BK-97005

Section 10. Summary of Safety and Effectiveness

COBE BCT requests that the attached "Summary of Safety and Effectiveness" for the Focussed System be distributed upon request under the Freedom of Information Act. This report is a summary of the information presented in this 510(k) submission.

Focussed System
Summary of Safety and Effectiveness

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Trade Name of Device: To be determined. This summary will use the project title, the Focussed System.

Common Name: Automated Blood Component Collection System

Classification Name: Automated Blood Cell Separator (21 CFR 864.9245)

Predicate Devices: COBE Spectra Apheresis System
(510(k)'s BK870022, BK900002, BK900004, BK920036, BK950056)

Device Description

The Focussed System is an automated blood cell separator intended for use in collecting blood components for transfusion. It has the capability to collect, as defined by country specific standards:

- Single Donor Platelets (SDP, > 3×10^{11} in the U.S)
- Double Platelet Products (DPP, > 6×10^{11} in the U.S.)
- Triple Platelet Products (TPP, > 9×10^{11} in the U.S.)
- SDP or DPP and a Unit of Plasma

The products collected will be dependent on the size (total blood volume), hematocrit, platelet count, and blood type of the donor. The blood center will manage their blood component inventory based on the specific needs of the prescribing physicians in their hospital or community.

Intended Use:

This device is intended to be used for collection, pre-storage leukoreduction, and storage of platelet products. Concurrent plasma products can also be collected depending on the needs of the blood center and the weight, total blood volume and hematocrit of the donor.

Technological Comparison:

The Focussed System disposable tubing set is equivalent to the sets used with the COBE Spectra Apheresis System. It generally uses the same materials, including the platelet storage bags, as used in the current COBE Spectra Extended Life Platelet Sets. The packaging and sterilization process are the same, and both sets are manufactured in comparable GMP-controlled medical manufacturing areas.

The Focussed System equipment uses the same centrifugal separation concept as the COBE Spectra. The Focussed System equipment is approximately 42 inches tall and 21 inches wide, and weighs less than 200 pounds. It is a transportable and automated system that separates whole blood into its major components: platelets, plasma, and red blood cells. The Focussed System uses a disposable tubing set with a cassette that automatically loads the tubing into the pumps, valves, and sensors. The touch screen display is designed to lead the Operator through the setup and operating procedures, and provide her/him with detailed alarm messages to assist in troubleshooting procedures.

The Focussed System uses five peristaltic pumps located on the front panel. During the collection process, whole blood is drawn from the donor and into the system by the inlet pump. As a result of the inlet and AC pump speeds, AC and whole blood are mixed near the needle stick at the configured inlet to AC ratio. The blood and AC mixture then enters the separation channel in the centrifuge. As the whole blood is separated within the channel, platelets and plasma are removed by the collect and plasma pumps. Any components not collected are directed to a reservoir on the cassette. RBCs are pushed from the channel into the reservoir by the pressure created from the inlet pump forcing more blood into the channel.

When the reservoir contains a sufficient volume of uncollected RBCs, plasma and platelets, a sensor is triggered which activates the return pump. The return pump interrupts the flow of incoming blood by pumping the return blood back through the single needle access to the donor until the level in the reservoir reaches the lower level sensor. Since the inlet pump remains at a constant speed, a small amount of blood is pumped back through the inlet line and into the channel. This recirculated blood allows the Focussed System to maintain a continuous flow of blood through the channel, which stabilizes the separation process.

Discussion of Clinical Data:

The safety and efficacy of the Focussed System were validated in a series of studies where the platelet and plasma quality were assessed. Feasibility studies concentrated on demonstrating safety for the blood component donor. These studies were followed by collection and storage studies that continued to look at donor safety, and evaluated platelet quality following 5 day storage with *in vitro*

assays. *In vivo* platelet quality was tested using a radiolabelled autologous platelet recovery and survival assay. Finally, platelet products were collected, stored and transfused into thrombocytopenic patients.

Donor Safety

Donor safety for the COBE Focussed System was evaluated with clinical procedures with paid donors. Blood trauma testing was done on donor blood samples drawn before and after clinical procedures, and the results compared. Adverse events were recorded for all Focussed System collection procedures.

