A national survey of preoperative treatment of asthmatic children by Israeli pediatric pulmonologists

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Background

Anesthesia, surgery and endotracheal intubation in asthmatic children:

- are risk factors for bronchospasm.

- are associated with stress requiring increased cortisol levels. Yet, asthmatic children treated with corticosteroids may encounter deficient adrenal response to stress.

Orestes M et al. Incidence of laryngospasm and bronchospasm in pediatric adenotonsillectomy. *Laryngoscope Feb. 2012*.

However, no guidelines exist for preoperative respiratory treatment of asthmatic children who are referred to elective anesthesia and surgery.

Objective

The aim of this study was to evaluate the practice of pediatric pulmonologists in Israel regarding preoperative management of asthmatic children using a national survey.

Methods

- A mail survey of preoperative management of children with asthma was conducted.

- All 48 certified hospital staff pediatric pulmonologists in Israel were contacted and were asked to complete a questionnaire regarding their approach to preoperative treatment in:
  6 case scenarios
  13 pre-structured questions

- Questions and scenarios covered a variety of clinical situations of asthmatic children at different ages and on different asthma treatment regimens.

Results

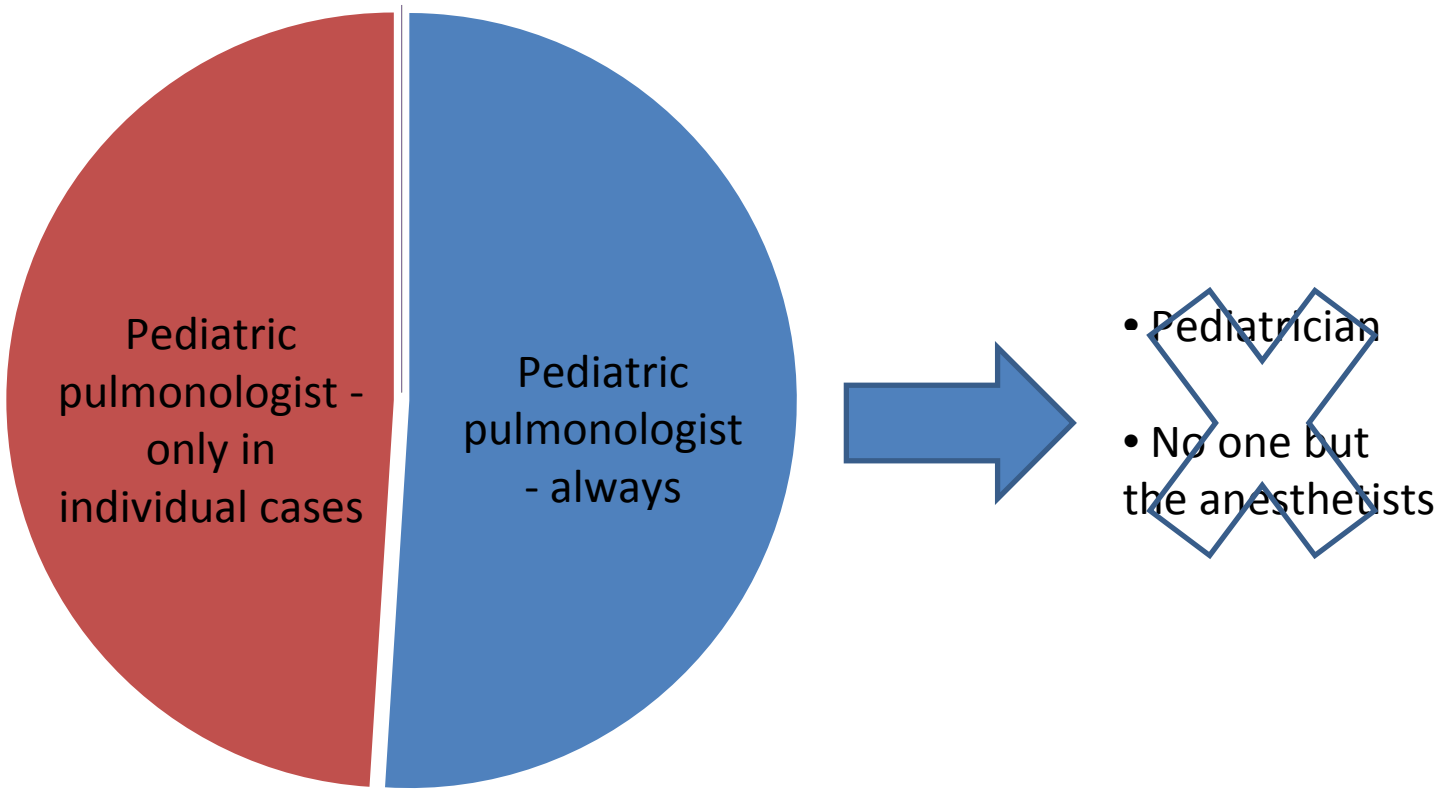
- All 48 pediatric pulmonologists responded (response rate =100%).

- A major variability was observed between the participants for most of the questions and clinical scenarios.

Responders characteristics

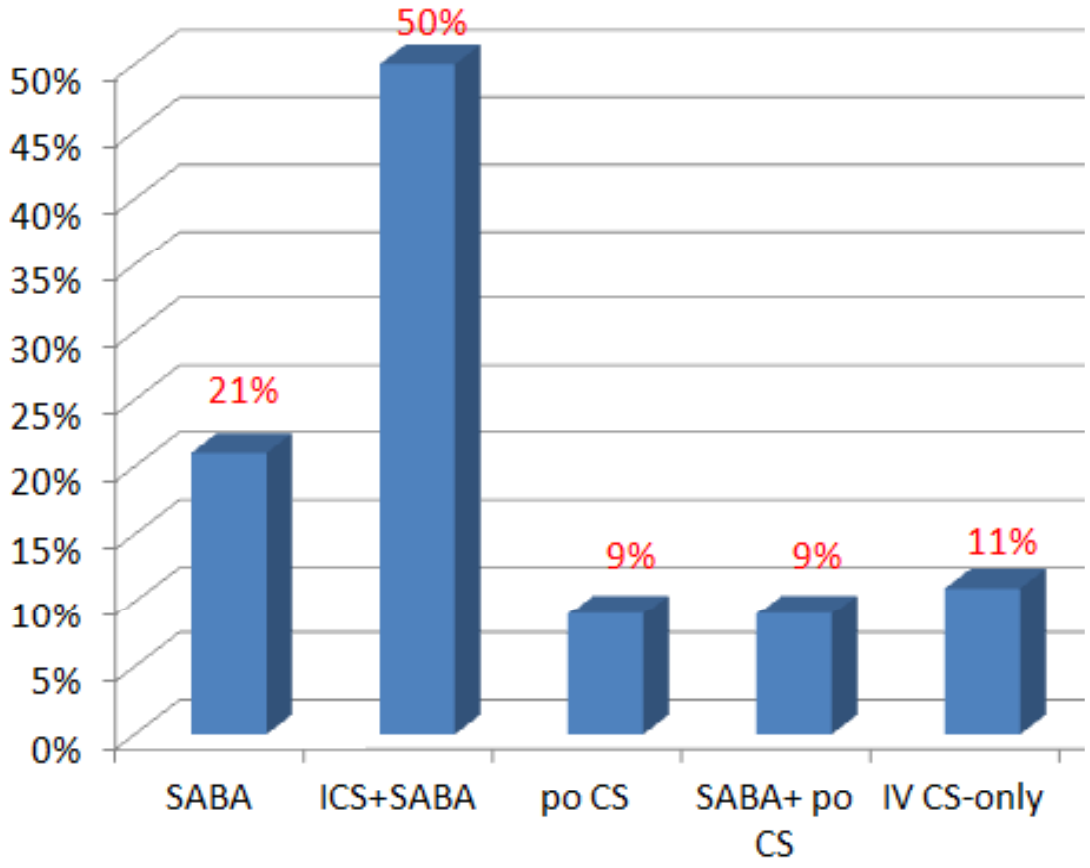
Characteristic	Responders %
Male	81%
Hospital staff only	61%
Training in North America or U.K	59%
Directors	41%

Who should be consulted – in addition to the anesthetists?



