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SPECIAL ARTICLE

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Reunión de la SEUP: Compendio de comunicaciones

EVALUATION AND IMPROVEMENT OF NURSING HANDOVER FROM THE PEDIATRIC EMERGENCY DEPARTMENT TO GENERAL INPATIENT UNITS AT A TERTIARY HOSPITAL

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Introduction. Ineffective communication among healthcare professionals is an important cause of safety incidents, particularly during care transitions. In pediatrics, patient vulnerability and the involvement of multiple caregivers increase the risk of errors. The use of Standardized Handoff Methods (SHM), such as the I-PASS model (Illness severity, Patient summary, Action list, Situation awareness and contingency planning, Synthesis by receiver), has been shown to improve continuity of care and patient safety, although its use in pediatric nursing remains limited.

Objective. To improve the quality and safety of nursing handoffs from the Pediatric Emergency Department (PED) to conventional inpatient units and reduce communication-related safety incidents.

Methodology. Before–after observational study with systematic proportional stratified sampling. Compliance with six quality criteria based on recommendations from the World Health Organization, the Agency for Healthcare Research and Quality, and The Joint Commission was assessed. Results were expressed as percentages with 95% confidence intervals. Analysis of non-compliance using a Pareto chart helped prioritize interventions. These included training 92.3% of nurses in the PED and conventional inpatient units in I-PASS, designing a single digital form, and creating "quiet zones" in each unit. Two periods (January and May 2025) were compared, with 60 cases per phase. Statistical analysis was performed using the Z-test for differences in proportions ($p<0.05$).

Results. Following the intervention, five of the six criteria improved significantly. Use of the single form increased from 1% to 91.7% ($p<0.001$), and use of an SHM from 15% to 85% ($p<0.001$). Confidentiality assurance increased from 35% to 83.3% ($p<0.001$), and nurse-to-nurse communication reached 98.3% ($p<0.001$). Accurate and complete medication handover improved from 65% to 80% ($p=0.034$). Perceived quality increased from 7.7 to 8.6 points, and delegated handovers decreased by 76.7%.

Conclusions. Implementing the I-PASS model, together with digitizing the process and creating safe communication environments, improved the quality and safety of pediatric nursing handoffs. The results confirm its applicability and sustainability and suggest that the model can be replicated in other pediatric hospitals in the National Health System. Although the reduction in safety incidents showed a positive trend, it was not statistically significant.

DIAGNOSTIC PERFORMANCE OF THE RATE OF INCREASE OF BIOMARKERS IN INFANTS WITH SHORT-DURATION FEVER

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In infants ≤90 days old with fever without source (FWS) of very recent onset (within the first two hours), biomarkers and clinical prediction rules have limited sensitivity for identifying invasive bacterial infections (IBIs).

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Objective. To evaluate the diagnostic performance of the rate of increase in procalcitonin, C-reactive protein (CRP), leukocyte, and neutrophil levels for detecting IBI in infants with fever without source (FWS) <6 h.

Methods. Multicenter retrospective study (2011–2024) conducted in 12 pediatric emergency departments. Infants ≤90 days old with fever without source (FWS) <6 h and two measurements of the same biomarker within <24 h were included. IBI was defined as isolation of a pathogenic bacterium from blood or cerebrospinal fluid. The rate of increase of each biomarker was calculated as the difference between the second and first measurements, divided by the interval in hours. A specific analysis was performed in those with <2 h of fever.

Results. A total of 826 infants were included (median fever duration: 2 h; P25-P75 1-3), with 31 IBIs (3.8%). The median rate of increase in CRP was 3.07 (P25-P75 0.57-5.75) mg/L/h in patients with IBI and 0 (P25-P75 -0.2 to 0.56) in those without IBI (p<0.05). The rate of increase in PCT was 0.673 (P25-P75 0.043-1.567) and 0.003 (P25-P75 0-0.01), respectively (p<0.05).

Among the 348 infants with <2 h of fever, 252 (72.4%) had normal initial procalcitonin, CRP, and neutrophil values according to the SEUP protocol; this group included five of the 12 diagnosed IBIs (41.7%). The sensitivity and specificity of these values at the second measurement were 40% (95% CI 11.8–76.9) and 23.9% (95% CI 19.0–29.6), respectively, with an area under the curve (AUC) of 0.319 (95% CI 0.078–0.561).

In this same subgroup, a procalcitonin increase rate of ≥0.008 ng/mL/h showed a sensitivity of 80.0% (95% CI 37.6–96.4), a specificity of 69.2% (95% CI 63.5–75.1), and an AUC of 0.748 (95% CI 0.550–0.946). The only false negative was a patient with S. aureus bacteremia who was discharged without antibiotics and had a good outcome.

Conclusion. In infants ≤90 days old with fever of short duration, especially <2 h, and normal biomarkers, when a repeat laboratory assessment is planned after a few hours, ΔPCT is more useful than the absolute value for identifying IBI. This approach may optimize decision-making in the emergency department and reduce diagnostic uncertainty during the earliest phase of the illness.

POSITIVE URINE CULTURES FOR ENTEROCOCCUS SPP. VERSUS ESCHERICHIA COLI IN FEBRILE INFANTS YOUNGER THAN 90 DAYS: A MATCHED COHORT STUDY

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Introduction. In infants ≤90 days old with febrile urinary tract infection (UTI), Enterococcus spp. are isolated less frequently than Escherichia coli and are often not accompanied by leukocyturia. This has raised debate over whether these findings represent asymptomatic bacteriuria, contamination, or a true UTI.

Objectives. To compare the characteristics of febrile infants ≤90 days with urine cultures positive for Enterococcus spp. and E. coli according to the urinalysis dipstick (UD) results.

Methods. Multicenter, retrospective, matched cohort study including febrile infants ≤90 days of age seen at 3 pediatric emergency departments between 2011 and 2023 with a positive urine culture (≥10,000 CFU/mL by bladder catheterization or ≥100,000 CFU/mL by clean-catch collection) for Enterococcus spp. or E. coli (matched 1:1 by age and sex). UTI was defined as a positive urine culture with associated pyuria. Biomarker values (white blood cell count, C-reactive protein, and procalcitonin) and subsequent outcomes (recurrent UTI and abnormalities on imaging tests) were analyzed in both groups according to the presence or absence of associated pyuria.

Results. Of a total of 4,006 febrile infants ≤90 days old, 77 (1.9%) had a positive urine culture for Enterococcus spp. The rate of leukocyturia was 27.3%, compared with 80.5% among the 77 matched cases with a positive urine culture for E. coli (p <0.001). There were no significant differences between the two microorganisms in the values of any of the three biomarkers.

When compared with the group of infants with UTI caused by E. coli, infants with UTI caused by Enterococcus spp. showed a significantly higher frequency of recurrent UTIs (33.3% vs 0.8%, p=0.006). Table 1 shows the frequency of abnormalities on imaging tests according to the bacteria isolated in the urine culture and the urine dipstick results.

Conclusions. Febrile UTIs caused by Enterococcus spp. in infants ≤90 days of age are more frequently associated with urinary tract abnormalities, recurrence, and renal damage than UTIs caused by E. coli. Studies are needed to clarify the role of leukocyte esterase in UTIs caused by Enterococcus spp.

	Leukocyturia			No leukocyturia		
n (%)	*E. coli* (N=62)	*Enterococcus* spp. (N=21)	p value	*E. coli* (N=15)	*Enterococcus* spp. (N=56)	p value
Ultrasound	16/56 (28.6)	6/16 (37.5)	0.55	4/15 (26.7)	7/27 (25.9)	1.0
Voiding cystourethrography	5/29 (17.2)	7/10 (70.0)	0.004	2/15 (13.3)	4/9 (44.4)	0.15
Renal scintigraphy	0/17	6/11 (54.5)	0.001	0/12	3/14 (21.4)	0.23

TABLE 1. Frequency of abnormal imaging findings according to the bacterium isolated on urine culture and the urine dipstick result.

BEYOND THE PATIENT: THE SETTING AND THE DRUG INFLUENCE OFF-LABEL PRESCRIBING IN PEDIATRIC EMERGENCY DEPARTMENTS.

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Introduction. Off-label prescribing is common in pediatric emergency departments (PEDs), with a prevalence ranging from 18% to 50% depending on the healthcare setting. This reflects the gap between the therapeutic needs of pediatric patients and the available regulatory information, resulting from the exclusion of children from clinical trials.

Objective. To analyze the factors associated with off-label prescribing in the pediatric emergency department of a secondary-level hospital.

Methodology. Retrospective observational study that included 376 pediatric prescriptions issued in the unit between 2019 and 2025. Each prescription was classified according to the official criteria provided by the Medicines Information Centre (CIMA). Potential associations between prescription inappropriateness and Anatomical Therapeutic Chemical (ATC) group, clinical condition, time of day, season, and route of administration were analyzed using the Chi-square test and Fisher's exact test. Independent factors were identified using logistic regression, estimating adjusted odds ratios (ORs) and 95% confidence intervals (95% CI).

Results. 43.1% of prescriptions were off-label. No association was observed with sex, age, the presence of chronic disease, or prior medication use. Prescription time was associated with appropriateness, with prescriptions made during the day more likely to be discordant with the product information (OR 1.79; 95% CI 1.08–2.95). Prescriptions intended for administration in the hospital setting were less likely to be regulatorily appropriate (OR 0.21; 95% CI 0.12–0.37). ATC groups A (OR 31.84; 95% CI 9.23–109.94) and R (OR 4.34; 95% CI 1.876–10.06) were very significantly associated with a higher rate of off-label prescribing.

Conclusions. The prevalence of off-label prescribing in pediatric emergency departments is high, highlighting a gap between clinical practice and the regulatory framework. Our findings suggest that inappropriate prescribing is not patient-dependent but is linked to the care setting and therapeutic groups. Official documents are outdated, placing greater responsibility on pediatricians to ensure effective, up-to-date therapeutic care.

ETIOLOGICAL CATEGORIZATION OF NEONATES WITH FEVER WITHOUT A SOURCE: DO EMERGENCY PHYSICIANS, NEONATOLOGISTS, AND INFECTIOUS DISEASE SPECIALISTS AGREE?

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Introduction. Care protocols for febrile neonates younger than 8 days recommend universal hospitalization and empirical antibiotic therapy because of the high risk of bacterial infection (BI). Nevertheless, the duration of both hospitalization and antibiotic therapy is not uniform, as the final clinical diagnosis may be open to debate depending on the interpretation of clinical, laboratory, and microbiological findings.

Objectives. To characterize the etiological classification of episodes of fever without a source in previously healthy neonates younger than 8 days, and to assess agreement and differences in classification among neonatologists, pediatric infectious disease specialists, and emergency pediatricians.

