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STATSPIN® EXPRESS 3 PRIMARY TUBE CENTRIFUGE: EVALUATION FOR USE IN BLOOD BANK TESTING

Sponsored At:
Newton-Wellesley Hospital,
Newton, Massachusetts

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StatSpin® Express 3 Primary Tube Centrifuge: Evaluation for use in Blood Bank Testing

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Introduction:

The Newton-Wellesley Hospital Blood Bank evaluated the StatSpin® Express 3 centrifuge (Iris Sample Processing, Westwood, MA) for the purpose of preparing samples for pre-transfusion testing. The results obtained from samples prepared using the Express 3 centrifuge were compared with those obtained from samples prepared using the existing centrifuge, Silencer® 2110 Automatic Digital Desktop Centrifuge (Global Focus Marketing & Distribution, Dallas, TX).

The StatSpin® Express 3 centrifuge can generate platelet-poor plasma in an EDTA sample spun for 2 or 3 minutes at a speed of 7,200 rpm. The Silencer® 2110 centrifuge is programmed to spin samples for 10 minutes at 3,500 rpm. (See Table 1 for Centrifuge Specifications.)

Table 1: Centrifuge Specifications

	Silencer® 2110	StatSpin® Express 3
Dimensions	13”w x 15.5”d x 13.25”h	11”w x 10”d x 7”h
Weight	approx. 40 lbs	8.75 lbs
Acceleration	approx. 10 seconds	≤ 25 seconds
Deceleration	approx. 25 seconds	≤ 30 seconds
dB(A)	62	< 65
RPM (as tested)	3,500	7,200
RCF (as tested)	1,789 g	4,400 g
Fixed rotor head capacity	12	8
Tube sizes	(not available)	1.5 – 10 mL
Rotor	horizontal	fixed angle

Objective:

This study evaluated if the Express 3 would generate a sample suitable for Blood Bank testing (using either the 2-minute or 3-minute spin time) that was comparable to a sample prepared using the existing centrifugation method. Pre-transfusion testing samples are collected in a 6-mL BD Vacutainer® Plus EDTA tube, P/N 367899 (Becton Dickinson, Franklin Lakes, NJ).

Method:

Thirty samples were collected from random patients who needed to have pre-transfusion testing. These paired samples were subject to a 2-minute centrifugation time in the StatSpin® Express 3 and a 10-minute spin in the Silencer® centrifuge. The samples were tested in parallel. Testing included:

- **Visual examination of the samples after centrifugation to determine any obvious problems such as hemolysis or failure to pack the cells adequately**
- **Antibody screen (3-cell) using the Ortho ID-Micro Typing System™ manual gel card (Ortho-Clinical Diagnostics, Raritan, NJ)**
- **ABO and Rh testing using a tube method**

The antibody screens were done using the same gel card, with 3-test wells used for the Express 3 sample, and 3-test wells used for the other sample. Using this technique, the antibody screen results could be examined from the two samples simultaneously to make a direct comparison.

This same procedure was done using 30 samples that were spun for 3 minutes. A total of 60 comparisons were made overall. (See Table 2 for Data Analysis.)

Table 2: Data Analysis

	Negative Ab Screen	Positive Ab Screen	Total
Silencer® 2110	59	1	60
StatSpin® Express 3	59	1	60
Total	118	2	120

Results:

There were no false negative or false positive antibody screen reactions seen with the StatSpin® Express 3 samples when compared with samples prepared using the other centrifuge. There were no typing discrepancies recorded. One concern was whether the higher centrifugation speed of the Express 3 would damage the red cells. There were no instances where red cell hemolysis was observed directly (hemolyzed plasma) or in the supernatant of a saline-washed cell suspension prepared from these centrifuged samples.

The only observed difference was in the cell separation line in the StatSpin® Express 3 samples. The red cells did adhere to one side of the tube to about 0.5 inches from the red cell interface. This did not cause any problems with pipetting plasma or cause any red cells to be introduced into the plasma samples. The cell separation line in samples spun in the Silencer® 2110 centrifuge was level, with no red cell adherence to the side of the sample tube.

Conclusion:

The faster centrifugation speed and shorter centrifugation times available on the Express 3 produced samples suitable for pre-transfusion testing at Newton-Wellesley Hospital. The shortened centrifugation time trimmed the average turn-around-time for a type and screen by 7-8 minutes. The necessary pre-transfusion testing could be completed in about 37 minutes. Using the

Silencer® 2110 and the 10-minute centrifugation time, the average turn-around-time for a type and screen was 45 minutes. (The Ortho ID-Micro Typing System™ uses a 15-minute incubation of the test card, followed by a 10-minute centrifugation step.)

Several Blood Bank staff members on different shifts participated in the evaluation of this centrifuge. There were no operational problems encountered during the trial period and all staff members were favorably impressed by its ease of operation, and the testing results observed.

There was no statistical difference in test results using the StatSpin® Express 3 centrifuge when compared with the Silencer® 2110 centrifuge.

Once Standard Operating Procedures are approved, the Newton-Wellesley Hospital Blood Bank will use the Express 3 for preparation of samples for routine pre-transfusion testing.

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