



# Actual Preoperative Fasting Time; A Report From Guilan Academic Hospitals: A Cross-sectional Study

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## Abstract

**Objectives:** Traditional guidelines for preoperative fasting (POF) time lead to several complications in surgery patients. However, not enough attention has been paid to the issue. This aimed of this study was to investigate the management of fasting times in Guilan academic hospitals.

**Materials and Methods:** In this descriptive cross-sectional study, individuals from five academic referral centers enrolled the survey and questionnaires including demographic characteristics, fasting hours for liquids and solids, POF recommenders, and patient's knowledge regarding the definition of clear liquids were completed.

**Results:** A total of 390 individuals candidate for elective surgeries enrolled in the study, the mean age of our cases were 46.61 years. The average POF time for solids and liquids was 11.43 and 9.70 hours, respectively. 95.38% of the participants did not know a correct definition of clear liquids, which was not related to their level of education ( $P=0.314$ ). A positive association was observed between age and POF times for liquids and American Society of Anesthesiologists Classification for both solids ( $P=0.010$ ) and liquids ( $P=0.0001$ ).

**Conclusions:** It was found that the real POF time in our hospitals was significantly longer than the modern guidelines, and needs to be corrected.

**Keywords:** Fasting, Preoperative care, Academic medical centers

## Introduction

Preoperative fasting (POF) status is defined as the time prescribed before elective surgeries or any procedure that needs anesthesia (1). Traditionally, the patients are not allowed to take any oral intake after midnight the night before surgery to prevent intraoperative pulmonary aspiration. Unfortunately, the mentioned time is recommended regardless of the time of surgery. In addition, since various properties are available to prevent pulmonary aspiration, there is limited evidence to suggest that the current fasting guidelines improve the outcomes (2,3). It should be noted that even the mentioned fasting time is often not performed, and unplanned emergency surgeries and changes in operating room schedule lead to more delay. Inadequate perioperative nutrition results in loss of lean body mass, valuable calories, or proteins. In addition following long POF time patients suffer from complications such as postoperative nausea and vomiting, dehydration, hunger, thirst, electrolyte imbalance, hypoglycemia, ketoacidosis confusion, and postoperative insulin resistance resulting in mortality, morbidity and longer length of hospital stay (4-6). Clearly postoperative insulin resistance results in mortality, morbidity, and longer length of hospital stay (7). In contrast to traditional guidelines, a modern protocol is defined as 6- 8 hours for solids and 2 hours for clear liquids (5).

It seems that not it has not enough attention has been paid to the issue in our hospitals. Here we evaluated the real situation of POF in Guilan academic hospitals.

## Materials and Methods

### Setting

This descriptive cross-sectional study was conducted at five major academic hospitals affiliated to Guilan University of Medical Sciences (GUMS), Rasht, Iran in 2018. These hospitals were the main referral centres in Guilan province which admitted a variety of surgeries related to their field, including Alzahra hospital for obstetrics and gynaecology surgeries, Poursina hospital for general surgery and orthopaedic surgeries, Heshmat hospital for cardiac surgeries, Razi hospital for vascular, thoracic and urologic surgeries and Amir Almomenin hospital for ear, nose, throat, and eye surgeries. Pediatric and psychiatric hospitals were excluded from the survey.

### Participants

All patients candidate for elective surgeries admitted to Guilan academic hospitals.

### Inclusion Criteria

Adults over 18, both male and female, candidate for various elective surgeries under general, regional, or

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## Key Messages

- ▶ Paying attention to the exact fasting time before surgery is a very important issue that affects the outcomes of surgery and patients' satisfaction.
- ▶ The present study stated that preoperative fasting time was not considered properly in academic hospitals affiliated with Guilan University of Medical Sciences.
- ▶ In this study, participants mostly did not know the correct definition of clear fluids and their fasting time was recommended by the nursing team.

combined general and regional anesthesia, the ability of appropriate communication.

### Exclusion Criteria

Emergency surgeries, pregnant women, and individuals with mental health problems or different languages which prevented a successful interview.

### Data Sources/Measurement

First the purpose and method of the study were explained to the surgery patients and then informed consent was obtained from those who wished to participate in this study. Arriving at the operating room, a questionnaire was filled out through a face-to-face interview by a medical student in charge of the study. The mentioned questionnaire consisted of demographic data including gender, type of operation, age, level of education, American Society of Anesthesiologists (ASA) class, time of the last oral intake for solids and liquids, POF time, the main advisers of fasting time and patients' knowledge about the correct definition of clear liquids. In each hospital an anesthesiologist took the responsibility of supervising the data collection process.

