# Towards the implementation of patient blood management across Europe

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It has been estimated that one every three or four people worldwide suffers from anaemia[1]. Indeed, although anaemia has been traditionally associated with young women during the reproductive age and with children in developing countries in the context of nutritional deficiency, it is nowadays well recognised that anaemia does not prefer any age, sex or socioeconomic status[2]. For example, in the era of increasing life-expectancy, it is not rare to encounter elderly patients presenting in daily clinical practice with a number of comorbidities and/or taking medications that globally hamper the intestinal absorption of iron and/or reduce it mobilisation from body stores, thus rendering it unavailable for red blood cell production and leading to iron-deficiency anaemia[3]. Besides worsening their quality of life, there is a growing body of evidence indicating that an anaemic condition, which is not rarely overlooked and thus underdiagnosed and undertreated, can severely affect patients' outcome imposing a significant burden on the healthcare system[1]. The deleterious effect of anaemia is particularly evident for patients scheduled for surgical procedures, being associated with an unacceptably higher risk of transfusion, morbidity and mortality[4-6]. Whether correction of pre-operative anaemia can completely offset the excess of risk of post-operative complications, other than those associated with allogenic blood transfusion, is presently unknown, but this should not deter treatment. Thus, leaving pre-operative anaemia untreated should be deemed as sub-optimal clinical practice[7].

In this context, patient blood management (PBM) programmes have been developed worldwide in the last decade[8-10]. PBM is defined as "the timely application of evidence-informed medical and surgical concepts designed to maintain haemoglobin concentration, optimise haemostasis and minimise blood loss in an effort to improve patient outcomes"[11]. PBM is, therefore, designed to handle the patient's "blood source", shifting the attention from blood components to the patient who acquires a central and essential role[8]. This approach is based on the knowledge of the risks associated with transfusion of allogeneic blood components, on the optimal use of a resource that is limited, and on the need to contain health-care costs[12,13].

Traditionally, PBM is based on three pillars, i.e. optimisation of the endogenous red blood cell mass through targeted stimulation of erythropoiesis and treatment of modifiable underlying disorders; minimisation of diagnostic, interventional, and surgical blood loss to preserve the patient's red blood cell mass; and optimisation of the patient-specific tolerance to anaemia allowing strict adherence to physiological transfusion thresholds[14]. By definition, this ambitious objective can only be attained through a multi-professional, multidisciplinary patient-centred approach which involves, besides the transfusion medicine specialists, professionals of anaesthesia and intensive care units, surgeons involved in planned operations and any other specialists who have a role in the diagnostic and therapeutic care pathways aimed at the implementation of PBM. Obviously, strong leadership is required to establish and run a PBM programme. To gain commitment, the PBM coordinator must interact with medical staff as part of planning, implementing and auditing the PBM programme. In addition, implementation of PBM also requires support from hospital administrators, health authorities and medical societies, as well as continuing medical education for healthcare professionals[7]. Adoption of a PBM programme not only may improve patients' outcome, but also carries undoubtable economic advantages. The resulting reduction of costs can be reinvested in further improving the healthcare of patients[14].

Considering its strategic importance, it is reasonable that national governments have been interested in implementing such PBM programmes in their respective countries[15]. In this regard, the enthusiastic initiative of the Italian National Blood Centre of the National Institute of Health should be acknowledged. As clearly reported by Vaglio and colleagues[16] in this issue of *Blood Transfusion*, a number of actions have been undertaken by the Italian National Blood Centre, on behalf of the Health Ministry, to promote the adoption of PBM in Italy, at both regulatory and scientific levels. Indeed, a number of Decrees from the Italian Ministry of Health have endorsed the adoption of PBM as a

*Blood Transfus 2017;* **15**: *292-3* DOI 10.2450/2017.0078-17

strategic tool to achieve (and maintain) national blood self-sufficiency[17,18] and improve patient health care. At the same time, an important set of recommendations, supported by the main Italian scientific societies and coordinated by the Italian National Blood Centre, was issued with the aim of translating the ministerial directives on PBM into major orthopaedic surgery practice[9]. In addition, the "Only one" media campaign was launched last year by the Italian National Blood Centre in order to sensitise patients and healthcare professionals towards a more appropriate (restrictive) use of packet red blood cell units, in accordance with available scientific evidence[5].

In conclusion, mirroring those of other non-European countries[19,20], European governments should intervene directly, issuing regulatory actions and recommendations and providing resources to implement PBM programmes effectively. The Italian regulatory guidelines may represent an excellent model for inspiring how to pursue this objective.

*The Authors declare no conflicts of interest.*

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