

# Perioperative Management of Obese Patients



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## KEYWORDS

- Obesity • Perioperative management • Surgery • Metabolic syndrome
- Bariatric surgery • Morbid obesity • Preoperative care • Postoperative care

## KEY POINTS

- There is an increase in the prevalence of obesity within the United States, with an estimated 30% of the population considered obese; given the increase in prevalence, practicing surgeons will encounter more and more of this complex population.
- Obese patients are at increased risk for morbidity and mortality secondary to associated comorbidities and benefits from optimization of these morbidities before elective surgery.
- The perioperative management of obese patients is complex and requires the coordinated care of surgeons, anesthesiologists, nurses, and other hospital staff.
- There is still considerable controversy and variability in certain aspects of management of obese patients; this article reviews the literature ranging from expert opinion to guidelines set forth by regulatory organizations to provide up-to-date management recommendations.

## INTRODUCTION

The prevalence of obesity in the United States has grown significantly within the past 2 decades, with current figures estimating that one-third of adults in the United States are obese<sup>1,2</sup>; a statistic that has quadrupled since the 1980s.<sup>3</sup> Paralleling the increased prevalence of obesity is the number of bariatric surgical procedures, which have increased from 8597 in 1993 to 220,000 in 2004.<sup>4,5</sup> The World Health Organization and US Centers for Disease Control and Prevention define obesity as body mass index (BMI) greater than or equal to 30.<sup>2,6</sup> Obese patients usually have other conditions associated with obesity, such as hypertension, type II diabetes mellitus, dyslipidemia, and cardiovascular disease.<sup>7,8</sup> The constellation of these comorbidities has been defined as metabolic syndrome, which has been shown in the literature to

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have increased morbidity and mortality.<sup>9–11</sup> Surgeons are likely to encounter this challenging population during the course of their practice and need to be adept at the often complex management of these patients.

### ANESTHESIA, PARALYTICS, AND ANALGESIA

Obesity causes variation in drug pharmacokinetic profiles, which makes drug dosing complicated, because most data are from nonobese patients. The greater fat mass, extracellular volume, and lean body weight in obese patients all affect drug pharmacokinetics.<sup>7</sup> In addition, the volume of distribution of lipophilic drugs is substantially greater than in normal-weight individuals, whereas hydrophilic drugs do not vary as much.<sup>12</sup> The decision to use ideal body weight (IBW) or total body weight to calculate drug dosages is not always clear. For example, paralytics are dosed based on IBW and most analgesics are based on lean body weight.<sup>7,12</sup> **Table 1** shows common medications and how dosage should be based.

Given the larger dosages required with the increased distribution volume and the risk of prolonged effects after discontinuation, lipophilic drugs, such as barbiturates, benzodiazepines, and volatile inhalation agents, should be used with caution or minimally in obese patients.<sup>3,10,12–16</sup> Maintenance of anesthesia can safely be performed either by intravenous (IV) anesthesia or inhalation anesthesia. The ideal inhalational anesthetic has a short onset and short, reliable recovery profile. Desflurane is the inhalational agent of choice in obese patients, but sevoflurane can also be used, because it has similar results to desflurane.<sup>3,12,17–20</sup>

With regard to paralytics, rocuronium, vecuronium, and cisatracurium have been studied and should be dosed based on IBW. Succinylcholine should be based on total body weight, because obese patients recover more rapidly secondary to increased pseudocholinesterase activity.<sup>7,12</sup> Sugammadex, a reversal agent for paralytics, has been used in the obese population with good results and should be dosed based

Medication	Dosing Weight
Propofol	Lean body weight (induction) Total body weight (maintenance)
Etomidate	Lean body weight
Succinylcholine	Total body weight
Vecuronium	IBW
Rocuronium	IBW
Cisatracurium	IBW
Fentanyl	Lean body weight
Sufentanil	Total body weight
Remifentanyl	IBW Lean body weight
Morphine (PCA)	Lean body weight
Neostigmine	Total body weight
Sugammadex	IBW + 40% or total body weight
Lidocaine (local)	Total body weight

Abbreviation: PCA, patient controlled analgesia.

Data from Refs.<sup>7,17,22,25</sup>

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