

Emergency Medicine Research Review™

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Issue 3 - 2013

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Abbreviations used in this issue:

ACS = acute coronary syndrome; **AUC** = area under the curve;
CI = confidence interval; **COPD** = chronic obstructive pulmonary disease;
ED = emergency department; **HR** = hazard ratio; **LOS** = length of stay;
NPV = negative predictive value;
NSTEMI = non-ST elevation myocardial infarction;
NTCP = non-traumatic chest pain; **OR** = odds ratio;
PE = pulmonary embolism; **RCT** = randomised controlled clinical trial;
ROC = receiver operating curve

Welcome to the third issue of Emergency Medicine Research Review.

Highlights of this review include evidence for using a shorter, five day course of corticosteroid therapy in patients with acute exacerbations of chronic obstructive airways disease, enabling a significant reduction in overall steroid dose without compromising efficacy. Several Australian studies are also reviewed, including one which suggests that vaginal examination may not be required for diagnosis in women with first trimester bleeding and another which assesses numbers of GP-type patients presenting to ED which may have important consequences for service provision.

We hope you enjoy these selections, and as always, look forward to hearing your comments and feedback.

Kind Regards,

Professor Anne-Maree Kelly

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Clinical Scaphoid Score (CSS) to identify scaphoid fracture with MRI in patients with normal x-ray after a wrist trauma

Authors: Berg T et al

Summary: This prospective study assessed the benefits of MRI to detect scaphoid fractures occult to x-ray. Subjects were adults aged 18 to 49 years with normal x-rays following wrist trauma. Each was assessed with a 3-part clinical scaphoid test and received MRI assessment within a mean of 24 hours of the injury. A sum of the three clinical tests, the clinical Scaphoid Score (CSS) was compared with confirmed fracture results via MRI to determine the utility of the CSS in identifying fracture. Of 154 patients included in the study, 13 had x-ray-occult scaphoid fractures. A CSS of ≥ 4 was a significant predictor of scaphoid fracture, $p < 0.05$. The negative predictive value of $\text{CSS} < 4$ was 96%. Based on these results the authors recommend MRI to confirm scaphoid fracture in patients with normal x-ray and wrist pain persisting after injury if $\text{CSS} \geq 4$.

Comment: Detection of occult scaphoid fractures can be difficult. A number of diagnostic approaches have been proposed but only about 20% of patients actually have fractures. This study from Norway investigated the accuracy of a novel clinical score (Clinical Scaphoid Score; tenderness in the anatomical snuffbox with the wrist in ulnar deviation [3 points], tenderness over the scaphoid tubercle [2 points] and pain on longitudinal compression of the thumb [1 point]) for the prediction of fractures identified on MRI. Sensitivity of score ≥ 4 was 77%, positive predictive value 14% and negative predictive value 96% (95% CI 90-99%). While this study has some methodological weaknesses, this score may identify patients warranting early imaging as opposed to a wait-and-reassess management strategy.

Reference: *Emerg Med J Online*, 10.1136/emered-2012-202219

<http://emj.bmj.com/content/early/2013/05/30/emered-2012-202219.abstract>

Emergency Medicine Research Review

Independent commentary by Professor Anne-Maree Kelly, MD MClinEd BS FACEM FCCP.

Professor Kelly is a senior emergency physician at Western Health in Melbourne, Director of the Joseph Epstein Centre for Emergency Medicine Research, Professorial Fellow of The University of Melbourne and Adjunct Professor, Queensland University of Technology. With over 200 publications, her research interests are broad and include health systems research, knowledge transfer and implementation science, pain management, acute cardiology, asthma, medical education and blood gas analysis. Professor Kelly is an international editor for *Annals of Emergency Medicine*, is on the editorial board of *Emergency Medicine Australasia* and *The Hong Kong Journal of Emergency Medicine* and is a reviewer for over 20 journals including *New England Journal of Medicine*, *British Journal of Sports Medicine*, *Medical Journal of Australia* and *BMJ*.



