OBESITY IN ANESTHESIA, PRE- AND POSTOPERATIVE CARE

WHY OBESE PATIENTS POSE A CHALLENGE

Obesity is a widespread problem these days, as the Western lifestyle paired with a lack of exercise have led to a steep increase in obesity rates around the world. To anesthesia care providers, obese patients impose a challenge as they require different approaches compared to lean patients. Apart from their mass, which makes obese patients more difficult to handle in the preparation for surgery, they also require special care during the entire anesthesia process. Obese patients not only require adapted approaches during pre-oxygenation, induction of general anesthesia and postoperative care, where obese patients face a higher risk of respiratory complications. The rate of difficult intubations is four times higher for obese patients. The risk of serious complications in airway management is reported to be increased four times higher for obese patients. The prevalence of obesity among adults in selected countries is presented in Table 1.

APPROXIMATIONS TO PRE-OXYGENATION AND INDUCTION IN OBESIVE PATIENTS

During that phase, obese patients…

OBESITY PATIENTS DURING RECOVERY AND IN THE POSTOPERATIVE PHASE

The effects of obesity that can cause problems in the postoperative phase, shown in Table 2, are also of significant importance. The reader must exercise his or her independent professional judgment when treating patients and follow the standard protocols adopted by the health care facility where he or she practices. For full references on clinical information in this paper, please see the clinical whitepapers on our website www.draeger.com/lungs.

... are more likely to develop pneumonia... have higher rates... develop more atelectasis ...

The table outlines the fraction of inspired oxygen during pre-oxygenation... induces atelectasis... mismatch... increased work of breathing... increased work for obese patients... approach may not... risk of hypotension... May complicate tracheal... increases the work of breathing... during pre-oxygenation... four times higher... the risk of serious complications in airway management... obesity rates around the world... bear in mind the challenges obesity imposes on surgical patients... a brief period of pre-oxygenation to ensure sufficient oxygen levels during the intubation process. Application of preventive measures in the immediate postoperative period has also been shown to improve the outcome of anesthesia induction. Modified respiratory care techniques in the immediate postoperative period have also been shown to improve the outcome of anesthesia induction.

... an increase of anesthesia... ventilations... an elevated position... maintaining the patient in an elevated position... during pre-oxygenation of... 

The time of apnea before the patient suffers clinically relevant arterial oxygen desaturation is significantly shorter.

... do in non-obese patients. The time of apnea before the patient suffers clinically relevant arterial oxygen desaturation... faster desaturation... atelectasis... 

... fast desaturation... more atelectasis... 

Table 1:

<table>
<thead>
<tr>
<th>Country</th>
<th>Prevalence among adults in selected countries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2013</td>
</tr>
<tr>
<td>United States</td>
<td>21%</td>
</tr>
<tr>
<td>Australia</td>
<td>25%</td>
</tr>
<tr>
<td>France</td>
<td>31%</td>
</tr>
<tr>
<td>China</td>
<td>43%</td>
</tr>
<tr>
<td>Germany</td>
<td>28%</td>
</tr>
</tbody>
</table>

Table 2:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Obese patients</th>
<th>Lean patients</th>
<th>Upsides Possible downsides</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxygen administration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevent isometric atelectasis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve tissue perfusion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decrease ventilation mismatch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduce the risk of hypotension</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Prevalence of obesity among adults in selected countries

- 2013: United States 21%, Australia 25%, France 31%, China 43%, Germany 28%
- 1980: United States 20%, Australia 24%, France 28%, China 32%, Germany 24%

Frequently-used approach to pre-oxygenation and induction

- Secure the airway first: Be sure the patient can breathe normally before you begin pre-oxygenation.
- Use a high inspiratory oxygen concentration. The inspiratory oxygen concentration (FiO₂) is the concentration of oxygen in the inspiratory gas mixture, expressed as a fraction of the total gas mixture. When administering pre-oxygenation, the anesthesia team should use a high FiO₂ concentration, typically between 0.35 and 1.0.
- Administer controlled ventilation and absence of spontaneous respirations. If the patient is not breathing spontaneously, controlled ventilation should be used to maintain adequate oxygenation.
- Consider the fraction of inspired oxygen during pre-oxygenation of obese patients. Experts recommend using high oxygen concentrations during pre-oxygenation of obese patients. The optimal inspired oxygen concentration may vary, but generally, a FiO₂ of 0.6 to 1.0 is recommended for pre-oxygenation.

The rate of difficult intubations... increased work of breathing... increased work for obese patients... approach may not... risk of hypotension... May complicate tracheal... increases the work of breathing... during pre-oxygenation of... 

... an increase of anesthesia... ventilations... an elevated position... maintaining the patient in an elevated position... during pre-oxygenation of... 

... a too-high rise of upper airway pressure. 

The risk of serious complications in airway management... obesity rates around the world... bear in mind the challenges obesity imposes on surgical patients... a brief period of pre-oxygenation to ensure sufficient oxygen levels during the intubation process. Application of preventive measures in the immediate postoperative period has also been shown to improve the outcome of anesthesia induction. Modified respiratory care techniques in the immediate postoperative period have also been shown to improve the outcome of anesthesia induction.

