

# COMPARATIVE ANALYSIS OF VASC-ALERT VS. TRANSONIC

This document summarizes a retrospective analysis of a year of data from a large dialysis center with 534 graft and fistula patients. The analysis compared the effectiveness of Vasc-Alert and Transonic over the course of a year, and focused on two questions: ‘Which technology anticipated more problems?’, and ‘Which technology anticipated problems earlier?’<sup>1</sup>

While this analysis reviewed the data as provided by the center, the data was not collected in advance with the idea that it would be analyzed. As a result, the findings presented here should be considered in this light and not as a definitive ‘study’ based on a rigorous protocol. However, these results have prompted a larger, multi-site study, which will begin soon.

## Data and procedures

Data for the analysis included a list of surgical and radiological interventions, a list of Transonic alerts, and a list of Vasc-Alert alerts. The determination of a Transonic alert was made following the standard criteria: i.e., a patient alerts when there is a flow of less than 600 mL/min. or where there was flow less than 1,000 mL/min. that has decreased by more than 25% over the prior 4 months. An alert from Vasc-Alert is defined as three consecutive values over the threshold of 0.55. The Vasc-Alert data contained both the VAPR alerts (alerts predicting problems on the venous side) and AAPR alerts (alerts predicting problems on the arterial side).

The analysis looked for predictions from both technologies of vascular access site problems, represented by an intervention being performed on a given patient. To be considered a valid prediction, the alert had to be within 90 days of the intervention.

## Which Technology Anticipated More Problems?

There were 136 patients during the year that had at least one problem. For this set of patients, Vasc-Alert flagged 74% of the patients who subsequently had an intervention; Transonic flagged patients with problems 52% of the time. Conversely, the false negative rate for Vasc-Alert was 26%, and 48% for Transonic.

# Patients with at least one intervention n=136	
<b>Vasc-Alert</b>	Predicted at least one problem for <b>74%</b> of these patients. (n = 101)
<b>Transonic</b>	Predicted at least one problem for <b>52%</b> of these patients. (n = 71)

% of Patients Identified with Stenosis

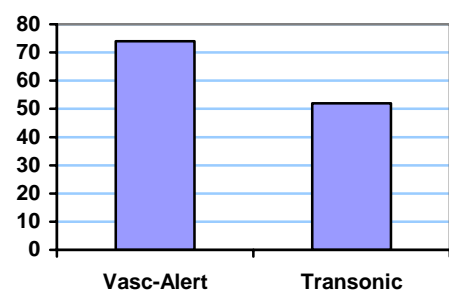


Table 1: Likelihood of each technology to catch at least one problem for patients with interventions

<sup>1</sup> Because the staff at the center did not in general send patients for revision based on Vasc-Alert results, there is no way in this analysis to gauge the number of false positives and true negatives associated with either technology. However, the data allowed a determination of true positives and false negatives (i.e., interventions that were not predicted by one or both technologies).

Vasc-Alert caught problems in 45 patients missed completely by Transonic. Transonic caught problems in 15 patients missed completely by Vasc-Alert.

### Which Technology Anticipated Problems Earlier?

There were 82 interventions that were predicted by both technologies<sup>2</sup>. Vasc-Alert preceded the earliest Transonic alert 74% of the time. Transonic predicted a problem earlier than Vasc-Alert 18% of the time. The two technologies tied 7% of the time.

# Problems predicted earlier n=82	
<b>Vasc-Alert</b>	Predicted the problem earlier <b>74%</b> of the time (n=61)
<b>Transonic</b>	Predicted the problem earlier <b>18%</b> of the time (n = 15)
<b>Tie</b>	The two technologies tied <b>7%</b> of the time (n = 6)

% of Problems Predicted Earlier

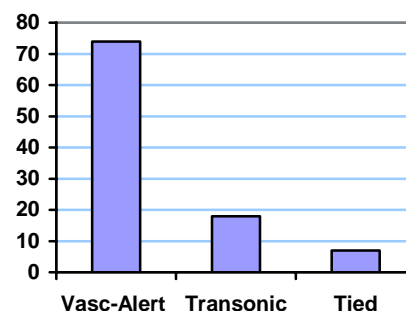


Table 2: Summary of how early were the predictions of Vasc-Alert and Transonic

Note: Vasc-Alert access calculations were made with each treatment. Transonic access measurements were made only once a month.

### How Much Earlier?

The average number of days by which an alert from Vasc-Alert preceded the earliest Transonic alert was 38 days. The average number of days by which a Transonic alert preceded the earliest alert from Vasc-Alert was 26 days.

Average number of days between first alert and intervention n=82	
<b>Vasc-Alert</b>	<b>38</b> days
<b>Transonic</b>	<b>26</b> days
<b>Tie</b>	n/a

Average Days of Extra Lead-Time

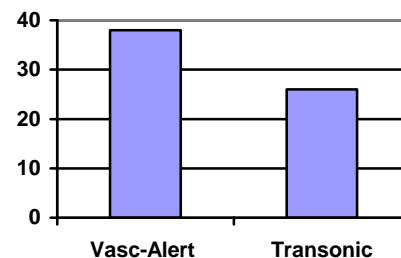


Table 3: Average days of lead-time between first alert and intervention

### Conclusions

These findings suggest that Vasc-Alert is more likely than Transonic to predict problems with individual patients and provide more lead-time to correct the problem. Patients therefore had a better chance of having a problem detected by Vasc-Alert than by Transonic. In a majority of cases where both technologies predicted a problem, Vasc-Alert predicted the problem earlier, and by a greater lead-time than Transonic.

<sup>2</sup> Some patients had multiple interventions.