ADVERTORIAL

Antiplatelet therapy for acute coronary syndromes: Introducing BRILINTA® (ticagrelor)

Approximately 75,000 Australians are hospitalised with an acute coronary syndrome (ACS) every year.¹ Although survival after ACS is improving, data from Australian and New Zealand patients enrolled in the Global Registry of Acute Coronary Events (GRACE) showed that, in 2006-2007, 5.0% of those with ST-elevation myocardial infarction (STEMI) and 2.3% with non-STEMI or unstable angina died during their initial hospital admission.²

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A/Prof Louise Cullen
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Emergency Medicine
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Can we safely discharge low-risk patients with febrile neutropenia from the emergency department?

Authors: Mamtani M et al

Summary: The authors of this 'Best Evidence Review' identified and distilled findings from three research articles addressing the topic of whether it is safe to discharge low-risk adults with febrile neutropenia for home-based treatment with oral antibiotics. Febrile neutropenia was defined as an absolute neutrophil count < 500 μ L and a temperature > 104°F (38.0°C). Criteria for low risk patients were variable in the studies and the authors proposed adoption of the well validated Multinational Association for Supportive Care in Cancer (MASCC) risk index which includes patients with no dehydration, no hypotension, no chronic obstructive pulmonary disease, no solid tumours, no history of fungal infection in haematological malignancy, outpatient status at presentation, age younger than 60 years and burden of illness criteria. They conclude that evidence supports discharge of low-risk patients with febrile neutropenia with oral antibiotics and close outpatient follow up.

Comment: Febrile neutropenia is one of the more common oncological emergencies. In many hospitals, all patients with febrile neutropenia are treated as inpatients. Recent evidence, summarized in this best evidence review, suggests that selected low risk patients can be treated with oral antibiotics as outpatients. Three articles addressing the safety of this approach were found, each of which used different low risk criteria. The authors found that the vast majority of low risk patients (~80%) were effectively treated with oral antibiotics as outpatients, with 17-21% requiring subsequent admission for ongoing illness and a mortality rate of 0-4%, depending on the criteria used. An approach worth considering.

Reference: *Ann Emerg Med* 2013, Epub ahead of print July 19. [http://www.annemergmed.com/article/S0196-0644\(13\)00664-1/abstract](http://www.annemergmed.com/article/S0196-0644(13)00664-1/abstract)

Characteristics of central lesions in patients with dizziness determined by diffusion MRI in the emergency department

Authors: Lee D et al

Summary: This study evaluated rates of, and risk factors for central lesions in patients presenting to the Emergency Department with a primary complaint of dizziness. Diffusion-weighted MRI was used to confirm the presence of central lesions. In total 645 patients received MRI, and in most cases, dizziness was benign. 3.6% (n = 23) had confirmed lesions (22 infarcts, 1 haemorrhage). Factors associated with central lesions in univariate analysis were older age, hypertension, atrial fibrillation, non-whirling type of dizziness and associated neurological symptoms (all p < 0.05). Independent predictors of central lesions by multivariate analysis were hypertension (p = 0.01, OR 3.42), non-whirling dizziness (p = 0.03, OR 3.12) and associated neurological symptoms (p < 0.01, OR 16.72). Incidence of central lesions by age was 40s (0%), 50s (3.9%), 60s (3.4%), 70s (7.4%) and \geq 80 (16.7%).

Comment: Dizziness is common and central causes are rare but very important. This study from Korea investigated risk factors for central causes of dizziness or vertigo identified using MRI. The rate of central lesions was 4%; with 23/26 being strokes. In multivariate analyses, hypertension, 'non-whirling' description of dizziness and associated neurological symptoms were independently associated with the presence of central lesions (OR 3.42, 3.12 and 16.72, respectively). The rate of central lesions in patients with isolated dizziness (no other neurological symptoms) was 2.3% and central causes were very rare in those aged under 50 (0%, 95% CI 0-4%). This study reinforces the importance of clinical assessment in determining the risk of central lesions in patients presenting with dizziness.

