Decision Support
Evidence Series

Improving the clinical management of critically ill patients during vasoactive blood pressure support[1]

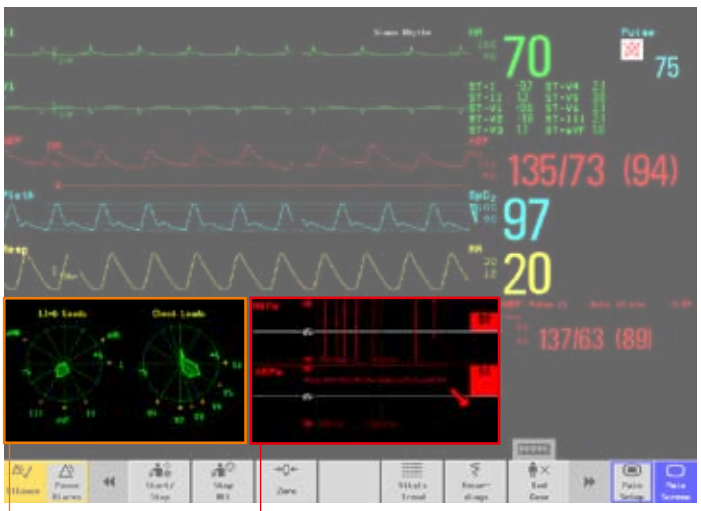
Karen K. Giuliano*, Greg Raber*, Jody Case**, Tara Drew**, Jill Donahue**

"The use of Horizon Trends helps us visually see how we are doing with IV medication titration in keeping our blood pressures at goal. It is nice being able to see trends with one quick look."

Tara Drew, RN and Jody Case, RN
Clinical Leaders, ICU
Concord Hospital
Concord, NH

Background

The management of blood pressure using vasopressor therapy is a fairly routine practice in the critical care setting. Most current bedside physiologic monitoring systems rely on audible alarms which are triggered when the patient's blood pressure drops above or below the alarm thresholds, often resulting in undesirable fluctuations in blood pressure. Little has been published regarding titration practices and the degree of compliance with a specified blood pressure range. Patients on vasoactive blood pressure support are hypoperfused by definition, putting them at increased risk for myocardial hypoperfusion and cardiac ischemia. Tighter control of mean arterial pressure may diminish post-operative complications and improve outcomes, as evidenced in studies on intraoperative and postoperative management of arterial pressure in cardiac surgery patients[2], and may decrease mortality in stroke patients[3].



Horizon Trends and ST Map were developed to provide meaningful and intuitive displays of actual clinical status to desired goals (Horizon Trends) and to make it easier to see any changes in the patient's ST segments (ST Map).

Purpose

The purpose of this study was twofold:

1. Assess whether or not the presence of an innovative display on the bedside monitor called "Horizon Trends" can improve the clinical management of patients on vasoactive blood pressure support .

2. Quantify the incidence of ST segment elevation or depression for critically ill patients on vasoactive blood pressure support.

Method

A total of 74 critically ill patients receiving titratable vasoactive medications for blood pressure support were used as study participants. Group 1 (N=30) used audible alarms for blood pressure management. Group 2 (N=21) used Horizon Trends in addition to the audible alarms. Group 3 (N=23) used both Horizon Trends and ST Map on the resting display. Information provided by this display was used to manage both the blood pressure and any ST segment changes in conjunction with the standard display. Continuous blood pressure measurements were recorded electronically using a laptop computer attached to the monitoring system, yielding over 4000 hours of continuously collected data. Demographic data on the study participants were also collected.

* Philips Healthcare, Andover, MA
** Concord Hospital, Concord, NH

PHILIPS

Results

Subjects in both the Horizon Trends group (Group 2) and the Horizon Trends/ST Map group (Group 3) had higher mean arterial blood pressures and spent more time within their target blood pressure ranges as compared to Group 1. These differences were significant between Group 3 and Group 1. No differences were found in the ST segments across the three groups. (Table 1)

Conclusion

Horizon Trends displays data that can be useful for blood pressure management using vasoactive medications in a way that appears to improve clinical practice. The impact of vasoactive blood pressure titration on ST Segment deviation requires further study.

	Mean BP mmHg	% of time at or above 65 mmHg	ST segments
Group 1 (n = 30)	68.1 (6.8)	63.7 (25.3)	
Group 2 (n = 21)	70.9 (7.2)	71.1 (21.6)	
Group 3 (n = 23)	74.7 (6.4)	81.1 (20.5)	
	p = .001*	p = .009	No differences across the groups

Table 1: means values and standard deviation for BP, % of time ≥ 65 mmHg

* Significant differences between groups 1 & 3

References

1. "Optimization of blood pressure management with vasoactive medications using Horizon Trends". Critical Care Medicine. 2008, 36(12) Suppl: A 62.
2. Cheung AT. Exploring an optimum intra/postoperative management strategy for acute hypertension in the cardiac surgery patient. Paper presented at symposium titled "Understanding Vasospasm to Improve Operative and Neurological Outcomes in Cardiac Surgery." American Association for Thoracic Surgery 85th Annual Meeting, April 2005.
3. Stead LG, Gilmore RM, Vedula KC et al. "Impact of acute blood pressure variability on ischemic stroke outcome". Neurology. 2006, 66(12):1878-1881.

Please visit www.philips.com/HorizonTrends

Philips Healthcare is part of Royal Philips Electronics

www.philips.com/healthcare
healthcare@philips.com
fax: +31 40 27 64 887

Printed in The Netherlands
4522 962 56581 * NOV 2009

Philips Healthcare
Global Information Center
P.O. Box 1286
5602 BG Eindhoven
The Netherlands