How is BeQuinT supporting the Belgian hospitals to improve quality in transfusion practice and implement patient blood management?

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SUMMARY

The Belgian health authorities created Belgian Quality in Transfusion (BeQuinT) in 2011 to gather experts to improve the quality of transfusion practices in Belgian hospitals. Its mission is also optimising care for patients who might need transfusion through implementation of Patient Blood Management (PBM). Its policy is based on creating and improving financial incentives, developing data-driven and IT-based tools, and providing education and guidance. In this way, BeQuinT attempts to overcome the challenges faced by clinicians and transfusion committees in implementing PBM. In clinical haematology, one of the additional challenges is the need for an individual transfusion approach taking into account the patient's quality of life and practical aspects of care for chronically transfused patients. In this paper, an overview is presented of the past activities of BeQuinT and PBM implementation challenges followed by a brief focus on PBM in haematology.

(BELG J HEMATOL 2022;13(7):263-8)

INTRODUCTION

Key elements of quality in transfusion practice are the safety and availability of blood products, the safety of processes in the transfusion chain, the rational use of blood products and the maximal preservation of the patient's own blood. These measures should ultimately lead to an improvement of patient outcome.

In 2011 the Belgian health authorities (Federal Public Service of Public Health) have established a national committee called Belgian Quality in Transfusion (BeQuinT). BeQuinT's activities have led to a significant improvement of the quality of transfusion practice and a marked reduction in the use of red blood cells (RBC) in the Belgian hospitals.[1] Since 2018, BeQuinT started to focus more explicitly on the implementation of Patient Blood Management (PBM) following the international shift from a product-centred to a patient-centred focus.[2]

PBM is a patient-centred, systematic, evidence-based approach to improve patient outcomes by managing and preserving a patient's own blood, while promoting patient safety and empowerment.[3] This bundle of care is often organised in three pillars:

- first, timely detection of anaemia and iron deficiency to allow pharmaceutical and nutritional treatments to support erythropoiesis;
- second, minimisation of blood loss including prevention and proactive management of coagulopathy and use of devices or drugs with haemostatic properties, intra- and postoperative cell salvage, and minimisation of phlebotomy volume and frequency;

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Conflict of interest: The authors have nothing to disclose and indicate no potential conflict of interest.

Keywords: Blood transfusion, implementation, patient blood management, quality management.

- third, improving tolerance of anaemia mainly referring to evidence based indications for transfusion.[4-6]

In this paper, an overview is presented of the past activities of BeQuinT and PBM implementation challenges followed by a brief focus on PBM in haematology.

BEQUINT: IMPROVING QUALITY IN TRANSFUSION PRACTICE

Since the beginning (2011), the policy of BeQuinT has focused on 1) structural measures including legislation, funding, and reimbursement mechanisms, 2) data collection, analysis, and feedback, 3) education, and 4) guidance.

LEGISLATION, FUNDING, AND REIMBURSEMENT MECHANISMS

Since 1st of January 2014, all general Belgian hospitals receive funding as part of the financial resources budget to establish and maintain a quality system related to transfusion practices under the responsibility of a multidisciplinary team.[7] The team accomplishes the following tasks in collaboration with the transfusion committee: prevention, analysis, notification of transfusion reactions and incidents, organising training for staff involved in transfusion, ensuring the use of a blood tracking system and participation to national surveys of BeQuinT. The budget (4.686,691 EUR, indexed amount in 2021) is distributed among the hospitals according to their blood use and number and type of hospital beds and a lump sum of 10,200 EUR is allocated to each hospital for the use of a blood tracking system.

