Results and Conclusion Results Rate of manipulations in PED increased from 41% to 78% in the 3rd cycle; improving to 86.36% after interventions stopped. Of those manipulated in PED, 73.68% were discharged from the department. Admissions for MUA decreased from 85% to 70% in the 3rd cycle; decreasing to 36.36% after interventions stopped.

The project showed success in improving management of paediatric angulated upper limb fractures. By identifying appropriate fractures, involving the senior orthopaedic team and providing adequate analgesia, admission for general anaesthesia can be avoided.

RCEM Free Papers

1480 THE APPLICATION OF AN AGE ADJUSTED D-DIMER THRESHOLD TO RULE OUT SUSPECTED VENOUSTHROMBOEMBOLISM (VTE) IN AN EMERGENCY DEPARTMENT SETTING: A RETROSPECTIVE DIAGNOSTIC COHORT STUDY

[1]Liam Barrett, [2]Tom Jones, [3]Daniel Horner. [1]*Cambridge University Hospital NHS Trust*; [2]*Wythenshawe Hospital*; [3]*University of Manchester*

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Aims, Objectives and Background Venous Thromboembolic disease (VTE) poses a diagnostic challenge for clinicians in acute care. Over reliance on reference standard investigations can lead to over treatment and potential harm.

We sought to evaluate the pragmatic performance and implications of using an age adjusted d-dimer (AADD) strategy to rule out VTE in patients with suspected disease attending an emergency department setting.

We aimed to determine diagnostic test characteristics and assess whether this strategy would result in proportional imaging reduction and potential cost savings.

Method and Design

Design Single centre retrospective diagnostic cohort study.

All patients >50 years old evaluated for possible VTE who presented to the ED over a consecutive 12-month period between January and December 2016 with a positive D-dimer result.

Clinical assessment records and reference standard imaging results were followed up by multiple independent adjudicators and coded as VTE positive or negative.

Results During the study period, there were 2132 positive D-dimer results. 1236 patients received reference standard investigations. A total increase of 314/1236 (25.1%) results would have been coded as true negatives as opposed to false positive if the AADD cut off point had been applied, with 314 reference standard tests subsequently avoided.

The AADD cut off had comparable sensitivity to the current cut off despite this increase in specificity; sensitivities for the diagnosis of DVT were 99.28% (95% CI 96.06–99.98%) and 97.72% for PE (95% CI 91.94% to 97.72). There were 3 potential false negative results using the AADD strategy.

Conclusion In patients with suspected VTE with a low or moderate pre-test probability, the application of AADD appears to increase the proportion of patients in which VTE can be excluded without the need for reference standard imaging. This management strategy is likely to be associated with substantial reduction in anticoagulation treatment, investigations and cost/time savings.

1522 THE COMPOSITE OUTCOME FALLACY IN THE PRIEST COVID-19 CLINICAL PREDICTION SCORE

[1]Kieran Dash, [2]Steve Goodacre, [2]Laura Sutton. [1]*Sheffield Teaching Hospitals*; [2]*School of Health and Related Research, University of Sheffield*

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Aims, Objectives and Background Clinical prediction models are often developed using composite outcomes, based on the implicit assumption that the predictors have similar associations with each component outcome. Using an example of a clinical prediction tool for adverse outcome in suspected COVID-19, we aimed to test this assumption and determine whether using a composite outcome led to suboptimal prediction of individual elements of the composite outcome.

Method and Design We reanalysed data from the Pandemic Respiratory Infection Emergency System Triage (PRIEST) study; data was collected from 20,891 patients attending 73 emergency departments with suspected COVID-19 and was used to develop a clinical score predicting a composite outcome of mortality or receipt of major organ support up to 30 days following attendance. In this reanalysis we created Least Absolute Shrinkage and Selection Operator (LASSO) multiple regression models to produce unrestricted prediction models for (1) the composite outcome, (2) mortality, and (3) receipt of major organ support.

Results and Conclusion Unrestricted regression models had c-statistics of 0.86 (95% Confidence Interval (CI) 0.85–0.86) for mortality, 0.78 (95% CI 0.77–0.80) for receipt of major organ support, and 0.82 (95% CI 0.82–0.83) for the composite outcome. Key variables in the clinical score (increased age, reduced performance status and reduced consciousness) predicted increased risk for mortality and the composite outcome but decreased or no significant risk for receipt of major organ support. The assumption that predictors have similar associations with individual elements of a composite outcome may not hold. Clinical prediction models may incur a 'composite outcome fallacy' if they are driven by predicting one element of the composite outcome but used to predict another. Further research into other clinical prediction score with composite outcomes is required.

1726 INTEGRATING ESTABLISHED CLINICAL SCORES WITH A NOVEL TRANSCRIPTOMIC SEVERITY CLASSIFIER AUGMENTS EARLY RISK ASSESSMENT IN THE ED

[1]Eva Diehl-Wiesenecker, [1]Noa Galtung, [2]Oliver Liesenfeld, [2]Florian Uhle, [2]Timothy E Sweeney, [1]Wolfgang Bauer. [1]*Department of Emergency Medicine, Campus Benjamin Franklin, Charité Universitaetsmedizin, Berlin, Germany*; [2]*Clinical Affairs, Inflammatix Inc., Redwood City, USA*

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Aims, Objectives and Background Reliable risk assessment in patients presenting to emergency departments (ED) with suspected infection is of utmost importance to support clinical decisions. Vital sign-based scoring systems such as NEWS2 or qSOFA enable a rapid first assessment of patient urgency at triage. However, their inherent high sensitivity might drive over-utilization of healthcare resources. Our aim was to evaluate if adding the result of a transcriptomic severity classifier can synergistically improve current score-based risk assessment in the ED.