Reference: *EMJ Online*, 10.1136/emered-2013-202674 <http://emj.bmj.com/content/early/2013/05/29/emered-2013-202674.abstract>

Short-term vs. conventional glucocorticoid therapy in acute exacerbations of chronic obstructive pulmonary disease: The REDUCE randomized clinical trial

Authors: Leuppi L et al

Summary: The aim of this randomised, double-blind, placebo-controlled, multicentre, non-inferiority clinical trial (REDUCE) was to compare the efficacy of a short, 5 day course of systemic corticosteroids for acute exacerbations of chronic obstructive pulmonary disease (COPD) with a conventional 14 day course. The primary endpoint was time to next exacerbation within 180 days. Participants were 314 past or present smokers (\geq 20 pack years) without a history of asthma who presented at the Emergency Department with an acute exacerbation of COPD, and were randomised to 5 or 14 days of 40 mg prednisone daily. Short-term vs. conventional treatment was non-inferior on the primary outcome measure, HR 0.95 (95% CI 0.7-1.29, p = 0.006, ITT analysis). There were no between-group differences in time to death, the combined endpoint of exacerbation, death or both, and recovery of lung function. Mean cumulative prednisone dose was significantly greater for patients in the conventional group (793 vs. 379 mg, 95% CI 311-446, p < 0.001) but was not associated with a greater proportion of adverse effects.

Comment: Guidelines recommend a 7-14 day course of systemic corticosteroids for patients with exacerbations of COPD, but the evidence base for duration and dosage is weak. This well-designed, multi-centre Swiss RCT compared prednisolone 40 mg/day for 5 days with a 14-day course and found no difference in clinical outcome (recurrent exacerbation within 6 months, time to re-exacerbation, death or recovery of lung function). This data strongly suggests that a change in practice is in order!

Reference: *JAMA* 2013; 309(21):2223-31. doi: 10.1001/jama.2013.5023 <http://jama.jamanetwork.com/article.aspx?articleid=1688035>

Quantifying the proportion of general practice and low-acuity patients in the emergency department

Authors: Nagree Y et al

Summary: The authors aimed to accurately estimate the percentage of patients suitable to be seen in General Practice who present to the Emergency Department. 24 months of data were collected from 3 major tertiary hospitals in Perth, Australia. Four separate methods for calculating the proportion of GP-type patients were compared. These comprised the validated Sprivilis method, the Australasian College for Emergency Medicine method, a discharge diagnosis method from the Tasmanian Department of Human and Health Services, and the Australian Institute of Health and Welfare (AIHW) method. The AIHW method found GP-type patients comprised 25% of the total, and made up 10-11% of the total ED length of stay (LOS). In contrast, each of the other 3 methods found GP-type patients were only 10-12% of the total and comprised 3-5% of total LOS. GP-type patients were most likely to present during weekdays in the daytime suggesting that factors other than lack of GP availability drive this process.

Comment: The belief that Emergency Departments are overcrowded because of a high proportion of GP-type patients is often stated by health bureaucrats and politicians. It has driven ineffective policy-making and distracted attention from the real causes of overcrowding; namely lack of inpatient beds and inefficient hospital processes. This study from Perth compares four methods for estimating the proportion of GP-type patients. Three of them report a rate of about 10%, while the AIHW method (used by government) reports a rate of 25%. Further, these patients only comprise 3-5% of ED length of stay. Good data informs good decisions. It can only be hoped that this paper will encourage a more sophisticated discussion of ED overcrowding.

Reference: *Med J Aust* 2013; 198:612-5 <https://www.mja.com.au/journal/2013/198/11/quantifying-proportion-general-practice-and-low-acuity-patients-emergency>

The utility of copeptin in the emergency department for non-ST-elevation myocardial infarction rapid rule out: COPED-MIRRO study

Authors: Llorens P et al

Summary: This prospective, observational, multicentre cohort study (COPED-MIRRO) examined the utility of copeptin measurement to exclude non-ST elevation myocardial infarction (NSTEMI) in patients with non-traumatic chest pain (NTCP) suggestive of acute coronary syndrome (ACS) and non-diagnostic electrocardiogram and initial troponin determination. Copeptin and troponin were performed at presentation to ED, and a second troponin at 6 hours. 1,018 patients were studied, including 107 (10.5%) with NSTEMI. At a cutoff of 14 pmol/mL, copeptin had a sensitivity of 69.2% (95% CI 59.9-77.1), specificity of 59.2% (95% CI 55.9-62.3) and NPV of 94.2% (95% CI 92-95.9). The authors concluded that in this setting the addition of copeptin to routine troponin determination was not useful or time-saving.

