

## Buprenorphine and acute pain management

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*JH is a 59 year-old man currently maintained on sublingual buprenorphine 32mg daily for the management of opioid dependence. He comes to clinic today for his regular visit and mentions he has been scheduled for a total knee replacement next month. What are our options for managing his acute pain after surgery?*

In 2002, the Food and Drug Administration approved two sublingual formulations of buprenorphine for the treatment of opioid addiction. These two formulations, Subutex (buprenorphine) and Suboxone (buprenorphine/naloxone), became the first and only agents available through so-called office-based treatment programs and greatly expanded the extent and scope of opioid addiction treatment.

Buprenorphine's usefulness in opioid dependence stems from several unique pharmacological properties. Buprenorphine displays partial mu opioid agonist and kappa antagonist activity. This partial agonist activity means that buprenorphine has a ceiling effect - a point where the mu agonist effect of the drug reaches maximum activity, despite increases in dose. At these higher doses, buprenorphine can act as an antagonist - displacing other opioids and occupying mu receptors without activating them. The result is an agent that can prevent withdrawal while inhibiting the effect of other opioids, should a patient relapse.

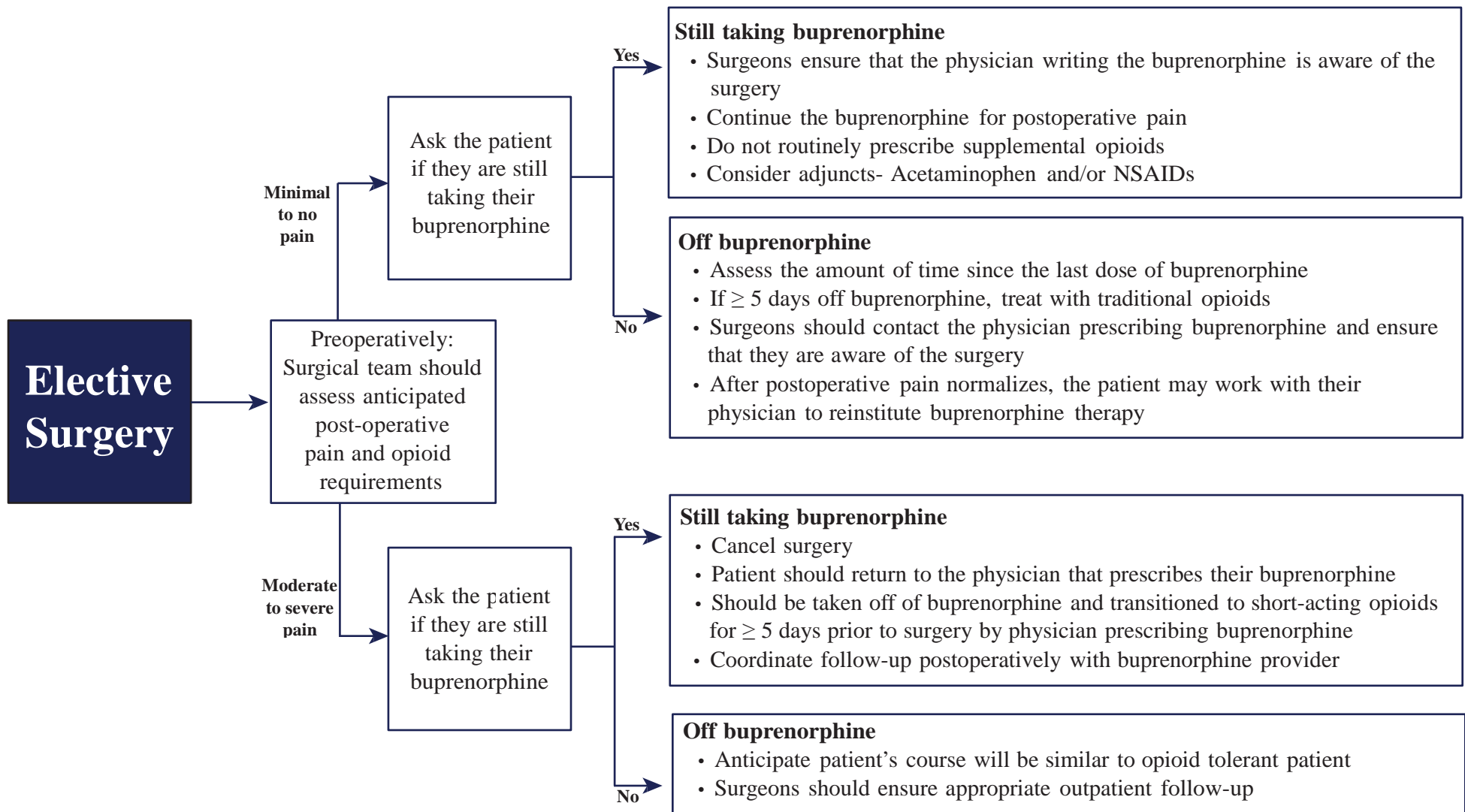
Unfortunately, these same pharmacological parameters can also complicate acute pain management. Buprenorphine's partial agonist activity and high receptor affinity can displace opioids prescribed for acute pain, decreasing their effectiveness. And its antagonist activity at higher doses may even precipitate withdrawal if initiated concurrently with opioid therapy.