School age-well control

8 years old boy, no prophylactic Tx, asthma exacerbation once in 6 months

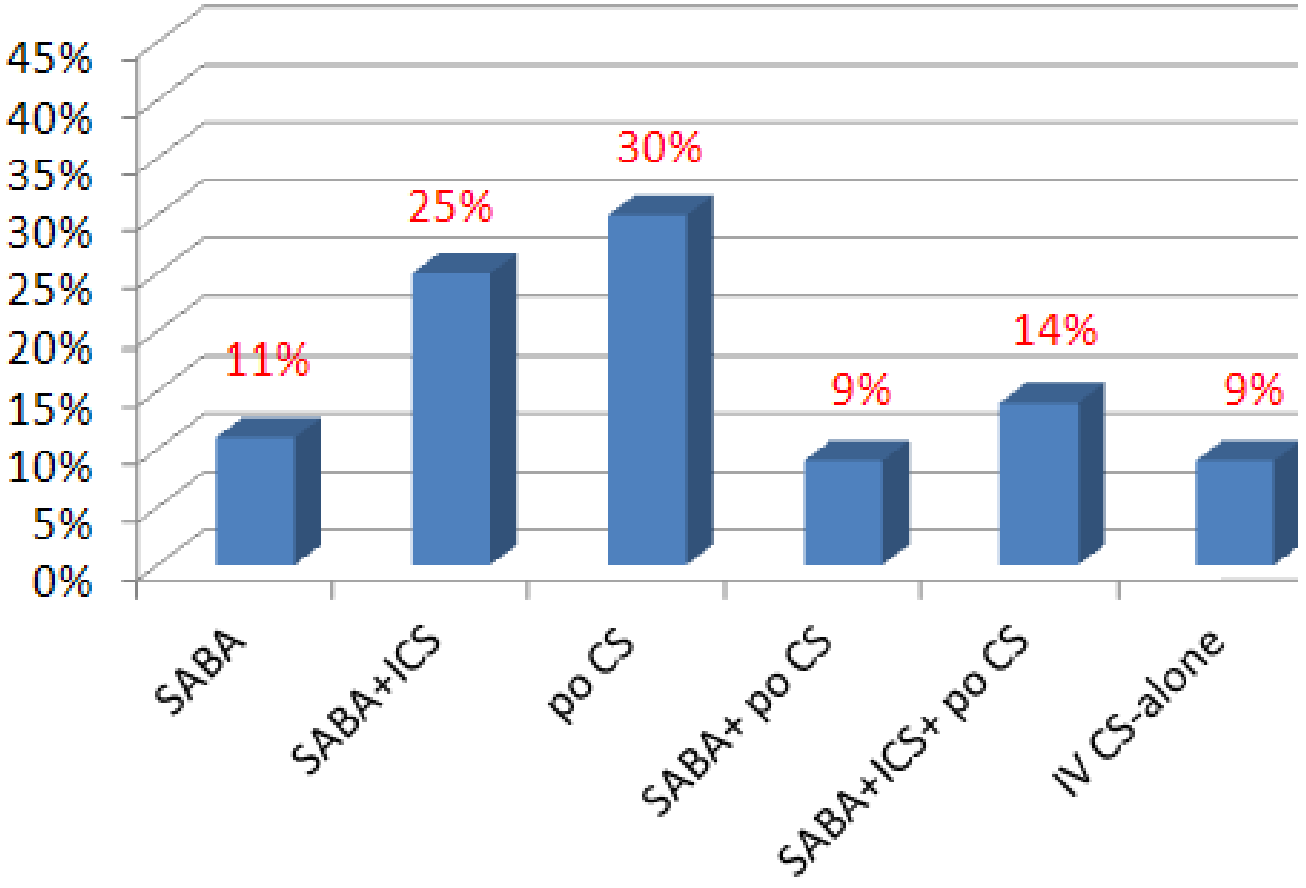


PO CS -1-5 d before anesthesia
IV dose just before anesthesia

Pulmonary function test prior to surgery – 38%

School age-poor control

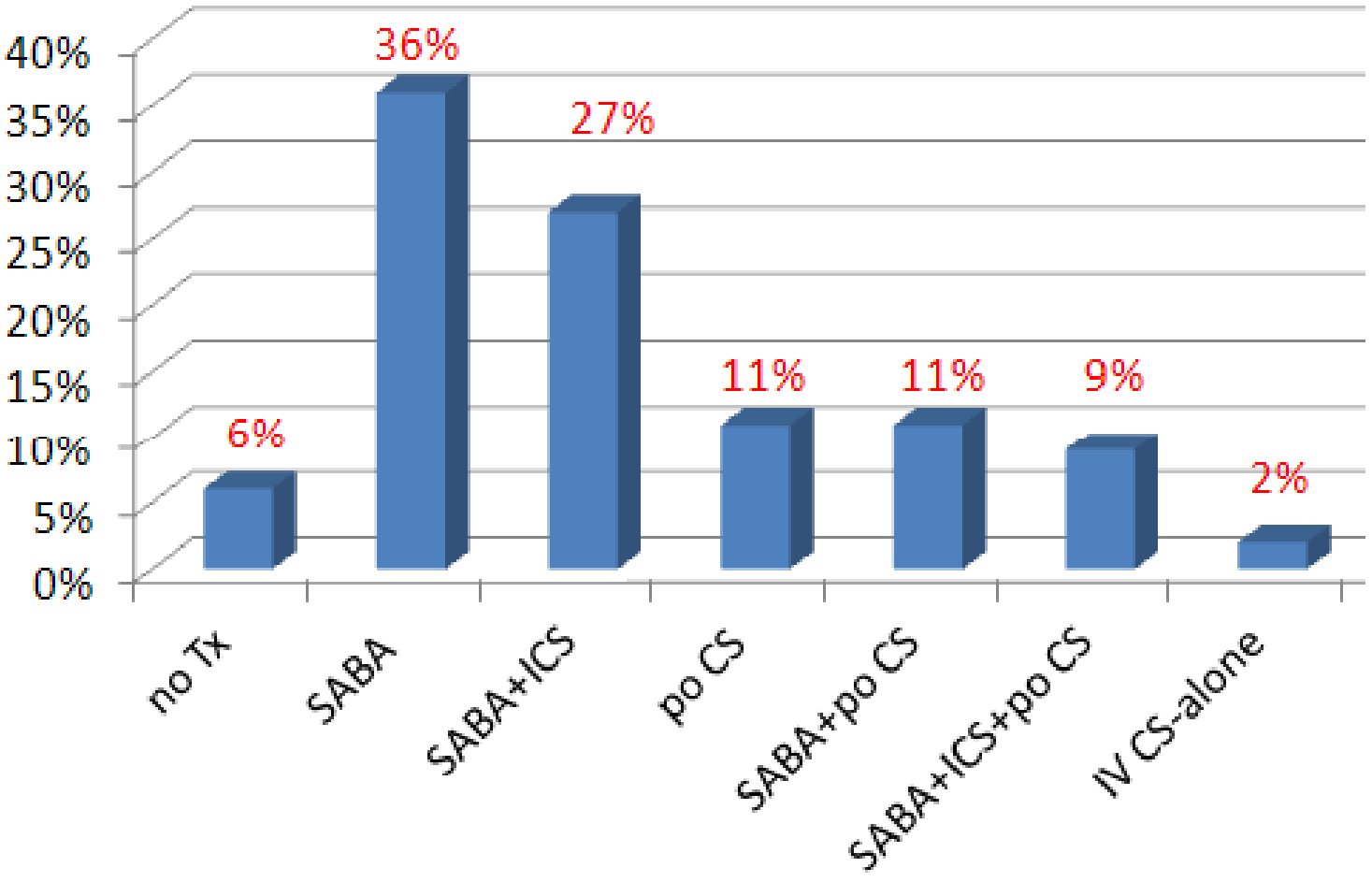
13 years old boy, high dose prophylactic ICS+LABA, asthma exacerbation 1-2 per month



