



Adaptation *via* Automation: How One Blood Center Used Automation to Adapt During the COVID-19 Pandemic

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ABSTRACT

COVID-19 pandemic exacerbated the global blood supply which was already struggling to meet transfusion needs for patients around the world. Even countries successful in keeping up with the demand for blood products were profoundly impacted. Unpredictability in blood donor presentation and blood product availability continues to be an issue today. One blood center in the United States implemented strategic changes in blood product collection and donor recruitment strategies with the primary goal of maintaining blood donor engagement. Through these changes the blood center not only maintained donor engagement, but actually increased donation frequency while balancing blood product supply with demand.

Keywords: COVID-19 pandemic; Blood donation; Automation; Blood collection strategy; Software

INTRODUCTION

COVID-19 pandemic has impacted nearly every industry, including blood banking and transfusion medicine. As the world was upturned with lockdowns, stay-at-home orders and other public health guidance and restrictions, blood centers, like many businesses, were forced to change or even stop their normal operations. The pandemic exacerbated the existing challenges with recruiting blood donors that already strain the global blood supply. Prior to the COVID-19 pandemic, it was estimated that most countries-including every country in sub-Saharan Africa and South Asia-had blood shortages [1,2]. Once lockdowns were put into place, even countries successful in keeping up with the demand for blood products were profoundly impacted, as the World Health Organization (WHO) reported a 20%-30% reduction of blood supply [3]. Although many blood collection activities have resumed across the globe, demand still outpaces the supply. Blood collection organizations in Europe and the United States have issued stark warnings that blood donations are critically needed to help ease the strain felt since the onset of the pandemic [4-6].

One primary challenge with the blood supply during the COVID-19 pandemic was the cancellation of mobile blood

drives which account for the majority of blood products collected, especially in the United States [7,8]. Prior to the pandemic, one blood center reported 60% of donations were collected in mobile blood drives [8]. In response, blood centers focused their collection strategies at fixed sites where automation played a central role in managing supply and demand [8]. Blood centers had to incorporate measures to prevent transmission of SARS-CoV-2 such as temperature screening for donors and staff, social distancing and increased spacing between donor beds, disinfecting machines and surfaces between donations, and having donors and staff wear face masks [7,9]. The U.S. Food and Drug Administration (FDA) changed donor deferral guidelines to allow some deferred donors back into the donor pool [7]. At the same time, blood centers were challenged with collecting COVID-19 Convalescent Plasma (CCP) from people who had recovered from COVID-19 to treat patients with active infections [7-9].

Blood centers quickly established complex processes to recruit and screen donors, as well as process and distribute CCP following strict clinical trial criteria and regulatory requirements [9]. Time and time again, blood centers adapted to the evolving challenges imposed by COVID-19 and continued to provide blood products for patients in need.

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LITERATURE REVIEW

In a recent publication, Pina et al. published their experience using automation, specifically apheresis and software applications, to fine-tune blood center operations to meet demand for blood products [8]. This was a retrospective study of blood collections and donor presentation at Gulf Coast Regional Blood Center, which is a mid-sized blood center in the United States. In March of 2020 mobile blood drives were completely suppressed for a two-week period and then operated on a limited basis [8]. The blood center focused on collecting the deficit of blood from fixed sites [8].

At the beginning of the pandemic, Pina et al. reported an 'outpouring' of donors who wanted to donate blood [8]. In order to maintain donor engagement, the blood center decided to keep donor appointments, in particular apheresis platelet donors, but collected less products per donor. Collection targets were changed to collect only single platelet products per donor to prevent a surplus of platelet products; this is contrary to best practice of maximizing the number of blood products collected per donor by apheresis. This shift in collection strategy was intentional to maintain donor engagement and donation habits because turning away repeat donors may cause them not to return [10]. This adjustment to fixed site collections resulted in a 37% increase in apheresis procedures in 2020 compared to 2019. This increase in apheresis procedures offset the decrease in blood collections due to canceled blood drives [8].

