

2022 VACO Achievement Award Nomination

Category: Criminal Justice & Public Safety

Nominee: Whole Blood Project

Brief Overview

To promote best possible outcomes for our patients, Orange County's Fire & EMS Department undertook an innovative project in 2021 to carry lifesaving "whole blood" units aboard on-duty response vehicles. Whole blood refers to the completeness of the product, as distinct from components such as plasma, platelets, etc. Evidence supports the use of whole blood in emergency response since it replaces everything a patient is losing and does not require sophisticated diagnostic equipment to determine which component is needed. Our department was the first to achieve this in our area and was an overall leader across the Commonwealth of Virginia.

Accomplishing this goal required extensive training of more than 40 staff members, locating a reliable source for the blood units, writing new protocols and procedures to promote proper handling, and procuring new equipment to allow both preservation and preparation of blood units. As a result of these efforts, our staff can provide treatment, as quickly as possible, to help prevent one of the leading causes of patient mortality, blood loss. Going further, Orange County is able to support neighboring localities through mutual aid agreements.

Executive Summary:

Seconds count. These two words resonate with all Emergency Medical Services (EMS) personnel. In rural communities, the distance between the scene of an injury or illness and arrival at the hospital can have a tremendous impact on the chance of a positive outcome for a patient. EMS staff frequently transport trauma patients, and the loss of blood that accompanies such injuries is a leading cause of mortality for patients over 40 years old. Orange County is no different; however, our extended travel times to the closest hospitals is sometimes cause for concern when transporting trauma patients. While our county's location and the distance to hospitals with trauma centers cannot be changed, our Fire & EMS Department worked to bring one of the most precious hospital resources, blood, closer to home.

In 2021, Orange County took the innovative step to become the first location in central Virginia to carry "whole blood" into the field. Whole blood refers to the completeness of the product, as distinct from plasma, platelets, etc. Extensive evidence has demonstrated that whole blood results in better outcomes, since it replaces everything a patient is losing. Furthermore, diagnostic tools to determine which specific blood component is needed are not practical to bring along in an ambulance.

Achieving the goal was not a simple process, it required extensive training, new procedures, and the procurement of new equipment. While this effort is certainly deserving of an award, the primary beneficiaries are our residents, and those of neighboring localities, who are safer thanks to these efforts.

Main Nomination:

In recent years, Orange County has made a committed effort to lead the way with Public Safety. Examples include our Public Safety Building, Computer Aided Dispatch system, and P25 Digital Radio framework. Thanks to the efforts our Fire & EMS personnel, this commitment also includes the ability to carry lifesaving “whole blood” aboard on-duty response vehicles. Whole blood simply means blood in its complete form, with all components. Care facilities may employ the use of blood components, such as platelets or plasma, if they are able to determine which aspect is needed. In the field, whole blood has proven much more effective, since it replaces everything a patient may be losing due to trauma, without the need for additional equipment or time-consuming diagnosis. The ability to provide blood to a patient is game-changing; our personnel can begin treatment before arrival at a hospital, providing the best possible chance for positive outcomes.

In fact, the need was identified in part due to the extensive travel times experienced by our crews when enroute to our closest hospitals with trauma centers, either Mary Washington Hospital in Fredericksburg, or UVA University Hospital in Charlottesville. Either of these options require a significant travel time from our Public Safety Building. Given that time is of the essence, the ability to

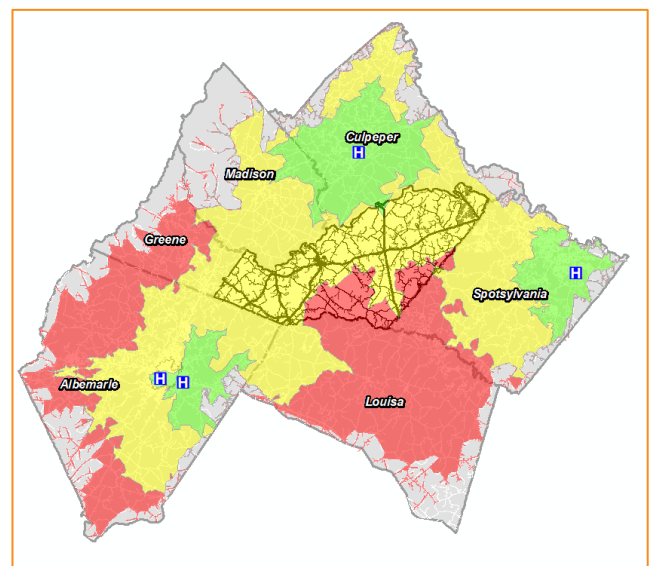


Figure 1: Drive time to local hospitals. Green: 0-15 minutes, Yellow: 15-30 minutes, Red: 30-60 minutes. Almost no locations in Orange County are within 15 minutes of a hospital. - Map Courtesy of Orange County GIS

