Hi, this is Evan Kharasch, Editor-in-Chief of Anesthesiology, with some highlights from the August 2020 issue, as selected by the journal editors.

We begin this month with an assessment of the anesthetic effects and adverse effects of the perioperative use of the gabapentinoioids gabapentin and pregabalin in adult patients. Dr. Michael Verret of Université Laval, Québec City, Québec, and colleagues there and elsewhere in Canada conducted a systematic review and meta-analysis. The primary outcome was the intensity of postoperative acute pain, and a minimally important difference of 10 percent. The authors analyzed 280 clinical trials that included nearly 25,000 patients. They found that gabapentinoids were associated with 9% less postoperative pain intensity at various time intervals compared to controls. This was statistically significantly less, however, this effect was not clinically significantly different. These results were consistent for both gabapentin and pregabalin. The use of gabapentinoioids was associated with a decreased risk of postoperative nausea and vomiting. However both peri- and normothermic normal and normal contralateral regions of the brain. Verret and colleagues there and the Free University of Brussels authored this review. They note that the role of the mineralocorticoid axis in critical illness has recently received renewed interest. They attribute this interest to the recent demonstration of the significant reduction in mortality in patients with septic shock treated with adjunctive glucocorticoids.

The authors concluded that there is evidence that burst suppression during cardiopulmonary bypass mediates the effect of physical function and temperature during cardiopulmonary bypass. Burst suppression may also mediate intraoperative electroencephalographic alpha power effects on postoperative delirium. Dr. Juan Pedemonte of Massachusetts General Hospital, Boston, and colleagues there and elsewhere conducted the study. This was a retrospective cohort observational substudy of the Minimizing ICU Neurological Dysfunction with Dexmedetomidine-induced Sleep (MINDDS) trial. The authors analyzed data from 159 cardiac surgery patients who were older than 60. They used kappa values to assess for associations and causality. They also used a validated questionnaire to evaluate delirium risk factors. The authors also analyzed electroencephalograph data for most of the patients. The incidence of delirium in patients with burst suppression was 25%. In contrast, 6% of patients without burst-suppression experienced delirium. In constructing a multivariable model for burst suppression, the authors identified physical function, lowest cardio- pulmonary bypass temperature, and electroencephalographic alpha power as predictors. They found that burst suppression and patient age emerged as predictors in the delirium multivariable model. Pedemonte and coworkers concluded that there is evidence that burst suppression during cardiopulmonary bypass mediates the effect of physical function and temperature during cardiopulmonary bypass. Burst suppression may also mediate intraoperative electroencephalographic alpha power effects on postoperative delirium. The authors of this review conducted a double-blind study in which the authors tested the hypothesis that phenylephrine reduces cerebral metabolic rate of oxygen compared with phenylephrine.

Next, we have a small clinical study that tested the hypothesis that an enhanced recovery pathway improves quality of recovery after one- to two-level lumbar fusion. Dr. Ellen Soffin and colleagues at Weil Cornell Medical College, New York, New York, conducted the double-blind study. They randomized 56 patients to receive either ephedrine or phenylephrine. The recovery. Enhanced recovery consisted of 17 evidence-based pre-, intra-, and postoperative care elements. The primary outcome was the quality of recovery—40 score at postoperative day 3. The authors found statistically significantly higher quality of recovery—40 scores in the enhanced recovery group. However, the difference did not meet the predetermined threshold of clinical significance. There was no difference in the incidence of adverse events. These results are statistically significant differences in Quality of Recovery—40 scores at days 0, 1, 2, 14 or 56. Some secondary endpoints were statistically different in the enhanced recovery pathway. These included time to oral intake, duration of patient-controlled analgesia use, and opioid consumption on postop day 1, but not day 2. The authors concluded that enhanced recovery strategies for spine surgery did not have a significant clinical impact.