The role of buprenorphine therapy in postoperative pain is a controversial issue. Clinical evidence is limited and expert opinion can be divided on the best approach to manage these challenging patients. In general, the options for managing buprenorphine are:

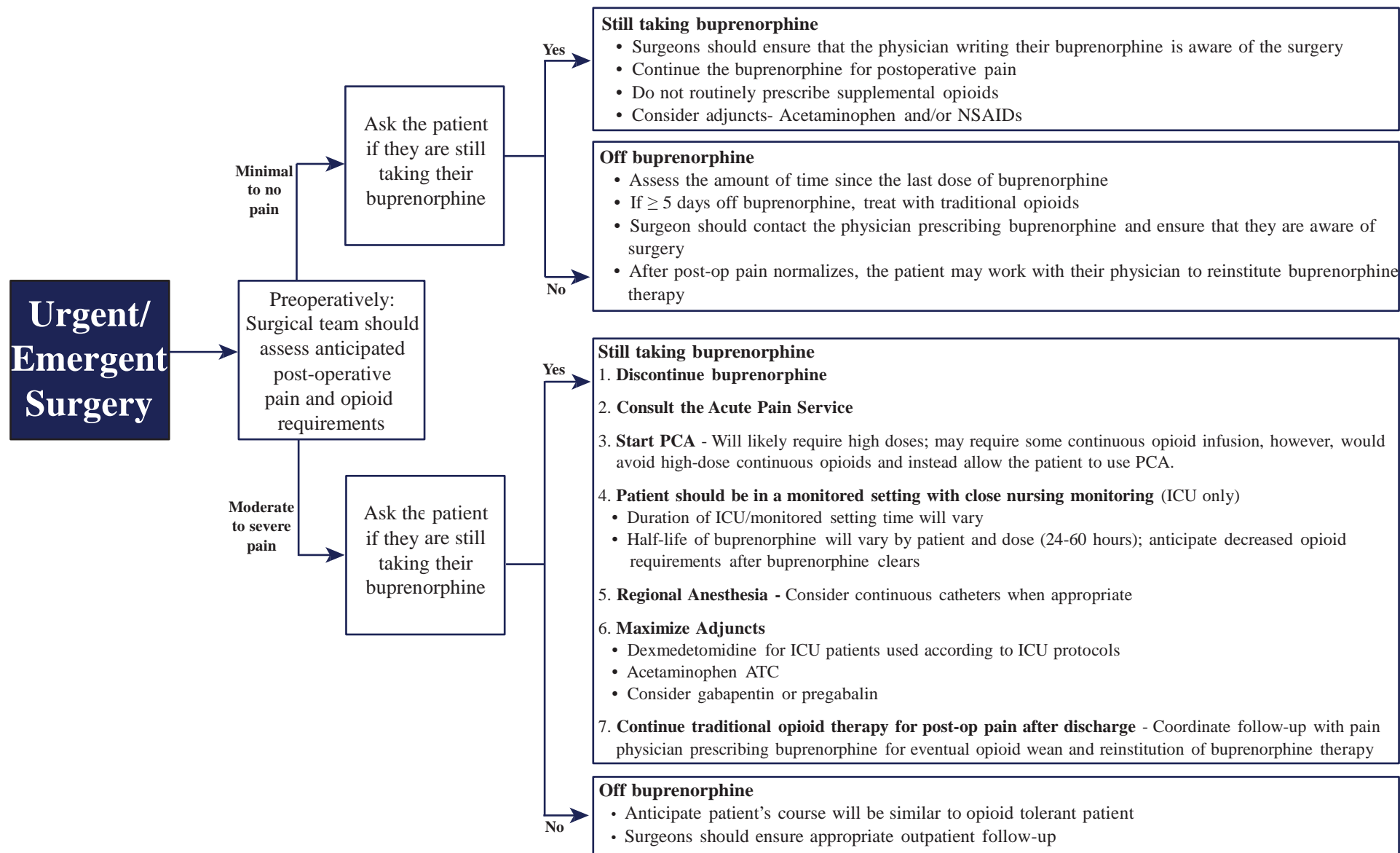
1. **Stop Buprenorphine.** As noted above, continuing buprenorphine after surgery can antagonize the effects of other opioids prescribed for postoperative pain. Discontinuing buprenorphine may help in making those opioids more effective. As postoperative pain diminishes over time and opioid requirements decrease, buprenorphine therapy can be restarted.
2. **Continue Buprenorphine.** Some experts contend that buprenorphine can be continued, although it may be necessary to treat with higher doses of opioids to compete for mu receptors. There are some controlled studies showing effectiveness of average doses of opioids for breakthrough pain in patients on the buprenorphine patch.<sup>1-2</sup> Remember that this provides a much lower dose of buprenorphine than what is more commonly used for opioid dependence in sublingual formulations. However, other studies support the concept that effective pain management can be achieved with higher dose opioids in patients on higher dose buprenorphine.<sup>3-4</sup>
3. **Rotate to Methadone.** If your institution has the necessary specialists, you can also consider rotating the patient to methadone for maintenance during the postoperative period. Since methadone is a full agonist, it removes the problems associated with mu receptor blockade while keeping the patient on treatment for their addiction. However, practitioners need to take into consideration the potential difficulties with transitioning a patient between these two agents and the restrictions on prescribing methadone at discharge.
