

# The bioavailability of orally administered drugs is reduced on the first days after open heart surgery

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Postoperative drug administration is essential to help cardiac surgery patients recover without undesired events and reap long-term benefits

from the surgical procedure. Oral drug administration is preferred due to its convenience for both patients and staff. However, according to the doctoral dissertation of Antti Valtola, Lic Med, in the early postoperative period, the bioavailability of perorally administered drugs is altered; thus, parenteral routes are preferred until gastrointestinal function has recovered.

After [cardiac surgery](#), [atrial fibrillation](#) is the most common arrhythmia likely to develop. It is a serious complication as it causes prolonged hospitalization, may lead to a deterioration of circulatory function, predisposing patients to stroke, and leading to increased treatment costs. Postoperative therapy with  $\beta$ -blockers has a significant role in preventing postoperative atrial fibrillation.

After cardiac surgery, [severe pain](#) is a common outcome, and the effective treatment of postoperative pain is crucial to ensure the patient's smooth recovery. Severe pain predisposes patients to poor pulmonary ventilation and delayed mobilization, both of which may lead to serious complications such as pneumonia. Patients with moderate and severe postoperative pain have an [increased risk](#) of suffering persistent postoperative pain.

Valtola's doctoral thesis aims to assess the bioavailability of orally administered metoprolol and oxycodone, and intranasally administered fentanyl in the early postoperative period after coronary artery bypass grafting (CABG). It was hypothesized that better knowledge on the pharmacokinetic properties of these drugs would enhance the prevention and treatment of postoperative atrial fibrillation and pain, and therefore improve patient outcome.

In summary, in the early postoperative period, the bioavailability of orally administered metoprolol markedly diminishes, necessitating parenteral administration during the first few postoperative days. The

absorption of peroral oxycodone is comparably delayed after CABG with or without CPB. In either case, oral administration of oxycodone should be avoided during the first 24 postoperative hours to avoid accumulation. As intranasal fentanyl proved to be a rapid, efficient, and well-tolerated drug, its use in the management of incidental postoperative breakthrough pain in cardiac surgical patients is encouraged.

The [doctoral dissertation](#) on Antti Valtola, Lic Med, titled "Clinical insights into the pharmacokinetic aspects of fentanyl, metoprolol and oxycodone dosing after cardiac surgery," will be examined at the Faculty of Health Sciences.

**More information:** Antti Valtola, Clinical insights into the pharmacokinetic aspects of fentanyl, metoprolol and oxycodone dosing after cardiac surgery. [erepo.uef.fi/handle/123456789/25914](https://erepo.uef.fi/handle/123456789/25914)

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