following changes in the healthcare framework in Hong Kong but this carries certain risks. Anticipation of possible deterioration of patients is important for patient safety and therefore risk stratification of patients before transport is important.OBJECTIVE: This study evaluated the simplified therapeutic intervention scoring system (TISS-28) and modified early warning score (MEWS) in predicting physiological deterioration en route.METHODS: This is a prospective single centre study of all emergency IFT for adult patients, excluding patients with obstetric conditions, occurring between 1 January 2005 and 30 June 2006. The severity of illness was quantified in terms of TISS-28 and MEWS. Mann-Whitney test and receiver operator characteristic (ROC) curves were used to illustrate and compare their performance.RESULTS: Among 102 patients requiring IFT, 28 had physiological deterioration en route (27%). The TISS-28 scores upon dispatch ranged from 5 to 34 with a mean of 16.5±/5.71 whereas MEWS ranged from 0 to 11 with a mean of 2.82±/2.01. The incidence of physiological deterioration en route was significantly greater with a higher MEWS score (P=0.001) but this was not seen with the TISS-28 score. The area under the ROC curve for the predictive value of MEWS was 0.71 which performed better than TISS-28 (area under the curve=0.53).CONCLUSION: IFT represents a group of patients with vast heterogeneity. TISS-28 is not a useful tool for risk stratification prior to transport. MEWS was able to identify patients at risk but was not ideal.

Source: MEDLINE

87. The paediatric early warning score

Author(s): Duncan H.P.

Citation: British Journal of Intensive Care, December 2007, vol./is. 17/4(133-139), 0961-
Abstract: Warning signs precede unexpected death, unplanned intensive care admission and cardiac arrest in hospitalised children and adults. Early warning scores are part of a system of care that aims to identify clinically deteriorating hospitalised patients, in a timely manner, to enable clinicians to stabilise them and, if needed, transfer them to an area of higher dependency or intensive care. Paediatric early warning scores consist of physiological parameters, diagnostic categories and therapeutic interventions. Four scores have been published addressing the special requirements of these systems adapted and designed for children, taking into consideration the developmental physiology and aetiology of critical illness. As yet, none has been fully validated. Intuitively these systems are both necessary and beneficial. It is important that the extensive experience gained from adult systems is applied to the relatively early development of paediatric systems. The scores should be prospectively validated, calibrated for use outside specialist children's hospitals and compared in a national interventional trial with monitoring of clinically relevant outcomes, including cost-effectiveness.

Source: EMBASE

88. In defence of early warning scores.

Author(s): Morgan RJ, Wright MM

Citation: British Journal of Anaesthesia, November 2007, vol./is. 99/5(747-8), 0007-0912;1471-6771 (2007 Nov)

Publication Date: November 2007

Source: MEDLINE

Full Text:
Available in fulltext at Highwire Press
Available in print at Lincoln County Hospital Professional Library

89. The effect of a critical care outreach service and an early warning scoring system on respiratory rate recording on the general wards.

Author(s): Odell M, Rechner IJ, Kapila A, Even T, Oliver D, Davies CW, Milsom L, Forster A, Rudman K

Citation: Resuscitation, September 2007, vol./is. 74/3(470-5), 0300-9572;0300-9572 (2007 Sep)

Publication Date: September 2007

Abstract: AIM: To determine whether the implementation of a Reading-Modified Early Warning Scoring (R-MEWS) system, is associated with an increased recording of respiratory rate (RR) in hospital inpatients, and whether the presence of a critical care outreach (CCO) service has a further impact on the recording of patient's vital signs.METHOD: Five annual point prevalence surveys of all adult, non-obstetric acute inpatients (n=2638) in two Hospitals (A and B) were carried out between 2001 and 2005. The R-MEWS system was implemented incrementally in both hospitals to include all study group patients, but a CCO service was only available in Hospital A. Data were collected on numbers of patients, routinely documented physiological observations and R-MEWS score.RESULTS: Respiratory rate (RR) recording increased from 6.0% in the first survey to 77.9% in the last, which correlated with the incremental implementation of the R-MEWS system. Hospital A that had the CCO service showed a greater increase in RR recording than Hospital B with no CCO service.CONCLUSION: The introduction of an early warning scoring (EWS) was associated with improved respiratory rate recording, which may have been further enhanced by the presence of a CCO service.

Source: MEDLINE

90. Adapted versions of the Sharp/van der Heijde score are reliable and valid for assessment of radiographic progression in juvenile idiopathic arthritis.
OBJECTIVE: To develop adapted versions of the Sharp/van der Heijde radiographic scoring system for use in juvenile idiopathic arthritis (JIA), and to investigate their validity in JIA patients with polyarticular disease. METHODS: The study group comprised 177 patients with polyarticular JIA. Radiographs of the wrist/hand of each patient were obtained at baseline (first observation) and then at 1, 3, 5, 7/8, and 10 years and were assessed independently by 2 pediatric rheumatologists according to different adaptations of the Sharp/van der Heijde method. To facilitate score assignment, the radiograph for each patient was compared with a bone age-related standard. Validation procedures included analysis of reliability, construct validity, and score progression over time. RESULTS: Interobserver and intraobserver agreement on longitudinal score values and score changes was good for all of the adapted scoring versions (intraclass correlation coefficient >0.85). Score changes over time were moderately to strongly correlated with the clinical indicators of long-term joint damage and with the amount of long-term radiographic damage as measured with the carpo:metacarpal ratio, thereby demonstrating good construct validity. A steady increase in scores over time was observed, with joint space narrowing being the most common form of damage throughout the disease course. The inclusion of 5 new areas appeared to increase the overall construct validity of erosion scores. CONCLUSION: Our results show that the adapted versions of the Sharp/van der Heijde score are reliable and valid for the assessment of radiographic progression in patients with JIA.
appendicitis, neither method provides sufficient PPV to be used in clinical practice as the sole method for determination of the need for surgery.

