

Recovery from propofol anesthesia may be sped by use of common stimulant

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The ability of the commonly used stimulant methylphenidate (Ritalin) to speed recovery from general anesthesia appears to apply both to the inhaled gas isoflurane, as previously reported, and to the intravenous drug propofol. Members of the same Massachusetts General Hospital (MGH) research team that reported the isoflurane study are publishing similar results for propofol in the May issue of *Anesthesiology*, and their paper has been issued online.

"Propofol is the most widely used intravenous general anesthetic, and there is currently no way to reverse its effects," says Ken Solt, MD, of the MGH Department of Anesthesia, [Critical Care](#) and [Pain Medicine](#), the paper's corresponding author. "By finding that [methylphenidate](#) can reverse [general anesthesia](#) with propofol as well as with isoflurane, we show that it may be broadly applicable for waking patients up from different [general anesthetic drugs](#)."

The MGH team's previous study in the October 2011 issue of *Anesthesiology* showed that methylphenidate - known to affect arousal pathways in the brain and commonly used to treat attention-deficit hyperactivity disorder - significantly decreased the amount of time it took for rats to recover from isoflurane anesthesia. The current study ran very similar experiments in which propofol, which has a different mechanism of action than isoflurane, was the anesthetic agent.

In the first experiments, animals that had lost consciousness after a single dose of propofol were given intravenous methylphenidate or saline, and those receiving methylphenidate recovered almost five minutes faster than those receiving saline. Administration of methylphenidate also induced signs of arousal - movement or standing up - in rats receiving a constant intravenous dose of propofol, while animals administered saline remained motionless. EEG readings of the brains of animals during constant infusion of a higher

propofol dose showed that methylphenidate caused brain activity to shift back toward the awake state. The change persisted for up to 10 minutes, during which the animals showed signs of arousal like opening their eyes and kicking, although they did not stand up.

"Propofol can be a very dangerous drug because it can cause patients to stop breathing and their blood pressure to drop," Solt explains. "It is often used for sedation during procedures such as colonoscopies, and if patients get oversedated, methylphenidate may be useful in getting them to wake up and resume breathing and in restoring their blood pressure. In the operating room, where propofol can be administered for several hours, patients may take as long as an hour to recover. The ability to use methylphenidate to induce recovery could make general anesthesia safer and more efficient, and we're hoping to conduct a clinical trial in patients in the near future."

Provided by Massachusetts General Hospital

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