... an increase of anesthesia... ventilations... an elevated position... maintaining the patient in an elevated position... during pre-oxygenation of... 

... a too-high rise of upper airway pressure. 

The risk of serious complications in airway management... obesity rates around the world... bear in mind the challenges obesity imposes on surgical patients... a brief period of pre-oxygenation to ensure sufficient oxygen levels during the intubation process. Application of preventive measures in the immediate postoperative period has also been shown to improve the outcome of anesthesia induction. Modified respiratory care techniques in the immediate postoperative period have also been shown to improve the outcome of anesthesia induction.

... a too-high rise of upper airway pressure. 

The risk of serious complications in airway management... obesity rates around the world... bear in mind the challenges obesity imposes on surgical patients... a brief period of pre-oxygenation to ensure sufficient oxygen levels during the intubation process. Application of preventive measures in the immediate postoperative period has also been shown to improve the outcome of anesthesia induction. Modified respiratory care techniques in the immediate postoperative period have also been shown to improve the outcome of anesthesia induction.

... a too-high rise of upper airway pressure. 

The risk of serious complications in airway management... obesity rates around the world... bear in mind the challenges obesity imposes on surgical patients... a brief period of pre-oxygenation to ensure sufficient oxygen levels during the intubation process. Application of preventive measures in the immediate postoperative period has also been shown to improve the outcome of anesthesia induction. Modified respiratory care techniques in the immediate postoperative period have also been shown to improve the outcome of anesthesia induction.

... a too-high rise of upper airway pressure. 

The risk of serious complications in airway management... obesity rates around the world... bear in mind the challenges obesity imposes on surgical patients... a brief period of pre-oxygenation to ensure sufficient oxygen levels during the intubation process. Application of preventive measures in the immediate postoperative period has also been shown to improve the outcome of anesthesia induction. Modified respiratory care techniques in the immediate postoperative period have also been shown to improve the outcome of anesthesia induction.

... a too-high rise of upper airway pressure. 

The risk of serious complications in airway management... obesity rates around the world... bear in mind the challenges obesity imposes on surgical patients... a brief period of pre-oxygenation to ensure sufficient oxygen levels during the intubation process. Application of preventive measures in the immediate postoperative period has also been shown to improve the outcome of anesthesia induction. Modified respiratory care techniques in the immediate postoperative period have also been shown to improve the outcome of anesthesia induction.

... a too-high rise of upper airway pressure. 

The risk of serious complications in airway management... obesity rates around the world... bear in mind the challenges obesity imposes on surgical patients... a brief period of pre-oxygenation to ensure sufficient oxygen levels during the intubation process. Application of preventive measures in the immediate postoperative period has also been shown to improve the outcome of anesthesia induction. Modified respiratory care techniques in the immediate postoperative period have also been shown to improve the outcome of anesthesia induction.

... a too-high rise of upper airway pressure. 

The risk of serious complications in airway management... obesity rates around the world... bear in mind the challenges obesity imposes on surgical patients... a brief period of pre-oxygenation to ensure sufficient oxygen levels during the intubation process. Application of preventive measures in the immediate postoperative period has also been shown to improve the outcome of anesthesia induction. Modified respiratory care techniques in the immediate postoperative period have also been shown to improve the outcome of anesthesia induction.

... a too-high rise of upper airway pressure. 

The risk of serious complications in airway management... obesity rates around the world... bear in mind the challenges obesity imposes on surgical patients... a brief period of pre-oxygenation to ensure sufficient oxygen levels during the intubation process. Application of preventive measures in the immediate postoperative period has also been shown to improve the outcome of anesthesia induction. Modified respiratory care techniques in the immediate postoperative period have also been shown to improve the outcome of anesthesia induction.

... a too-high rise of upper airway pressure. 

The risk of serious complications in airway management... obesity rates around the world... bear in mind the challenges obesity imposes on surgical patients... a brief period of pre-oxygenation to ensure sufficient oxygen levels during the intubation process. Application of preventive measures in the immediate postoperative period has also been shown to improve the outcome of anesthesia induction. Modified respiratory care techniques in the immediate postoperative period have also been shown to improve the outcome of anesthesia induction.

... a too-high rise of upper airway pressure. 

The risk of serious complications in airway management... obesity rates around the world... bear in mind the challenges obesity imposes on surgical patients... a brief period of pre-oxygenation to ensure sufficient oxygen levels during the intubation process. Application of preventive measures in the immediate postoperative period has also been shown to improve the outcome of anesthesia induction. Modified respiratory care techniques in the immediate postoperative period have also been shown to improve the outcome of anesthesia induction.

... a too-high rise of upper airway pressure. 

The risk of serious complications in airway management... obesity rates around the world... bear in mind the challenges obesity imposes on surgical patients... a brief period of pre-oxygenation to ensure sufficient oxygen levels during the intubation process. Application of preventive measures in the immediate postoperative period has also been shown to improve the outcome of anesthesia induction. Modified respiratory care techniques in the immediate postoperative period have also been shown to improve the outcome of anesthesia induction.