**Source:** CINAHL

**Full Text:**
Available in print at Pilgrim Hospital Staff Library

92. A warning on early-warning scores!

**Author(s):** Cuthbertson BH, Smith GB

**Citation:** British Journal of Anaesthesia, June 2007, vol./is. 98/6(704-6), 0007-0912;0007-0912 (2007 Jun)

**Publication Date:** June 2007

**Source:** MEDLINE

**Full Text:**
Available in fulltext at Highwire Press

Available in print at Lincoln County Hospital Professional Library


**Author(s):** Duckitt RW, Buxton-Thomas R, Walker J, Cheek E, Bewick V, Venn R, Forni LG

**Citation:** British Journal of Anaesthesia, June 2007, vol./is. 98/6(769-74), 0007-0912;0007-0912 (2007 Jun)

**Publication Date:** June 2007

**Abstract:** BACKGROUND: Several physiological scoring systems (PSS) have been proposed for identifying those at risk of deterioration. However, the chosen specific physiological values chosen and the scores allocated have not been prospectively validated. In this study, we investigate the relative contributions of the ventilatory frequency, heart rate, arterial pressure, temperature, oxygen saturation, and conscious level to mortality in order to devise a robust scoring system. All data were collected on admission to the emergency unit. Precise 'intervention-calling scores' could then be derived to trigger interventions.

METHODS: Our observational, population-based single-centred study took place in a 602-bedded district general hospital. Patients admitted to the emergency care unit at Worthing general hospital during an initial study period between July and November 2003 (n = 3184) and a further validation period between October and November 2005 (n = 1102) were included.

RESULTS: Multivariate logistic regression analysis demonstrated that a ventilatory frequency > or = 20 min(-1), heart rate > or =102 min(-1), systolic blood pressure < or = 99 mm Hg, temperature <35.3 degrees C, oxygen saturation < or = 96%, and disturbed consciousness were associated with an increase in mortality. The Worthing PSS was developed from the regression coefficients associated with each variable. The model showed good discrimination with an area under the receiver operating characteristic curve, 0.74, excluding age as a variable. The discrimination of this system was significantly better than the early-warning scoring system.

CONCLUSIONS: A simple validated scoring system to predict mortality in medical patients with precise 'intervention-calling scores' has been developed.

**Source:** MEDLINE

**Full Text:**
Available in fulltext at Highwire Press

Available in print at Lincoln County Hospital Professional Library

94. Observation-based early warning scores to detect impending critical illness predict in-hospital and overall survival in patients undergoing allogeneic stem cell transplantation.
Observation-based early warning scoring systems (EWSS) have been developed to improve the outcome of critically ill patients by triggering early critical care intervention. To date, none of these scoring systems have been evaluated in cancer patients or stem cell transplant (SCT) recipients. The aim of this study was to validate 3 established EWSS (modified early warning score [MEWS], patient-at-risk score [PARS], and Leed's early warning score [LEWS]) in adult recipients of Allogeneic SCT (Allo-SCT) and to determine their usefulness at predicting survival. We retrospectively analyzed the physiologic observations during the initial admission of 43 Allo-SCT recipients. Respiratory dysfunction was the most common (40 patients, 93%) event. All 3 EWSS revealed high accuracy in predicting in-hospital survival. The cutoff level associated with a high risk of in-hospital mortality was 7. Of 8 patients with a LEWS = 7, 6 died during their initial admission, whereas no patient with a lower score died (specificity 95%, sensitivity 100%). Acute clinical deterioration during the initial admission appeared to have an adverse effect on overall survival: in-hospital survivors with a LEWS >3 during their admission had a shorter median survival than patients with LEWS < or = 3, P = .018. This is the first study to validate EWSS in Allo-SCT and demonstrate that these systems are highly predictive of in-hospital and overall survival.

Source: MEDLINE

95. Systematic review and evaluation of physiological track and trigger warning systems for identifying at-risk patients on the ward.

Objective: Physiological track and trigger warning systems (TTs) are used to identify patients outside critical care areas at risk of deterioration and to alert a senior clinician, Critical Care Outreach Service, or equivalent. The aims of this work were: to describe published TTs and the extent to which each has been developed according to established procedures; to review the published evidence and available data on the reliability, validity and utility of existing systems; and to identify the best TT for timely recognition of critically ill patients. Design and Setting: Systematic review of studies identified from electronic, citation and hand searching, and expert informants. Cohort study of data from 31 acute hospitals in England and Wales. Measurements and Results: Thirty-six papers were identified describing 25 distinct TTs. Thirty-one papers described the use of a TT, and five were studies examining the development or testing of TTs. None of the studies met all methodological quality standards. For the cohort study, outcome was measured by a composite of death, admission to critical care, ‘do not attempt resuscitation’ or cardiopulmonary resuscitation. Fifteen datasets met pre-defined quality criteria. Sensitivities and positive predictive values were low, with median (quartiles) of 43.3 (25.4-69.2) and 36.7 (29.3-43.8), respectively. Conclusion: A wide variety of TTs were in use, with little evidence of reliability, validity and utility. Sensitivity was poor, which might be due in part to the nature of the physiology monitored or to the choice of trigger threshold. Available data were insufficient to identify the best TT.

Source: MEDLINE

Full Text: Available in fulltext at EBSCO Host
OBJECTIVE: Physiological track-and-trigger warning systems are used to identify patients on acute wards at risk of deterioration, as early as possible. The objective of this study was to assess the inter-rater and intra-rater reliability of the physiological measurements, aggregate scores and triggering events of three such systems.

DESIGN: Prospective cohort study.

SETTING: General medical and surgical wards in one non-university acute hospital.

PATIENTS AND PARTICIPANTS: Unselected ward patients: 114 patients in the inter-rater study and 45 patients in the intra-rater study were examined by four raters.

MEASUREMENTS AND RESULTS: Physiological observations obtained at the bedside were evaluated using three systems: the medical emergency team call-out criteria (MET); the modified early warning score (MEWS); and the assessment score of sick-patient identification and step-up in treatment (ASSIST). Inter-rater and intra-rater reliability were assessed by intra-class correlation coefficients, kappa statistics and percentage agreement. There was fair to moderate agreement on most physiological parameters, and fair agreement on the scores, but better levels of agreement on triggers. Reliability was partially a function of simplicity: MET achieved a higher percentage of agreement than ASSIST, and ASSIST higher than MEWS. Intra-rater reliability was better than inter-rater reliability. Using corrected calculations improved the level of inter-rater agreement but not intra-rater agreement.