DATA COLLECTION, ANALYSIS, AND FEEDBACK

BeQuinT conducted three consecutive national surveys to study the quality of transfusion practices in Belgian hospitals.[1] The functioning of the transfusion committees and transfusion practitioners, training, the processes of ordering, transport, storage and tracking of blood products and the management of transfusion incidents and reactions were questioned. For each hospital, scores were attributed to several answer categories and converted to a score out of ten for each of the four chapters of the survey and a total score on 40, being the sum of the four scores for each chapter. Following each survey, feedback was provided to the hospitals through a national report, an anonymous benchmarking with individual scores, and an information session. This approach resulted in a significantly increased quality of transfusion practice in Belgian hospitals with an average total score increasing from 24.2 (2014) to 30.5 (2016) to 40. Moreover, a marked and structural decrease in RBC utilisation was observed at the same time. Hence, the authors concluded that this methodology was successful to increase awareness and involvement of transfusion committees and hospital managements to improve transfusion policy.[1]

EDUCATION

BeQuinT started the development of thirteen e-learning modules for physicians, nurses, midwives, and laboratory technicians addressing relevant topics ranging from the description of blood products and pre-transfusion testing to indications for transfusion, the administration of blood products, transfusion reactions and incidents. Additionally, experts were invited to yearly symposia and workshops for transfusion practitioners were held about the retrospective analysis of transfusion incidents (in 2015, 2016, and 2020).

GUIDANCE

In 2017 BeQuinT provided recommendations about the data that should be integrated in the Computerised Physician Order Entry (CPOE) of blood products and user-friendliness of the interface to facilitate the workflow, including an example of a mock-up.[8]

PROMOTING PATIENT BLOOD MANAGEMENT (PBM)

PBM is recognised and promoted by intergovernmental organisations such as the WHO and the European Commission, national health and blood authorities and international organisations such as the International Society of Blood Transfusion (ISBT), the Network for the Advancement of PBM, Haemostasis and Thrombosis (NATA) and the Society for the Advancement of Blood Management (SABM).[9-11]

HOW TO IMPLEMENT PBM IN A SUSTAINABLE WAY?

Comprehensive PBM implementation is challenging due to the wide range of clinical conditions of concerned patients, many clinical settings and many types of involved health care professionals.[12] To facilitate the translation of PBM research findings into practice, implementation science and change management are increasingly used and described in the scientific literature.[4,10,13-18]

Identified barriers to implement PBM have been described across the literature: access to knowledge and information, knowledge and beliefs about the intervention and tension for change.[13] Hofmann *et al.* found that **the need to change work practice and the need for collaboration and communication, were rated as the most prominent barriers for the implementation of PBM**.[4] Education, clinical

