

# Pre-operative fasting times in paediatric patients admitted to the Orthopaedic Department

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## BACKGROUND

Recent research has shown that children are often fasted for unnecessarily long intervals and that prolonged fasting could have detrimental metabolic and behavioural effects in small children. In 2011, the European Society of Anaesthesiology proposed the 6-4-2 regimen for pre-operative fasting in paediatric patients. Solids, including semi-solid food and milk-containing products should be avoided 6 hours before anaesthesia induction, whilst breast milk and clear fluids, should be avoided 4 hours and 2 hours before anaesthesia induction respectively.

## METHODS

Patients, aged 16 years and younger, requiring emergency surgery within the Orthopaedic department over a period of three months, were included in this audit. 49 patients were identified from the trauma lists issued daily by the Orthopaedic Department. Data was collected from patients' case notes.

## RESULTS

Out of 41 patients, 22 patients (54%) were advised to remain starved from fluids and solids from 2 am in the morning. On the other hand, 37% of the patients (15 patients) were advised to remain starved from midnight.

## CONCLUSION

The majority of doctors that admit paediatric patients within the Orthopaedic Department seem to be unaware of the guidelines from the European Society of Anaesthesiology regarding pre-operative fasting times in children. As a result, these patients are fasted for unnecessarily long intervals leading to detrimental metabolic and behavioural effects.

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## BACKGROUND

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Recent research has shown that children are often fasted for unnecessarily long intervals and that prolonged fasting could have detrimental metabolic and behavioural effects in small children. Moreover, reducing fasting intervals to less than 2 hours, may be safe and result in a reduced risk of negative metabolic effects of fasting.<sup>1</sup>

In 2011, the European Society of Anaesthesiology proposed the 6-4-2 regimen for pre-operative fasting in paediatric patients. Solids, including semi-solid food and milk-containing products should be avoided 6 hours before anaesthesia induction, whilst breast milk and, clear fluids should be avoided 4 hours and 2 hours before anaesthesia induction respectively.<sup>2</sup>

The aim of preoperative fasting is to minimise the risk of pulmonary aspiration of gastric contents, as a result of regurgitation and loss of protective airway reflexes by anaesthetic agents.<sup>1</sup> Aspiration of gastric contents is an uncommon event but can lead to devastating consequences.<sup>3</sup> The current European guidelines have a good track record, as a recent audit of almost 120,000 cases in the United Kingdom, had a reported incidence of pulmonary aspiration of 0.02%.<sup>4</sup>

Moreover, there is no definite evidence that links the length of pre-operative fasting with risk of pulmonary aspiration during anaesthesia. Several studies have shown that it is likely that a child's last drink before surgery would have passed through the stomach within less than an hour.<sup>1</sup> On the other hand, a study carried out by Van de Putte et al. (2017) showed that a 2 hour fasting interval for fluids does not guarantee an empty stomach.<sup>5</sup>

Prolonged fasting in the paediatric population has been shown to increase the incidence of hypoglycaemia, metabolic acidosis, dehydration, cardiovascular instability, discomfort, hunger, thirst and grumpiness.<sup>6</sup>

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## MATERIALS AND METHODS

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### *Aim*

The aim of this clinical audit project is to assess compliance with current guidelines regarding pre-operative fasting times in paediatric patients. If compliance is found to be poor, recommendations for change should be made, which include further education to the surgical teams within the Orthopaedic Department.

### *Objectives*

The objective is to determine whether or not paediatric patients and their parents, are given the appropriate advice regarding pre-operative fasting.

### *Standards*

Peri-operative fasting in adults and children: guidelines from the European Society of Anaesthesiology are used to measure current practice. The guidelines advise that children should be starved 6 hours from solid, 4 hrs from breast milk and 2 hours from clear fluids pre-operatively.

### *Methodology*

Patients aged 16 years and younger requiring emergency surgery within the Orthopaedics department were included in this audit. This is a retrospective audit looking at admissions from 9th May 2019 to 9th August 2019. 49 patients were identified from the trauma lists issued daily by the Orthopaedic Department. Data was collected from patients' case notes and this was inputted into and analysed using Microsoft Excel.

## Results

A total of 41 case notes were reviewed. In the case of 6 patients, the case notes were not retrieved as they were still in use at outpatients' clinics. 1 patient's case notes were not available for an unknown reason while for another patient no notes regarding the concerned admission were found in his case notes.

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## DISCUSSION

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The mean age of the population audited was 7.71 years. The youngest patient was 5 weeks old while the oldest patient was 16 years old. The population studied was almost equally distributed into the 3 age groups: ≤5 years old; 6 – 10 year old; 11 – 16 years old (Refer to Table 1). The majority of patients, 26 out of 41 patients (63%), were male while 37% (15 out of 41 patients) were female.

Out of 41 patients, 22 patients (54%) were advised to remain starved from fluids and solids from 2 am in the morning (Refer to Table 2). As a result, these patients were kept nil by mouth for at least 6 hours and 30 minutes, keeping in mind that usually the first case on

the trauma list starts at 8.30am. This is in keeping with the guidelines regarding starvation from solids but not in the case of clear fluids.

15 patients, (37%) were advised to remain starved from midnight (Refer to Table 2). These patients were kept nil by mouth for at least 8 hours and 30 minutes. This period was even longer in cases where the patient was not done first on the trauma list. This usually occurs when other cases take priority, such as a younger patient or when a life/limb threatening case is admitted.

In 9% of the patients (i.e. 4 patients), it was noted that they were operated on the same day of admission and no clear documentation was available in the case notes regarding the advice that the patients and their parents were given. No documentation about the period of starvation was noted as well.

Out of the 22 patients who were starved from 2am, 4 of them were reviewed at around 2am by the orthopaedic trainees. It is possible that different advice would have been given if the patient was reviewed at an earlier time during the night.

**Table 1** Demographic data of the population studied

		Number of patients	Percentage
<b>Total</b>		41	100%
<b>Age</b>	<i>Mean: 7.71</i>		
	≤ 5 years old	14	34%
	6 - 10 years old	12	29%
	11 - 16 years old	15	37%
<b>Sex</b>	Male	26	63%
	Female	15	37%

**Table 2** Data on advice given to paediatric admissions regarding pre-operative fasting

		Number of patients	Percentage
<b>Advice given</b>	Starve from Midnight	15	37%
	Starve from 2am	22*	54%
<b>Surgery done on same day of admission</b>		4**	9%

\*4 of which were reviewed at around 2am

\*\*No clear documentation was available on how long the patient was starved.

### CONCLUSION

The majority of doctors that admit paediatric patients within the Orthopaedic Department seem to be unaware of the guidelines from the European Society of Anaesthesiology regarding pre-operative fasting times in children. As a result, these patients are fasted for unnecessarily long intervals leading to detrimental metabolic and behavioural effects.

The authors suggest teaching sessions on peri-operative care of such paediatric patients to be included in the surgical training programme. Moreover, it would be interesting to carry out similar audits in other surgical departments that operate on paediatric patients, to improve current practices and, create more awareness of these guidelines and the detrimental effects of prolonged fasting in children.

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## REFERENCES

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