Method and Design We performed a secondary analysis of a patient cohort (n=312) enrolled in the Charité University hospital ED (Berlin, Germany) with suspected infection and at least one vital sign alteration. The expression of 29-host mRNAs in PAXgene-stabilized whole blood was quantified using NanoString nCounter® SPRINT. The proprietary machine learning classifier IMX-SEV-3 was applied to calculate a score that falls into pre-defined interpretation bands: low/moderate/high severity. NEWS2 and qSOFA were documented on admission and combined with the classifier results to analyze the incidence of two clinical endpoints: 'need for critical care' (composite of need for ventilation, dialysis, and/or vasopressors) within 7d and '28d mortality'.

Results and Conclusion Among enrolled patients, 22 (7.1%) died and 66 (21.1%) required ICU-level care. Of patients with a high NEWS2 (≥5 points; n=184), there was a stepwise increase in mortality among the low (0%; n=0/47), medium (10.1%; n=12/119) and high (44.4% n=8/18) IMX-SEV-3 severity subgroups. A similar stratification was achieved across the low (17%), moderate (31%), and high (61%) IMX-SEV-3 subgroups for prediction of critical care. More granular risk stratification could also be confirmed when using IMX-SEV-3 in combination with high qSOFA (≥2 points; n=76): 0/10.6/50% mortality and 23.5/40.4/66% need for critical care in the low/moderate/high subgroups, respectively.

In summary, the combined use of immune-based IMX-SEV-3 results for ED patients with high clinical scores allows improved prediction of mortality and the need for critical care.

1473 IN PATIENTS WITH CHEST PAIN SUSPICIOUS FOR ACS, IS ARRIVAL BY EMERGENCY AMBULANCE ASSOCIATED WITH INCREASED LIKELIHOOD OF MYOCARDIAL INFARCTION?

[1]James Murray, [1]Edwin Amalraj Raja, [2]Jamie Cooper. *[1]University of Aberdeen; [2]Aberdeen Royal Infirmary Emergency Department, University of Aberdeen*

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Aims, Objectives and Background Patients commonly present to the Emergency Department (ED) with chest pain suspicious of an acute coronary syndrome (ACS). Clinical features and historical risk factors for ACS are assimilated with electrocardiographic (ECG) findings and cardiac biomarkers to assess risk, determine diagnosis and decide subsequent disposition. Many such patients arrive by ambulance but whether the mode of arrival is associated with an increased likelihood of myocardial infarction is unknown.

Method and Design Adult patients (≥16 years) presenting to Aberdeen Royal Infirmary ED with chest pain suspicious of ACS and non-diagnostic ECGs were identified from two prospectively collected cohorts. Patient demographics, known ACS risk factors at presentation, cardiac biomarker results and clinical outcomes up to 30 days were recorded. Data sets were retrospectively interrogated electronically to identify the mode of ED arrival: by ambulance, or other. The independently adjudicated primary outcome was the development of type 1 or 4 myocardial infarction or cardiac death at 30 days.

Logistic regression was used to determine the association between mode of arrival and the primary outcome after adjusting for other confounds. The strength of association was reported as odds ratio (OR) and adjusted odds ratio (aOR) and its 95% confidence interval (CI).

Statistical analysis was performed using SPSS v27. A p-value <0.05 was considered to be statistically significant.

Results and Conclusion Of 1606 patients [mean age 62 (SD 16) years, 45% women], 1246 (78%) arrived via ambulance and 188 (12%) reached the primary outcome.

After adjusting for known confounders, a statistically significant association (aOR 1.72; 95% CI 1.11 to 2.66) between ED arrival by ambulance and the development of type 1 or type 4 myocardial infarction or cardiac death at 30 days was demonstrated (table 1).

In our cohort of patients with chest pain suspicious of ACS, ED arrival by ambulance correlates strongly with the development of myocardial infarction at 30 days.

Abstract 1473 Table 1 Relationship of risk factors to the development of the primary outcome expressed using a Chi-square test and calculation of crude and adjusted Odds Ratios (OR) with 95% confidence intervals (CI). A P-value of <0.05 was considered statistically significant. The primary outcome was the development of a Type 1 or Type 4 myocardial infarction or cardiac death at 30 days

Patient Characteristics		Total (n=1606)		Primary Endpoint (n=188)		No Primary Endpoint (n=1418)		Chi-Square test p-value	Crude Odds Ratio & 95% CI	Adjusted Odds Ratio & 95% CI
		Number	%	Number	%	Number	%			
Mode of transport	Ambulance	1246	77.6	162	13.0	1084	87.0	0.03	1.92 (1.25 to 2.96)	1.72 (1.11 to 2.66)
	Other	360	22.4	26	7.2	334	92.8	-	-	-
Diabetes	Yes	312	19.4	54	17.3	258	82.7	0.01	1.81 (1.29 to 2.26)	1.39 (0.97 to 1.99)
	No	1294	80.6	134	10.4	1160	89.6	-	-	-
Hypertension	Yes	770	48.0	123	16.0	647	84.0	<0.01	2.25 (1.64 to 3.10)	1.81 (1.29 to 2.56)
	No	835	52.0	65	7.8	770	92.2	-	-	-
Hyperlipidaemia	Yes	525	32.7	90	17.1	435	82.9	<0.01	2.08 (1.53 to 2.82)	1.589 (1.14 to 2.21)
	No	1081	67.3	98	9.1	983	91.5	-	-	-
Smoking status	Yes	391	24.3	42	10.7	349	89.3	0.495	0.88 (0.61 to 1.27)	1.06 (0.73 to 1.55)
	No	1215	75.7	146	12.0	1069	88.0	-	-	-