Editorial

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Blood self-sampling: friend or foe?

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In recent years, and particularly in the aftermath of the COVID-19 pandemic, there has been increasing interest in the need for decentralized healthcare solutions and patient empowerment. Decentralized testing options such as point-of-care (POCT), near-patient (NPT) and home testing are increasingly being used to integrate and/or replace traditional centralized laboratory testing. Blood collection, a fundamental step in ensuring the quality of the entire testing cycle, is involved in this process, which aims to improve the accessibility to laboratory testing, giving patients more control over their own care while reducing the potential disruption to their daily routines. Self-collected samples have become increasingly attractive, particularly as capillary collection has been described as "convenient, minimally invasive and cost-effective", while traditional venipuncture has been defined as "an invasive procedure that can cause pain, distress and anxiety to patients" [1], despite evidence that millions of patients undergo this procedure every day. In several studies, patient satisfaction with the blood collection process has been assessed using questionnaires. Overall, patients were satisfied with the alternative collection techniques, which were found to be easy to perform and preferred to traditional venipuncture in a medical center [2], with fear of needles being a major challenge [3]. Despite the described advantages over conventional sampling, widespread adoption of self-sampling in clinical practice has been slow. While several factors may contribute to this delay, the type of available devices and the quality of the samples collected have been identified as the most critical issues. In addition, implementation of self-sampling requires well-defined user instructions for proper sample collection and compliance, as well as strategies for monitoring patient discipline to ensure sample quality and reduce data variability [4]. Safety lancets have been and continue to be widely used for capillary blood sampling, particularly on the fingertips of the middle and ring fingers and the heel. However, in recent years, new devices have become available to use the upper arm for capillary blood collection. In this issue of the *Journal*, an interesting paper by Dennis C.W. Poland and Christa M. Cobbaert deals with innovation in blood self-sampling devices and the integration of alternative sampling options in the total testing process [5]. In their paper, the authors review the various decentralized capillary blood self-testing options for both liquid collection and dried capillary blood spots, focusing on the potential advantages and limitations. In particular, the authors highlight an essential issue that is "before considering blood self-sampling, the differences between venous and capillary blood should be well identified". In addition, they emphasize that "more data should be collected on the influence of time and temperature between blood collection and analysis" [5]. In fact, while capillary whole blood is used in neonatal screening, for glucose and glycated hemoglobin (HbA_{1c}) monitoring [6], in studies on infectious diseases, and in pediatric patients, limited evidence has been collected to demonstrate the comparability of analytical results between venous and capillary blood for many measurands, eventual differences in reference intervals (RI) and in pre-analytical variables, including sample stability [7]. In the same issue of the *Journal,* a paper by Perrotta and Coll. shows that capillary blood parameters are gestational age, birthweight, delivery mode and gender dependent in healthy preterm and term infants [8], thus stressing the need for further studies on capillary blood samples. Therefore, it is essential to establish a beneficial equilibrium between the potential benefits of capillary blood collection and the guarantee of the accuracy and reliability of analytical results and laboratory information. In some recently published papers, the social impact of implementing at-home self-sampling for chronic care patients [9], and the need to reduce blood-over testing and related iatrogenic anemia in hospitalized patients [10] have been emphasized, recommending the adoption of microsampling technologies. The reduction of dead volumes and number of tubes in routine laboratory process are additional and important procedures to reduce the amount of blood waste per sample: this is, for sure, a patient safety issue. Self-sampling, however, is not only related to blood collection as many other biological samples such as urine, oral specimens, vaginal/rectal and throat/pharyngeal swabs should be used for human papillomavirus (HPV) [11, 12], sexually transmitted infection (STI) [13] and monkeypox virus (MPXV) testing, respectively [14]. Saliva is another matrix which offers a valuable opportunity of self-sampling for the diagnosis of several diseases [15], including SARS-CoV-2 [16],

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while stool samples are suitable for self-sampling in patients affected by inflammatory bowel diseases [17].

Self-collected samples should be used for self-testing, as Direct Access Testing (DAT) is an emerging pathway of laboratory testing [18], or transported to a centralized laboratory to ensure a valuable intra-analytical phase, as demonstrated by Poland and Cobbaert in their work [5]. Therefore, the involvement of laboratory professionals to better understand the benefits and barriers to ensuring accurate, safe and effective self-sampling options is essential and of added value to overcome any risk of inappropriateness, increased costs and patient harm.

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