

*Original articles*

## Current practice of preoperative fasting: a nationwide survey in Japanese anesthesia-teaching hospitals

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### Abstract

**Purpose.** We conducted a nationwide survey to investigate the current practice of the preoperative fasting period in Japanese anesthesia-teaching hospitals. Acceptance of the clinical practice guideline published by the American Society of Anesthesiologists (ASA) was also surveyed.

**Methods.** A written type-of questionnaire was mailed to 795 teaching hospitals.

**Results.** The response rate of the questionnaires was 57%. Most (>90%) of the respondents had been applying a longer fasting period than the ASA-recommended minimum period specifically in adults; the median duration of fasting was 12–13 h for solids and 6–9 h for liquids. Children or infants were allowed a more liberalized fasting period, frequently being permitted an oral intake of clear fluids up to 3 h before anesthesia. The incidence of pulmonary aspiration was 1/12500 general anesthesia cases, and application of the ASA guideline appeared not to affect the incidence. Japanese anesthesiologists were still reluctant to depart from their traditional long fasting periods, as most of them could find little benefit in reducing the fasting periods.

**Conclusion.** The long preoperative fasting period is still common practice in Japanese anesthesia-teaching hospitals. A national guideline for a preoperative fasting policy is worth exploring to change the current practice.

**Key words** Preoperative fasting periods · General anesthesia · Japanese practice

### Introduction

Until recently, prescribing a longer duration of preoperative fasting, represented by “NPO after midnight,”

had been common practice. It is doubtful, however, whether this long fasting period has any benefit in clinical anesthesia practice. Recent clinical studies have frequently addressed the benefits of short fasting periods. A shorter duration of fasting might be sufficient to ensure gastric emptying and hence reduce the incidence of pulmonary aspiration. Several clinical studies performed around a decade ago had revealed that oral intake of clear fluids administered up to 2 h prior to anesthesia does not adversely affect the gastric contents [1–3]. It may also be beneficial in improving patient comfort by reducing thirst, thereby increasing compliance with the oral restriction program, especially among outpatients [4,5]. The American Society of Anesthesiologists (ASA) thus proposed a more liberal clinical practice guideline regarding this issue in 1999 [6]. They proposed short fasting periods to be applied to elective surgical patients, depending on the type of material being ingested. However, the outcome of applying the short fasting period on aspiration-related complications has not yet been evaluated.

Indeed, it has been of great concern to Japanese anesthesiologists that no information regarding the attitudes of Japanese anesthesiologists toward this topic has ever been made available. To date, authorized clinical practice guidelines or recommendations have not yet been proposed by the Japanese Society of Anesthesiologists or by the Ministry of Health, Labor, and Welfare of Japan. Therefore, we conducted a survey to demonstrate the current practice of preoperative fasting in Japanese teaching hospitals.

### Materials and methods

A written type of questionnaire was sent to chief anesthesiologists in all of the anesthesia-teaching hospitals with more than two anesthesia instructors certified by the Japanese Society of Anesthesiologists. There were

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795 anesthesia-teaching hospitals in Japan when this study was conducted in February 2003.

The purpose of the questionnaire was to obtain an insight into preoperative fasting routines. The details of the questionnaire are described in the Appendix. This original questionnaire form includes several queries associated with preoperative fasting other than the fasting period itself, as we aimed at analyzing that data for different purposes. In this study, we focused on the duration of preoperative fasting in elective surgery patients and acceptance of the ASA guideline in this analysis. Specifically, we analyzed questions 1, 8, 9, and 10 described in the Appendix.

The questionnaire was as follows.

1. Please describe the average fasting periods the patients are told to follow for the various types of solids and liquids before general anesthesia. There were three categories for the type of materials ingested (solid foods, milk, clear fluids), three categories for the patients' age (adult, child, infant), and two categories for the timing of the initiation of surgery (morning or afternoon).
2. Are you applying the ASA-recommended minimum fasting period? If not, please state the reasons why.