CONCLUSION: There was significant variation in the reproducibility of different track-and-trigger warning systems. The systems examined showed better levels of agreement on triggers than on aggregate scores. Simpler systems had better reliability. Inter-rater agreement might improve by using electronic calculations of scores.

Source: MEDLINE

Full Text:

Available in fulltext at EBSCO Host

97. The CURB65 pneumonia severity score outperforms generic sepsis and early warning scores in predicting mortality in community-acquired pneumonia.

Author(s): Barlow G, Nathwani D, Davey P

Citation: Thorax, March 2007, vol./is. 62/3(253-9), 0040-6376;0040-6376 (2007 Mar)

Publication Date: March 2007

BACKGROUND: The performance of CURB65 in predicting mortality in community-acquired pneumonia (CAP) has been tested in two large observational studies. However, it has not been tested against generic sepsis and early warning scores, which are increasingly being advocated for identification of high-risk patients in acute medical wards. Method: A retrospective analysis was performed of data prospectively collected for a CAP quality improvement study. The ability to stratify mortality and performance characteristics (sensitivity, specificity, positive predictive value, negative predictive value and area under the receiver operating curve) were calculated for stratifications of CURB65, CRB65, the systemic inflammatory response syndrome (SIRS) criteria and the standardised early warning score (SEWS).RESULTS: 419 patients were included in the main analysis with a median age of 74 years (men = 47%). CURB65 and CRB65 stratified mortality in a more clinically useful way and had more favourable operating characteristics than SIRS or SEWS; for example, mortality in low-risk patients was 2% when defined by CURB65, but 9% when defined by SEWS and 11-17% when defined by variations of the SIRS criteria. The sensitivity, specificity, positive predictive value and negative predictive value of CURB65 was 71%, 69%, 35% and 91%, respectively, compared with 62%, 73%, 35% and 89% for the best performing version of SIRS and 52%, 67%, 27% and 86% for SEWS. CURB65 had the greatest area under the receiver operating curve (0.78 v 0.73 for CRB65, 0.68 for SIRS and 0.64 for SEWS).CONCLUSIONS: CURB65 should not be supplanted by SIRS or SEWS for initial prognostic assessment in CAP. Further research to identify better generic prognostic tools is required.

Source: MEDLINE
98. The perfect score

Author(s): Subbe C.

Citation: Care of the Critically Ill, February 2007, vol./is. 23/1(21-25), 0266-0970 (Feb 2007)

Publication Date: February 2007

Abstract: Recent research as well as the 100.000 lives campaign in the US suggest that structured interventions to identify patients at risk of catastrophic deterioration can save lives. These interventions have been known in Australia as Medical Emergency Teams, in the UK as Critical Care Outreach teams and in the US as Rapid Response Teams. They use tools to identify sick patients that can be summarized under the term "track and trigger systems". Whether any of these tools is better then any else is not clear. The article discusses evidence for existing systems and suggests factors affecting the performance and the choice of track and trigger systems.

Source: EMBASE

99. Can physiological variables and early warning scoring systems allow early recognition of the deteriorating surgical patient?

Author(s): Cuthbertson BH, Boroujerdi M, McKie L, Aucott L, Prescott G

Citation: Critical Care Medicine, February 2007, vol./is. 35/2(402-9), 0090-3493/0090-3493 (2007 Feb)

Publication Date: February 2007

Abstract: OBJECTIVE: Early warning scoring systems are widely used in clinical practice to allow early recognition of the deteriorating patient, but they lack validation. We aimed to test the ability of physiologic variables, either alone or in existing early scoring systems, to predict major deterioration in a patient's condition and attempt to derive functions with superior accuracy.DESIGN: A comparative cohort study.SETTING: A teaching hospital in Scotland.PATIENTS: Two cohorts of general surgical high-dependency patients. The cohorts are a group of surgical high-dependency care patients who did not require intensive care admission and another group of patients who did require admission.INTERVENTIONS: None.MEASUREMENTS AND MAIN RESULTS: Prospective physiologic data on consecutive surgical high-dependency unit patients were collected and compared with physiologic data on patients admitted to the intensive care unit from the same surgical high-dependency units. Data were quality checked and summarized, and discriminant analysis and receiver operator curves were used to discriminate between the groups. There were significant physiologic differences between groups with regard to heart rate (p<.001, area under the receiver operating characteristic curve [AUC] 0.7), respiratory rate (p<.001, AUC 0.71), and oxygen saturation (p<.001, AUC 0.78) across time points. This was not present for systolic blood pressure or temperature. Existing early warning scoring systems had good discriminatory power (AUC 0.83-0.86). We derived discriminant functions, which have a high predictive ability to determine differences between groups (p<.0001, AUC 0.86-0.90). We found that heart rate and respiratory rate could detect differences between groups at 6 and 8 hrs before ICU admission, but oxygen saturation and the discriminant function 2 could detect differences 48 hrs before ICU admission.CONCLUSIONS: Some commonly used physiologic variables have reasonable power in determining the difference between patients requiring intensive care unit admission, but others are poor. Existing early warning scores have comparatively good discriminatory power. We have derived functions with excellent predictive power in this derivation cohort.

Source: MEDLINE

Full Text:
100. Physiological-social score (PMEWS) vs. CURB-65 to triage pandemic influenza: a comparative validation study using community-acquired pneumonia as a proxy.