Pulmonary function test prior to surgery -44%

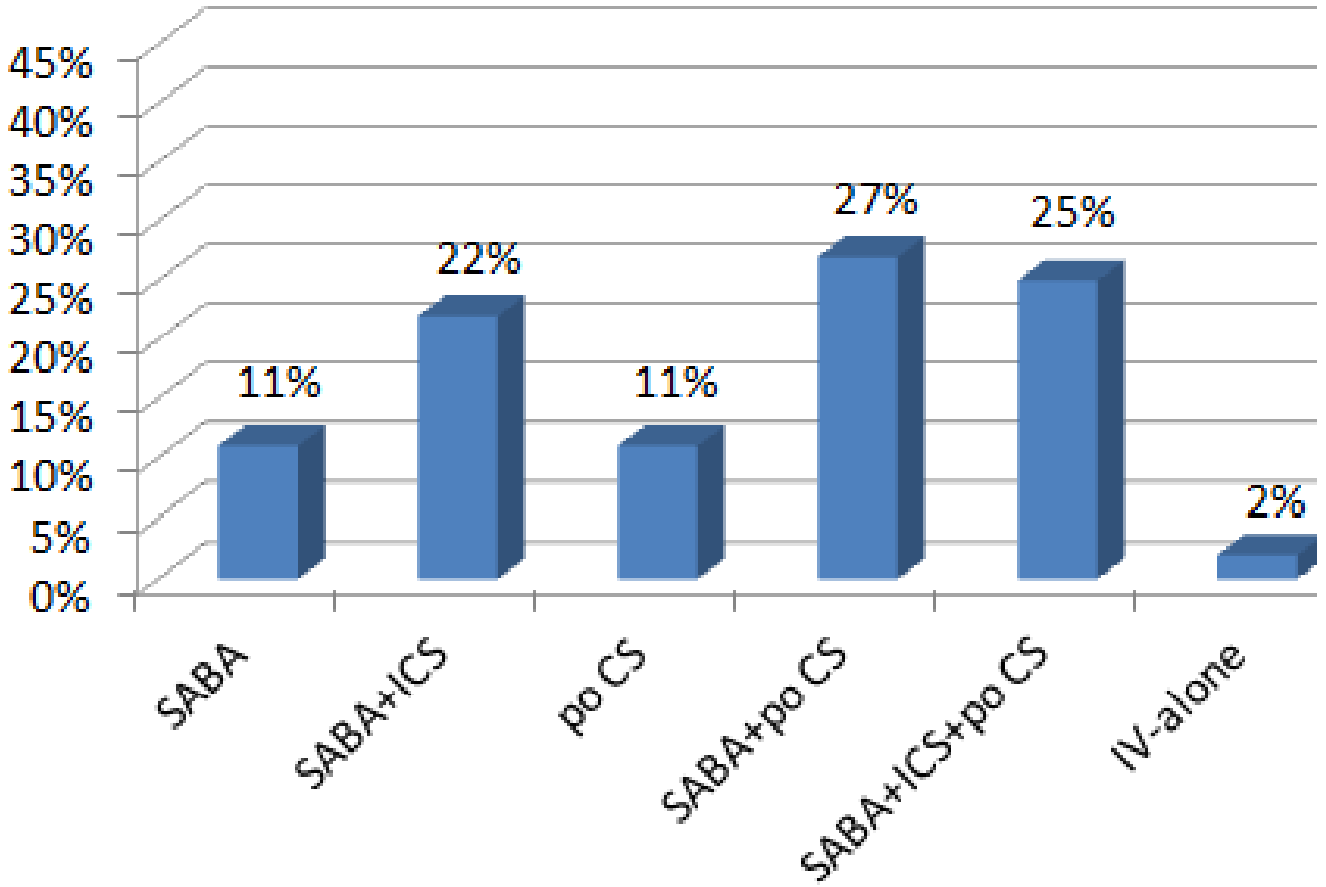
Preschool –well control

2 years old girl, low dose ICS prophylaxis, no recent exacerbation

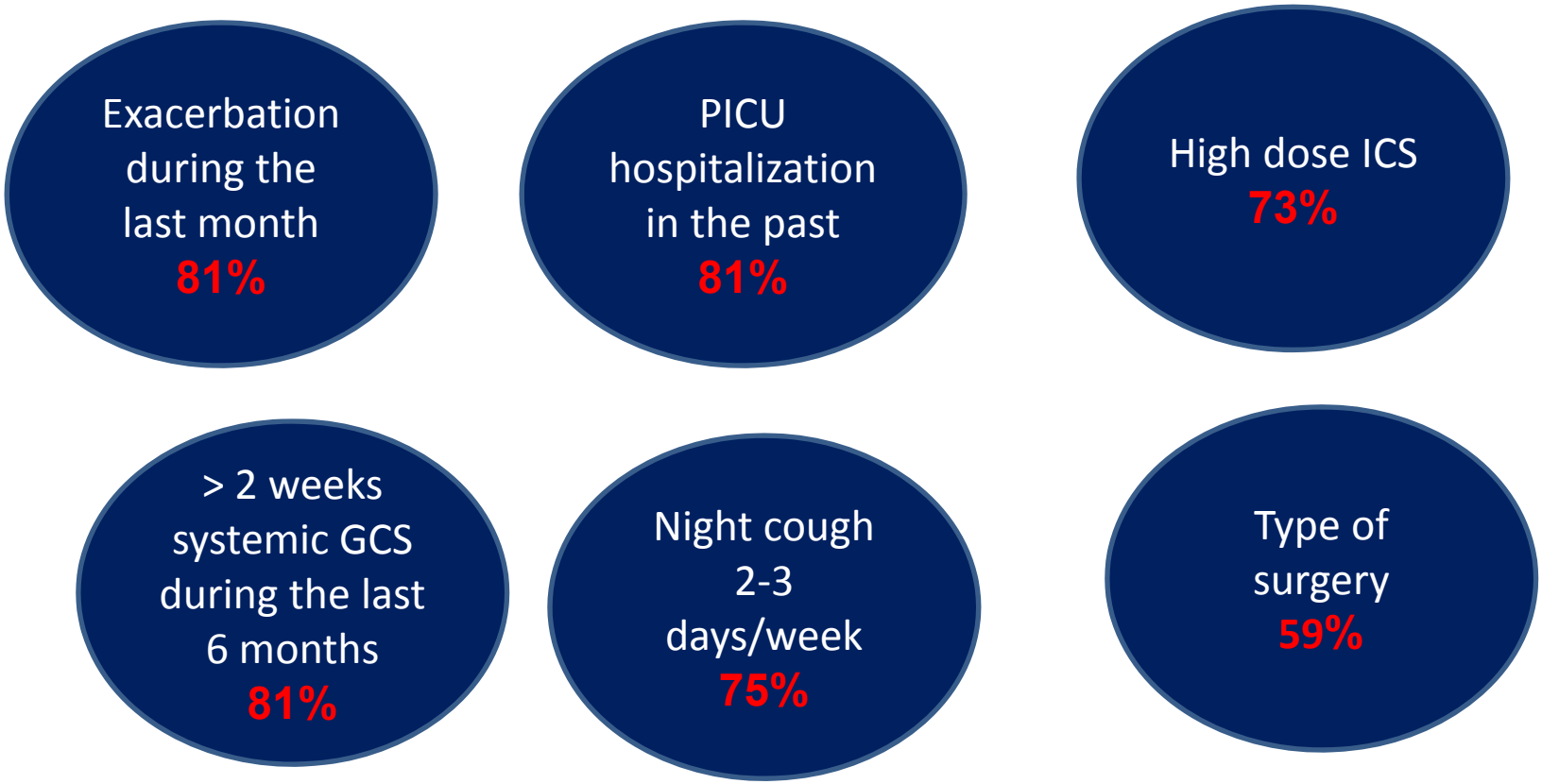


Preschool-poor control

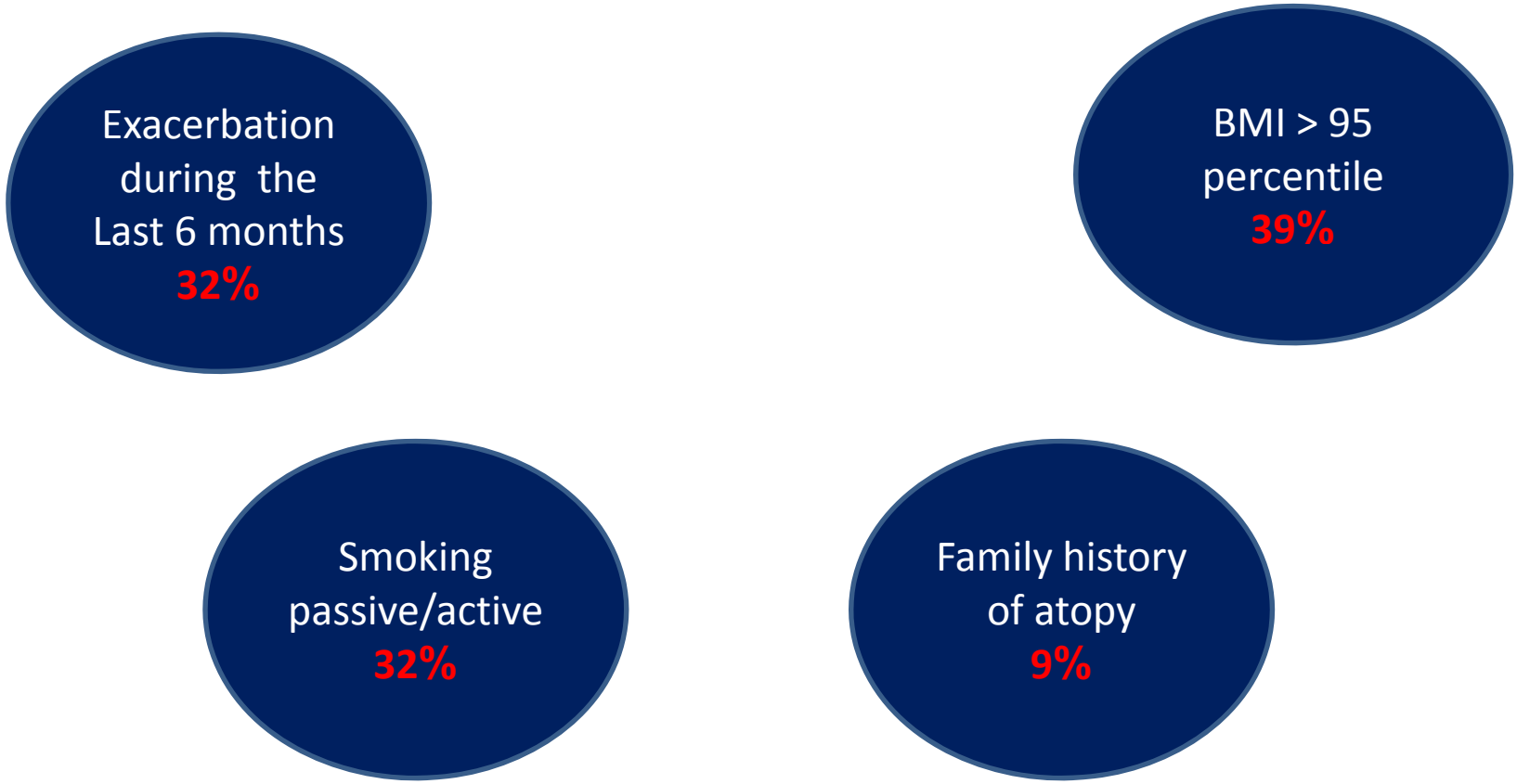
2 years old boy, low dose ICS prophylaxis, 2 courses of systemic GCS during the last 6 months



The majority of PP augment treatment prior to surgery for the following scenarios:



Most PP do not augment treatment prior to surgery for the following scenarios:



Discussion

AAP Textbook of pediatric care

"The incidence of RAD has increased markedly in the general pediatric population and is now approximately 25% of the pediatric surgical population".

"Asthma medical therapy must be escalated preoperatively even in asymptomatic patients".

"Short courses of GCS are extremely effective in preventing perioperative wheezing, even in patients who have severe asthma."

Aaron L. Zuckerberg et al, AAP Textbook of pediatric care . Chapter 62: Preoperative Assessment. 2008.

Discussion

Children on no prophylaxis – “should begin use SABA or oral medications 3 to 5 days preoperatively”.

Children on prophylaxis – “should have steroids added”

“The *difficult* asthmatic child requires intensification in the frequency of nebulizer treatments, added bronchodilators, increased steroids, or, on occasion, all of these measures.”

Aaron L. Zuckerberg et al, AAP Textbook of pediatric care . Chapter 62: Preoperative Assessment. 2013.

Discussion

- Randomized, prospective, placebo-controlled study.

- 31 patients with partially reversible airway obstruction
- Lung function and wheezing after intubation.

- Prophylaxis with:
1. combined salbutamol–methylprednisolone
2. salbutamol alone
3. salbutamol single dose