Methods. Single-center retrospective observational study based on a series of 42 neonates younger than 8 days with stable pediatric assessment triangle (PAT), seen for fever without a source at a tertiary hospital between 2023 and 2025. Clinical, laboratory, and microbiological

data were collected for each neonate and presented in a standardized manner to 12 specialists: 4 neonatologists, 4 pediatric infectious disease specialists, and 4 emergency pediatricians. Each evaluator classified each case as bacterial infection (BI), viral infection (VI), or fever of indeterminate origin (FIO). The distribution of diagnoses by specialty and differences between observers were analyzed.

Results. Overall, BI was the least frequent of the three categories. Interobserver agreement was moderate (κ=0.454, 95% CI 0.401–0.510), although agreement on the diagnosis of BI was high (κ=0.761, 95% CI 0.723–0.880). Although the proportion of patients classified as having BI was similar among neonatologists (18.5%, 95% CI 13.3–25.1), infectious disease specialists (15.5%, 95% CI 10.7–21.8), and emergency physicians (14.3%, 95% CI 9.8–20.4), the three participants with the lowest proportion of BI diagnoses were in the latter group (7.1%, 9.5%, and 11.9%). Discrepancies were particularly notable in cases of positive urine culture with a negative urine dipstick, isolation of bacteria considered contaminants, and laboratory findings consistent with dehydration.

Conclusions. Although there is substantial variability in the etiological categorization of febrile neonates younger than 8 days according to the evaluator's specialty, diagnosis appears to be more consistent in patients with possible BI. Nevertheless, neonatologists and infectious disease specialists are more likely than emergency pediatricians to diagnose BI in cases of microbiological uncertainty. This study highlights the need for homogeneous, consensual diagnostic criteria to optimize clinical management and the rational use of antibiotics in this age group.

PERFORMANCE OF SIMULTANEOUS PERIPHERAL AND CENTRAL BLOOD CULTURE COLLECTION IN FEBRILE ONCOLOGY PATIENTS

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Introduction. In the care of an oncology patient with fever, all guidelines recommend obtaining a blood culture from the central venous catheter (CVC). However, the practice of simultaneously obtaining a peripheral blood culture remains controversial. Arguments against it include uncertainty about the impact of bacteremias identified only through peripheral blood cultures and the potentially higher likelihood of contamination in this sample compared with central blood cultures.

Objective. To evaluate the diagnostic performance of peripheral blood cultures in identifying bacteremia in febrile oncology patients.

Methods. Secondary analysis of a prospective multicenter study conducted at 15 hospitals belonging to the Research Network of the Spanish Society of Pediatric Emergency Medicine (RISEUP). Oncology patients who presented with fever between November 2022 and October 2024 were included.

Bacteremia was defined as the growth of a) a non-opportunistic bacterium in any blood culture, b) an opportunistic bacterium in peripheral and central blood cultures obtained simultaneously in the Emergency Department, or c) an opportunistic bacterium in two different central blood cultures obtained during the febrile episode.

Episodes in which both blood cultures were collected simultaneously in the Emergency Department were selected. The percentage of bacteremias caused by non-opportunistic pathogens detected by each blood culture and the rate of possible contamination (growth of an opportunistic bacterium in only one blood culture) in each were analyzed.

Results. A total of 1,197 episodes were included (median age: 6 years [interquartile range: 3–10]; rate of severe neutropenia [<500 neutrophils/mcL]: 46.6%). Central and peripheral blood cultures were collected simultaneously in 808 episodes (67.5%; range across centers: 1.2–100%), and 77 of these (9.5%) were diagnosed with bacteremia. Of these, 36 (46.8%) were caused by non-opportunistic bacteria: 18 (50%) were identified in both blood cultures; 11 (30.6%), only in the peripheral blood culture; and 7 (19.4%), only in the central blood culture. Possible contamination was observed in 14 (1.7%) central blood cultures and 9 (1.1%) peripheral blood cultures (p=0.3).

The bacteremia rate among the 331 episodes in which only one blood culture was obtained was 6.2% (p=0.08). Patients in whom both blood cultures or only one of them were obtained were similar in terms of sex, age, general appearance, degree of fever, and rate of severe neutropenia.

Conclusions. A single blood culture obtained from a CVC in febrile oncology patients may lead to the underdiagnosis of clinically significant bacteremia. Peripheral blood cultures are not associated with higher contamination rates than those obtained from CVCs.

PREDICTIVE FACTORS FOR INVASIVE INFECTION IN NON-ONCOLOGICAL IMMUNOCOMPROMISED PATIENTS PRESENTING WITH FEVER TO THE EMERGENCY DEPARTMENT

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Introduction. The number of non-oncology patients receiving prolonged immunosuppressive therapy for a solid organ transplant (SOT) or a systemic disease (SD) who are seen in pediatric emergency departments (PEDs) has increased in recent years. These treatments could increase the risk of severe infections. However, unlike for oncology patients, risk stratification is not well defined.

Objective. To identify clinical and laboratory risk factors associated with invasive infection in non-oncological patients receiving immunosuppressive treatment who present to pediatric emergency departments with fever.

Methodology. Prospective, multicenter cohort study conducted at five hospitals belonging to the infectious diseases working group of the Spanish Society of Pediatric Emergency Medicine (SEUP). The study included non-oncology patients receiving immunosuppressive treatment who presented with fever (≥38ºC) between June 2023 and November 2025.

Invasive infection was defined as isolation of a pathogenic bacterium from a sterile fluid, isolation of a bacterium that is usually a contaminant in two separate blood cultures, or episodes meeting clinical criteria for sepsis, requiring inotropic support, or resulting in complications, sequelae, or death.

Two independent multivariate analyses were performed: one in patients with SOT and another in patients with SD (rheumatological, digestive, hematological, nephrological, neurological, and dermatological). The following variables were included: age, sex, degree of immunosuppression according to the potency and biological target of the therapeutic agent (high, moderate, or low), Pediatric Assessment Triangle (PAT), maximum temperature, vital signs, cell counts (leukocytes, neutrophils, lymphocytes, monocytes, and platelets), and biomarkers (C-reactive protein and procalcitonin).

Results. A total of 373 episodes were included: 200 (53.6%) in patients with SOT and 173 (46.4%) in patients with SD. Overall, 48.3% were male, and the median age was 6 years (interquartile range 3–11).

The overall prevalence of invasive infection was 4.8% (95% CI 2.9–7.5); in the SOT group it was 8.0% (95% CI 4.6–12.7), and in the SD group it was 1.2% (95% CI 0.1–4.1). No invasive infections occurred in patients with a low degree of immunosuppression.

In the SOT group, unstable PAT was identified as an independent risk factor for invasive infection (aOR 11.0; 95% CI 1.1–114.4). The area under the curve was 0.86 (95% CI 0.78–0.97). No independent risk factors were identified in the SD group.

Conclusions. The prevalence of invasive infection in non-oncological immunocompromised patients was low overall, particularly among those with systemic diseases. However, SOT patients presenting with unstable PAT constitute a higher-risk subgroup.

VALIDATION OF A CLINICAL PREDICTION RULE TO IDENTIFY INFANTS YOUNGER THAN 3 MONTHS WITH MILD TRAUMATIC BRAIN INJURY AND A LOW RISK OF INTRACRANIAL INJURY

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Introduction. In 2022, a clinical prediction rule (CPR) was derived to identify infants <3 months old at low risk of radiological intracranial injury (ICI) following mild traumatic brain injury (TBI). Its validation is necessary before it can be applied in clinical practice.

Objective. To validate the CPR derived to identify infants <3 months old with mild head trauma and a low risk of radiological intracranial injury.

Methodology. Prospective cohort study of infants <3 months of age seen within 24 hours of mild TBI (Glasgow Coma Scale score of 14–15) at 34 Spanish pediatric emergency departments (PEDs) between November 2022 and December 2025. Exclusion criteria were multiple trauma, pre-existing neurological disease, bleeding diathesis, and/or non-accidental TBI. All infants were followed up by telephone for four weeks. The derived CPR comprises four factors (severe injury mechanism, abnormal behavior according to the parents, signs of skull fracture, and non-frontal cephalohematoma); the absence of all four indicates a low risk of radiological ICI. Radiological ICI was defined as radiological evidence of intracranial hemorrhage, or a diastatic or depressed skull fracture at least as deep as the thickness of the skull.

A logistic regression analysis was performed to validate the CPR, and its discriminative ability was calculated.

Results. Of the 36,256 patients aged <18 years with minor head trauma who were seen in the included pediatric emergency departments, 782 were <3 months old, and 781 ultimately met the inclusion criteria. The prevalence of radiological ICI was 3.3% (95% CI 2.2–4.9); no cases required neurosurgical intervention.

In the validation, the simplified version of the CPR, with 2 of the 4 predictors (non-frontal cephalohematoma and signs of skull fracture), performed better than the full CPR, with a sensitivity of 88.5% (95% CI 71.0–96.0), specificity of 88.5% (95% CI 86.0–90.6), negative predictive value of 99.0% (95% CI 98.7–99.6), and an area under the curve of 0.89 (95% CI 0.81–0.94). The CPR did not identify three infants: one who was asymptomatic, with no signs on physical examination, and the other two with frontal cephalohematomas; one of these also presented with irritability. All included infants had a good clinical outcome.

Conclusions. Our series confirms the good predictive performance of the simplified Spanish CPR for identifying infants <3 months old with mild TBI and a low risk of radiological ICI. However, a decision tree should be developed to include intermediate-risk factors that can help guide clinical decision-making.

DRAWING A MAP OF HUMANIZATION. A MULTICENTER STUDY IN SPANISH PEDIATRIC EMERGENCY DEPARTMENTS.

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Introduction. Humanization in pediatric emergency departments (PEDs) is essential to ensuring the well-being of patients and healthcare professionals. In 2025, the SEUP Humanization Working Group (GTHum) drafted quality criteria for humanization (37 items).

Objectives. 1) To analyze the level of humanization in Spanish pediatric emergency departments (PEDs); 2) To identify the most and least widely implemented items in PEDs.

Methodology. A quantitative, multicenter, observational-descriptive study based on surveys was conducted. In December 2025, the digital questionnaire (REDCap platform) was distributed by email to the medical and/or nursing leads of Spanish pediatric emergency departments.

The survey collects epidemiological data on the participant and the degree of implementation of the criteria drafted by the GTHum, using a Likert-type scale (1: the criterion is not considered; 2: planned but not started; 3: sometimes met; 4: always met; 5: always met and evaluated).

The Global Humanization Index (GHI) is calculated (the average of all items, converted to a 0–100 scale). A low (GHI<50), moderate (GHI 50–74), or high (GHI≥75) level of humanization of the pediatric emergency department (PED) is defined.