Author(s): Challen K, Bright J, Bentley A, Walter D

Citation: BMC Health Services Research, 2007, vol./is. 7/(33), 1472-6963;1472-6963 (2007)

Publication Date: 2007

Abstract: BACKGROUND: An influenza pandemic may increase Emergency Department attendance 7-fold. In the absence of a validated "flu score" to assess severity and assist triage decisions from primary into secondary care, current UK draft management recommendations have suggested the use of CURB-65 and chest X-ray as a proxy. We developed the Pandemic Medical Early Warning Score (PMEWS) to track and triage flu patients, taking into account physiological and social factors and without requiring laboratory or radiology services.METHODS: Validation of the PMEWS score against an unselected group of patients presenting and admitted to an urban UK teaching hospital with community acquired pneumonia. Comparison of PMEWS performance against CURB-65 for three outcome measures: need for admission, admission to high dependency or intensive care, and inpatient mortality using area under ROC curve (AUROC) and the Hanley-McNeil method of comparison.RESULTS: PMEWS was a better predictor of need for admission (AUROC 0.944) and need of higher level of care (AUROC 0.83) compared with CURB-65 (AUROCs 0.881 and 0.640 respectively) but was not as good a predictor of subsequent inpatient mortality (AUROC 0.663).CONCLUSION: Although further validation against other disease datasets as a proxy for pandemic flu is required, we show that PMEWS is rapidly applicable for triage of large numbers of flu patients to self-care, hospital admission or HDU/ICU care. It is scalable to reflect changing admission thresholds that will occur during a pandemic.

Source: MEDLINE

Full Text:
Available in fulltext at BioMedCentral
Available in fulltext at National Library of Medicine

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

Author(s): Tume L.

Citation: Nursing in critical care, January 2007, vol./is. 12/1(12-19), 1478-5153 (2007 Jan-Feb)

Publication Date: January 2007

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 Paediatric 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.

Source: EMBASE

Full Text:
102. Evaluation of a pediatric early warning tool -- claims unsubstantiated...

Author(s): Tibballs J, Kinney S
Citation: Intensive & Critical Care Nursing, 01 December 2006, vol./is. 22/6(315-316), 09643397
Publication Date: 01 December 2006
Source: CINAHL
Full Text: Available in print at Lincoln County Hospital Professional Library

103. Reply to letter to the editor... Promoting care for acutely ill children -- development and evaluation of a pediatric early warning tool.

Author(s): Haines C
Citation: Intensive & Critical Care Nursing, 01 December 2006, vol./is. 22/6(317-317), 09643397
Publication Date: 01 December 2006
Source: CINAHL
Full Text: Available in print at Lincoln County Hospital Professional Library

104. Predicting outcomes of neonates diagnosed with hypoxemic-ischemic encephalopathy.

Author(s): Ambalavanan N, Carlo WA, Shankaran S, Bann CM, Emrich SL, Higgins RD, Tyson JE, O’Shea TM, Laptook AR, Ehrenkranz RA, Donovan EF, Walsh MC, Goldberg RN, Das A
Citation: Pediatrics, 01 November 2006, vol./is. 118/5(2084-2093), 00314005
Publication Date: 01 November 2006
Abstract: OBJECTIVE: The goals were to identify predictor variables and to develop scoring systems and classification trees to predict death/disability or death in infants with hypoxic-ischemic encephalopathy. METHODS: Secondary analysis of data from the multicenter, randomized, controlled, National Institute of Child Health and Human Development Neonatal Research Network trial of hypothermia in hypoxic-ischemic encephalopathy was performed. Data for 205 neonates diagnosed as having hypoxic-ischemic encephalopathy were studied. Logistic regression analysis was performed by using clinical and laboratory variables available within 6 hours of birth, with death or moderate/severe disability at 18 to 22 months or death as the outcomes. By using the identified variables and odds ratios, scoring systems to predict death/disability or death were developed, weighting each predictor in proportion to its odds ratio. In addition, classification and regression tree analysis was performed, with recursive partitioning and automatic selection of optimal cutoff points for variables. Correct classification rates for the scoring systems, classification and regression tree models, and early neurologic examination were compared. RESULTS: Correct classification rates were 78% for death/disability and 71% for death with the scoring systems, 80% and 77%, respectively, with the classification and regression tree models, and 67% and 73% with severe encephalopathy in early neurologic examination. Correct classification rates were similar in the hypothermia and control groups. CONCLUSIONS: Among neonates diagnosed as having hypoxic-ischemic encephalopathy, the classification and regression tree model, but
not the scoring system, was superior to early neurologic examination in predicting death/disability. The 3 models were comparable in predicting death. Only a few components of the early neurologic examination were associated with poor outcomes. These scoring systems and classification trees, if validated, may help in assessments of prognosis and may prove useful for risk-stratification of infants with hypoxic-ischemic encephalopathy for clinical trials.

Source: CINAHL

Full Text:
Available in fulltext at American Academy of Pediatrics
Available in fulltext at Highwire Press

Available in print at Lincoln County Hospital Professional Library

105. Validation of physiological scoring systems in the accident and emergency department.

Author(s): Subbe CP, Slater A, Menon D, Gemmell L

Citation: Emergency Medicine Journal, November 2006, vol./is. 23/11(841-5), 1472-0205;1472-0213 (2006 Nov)

Publication Date: November 2006

Abstract: BACKGROUND: Scoring systems that weigh the degree of abnormality of bedside observations might be able to identify patients at risk of catastrophic deterioration.OBJECTIVES: To establish a frequency distribution for typical physiological scoring systems and to establish the potential benefit of adding these to an existing triage system in accident and emergency departments.METHODS: Physiological data were collected from 53 unselected emergency department admissions, from 50 patients admitted from the emergency department to intensive care, and from 50 patients admitted from emergency department to general wards and then to intensive care. Three different physiological scores were calculated from the data. Identification of sick patients by the scores was compared with triage information from the Manchester Triage System (MTS).RESULTS: Most patients admitted to the emergency department would not be identified as critically ill with the aid of physiological scoring systems. This was true even for patients who were admitted to intensive care. Only in 0-8% of unselected patients did the scores indicate increased risk. In 100 patients admitted to the intensive care, adding of medical emergency team call-out criteria, Modified Early Warning Score or Assessment Score for Sick patient Identification and Step-up in Treatment would identify none, seven or one patient in addition to those triaged as orange and red by the MTS.CONCLUSIONS: Introduction of a physiological scoring system would have identified only a small number of additional patients as critically ill and added little to the triage system currently in use.