provide blood as soon as crews arrive at the patient’s location can significantly help to prevent mortality due to blood loss during transport.

Achieving the goal was not a simple process. As the first locality in central Virginia to attempt to carry blood in the field, our staff were required to create much of the procedure along the way. Even looking beyond our region, Orange County was blazing a new trail. As our staff began planning, the only other agencies operating similar programs were located in northern Virginia, in much more densely populated localities. Their solutions required a partnership with their local hospital to supply blood or allow for enroute pickup when needed. As mentioned, our program was planned in response to our distance from hospitals; therefore, that method was not adaptable to our needs.

That being the case, our staff were forced to overcome several challenges. Foremost among these was sourcing blood. Following an extensive search, no local source proved practical; despite this, our staff were able to find a reliable provider and have been able to continuously maintain an active unit, as well as a reserve unit, since the program became operational. For maximum benefit, the blood must be compatible with the most patients possible. Of course, the O negative blood type is well known as a universal donor, but it is rare and not readily available outside of hospital trauma centers. For in-field use, O positive is the standard, as it is more common and still widely compatible. With that in mind, our in-field units are typed O positive.

The next challenge was implementation and training. Following Medical Director approval, procedures had to be developed to ensure that the blood was used properly and effectively. It was imperative that standard operating procedures avoided the waste of any units. Therefore, several pieces of specialized equipment were required. For example, dedicated carry bags store blood at the proper temperature, which preserves the units until needed. However, treatment cannot be administered while the blood is cold,

so warmers must be present on the response vehicle to bring the blood to a temperature at which it is safe to provide to a patient.

Logistical concerns addressed; training was still a critical hurdle to overcome. To ensure the best possible training, and thus the most effective use, Training Captain Mark Sikora contracted an expert trauma center nurse to instruct over 40 personnel in the proper use of the whole blood units. Preparedness is maintained with regular training, and as more localities are working on similar projects, it has recently



Figure 2: Orange County Fire & EMS Staff begin carrying whole blood into the field. Staff pose with the cooler and warmer units necessary to provide blood on the scene.

become a state requirement that agencies offering blood refresh their training annually.

The project has been a great success. The ability to administer blood to those in need long before arrival at the hospital is a force multiplier and greatly contributes to better outcomes. Since the program began, whole blood has been administered in the treatment of four patients. Orange County residents can rest assured knowing their first responders are both prepared and equipped to assist when emergency strikes. However, our department did not want to keep this lifesaving capability fenced within our borders. Instead, as the program officially became operational, Captain Sikora sent a mutual aid notification to our surrounding localities, alerting them to this treatment's availability if they should require such support (see figure three on page seven).

We believe this project should serve as an example to other localities, especially those in rural areas lacking quick access to hospital facilities. In fact, our staff are currently

working with our neighbors to help them develop similar capabilities. Orange County Fire & EMS's hard-won expertise is readily provided to those seeking advice. This achievement is award worthy due to the great improvement in treatment opportunities, the monumental effort required, and the cross-county cooperation it promotes.



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County of Orange Fire and EMS is pleased to announce the implementation of a long-awaited initiative. As of July 1, 2021, O positive whole blood will be available for administration. Blood will be carried on duty officer vehicles for rapid deployment throughout the county as needed. We are excited to offer this as a mutual aid service and are happy to do so as logistics allow. Please note that a COFEMS paramedic must accompany the patient and maintain responsibility for the administration of the blood products.

Should there be any concerns or questions related to this new protocol, please feel free to reach out to myself as the training officer at any time. I would be happy to obtain your feedback.

As always, thank you for your continued support of County of Orange Fire and EMS.

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Figure 3: Captain Mark Sikora's mutual aid notification was sent to our neighboring localities to alert them to the potential benefit of our whole blood program.