Items are considered not implemented when they receive a score of 1–2 on the Likert scale, partially implemented when they receive a score of 3, and fully implemented when they receive a score of 4 or 5.

Results. A total of 107 department leads were contacted, and 34 responses were obtained (response rate 32%). The participants were women (23), with a median age of 47 years (p25-p75 40-55); they were medical leads (29) and nursing leads (5).

The participating pediatric emergency departments have a median GHI score of 43 points (p25–p75 34–53); 2 departments have a high level of humanization, 10 a moderate level, and 22 a low level.

The most widely implemented items are: a pediatric waiting room (33 hospitals), adequate cleanliness (29), accessible spaces (25), spaces that preserve privacy (22), and clear signage (21). The least widely implemented items are: control of environmental noise (27), the presence of staff to support patients and families (24), conducting workplace climate surveys (22), information for patients about how the pediatric emergency department operates (22), and the presence of a staff member responsible for humanization in the department (22).

Conclusions. Humanization in Spanish pediatric emergency departments could be improved, particularly with regard to processes and care for people. Strategies are therefore needed to advance toward more humanized care.

CONTAMINATION RATES OF URINE CULTURES OBTAINED BY SPONTANEOUS VOIDING VERSUS URETHRAL CATHETERIZATION IN INFANTS: SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction. The diagnosis of urinary tract infection (UTI) in infants requires sterile urine samples. Despite the growing use of spontaneous voiding (SV) urine collection as an alternative to urethral catheterization (UC), controversy remains over whether it has an unacceptably high contamination rate.

Objectives. To compare the prevalence of contaminated cultures obtained using SV versus urethral catheterization (UC) in infants younger than 12 months. Secondary objective: to describe the contamination rate for each method, stratified by patient age (0–3, 0–6, and 0–12 months).

Methodology. A systematic review and meta-analysis were conducted describing the prevalence of contaminated urine cultures obtained using SV and UC in infants <12 months.

A three-pronged search strategy was used: 1) a systematic search of bibliographic databases; 2) a manual review of references in selected studies; and 3) a review of pediatric conference proceedings (2024–2025) to identify unpublished research. Data were extracted from published articles or obtained by contacting the authors. The contamination definitions used in each study were applied.

The primary outcome was estimated using a random-effects meta-analysis with 95% confidence intervals (CIs). Since not all studies included both methods, the Pearson continuity correction was applied, adding 0.5 to cells with zero subjects. In addition, a meta-analysis of proportions was conducted, analyzing the urine culture contamination rate for each technique separately.

Results. Of 677 records, 75 full-text studies were reviewed, and 24 were ultimately included, comprising a total of 3,260 urine samples collected using the SV method and 2,304 using the UC method.

In infants younger than 12 months, the SV method is associated with a significantly higher probability of urine culture contamination than the UC method (OR 2.52; 95% CI 1.52–4.19), despite moderate heterogeneity among the studies (I^2 52.0%). Table 1 shows the contamination rates by method and age.

Conclusions. In infants under 12 months of age, urine collection by SV has a significantly higher contamination rate than UC across all age groups analyzed. These findings call its validity into question and suggest the need for a critical evaluation of its use in clinical practice.

	Urine culture contamination, spontaneous voiding (%)	Urine culture contamination, urethral catheterization (%)
0–3 months	25.9% (95% CI 19.4–32.5)	9.5% (95% CI 5.7–13.3)
0–6 months	21.9% (95% CI 16.4–21.4)	6.9% (95% CI 4.2–9.6)
0–12 months	19.2% (95% CI 14.6–23.9)	9.2% (95% CI 6.1–12.3)

TABLE 1. Contamination rate by collection method and patient age. CI: confidence interval.

PROSPECTIVE VALIDATION OF A DIAGNOSTIC SCORE FOR FOREIGN BODY ASPIRATION IN THE PEDIATRIC EMERGENCY DEPARTMENT Arteche-Gonzalez N, Tuduri-Limousin I, Benito-Fernández J, Zorrozúa-Santos B, Acedo-Alonso Y, Group for the study of suspected foreign body aspiration in children of RISEUP, Cahís-Vela N, Miró-Rubio I, Sensarrich-Roset M, Escobar-Castellanos M, Aguilar-Gómez, Morante-Valverde R, Crehuet-Gramatyka D, Muñoz-Bernal JÁ, Giuseppe-Ecclesia F, García-Sánchez P, Hurtado-Mingo Á, del Peral-Samaniego MP, Gálvez-Estevez CM. *Department of Pediatrics - Cruces University Hospital. Barakaldo, Spain. Pediatric Emergency Department - Cruces University Hospital. Barakaldo, Spain. Department of Pediatric Surgery - Cruces University Hospital. Barakaldo, Spain. Biobizkaia Health Research Institute (BioBizkaia). Bilbao, Spain. Research Network of the Spanish Society of Pediatric Emergency Medicine (RISeuP-SPERG). Spain. Parc Taulí Health Cooperation Consortium - I3PT-CERCA. Sabadell, Spain. Insular-Maternal and Child University Hospital Complex - Pediatric Surgery. Las Palmas de Gran Canaria, Spain. Hospital de la Santa Creu i Sant Pau - IR SANT PAU. Barcelona, Spain. Gregorio Marañón General University Hospital. Madrid, Spain. Illes Balears Health Research Institute - Multidisciplinary Research Group. Palma de Mallorca, Spain. 12 de Octubre University Hospital - Department of Pediatric Surgery. Madrid, Spain. Central University Hospital of Asturias. Pediatric Emergency Department. Oviedo, Spain. Donostia University Hospital - Pediatric Emergency Department. San Sebastián, Spain. Niño Jesús Children's University Hospital - Emergency Department. Madrid, Spain. La Paz University Hospital - Pediatric Emergency Department. Madrid, Spain. Virgen del Rocío Hospital, Pediatric Emergency Department. Seville, Spain. Miguel Servet University Hospital - Pediatric Surgery. Zaragoza, Spain. Álvaro Cunqueiro Hospital, Pediatric Surgery. Vigo, Spain.*

Introduction. Foreign body (FB) aspiration is a potentially life-threatening condition that requires a high index of suspicion. The Janahi score (witnessed choking 1 point; episode of stridor 1 point; episode of wheezing 2 points; unilateral hypoventilation 1 point; abnormal radiograph 2 points) appears to identify patients at low risk of aspiration and could be useful in reducing the number of bronchoscopies, allowing for more conservative management in some cases.

Objective. To prospectively validate the Janahi score for diagnosing foreign body aspiration in children.

Method. Prospective multicenter observational study including patients <14 years of age who presented with suspected foreign body aspiration to pediatric emergency departments between October 2022 and November 2025. Patients with respiratory failure and/or hemodynamic instability were excluded.

Results. A total of 182 patients were included; 45 had confirmed foreign body aspiration. The mean age was 25 months (95% CI: 15–49.5). In the multivariate analysis, four variables were independently associated with confirmed aspiration: foreign body type (nut), stridor during the episode, tachypnea on physical examination, and abnormal chest radiograph (Table 1).

The Janahi score cutoff that maximized the Youden index was 3, with a sensitivity of 71% (95% CI: 55–84), specificity of 83% (95% CI: 76–89), and an area under the ROC curve of 0.77 (95% CI: 0.7–0.85). A score <2 ruled out foreign body aspiration with a sensitivity of 86% (95% CI: 74–94). A modification of the score incorporating the nature of the foreign body as a nut yielded a sensitivity of 97.8% (95% CI: 88.4–99.6) for a score <2 in the study sample.

Conclusions. The Janahi score can identify pediatric patients at low risk of aspiration; however, despite obtaining low scores, conservative management cannot be recommended in all cases. Incorporating other variables, such as the nature of the FB, particularly nuts, could improve the score's performance.

		N	OR (95% CI)	p value	OR (95% CI)	p value
Material: nut		176	8.9 (4.12–19.92)	<0.001	13.51 (5.1–40.7)	<0.001
During the episode	Cyanosis	182	1.86 (0.87–3.89)	0.101		
	Stridor		5.08 (2.51–10.64)	<0.001	6.02 (2.35–16.66)	<0.001
	Wheezing		6.01 (2.2–17.45)			
Cough after the episode			3.12 (1.15–10.97)	0.042		
Physical examination	Tachypnea		4.14 (1.92–9)	<0.001	4.71 (1.61–14.44)	0.005
	Retractions		6.36 (2.81–14.82)			
	Unilateral hypoventilation		4.97 (2.33–10.97)			
	Unilateral wheezes		2.67 (0.84–8.01)	0.083		
	Bilateral wheezes		3.34 (1.29–8.5)	0.011		
Abnormal radiograph		180	6.82 (3.25–14.69)	<0.001	5.63 (2.13–15.67)	<0.001

TABLE 1. Variables associated with confirmed foreign body aspiration.

COMPARISON OF THE MINI FLUID CHALLENGE AND THE PASSIVE LEG RAISE TEST AS PREDICTORS OF FLUID RESPONSIVENESS IN SPONTANEOUSLY BREATHING CHILDREN

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Introduction. The administration of intravenous fluids is a cornerstone of the initial management of hemodynamically unstable patients. Although it can improve cardiac output and tissue perfusion, excessive use is associated with adverse effects. Therefore, tests that can predict fluid responsiveness are recommended.

The passive leg raise test (PLR) assesses the cardiac response to a transient increase in preload, but its usefulness in pediatrics is limited, particularly in young children, because of a smaller venous reservoir in the lower limbs. The mini fluid challenge (mini-FC) assesses the hemodynamic response to small fluid boluses (2–4 ml/kg).

Objectives. To compare the diagnostic performance of the PLR and mini-FC as predictors of fluid responsiveness in spontaneously breathing children during initial stabilization, and to analyze the influence of age.

Methods. Children aged 2 to 14 years with an indication for fluid resuscitation were included. A PLR was performed, followed by volume expansion. Stroke volume (SV) was measured by transthoracic echocardiography. Fluid responsiveness was defined as an increase in SV of >15% after 20 ml/kg.

Diagnostic performance was assessed using ROC curves. Cutoffs were defined using the Youden index and predefined clinical values, prioritizing high specificity (≈90%). Gray-zone analyses and age–predictor interaction models were performed.

Results. A total of 87 children were analyzed. The percentage change in SV after mini-FC showed good diagnostic performance (AUC 0.84; 95% CI: 0.75–0.92), whereas PLR showed acceptable discrimination (AUC 0.77; 95% CI: 0.67–0.87; p=0.26).

The optimal thresholds were 8% for mini-FC (sensitivity 71.7%; specificity 90.2%) and 14.5% for PLR (sensitivity 58.7%; specificity 95.1%). Mini-FC classified more patients outside the gray zone than PLR (63.2% vs. 50.6%), with fewer errors (14.5% vs. 18.2%). PLR performance improved with age, whereas mini-FC performance remained stable.