Source: MEDLINE

Full Text:
Available in fulltext at Highwire Press
Available in fulltext at National Library of Medicine
Available in print at Grantham Hospital Staff Library

106. The value of Modified Early Warning Score (MEWS) in surgical in-patients: a prospective observational study.

Author(s): Gardner-Thorpe J, Love N, Wrightson J, Walsh S, Keeling N

Citation: Annals of the Royal College of Surgeons of England, October 2006, vol./is. 88/6(571-5), 0035-8843;1478-7083 (2006 Oct)

Publication Date: October 2006

Abstract: INTRODUCTION: The Modified Early Warning Score (MEWS) is a simple, physiological score that may allow improvement in the quality and safety of management provided to surgical ward patients. The primary purpose is to prevent delay in intervention or transfer of critically ill patients.PATIENTS AND METHODS: A total of 334 consecutive
ward patients were prospectively studied. MEWS were recorded on all patients and the primary end-point was transfer to ITU or HDU.

**RESULTS:** Fifty-seven (17%) ward patients triggered the call-out algorithm by scoring four or more on MEWS. Emergency patients were more likely to trigger the system than elective patients. Sixteen (5% of the total) patients were admitted to the ITU or HDU. MEWS with a threshold of four or more was 75% sensitive and 83% specific for patients who required transfer to ITU or HDU.

**CONCLUSIONS:** The MEWS in association with a call-out algorithm is a useful and appropriate risk-management tool that should be implemented for all surgical in-patients.

**Source:** MEDLINE

**Full Text:**
Available in fulltext at National Library of Medicine
Available in print at Lincoln County Hospital Professional Library

107. "Packaging" information about patient deterioration in terms of vital signs and the Early Warning Score facilitated nurses' communication with doctors.

**Author(s):** Maiocco G

**Citation:** Evidence-Based Nursing, October 2006, vol./is. 9/4(128), 1367-6539;1367-6539 (2006 Oct)

**Publication Date:** October 2006

**Source:** MEDLINE

**Full Text:**
Available in fulltext at Highwire Press


**Author(s):** Fraser DD, Singh RN, Frewen T

**Citation:** Journal of Critical Care, September 2006, vol./is. 21/3(278-9), 0883-9441;0883-9441 (2006 Sep)

**Publication Date:** September 2006

**Source:** MEDLINE

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

**Author(s):** Duncan H, Hutchison J, Parshuram CS

**Citation:** Journal of Critical Care, 01 September 2006, vol./is. 21/3(271-278), 08839441

**Publication Date:** 01 September 2006

**Abstract:** PURPOSE: We developed and performed the initial retrospective validation of a pediatric severity of illness score. The score is to preemptively identify hospitalized children who are likely to require resuscitation to treat cardiopulmonary arrest. MATERIALS AND METHODS: The Pediatric Early Warning System (PEWS) score was developed using expert opinion. The score generated contained 20 items, 16 of which were able to be retrospectively abstracted. Validation used a case-control study design in a Canadian university-affiliated pediatric hospital. Eligible patients were younger than 18 years, were admitted to a hospital ward, and had no level-of-care restrictions. Case patients had a code blue called to obtain immediate assistance for treatment of impending or actual cardiopulmonary arrest. Control patients had no code blue event and were not urgently admitted to the intensive care unit within 48 hours of study. A total of 128 controls and 87 cases were compared. RESULTS: The PEWS score area under the receiver operating characteristic curve was 0.90. The sensitivity was 78% and the specificity was 95% at a score of 5. CONCLUSIONS: Application of the score may have identified more than 3 quarters of code blue calls in our hospital with at least an hour's warning. After further refinement and validation, the PEWS score has great potential to increase the efficiency of care delivery and to improve the outcomes of care provided to hospitalized children.
110. Childhood falls: characteristics, outcome, and comparison of the Injury Severity Score and New Injury Severity Score.

Author(s): Bulut M, Koksal O, Korkmaz A, Turan M, Ozguc H

Citation: Emergency Medicine Journal, 01 July 2006, vol./is. 23/7(540-545), 14720205

Publication Date: 01 July 2006

Abstract: OBJECTIVES: The aim of this study was to determine the general characteristics of childhood falls, factors affecting on mortality, and to compare the Injury Severity Score (ISS) and the New Injury Severity Score (NISS) as predictors of mortality and length of hospital stay in childhood falls. METHODS: We retrospectively analysed over a period of 8 years children aged younger than 14 years who had sustained falls and who were admitted to our emergency department. Data on the patients’ age, sex, type of fall, height fallen, arrival type, type of injuries, scoring systems, and outcome were investigated retrospectively. The ISS and NISS were calculated for each patient. Comparisons between ISS and NISS for prediction of mortality were made by receiver operating characteristic (ROC) curve and Hosmer-Lemeshow (HL) goodness of fit statistics. RESULTS: In total, there were 2061 paediatric trauma patients. Falls comprised 36 (n = 749) of these admissions. There were 479 male and 270 female patients. The mean (SD) age was 5.01 (3.48) years, and height fallen was 3.8 (3) metres. Over half (56.6%) of patients were referred by other centres. The most common type of fall was from balconies (38.5%), and head trauma was the most common injury (50%). The overall mortality rate was 3.6%. The cut off value for both the ISS and NISS in predicting mortality was 22 (sensitivity 90.5%, specificity 95.4% for ISS; sensitivity 100%, specificity 88.7% for NISS) (p>0.05). Significant factors affecting mortality in logistic regression analysis were Glasgow Coma Scale (GCS) <9, ISS >22, and NISS >22. There were no significant differences in ROC between three scoring systems. The HL statistic showed poorer calibration (p = 0.02 v p = 0.37, respectively) of the NISS compared with the ISS. CONCLUSIONS: In our series, the head was the most frequent site of injury, and the most common type of fall was from balconies. Scores on the GCS, NISS, and ISS are significantly associated with mortality. The performance of the NISS and ISS in predicting mortality in childhood falls was similar.