4. **Determine Buprenorphine Use based on Risk.** Lately, pain specialists have been taking a more stratified approach (see figures 1 and 2). For more high risk or major surgeries, they recommend stopping buprenorphine to maximize opioid efficacy. For minor surgeries, they recommend continuing buprenorphine, as pain can often be controlled with non-opioid therapies. The result is a



Figure 1. The University of Michigan Protocol for the Management of Sublingual Buprenorphine (Suboxone and Subutex) in the Acute Perioperative Setting For Elective Surgery (used with permission)



**Figure 2. The University of Michigan Protocol for the Management of Sublingual Buprenorphine (Suboxone and Subutex) in the Acute Perioperative Setting for Emergent Surgery (used with permission)**



protocol based on risk stratification. Surgeries that are more painful will require higher opioid consumption, even in opioid naïve patients. In these situations, where the risk for complications related to uncontrolled pain outweigh the benefits of maintaining buprenorphine therapy – this approach recommends discontinuing buprenorphine. In other more minor surgeries, where pain is often controlled with minimal to no opioids, it may not be necessary to stop buprenorphine to manage pain effectively.

Regardless of the approach to buprenorphine, clinicians agree that any treatment program for these patients should also include a multimodal approach to pain management, including regional anesthesia and other non-opioid analgesics. These can help improve pain management while reducing opioid requirements.

Acute pain management in an opioid dependent patient can be a complex and challenging issue. With a well-balanced approach and a multidisciplinary team, these patients can be managed successfully.

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