Fig. 2. Incidence of airway obstruction (wheezing) in patients after intubation when pretreated with salbutamol once and in patients pretreated for 5 days with either salbutamol alone or salbutamol combined with methylprednisolone. Only combined treatment with methylprednisolone and salbutamol significantly decreased the incidence of wheezing ($P < 0.05$).

Silvanus M-T et al. Corticosteroids and inhaled salbutamol in patients with reversible airway obstruction markedly decrease the incidence of bronchospasm after tracheal intubation. *Anesthesiology.* 2004

Does it make any difference?

Review 6.2013

- The effects of GCS on wound healing - animal and human from 1949 to 2011.
- Animal studies - 30% reduction in wound tensile strength with perioperative corticosteroids.
- Acute, high-dose systemic GCS use likely has no clinically significant effect on wound healing, whereas chronic systemic steroids may impair wound healing.

Wang AS et al. **Corticosteroids and wound healing: clinical considerations in the perioperative period.** Am J Surg. Jun 2013.

Does it make any difference?

- Observational prospective study.
- 212 pregnant woman
- Corticosteroid administration were found to be correlated with wound complications.
- To avoid wound complications obstetricians should be careful in the administration of steroids before surgery.

De Vivo A et al. Wound length and corticosteroid administration as risk factors for surgical-site complications following cesarean section. Acta Obstet Gynecol Scand 2010

Conclusions

- A major variability exists among pediatric pulmonologists in Israel regarding the indications and use of preoperative management of asthmatic children.
- This is most probably explained by the paucity of evidence-based data.
- Consensus guidelines for the preoperative management of asthmatic children are needed.

