

Derivation and validation of a multivariate model to predict mortality from pulmonary embolism with cancer: the POMPE-C tool

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Permanent Link: <http://hdl.handle.net/1805/4894>

Link:

Keywords: [pulmonary embolism](#) ; [outpatient](#) ; [risk stratification](#)

Date: 2012-05

Cite As:

Kline, J. A., Roy, P. M., Than, M. P., Hernandez, J., Courtney, D. M., Jones, A. E., ... & Pollack Jr, C. V. (2012). Derivation and validation of a multivariate model to predict mortality from pulmonary embolism with cancer: The POMPE-C tool. *Thrombosis research*, 129(5), e194-e199.

Abstract:

Background Clinical guidelines recommend risk stratification of patients with acute pulmonary embolism (PE). Active cancer increases risk of PE and worsens prognosis, but also causes incidental PE that may be discovered during cancer staging. No quantitative decision instrument has been derived specifically for patients with active cancer and PE. Methods Classification and regression technique was used to reduce 25 variables prospectively collected from 408 patients with AC and PE. Selected variables were transformed into a logistic regression model, termed POMPE-C, and compared with the pulmonary embolism severity index (PESI) score to predict the outcome variable of death within 30 days. Validation was performed in an independent sample of 182 patients with active cancer and PE. Results POMPE-C included eight predictors: body mass, heart rate > 100, respiratory rate, SaO2%, respiratory distress, altered mental status, do not resuscitate status, and unilateral limb swelling. In the derivation set, the area under the ROC curve for POMPE-C was 0.84 (95% CI: 0.82-0.87), significantly greater than PESI (0.68, 0.60-0.76). In the validation sample, POMPE-C had an AUC of 0.86 (0.78-0.93). No patient with POMPE-C

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estimate \leq 5% died within 30 days (0/50, 0-7%), whereas 10/13 (77%, 46-95%) with POMPE-C estimate $>$ 50% died within 30 days. Conclusion In patients with active cancer and PE, POMPE-C demonstrated good prognostic accuracy for 30 day mortality and better performance than PESI. If validated in a large sample, POMPE-C may provide a quantitative basis to decide treatment options for PE discovered during cancer staging and with advanced cancer.

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