Conclusions. In spontaneously breathing children during initial stabilization, both PLR and mini-FC predicted fluid responsiveness. However, mini-FC showed more consistent performance across age groups and greater diagnostic safety, especially in young children.

TABLE 1. Changes in stroke volume during the PLR, the mini-fluid challenge and the full fluid challenge.

Test parameters	
PLR	N=87
SV, mL (before PLR)	38.4 (13.6)
ΔSV%, PLR	12.7 (9.1)
Fluid challenge	N=87
SV, mL (T_0)	39.4 (14)
SV, mL (4 mL/kg)	8.2 (7.5)
SV, mL (20 mL/kg)	46.5 (17.2)
ΔSV% (4 mL/kg)	14.9 (10.4)
ΔSV% (20 mL/kg)	17.9 (10.9)
Fluid responders	46 (52.9%)

Hemodynamic parameters obtained during the PLR, mini-FC (4 mL/kg), and full volume expansion (20 mL/kg). Stroke volume (SV) values are expressed in milliliters and as percentage changes (ΔSV%) relative to the corresponding baseline measurement. For the PLR, ΔSV% represents the change from the baseline value before the PLR to the mean of the measurements after the PLR. In the mini-FC, ΔSV% at 4 mL/kg reflects

the change from baseline (T_0) after infusion of 4 mL/kg, while ΔSV% at 20 mL/kg corresponds to the response after completing volume expansion. Data are presented as mean (standard deviation) or number (percentage), as appropriate. Fluid responsiveness was defined as a ΔSV% >15% after administration of 20 mL/kg.

SEUP QUALITY INDICATORS OBSERVATORY. ANALYSIS OF THE INDICATORS REVIEWED IN 2025

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Introduction. The Quality Indicators Observatory of the Spanish Society of Pediatric Emergency Medicine (OIC-SEUP), promoted by the Quality Improvement and Safety Group, aims to monitor and disseminate quality indicators in pediatric emergency departments (PEDs). Its goal is to optimize patient safety and clinical outcomes by promoting data-driven decision-making.

Objective. To assess compliance with two key indicators:

-Compliance with the time-to-care target for Level III triage patients (CTANIII).

-Return within 72 hours with admission (R72HCI).

Materials and methods. Observational, descriptive, multicenter study conducted during the second half of 2025. Hospitals affiliated with the SEUP submitted aggregated data for the second half of 2024 using an ad hoc form distributed via Google Forms. Statistical analysis: Quantitative variables (indicators) were expressed as means, medians, and interquartile ranges, while qualitative variables (compliance and data availability) were presented as absolute frequencies and percentages. The Mann–Whitney U test was used to assess the relationship between the annual number of emergency visits and compliance with CTANIII. The association between annual emergency visits and return within 72 hours resulting in admission was analyzed using Spearman's coefficient. Unavailable data were excluded, and the significance level was set at $p < 0.05$. The reference standards were compliance >90% for CTANIII and <15% for R72HCI.

Results. Twenty hospitals participated, with 724,324 recorded emergency department visits.

CTANIII: Only 31.25% of centers with recorded data (5/16) met the standard (>90%). Mean 83.54%; median 85%. Range 50.20%; Q1 77.50%; Q3 91.15%. 20% of centers did not provide data.

R72HCI: 100% of centers with records (18/18) met the standard (<15%). Mean 6.63% and median 6.90%. Range 13.02%; Q1 2.37%; Q3 8.65%. 10% of centers lacked data.

No significant difference between annual emergency department visits and CTANIII compliance ($p \approx 0.95$), nor a significant correlation between annual emergency department visits and 72-hour return visits (Spearman $r \approx 0.35$; $p > 0.10$).

Conclusions. The analysis highlights gaps in data availability, particularly for CTANIII, underscoring the urgent need to advance digitalization. Compliance with the CTANIII standard falls short of the target at a substantial proportion of centers, pointing to clear opportunities to improve care. By contrast, R72HCI shows a high level of compliance, reflecting good safety and quality standards in the services analyzed.

DERIVATION AND VALIDATION OF A CLINICAL PREDICTION RULE FOR MORTALITY IN CRITICALLY ILL PATIENTS UPON ARRIVAL AT THE EMERGENCY DEPARTMENT

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Introduction and objective. Early identification of critically ill patients at high risk of death in pediatric emergency departments (PEDs) is key to determining prognosis and optimizing resource use. The objective was to identify independent risk factors for mortality in critically ill pediatric patients and to develop and validate a clinical prediction rule for mortality upon arrival at the PED.

Methodology. Critically ill patients treated in the pediatric emergency department (PED) were included (those who died in the PED or were admitted to the PICU). The derivation cohort consisted of a prospective, single-center database from a tertiary hospital (2011–2024), and the validation cohort of a prospective, multicenter database from 20 Spanish PEDs (2021–2025).

An initial univariate logistic regression analysis included demographic data, medical history and previous visits, reason for consultation, triage level, pediatric assessment triangle (PAT), first recorded vital signs, and diagnosis. Independent predictors of mortality were identified using multivariable logistic regression. These were used to develop the Mortality Score for Critically Ill Patients in Pediatric Emergency Departments (SMUP) using the Sullivan method.

Results. The derivation cohort included 1,511 patients (50 deaths, 3.3%) and the validation cohort included 432 (12 deaths, 2.7%).

In the derivation cohort, 4 independent predictors of mortality on arrival at the ED were identified: severity level 1–2 (OR 3.53; 95% CI: 1.67–8.36), abnormal circulation in the PAT (OR 3.48; 95% CI: 1.82–6.64), abnormal breathing in the PAT (OR 2.69; 95% CI: 1.39–5.57), and systolic hypotension (OR 5.92; 95% CI: 2.72–12.60). Based on these predictors, we developed the SMUP, assigning 2 points to pathological systolic blood pressure and 1 point to each of the other predictors (total range 0–5).

The mortality rate increased with the number of independent risk factors included and the SMUP value in both the derivation and validation cohorts.

The optimal cutoff for identifying the group at highest risk of mortality was ≥3 points. In the validation dataset, an SMUP ≥3 showed a sensitivity of 58.3% (95% CI: 30.4%–86.2%), a specificity of 91.7% (95% CI: 89.0–94.3),

and an NPV of 98.7% (95% CI: 97.6–99.8). None of the 70 patients with SMUP=0 died.

Conclusions. The SMUP, based on variables recorded upon arrival in the Emergency Department, allows mortality risk stratification in critically ill pediatric patients.

USE OF NEBULIZED BUDESONIDE IN THE TREATMENT OF SEVERE ASTHMA EXACERBATIONS IN THE EMERGENCY DEPARTMENT

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Introduction. In September 2025, the protocol for managing severe asthma exacerbations (SAE) at our center was updated, emphasizing early corticosteroid administration and adding nebulized budesonide and the use of a vibrating mesh nebulizer to initial treatment when the response to salbutamol and ipratropium bromide is poor.

Objective. To determine whether the changes included in the updated SAE protocol affect its clinical course.

Methods. Quasi-experimental study with historical controls. Study period: 1 (from 1/11/2024 to 31/12/2024) and 2 (from 1/11/2025 to 31/12/2025). Patients aged 2–<18 years who were seen in the Emergency Department with a diagnosis of SAE (PS > 7 and/or SatHb<90%) were included. Patients with chronic diseases, those receiving corticosteroid treatment, return visits within the first 72 hours, and patients transferred to other centers were excluded. Medical records were reviewed, and a comparative study of SAE with poor outcomes (SAE-PO) was conducted across both periods. SAE-PO was defined as exacerbations requiring rescue treatment (continuous nebulized salbutamol or intravenous magnesium sulfate) and/or respiratory support devices (high-flow oxygen therapy or mechanical ventilation devices).

Results. A total of 355 patients with SAE were seen; 143 (40.3%) were excluded, 51.4% of them because corticosteroid treatment had been started before consultation. Of the 210 patients included, 98 corresponded to period_1 and 112 to period_2, with no differences in median age (5 years; p25-75: 3-7), sex (55.2% male), documented preventive treatment (25.2%), presence of fever (44.3%), or median duration of respiratory distress (12h; p25-75: 6-24). In period_1, corticosteroids were administered during the first hour of care in 88.8% of cases, versus 97.3% in period_2 (p=0.013); nebulized budesonide was prescribed in 0% versus 52.7% (p<0.001), and a vibrating mesh nebulizer was used in 1% versus 17% (p<0.001), respectively. Thirty-six cases (17.6%) had an unfavorable course: SAE-PO occurred in 23.5% in period_1 versus 11.6% in period_2 (p=0.023).

Conclusions. Updating the protocol, although it was not widely adopted, was associated with a significant decrease in the proportion of SAE-PO.

IMPACT OF ORGANIZATIONAL PATIENT SAFETY PRACTICES ON SAFETY CULTURE AND ADVERSE EVENT REPORTING IN PEDIATRIC EMERGENCY DEPARTMENTS: A MULTICENTER STUDY

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Introduction. Strengthening the safety culture (SC) is essential to improving safety and quality of care, particularly in complex settings such as pediatric emergency departments (PEDs).

Various organizational practices have been promoted to strengthen the safety culture (SC), including adverse event (AE) reporting systems, safety champions, patient safety (PS) training, clinical simulation, and safety rounds.

Objective. To analyze the impact of organizational patient safety practices on professionals' safety culture and adverse event reporting in the pediatric emergency department.

Methodology. An observational, analytical, cross-sectional, multicenter study in nineteen EDs at different levels of care. Healthcare professionals working in the ED participated. SC was assessed using the Hospital Survey on Patient Safety Culture questionnaire, following the methodology of the Agency for Healthcare Research and Quality.

The organizational practices were safety rounds, the presence of designated safety leads, adverse event (AE) reporting systems, and training in patient safety (PS) and clinical simulation.

Descriptive analyses and logistic regression models were conducted to identify associations between organizational practices, dimensions of the safety culture, and adverse event reporting.

Results. A total of 1176 professionals participated (response rate: 63.8%).

The presence of safety champions was associated with significant improvements in: managers' expectations/actions; organizational learning–continuous improvement; and teamwork (p<0.001).

Having other reporting systems was associated with higher scores for: Frequency of reported AEs and Feedback (p<0.001). The presence of safety rounds influenced Expectations/actions of managers (p=0.013) and Organizational learning/continuous improvement (p=0.048).

Training in PS and clinical simulation yielded significant differences in positive responses across all dimensions except Teamwork, Staffing, and Handoffs.

