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Editorial

The utility of point-of-care C-reactive protein testing and rapid diagnostic tests in Primary Care to reduce uncertainty and improve antibiotic prescribing

Jose Luis Ramón-Trapero [a,*], *Yolanda Sánchez Diaz-Aldagalán* [b], *José María Molero García* [c], *Jesús Ortega-Martínez* [d]

[a] *Primary Care Service, Health Centre Haro, Rioja Salud, La Rioja, Spain*
[b] *Primary Care Service, Health Centre Calahorra, Rioja Salud, La Rioja, Spain*
[c] *Primary Care Service, Health Centre San Andres, Madrid, Spain*
[d] *Primary Care Service, Health Centre Navarrete, Rioja Salud, La Rioja, Spain*

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* *Corresponding author*.
E-mail address: josoramon@hotmail.com
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Diagnostic uncertainty is not a system failure, but an intrinsic and ubiquitous element of Primary Care (PC) practice [1, 2]. It is defined as the subjective perception of insufficient knowledge about a patient's health status or the difficulty in predicting the outcomes of an intervention [2]. In the PC setting, family physicians frequently face vague or undifferentiated symptoms at very early stages of disease [3].

To manage this reality, clinicians must adopt a reflective approach. They must recognize that uncertainty is influenced not only by clinical factors, but also by the patient's social context, workload pressure, and the physician's own emotional tolerance of the unknown [1, 4]. A reflective physician uses time as a diagnostic tool, while acknowledging that unmanaged uncertainty may lead to suboptimal decisions [5].

The main consequence of poorly managed uncertainty is defensive or inappropriate antibiotic prescribing [1, 6]. When there is concern about missing a serious bacterial infection—especially in acute respiratory infections—antibiotics are often prescribed "just in case" [6, 7]. Greater perceived diagnostic uncertainty has been directly associated with increased antibiotic use in conditions that are mostly viral in origin [4].

This practice is not only ineffective but also promotes overdiagnosis and overtreatment. It increases the risk of adverse effects, unnecessarily raises healthcare costs, and, most critically, accelerates the global crisis of antimicrobial resistance [8, 9]. Therefore, the physician's ability to reduce this uncertainty gap is both an ethical and clinical imperative [2].

Based on current evidence, rapid diagnostic tests (RDTs) are primarily applied to prevalent infectious diseases to reduce uncertainty and improve antibiotic prescribing. In acute respiratory infections, they are used to quickly distinguish between viral and bacterial aetiology, a key step to reduce inappropriate antibiotic use and to promote more targeted antimicrobial therapy.

Rapid antigen detection tests for Streptococcus pyogenes confirm bacterial aetiology in acute pharyngotonsillitis and reduce overall antibiotic prescribing by 15–30%. Similarly, antigen-based RDTs for respiratory viruses (Influenza A/B, RSV, and SARS-CoV-2) facilitate outbreak identification and help avoid inappropriate antibiotic use in viral syndromes [10, 11]. Their impact on reducing antibiotic use in adults is variable and tends to be greater when they are integrated into clinical algorithms and interpreted alongside disease severity, comorbidity, and clinical course [11].

Beyond respiratory disease, RDTs are also available for urinary tract infections, infectious mononucleosis, and screening for sexually transmitted infections such as HIV and hepatitis C, using immunochromatographic or antigen-detection techniques [11, 12].

These tools are technically simple. Most rely on samples obtained via nasopharyngeal or oropharyngeal swabs or capillary blood [11, 13]. Through antigen–antibody binding reactions—commonly via lateral flow immunochromatography—the device provides a visual result within 5 to 15 minutes [11, 14]. More advanced systems, such as capillary blood C-reactive protein testing at the point of care (CRP-POCT), help grade the probability of bacterial infection in lower respiratory tract infections and support decisions regarding no antibiotic use, delayed prescription, or immediate treatment, always with clinical reassessment [6,7,9]. These tests offer sensitivity and specificity comparable to central laboratory methods, with immediacy that enables real-time decision-making during the consultation [7, 14].

RDTs are key tools in antimicrobial stewardship programmes. Their use and interpretation must always be adapted to the clinical context, including age, type, intensity and duration of symptoms, comorbidities, and predictive rules such as Centor or McIsaac scores in pharyngotonsillitis [7, 9, 11, 14]. They must also be interpreted cautiously in special populations (young children, older adults, and patients with significant comorbidity), where biomarker thresholds and clinical tolerance for uncertainty may differ [8]. In these groups, negative results do not exclude complications or bacterial coinfection.

Fortunately, reflective physicians now have tools that allow immediate objectification of clinical suspicion. Capillary CRP-POCT is an additional strategic ally in lower respiratory tract infections. An inexpensive, simple technique provides results within minutes [13, 14].

Recent evidence confirms that capillary CRP testing is highly cost-effective and reduces antibiotic consumption in exacerbations of chronic obstructive pulmonary disease (relative reduction of 26% and absolute reduction of 20%) [16], and in acute bronchitis (25% reduction in initial prescribing and 21% at 28 days) [17], without compromising patient safety or increasing subsequent healthcare demand [10, 15]. These tools allow clinicians to communicate decisions with greater confidence, strengthen mutual trust, and reduce cognitive burden [6, 7, 11].

When uncertainty persists despite testing, reflective physicians may use delayed antibiotic prescribing [5]. This strategy consists of issuing a prescription with clear instructions not to initiate treatment unless symptoms worsen after a period of observation, together with explicit criteria for reassessment [5].

It is a safe approach that facilitates shared decision-making, educates patients about the natural course of illness and self-care, and avoids immediate and unnecessary antibiotic use [5, 14, 18]. In respiratory infections, delayed prescribing significantly reduces unnecessary antibiotic consumption (approximately 26–39%) without compromising symptom control or patient satisfaction, and is particularly valuable when diagnostic uncertainty remains after rapid testing [18].

The management of uncertainty is a challenge that extends beyond Primary Care. Although hospitals have more resources, the pressure for rapid decision-making in emergency departments and inpatient wards also generates a high burden of diagnostic uncertainty [2, 12]. The implementation of simple, rapid diagnostic tools across all levels of care not only optimizes economic resources but also substantially improves patient care by avoiding

unnecessary interventions, admissions, or treatments [8, 10]. Ultimately, the future of high-quality medicine lies in combining clinical expertise and medical humanism with agile and precise diagnostic technologies such as point-of-care rapid tests. Physicians must act as expert managers of uncertainty, using these tools not to replace clinical judgment but to complement and strengthen it. Rapid tests are most useful when they answer a specific clinical question, are integrated into a management algorithm, and are accompanied by effective patient communication, including safety-netting and follow-up when appropriate. Only in this way can we move toward a safer, more efficient, and above all, more humane model of care.

1. CONFLICT OF INTERESTS

The authors have no conflict of interest to declare. The authors declared that this study has received no financial support.

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