Comment: Copeptin has been touted as a biomarker capable of facilitating very early rule out of ACS. Given that current ACS rule out processes usually require serial biomarker assays, if either the number of test times or their interval could be reduced it would be good for patients and EDs. This multicentre Spanish study tested the hypothesis that adding copeptin analysis at presentation could rule out NSTEMI without the need for serial troponin assays. Unfortunately this study shows that this is not true, with sensitivity of only 63% at a cut-off of 14pmol/L.

Reference: *Eur J Emerg Med*. 2013 Jun 14 <http://journals.lww.com/euro-emergencymed/pages/articleviewer.aspx?year=9000&issue=00000&article=99604&type=abstract>

Antiplatelet therapy for acute coronary syndromes: Introducing BRILINTA® (ticagrelor)

Approximately 75,000 Australians are hospitalised with an acute coronary syndrome (ACS) every year.¹ Although survival after ACS is improving, data from Australian and New Zealand patients enrolled in the Global Registry of Acute Coronary Events (GRACE) showed that, in 2006-2007, 5.0% of those with ST-elevation myocardial infarction (STEMI) and 2.3% with non-STEMI or unstable angina died during their initial hospital admission.² A further 2.9% of patients with STEMI and 2.8% with non-STEMI or unstable angina died during the following 6 months.

Medical management

The current guidelines for the management of ACS developed by the National Heart Foundation and the Cardiac Society of Australia and New Zealand recommend that patients with ACS should be treated with dual antiplatelet therapy (aspirin and a second antiplatelet – ticagrelor, clopidogrel or prasugrel) regardless of whether they are managed by an invasive or medical strategy.^{3,4}

Despite the guideline recommendations, many ACS patients do not receive dual antiplatelet therapy. In the GRACE study, only 80.4% of all patients with STEMI treated in 2006-2007 received a thienopyridine antiplatelet agent, diminishing to 34.6% of those not treated with PCI.² In GRACE patients with non-STEMI or unstable angina, the proportions were 63.1% overall and 44.1% in those not treated with PCI.

More recently the SNAPSHOT ACS Study, conducted at 286 hospital sites in Australia and New Zealand during May 2012, found significant variations in care and outcomes between different types of hospitals and between health jurisdictions.⁵

Antiplatelet therapy with BRILINTA (ticagrelor)

BRILINTA is an antiplatelet agent that acts on P2Y₁₂ ADP receptors to prevent ADP-mediated platelet activation and aggregation.

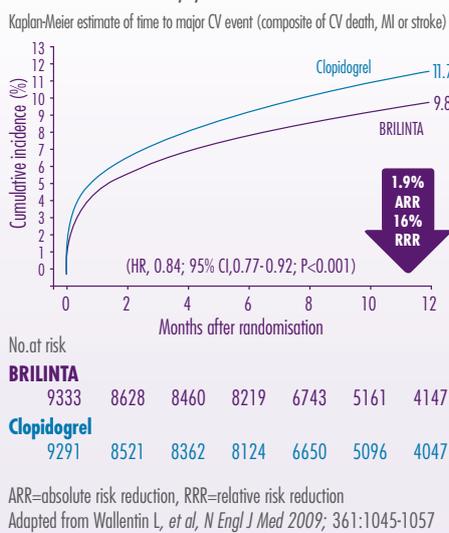
The PLATelet Inhibition and patient Outcomes (PLATO) Study was a 12 month, randomised, double-blind, parallel-group trial, comparing ticagrelor and clopidogrel in more than 18,000 patients admitted to hospital with ACS, with or without ST-segment elevation.⁶ Patients also received aspirin (unless intolerant).