Training in clinical simulation, safety champions, safety rounds, and other reporting systems were associ-

ated with increased AE reporting. Having other reporting systems (OR = 2.228; 95% CI: 1.322–3.789) and the presence of two safety champions were associated with a greater likelihood of reporting AEs (OR = 1.701; 95% CI 1.077–2.698). Job category also had an influence, with pediatricians being more likely to report AEs.

Conclusions. Organizational practices in patient safety have a positive impact on healthcare professionals' safety culture and adverse event reporting, although their implementation remains limited. Patient safety training and clinical simulation are effective strategies for strengthening healthcare professionals' safety culture.

ORAL ANTIBIOTIC THERAPY VERSUS NO ORAL ANTIBIOTICS AFTER DISCHARGE FOR COMPLICATED PEDIATRIC APPENDICITIS: SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction and objective. The use of oral antibiotic therapy after hospital discharge in children who have undergone surgery for complicated acute appendicitis (CAA) remains routine at many institutions, despite growing evidence questioning its clinical benefit. The objective was to assess whether oral antibiotics prescribed for home use reduce the risk of complications compared with no antibiotics at discharge.

Methodology. The review was prospectively registered in PROSPERO. Structured literature searches, using a predefined strategy, were conducted in the main biomedical databases from their inception through March 2025. Two independent reviewers selected the studies, extracted the data, and assessed the risk of bias using the ROBINS-I tool. Random-effects meta-analyses (MAs) were performed, with estimates of relative risks (RRs), 95% confidence intervals and prediction intervals, as well as sensitivity analyses, for the outcomes of intra-abdominal abscesses (IAAs), surgical site infections (SSIs), organ/space infections (OSIs), and hospital readmissions (HRs). The certainty of the evidence for all outcomes was formally assessed using the GRADE system.

Results. Fourteen studies comprising 26,174 pediatric patients with CAA were included. The MAs showed no statistically significant differences between the intervention and comparison groups in IAAs (RR 1.23; 95% CI: 0.62–2.46), OSIs (RR 1.19; 95% CI: 0.73–1.93), or HRs (RR 1.07; 95% CI: 0.78–1.45). In analyses stratified by exposure, patients who did not receive home antibiotic therapy had a modestly lower risk of HRs (RR 0.78; 95% CI: 0.61–1.01; p = 0.05). In contrast, the risk of SSIs was significantly higher in the home antibiotic therapy group (RR 0.77; 95% CI: 0.61–0.96; p = 0.02). However, this association was not robust and disappeared in sensitivity analyses, with the effect reversing, probably owing to confounding by indication. The certainty of the evidence was very low for all outcomes because the included studies were nonrandomized.

Conclusions. Oral antibiotic therapy at home after discharge does not appear to reduce the risk of postoperative complications in children undergoing surgery for CAA. Given the absence of consistent benefit and the potential for unnecessary harm, routine use of oral antibiotics at home after discharge is not supported. As the certainty of the evidence is very low, high-quality prospective studies are needed to determine the true effect of oral antibiotics at home in this setting.

PROSPECTIVE MULTICENTER EXTERNAL VALIDATION OF THE BIDIAP SCORE FOR DIAGNOSING ACUTE APPENDICITIS IN CHILDREN

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Introduction and objective. The diagnosis of pediatric acute appendicitis (PAA) remains a clinical challenge, despite the tools currently available. The BIDIAP score is a diagnostic tool comprising three items that demonstrated high discriminatory performance in its derivation cohort. The objective of this study was to externally validate the BIDIAP score for the diagnosis of PAA.

Methodology. An observational, prospective, multicenter study was conducted at four national tertiary-care hospitals, including children seen for suspected PAA. Two groups were defined: patients with histopathologically confirmed PAA and patients in whom PAA was definitively ruled out after the diagnostic process (non-surgical abdominal pain or NSAP). The BIDIAP score was applied using a predefined cut-off (≥ 4 points), and its diagnostic performance was evaluated using ROC analysis, bootstrapping, calibration metrics, and decision curve analysis (DCA).

Results. The primary analysis included 644 patients. The BIDIAP score showed very high diagnostic performance, with an area under the ROC curve of 0.93 (95% CI, 0.91–0.95). Calibration was adequate. At the predefined cutoff of ≥ 4 points, the score achieved a sensitivity of 90.5% and a specificity of 81.6%. DCA demonstrated a positive net clinical benefit compared with the "treat all" or "treat none" strategies across the entire range of clinically relevant threshold probabilities.

Conclusions. The BIDIAP index showed excellent diagnostic performance for PAA. Its simplicity, based on only three items, and its applicability even when the appendix is not visualized on ultrasound make it a promising tool

for supporting routine clinical decision-making in pediatric emergency departments.

IMPACT OF A QUALITY IMPROVEMENT STRATEGY ON VITAL SIGN RECORDING IN THE EMERGENCY DEPARTMENT OBSERVATION UNIT

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Introduction. Measuring and recording vital signs (VS) in patients treated in pediatric emergency departments (PEDs) who are not critically ill but require admission to the observation unit (OU) is essential for assessing severity and guiding clinical decisions. However, factors such as high workload or limited awareness of their importance mean that they are not always recorded systematically, which is a common cause of medical errors.

Objective. To analyze the impact of a quality improvement strategy on the recording of vital signs in patients admitted to the observation unit.

Methods. In June 2024, a multidisciplinary team of healthcare professionals from the pediatric emergency department of a referral hospital was established. Recording of vital signs in the observation unit was identified as an area for improvement, and the goal was set to increase the percentage of patients with complete vital signs recorded at discharge from the observation unit (at least weight, temperature, blood pressure, heart rate, and oxygen saturation) to 80% by December 2025.

Using a key driver diagram, the main drivers were identified (communication, professional training and awareness, task organization, and facilitation of documentation), along with the interventions with the greatest potential impact, including training sessions, poster distribution, and joint handovers at shift changes.

A random sample of patients from the pre-intervention period (November 2024–January 2025) was reviewed to establish baseline status; subsequently, a random sample of 40% of patients admitted to the OU during the post-intervention period (February–November 2025) was reviewed weekly.

A continuous improvement strategy was implemented using PDSA (plan, do, study, act) cycles, progressively incorporating interventions with a favorable impact. Monitoring was carried out using a run chart.

Results. A total of 1,314 episodes were analyzed, of which 50 occurred during the pre-intervention period, with a median of 0% for complete VS documentation at discharge. During the PDSA process, a nursing assistant was added to the multidisciplinary team as an additional intervention to those previously described.

Following the implementation of quarterly interventions, a median of 70% was achieved over 25 consecutive weeks, without reaching the established target of 80%.

Conclusions. The implementation of a quality improvement strategy based on PDSA cycles significantly improved VS documentation in the ED observation unit.

REDUCING LENGTH OF STAY IN THE OBSERVATION AREA OF A PEDIATRIC EMERGENCY DEPARTMENT UNIT

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Introduction. The Observation Area (OA) of the Pediatric Emergency Department (PED) has a limited number of beds, making efficient management essential. It is intended for the initial assessment and treatment of non-critical pediatric patients with urgent medical or surgical conditions and has the human and technical resources needed to provide high-quality care. Prolonged stays lead to overcrowding in the OA and the relocation of patients to less suitable alternative areas.

Objective. To reduce the proportion of pediatric patients who do not require hospital admission but have prolonged stays in the Observation Area (> 4 hours) from 30% to 15% by 2025.

Methods. In June 2024, a multidisciplinary team was formed in the pediatric emergency department of a tertiary hospital: a nurse, a pediatric nursing supervisor, a pediatric resident, a pediatrician, and the unit coordinator.

Reducing prolonged stays (PS) in the OA was identified as a priority area for improvement. A retrospective analysis of the first quarter of 2024 (preintervention period) was conducted to establish the baseline, followed by weekly monitoring during the postintervention period (2025). A key driver diagram was used to identify factors with potential impact, including streamlining operational processes (cleaning), assigning specific responsibilities in the OA, improving internal communication, and raising staff awareness. The continuous improvement methodology was applied using PDSA (Plan–Do–Study–Act) cycles. To date, only the reorganization of cleaning shifts has been implemented; the remaining interventions are still in development. Monitoring was conducted using a run chart.

Results. During the follow-up period, the percentage of prolonged stays showed week-to-week variability, with no shift or sustained trend identified on the run chart. The overall percentage of prolonged stays decreased from 30% to 23.3% over the period analyzed; however, this change does not meet the criteria for special-cause variation and therefore cannot be causally attributed to the intervention implemented.

Conclusions. This quality improvement project is in the initial implementation phase. The absence of clear signals of change in the run chart highlights the need to complete the planned PDSA cycles and introduce additional interventions targeting the main process drivers. Ongoing monitoring will make it possible to assess the impact of future system changes and progress toward the proposed goal.

IMPROVING COMPLIANCE WITH THE TRAUMA PATIENT CARE PROTOCOL IN A TERTIARY-LEVEL PEDIATRIC EMERGENCY DEPARTMENT

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Introduction. Polytrauma patients (PTPs) require multidisciplinary initial care involving numerous healthcare professionals, as well as coordination between different specialties and hospital services. Given the high complexity of these patients, having common action protocols that specify the composition of trauma teams can facilitate patient care and improve coordination among hospital teams. A quality improvement project was developed to reduce the number of professionals in the resuscitation bay and ensure compliance with the protocol currently in place at our center.

Objective. To improve adherence to the PTPs protocol regarding the number of professionals involved in care, reducing the number of excess personnel in the resuscitation room by 15%.

Methodology. A study was conducted from January 2025 to December 2025 using an improvement methodology. The current pathway for PTPs in our Pediatric Emergency Department (PED) was analyzed, and noncompliance with the protocol in force regarding the number of staff in the stabilization room was identified. A survey was sent to the professionals involved in stabilizing these patients to confirm that this issue was shared by all those involved. The following improvements were designed, implemented, and evaluated: introducing a structured record of the staff attending each case, disseminating the protocol and the improvement project, and using a checklist before the patient's arrival to remind staff of the maximum number of people allowed in the room.

Results. A total of 22 episodes were analyzed during the period described. In the first phase (January–June 2025), systematic data collection revealed considerable variability in the number of staff involved [median of 18 professionals, range (10–30)], reflecting a poorly standardized process.

In the second phase (July–October 2025), following the implementation of measures, the median decreased to 13 professionals, representing a 28% reduction. Variability decreased, extreme values disappeared, and records became more concentrated in lower ranges, indicating greater process stability.

Conclusions. The improvement methodology made it possible to identify high initial variability and a substantial, sustained reduction in the number of staff involved after the interventions. The small sample size and institutional barriers to implementing improvements were the most significant limiting factors in the project's development.

