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# Comparative Clinical Effectiveness of Intraoperative Autotransfusion during Cardiac Surgery: Does the Type of Device Make a Difference?

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**Purpose**
The use of automatic cell washers to collect and process shed blood during cardiac surgery is an effective component of a blood management program in reducing allogeneic transfusion rates. Several commercially available devices are available to facilitate intraoperative autotransfusion (IAT), which may confer differential benefits based upon the processing methodology. The present study was undertaken to clinically evaluate two distinct IAT systems in adult patients undergoing cardiac surgery for acquired heart disease.

**Methods**
All adult patients undergoing cardiac surgery over a two-year period were entered into the study. The autotransfusion systems evaluated were the Haemonetics™ Cell Saver V® (CSV) and the Terumo™ Fresenius Continuous Autotransfusion System® (CATS). Each system was used sequentially for approximately one calendar year. All patients were treated using established algorithms as part of the institutional goal-directed patient management processes. Subcategory analysis was undertaken to assess off-pump and on-pump procedures. The primary end-points were processing volumes and transfusion rates.

**Results**
There were no intergroup preoperative differences in any demographic, hemodynamic or hematological variable for the 320 patients enrolled in the study (CSV, n=150, CATS, n=170). The post-CPB IAT processed volume was greater in the CSV group compared to CATS (3,090.8±1,775.7 mL vs. 2,590.3±997.1 mL, p<.048) as well as the IAT returned volume (1,012.1±477.6 mL vs. 814.9±420.8 mL, p<.012). More patients in the CSV group did not have autotransfusate volume returned compared to patients in the CATS group (22.7% vs. 2.9%, p<.0001). Allogeneic operating room transfusion rates were similar between groups but a higher percentage of patients were transfused in the

cardiovascular intensive care unit in the CSV group compared to CATS patients (31.3% vs. 17.6%, p<.004). Subcategory analysis revealed that on-pump group had higher total IAT returned volumes in the CSV group versus CATS (1,029±517.0 mL vs. 807.5±412.4 mL, p<.006). For off-pump procedures 43.6% of patients had no IAT volume returned in the CSV group, versus 4.9% of patients in the CATS group (p<.0001).

**Conclusions**

In conclusion, utilization of the CSV resulted in a higher percent recovery of processed red blood cells, but fewer patients received IAT volume resulting in a higher percent of patients transfused in the postoperative period.