Overall, a total of 33 runs have been performed in the laboratory and 29 runs in the clinic with extensive blood trauma measurements taken. No significant blood trauma was seen. A total of 408 clinical runs have been completed worldwide with no significant adverse effects noted.

In vitro Platelet Function

The *in vitro* assays used to evaluate the collected platelet products are listed in Table 1. The assays were performed according to the standard operating procedures of each laboratory.

Table 1. *In vitro* Platelet Function Assays

Assay
BLOOD DONOR SCREEN: Blood Borne Virus Tests
BLOOD CELL COUNT: CBC WBC (Nageotte Count)
PLATELET ACTIVATION: GMP-140 Platelet Morphology Hypotonic Shock Response
BLOOD GAS: pH PO_2 PCO_2
MICROBIAL CULTURES: Bacterial and Fungal

The results from the 5 day *in vitro* platelet storage measurements were acceptable and supported the decision to proceed to the autologous transfusion phase of the study.

In vivo Platelet Function

The most convincing data demonstrating platelet function is the *in vivo* autologous radiolabelled platelet recovery and survival studies. Summary data from two clinical centers is in Table 2. These results show no difference when platelet products collected using the Focussed System and the COBE Spectra are compared.

Table 1. *In Vivo* Platelet Recovery and Survival (Mean ± SD)

Center 1 N = 10	Spectra	Focussed	p value
Recovery	56.8 ± 7.80%	57.2 ± 7.78%	0.77
Survival	164.97 ± 16.16 hr.	166.86 ± 27.83 hr.	0.79
Center 2 N = 10			
Recovery	64.6 ± 11%	65.4 ± 11%	0.53
Survival	160 ± 17.4 hr.	150 ± 17.5 hr.	0.14

Platelet Transfusion Studies

These studies were done in three different centers. Thrombocytopenic patients requiring platelet transfusions were identified. Ninety-nine (99) of the platelet products collected in these three centers were transfused. In one study, 29 Focussed System platelet products were collected for transfusion. In 11 out of the 12 transfusions where CCI data was reported, the CCI's were greater than 7.5. There was no indication in the *in vitro* data that the unit with a CCI of less than 7.5 was not functional. These CCI data support the results reported earlier in the radiolabelled autologous platelet recovery and survival study, and show that the platelet collected using the Focussed System are functional upon transfusion.

Leukoreduced Platelet Products

There were 244 platelet collections evaluated for white cell count. The log normal plot developed from the white cell count data predicts that 95.8 percent of platelet products collected using the Focussed System will have less than 1×10^6 white cells per unit, with 97.5% with less than 5×10^6. The Focussed System uses a computerized on-line process that monitors for conditions known to increase the WBC contamination levels. The Focussed System will notify the operator when a platelet product needs to be counted for white cells.

Plasma Product Quality

The results from plasma component assays demonstrate that the Focussed System can collect concurrent plasma during platelet collection procedures. The studies comparing the plasma products collected on the Focussed System to those collected on COBE Spectra showed that the plasma products were

comparable, with no clinically significant differences. The mean levels of Factor VIII were well above the 50 International Units per product, as per the AABB standards for Factor VIII.

Conclusion

Donor blood trauma measurement taken before and after the collection procedures, and adverse events recorded for all procedures, demonstrate that the safety of the Focussed System is comparable to the COBE Spectra Apheresis System and to other Automated Blood Cell Separators currently available for sale in the United States.

The data collected during the Focussed System clinical studies evaluating the collection, storage and transfusion of platelet products demonstrate that these products are safe and effective when transfused. Results from the definitive test, the autologous radiolabelled recovery and survival assay, show no difference when platelet products collected using the Focussed System and the COBE Spectra are compared. The platelet transfusion studies done in the United States and Europe demonstrate that the Focussed System can be used by typical Operators to collect platelet products, and that those products are functional upon transfusion. The results from the concurrent plasma products collected during these procedures showed that there were no clinically significant differences when compared to products collected using the COBE Spectra.