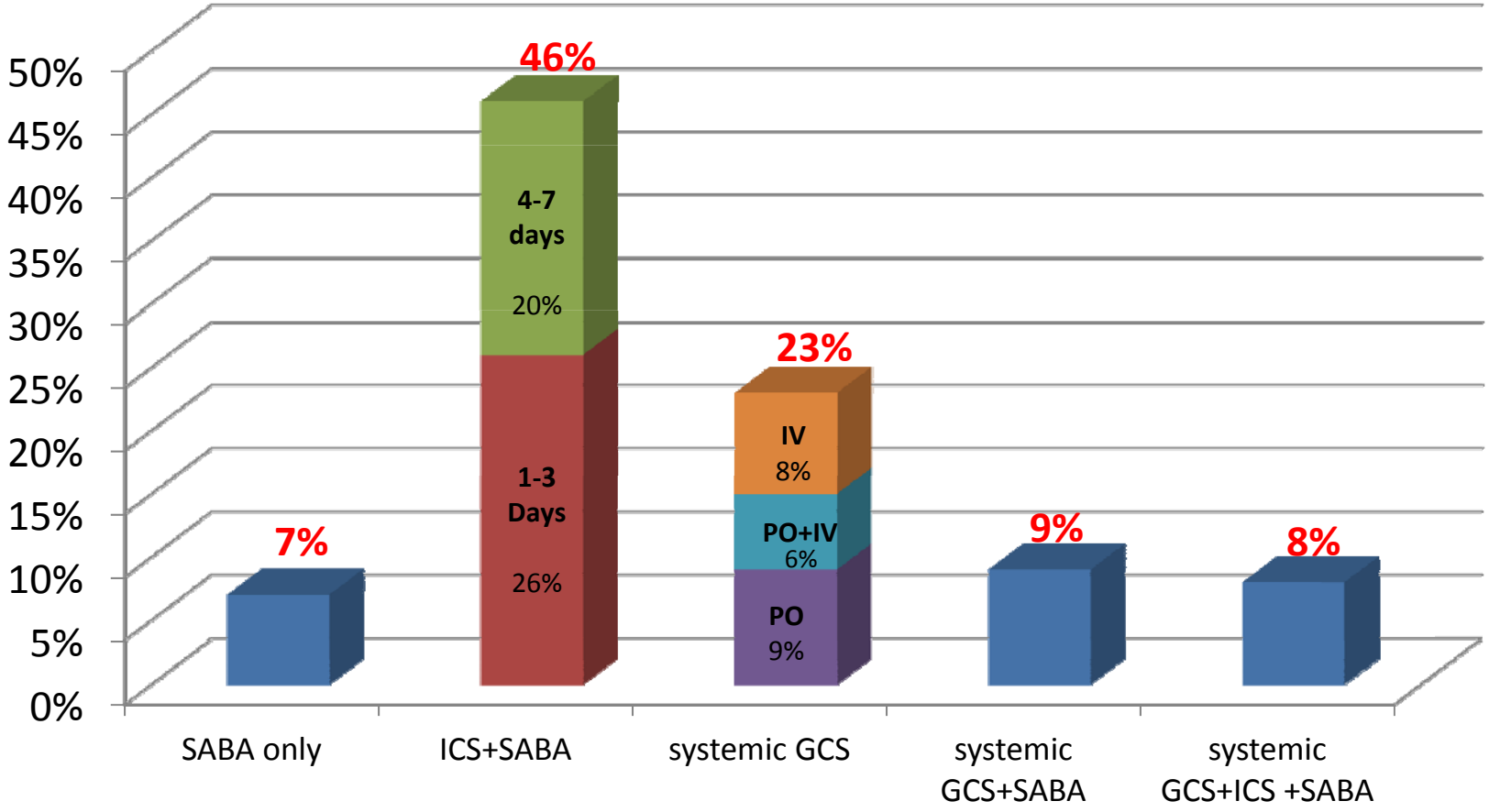
Future evaluation

A national survey of pediatric anesthesiologists to compare their strategies applied to the asthmatic child and their opinion on the role of the pediatric pulmonologist in the process.

תודה רבה על
שיתוף
הפעולה
!!!!

School age- well control

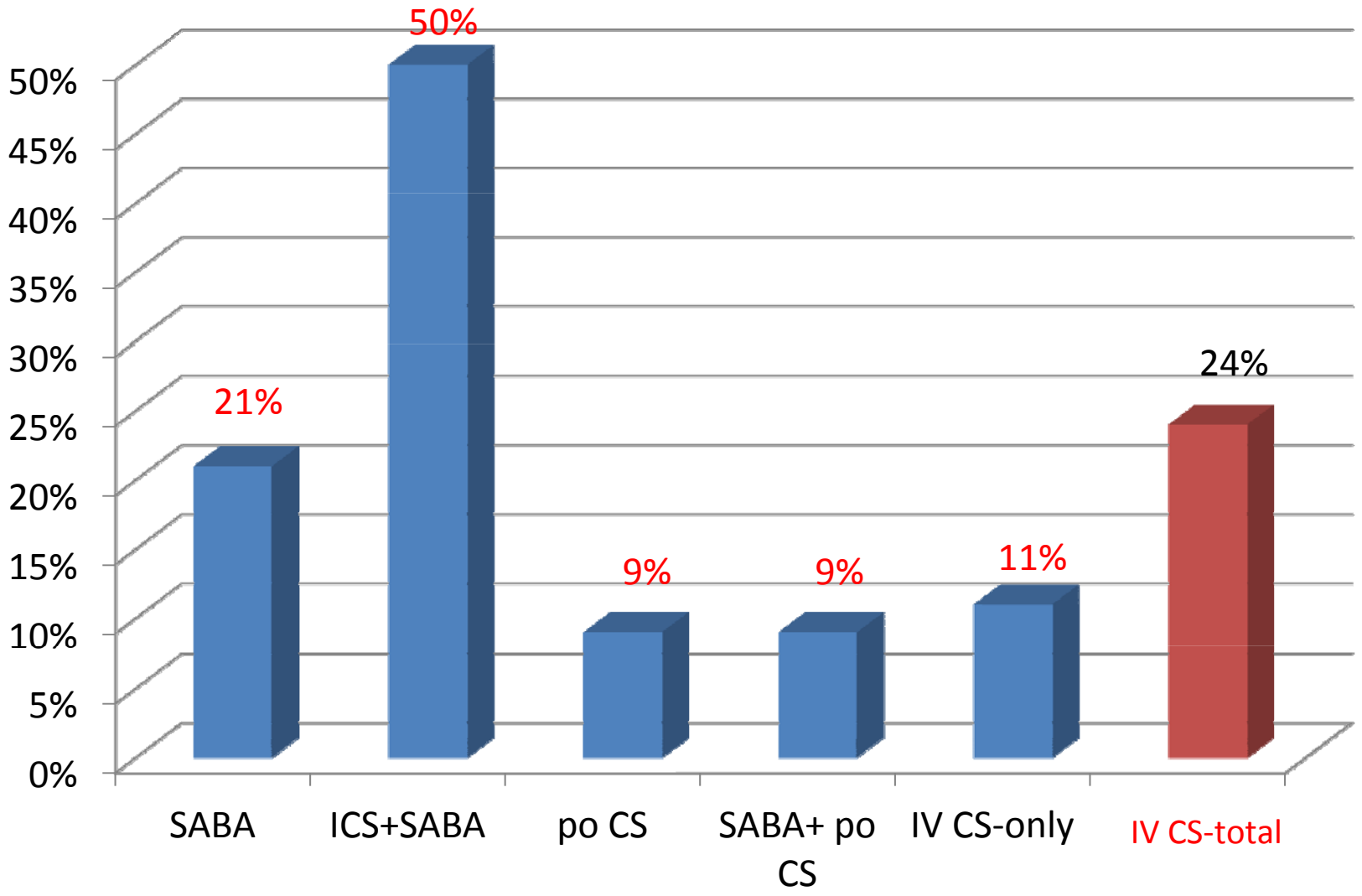
7 years old boy, 4 years ago PICU hospitalization, no prophylaxis, 2 asthma exacerbation per year



