Nevertheless, the authors are to be congratulated on making patients and their GPs think more about the causes of chronic cough.

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To the Editors:

We read with great interest the recent article in the *European Respiratory Journal* by DETTMAR *et al.* [1] which discussed an online cough diagnostic clinic. There have been few studies of chronic cough in the population so we are grateful to the authors for providing further data on this topic. We do, however, have several qualms regarding their study.

First, our main concern regards how the differential diagnosis between reflux, asthma and rhinitis was achieved. No clinical characteristic of cough (with the exception of moist cough in children) has been found to be useful in determining diagnostic probability [2–4]. DETTMAR *et al.* [1] use items from various pathology-specific scales to determine the most probable cause of patients' cough. Most of these scales were originally developed and validated to evaluate disease severity, not to determine a cough's aetiology. The items from reflux symptoms index tools were validated to evaluate voice disorders in laryngopharyngeal reflux, not to ascertain a diagnosis of reflux in a patient presenting with a chronic cough. The questionnaire developed by JUPINER *et al.* [5] aimed to assess asthma control, not to make a diagnosis of asthma in a patient with a chronic cough. Furthermore, items related to cough timing such as "cough when you get out of bed in the morning", "cough brought on by singing or speaking", "cough after lying down", "cough waking you from sleep" are not correlated with a specific aetiology and may indeed be more related to disease severity than to its aetiology [2].

Secondly, DETTMAR *et al.* [1] conducted a validation study of their online cough clinic in 30 patients and found a close association between the web-based cough clinic diagnosis and that of the clinician's full work-up. However, they do not describe the criteria used by the clinician to establish the final diagnosis. Were the same questions used in the clinician's

assessment? Furthermore, there is no mention of whether the clinician was blinded to the result of the computerised diagnosis. The close association between the two assessments could be due to lack of blinding in the procedure.

Thirdly, chronic obstructive pulmonary disease (COPD) was not included in the online algorithm. 41.4% of included patients were either current or ex-smokers. Smokers with shortness of breath and cough could also be suffering from COPD.

Finally, the study concludes that patients with asthma had worse cough scores than those with reflux or rhinitis. This may, however, be a case of secondary association. The diagnosis of asthma in the study was linked to a positive response to the item "cough waking you from sleep", and lack of sleep is the most important cough consequence affecting quality of life.

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From the authors:

We are grateful to J. Widdicombe and G. Fontana, and S. Leconte and J. Degryse, for providing a detailed critical analysis of our online Cough Clinic programme [1]. However, we believe they have essentially missed the point of the endeavour. We set out to tackle the thorny issue of translating the guidelines into advice accessible to members of the public. Such an enterprise will never provide the precision of a dissected animal, but to dismiss our mainly positive feedback because it is from a mere 944 patients is not only partial but is also a failure to appreciate inherent methodological differences.

The online Cough Clinic provides tailored advice based on a probabilistic assessment of symptoms. It is not and was never intended to be a comprehensive diagnostic service. Patients who attend cough clinics almost invariably come with a diagnosis of "asthma". What else could it be? We suggest possible alternatives and cough-specific therapeutic trials are advised, as recommended in the guidelines. Of course, there are many different causes of chronic cough but numerous studies have repeatedly described three common syndromes [2]. Recently, it has been proposed that the strikingly similar clinical history obtained in the majority of chronic cough patients indicates a single clinical entity of the cough hypersensitivity syndrome and that there are three different phenotypes within this disorder: asthmatic cough, reflux cough and rhinitis [3]. These phenotypes are the targets for the online Cough Clinic, since they represent the overwhelming majority of chronic cough patients in the general population. The programme is simply not designed to detect and recommend treatment for rare or unusual presentation of disease. Yet, this is precisely what J. Widdicombe and G. Fontana do in their test of the online Cough Clinic.

First, we would question the accuracy of their diagnosis of their patients' cough. Thus, post-viral cough is frequently reflux related, the virus having increased the sensitivity of the cough reflex, revealing previously asymptomatic reflux as the cause. Chronic cigarette smoking is not usually seen in patients in cough clinics. While it does cause a dose-related increase in coughing, paradoxically, smoking cigarettes decreases cough reflex sensitivity. Indeed, objective cough counting demonstrates that patients with chronic obstructive pulmonary disease, as suggested by S. Leconte and J. Degryse, do not cough excessively, as do patients with the cough hypersensitivity syndrome. Chronic cough, with or without cigarette smoking, is an extremely common phenomenon, with the Yorkshire Survey revealing an incidence of 12% in the general population [4]. How do J. Widdicombe and G. Fontana know that their patient, who was a smoker, did not have an underlying cause for his cough that was not tobacco related? Even in adolescent boys, Tourette's Syndrome is an infrequent cause of cough, which we were among the first to describe [5]. An online questionnaire base assessment will never pick up such rarities. Finally, an upper respiratory tract infection that lasts for >8 weeks as a cause of cough is a dubious diagnosis by any standard. We suggest the online diagnosis (except for Tourette's) has at least as good a chance of being the correct one.

The cut off of 8 weeks duration as the definition of chronic cough is of course arbitrary and needs to be applied with common sense. Meticulous cough counting work from both the Manchester and Leicester groups in the UK has clearly shown a vast difference in cough rates between normal and chronic cough patients. It is simply untrue to blur the difference between these distinct groups because we all cough occasionally. These patients cough many, perhaps hundreds, of times in an hour.

Both correspondents are correct that some of the questions used are not very specific. In the scoring scheme, some questions are allowed to point to two diagnoses. Those questions pointing to reflux were developed (with permission) out of the well-accepted reflux symptom index of BELAFSKY *et*

al. [6]. This instrument is widely used in voice disorders to diagnose laryngopharyngeal reflux. Since no accurate objective test exists for laryngopharyngeal or airway reflux, we acknowledge that these questions are more opinion based rather than evidence based, but that does not make them less valid. The paper by MELLO *et al.* [7], quoted by S. Leconte and J. Degryse, claiming that there are no specific diagnostic features of cough, does not contain any substantial evidence to support this contention.

The weighting system was used in an attempt to prevent bias in the questionnaire in favour of one particular diagnosis with more associate questions. We chose not to present all of the weightings in the paper since this paradigm composes a large spreadsheet. We would be happy to share this with anyone who wishes to see it but the principle is as described by J. Widdicombe and G. Fontana. Cough on eating was more strongly associated with reflux than throat clearing, and wheeze more strongly with asthma than cough on waking. These weightings are not based on any formula but reflect the clinical practice within the Hull Cough Clinic, *i.e.* they are as arbitrary as any clinical judgement and are as nonlinear as it is possible to get! The limited validation of the questionnaire raised by S. Leconte and J. Degryse was undertaken in a blinded fashion and this issue will hopefully be resolved by our substantial analysis currently under review.

We suggest that the apparent lack of disease specificity of reflux-related questions is not due to any lack of discrimination. We are both advocates of the hypothesis that non-acid, gaseous reflux underlies the cough hypersensitivity syndrome. That reflux questions are positive in all phenotypes is further evidence of its essential role.

Finally, the website is under continuous development and we hope to launch a further version shortly. Refining and improving our tools does not invalidate earlier experience and indeed should be the aim in improving clinical practice and awareness of the important but neglected area of chronic cough.

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