3. Please note the number of patients who suffered complications of pulmonary aspiration during general anesthesia at your institute during the year 2002 and describe the total number of general anesthetics performed at your institute during this time.

## Results

Of the 795 anesthesiologists eligible for this study, 453 (66 from university-affiliated hospitals and 387 from others) responded to the questionnaire (response rate 57%). The total number of cases in which general anesthesia was performed was 727264 for 446 of the 453 hospitals. (The numbers of general anesthesia cases were not provided from the other seven hospitals.)

### *Duration of preoperative fasting*

The duration of preoperative fasting is shown in Table 1. The duration of preoperative fasting was markedly longer in adults. The median duration for restriction of clear fluids or solids was 9–12 h in adults. It is of note that more than 90% of the adult respondents were applying longer durations of restriction than was recom-

**Table 1.** Preoperative fasting periods

Parameter	Percent of institutes, according to their fasting periods			Median duration (h)	No. of respondents
	>2	2 <sup>a</sup>	<2		
Clear liquids					
Hours of fasting	>2	2 <sup>a</sup>	<2		
Adults					
a.m.	92	8	0	9	399
p.m.	94	6	0	6	399
Children					
a.m.	81	19	0	3.5	403
p.m.	82	18	0	3	394
Infants					
a.m.	59	40	1	3	374
p.m.	60	39	1	3	361
Milk					
Hours of fasting	>4	4 <sup>a</sup>	<4		
Infants					
a.m.	41	49	10	4	370
p.m.	40	50	10	4	356
Solids					
Hours of fasting	>6	6 <sup>a</sup>	<6		
Adults					
a.m.	95	4	1	12	436
p.m.	96	2	2	13	437
Children					
a.m.	73	19	8	9	406
p.m.	54	34	12	8	389

Preoperative fasting periods depended on the materials ingested, the age of the patients, and the time anesthesia was started a.m., anesthesia starting in the morning; p.m., anesthesia starting in the afternoon; ASA, American Society of Anesthesiologists

<sup>a</sup>ASA-recommended minimum duration

**Table 2.** Reasons for not complying with the minimum fasting period recommended by the ASA

Reason	No.
No hospital benefit in changing the current practice	192 (56%)
To allow flexibility for changes in the operating schedule	171 (50%)
To avoid intrahospital confusion associated with changes in the fasting period	135 (40%)
Intravenous fluid supplementation would compensate for the long fasting time	109 (32%)
Fear of the possible increased risk of aspiration	85 (25%)
No benefit for anesthesiologists	71 (21%)
Unaware of the ASA guideline	50 (14%)
Doubt about the clinical applicability of the American recommendation in Japanese practice	41 (12%)
Frequent use of laryngeal mask	26 (8%)
No benefit for patients	17 (5%)

Respondents could check all that apply

**Table 3.** Incidence of aspiration depending on acceptance of the ASA-recommended minimum fasting period

Acceptance	No. of institutes	No. of general anesthetics	Aspiration	
			No.	Incidence <sup>a</sup> (per 100 000 anesthetics)
Yes	101	188 301	9	4.8
No	345	538 363	49	9.1

<sup>a</sup>No significant difference between groups

mended in the ASA guideline. On the other hand, children or infants were allowed a more liberalized fasting period, frequently being permitted oral intake of clear fluids up to 3h before anesthesia.

#### *Acceptance of the ASA guideline on the preoperative fasting period*

Altogether, 101 institutes (22.6%) answered that they were basically applying the minimum fasting period recommended by the ASA. For the institutes who did not answer “yes,” the most frequent attitude toward the fasting period was “overnight fasting.” The reasons for not complying with the ASA guideline are listed in Table 2. Most respondents were of the opinion that they or their institutes would not find any benefit in adopting the short duration of fasting. They responded that changing the traditional institutional routine of a long fasting period might be problematic by creating confusion in their established clinical routine. A considerable number of the respondents (25%) still feared an increase in aspiration-related complications if the shorter fasting time were to be applied. Another 14% of the respondents were not aware of the existence of the ASA guideline, and 12% were reluctant to accept a U.S.-based guideline.

