FIGURE 1. Reflex versus voluntary cough flow rate. ▼: stroke patients; ●: control subjects; ---: individuals with lower reflex than voluntary cough flow rate; —: reference line, $y=x$.

reflex cough peak flow and voluntary cough peak flow, there are few individuals (highlighted in circle, both patients and controls) in whom reflex cough flow is lower than voluntary

cough flow, but, contrary to Widdicombe and Addington's proposal, there was none in whom reflex cough flow rate was greater than voluntary cough.

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Adequate use of pulmonary embolism clinical prediction rule in COPD patients

To the Editors:

We read with interest the article by GUNEN *et al.* [1], entitled "Venous thromboemboli and exacerbations of COPD", recently published in the *European Respiratory Journal* (ERJ).

We congratulate the authors for their study, which is one piece of the puzzle of a persistent clinical dilemma: when and how do we have to search for a pulmonary embolism (PE) in chronic obstructive pulmonary disease (COPD) patients? One of their conclusions is that "the Wells criteria appear to be a significantly better tool [than the Geneva score] for exploring COPD patients for PE". This point raises some concerns, and readers of the *ERJ* should consider the following before applying this proposition.

This conclusion is mainly based on the distribution of PE among probability classes and comparison of receiver operating characteristic curves obtained with the Wells score and the Geneva score, both calculated in COPD patients hospitalised for an acute exacerbation. Contrary to the Wells score, which may be used in in- and outpatients, the Geneva score was initially derived and then validated only in outpatients. Therefore, its application in such selected hospitalised patients is hazardous and is not recommended [2]. This may explain the unexpected distribution of COPD patients among the different clinical classes, with only 10.6% of patients classified as low clinical probability when the expected proportion of patients in this subgroup is ~50%.

Notably, the Wells score is heavily influenced by the existence of an alternative diagnosis, and one can imagine that this point deeply decreases the external validity of the result of GUNEN *et al.* [1], who conducted a study focusing specifically on the prevalence of PE during COPD exacerbation. As COPD exacerbation may be easily integrated as an alternative diagnosis, it may reduce the reproducibility of these results among physicians in an emergency department, for example.

It is not clearly stated why the authors used quite outdated versions of both scores. Indeed, the Wells score [2, 3] has recently been submitted to revision and dichotomisation, with PE now considered as being "unlikely" or "likely". The same may be said for the Geneva score, which has been revised [4] a few years ago and simplified 2 yrs ago [5]. Blood gas analysis and chest radiography were excluded from the revised form. We can understand that it may be thought a waste of information for physicians aware of the issues, such as pneumologists, but the main objective of this revision was to provide an easier-to-use score, allowing clinical evaluation at bedside in the emergency department.

As clinical prediction rules (CPRs) tend to be underused [6], we think that revision and simplification of both rules matched the objective of rendering them easier to use. Therefore, new versions of these rules should be used. Notably, assessment of PE probability is the first step in the evaluation of PE suspicion and the use of a CPR is widely recommended [3]. According to

the results of the score, patients will be integrated in validated diagnostic and therapeutic algorithms. Inappropriate management has been found to be related to poor outcomes [6], and chronic lung diseases (including COPD) were independent risk factors for inappropriate management [6]. Thus, a management study comparing outcomes in patients in whom PE was suspected and who were randomised among two groups (Wells or Geneva rules) would be the only way to compare these scores, either with a superiority design or a noninferiority design.

In their paper, GUNEN *et al.* [1] discussed grouping patients with an intermediate and a high clinical probability. Algorithms for patients with intermediate or high may differ markedly. In particular, some centres still propose to perform an additional test in the presence of a high clinical probability and a negative computed tomography scan. Thus, putting together these two groups does not seem to be advisable.

In conclusion, we believe that the necessary required qualities for a CPR are to be easy to compute and well validated in management outcome studies. Both the Wells and the Geneva score reached this level of validation. However, the Geneva rule as been derived and validated only in outpatients and its use should be restricted to this population. The study of GUNEN *et al.* [1] raised an interesting question: do we need specific scores for specific situations? Despite the fact that it may be intellectually appealing, we think that too many declinations of a score may render that score unusable.

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From the authors:

We deeply appreciate L. Bertoletti and M. Righini's interest and important comments about our paper published in the June issue of the *European Respiratory Journal* [1].

L. Bertoletti and his colleague stated in their letter that application of the Geneva clinical prediction rule for pulmonary emboli (PE) is not appropriate in hospitalised patients because it was originally derived from a database of emergency ward patients. We completely agree with this comment that probability of PE development after hospitalisation should not be assessed using the Geneva criteria. In our study population, in the majority of patients, evaluation of prediction rules for PE was done within a few hours of admission to the hospital, either in the emergency department or in outpatient clinics, before transferring the patients to the intensive care unit or respiratory ward. In other words, all necessary data for the Geneva and the Wells clinical prediction rules had already been obtained during their initial evaluation at the emergency department or outpatient clinics, and the probability scoring for each patient was based upon that admission data, not later data. So we do not think that our approach was a clear violation of application of the Geneva model in this study. As mentioned in our article [1], every chronic obstructive pulmonary disease (COPD) patient on an apparently severe exacerbation could be considered as an at-risk patient for venous thromboemboli (VTE) due to the presence of some strong common risk factors, such as being elderly, immobile or having cardiac problems, or infection of varying severity. Hence, application of the Geneva prediction rule should not yet be denied in this specific group of patients, unless new data from further studies will suggest otherwise.

An item in the Wells scoring system requires the clinician's judgment of whether an alternative diagnosis is less likely than PE or not. As mentioned by L. Bertoletti and M. Righini, as well as other authors [2, 3], several times, inclusion of this item in the Wells model seems to increase the subjectivity of the scoring and to decrease the external validity and reproducibility of any study related to PE prediction. Although the relevant item has long been considered as the weak point of this Canadian scoring system, findings from the available studies did not support this opinion clearly. In general terms, the Wells criteria were found to have moderate to substantial interobserver agreement [4–6].

Our study was designed and initiated in 2005 and 2006. At that time, the revised version of the Geneva criteria was neither available nor tested in an outcome study. Moreover, the main advantage of the new version of the Geneva model is its simplicity, by exclusion of arterial blood gas analysis and chest radiography. Although we also agree that the revised version suggests an easier alternative tool, it does not mean that it is superior to the original one regarding their PE prediction