Next, we have a rat study in which the authors tested the hypothesis that dorsal root ganglion stimulation is effective in reducing pain-like behaviors in chronic pain models in animals. Dr. Guoliang Yu of the Medical College of Wisconsin, Milwaukee, Wisconsin and colleagues there and at the First Affiliated Hospital of Zhengzhou University, Zhengzhou City, Henan, China, conducted the study. The authors provided dorsal root ganglion stimulation or direct spinal cord stimulation to rats that had either traumatic neuropathy via a tibial nerve injury, or knee osteoarthritis induced by intraarticular injection of monosodium iodoacetate. Control rats had no injury. The authors evaluated analgesia by testing a battery of pain-related reflexive, functional, and affective behaviors. In rats with nerve injury, multilevel L4 and L5 ganglion stimulation decreased hypersensitivity to noxious mechanical stimulation more than single level ganglion stimulation at L4. In rats with osteoarthritis, multilevel L3 and L4 ganglion stimulation reduced sensitivity to knee motion than single level ganglion stimulation at L3 or L4. The authors concluded that dorsal root ganglion stimulation is effective in neuropathic and osteoarthritic rat pain models with peripheral pathologic origins. This study demonstrates the effectiveness of ganglion stimulation in a placebo-free setting and suggests that this model may be a suitable platform for mechanistic studies.

Our Clinical Focus Review article this month examines the perioperative management of oral glucose-lowering drugs in patients with type 2 diabetes. Dr. Jean-Charles Preiser of Erasmus Hospital in Brussels, Belgium and colleagues there and the Free University of Brussels authored this review. They review the major categories of drugs to treat type 2 diabetes. These include drugs that inhibit endogenous hepatic glucose production, like the first-line drug metformin, those that lower blood glucose by increasing insulin release, those lowering glycemia by increasing insulin action, those reducing glucose absorption, and those increasing urinary glucose elimination. They summarize current recommendations for each drug class in patients having surgery. In the case of scheduled surgical procedures, previous guidelines recommended withholding oral glucose-lowering drugs. Based on recent literature, this tendency has shifted toward the continuation of treatment. In most cases, the continuation of glucose-lowering drugs seems safe, although treatment interruption on the day of surgery may be recommended due to fasting, reduced food intake, or risk of renal dysfunction. Preiser and coworkers note that many patients on glucose-lowering medication may worsen glycemic control and increase complication rates. Additionally, the inappropriate continuation of sulfonylureas or sodium glucose cotransporter-2 inhibitors may induce hypoglycemia or ketoacidosis.

Finally, we close this month with a Review article that addresses mineralocorticoid dysfunction during critical illness. Dr. Gladding Dakalo Nethathe of the University of the Witwatersrand, Johannesburg, South Africa, and colleagues there and at OCHSIN in South Africa and in Australia, wrote this review. They note that the role of the mineralocorticoid axis in critical illness has recently received renewed interest. They attribute this interest to the recent demonstration of the significant reduction in mortality in patients with septic shock treated with adjunctive glucocorticoids combined with fludrocortisone. Additionally, the effectiveness of...
angiotensin II in treating vasodilatory shock has sparked renewed interest. The authors note that glucocorticoids have variable interactions at the mineralocorticoid receptor. Similarly, mineralocorticoid receptor–aldosterone interactions differ from mineralocorticoid receptor–glucocorticoid interactions and predicate receptor–ligand interactions evoke different cellular effects. Hyperreninemic hypoaldosteronism associated with a high mortality rate has been previously described in critically ill patients with shock. Variable plasma concentrations of aldosterone are seen in critical illness, as well as an impaired adrenal aldosterone response to increased levels of renin. However, the assessment of hypoaldosteronism, as well as the role of mineralocorticoid replacement in the critically ill, remains a challenge. Additionally, the effect of angiotensin II in shock states remains untested. Whether mineralocorticoid deficiency exists as a relevant pathophysiologic entity in critical illness and the role of fludrocortisone treatment remain unknown.

Thanks for joining me for this brief exploration of the exciting work being done in Anesthesiology. I’ll be back in just a few weeks with highlights from the September issue.