APPLICATION OF THE CONTINUOUS IMPROVEMENT METHODOLOGY TO REDUCE LENGTH OF STAY IN A PEDIATRIC EMERGENCY DEPARTMENT (PED)

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Introduction. Efficiency in pediatric emergency departments (PEDs) is key to ensuring safe, high-quality care and reducing workload. Length of stay is a fundamental indicator of the overall functioning of the care process. In our PED, approximately 30% of patients had stays > 3 hours, well above the standard (<10%) established by the Spanish Society of Pediatric Emergency Medicine (SEUP), prompting the development of an improvement project.

Objectives. General objective: to improve care efficiency through the systematic application of continuous improvement methodology, using length of stay as a quality indicator and the SEUP standard (<10%) as a benchmark.

SMART objective: reduce the percentage of patients with stays >3 hours to ≤15% within one year (July 2024–July 2025), through structured interventions using PDSA (Plan–Do–Study–Act) cycles with a multidisciplinary approach.

Methodology. Project carried out between July 2024 and July 2025 as part of the SEUP and Cincinnati Children's Hospital Improvement Methodology Course. The primary indicator was the percentage of patients with stays >3 hours among all patients seen, excluding hospitalized patients and those whose care depended on other services. The interventions implemented, designed by a multidisciplinary team, included: defining and refining the target population; raising awareness and training the care team; standardizing the discharge process; assigning patients to specialties early; and optimizing the use of diagnostic tests. The indicator's progress was monitored using a run chart.

Results. A total of 14,752 care episodes were analyzed. Following definition and refinement of the target population, the percentage of patients with stays >3 hours decreased from 30% to 16% (Figure 1), establishing a new baseline that more accurately reflects the service's care process. Subsequently, the indicator remained broadly stable, with occasional decreases below 15% that were not sustained, providing relevant information about the system's limitations and priority areas for future PDSA cycles.

Conclusions. The continuous improvement methodology led to a substantial initial reduction in the percentage of prolonged stays and a better understanding of the organizational factors affecting efficiency in our pediatric emergency department. Although the SMART objective was not achieved consistently, the project generated organizational learning, strengthened engagement across the department, and provided key information to guide the continuation of the improvement process.

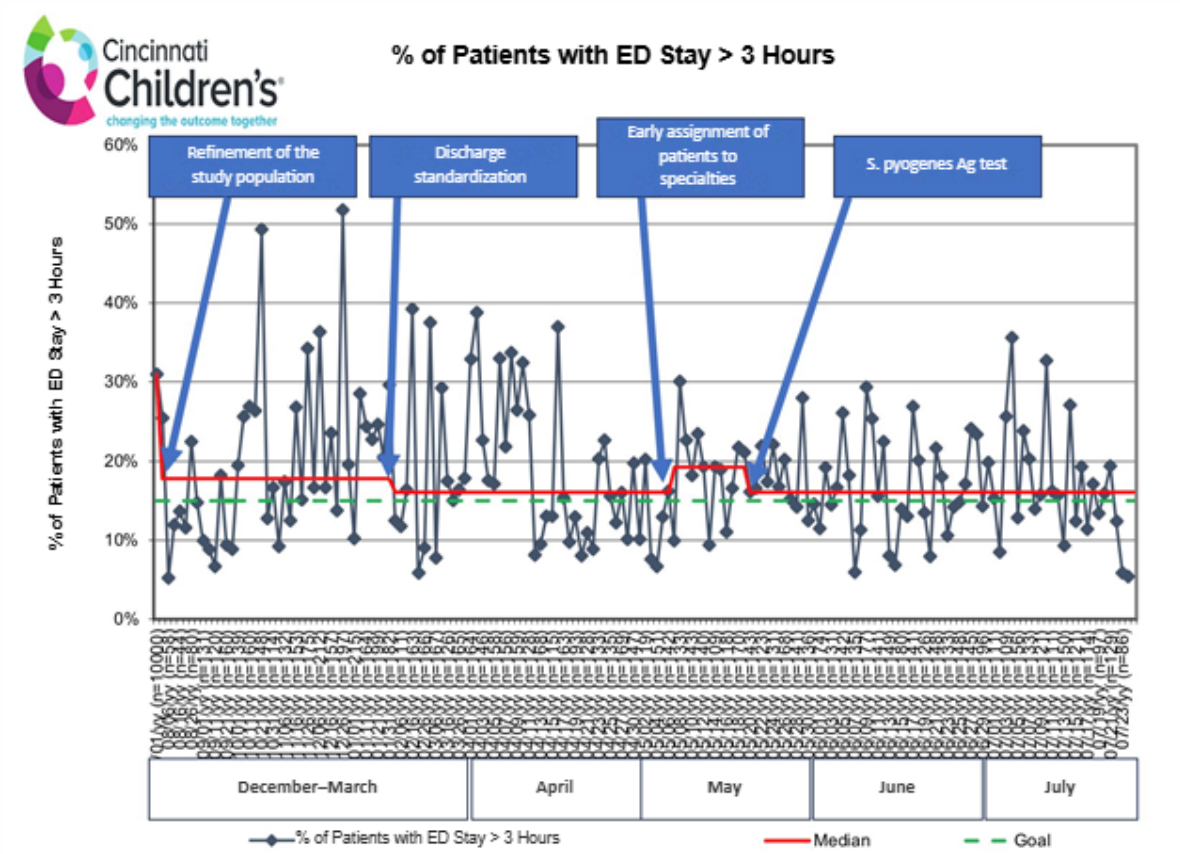


FIGURE 1. Percentage of patients with an emergency department stay longer than 3 hours.

QUALITY OF CARE IMPROVEMENT METHODOLOGY PROJECT: REDUCING LENGTH OF STAY IN THE MULTIPURPOSE TREATMENT ROOM FOR PATIENTS UNDERGOING AN ORAL INTAKE CHALLENGE de Pablos-Alfaro MP, García-Herrero MÁ, Zamora-Gómez L, Castelao-López P. *Príncipe de Asturias University Hospital. Madrid, Spain.*

Introduction and objective. Efficient management of waiting and length-of-stay times in the emergency department is key to ensuring patient safety and quality of care. Patients presenting with vomiting who require an oral intake challenge in the observation area often have prolonged stays, negatively affecting the experience of patients and their families, as well as the department's operational capacity. This highlights the need to implement strategies aimed at optimizing care processes and reducing observation times. The objective was to reduce by 20% the length of stay of patients presenting with vomiting who undergo an oral intake challenge in the emergency department's multipurpose observation area.

Methods. The project was carried out at a secondary-level hospital with an annual average of 25,000 emergency department visits. The department has a waiting room, consultation cubicles, 10 observation/short-stay cubicles, and a multipurpose area with 10 stations where oral tolerance testing is performed, among other procedures. A multidisciplinary team comprising three physicians and a nurse from the Pediatric Emergency Department analyzed a database of length-of-stay times for patients presenting with vomiting who required oral tolerance testing in the multipurpose area, excluding those with a triage level of 3 or lower (yellow). A key driver diagram was used to identify the optimal scenarios for achieving our objective and the interventions we could implement to reach them.

Results. The median length of stay before the interventions was 120 minutes (January–June 2024). Two interventions were implemented: an informational poster for families and healthcare professionals about the oral tolerance process (February 2025) and a training session in the Pediatrics Department to standardize care through a specific protocol (April 2025). Analysis using a run chart showed a greater impact from the second intervention, reducing the median to 96 minutes (20%); this effect was sustained over time, with a median of 103 minutes in July, August, and September.

Conclusions. The project significantly reduced the length of stay in the emergency department for patients with vomiting who required an oral challenge, improving care efficiency. Standardization of care was a key intervention and laid the groundwork for future initiatives aimed at optimizing coordination and expediting discharge.

CLINICAL PRACTICE INDICATORS IN THE PEDIATRIC POPULATION AFTER PARTICIPATING IN AN ONLINE EDUCATIONAL PROJECT ON PRUDENT ANTIBIOTIC USE AND INFECTION PREVENTION (TEAM-COACH PROJECT) Villaverde-González S, Goy-

cochea-Valdivia WA, Paredero-Domínguez JM, Ciudad-Gutiérrez P, Martínez-Nuñez ME, Arias-Felipe A. *Infectious Diseases Unit. Department of Pediatrics. Hospital 12 de Octubre. Madrid, Spain. Pediatric Clinical Trials Unit. Research Institute of Hospital 12 de Octubre. Madrid, Spain. Department of Infectious Diseases, Rheumatology and Immunology. Pediatrics Unit, Virgen del Rocío University Hospital. Seville, Spain. Seville Institute of Biomedicine. IBIS. Seville, Spain. Deputy Directorate-General for Pharmacy and Medical Products. Madrid Health Service. Madrid, Spain. Hospital Pharmacy Department. Virgen del Rocío University Hospital. Seville, Spain. Hospital Pharmacy Department. Getafe University Hospital. Getafe, Spain. Pediatric Emergency Unit. Department of Pediatrics. Hospital 12 de Octubre. Madrid, Spain.*

Challenges in acquiring and maintaining professional competencies in pediatric emergency medicine.

Introduction. Antibiotic prescribing in pediatric emergency departments is high, and several studies have found that around 50% of prescriptions are inappropriate. Training in this area is therefore one of the fundamental pillars. TEAM-COACH is an initiative aimed at developing an electronic tool to train healthcare professionals, focusing on infection prevention and control and on optimizing antimicrobial use in pediatric care in Spain, Italy, and Greece.

Objective. To assess changes in clinical practice following online training.

Method. An interactive online platform consisting of 18 modules and a network of healthcare professionals was designed. The programme included different care settings in the 3 countries: inpatient care (secondary and tertiary hospitals) and outpatient care (emergency departments and primary care). The training, aimed at entire teams with different professional backgrounds, lasted three months, from the fourth quarter of 2024 to the first quarter of 2025. Clinical practices were assessed in the month before training and one and three months afterwards. This study focused on specifically assessing the following indicators in outpatient settings: volume of alcohol-based hand rub requested per visit, proportion of patients prescribed antibiotics out of the total number of patients seen, and proportion of amoxicillin/amoxicillin-clavulanate prescriptions.

Results. The total network included 1,163 healthcare professionals in 30 pediatric units: 12 inpatient wards, 8 emergency departments, and 10 primary care groups.

In all three levels of care, the proportion of patients treated with antibiotics decreased significantly after the training ($p<0.001$): from 48.4% to 33.6% in hospital wards, from 10.5% to 8.5% in emergency departments, and from 11.4% to 9.6% in primary care. The amoxicillin/amoxicillin-clavulanate ratio showed a favorable trend in primary care (1.6 to 2.0; $p<0.001$), whereas the trend was unfavorable in emergency departments (1.5 to 0.9; $p<0.001$). The hand hygiene indicator showed a transient increase in emergency departments and declined in primary care, where the volume of requests per visit was very low.