111. Research. Using a Paediatric Early Warning (PEW) tool.

Author(s): Haines C, Perrott M, Weir P

Citation: Paediatric Nursing, 01 July 2006, vol./is. 18/6(10-10), 09629513

Publication Date: 01 July 2006

Source: CINAHL

Full Text:
Available in fulltext at Highwire Press
Available in fulltext at National Library of Medicine
Available in print at Grantham Hospital Staff Library

112. Standardised early warning scoring system.

Author(s): Subbe C
113. Early warning scores predict outcome in acute pancreatitis.

**Author(s):** Garcea G, Jackson B, Pattenden CJ, Sutton CD, Neal CP, Dennison AR, Berry DP

**Citation:** Journal of Gastrointestinal Surgery, July 2006, vol./is. 10/7(1008-15), 1091-255X;1091-255X (2006 Jul-Aug)

**Abstract:** The Early Warning Score (EWS) is a widely used general scoring system to monitor patient progress with a varying score of 0-20 in critically unwell patients. This study evaluated the EWS system compared with other established scoring systems in patients with acute pancreatitis. EWS scores were compared with APACHE scores, Imrie scores, computed tomography grading scores, and Ranson criteria for 110 admissions with acute pancreatitis. A favorable outcome was considered to be survival without intensive therapy unit admission or surgery. Nonsurvivors, necrosectomy, and critical care admission were considered adverse outcomes. EWS was the best predictor of adverse outcome in the first 24 hours of admission (receiver operating curve, 0.768). The most accurate predictor of mortality overall was EWS on day 3 of admission (receiver operating curve, 0.920). EWS correlated with duration of intensive therapy unit stay and number of ventilated days (P < 0.05) and selected those who went on to develop pancreas-specific complications such as pseudocyst or ascites. EWS of 3 or above is an indicator of adverse outcome in patients with acute pancreatitis. EWS can accurately and reliably select both patients with severe acute pancreatitis and those at risk of local complications.

**Source:** MEDLINE


**Author(s):** Paterson R, MacLeod DC, Thetford D, Beattie A, Graham C, Lam S, Bell D

**Citation:** Clinical Medicine, May 2006, vol./is. 6/3(281-4), 1470-2118;1470-2118 (2006 May-Jun)

**Abstract:** This aim of this study was to assess the impact of the introduction of a standardised early warning scoring system (SEWS) on physiological observations and patient outcomes in unselected acute admissions at point of entry to care. A sequential clinical audit was performed on 848 patients admitted to a combined medical and surgical assessment unit during two separate 11-day periods. Physiological parameters (respiratory rate, oxygen saturation, temperature, blood pressure, heart rate, and conscious level), in-hospital mortality, length of stay, transfer to critical care and staff satisfaction were documented. Documentation of these physiological parameters improved (P<0.001-0.005) with the exception of oxygen saturation (P=0.069). The admission early warning score correlated both with in-hospital mortality (P<0.001) and length of stay (P=0.001). Following the introduction of the scoring system, inpatient mortality decreased (P=0.046). Staff responding to a questionnaire indicated that the scoring system increased awareness of illness severity (80%) and prompted earlier interventions (60%). A standardised early warning scoring system improves documentation of physiological parameters, correlates with in-hospital mortality, and helps predict length of stay.

**Source:** MEDLINE


**Author(s):** Haines C, Perrott M, Weir P

**Citation:** Intensive & Critical Care Nursing, 01 April 2006, vol./is. 22/2(73-81), 09643397
Abstract: 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.

Source: CINAHL

Full Text: Available in print at Lincoln County Hospital Professional Library


Author(s): Smith AF, Oakey RJ

Citation: Anaesthesia, March 2006, vol./iss. 61/3(222-8), 0003-2409:0003-2409 (2006 Mar)

Abstract: Early warning scoring is designed to be an objective tool to aid identification of hospital patients at risk of deterioration. 'Track and trigger' systems using such scores are widely used but many aspects of scoring have not been clarified. We aimed to document how observations and scores are used in practice as part of a typical track and trigger system. We extracted patient observations and early warning scores from the casenotes of 189 patients admitted to Furness General Hospital during a large outbreak of Legionnaires’ disease in 2002. We used these 3739 sets of primary observations to recalculate scores, and compared them with those recorded in the casenotes. Recording of patient observations was variable. Early warning scores were derived from 2607 sets of observations (69.7%), of which 571 (21.9%) had been incorrectly calculated. Incorrect scoring meant that 66 of 270 patients (24.4%) whose observations should have reached the trigger value did not. Patients with more abnormal observations were more likely to be misscored. Scoring errors were more likely to lead to underscoring as the degree of physiological abnormality increased. Patients with confirmed Legionnaires’ disease were more likely to be incorrectly scored. We conclude that the assignment of early warning scores is prone to error and this may delay referral of at-risk patients for critical care management.

Source: MEDLINE

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117. Validation of a Modified Early Warning Score (MEWS) in emergency department observation ward patients

Author(s): Lam T.S., Mak P.S.K., Siu W.S., Lam M.Y., Cheung T.F., Rainer T.H.

Citation: Hong Kong Journal of Emergency Medicine, January 2006, vol./iss. 13/1(24-30), 1024-9079 (Jan 2006)

Publication Date: January 2006
Abstract: Objective: The Modified Early Warning Score (MEWS) is a simple physiological scoring system, which can easily be applied at the bedside. The ability of MEWS to identify patients at risk of deterioration in a busy ward was investigated. Method: In a prospective cohort study, we applied MEWS to patients admitted to the 16-bed emergency department observation ward (EDOW) of a tertiary teaching hospital. Results: Data on 427 consecutive EDOW admissions were collected from 7 June to 4 July 2004. Main outcome measures were death, intensive care unit (ICU) admission and inpatient hospital admission. Scores of > 4 were associated with increased risk of death (OR 54.4, 95% CI = 4.7-633.7), ICU admission (OR 12.7, 95% CI = 1.1-147.3) and hospital admission (OR 9.5, 95% CI = 3.3-27.9). Conclusion: MEWS is suitable for bedside application in an EDOW setting and may help identify patients at risk of deterioration who require increased levels of care as hospital inpatients and in ICU. Where experienced staff is not available to closely monitor patients in an EDOW the use of the MEWS system may aid close monitoring and identification of high-risk patients.