Pulmonary function test prior to surgery 48%

School age-well control

8 years old boy, no prophylactic Tx, asthma exacerbation once in 6 months



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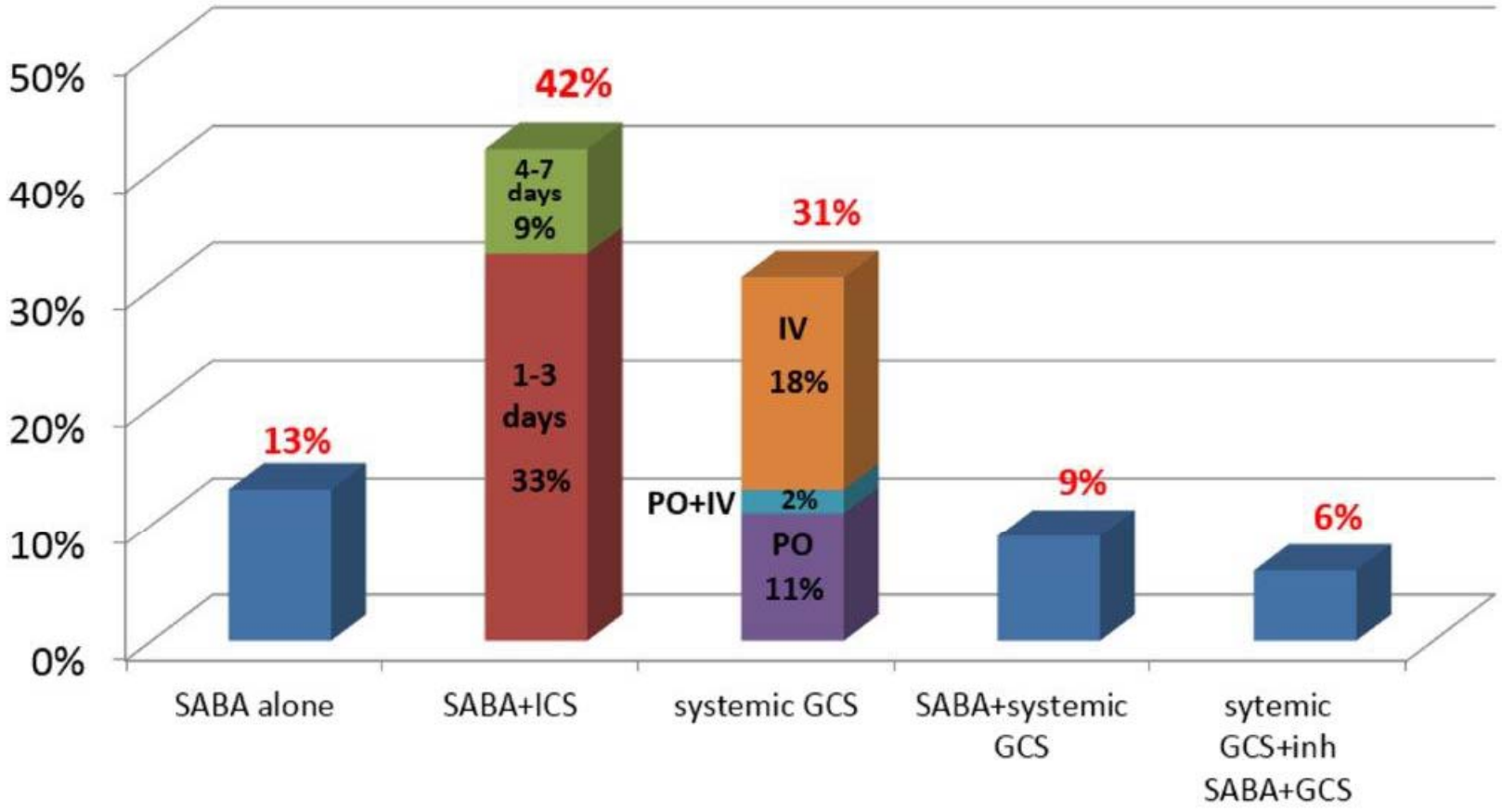
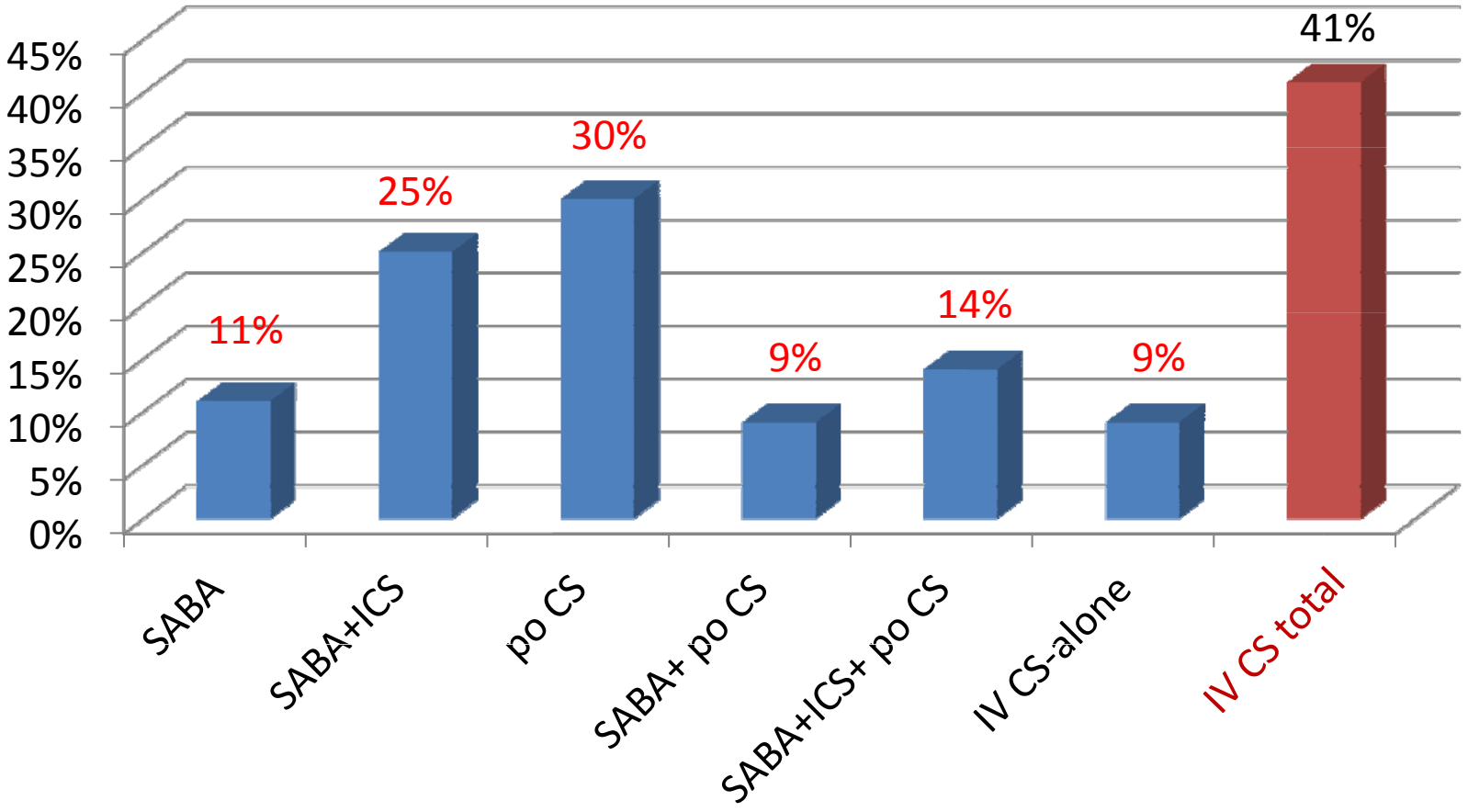


Pulmonary function test prior to surgery – 38%

School age-poor control

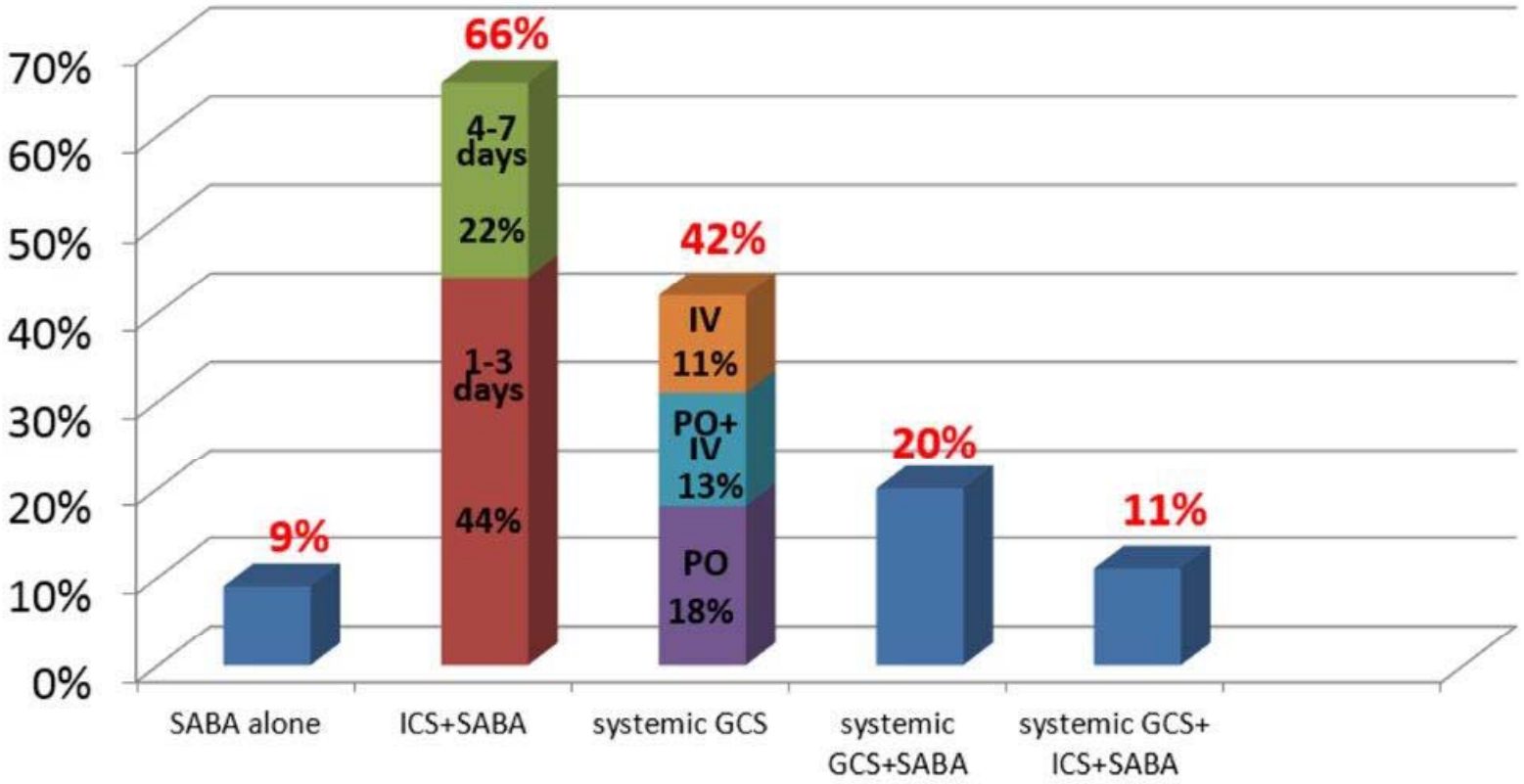
13 years old boy, high dose prophylactic ICS+LABA, asthma exacerbation 1-2 per month



