

**An individualized
hemodynamic optimization:
Tailoring the targets of therapy**

To The Editor,

The modern medicine endorses a growing trend towards a “precision” or a “personalized” management approach that fundamentally aims to customize the therapy in accordance

with the individual characteristics and needs, and in contrast to the conventional one-size-fits-all regimen.

The specific conceptualization of goal-directed therapy (GDT) involves the titration of fluids, inotropes, and vasopressors to “predetermined” physiological target values of the assessed hemodynamic variables aimed at adequate tissue perfusion. These “predetermined” targets are essentially the population-derived “normal” values which might not necessarily truly represent the optimal values for an individual patient. This notion is strengthened by the recent literature demonstrating a substantial degree of interindividual variability and biometric dependency of a number of hemodynamic parameters such as cardiac output (CO), global end-diastolic volume (GEDV), and extravascular lung water (EVLW) and so on.^[1,2]

Ever since the first description of GDT in the 1980s, the last three decades have witnessed considerable evidence on GDT accumulating from diverse perioperative settings. However, the adoption of GDT in the routine perioperative practice has been rather moderate owing to the poor understanding of the core principle. Saugel *et al.* recently outlined the 5-Ts of GDT including, the target patient population, the timing of intervention, the type of intervention, the target hemodynamic parameters, and the target specified values. This particular model could constitute the basis of an augmented implementation of GDT.^[3]

However, a nuanced perspective of the framework reveals the importance by correctly defining the targets of hemodynamic optimization. The present emphasis is on evaluating the role of accomplishment of personalized hemodynamic goals in improving the perioperative outcomes. Futier *et al.* demonstrated the role of an individualized blood pressure management regimen in minimizing the risk of postoperative organ dysfunction following abdominal surgery.^[4] Moreover, a functional form of an adaptive multi-parametric hemodynamic monitoring, characterizing the fluid responsiveness employing dynamic cardiac preload variables provides a viable substrate for individualized hemodynamic management. Salzwedel *et al.* focused on a pulse pressure variation based on CO individualization, relying on a similar concept.^[5] They depicted a significantly decreased rate of postoperative complications. However, the individualized perioperative hemodynamic goal-directed therapy in major abdominal surgery (iPEGASUS) trial outlined a comparable complication rate following the GDT protocol of an individually optimized CO.^[6] Ackland *et al.* emphasized the significance of an individualized oxygen delivery targeted hemodynamic

management at alleviating postoperative morbidity following high-risk surgery.^[7]

To conclude, an individualized hemodynamic optimization addresses the concept of personalized normal hemodynamic variables adjusted for the biometric profile and the clinical context which could serve as the situational optimal target values. This approach may facilitate a sound assessment of the adequacy of the hemodynamic status of an individual patient thereby, tailoring the perioperative goal-directed therapeutic regimen. Considering the upcoming digital innovations and the technical metamorphosis of hemodynamic monitoring, the future of a personalized hemodynamic management is certainly bright.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Access this article online	
Quick Response Code:	Website: www.joacp.org
	DOI: 10.4103/joacp.JOACP_299_19

How to cite this article: Magoon R, Kapoor PM, Choudhury A, Karanjkar A. An individualized hemodynamic optimization: Tailoring the targets of therapy. *J Anaesthesiol Clin Pharmacol* 2020;36:274-6.
Received: 11-Sep-2019 **Accepted:** 24-Sep-2019 **Published:** 15-Jun-2020
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