The primary efficacy endpoint, a composite of death from vascular causes, myocardial infarction or stroke at 12 months, was significantly reduced in patients randomised to ticagrelor (9.8% vs 11.7%, HR 0.84 [0.77-0.92], p<0.001) (see Figure 1).

There was no difference in total major bleeding between BRILINTA and clopidogrel (11.6% vs 11.2%, HR 1.04 [0.95-1.13], p=0.43), although major bleeding unrelated to coronary artery bypass grafting (CABG) was significantly higher with BRILINTA (4.5% vs 3.8%, HR 1.19 [1.02-1.38], p=0.03). However as

with other antiplatelet agents, BRILINTA prolongs bleeding time and should be used in caution with patients who may be at risk of increased bleeding.

Figure 1: BRILINTA significantly reduced risk of major CV event vs clopidogrel over the 12-month treatment in patients with acute coronary syndromes⁶



Implications for the Emergency Department

“Emergency physicians are skilled in the urgent assessment of patients with suspected ACS and in determining their initial management,” according to Associate Professor Louise Cullen, Senior Staff Specialist at the Department of Emergency Medicine, Royal Brisbane and Women’s Hospital.

“However, the role of the emergency department, cardiology service and internal medicine units varies from hospital to hospital, as do hospitals’ protocols for antiplatelet medication and other aspects of ACS management,” she says. “Ideally, a protocol will define the patient’s assessment and treatment from hospital presentation through to discharge and beyond.”

The choice of an antiplatelet agent in addition to aspirin is continuing to evolve. “Guidelines from the European Society of Cardiology released in 2011 and 2012 recommend ticagrelor for all patients with non-ST-elevation ACS and a moderate to high risk of ischaemic events, regardless of treatment strategy and including those pre-treated with clopidogrel,” Professor Cullen says.^{11,12} “They also recommend ticagrelor in patients with STEMI. The current Australian ACS guidelines, published in 2011, recommend ticagrelor and prasugrel as an alternative to

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BRILINTA in the Emergency Department: practical issues

- BRILINTA is indicated, in combination with aspirin, for the prevention of atherothrombotic events in a broad range of ACS patients including those with STEMI, non-STEMI and unstable angina, including patients managed medically, by PCI or CABG.⁹
- BRILINTA provides a rapid onset of platelet inhibition: inhibition of platelet activation at 30 minutes was estimated at 41% with ticagrelor compared to 8% with clopidogrel (p<0.0001).^{9,10}
- BRILINTA treatment should be initiated with a single 180 mg loading dose (two tablets of 90 mg) and then continued at 90 mg twice daily. Patients should also take aspirin daily unless specifically contraindicated.⁹
- Patients previously treated with clopidogrel can be treated with BRILINTA, administering the initial 180 mg loading dose of BRILINTA 24 hours following the last dose of clopidogrel, independent of whether a maintenance or loading dose of clopidogrel has been given.^{6,9}
- No dose adjustment is required in elderly patients, in patients with renal impairment, mild hepatic impairment, diabetes, a prior history of ischaemic stroke or transient ischaemic attack, or according to gender or CYP2C19 genotype.⁹
- Treatment with BRILINTA is contraindicated in patients with hypersensitivity to ticagrelor or any of the excipients, active pathological bleeding, a history of intracranial haemorrhage, or moderate to severe hepatic impairment. Co-administration with strong CYP3A4 inhibitors is contraindicated.⁹
- BRILINTA should be continued for at least 12 months in conjunction with aspirin, unless discontinuation is clinically indicated.^{4,9}

clopidogrel in high-risk subgroups of patients with STEMI, and in patients with non-ST-elevation ACS who have a low risk of bleeding.⁴

Among patients in the PLATO study, the median time from hospital presentation to administration of ticagrelor was 4.9 hours, but the interquartile range was 1.3-18.8 hours.⁶ “It would be useful to explore whether the time of administration of ticagrelor had any influence on outcomes,” Professor Cullen says. “This could influence our approach to early treatment in the emergency department.”