Source: EMBASE

118. The recognition and early management of critical illness.

Author(s): Ridley S

Citation: Annals of the Royal College of Surgeons of England, September 2005, vol./is. 87/5(315-22), 0035-8843;1478-7083 (2005 Sep)

Publication Date: September 2005

Abstract: INTRODUCTION: Critical illness is an emergency because the inflammatory response has redundant multiple pathways; once triggered, it is difficult to control or suppress. Infection is a potent precursor of critical illness and increasing organ dysfunction has a synergistic, rather than purely additive, adverse effect on mortality. The longer the inflammatory process continues unabated, the more advanced and unrecoverable the pathophysiological processes become resulting in a high mortality. METHODS: The review is a statement of the author's opinion supported by selected references. The content of the review was presented as the Tutor Edwards Lecture at The Royal College of Surgeons of England in December 2004. RESULTS: Critical illness is preceded by prodromal signs warning of impending physiological catastrophe. These simple physiological signs, the most sensitive of which is the respiratory rate can be quantified using Early Warning Scores. If patients trigger the Early Warning Score, emergency management is required to reverse the abnormal physiological decline or to prompt admission to a critical care area. The emergency management principles include removal or reversal of the cause so shutting down the inflammatory response, appropriate antibiotic therapy and general organ support. CONCLUSIONS: Formalising measurement of physiological (in)stability on the general ward using Early Warning Scores improves recognition of unstable and potentially critically ill patients. Prompt intervention will either reverse further physiological decline or facilitate timely referral to the critical care service for further, more invasive, organ support.

Source: MEDLINE

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119. The Pediatric Multiple Organ Dysfunction Score (P-MODS): development and validation of an objective scale to measure the severity of multiple organ dysfunction in critically ill children.

Author(s): Graciano AL, Balko JA, Rahn DS, Ahmad N, Giroir BP

Citation: Critical Care Medicine, 01 July 2005, vol./is. 33/7(1484-1491), 00903493

Publication Date: 01 July 2005

Abstract: OBJECTIVE: To develop and then prospectively validate an objective scale to grade multiple organ system dysfunction in a large population of critically ill children. DESIGN: Prospective, observational cohort study. SETTING: A pediatric intensive care
unit at a tertiary care pediatric teaching hospital. PATIENTS: A total of 6,456 pediatric consecutive admissions (mean age 4.62 yrs) admitted to the pediatric intensive care unit. INTERVENTIONS: a) Identification of variables that could define organ dysfunction in children; b) development of a Pediatric Multiple Organ Dysfunction Score (P-MODS); c) correlation of the score with outcome at pediatric intensive care unit discharge; d) subsequent prospective validation. MEASUREMENTS AND MAIN RESULTS: A computer system randomly separated patients into two groups: a development set to create the scoring system and a validation set to evaluate score performance and reproducibility. Survivors and nonsurvivors were compared to define variables that were significantly more abnormal in nonsurvivors. Those variables were correlated with pediatric intensive care unit mortality rate. Optimal intervals for each variable were defined on the development set, and their performance was evaluated in the validation set. Descriptors for organ dysfunction were identified in five organ systems: cardiovascular (lactic acid), respiratory (Pa(O2)/Fi(O2) ratio), hepatic (bilirubin), hematologic (fibrinogen), and renal (blood urea nitrogen). A grading scale for each variable was set from 0 to 4, corresponding to mortality rates of <5% and >50%, respectively. P-MODS was calculated by summing the worst score for all variables. Overall performance of the score was evaluated by generating receiver operating characteristic curves for both study sets. The score correlated strongly and in a graded fashion with pediatric intensive care unit mortality rate. In both sets (development and validation), mortality rate was <5% when the score was 0 and >70% at the highest score. Overall mortality rate was 5.9% (development set) and 5.3% (validation set). The score showed excellent discrimination reflected in areas under the curve: 0.81 (development set) and 0.78 (validation set). CONCLUSIONS: P-MODS correlated strongly with pediatric intensive care unit mortality in both study sets and can provide an objective measure for assessing organ dysfunction in the pediatric intensive care unit. With further study and validation across many centers, it is likely that P-MODS could function as a quantitative, clinically relevant surrogate outcome measure for future therapeutic trials.

Source: CINAHL

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120. Long-term effect of introducing an early warning score on respiratory rate charting on general wards.

Author(s): McBride J, Knight D, Piper J, Smith GB
Citation: Resuscitation, April 2005, vol./is. 65/1(41-4), 0300-9572;0300-9572 (2005 Apr)
Publication Date: April 2005

Abstract: The respiratory rate is an early indicator of disease, yet many clinicians underestimate its importance and hospitals report a poor level of respiratory rate recording. We studied the short- and long-term effects of introducing a new patient vital signs chart and the modified early warning score (MEWS), which incorporates respiratory rate on the prevalence of respiratory rate recording in six general wards of our hospital. Prior to the commencement of the study, the average percentage of occupied beds where at least one respiratory rate recording had been made in a single 24-h period was 29.5+/-13.5%. After the introduction of the new vital signs chart to all six wards, and the introduction of MEWS to three wards, this rose to 68.9+/-20.9%. When all six wards had been using both the new chart and the MEWS system for almost 1 year, the figure had reached 91.2+/-5.6%. During the pre-introduction period, there was no difference in the prevalence of respiratory rate recording between the specialties (orthopaedic, 26.9%; surgery, 32.9%; medicine, 29.8%; p=0.118). During the second two audit periods, the prevalence of respiratory rate monitoring was consistently higher on medical wards than on surgical and orthopaedic wards (p<0.001). The study confirms the long-term beneficial effect of introducing the MEWS system on respiratory rate recording into the general wards of our hospital. As respiratory rate abnormalities are early markers of disease, it is hoped that improved monitoring will have an impact on the nature and timeliness of the response to critical illness. This may have an impact on the future incidence of potentially avoidable cardiac arrest, deaths and unanticipated intensive care unit admission.

Source: MEDLINE
121. 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 Nestle Charitable Trust.