#### *Status of pulmonary aspiration*

There were 58 cases of pulmonary aspiration reported, for an incidence of 1 case per 12 500 general anesthetics. If we compare the incidence of aspiration during anesthesia in the institutes of respondents who answered that they were following the minimum fasting period versus those who were not, there was no significant difference between the two groups (4.8/100 000 vs. 9.1/100 000,  $P = 0.22$  by Mann-Whitney U-test) (Table 3).

#### **Discussion**

This is a first-ever nationwide survey conducted to evaluate the common attitude of anesthesiologists regarding the preoperative fasting period in Japan, although national surveys or consensus agreements regarding preoperative fasting policies have already been established in most developed countries [7,8]. A response rate of 57%, which was comparable to those reported in the other national surveys [9–11], indicates that the results from this survey well represent the current status of the preoperative fasting period in Japanese clinical anesthesia practice.

This study revealed that most of the anesthesiologists in Japanese anesthesia-teaching hospitals are currently applying a longer-than-recommended fasting period. Only about one-fourth of the respondents answered that they were following the ASA recommendation. The exact duration of preoperative fasting was longer in adults, their median duration of fasting being 12–13 h for solids and 6–9 h for clear liquids, compared with that described in the ASA recommendation (6 and 2 h, respectively). It is of note that more than 90% of the respondents did not allow patients to ingest clear fluids up to 2 h preoperatively. These results were comparable to the data described in a U.S. study conducted and published before publication of the ASA recommendation, where overnight fasting (or 6–8 h of fasting) was still common practice [10] (59% of adults and 31% of children were fasted overnight). Current practices in the United States, however, have changed dramatically after publication of the ASA recommendation. In a national survey conducted in the United States in 2000, about 62% of respondents allowed their patients to have clear liquids 2–3 h before surgery [11]. Thus, in Japan there seems to be significantly insufficient acceptance of the ASA recommendation even 4 years after the ASA guideline was published. Adopting a shorter fasting period, specifically in terms of the liquid intake by adults, is worth exploring in future Japanese anesthesia practice.

Pulmonary aspiration occurred in 58 of the total cases, indicating that the incidence is 0.8 cases per 10000 anesthetics. This incidence is comparable to or even lower than those reported previously in North American or European multicenter or single-institute surveys, in which the incidence ranged from 0.8 to 6.5 cases per 10000 anesthetics [8,12–16]. This study, therefore, reiterates the fact that the incidence of anesthesia-related pulmonary aspiration appears to be quite low in modern anesthesia practice.

Another important finding pertains to the effect of the short fasting period on the incidence of aspiration. Although one large-scale, single-institute, prospective study published in 2000 assessed the effect of a short fasting period on operating room utilization [17], no study has yet been conducted to assess the aspiration-related outcome. Our study revealed that there was no significant difference in the rate of pulmonary aspiration between the institutes that were applying the minimum period (4.8/100000) and institutes with longer fasting periods (9.1/100000). A liberal, ASA-recommended preoperative fasting guideline appears to be adoptable without increasing the aspiration risk.

Japanese anesthesiologists should also be concerned about the fact that prolonged fasting is associated with the risk of dehydration, emesis, hypoglycemia, and patient discomfort or dissatisfaction [4,5], as well as cost-ineffective utilization of health care resources [17].

Further supportive study should be conducted to assess the benefit of the shorter fasting period (e.g., allowing the patient to drink clear water until 2–3 h preoperatively according to the patients' need) in improving perioperative quality of life or body fluid homeostasis.

This study has some limitations specifically regarding the aspiration survey. First, the reports of aspiration were retrospective and totally dependent on the memory of the respondent or a database search, the accuracy and completeness of which might be different for each of the respondents. This might have resulted in a lower incidence of aspiration in this survey. Another limitation is that we had not provided any definitions regarding aspiration, its diagnosis being totally dependent on the clinical diagnosis made by each respondent. The researchers were unable to reevaluate the medical charts of the cases. This also may have resulted in a lower morbidity/mortality rate associated with aspiration being reported.

