Welcome to the January 2023 Anesthesiology podcast. I'm Evan Kharasch, Editor-in-Chief, bringing you some highlights from the first issue of the new year. This month, we discuss a study examining cryoneurolysis and its effectiveness in relieving phantom limb pain, look at the safety of beta-blockers prior to surgery, and the influence of intraoperative supplemental oxygen on preventing postoperative nausea. This issue also includes a Clinical Focus Review on anaphylaxis with tips to manage it in the perioperative setting. Lastly, we'll conclude with practice guidelines that include evidence-based recommendations on the appropriate management of neuromuscular monitoring.

We'll start with a prospective investigation that looks at relieving phantom pain after lower limb amputation. Between 50 to 85% of amputation patients develop chronic pain perceived as originating from the missing limb. Brian Ilfeld from the University of California, San Diego and researchers from the PAINfre group tested whether a single cryoneurolysis treatment could decrease phantom pain. 144 patients were enrolled at 6 medical centers. All patients received a single-injection femoral and sciatic nerve block with lidocaine. They were then randomized to receive either ultrasound-guided percutaneous cryoneurolysis or sham treatment. Pretreatment phantom pain scores were similar for both groups with a median score of 5. At 4 months, average phantom limb pain scores were 4.3 for cryoneurolysis treatment and 4.5 for placebo, with an estimated difference in means of 0.1. Based on the study protocol, percutaneous cryoneurolysis did not affect chronic lower extremity phantom pain four months following treatment.

Our next study focuses on the pharmacokinetics of lidocaine in donor partial hepatectomy. Over the past 10 years, the number of living donor hepatectomies has almost doubled from 282 in 2010 to 524 in 2019. Approximately 21 to 27 percent of patients report acute surgical pain after hepatectomy for donation. This pain can last up to one year following donation. One approach to try and mitigate pain is a lidocaine infusion. Lidocaine is eliminated by the liver and decreased hepatic metabolism and clearance after liver resection raises concerns about safe lidocaine dosing in this patient population. Cara Crouch from the University of Colorado School of Medicine and colleagues tested whether lidocaine clearance is reduced after a partial hepatectomy. Fifteen patients undergoing a partial hepatectomy received an intravenous lidocaine bolus during anesthesia induction. Researchers collected blood samples from the patients before and immediately after anesthesia, during hepatectomy, 30 minutes after completion and 24 hours after surgery end. They found that lidocaine elimination clearance was reduced to about one third of the baseline clearance after the donor graft was surgically isolated and removed. The major determinant of post-hepatectomy lidocaine clearance was the amount of liver remaining. At the lidocaine dose used, plasma concentrations of lidocaine and metabolites generally remained below the theoretical toxic threshold. The authors conclude that Intravenous lidocaine infusions can be used in patients undergoing partial hepatectomy for living donation, but the lidocaine infusion should be stopped when the liver is resected.

We'll look now at a retrospective analysis of beta-blocker use prior to major abdominal surgery. Major adverse cardiac events occur in about 1.4% to 3.9% of patients following non-cardiac surgery. In their practice guidelines, the American College of Cardiology and American Heart Association recommended beta-blocker use a day prior to surgery. But the POISE trial found that preoperative beta-blocker use within hours prior to surgery increased the risk of hypotension, stroke and death. After that trial, the use of beta-blockers just prior to surgery was reduced. However the effect of beta-blocker initiation in the weeks before major noncardiac surgery on the risk of stroke or major adverse cardiac events practice remained unknown. Researchers led by Nicholas McKenzie from the University of Chicago, Illinois and colleagues theorized that there was no association between preoperative beta-blocker use within 60 days of surgery and the risk of stroke in patients undergoing major abdominal surgery. They studied the records of 241,000 patients who underwent major abdominal surgery between 2005 and 2015. In the group, almost 76% were beta-blocker naïve, 2% began a beta-blocker within 60 days of surgery and 22% were on a chronic beta-blocker >60 days prior to surgery. The overall frequency of stroke was 0.2%. After propensity score weighting, patients initiated on a beta-blocker within 60 days of surgery or who were on chronic beta-blocker were found to have a similar stroke risk as patients who were beta blocker naïve. These results suggested there is no association between stroke and preoperative beta-blocker initiation within 60 days of surgery or between stroke and chronic beta-blocker therapy among patients undergoing elective major abdominal surgery. In an accompanying editorial, Drs. Jessica Spence and Sachin Kheterpal state that based on this study, the use of beta-blockers is "most likely safe." However, they stress that clinicians should make patient-centered decisions based on the evidence, considering the potential benefits and harms. Listen to the author and editorialist discuss this topic further in the article's Featured Author podcast.

