

# Paediatric Emergency Department

## Current Awareness Newsletter



## January 2017

Respecting everyone  
Embracing change  
Recognising success  
Working together  
**Our hospitals.**



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## Training Calendar 2017

*All sessions are 1 hour*

### January (1pm - 2pm)

Tues 10th	<b>Literature Searching</b>
Weds 18th	<b>Critical Appraisal</b>
Thurs 26th	<b>Interpreting Statistics</b>

### February (12pm - 1pm)

Fri 3rd	<b>Literature searching</b>
Mon 6th	<b>Critical Appraisal</b>
Tues 14th	<b>Interpreting Statistics</b>
Weds 22nd	<b>Literature Searching</b>


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**Outreach:** Your Outreach Librarian can help facilitate evidence-based practice for all in the team, as well as assisting with academic study and research. We also offer one-to-one or small group training in **literature searching, critical appraisal and medical statistics**. Get in touch: [library@uhbristol.nhs.uk](mailto:library@uhbristol.nhs.uk)

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## Latest Evidence

**NICE** National Institute for  
Health and Care Excellence

[No new evidence](#)



<http://www.cochranelibrary.com/topic/Child%20health/>

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## Key Papers

1. Comparison of peripheral and central capillary refill time in febrile children presenting to a paediatric emergency department and its utility in identifying children with serious bacterial infection.

Author(s): de Vos-Kerkhof, Evelien; Krecinic, Tarik; Vergouwe, Yvonne; Moll, Henriëtte A; Nijman, Ruud G; Oostenbrink, Rianne

Source: Archives of disease in childhood; Jan 2017; vol. 102 (no. 1); p. 17-21

Publication Date: Jan 2017

Publication Type(s): Journal Article

Available in full text at [Archives of disease in childhood](http://archdischild.bmj.com/) - from Highwire Press

Abstract: To determine the agreement between peripheral and central capillary refill time (pCRT/cCRT) and their diagnostic values for detecting serious bacterial infection (SBI) in febrile children attending the paediatric emergency department (ED). Prospective observational study. Paediatric ED, Erasmus Medium Care-Sophia Children's hospital, the Netherlands. 1193 consecutively included, previously healthy, febrile children (1 month-16 years) with both pCRT measurements and cCRT measurements available. SBI diagnosis was based on abnormal radiographic findings and/or positive cultures from normally sterile locations in addition to clinical criteria. Agreement between pCRT and cCRT (Cohen's  $\kappa$ ), overall and stratified for age and body temperature. The diagnostic value of pCRT and cCRT for SBI was assessed with logistic regression. Overall agreement was 0.35 (95% CI 0.27 to 0.43; considered 'fair'). Although not significant, agreement was lower in children aged 1-39.5°C. Abnormal pCRT (>2 s) was observed in 153 (12.8%; 95% CI 10.9% to 14.7%) and abnormal cCRT in 55 (4.6%; 95% CI 3.4% to 5.8%) children. The OR of abnormal pCRT (>2 s) for predicting SBI was 1.10 (95% CI 0.65 to 1.84). For abnormal cCRT (>2 s), the OR was 0.43 (95% CI 0.13 to 1.39). The pCRT and cCRT values showed only fair agreement in a general population of febrile children at the ED, and no significant association with age or body temperature was found. Only a small part of febrile children at risk for serious infections at the ED show abnormal CRT values. Both abnormal pCRT and cCRT (defined as >2 s) performed poorly and were non-significant in this study detecting SBI in a general population of febrile children. Published by the BMJ Publishing Group Limited. For permission to use (where not already granted under a licence) please go to <http://www.bmj.com/company/products-services/rights-and-licensing/>.

2. [Ann Emerg Med](#). 2016 Dec 29. pii: S0196-0644(16)31223-9. doi: 10.1016/j.annemergmed.2016.10.008. [Epub ahead of print]

Interpretation of Cerebrospinal Fluid White Blood Cell Counts in Young Infants With a Traumatic Lumbar Puncture.

[Lyons TW](#)<sup>1</sup>, [Cruz AT](#)<sup>2</sup>, [Freedman SB](#)<sup>3</sup>, [Neuman MI](#)<sup>1</sup>, [Balamuth F](#)<sup>4</sup>, [Mistry RD](#)<sup>5</sup>, [Mahajan P](#)<sup>6</sup>, [Aronson PL](#)<sup>7</sup>, [Thomson JE](#)<sup>8</sup>, [Pruitt CM](#)<sup>9</sup>, [Shah SS](#)<sup>8</sup>, [Nigrovic LE](#)<sup>10</sup>; [Pediatric Emergency Medicine Clinical Research Network \(PEM CRC\) Herpes Simplex Virus Study Group](#).

Abstract

STUDY OBJECTIVE:

We determine the optimal correction factor for cerebrospinal fluid WBC counts in infants with traumatic lumbar punctures.

METHODS:

We performed a secondary analysis of a retrospective cohort of infants aged 60 days or younger and with a traumatic lumbar puncture (cerebrospinal fluid RBC count  $\geq 10,000$  cells/mm<sup>3</sup>) at 20 participating centers. Cerebrospinal fluid pleocytosis was defined as a cerebrospinal fluid WBC count greater than or equal to 20 cells/mm<sup>3</sup> for infants aged 28 days or younger and greater than or equal to 10 cells/mm<sup>3</sup> for infants aged 29 to 60 days; bacterial meningitis was defined as growth of pathogenic bacteria from cerebrospinal fluid culture. Using linear regression, we derived a cerebrospinal fluid WBC correction factor and compared the uncorrected with the corrected cerebrospinal fluid WBC count for the detection of bacterial meningitis.