Conclusions. The program achieved a significant reduction in antibiotic use for up to three months after training across all three levels of care, including the Emergency Department. These findings demonstrate the value of training programs in improving prescribing quality and the appropriate use of antibiotics in pediatric emergency care.

Co-funded by the European Union (GA:101079939).

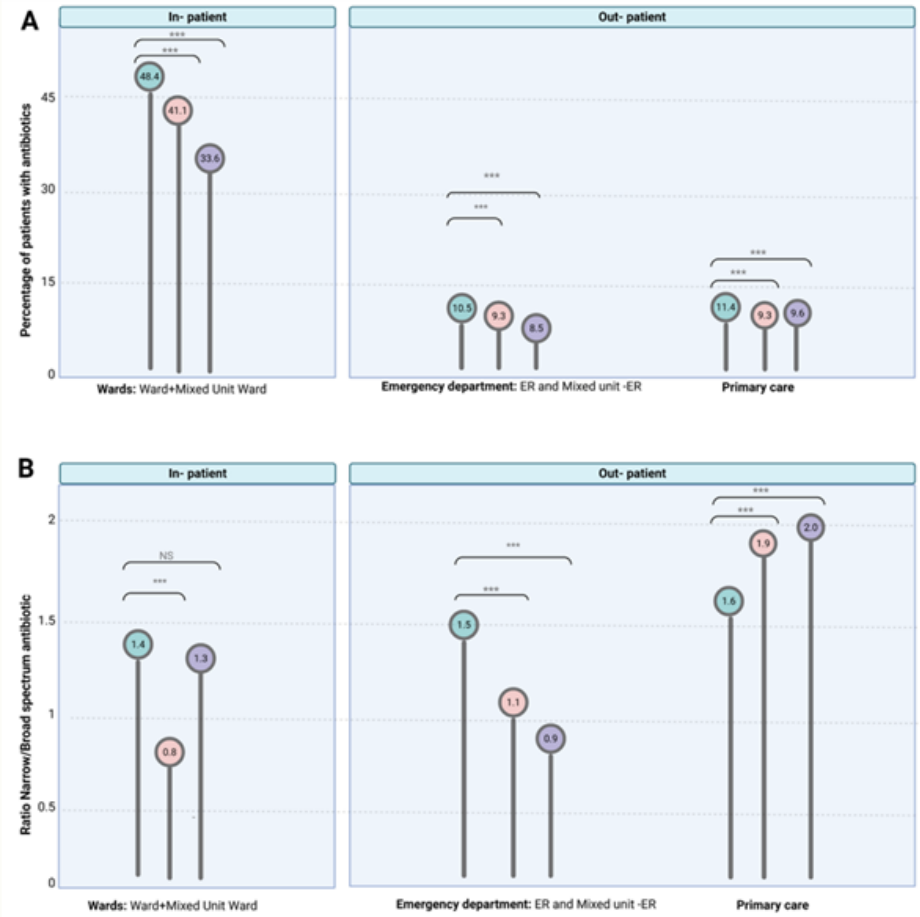


FIGURE 1. Percentage of patients receiving antibiotics (A) and narrow- to broad-spectrum antibiotic ratio (B) by care setting.

DO WE TEACH LIFE-SAVING SKILLS WELL? A SYSTEMATIC REVIEW OF THE ACQUISITION, RETENTION, AND CLINICAL TRANSFER OF PEDIATRIC LIFE SUPPORT COMPETENCIES. de Lucas N, Casal-Angulo C, Martínez-Mejías A, Yañez-Mesía S, Leonardo-Cabello MT, de Ceano-Vivas la Calle M. *Samur-Protección Civil. Madrid, Spain.*

Challenges in acquiring and maintaining professional competencies in pediatric emergency care.

Introduction. Pediatric cardiopulmonary arrest is an infrequent event that requires the highest level of preparedness. To date, no evidence synthesis has quantified the actual impact of new teaching methodologies compared with traditional teaching, or analyzed effective strategies to prevent the rapid deterioration of these skills. These factors are vital to patient safety.

Objective. To quantitatively assess the effectiveness of active teaching methodologies and simulation, compared with traditional approaches, in the acquisition, long-term retention, and clinical transfer of psychomotor skills in pediatric life support.

Methodology. Systematic review registered in PROSPERO (with a PICOST question and selection criteria), conducted according to PRISMA criteria. The search strategy identified 9025 articles in PubMed, Embase, CINAHL, SCI, and SSCI (2000–2025). After duplicates were removed, 2552 articles remained. The initial screening of each article was performed independently by at least two blinded reviewers. Eligibility and quality were assessed for included articles and those with screening discrepancies, and 48 experimental and quasi-experimental articles were ultimately selected. Psychomotor performance variables (timing, adherence, technical quality) and retention over time were extracted.

Results. Simulation showed significant improvements in critical interventions compared with passive methods. Time to initiation of chest compressions decreased from 60.8 to 27.1 seconds ($p < 0.0001$), and time to defibrillation decreased by 40 to 63 seconds ($p < 0.001$). Adherence to algorithms increased from 72% to 93% with blended learning. Regarding fidelity, low-fidelity simulation demonstrated non-inferiority in the acquisition of basic technical skills, although high fidelity significantly reduced instructor prompts ($p = 0.015$). Skill deterioration reached 42.5% after several months; however, refresher sessions of just 5 minutes reduced this deterioration to 12.7% ($p < 0.001$), increasing the likelihood of retention 2.9-fold ($p = 0.005$). Clinical transfer is not automatic: one study showed that, despite success in simulation (93% accuracy), performance with real patients returned to baseline levels (64.6%), suggesting the need for in situ simulation.

Conclusions. Simulation is superior for acquiring skills, but a single-course model is insufficient: skills decline significantly without refreshers. Evidence supports implementing "low-dose, high-frequency" programs (brief refreshers) to slow deterioration, and prioritizing in situ simulation to improve transfer to real patients.

TRAINING THE INTERDISCIPLINARY TEAM IN THE CARE OF CRITICALLY ILL PEDIATRIC PATIENTS IN THE EMERGENCY DEPARTMENT THROUGH CLINICAL SIMULATION

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Challenges in acquiring and maintaining professional competencies in pediatric emergency medicine.

Introduction. The initial care of critically ill pediatric patients in emergency departments requires rapid, structured assessment and effective intervention. Simulation-based training has been shown to improve response times, team performance, and skill acquisition in highly complex scenarios.

Objective. To describe a training activity focused on identifying, assessing, and stabilizing critically ill pediatric patients in the emergency department through clinical simulation, and to evaluate participants' perceptions of the training received.

Methodology. A blended training course (e-learning and in-person simulation) was designed as part of the Training Plan of a tertiary hospital. The activity lasted 30 hours. The online phase included 7 theoretical modules and 12 interactive clinical cases, with assessment by means of a test and a final assessment. The in-person phase was conducted using high-fidelity simulation with a SIMPAD© simulator (Laerdal). Participants completed four scenarios involving the care and stabilization of critically ill pediatric patients. Each scenario was followed by an assessment and a structured debriefing. Participants were sent a post-course survey using a Likert scale (1=insufficient, 5=excellent). Perceived improvement in initial assessment and decision-making, performance in critical cases, and technical skills was evaluated.

Results. A total of 74 healthcare professionals participated in the training activity; of these, 55 (74%) completed the course, with a mean score of 89.5/100 on the theoretical examination (SD ± 6.9) and a score range of 80–100. Of these 55 participants, 44 (80%) completed the post-course survey. Nursing staff perceived the greatest improvement in initial assessment and decision-making (4.08 ± 0.75) and technical skills (3.97 ± 0.54); the mean score for clinical performance in critical cases was 4.03 ± 0.66. Medical staff achieved the highest score for clinical performance in critical cases (4.08 ± 0.65). They also reported scores of 3.87 ± 0.90 for initial assessment and 3.87 ± 0.70 for technical skills. Nursing assistants gave the most moderate ratings, with means of 3.57 ± 0.93, 3.79 ± 0.76, and 3.50 ± 0.82, respectively.

Conclusions. Blended training based on e-learning and high-fidelity simulation is a strategy that has been perceived as effective for training in different areas, with a positive assessment across the various professional profiles.

EVALUATION OF THE IMPACT OF A QUALITY IMPROVEMENT CYCLE ON THE APPROPRIATENESS OF BLOOD CULTURE ORDERING IN THE PEDIATRIC EMERGENCY DEPARTMENT.

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Challenges in acquiring and maintaining professional competencies in pediatric emergency care.

Introduction. Blood cultures (BCs) are frequently ordered in pediatric emergency departments. However, inappropriate indications can lead to false-positive results, unnecessary antibiotic treatment, and additional costs. Optimizing clinical outcomes for patients with bacteremia is a key objective of antimicrobial stewardship programs (ASP). Therefore, improving the appropriateness of BC indications is a priority for quality of care.

Objective. To evaluate the impact of a continuous improvement PDSA (Plan-Do-Study-Act) cycle on the appropriateness of blood culture (BC) orders in the pediatric emergency department (PED) of a tertiary hospital through an educational intervention and the development of a specific quality indicator incorporated into the hospital's pediatric antimicrobial stewardship program.

Materials and methods. Quasi-experimental before-and-after intervention study with retrospective data collection conducted in the pediatric emergency department of a tertiary hospital. Patients aged 0–18 years seen between February and November 2025 for whom a blood culture was requested in the emergency department were included. A PDSA cycle was developed with two main interventions:

1. Educational intervention based on clinical feedback sessions, specific training, reminder messages, and an infographic on appropriate indications for BC.

2. System-level intervention, through the implementation of a quality indicator (QI) calculated as the percentage of appropriately indicated BC according to criteria based on national guidelines (standard >80%).

Preintervention cohort (February–May 2025) and postintervention cohort (June–November 2025). Data were collected two days per week, including the reason for the request, its appropriateness, the requester's professional category, and the BC result. Qualitative variables are expressed as numbers and percentages. Variables were compared using the chi-square test. Statistical significance was set at $p<0.05$.

Results. A total of 346 requests for BC were analyzed (176 in the preintervention cohort and 170 in the postintervention cohort). The proportions of requests submitted by attending physicians (51.6%) and residents (48.1%) were similar. The main reasons for requesting BC were

prolonged fever (17%), fever in immunocompromised patients (14.1%), and fever without a focus in children < 60 days old (14.1%). After the intervention, the appropriateness of BC requests improved significantly, from 69.3% to 82.9% (p<0.05), as did compliance with the quality standard measured using the specific indicator developed.

Conclusions. Implementing a PDSA cycle significantly improved the appropriateness of blood culture requests in our pediatric emergency department. The combination of educational interventions and monitoring tools based on the quality indicator (QI) proved effective and reproducible, contributing to patient safety, the rational use of diagnostic resources, and the strengthening of the institution's pediatric antimicrobial stewardship program.