Prior to October 2020, blood center leadership would communicate the prioritization of blood product combinations (single, double, or triple platelet products with concurrent plasma, and/or red blood cells) for collection by apheresis to staff on a weekly or even daily basis. The operator could choose to collect the maximum number of products offered by the apheresis device or choose to collect a less desirable product combination. By October 2020, blood center leadership at Gulf Coast had a strong understanding of hospital demand and focused on collecting only what was needed. At this point in time, blood center leadership assumed centralized control of blood product prioritization. The blood center leveraged 'focus lists' in order to collect only the number of blood products needed based on hospital demand and donor availability. Focus lists on the Trima Accel automated blood collection system (Terumo Blood and Cell Technologies) establish the priority of product combinations collected from each donor. In the United States, focus lists are programmed into the Vista Information System, which can be used to instantaneously transmit procedure priorities to all Trima Accel devices within an organization. Outside of the United States, this focus list functionality can be accomplished with the TOMEs (Terumo Operational Medical Equipment Software) system. Focus lists eliminated the need for leadership to communicate changes in collection priorities to staff. Instead, blood center leadership provided clear instructions that collections staff were to collect optimum procedure offered by the apheresis device, eliminating the need for staff to make decisions about collections. Pina et al. reported that collections staff achieved nearly 100% compliance of operators collecting the optimal procedure offered by the apheresis device [8]. By fine-tuning collection strategies to meet

demand, Gulf Coast decreased their platelet expiration rate from 6.8% before the pandemic to less than 4% during the pandemic [8].

In addition to adjusting collection strategies, Gulf Coast also adjusted donor recruitment strategies [8]. There was a concerted effort to recruit mobile blood donors to fixed sites using multiple channels including tele-recruitment, email communications, texting programs, and targeted advertising. Donors were converted to donate blood products based on what was needed on the day of presentation rather than what they donated historically. Gulf Coast has built a culture where all individuals who interact with donors have a responsibility to convert donors based on blood product needs [8]. The blood center also started a CCP collection program as early as April 2020, which resulted in the production of 11,638 units of CCP over a nine-month period [8]. CCP donors were not treated differently in terms of demonstrated interest or pre-qualification. If a donor failed to qualify for CCP donation, they were converted to donate a different type of blood product [8].

The blood center controlled the flow of blood donors by requiring appointments rather than walk-ins during the pandemic. Donors were required to make appointments, which resulted in almost doubling the total number of appointments compared to pre-pandemic levels [8]. Sixty-four percent (64%) of donors booked their own appointments with a show rate of 72% [8].

DISCUSSION AND CONCLUSION

Gulf Coast Blood Center made strategic changes to collection and donor recruitment strategies during the COVID-19 pandemic with the goal of maintaining donor engagement. The primary metric used by Gulf Coast to measure donor engagement is donation frequency (calculated as donations per donor) which increased by 12% from January 2020 to March 2021 [8]. Donor engagement and donor retention are important to blood centers because it is more expensive to recruit new donors than to retain existing donors [10]. In a recent study, Clement et al. confirmed that even temporary donor deferrals hurt future donation behavior [10]. With that in mind, Gulf Coast decided to continue apheresis donor appointments to maintain donor engagement but collected less product per donor to prevent a surplus. Blood center leadership controlled the number and types of products collected by apheresis using centralized focus lists. Leadership leveraged the combination of apheresis devices with software applications to manage collections staff behaviors to ensure the right products were being collected. This hardware/software ecosystem allowed blood center leadership to react to changes in the market and to fine-tune supply to better meet demand, resulting in a decreased platelet expiration rate.

Unpredictability in blood donor presentation and blood product availability continues to be an issue today. As the second year of the pandemic comes to an end and some blood centers are reporting severe blood shortages, Pina et al. continue to report success with an increase in product collections by 1.23% in 2021. Gulf Coast, an independent blood center,

credits their size, which allows them to be nimble and flexible, as a key to their success during the pandemic. Strategies used by this blood center to adapt to the pandemic may be beneficial to blood centers across the globe as the demand for blood products continues to strain the supply.

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