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CV = cardiovascular; RRR = relative risk reduction; ARR = absolute risk reduction; ACS = acute coronary syndromes. **References:** 1. Access Economics Pty Ltd. Acute coronary syndromes in perspective. The importance of secondary prevention. 2011. 2. Aliprandi-Costa B et al. *Medical Journal of Australia* 2011; 195: 116-121. 3. Aroney CN et al. *Medical Journal of Australia* 2006; 184 (8 Suppl): S1-S30. 4. Chew DP et al. *Heart Lung and Circulation* 2011; 20: 487-502. 5. Chew DP et al. *Medical Journal of Australia* 2013; 199: 185-191. 6. Wallentin L et al. *New England Journal of Medicine* 2009; 361: 1045-1057. 7. Cannon CP et al. *Lancet* 2010; 375: 283-293. 8. Steg PG et al. *Circulation* 2010; 122: 2131-2141. 9. BRILINTA Approved Product Information. 10. Gurbel PA et al. *Circulation* 2009; 120: 2577-2585. 11. Hamm CW et al. *European Heart Journal* 2011; 32: 2999-3054. 12. Steg PH et al. *European Heart Journal* 2011; 33: 2569-2619. Supplier AstraZeneca Pty Ltd. 5 Alma Road, North Ryde NSW 2113. Medical Information: 1800 805 342. www.astrazeneca.com.au. AU-BRI000700, WL272175, August 2013



Vaginal examination does not improve diagnostic accuracy in early pregnancy bleeding

Authors: Johnstone C

Summary: The diagnostic accuracy of vaginal examination in assessing women presenting to ED with vaginal bleeding during the first trimester of pregnancy was assessed in this prospective, randomised study. Participants were randomised to vaginal examination ($n = 61$) or not ($n = 74$) and then given a provisional diagnosis. Following ultrasound, beta-human chorionic gonadotropin (beta-HCG) and gynaecological follow-up a final diagnosis was given. In around 50% of cases the provisional and final diagnoses matched, and this was not-different between groups ($p = 0.94$). These results suggest that in stable patients presenting to the ED with first trimester bleeding, clinical diagnosis is not improved by vaginal examination and therefore it is not a necessary component of initial patient assessment.

Comment: It has long been taught that vaginal examination is an essential part of the examination of patients with early pregnancy bleeding. Experienced clinicians know that vaginal exam rarely contributes to diagnosis and adds to patient distress at a difficult time. This Australian RCT, which randomized patients to vaginal exam or not, compared provisional and final diagnosis (based on ultrasound, beta-HCG and follow-up). It found that provisional diagnosis agreed with final diagnosis in a little over half of cases and did not differ whether a vaginal exam was performed or not. A strong case for abandoning this unpleasant test in many patients.

Reference: *Emerg Med Austral* 2013; 25, 219–221

<http://onlinelibrary.wiley.com/doi/10.1111/1742-6723.12068/full>

Comparison of the unstructured clinician gestalt, the Wells score, and the revised Geneva score to estimate pretest probability for suspected pulmonary embolism

Authors: Penaloza A et al

Summary: This retrospective analysis used a prospective observational cohort of suspected pulmonary embolism (PE) patients presenting to ED to compare the diagnostic accuracy of physician gestalt with the Wells Score and the revised Geneva score. 1,038 patients, of which 31.3% had PE were included in the study. Area under the curve (AUC) of receiver operating characteristic (ROC) curve was 0.81 (95% CI 0.78-0.94), 0.71 (0.63-0.70) and 0.66 (0.63-0.7) for gestalt, Wells and Geneva respectively. There was a significantly lower prevalence of PE in low risk patients as scored by gestalt (7.6%) vs. Wells (12.6%) or Geneva (13%). Similarly the prevalence of PE in high-risk patients was significantly higher as scored by gestalt (72.1%) vs. Wells or Geneva combined (58.1%). The authors concluded that gestalt assessment was superior to clinical decision rules as a consequence of more accurate classification of patients as low and high risk for PE.