## Conclusions

A long preoperative fasting period is still common practice in Japanese anesthesia-teaching hospitals. Given that a national consensus had a significant impact on liberalizing the fasting policy [9], establishing a Japanese national guideline for preoperative fasting as liberal as that recommended by the ASA is worth exploring.

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**Appendix**

**A. Questionnaire for preoperative fasting periods and associated conditions**

**Q1. Please describe how long you keep patients nil by mouth.** Describe the fasting periods (in hours) in each category.

	Adults am	Adults pm	Children am	Children pm	Infants am	Infants pm	Emergency	Day surgery
Solids								
Milk								
Clear fluids								

**Q2. Preoperative intravenous fluids.** Please describe the details of preoperative intravenous fluid infusion in each category.

	Adults am	Adults pm	Children am	Children pm	Infants am	Infants pm	Emergency	Day surgery
Application: yes (+) or no (-)								
Materials								
Dose								

**Q3. Orders for preoperative fluid infusion.**

1. Do anesthesiologists make the order? (a. yes; b. no; c. depends on the situation)
2. For what kind of patient does the anesthesiologist order the infusion?

**Q4. Preoperative oral intake (on the day before surgery)**

1. Does the anesthesiologist recommend the preoperative oral intake? (a. yes; b. no; c. depends on the situation)
2. For what kind of patients do you recommend oral intake preoperatively?
3. How do you make the recommendation?

**Q5. Preanesthetic medications used (circle all that apply):** a. histamine-2 receptor antagonists, injection; b. histamine-2 receptor antagonists per os; c. pirenzepine; d. metoclopramide; e. atropine; f. antianxiety drugs; g. narcotics; h. antagonistic analgesics

- Q6. Do you insert nasogastric tubes** (*circle whichever is appropriate*)? **a.** all cases; **b.** never use; **c.** gastrointestinal surgery only; **d.** postoperatively mechanically ventilated patients only; **e.** emergency surgery only; **f.** depends on the situation; **g.** preoperatively inserted for all cases; **h.** preoperatively inserted in case of gastrointestinal surgery)
- Q7. Prophylaxis for anticipated aspiration** (*circle all that apply*): **a.** delay starting time; **b.** antacids use; **c.** awake insertion of nasogastric tube; **d.** awake intubation; **e.** rapid sequence induction with cricoid pressure; **f.** others: *please describe*
- Q8. Aspiration associated with general anesthesia**
1. Total number of general anesthetics in 2002
  2. Incidence of aspiration in 2002

### **B. Questionnaire for ASA guideline**

The American Society of Anesthesiologists (ASA) published a guideline regarding preoperative fasting periods for elective surgery patients in 1999.

In the guideline, the recommended minimum fasting period for clear liquids, milk, and light meals are set at 2, 4, and 6 h, respectively.

- Q9. Do you follow the aforementioned ASA guideline at your institute?** **a.** yes; **b.** no  
If “no,” please proceed to Q10 and Q11; if “yes,” proceed to Q11
- Q10. What are the reasons for “no” in Q9?** (*circle all that apply*)
- a. No hospital benefit in changing the current practice
  - b. Intravenous fluid supplementation would compensate for the long fasting time
  - c. To avoid intrahospital confusion associated with changes in the fasting period
  - d. No benefit for anesthesiologists
  - e. No benefit for patients
  - f. To allow flexibility for changes in the operating schedule
  - g. Fear of the possible increased risk of aspiration
  - h. Doubt about the clinical applicability of the American recommendation in Japanese practice
  - i. Unaware of the ASA guideline
  - j. Frequent use of laryngeal mask
  - k. Others (*please describe*)
- Q11. Use of laryngeal mask and fasting period**
1. How long are the fasting periods you prescribe when you use a laryngeal mask? Please compare the duration with that required for tracheal intubation: **a.** same; **b.** longer periods than for tracheal intubation; **c.** shorter periods than for tracheal intubation
  2. What is the percentage of patients in whom a laryngeal mask is used at your institute?