EVALUATION OF THE USEFULNESS OF ARTIFICIAL INTELLIGENCE TOOLS FOR MANAGING FEVER WITHOUT A SOURCE IN INFANTS UNDER 3 MONTHS IN PEDIATRIC EMERGENCY DEPARTMENTS

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Impact of new technologies and artificial intelligence on clinical practice in the emergency department.

Introduction. Fever without a source (FWS) is one of the most common reasons for visits to pediatric emergency departments (PEDs), particularly among infants younger than 90 days, and poses a diagnostic and therapeutic challenge. Artificial intelligence (AI) is emerging as a resource with considerable potential and capabilities, generating predictive models to support decision-making.

Objective. To evaluate the usefulness of the AI tools Chat-GPT-5 "raw," Chat-GPT-5 "trained," and OpenEvidence in managing fever without a source (FWS) in patients under 90 days of age in a pediatric emergency department.

Methodology. A cross-sectional survey study was conducted. The principal investigators (third- and fourth-year residents) created a questionnaire following the Delphi methodology, consisting of 30 clinical simulation questions that could raise doubts about the management of FWS. The two most experienced physicians in the pediatric emergency department, based on protocols and clinical practice guidelines, developed consensus answers to this questionnaire, which were considered the gold standard. The questionnaire was then administered to the three models: Chat-GPT-5 "raw" (with memory disabled), Chat-GPT-5 trained on SEUP protocols, and OpenEvidence, at two time points 24 hours apart (November 17–18, 2025). These responses were blinded and sent to the principal investigators, who compared them separately with the gold standard and classified them according to two variables: accuracy (correct/incomplete/incorrect) and risk (no harm/possible harm/certain harm). In cases of disagreement, two pediatric emergency department physicians not involved in the study resolved the discrepancies by consensus. The usefulness of the AIs was assessed based on agreement with the gold standard, expressed as percentages and sensitivity (assuming incomplete answers to be incorrect), and potential harm to the patient.

Results. A total of 180 responses were analyzed: 52.22% were correct, 17.22% incomplete, and 30.56% incorrect. It was determined that 18.33% of responses would pose a definite risk of harm to the patient, and 26.11% a possible risk. Table 1 presents a breakdown of the utility data for each AI.

Conclusion. The model with the highest accuracy rate and lowest probability of harm was "trained" Chat-GPT-5, followed by "raw" Chat-GPT-5 and OpenEvidence. The reliability of this technology is variable, even at different points in time for the same AI. Clinical assessment remains essential for managing FWS.

	Correct answers	Incomplete answers	Incorrect answers	Sensitivity (95% CI)	Safe answers
Chat-GPT "raw" T1	53.30%	16.70%	30%	53.33% (35.48–71.19)	56.67%
Chat-GPT "raw" T2	53.30%	13.30%	33.30%	53.33% (35.48–71.19)	56.67%
Chat-GPT "trained" T1	70%	0%	30%	70% (53.6–86.40)	70%
Chat-GPT "trained" T2	60%	23.30%	16.70%	60% (42.47–77.53)	66.67%
OpenEvidence T1	36.70%	26.70%	36.70%	36.67% (19.42–53.91)	40%
OpenEvidence T2	40%	23.30%	36.70%	40% (22.47–57.53)	43.33%

TABLE 1. Utility of each artificial intelligence tool.

DEVELOPMENT AND INTERNAL VALIDATION OF A MODEL FOR PREDICTING HOSPITAL ADMISSION FROM TRIAGE IN A PEDIATRIC EMERGENCY DEPARTMENT USING MACHINE LEARNING (PREDING-IA1 STUDY)

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Impact of new technologies and artificial intelligence on clinical practice in emergency care.

Introduction. The prolonged stay of patients awaiting hospitalization is a known cause of overcrowding in Pediatric Emergency Departments (PEDs). One solution is to use predictive models that analyze triage data to identify which patients will require admission, so that arrangements for inpatient beds can be initiated early and admission expedited. Recently, machine learning (ML) has expanded the potential of these predictive models. In some PEDs, ML-based models have already been developed to predict hospitalization from triage data. However, it is recommended that models be developed according to the characteristics of each PED.

Objective. To develop and evaluate an ML-based model to predict the need for hospitalization after the pediatric emergency department triage process.

Methods. Single-center retrospective observational cohort study. Patients aged <18 years treated in a pediatric emergency department (PED) during 2024 were included. Patients admitted to an Intensive Care Unit or who died were excluded. Patients were randomly divided into Group_1 (70%) for model development and Group_2 (30%) for validation. In Group_1, the influence of 22 predictor variables available at triage on the outcome variable "Hospitalization" (decision by the medical staff) was analyzed to develop different predictive models using Logistic Regression (LR) and ML algorithms such as Random Forest (RF), Light Gradient Boosting Machine (LightGBM), and Extreme Gradient Boosting (XGBoost). Once developed, their performance was analyzed in Group_2 using AUC-ROC, which ranges from 0 to 1 and assesses a model's discriminatory ability.

Results. Of the 81,369 visits, 6,002 (7.4%) required admission. There were no significant differences between patients in Group_1 and Group_2. The mean length of stay in the ED was 118 minutes for patients discharged home and 339 minutes for those admitted to hospital, who required a mean of 165 minutes until a bed was requested.

The validation data (AUC-ROC) for the models developed were: LR 0.841, RF 0.840, LightGBM 0.845, and XGBoost 0.850. The predictors with the greatest influence on admission were "Triage level," "Reason for consultation," and "Referred." The best-performing model (XGBoost) was estimated to reduce the time to bed request by an average of 177 minutes per patient among patients who would be admitted.

Conclusions. For patients requiring admission, an XGBoost model has been developed that could reduce the time to admission request and, consequently, the length of stay in the pediatric emergency department, thereby reducing overcrowding.

DIAGNOSTIC PERFORMANCE OF ARTIFICIAL INTELLIGENCE SOFTWARE IN INTERPRETING ELBOW RADIOGRAPHS IN THE PEDIATRIC EMERGENCY DEPARTMENT

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Impact of new technologies and artificial intelligence on clinical practice in the emergency department.

Introduction. Elbow radiographs in pediatric trauma are particularly difficult to interpret due to a combination of anatomical, developmental, and technical factors. These factors make the pediatric elbow one of the most challenging joints to assess radiologically in pediatric emergency departments, justifying interest in support tools such as artificial intelligence (AI).

Objective. To evaluate the diagnostic accuracy of RBfracture™ (an AI algorithm by Radiobotics) for detecting elbow fractures in the pediatric emergency department.

Methods. Analytical observational study (validation of an AI algorithm) including a convenience sample of children seen in the Pediatric Emergency Department for elbow trauma who required radiography to rule out fracture. Patients with a previous diagnosis of fracture, those with an obvious deformity, and/or those with neurovascular injuries were excluded. A group of five medical residents recruited consecutive patients who, after undergoing radiography, were assessed by the Traumatology Department; its diagnosis (in the Emergency Department and/or during follow-up) was considered the gold standard for fracture diagnosis. Subsequently, the set of radiographs was analyzed using RBfracture™, designed to provide a structured interpretation (including in the pediatric setting), classifying each study as showing either absence or presence of fracture. In positive cases, the algorithm highlights the suspicious region with a box over the image, guiding the clinician's review.

Results. A total of 106 patients were recorded, of whom 91 were ultimately included. The median age was 7.5 years (interquartile range 5.2–10.6 years), and 50.6% were male. A total of 28 patients (30.8%) were diagnosed with an elbow fracture, the most frequent type being supracondylar (44.8%). RBfracture™ identified a fracture in 26 patients.

The sensitivity and specificity of RBfracture™ for detecting elbow fractures were 92.86% (95% CI: 76.5–99.1) and 88.89% (95% CI: 78.44–95.41), respectively; the positive and negative predictive values were 78.81% (95% CI: 64.74–88.28) and 96.55% (95% CI: 88–99), respectively.

Conclusions. RBfracture™ showed high sensitivity and a high negative predictive value for detecting elbow fractures in patients seen in pediatric emergency departments. These findings support its potential usefulness as a screening tool and aid to radiological interpretation. Its cautious implementation, integrated into well-defined clinical protocols, could help strengthen clinicians' diagnostic confidence in a highly complex care setting, as well as improve diagnostic accuracy and patient safety.

IMPACT OF VIRTUAL REALITY USE ON PAIN MANAGEMENT DURING VENIPUNCTURE IN THE

PEDIATRIC EMERGENCY DEPARTMENT: A RANDOMIZED CLINICAL TRIAL. Perez-Llarena G, Alvarez del Rey M, Martínez-Ortega I, Navarro-Sanchez A, Vela-Durbán S, Ferreras-Carracedo S. *Cruces University Hospital. Barakaldo, Spain.*

Impact of new technologies and artificial intelligence on clinical practice in the emergency department.

Introduction. Peripheral intravenous (PIV) catheterization in Pediatric Emergency Departments (PEDs) is one of the most frequently performed invasive procedures. It is associated with pain and anxiety, which affect not only the patient but also the accompanying caregivers and nursing staff. Several studies suggest that virtual reality (VR) may be useful during these procedures, although the evidence is limited, as are publications in our setting.

Objective. To analyze the effectiveness of using VR goggles as a non-pharmacological method for managing pain perceived by pediatric patients undergoing peripheral IV cannulation in the pediatric emergency department.

Method. Randomized clinical trial involving patients aged 7–14 years who required IV cannulation in the pediatric emergency department between March and December 2025. To assess efficacy, perceived pain and anxiety were compared using validated scales (VAS and Groningen Distress Scale), along with changes in heart rate (HR), patient and guardian satisfaction, and the presence of adverse effects in the VR group (VR goggles) and the control group (standard cannulation method).

Results. A total of 126 patients were included: 64 in the VR group and 62 in the control group, with no differences in baseline characteristics. There were no significant between-group differences in perceived pain or patient anxiety. The VR group had a significantly smaller increase in HR during the procedure (median HR 95 vs. 107, p=0.001). Caregiver satisfaction was higher in the VR group (very satisfied: 85.94% vs. 61.29%, p=0.003), as was satisfaction among caregivers of patients with a history of venipuncture, both with the assistance received (p=0.003) and with IV catheter placement (p=0.012). The procedure took longer in the VR group (3.10’ vs. 2.78’, p=0.043). One patient in the VR group reported dizziness, but the procedure did not need to be stopped.

Conclusions. The use of VR goggles may be considered a safe non-pharmacological measure for pain management during peripheral intravenous cannulation in the PED. However, further studies are needed to help identify selected populations in which they may be more effective.