

# Perioperative Pharmacologic Considerations in Obesity



Simon Willis, MD<sup>a</sup>, Gregory J. Bordelon, MD<sup>b</sup>,  
Maunak V. Rana, MD<sup>c,\*</sup>

## KEYWORDS

• Obesity • Anesthesia dosing • Induction • Scalars • Overdose • Morbid obesity

## KEY POINTS

- Perioperative physicians must be aware of the physiologic alterations in obese patients because of the increase in incidence of this condition.
- Obese patients have alterations in the pharmacologic responses to induction agents and perioperative physicians should take a tailored approach for anesthetic choices.
- Perioperative physicians should be familiar with common dosing scalars to choose appropriate dosing in patients to avoid both underdosing and overdosing obese patients.

## INTRODUCTION

Over the last 3 decades the incidence of morbid obesity has tripled worldwide; at least 5% of the population in the United States is considered morbidly obese.<sup>1</sup> As the incidence of obesity increases, there has been a correlative increase in the incidence of associated comorbidities, including diabetes, cardiopulmonary disease, hypertension, and obstructive sleep apnea. Furthermore, morbid obesity is also associated with important physiologic and anthropometric changes that may alter the pharmacokinetic properties of most anesthetic drugs.<sup>2</sup> As obesity becomes more prevalent in the population, the number of obese patients who require surgical procedures will consequently increase. Associated comorbidities in conjunction with the altered

---

Disclosure: The authors have nothing to disclose.

<sup>a</sup> Department of Physical Medicine and Rehabilitation, MedStar Georgetown University Hospital/National Rehabilitation Hospital, 102 Irving Street Northwest, Washington, DC 20010, USA;

<sup>b</sup> Department of Anesthesiology, Louisiana State University Medical Center, 1542 Tulane Avenue, Room 659, New Orleans, LA 70112, USA; <sup>c</sup> Department of Anesthesiology, Advocate Illinois Masonic Medical Center, 836 West Wellington Avenue, Suite 4815, Chicago, IL 60657, USA

\* Corresponding author.

E-mail address: [maunakr@gmail.com](mailto:maunakr@gmail.com)

Anesthesiology Clin 35 (2017) 247–257  
<http://dx.doi.org/10.1016/j.anclin.2017.01.010>

[anesthesiology.theclinics.com](http://anesthesiology.theclinics.com)

1932-2275/17/© 2017 Elsevier Inc. All rights reserved.

pharmacokinetics of obese patients highlight the importance for modern anesthesiologist/procedural physicians to understand the increased risks associated with providing anesthesia to this patient population.

## EPIDEMIOLOGY

Obesity is a global epidemic that has been increasing in incidence and prevalence. Over the past 30 years, with the evolution of economic prosperity and growth, industrialization, and urbanization, the prevalence of obesity has increased exponentially throughout many countries. Furthermore, a nutritional transition to processed foods and high-calorie diets in combination with an increasingly sedentary lifestyle has driven people into overweight states subsequently caused an increase in associated comorbidities.<sup>3</sup> It is estimated that more than a third of the world's population is affected by obesity.<sup>4</sup> If the current trend of increasing obesity continues, experts predict that 38% of the world's adult population will be overweight by 2030, with another 20% being obese.<sup>5</sup> By 2030 in the United States alone, it is expected that up to 85% of adults will be overweight or obese.<sup>6</sup> In general, the prevalence of obesity is greater in developed countries in patients of a poor socioeconomic status, whereas, in areas of development, the wealthier population is more likely to have a higher portion of obesity.<sup>7</sup>

## DEFINITIONS

Contrary to drug dosing in normal-weight patients, dosing scalars in obese patients should reflect and compensate for changes in body composition. Scalars that take into consideration body composition relevant to obese patients include body mass index (BMI), ideal body weight (IBW), lean body weight (LBW), total body weight (TBW), percentage IBW, body surface area (BSA), adjusted body weight, and predicted normal weight.<sup>1</sup> These scalars are metrics that frequently are used to determine dosing of anesthetic agents. On careful consideration, certain scalars are more appropriate and easily adjusted to suit obese patients, with safe and appropriate dosing.

BMI is the most commonly used parameter in the determination and grading of obesity. It takes into consideration both the body weight in kilograms and height in squared meters of the individual, using the formula of body weight (kg)/height (m)<sup>2</sup>. Different categories of obesity have been established using various ranges of BMI, with higher BMI correlating with obesity severity. Normal BMI is represented in the range between 20 and 25 kg/m<sup>2</sup>. Individuals are classified as overweight with a BMI between 26 and 29 kg/m<sup>2</sup>, and obese with a BMI of greater than or equal to 30 kg/m<sup>2</sup>. Obesity is further broken down with class I obesity being diagnosed with a BMI of 30 to 34 kg/m<sup>2</sup>, class II obesity as 35 to 39 kg/m<sup>2</sup>, and class III obesity (formerly known as morbid obesity) as a BMI of greater than 40 kg/m<sup>2</sup>. Furthermore, individuals with a BMI of greater than 50 kg/m<sup>2</sup> are considered supermorbidly obese and super-supermorbidly obese with a BMI of greater than 60 kg/m<sup>2</sup>.<sup>1</sup>

TBW is a term used in the biological and medical sciences to describe mass or weight, generally measured in kilograms. It represents the weighed body weight of an individual without any added adjustments.

The concept of IBW was developed in both men and women for what was thought to represent a maximally healthy person.<sup>8</sup> It is associated with the maximum life expectancy for people with a particular build, describing a relationship between the idealized weight correlated with height.<sup>1</sup> IBW differs between genders; because it is based on height, it is not a particularly appropriate means of identifying anesthetic doses in obese patients because all patients of the same height receive the same dose.

Download English Version:

<https://daneshyari.com/en/article/5580523>

Download Persian Version:

<https://daneshyari.com/article/5580523>

[Daneshyari.com](https://daneshyari.com)