Pulmonary function test prior to surgery -44%

School age-poor control

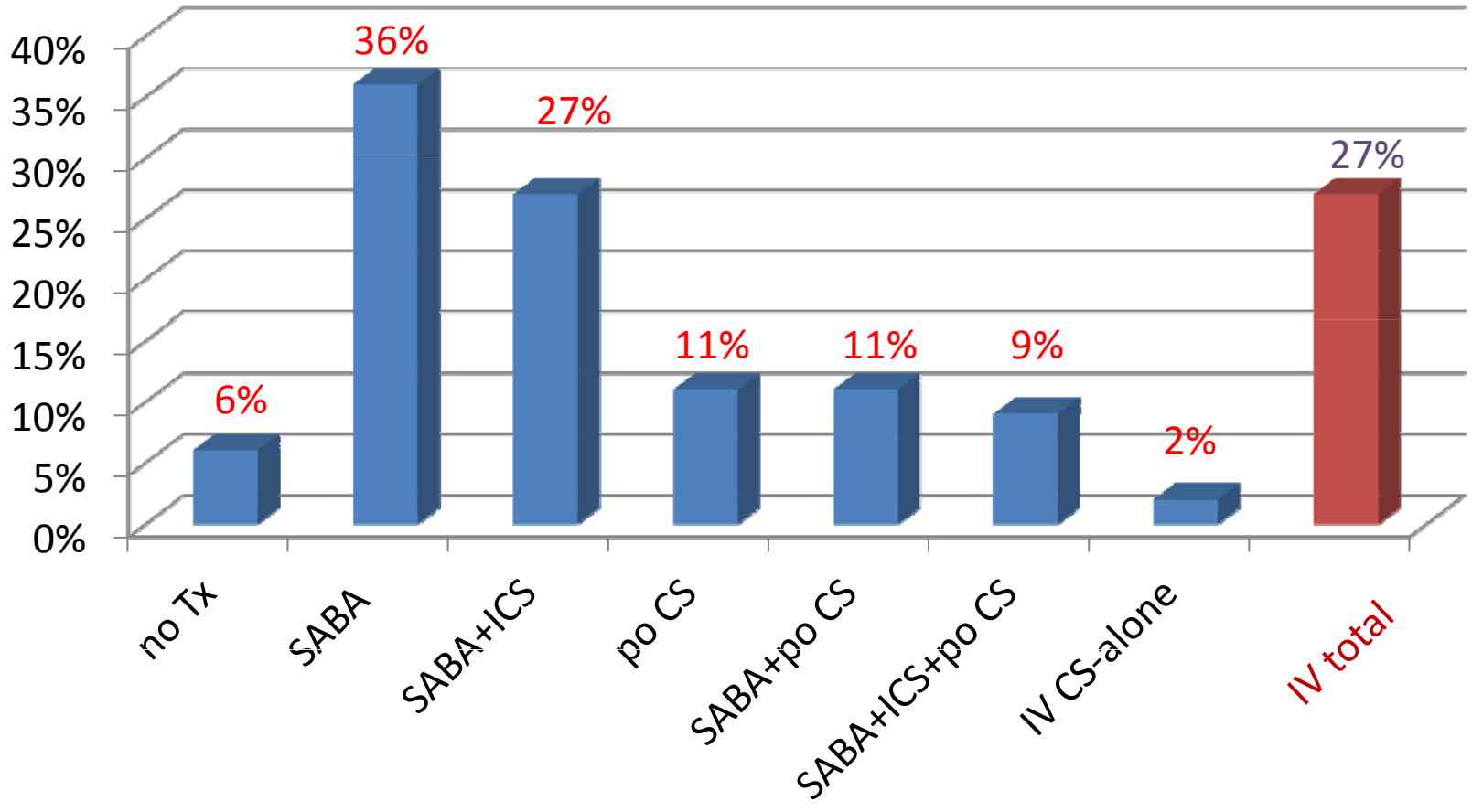
9 years old boy, no prophylactic Tx, asthma exacerbation every 1-2 mo



Pulmonary function test prior to surgery – 40%

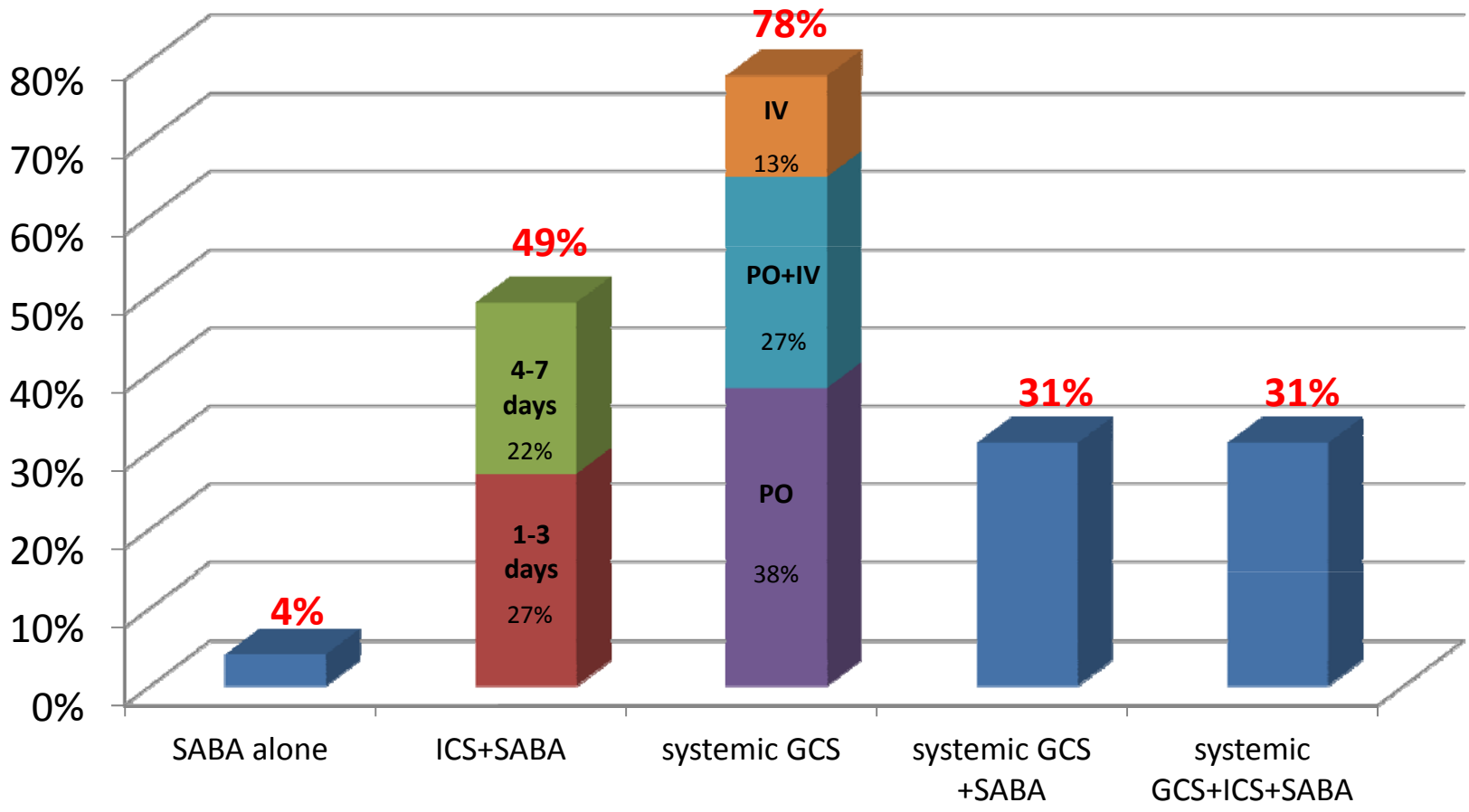
Preschool –well control

2 years old girl, low dose ICS prophylaxis, no recent exacerbation



Preschool-poor control

2 years old boy, low dose ICS prophylaxis, 2 courses of systemic GCS during the last 6 months