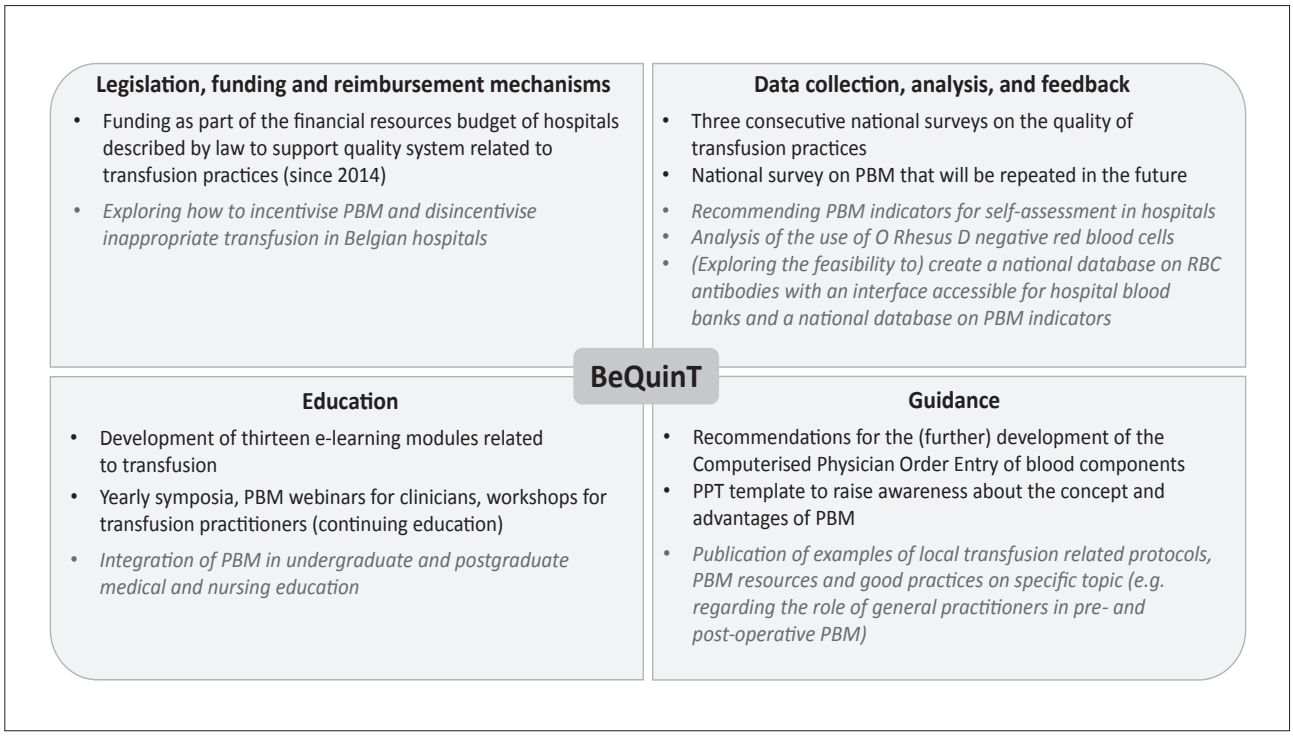

FIGURE 1. The past, current, and future[+] activities of BeQuinT.
[+]*Italic text.*

guidelines, protocol, audit and feedback, CPOE and computerised decision support have been used to improve adherence to transfusion/PBM guidelines but further research is required to suggest which implementation strategies are most (cost-)effective using validated implementation approaches.[13,19,20] The Kotter model for **change management** methodology described in the European PBM implementation guide illustrates key elements to anchor PBM in culture: exploring why change is needed, crafting the right messages for stakeholders at every step, monitoring short-term goals and creating moments of celebration for achieving measurable improvements.[10,21]

Sustainable PBM programmes require a comprehensive **project management** where each hospital should appoint key leaders to coordinate PBM implementation through a structured communication, education, and documentation, and most of all by creating the collaborations between diverse stakeholders including, for example the supplying blood establishment.[4,5] Therefore, transfusion practitioners (TP) from diverse backgrounds (e.g. nursing or laboratory management), are invaluable in supporting hospital PBM programmes.[22]

To facilitate institutionalisation, national policy makers and representatives of the Health Ministry should promote and coordinate PBM nationally.[4] Additionally, modifying the reimbursement systems and funding to incentivise PBM and disincentivise inappropriate transfusion is essential to increase the feasibility for hospitals to apply PBM.[4]

BEQUINT AND PBM

Since 2018, at the national level, BeQuinT took on this important coordinating role and started to actively promote PBM as a standard of care according to the same four domains used to improve the quality of transfusion practice.

LEGISLATION, FUNDING, AND REIMBURSEMENT MECHANISMS

BeQuinT will investigate how reimbursement systems and funding can be adapted in Belgium to incentivise PBM and disincentivise inappropriate transfusion.

DATA COLLECTION, ANALYSIS, AND FEEDBACK

Following a similar methodology used for the surveys on quality of transfusion practices in Belgian hospitals, BeQuinT has launched in 2020 an online survey on PBM in all Belgian hospitals with the aim of measuring and promoting the implementation of PBM. The survey consisted of five chapters: 1) organisational issues, 2) PBM in haemato-oncology, 3) pre-operative PBM, 4) intra- and post-operative PBM, and 5) PBM in internal medicine and geriatrics. For each hospital, scores were attributed to several answer categories and converted to a score out of

ten for each of the five chapters of the survey and a total score on ten, being the average of the five scores for each chapter. As the scores provide information on the degree of implementation on a national scale, the overall median score of 3.9 out of 10 suggested that there is already some preparedness but still a lot of room for improvement to implement PBM.[23] BeQuinT will repeat the PBM survey after some years to evaluate the hospitals' progress. Other initiatives will be taken to obtain more detailed and timely information on PBM indicators on a national scale.

EDUCATION AND GUIDANCE

Since 2021, BeQuinT organises PBM webinars for clinicians and provides PBM resources on its website.[24] Additionally, initiatives will be taken to integrate PBM in undergraduate and postgraduate medical and nursing education. Workshops for transfusion practitioners will be organised to promote their role to support PBM. Collaborations with the Superior Health Council, Belgian Health Care Knowledge Centre and professional societies will be considered for the drafting of guidance.

