

## Defining Hypotension during Anesthesia: Comment

To the Editor:

In their otherwise excellent review, Brady *et al.*<sup>1</sup> made an error in recommending subtracting 1.35 mmHg per 1 cm of head elevation in order to account for the difference in the projected blood pressure at the Circle of Willis (where the pressure is needed for cerebral perfusion) and the arm (where the blood pressure is measured). By their recommendation, since 2.54 cm = 1 inch, 1 inch of height would correspond to a 3.43 (1.35 × 2.54) mmHg—pressure adjustment. The correct adjustment should be approximately 0.75 mmHg per vertical centimeter, or approximately 2.0 mmHg per vertical inch. This may not apply if an arterial line is used. Regardless of the insertion site of the arterial line, if the zero point of the transducer is on the same horizontal plane as the Circle of Willis, no adjustment is necessary for determining the pressure at the Circle of Willis. If the zero point of the transducer is at a different vertical position, then an adjustment is needed.

### Competing Interests

The author declares no competing interests.

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DOI: 10.1097/ALN.0000000000003378

### Reference

1. Brady KM, Hudson A, Hood R, DeCaria B, Lewis C, Hogue CW: Personalizing the definition of hypotension to protect the brain. *ANESTHESIOLOGY* 2020; 132:170–9

(Accepted for publication April 16, 2020. Published online first on May 28, 2020.)

## Defining Hypotension during Anesthesia: Comment

To the Editor:

In the Discussion section of their article, “Personalizing the Definition of Hypotension to Protect the Brain,”<sup>1</sup>

Brady *et al.* state that when a patient’s head is elevated above the horizontal, one should estimate blood pressure at the Circle of Willis by “subtract[ing] 1.35 mmHg per 1 cm of head elevation from blood pressure measured from arm or leg.” Since the density of mercury is 13.6 times greater than that of water, each mmHg corresponds to 13.6 mm H<sub>2</sub>O (or 1.36 cm H<sub>2</sub>O) and each cm H<sub>2</sub>O corresponds to a pressure of  $1/1.36 = 0.74$  mmHg. Therefore, the appropriate correction is to subtract 0.74 mmHg for each centimeter of head elevation above the horizontal.

### Competing Interests

The author declares no competing interests.

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DOI: 10.1097/ALN.0000000000003379

### Reference

1. Brady KM, Hudson A, Hood R, DeCaria B, Lewis C, Hogue CW: Personalizing the definition of hypotension to protect the brain. *ANESTHESIOLOGY* 2020; 132:170–9

(Accepted for publication April 16, 2020. Published online first on May 28, 2020.)

## Defining Hypotension during Anesthesia: Reply

In Reply:

We wish to thank Drs. Roth<sup>1</sup> and Gross<sup>2</sup> for pointing out a typographical error in our recent Clinical Focus Review in *ANESTHESIOLOGY*.<sup>3</sup> In the next to last paragraph of that review we erroneously stated that 1.35 mmHg should be subtracted from blood pressure measured at the heart level for each 1 cm of head elevation, such as with “beach chair” patient positioning. The aim of that subtraction is to obtain an estimate of the blood pressure at the Circle of Willis as widely discussed.<sup>4</sup> We meant this sentence to read: 1 mmHg should be subtracted from the blood pressure measured at heart level for each 1.35 cm of head elevation, or more precisely, 0.74 mmHg for each 1 cm of head elevation.

## Research Support

This work was funded in part by National Institutes of Health grant No. R01HL092259 (Bethesda, Maryland; to Dr. Hogue).

## Competing Interests

Dr. Hogue has served as a consultant and provide lectures for Medtronic, Inc, (Minneapolis, Minnesota) and Edwards Lifescience (Irvine, California), and indicates a financial relationship with Merck, Inc. (DSMB, Sugamadex).

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DOI: 10.1097/ALN.0000000000003380

## References

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2. Gross JB: Defining hypotension during anesthesia: Comment. *ANESTHESIOLOGY* 2020; 133:461
3. Brady KM, Hudson A, Hood R, DeCaria B, Lewis C, Hogue CW: Personalizing the definition of hypotension to protect the brain. *ANESTHESIOLOGY* 2020; 132:170–9
4. Drummond JC: A beach chair, comfortably positioned atop an iceberg. *Anesth Analg* 2013; 116:1204–6

(Accepted for publication April 20, 2020. Published online first on May 28, 2020.)

# Preventing Infection of Patients and Healthcare Workers Should Be the New Normal in the Era of Novel Coronavirus Epidemics: Comment

To the Editor:

We read with great interest the editorial by Bowdle *et al.*<sup>1</sup> We wish to describe what Spanish

anesthesiologists and healthcare professionals are experiencing with the first pandemic of the twenty-first century, caused by a new coronavirus. The disease is highly contagious and has therefore spread faster than previous coronavirus infections. The disease has surpassed the capacity of even the most solvent healthcare systems. The natural tendency is to collapse, making it inevitable to ration health resources. The situation in our country, Spain, which currently presents the steepest infection curve, is particularly striking. All Spanish governments to date have boasted about the excellence of the national health service, considering it the “jewel in the crown.” And rightly so, given the high standard of clinical results and quality of care, even in times of budget constraints. This has largely been achieved at the cost of substandard working conditions (understaffing, extended shifts, and poor pay) and cutbacks on resources to protect staff from occupational risks. Unfortunately, it has taken a coronavirus to reveal the extent of these shortcomings, and it comes as no surprise that 12,300 Spanish health professionals have so far been infected, with 2,000 infections registered today. This represents 15% of total infections, a far higher percentage than countries such as Italy (8.67%), China (4.12%), or the United States (1.42%). Our patients have been protected—a source of pride for all—but our healthcare professionals, the foundation of our system, have been sorely neglected. This has an enormous impact. Our colleagues are “falling like flies,” reducing the number of healthcare workers on duty and our capacity to treat our patients, and producing further infections in patients and colleagues. Staff numbers are severely depleted, and we are now reduced to recalling retired doctors and recruiting trainees and even medical students. There are two reasons for this: (1) personal protective equipment, which was scarce even at the start of the outbreak, is now entirely lacking, and (2) symptomatic healthcare workers cannot be polymerase chain reaction–tested, so the authorities have to allow them to continue working.

At the start of the outbreak, hospital departments went to great lengths to draw up local protocols to ensure the highest quality of care for patients with coronavirus disease 2019 (COVID-19). However, many of these protocols are infeasible due to lack of material resources.

Anesthesiologists perform high-risk procedures such as endotracheal intubation, with the consequent risk of contamination from secretions, blood, droplets, and aerosols.<sup>2,3</sup> These procedures warrant special measures and should be performed using appropriate personal protective equipment for airborne precautions.<sup>1,2</sup> However, we have no appropriate masks, hazmat suits, goggles, or face shields. The safety of healthcare workers and the enforcement of stringent precautions to control infection should be our highest priority. But our day-to-day reality is far removed from these laudable principles.

## Competing Interests

The authors declare no competing interests.