

pressure usually decreases well below the patient's baseline or preoperative level to MAPs of 60 to 70 mmHg. If these low cuff blood pressures are not restored toward baseline levels and may even drift down further to MAPs in the 40- to 60-mmHg range, cerebral perfusion pressure will be in the 20- to 50-mmHg range.

Therefore, it is critically important, when evaluating the etiology of brain death or stroke in these patients, to account for the gravitational effect on cerebral perfusion pressure in order to include severe hypotension leading to brain damage in the differential diagnosis of the ischemic stroke. Thus, it is recommended that cuff blood pressure be maintained at or near baseline to better protect cerebral perfusion.<sup>6,8,9</sup>

As Drummond states,<sup>10</sup> "We cannot take assurance from the notion that at any given time, 'some' of the brain is not ischemic. It would be slim consolation to the devastated patient or their families to know that blood flow continues to some portions of the nervous system while disabling damage was evolving in others."

### Competing Interests

The author declares no competing interests.

David Jonathan Cullen, M.D. Harvard Medical School at Massachusetts General Hospital (retired), Boston, Massachusetts; and St. Elizabeth's Medical Center and Tufts University School of Medicine (retired), Boston, Massachusetts.  
djcullen1940@gmail.com

DOI: 10.1097/ALN.0000000000003919

### References

1. Vlisides PE, Moore LE: Stroke in surgical patients: A narrative review. *ANESTHESIOLOGY* 2021; 134:480–92
2. Enderby GEH: Postural ischaemia and blood pressure. *Lancet* 1954;23: 185–7
3. Drummond JC, Patel PM: Neurosurgical anesthesia, Anesthesia, 5th edition. Edited by Miller RD, Cucchiara RF, Miller ED Jr, Philadelphia, Churchill Livingstone, 2000, p 1903
4. Pohl A, Cullen DJ: Cerebral ischemia during shoulder surgery in the upright position: A case series. *J Clin Anesth* 2005; 17:463–9
5. Lee L, Caplan R: APSF Workshop: Cerebral perfusion experts share views on management of head up cases. *APSF Newsletter* 2009; 24:45–8
6. Murphy GS, Greenberg SB, Szokol JW: Safety of beach chair position shoulder surgery: A review of the current literature. *Anesth Analg* 2019; 129:101–18
7. Drummond JC: The lower limit of autoregulation: Time to revise our thinking? *ANESTHESIOLOGY* 1997; 86:1431–3
8. Shear T, Murphy G: Impact of the beach chair position on cerebral perfusion: What do we know so far. *APSF Newsletter* 2013; 28:18–20
9. Cullen DJ: Why worry about blood pressure during surgery in the beach chair position? *APSF Newsletter* 2020; 35:90–2
10. Drummond JC, Hargens AR, Patel TM: Hydrostatic gradient is important: Blood pressure should be corrected. *APSF Newsletter* 2009; 24:6

(Accepted for publication July 9, 2021. Published online first on August 16, 2021.)

The corresponding author of the original article referenced above has read the letter and does not have anything to add in a published reply.

## Liposomal Bupivacaine to Treat Postoperative Pain: Comment

### To the Editor:

We commend Ilfeld *et al.*<sup>1</sup> for their comprehensive review regarding the clinical effectiveness of liposomal bupivacaine when administered *via* infiltration or peripheral nerve block for postoperative analgesia. Since its approval by the U.S. Food and Drug Administration (Silver Spring, Maryland) in 2011, liposomal bupivacaine has been widely adopted and its clinical applications expanded.<sup>1</sup> In the midst of the opioid epidemic, it is easy to understand how long-acting, nonopioid alternatives like liposomal bupivacaine have been eagerly embraced by many physicians. Along with many regional anesthesiologists, we have remained open to the concept but skeptical of the results. The considerable increase in randomized, controlled trials over the last few years has not only shown that the "evidence fails to support the routine use of liposomal bupivacaine over standard local anesthetics,"<sup>1</sup> but it is also fraught with bias.<sup>1</sup> Not limited to the anesthesiology literature, these negative results have been reproduced in other specialties as well.<sup>2–4</sup>

With high-quality studies and a meta-analysis demonstrating that liposomal bupivacaine is not clinically superior to bupivacaine hydrochloride in pain score or length-of-stay measures,<sup>5</sup> one would expect to see an according decline in purchasing, as the 100-fold increase in the cost of liposomal

bupivacaine is difficult to justify.<sup>1</sup> On the contrary, sales and revenue from liposomal bupivacaine continue to grow,<sup>6</sup> undoubtedly owing to an aggressive marketing campaign. We have seen first-hand the results of this campaign, as many physician colleagues who are grounded in evidence-based medicine have shifted their practice to anecdotal medicine, insisting that liposomal bupivacaine exhibits superior pain control and leads to clinically significant reduced length of stay. Perhaps the dose influences their observations: We suspect that they are injecting the maximum dose of liposomal bupivacaine (*i.e.*, 266 mg), while using a lower dose of nonliposomal bupivacaine.<sup>1</sup> We have additionally observed that liposomal bupivacaine usage tends to be an institutional decision: If the hospital system has decided to purchase this expensive product, then surely it ought to be used. And so, as more practices and hospitals are infiltrated with liposomal bupivacaine despite an absence of strong evidence, where do we go from here?

