

## CORRESPONDENCE

from the supplementary oxygen flowmeter should always be verified when a machine is placed into service.

Our department developed a policy that states that operating room circulating nurses who apply supplemental oxygen must obtain their supply from separate flowmeters connected directly to wall-mounted oxygen fittings. Only anesthesiologists and certified registered nurse anesthetists may use the anesthesia machine for an oxygen source because of the potential problems described in this letter.

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## Hypotension and Spinal Anesthesia

*To the Editor:*—The recent study by Carpenter *et al.*<sup>1</sup> imposes a few specifications concerning the definition and prevention of hypotension during spinal anesthesia.

First, as pointed out by the authors, the definition of hypotension during spinal anesthesia is controversial.<sup>1</sup> Nevertheless it seems to be unsafe to define hypotension as a systolic blood pressure of less than 90 mmHg. Rather than an arbitrary value, hypotension usually is defined as a decrease of systolic blood pressure of more than 30% from the baseline.<sup>2</sup>

Second, the authors have found many risk factors for hypotension during spinal anesthesia, but they omitted discussing the role of fluid loading in preventing hypotension. Venn *et al.*<sup>3</sup> found a tendency toward a more stable systolic blood pressure after fluid loading in patients in whom the block extended to T5 or above, whereas others found it less effective.<sup>4</sup> It seems that different volumes of fluid loading are the reason for these contradictory results.

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*In Reply:*—Szmuk *et al.* state that our definition of hypotension seems unsafe and then suggest that it would have been more appropriate to define hypotension as a 30% decrease from baseline. Szmuk *et al.* may be correct. However, it is not possible to define the lowest acceptable blood pressure for any individual patient using routine anesthetic monitoring techniques. Furthermore, the absence of data on this topic precludes a definitive conclusion and leaves our study open to criticism of what seems to be appropriate.

In defense of our definition, we do not agree that relative definitions of hypotension would have reduced the risk or improved our ability to interpret the data. For example, a recent epidemiologic publication utilized  $\geq 20\%$  decline in blood pressure from baseline (measured

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immediately prior to induction of anesthesia) as a relative definition of hypotension.<sup>1</sup> Although this is a concise definition, the clinical relevance of a 20% (or even a 30%) decline is questionable for at least two reasons.

First, blood pressure normally decreases by an average of 20% with sleep each night,<sup>2</sup> yet the effect of sleep on blood pressure is not considered to place individuals at risk for morbidity or mortality. Second, selection of an accurate and representative baseline blood pressure is difficult (a critical factor that is often ignored). Blood pressure measurements made immediately prior to induction of anesthesia can be considerably higher or lower than those measured in the clinic or hospital and thus may not accurately represent the