Our next study also explores two common topics in surgery. Specifically, the problem of postoperative nausea and vomiting, and, the use of intraoperative supplemental oxygen. About one-third of surgical patients suffer from postoperative nausea and vomiting. Researchers led by Metabel Markwei at the Cleveland Clinic and colleagues theorized that the use of intraoperative supplemental oxygen might reduce postoperative nausea. They conducted an unplanned retrospective sub-analysis of a previous trial that evaluated the effect of 80% versus 30% intraoperative inspired oxygen on surgical site infection. This analysis assessed the effect of 80% versus 30% oxygen on the incidence of postoperative nausea and/or vomiting. The incidence of postoperative nausea and vomiting was not different between patients assigned to 80% and 30% oxygen. The authors also conducted a systematic review, which included 15 trials in more than 7,000 patients. In the review, they included trials in adults who had general anesthesia where the assigned low inspired oxygen was less than half the assigned high inspired oxygen. This too found that supplemental oxygen did not affect postoperative nausea and vomiting. In an accompanying editorial, authors David Douin and Ana Fernandez-Bustamante recognize that the ideal titration of oxygen delivery in hospital care is still undetermined. They note that the study results are "clear," that intraoperative oxygen administration has no clinical benefit on postoperative nausea and vomiting, meaning that intraoperative oxygen should only be administered to prevent or treat hypoxemia. For more information, listen to the Featured Author podcast featuring the study author and editorialist.

This month's clinical focus review provides an overview of anaphylaxis, including its incidence, pathophysiology, presentations and acute management in the perioperative setting. Anesthesiologists care for patients in a myriad of settings. Patients receive a variety of drugs, blood products and/or imaging agents. Each of these has the potential for an adverse reaction, the most life-threatening being anaphylaxis. Authors Charles Tacquard, Toshiaki Iba and Jerrold Levy stress the importance of rapid diagnosis and management of cardiopulmonary dysfunctions that can occur due to anaphylaxis.

Practice guidelines provide recommendations for anesthesia care supported by synthesis and an analysis of the existing literature. Their aim is to improve patient care. This issue includes a major new practice guideline with evidence-based recommendations on the appropriate management of neuromuscular monitoring. The guidance document was developed by a task force from the American Society of Anesthesiologists. It focuses on the pharmacology of antagonizing neuromuscular blockade, and the monitoring of that reversal. It includes recommendations on the appropriate type and site of monitoring and dosing of different antagonist drugs depending on the depth of the blockade. In their accompanying editorial, Sorin Brull and Aaron Kopman state that the recommendations are straight-forward and scientifically sound. They conclude, "it is time to internalize the recommendations of these guidelines."

Thank you for joining me at the start of this new year. But before I go, let me mention one more item of importance. Medical research and scholarly publishing continue to change. And Anesthesiology takes great effort and pride to introduce new initiatives to benefit our readers and our authors. In the last year, we implemented new initiatives that have accelerated the article publication process to only 3 days after manuscript acceptance, streamlined the manuscript submission process, and introduced a new type of research article. We also expanded our resources for authors. For a deeper look into what's changed recently, read "Anesthesiology 2023: Ch-ch-ch-changes" in this month's issue and visit our website at anesthesiology.org.

That's all for this month's overview. Thank you again for listening, and be sure to join me next month for highlights from the February 2023 issue.