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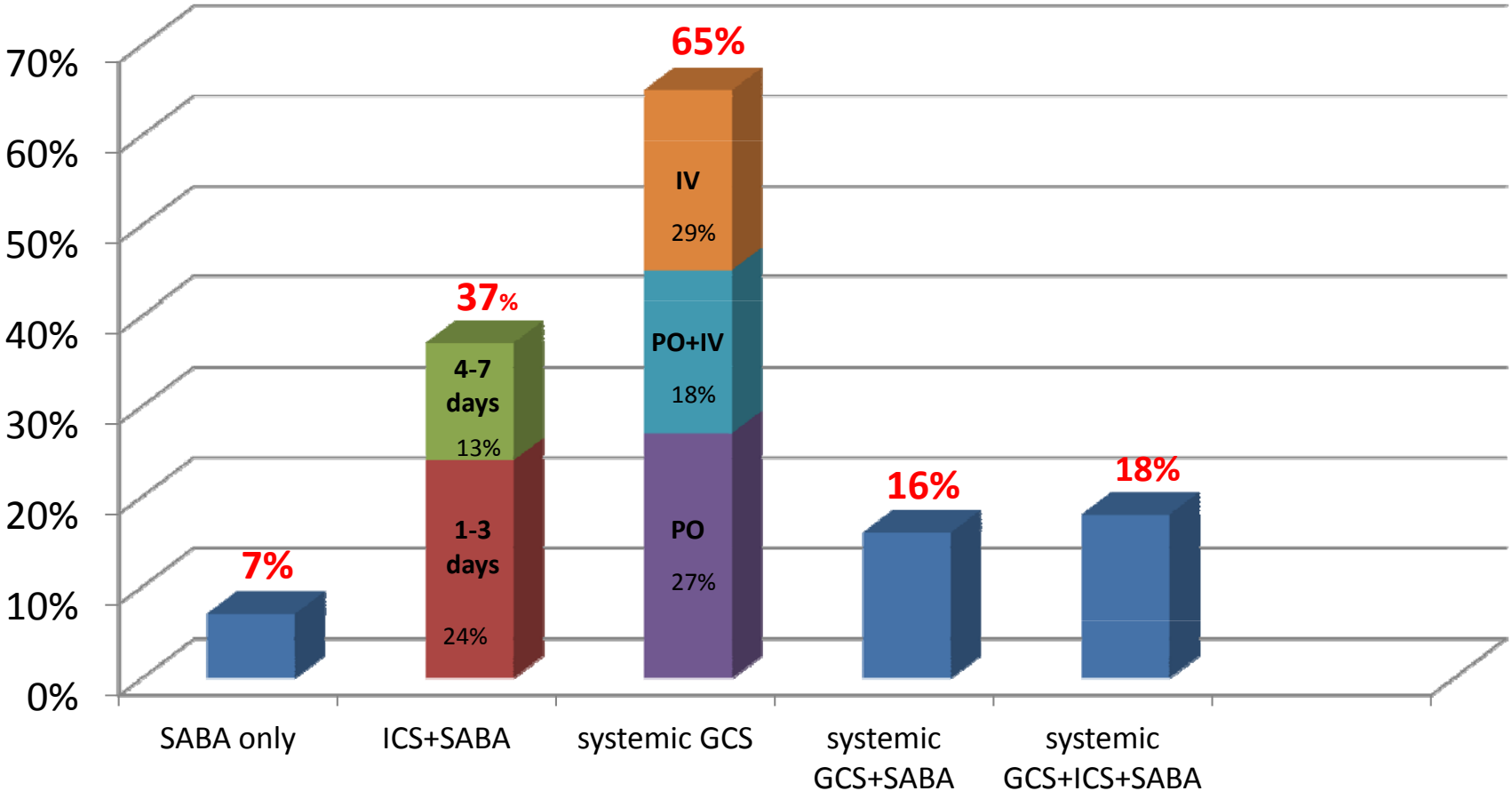

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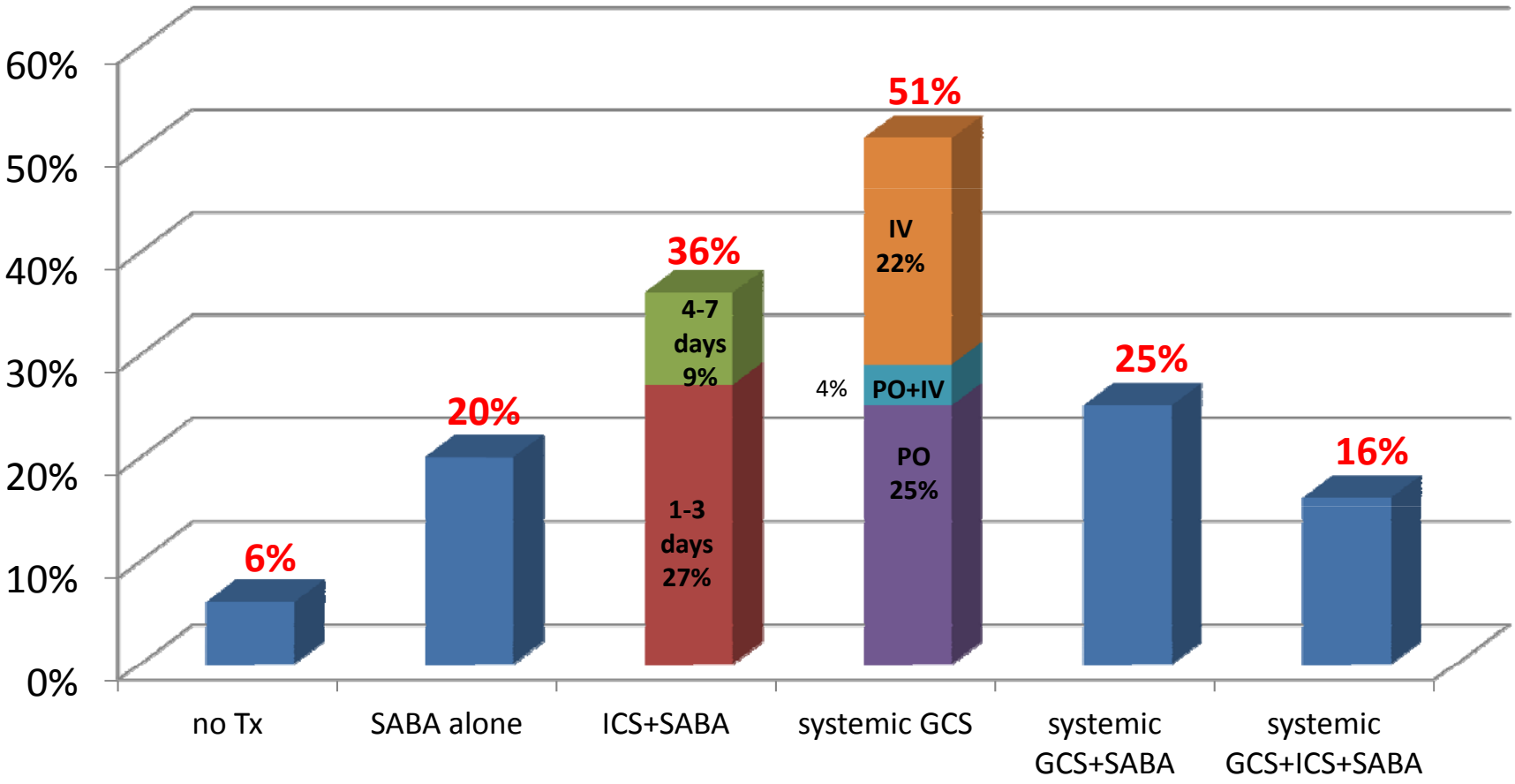

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