Author(s): Haines C

Citation: Nursing in Critical Care, 01 March 2005, vol./is. 10/2(98-104), 13621017

Publication Date: 01 March 2005

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.

Source: CINAHL

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122. Detecting and managing deterioration in children.

Author(s): Monaghan, A

Citation: Paediatric Nursing, February 2005, vol./is. 17/1(32-5), 0962-9513 (2005 Feb)

Publication Date: February 2005

Abstract: The setting up of a paediatric critical care outreach service and the use of a Paediatric Early Warning Score (PEWS) in a Brighton hospital. Report of a pilot study testing the reliability of the PEWS and examining the experience of staff on acute children's ward using the outreach service. 8 refs.

Source: BNI

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123. Acutely ill children within ward areas: care provision and possible development strategies.

Author(s): Haines, C

Citation: Nursing in Critical Care, 2005, vol./is. 10/2(98-104), 1362-1017 (2005 Mar/Apr)

Publication Date: 2005

Abstract: Key findings of a Florence Nightingale Foundation travel scholarship to paediatric centres in the UK, USA and Australasia to examine service provision for acutely ill children in general ward settings. The use of paediatric critical care outreach services, paediatric early warning assessment tools and high dependency care were also
investigated. 22 refs.

Source: BNI

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124. Early warning tools to identify children at risk of deterioration: a discussion.

Author(s): Tume, L, Bullock, I

Citation: Paediatric Nursing, October 2004, vol./is. 16/8(20-3), 0962-9513 (2004 Oct)

Publication Date: October 2004

Abstract: Early warning scoring tools in paediatrics to identify children at risk of clinical deterioration and to facilitate their timely referral to ICU. The role of blood pressure measurement, temperature, respiratory rate, heart rate and pulse oximetry in scoring is outlined. 32 refs.

Source: BNI

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125. Use of the nursing acuity score in children admitted to a pediatric oncology intensive care unit

Author(s): Tamburro R.F., West N.K., Piercy 4th. J., Towner G., Fang H.B.

Citation: Pediatric critical care medicine : a journal of the Society of Critical Care Medicine and the World Federation of Pediatric Intensive and Critical Care Societies, January 2004, vol./is. 5/1(35-39), 1529-7535 (Jan 2004)

Publication Date: January 2004

Abstract: OBJECTIVE: To determine whether a unit specific nursing acuity score is useful for assessing patients with cancer admitted to the pediatric intensive care unit. DESIGN: Prospective, cohort analysis. SETTING: The intensive care unit of a tertiary-care pediatric oncology hospital. PATIENTS: A total of 219 patients admitted to the pediatric intensive care unit with a diagnosis of cancer or after hematopoietic stem cell transplantation. INTERVENTIONS: The nursing acuity scores obtained during the second shift after admission were recorded and compared with rates of mortality. These nursing acuity scores were also compared with the Pediatric Risk of Mortality (PRISM III) and Therapeutic Intervention Scoring System (TISS-28) scores recorded during the first day of intensive care unit admission. MAIN RESULTS: Mortality differed across the nursing acuity categories (0%, 7.5%, 20.8%, and 47.4%; p=.0002). TISS-28 and PRISM III scores progressively increased with each increase in the categorical nursing score and differed significantly among these levels (TISS-28, p=.0078; PRISM III, p=.0327). The Spearman correlation coefficients between the nursing score and TISS-28 and PRISM III were 0.432 and 0.285, respectively (p<.0001). CONCLUSIONS: The nursing acuity score accurately predicts survival in pediatric patients with cancer, correlates with established indexes of severity of illness and predictors of mortality, and identifies different mortalities across the nursing acuity categories. Although its predictive value may have been enhanced by the use of a second shift score, these findings suggest that it may be a useful tool in this patient population and affirms the insight of the bedside nurse in assessing severity of illness.

Source: EMBASE
Making A Difference: Introducing Paediatric Critical Care Outreach Supports Effectiveness of An Early Warning Scoring System Improving Patient Safety: 468
N Taylor... - Pediatric Research, 2010 - journals.lww.com
Background: Current research within the field of children's palliative care primarily focuses on the perspectives of mothers, to the relative detriment of fathers. The reason for the absence of the male perspective has often been attributed to the difficulty of recruiting fathers and...

Systematic review of paediatric alert criteria for identifying hospitalised children at risk of critical deterioration
SM Chapman, MPW Grocott... - Intensive care medicine, 2010 - Springer
... clinicians to patients at risk of a SAE in a similar way to early warning scores/systems... authors of included papers and additional experts who have written papers on paediatric EW scores... information [16], it must allow sufficient time for clinicians to assess the child and intervene...
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BD Winters... - Textbook of Rapid Response Systems, 2011 - Springer
... Outreach and Early Warning System (EWS) for the prevention of intensive care admission and death of critically ill adult patients on general... 69. Tibballs J, Kinney S, Duke T, Oakely E, Hennessy M. Reduction of paediatric in-patient car- diac arrest and death with a... Arch Dis Child. ...
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H Winberg, K Nilsson... - Acta Anaesthesiologica ...., 2008 - Wiley Online Library
... PEWS have been developed and shown to trigger for a large proportion of children who later need resuscitation or admission to PICU (27... 23 Tume L, Bullock I. Early warning tools to... Rapid response team in a paediatric hospital: one nurse's focus on outcomes, quality, and safety. ...
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An early warning? Universal risk scoring in emergency medicine
D Roland... - Emergency Medicine Journal, 2011 - emj.bmj.com
... in place, but all follow this same principle and can be applied to both adults and children... recognition by medical and nursing staff.1 This led to the development of 'early warning scores' (a... a wide variety of TTS were in use, but 'with little evidence of reliability, validity and utility'.3...
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Significant deficiencies in the overnight use of a Standardised Early Warning Scoring system in a teaching hospital
CF Gordon... - Scottish Medical Journal, 2011 - smj.rsmjournals.com
... Worldwide, these scoring systems have been validated to identify patients ‘at risk’, although the sensitivity and specificity vary with the ‘cut-off’. SEWS, Standardised Early Warning Score. ... at ward level in the function and use of SEWS, with a view to auditing the effectiveness of such ...