RESULTS:

Of the eligible 20,319 lumbar punctures, 2,880 (14%) were traumatic, and 33 of these patients (1.1%) had bacterial meningitis. The derived cerebrospinal fluid RBCs:WBCs ratio was 877:1 (95% confidence interval [CI] 805 to 961:1). Compared with the uncorrected cerebrospinal fluid WBC count, the corrected one had lower sensitivity for bacterial meningitis (88% uncorrected versus 67% corrected; difference 21%; 95% CI 10% to 37%) but resulted in fewer infants with cerebrospinal fluid pleocytosis (78% uncorrected versus 33% corrected; difference 45%; 95% CI 43% to 47%). Cerebrospinal fluid WBC count correction resulted in the misclassification of 7 additional infants with bacterial meningitis, who were misclassified as not having cerebrospinal fluid pleocytosis; only 1 of these infants was older than 28 days.

CONCLUSION:

Correction of the cerebrospinal fluid WBC count substantially reduced the number of infants with cerebrospinal fluid pleocytosis while misclassifying only 1 infant with bacterial meningitis of those aged 29 to 60 days.

3. [Pediatr Emerg Care](#). 2017 Jan;33(1):62-66. doi: 10.1097/PEC.0000000000000969.

Lung Ultrasound as First-Line Examination for the Diagnosis of Community-Acquired Pneumonia in Children.

[Boursiani C1](#), [Tsolia M](#), [Koumanidou C](#), [Malagari A](#), [Vakaki M](#), [Karapostolakis G](#), [Mazioti A](#), [Alexopoulou E](#).

#### [Author information](#)

Abstract

#### OBJECTIVES:

The diagnosis of pediatric community-acquired pneumonia (CAP) is based on clinical criteria. Even though chest x-ray (CXR) is only recommended in severe cases, it is often requested from physicians in mild cases, thus increasing radiation exposure. Lung ultrasound (LUS) is not included in the diagnostic workup. The objective of this study was to evaluate the diagnostic performance of LUS against CXR.

#### METHODS:

Children who presented to the emergency department with clinical signs suggesting CAP and had already been evaluated with a CXR were included in the study. Availability of a pediatric sonographer expert in LUS was also considered a criterion for participation. Chest x-ray and LUS were considered positive for CAP in cases of alveolar or interstitial pattern of disease. The diagnostic criterion standard was the ex post diagnosis of pneumonia, made by an independent senior expert pediatrician, after evaluation of the complete medical chart.

#### RESULTS:

Sixty-nine children were enrolled in the study, with 66 of 69 positive for CAP. Receiver operating characteristic curve analysis results for CXR were 95.5% sensitivity and 100% specificity, whereas for LUS, sensitivity was reported 92.42% and specificity 100%. Comparison of the 2 receiver operating characteristic curves revealed no difference in the diagnostic value of the 2 methods for the diagnosis of pneumonia ( $P = 0.658$ ). However, LUS classified more cases as alveolar disease compared with CXR.

#### CONCLUSIONS:

Lung ultrasound plays a significant role in the detection of CAP, not inferior to CXR. The aim of this study was to encourage the use of ultrasound as a first-line examination for CAP in children.



**Hyperlinks only to the following papers:**

1. [The 4-hour standard is a meaningful quality indicator: correlation of performance with emergency department crowding.](#)  
Author(s): Higginson, Ian; Kehoe, Anthony; Whyatt, Justin; Smith, Jason E Source: European journal of emergency medicine : official journal of the European Society for Emergency Medicine; Feb 2017; vol. 24 (no. 1); p. 25-28
2. [The impact of critically ill children on paediatric ED medication timeliness.](#)  
Author(s): Michelson, Kenneth A; Bachur, Richard G; Levy, Jason A Source: Emergency medicine journal : EMJ; Jan 2017; vol. 34 (no. 1); p. 8-12
3. [Incorporating a Computerized Cognitive Battery Into the Emergency Department Care of Pediatric Mild Traumatic Brain Injuries-Is It Feasible?](#)  
Khetani AM<sup>1</sup>, Brooks BL, Mikrogianakis A, Barlow KM. Pediatr Emerg Care. 2016 Dec 28. doi: 10.1097/PEC.0000000000000959. [Epub ahead of print]
4. [The utility of a handheld metal detector in detection and localization of pediatric metallic foreign body ingestion.](#) Nation J1, Jiang W2.Int J Pediatr Otorhinolaryngol. 2017 Jan;92:1-6. doi: 10.1016/j.ijporl.2016.10.035. Epub 2016 Nov
5. [Perceptions on the Impact of a Just-in-Time Room on Trainees and Supervising Physicians in a Pediatric Emergency Department.](#) Thomas AA, Uspal NG, Oron AP, Klein EJ. J Grad Med Educ. 2016 Dec;8(5):754-758. doi: 10.4300/JGME-D-15-00730.1.

## Exercise: Sensitivity and Specificity

### **Sensitivity:**

If a person has a disease, how often will the test be positive (true positive rate)?

If the test is highly sensitive and the test result is negative you can be nearly certain that they don't have disease.

### **Specificity:**

If a person does not have the disease how often will the test be negative (true negative rate)?

If the test result for a highly specific test is positive you can be nearly certain that they actually have the disease.

### Quick Quiz:

1. A very sensitive test, when negative, helps you:
  - a: Rule-in disease
  - b: Rule-out disease
  - c: Confuse medical students
  - d: Save money
  
2. A test which is highly specific, when positive, helps you:
  - a: Rule-in disease
  - b: Rule-out disease
  - c: Confuse medical students
  - d: Save money

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Answers: 1b, 2a



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**University Hospitals Bristol**

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**Helen Pullen**