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Title: Clinical utility of the pulmonary embolism rule-out criteria (PERC) in investigation of possible pulmonary embolism

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Body: The PERC score was proposed as a means of identifying patients who are at low risk of pulmonary embolism (PE) by Kline et al in 2004. We retrospectively applied the PERC rule to patients who presented to our institution between May 2007 and November 2008 who had a CT Pulmonary Angiogram (CTPA) for the investigation of possible PE. We postulated that a sequential exclusion process - using PERC, a dichotomous Wells score (cutoff at greater than 4), and then d-dimer if indicated would improve the diagnostic process by reducing unnecessary d-dimer testing and exposure to ionizing radiation. 249 CTPAs were performed for possible PE, clinical notes being available on 220. 186 patients were PERC positive, 34 negative. 174 had elevated quantitative d-dimer assays, and 52 had positive CTPA investigations. The positive predictive value of the PERC score was 28% and the negative predictive value 100%. D-dimer assay had a positive predictive value of 21.8% but a negative predictive value in our series of only 72.4%. Importantly in our study group no patients with a positive CTPA had a negative PERC score. The result of this small, retrospective, study suggest that the addition of the PERC score prior to standard testing would result in fewer negative CTPA examinations and/or d-dimer assays (reducing inappropriate exposure to ionizing radiation and costs). We suggest the PERC score as an additional risk stratification tool first line prior to the Wells (or Geneva) score and d-dimer assays. The format of the PERC domains may also reduce inter-operator variability in junior staff who may struggle with "Alternative diagnosis less likely than PE", a clinical gestalt question.