Comment: Clinical decision rules provide a structured, evidence-based approach to assessment of risk and need for investigation/intervention. This multi-site study from France and Belgium compared physician gestalt with the Well's score and revised Geneva Score for diagnosis of pulmonary embolism (PE). The study had a high rate of PE (>30%) which suggests some selection bias. That said, clinician gestalt had the best ROC curve (AUC 0.71), highest proportion of PE assessed as high risk (72%) and lowest proportion of PE assessed as low risk (7.2%). This provides evidence that clinical decision rules may not be better than clinician gestalt and emphasizes that research on clinical decision rules should test them against physician judgment.

Reference: *Ann Emerg Med* 2013; 62:117-124

[http://www.annemergmed.com/article/S0196-0644\(12\)01718-0/abstract](http://www.annemergmed.com/article/S0196-0644(12)01718-0/abstract)

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RESEARCH REVIEW™
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Children with fever and cough at emergency care: Diagnostic accuracy of a clinical model to identify children at low risk of pneumonia

Authors: Oostenbrink R et al

Summary: Development and validation of a prediction model for early identification of children with pneumonia was the goal of this study. Subjects were 1,290 children aged 1 month to 16 years presenting to ED at the three participating centres with fever and cough. Pneumonia was defined by the presence of pulmonary consolidations on chest radiograph or follow-up. Rates of pneumonia were 16%, 14% and 7% at the 3 different sites. Children were categorised as being at high (> 16%) or low (< 5%) risk of pneumonia based on a clinical decision rule encompassing ill appearance, tachypnoea, decreased oxygen saturation and elevated serum C-reactive protein. The discriminative value of this rule was 0.79 (0.69-0.89) in one study population and validated well in the other two. Children with a low risk of pneumonia can therefore be discharged without need for radiographs or antibiotics.

Comment: Pneumonia is the most common serious bacterial illness in febrile children. The challenge in ED is identifying children at high risk of pneumonia and avoiding unnecessary investigations and treatment in children who have minor illness. This multi-site Netherlands and UK study derived a simple clinical rule based on the presence of ill appearance plus either or both of tachypnoea or desaturation. Children with none of these have a very low risk of pneumonia (~5%) while children who look unwell and had either tachypnoea or desaturation had a risk of pneumonia of 31%. This approach is promising but prospective validation and assessment of inter-observer agreement for 'ill appearance' is needed.

Reference: *Eur J Emerg Med* 2013; 20:273-80

<http://tinyurl.com/kden6gs>

Does the use of a bougie reduce the force of laryngoscopy in a difficult airway with manual in-line stabilisation?: A randomised crossover simulation study

Authors: Hung R et al

Summary: This randomised crossover simulation study compared the force applied to the head and neck during tracheal intubation alone or with a bougie. The simulations took place using a Macintosh laryngoscope with or without a bougie in a Laerdal SimMan with a simulated difficult airway and manual in-line stabilisation. The participants were 20 anaesthetists with ≥ 1 year of experience. Use of the bougie during intubation was associated with significantly less force exerted on the cervical spine (24.9 vs. 44.5 N, $p < 0.001$). A reduction in the time taken for intubation was observed with use of the bougie but this was not significant. All patients were intubated within 2 minutes. The authors suggest that use of a bougie is considered in patients with potential cervical spine injuries to ensure minimal force is exerted during laryngoscopy.

Comment: Intubation with in-line c-spine immobilization can be tricky, particularly for difficult airways. Laryngoscopy can apply force to the c-spine potentially increasing the risk of injury. This study, involving experienced UK anaesthetists, compared the difference in force applied to the head and neck during intubation using a laryngoscope with or without a bougie in a simulated difficult airway model. They found that while intubation was promptly successful with both approaches, significantly less force was applied when a bougie was used. It is never going to be possible to prove if this reduction in force translates to avoided adverse outcomes but this evidence should raise questions about preferred techniques for airway management in this high risk group.

Reference: *Eur J Anaesthesiol* 2013;30:563-6

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