In addition to PBM, BeQuinT has the intention to focus on 1) haemovigilance, e.g. facilitating the benchmarking of reported transfusion incidents with the Federal agency for Medicines and Health Products and 2) immunohaematology, e.g. creating a national database to make previously detected RBC antibodies in patients readily available in hospital blood banks for efficient pre-transfusion testing and prevention of haemolytic transfusion reactions; and providing guidance for the prevention and follow-up of the risk of maternal foetal alloimmunisation. A summary of the past, current and future activities of BeQuinT is presented in *Figure 1*.

PBM IN HAEMATOLOGY IN BELGIAN HOSPITALS

Although many advances have been made in PBM in the past decades, there is still a paucity of evidence and clinical trials in chronically transfused patients, including in patients with haematological malignancies and bone marrow failure syndromes.[25] Being one of the largest consumers of blood products, PBM is likely to improve transfusion practice and patient outcome in clinical haematology.[26,27]

In 2020, all Belgian hospitals with transfusion committees (n=96) participated to a national survey of BeQuinT aiming to measure and promote the implementation of PBM. One of the five chapters of the survey addressed PBM in haemato-oncology.[23] The results of the survey showed that some PBM measures are implemented in many hospitals but that improvement in several issues is needed:

- the threshold for the transfusion of RBC in stable patients after intensive cytoreductive therapies including intensive chemotherapy and/or stem cell transplantation is not described in a written procedure in 64.5% of the hospitals*;
- less than 5% of hospitals use a procedure to individualise the RBC transfusion threshold in the outpatient setting by means of a comorbidity score and/or a quality of life (QoL) score;
- single-unit transfusion policy of RBC is not applied in 22.4%*;
- measures to limit iatrogenic blood loss are not applied in 35.5%* (*only applicable in the 76 hospitals with hospitalisation for standard care chemotherapy and supportive care or 'high care' chemotherapy in the context of acute leukaemia, autologous or allogeneic stem cell transplantation). Other PBM measures including the use of ESA and IV iron were also questioned but the interpretation of the answers is less relevant due to the reimbursement restrictions for the use of these drugs in this particular setting.

The need of individualised patient approaches in the haemato-oncological setting might complicate the implementation of PBM. There is lack of trials on restrictive versus liberal transfusion thresholds in patients undergoing intensive chemotherapy/radiotherapy or haematopoietic stem cell transplantation and also in outpatient settings for chronically transfused patients.[25] More research is needed to examine whether a higher haemoglobin (Hb) threshold in chronically transfused patients would improve QoL and, if so, what that Hb target should be and how the potential benefits in QoL and symptoms outweigh the risks of increased RBC usage such as transfusion reactions, iron overload, and cost.[25]

Potential strategies to reduce iatrogenic anaemia are the elimination of unnecessary laboratory tests, the use of small volume blood tubes to reduce phlebotomy volumes, the use of closed blood sampling devices, and substituting lab tests with point-of-care testing.[28] Myles *et al.* demonstrated that implementation of small volume blood tubes is an effective means of reducing iatrogenic blood loss in haematology patients (42% reduction in blood loss equivalent to 8.5 mL per patient per day) without substantially impacting on test quality or specimen integrity.[29]

CONCLUSION

BeQuinT chooses to include several aspects of quality of transfusion practices in its mission such as haemovigilance, immunohematology and PBM. In order to address barriers and implement the multimodal approach of PBM in a

KEY MESSAGES FOR CLINICAL PRACTICE

1 **PBM is internationally recognised and promoted as a standard of care.**

2 **The collection of data and feedback on a local level, education and involving all relevant stakeholders are essential elements to create a sense of urgency to implement PBM.**

3 **More research is needed on PBM in chronically transfused patients, including in patients with haematological malignancies and bone marrow failure syndromes.**

sustainable way, it focuses on creating and improving (existing) financial incentives, developing data-driven and IT-based tools, and providing education and guidance. Some PBM measures are already applied in haematology patients in Belgian hospitals. However, more research is needed for an individualised transfusion approach taking into account quality of life and practicalities of the care for chronically transfused patients.

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