As physicians, we must strive to practice evidence-based medicine and use evidence such as that presented by Ilfeld *et al.*<sup>1</sup> and Hussain *et al.*<sup>5</sup> to defend against inappropriate and wasteful healthcare costs. However, distinguishing between objective data and marketing bias may pose a challenge for providers seeking to stay abreast of the current evidence in their field, given the prominent role the industry plays in medical education.<sup>7</sup> Not too long ago, we witnessed the perils of the pharmaceutical industry's influence on medical education and practitioners and how this ultimately helped fuel the opioid epidemic.<sup>8,9</sup> Nowadays, in our determination to optimize postoperative pain control with nonopioid alternatives, are we repeating the missteps of the past by allowing the industry to again influence our practice without high-quality evidence? The continued intersection of the industry with medical education places us at risk of propagating non-evidence-based practices that may translate into little benefit, potential unforeseen harm, and unnecessary costs on an already taxed healthcare system.<sup>8,9</sup>

## Competing Interests

The authors declare no competing interests.

Ashley V. Wells, M.D., Ryan Lippell, M.D., Roniel Y. Weinberg, M.D., Tiffany R. Tedore, M.D., Michael Akerman, M.D. Veterans Affairs New York Harbor Healthcare System, NYU Langone Health, New York, New York (A.V.W.). awells2245@gmail.com

DOI: 10.1097/ALN.0000000000003882

## References

1. Ilfeld BM, Eisenach JC, Gabriel RA: Clinical effectiveness of liposomal bupivacaine administered by infiltration or peripheral nerve block to treat postoperative pain. *ANESTHESIOLOGY* 2021; 134:283–344

2. Abd-Elseyed A. Liposomal bupivacaine for surgical site infiltration. (Is it superior to plain bupivacaine?) *Reg Anesth Pain Med* 2021; 46:362
3. Feng JE, Ikwuazom CP, Slover JD, Macaulay W, Schwarzkopf R, Long WJ. Discontinuation of intra-operative liposomal bupivacaine in primary THA does not clinically change postoperative subjective pain, opioid consumption or objective functional status. *J Arthroplasty* 2021; 36:2062–67
4. Pedoto A, Noel J, Park BJ, Amar D. Liposomal bupivacaine versus bupivacaine hydrochloride for intercostal nerve blockade in minimally invasive thoracic surgery. *J Cardiothorac Vasc Anesth* 2021; 35:1393–8
5. Hussain N, Brull R, Sheehy B, Essandoh MK, Stahl DL, Weaver TE, Abdallah FW: Perineural liposomal bupivacaine is not superior to nonliposomal bupivacaine for peripheral nerve block analgesia. *ANESTHESIOLOGY* 2021; 134:147–64
6. Pacira Biosciences, Inc.: News release Pacira reports record revenues for 2020 of 429.6 million. 2021. Available at: <https://investor.pacira.com/news-releases/news-release-details/pacira-reports-record-revenue-2020-4296-million>. Accessed February 21, 2021.
7. Kearney P, Simoons M, Ryden L, Kirchhof P, Pries A, O'Morain C, Bax JJ: The medical profession, industry, and continuing medical education: Finding the balance that's right for patients. *Am J Med* 2019; 132:921–5
8. Van Zee A: The promotion and marketing of oxycontin: Commercial triumph, public health tragedy. *Am J Public Health* 2009; 99:221–7
9. Jones GH, Bruera E, Abdi S, Kantarjian HM: The opioid epidemic in the United States: Overview, origins, and potential solutions. *Cancer* 2018; 124:4279–86

(Accepted for publication June 14, 2021. Published online first on July 13, 2021.)

The corresponding author of the original article referenced above has read the letter and does not have anything to add in a published reply.

## Personal Protective Equipment: Comment

To the Editor:

Ruskin *et al.*<sup>1</sup> describe how personal protective equipment used because of COVID-19 impairs the performance of anesthesia clinicians and teams. They detail how reductions in the senses of sight, sound, and touch challenge