### Outcomes

Determining fasting time for both solid and liquid based on study variables, patients' knowledge of the correct definition of clear liquids and being aware from fasting time recommenders to the surgery patients

### Sample Size

The appropriate sample size, at least 384 people, was identified based on a pilot study and the following formula. Then, considering the average of daily elective surgeries in each hospital the required number of participating patients in each center was determined.

$$\bar{x} \pm SD \rightarrow 11.7 \pm 2.002$$

$$n = \frac{Z^2 SD^2}{d^2 (0.2)^2} = \frac{(1.96)^2 (2.002)^2}{0.04} = 384$$

### Statistical Analysis

The data were analyzed by using SPSS version 21 software (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, version 21.0. Armonk, NY: IBM Corp).

Continuous data were initially analyzed for homogeneity and normality by the Kolmogorov-Smirnov test. Mann-Whitney test was applied accordingly. To compare the categorical data, the chi-square test was used. Statistical significance was considered as ( $P < 0.05$ ).

### Results

In this multicenter study, a total of 390 participants enrolled. The mean age of the participants was 45.61 (18-85) years, of which 53.8% were male. The participant's socio-demographic information, type of surgery, and source of information are presented in (Table 1). The mean fasting hours for solids was 11 hours and 26 minute and for liquids was 9 hours and 42 minutes, which presents a significant difference with standard schedule ( $P = 0.0001$ ). A negative association was observed between age and POF times for liquids ( $P = 0.0001$ ) and ASA class for both solids ( $P = 0.010$ ) and liquids ( $P = 0.0001$ ). No significant relationship was observed between gender and POF times ( $P = 0.052$ ).

While nurses were the main advisers for POF time, it

**Table 1.** Descriptive Analysis of Factors Affecting Preoperative Fasting Time

Variable	No. (%)
Age (y)	
<60	294 (75.4)
>60	96 (24.6)
Gender	
Male	210 (53.8)
Female	180 (46.2)
ASA Class	
I	205 (52.6)
II	136 (34.9)
III	49 (12.5)
Residence area	
Urban	262 (67.2)
Rural	128 (32.8)
Education	
Uneducated	75 (19.2)
Primary	99 (25.4)
Secondary	172 (44.1)
College	44 (11.3)
Source of information	
Surgeon	72 (18.5)
Anesthesiologist	7 (1.8)
Nurse	306 (78.5)
Others	5 (1.2)
Type of surgery	
Cardiac surgery	40 (10.3)
Obstetric surgery	53 (13.6)
ENT surgery	83 (21.3)
Eye surgery	23 (5.9)
Urology surgery	41 (10.5)
Orthopedic surgery	56 (14.4)
Vascular surgery	24 (6.16)
General surgery	70 (17.84)

ASA: American Society of Anesthesiologists Classification; ENT: Ear, nose, and throat

was also found that the results were significantly different between the source of information regarding liquids ( $P=0.015$ ) but not solids ( $P=0.271$ ). The mean POF times in terms of the types of surgeries is also presented. There was no significant differences between POF times and education, neither for solids ( $P=0.221$ ) nor for liquids ( $P=0.118$ ). In addition the correct definition of clear liquids was not related to the education of participants ( $P=0.314$ ) (Table 2).

**Discussion**

The main finding of this paper was that there was no specific policy regarding modern guidelines for POF times in our hospitals for solids and liquids. A negative association was observed between participants' age, ASA class, and fasting time, indicating appropriate operating room arrangement because older participants with higher ASA class were scheduled earlier. No significant difference was found between level of education and

**Table 2.** The Mean and Distribution Indexes of Fasting Time according to Different Variables

Variable	No.	Mean	95% CI		P Value	
			Min.	Max.		
Solids	390	11.43	11.28	14.58	0.0001	
Liquids	390	9.70	9.53	17.07	0.0001	
ASA class						
Solids	I	205	11.70	11.27	12.12	0.010
	II	136	11.44	11.00	11.88	
	III	49	10.29	6.63	10.94	
Liquids	I	205	10.29	9.83	10.75	0.0001
	II	136	9.41	8.89	9.93	
	III	49	8	7.04	8.96	
Informative person						
Solids	Nurse	306	11.43	11.10	11.75	0.271
	Anesthesiologist	7	9.71	7.47	11.96	
	Surgeon	72	11.56	10.91	12.20	
	Other	5	4.117	7.19	17.41	
Liquids	Nurse	306	9.75	9.40	10.10	0.015
	Anesthesiologist	7	4.43	0.51	8.35	
	Surgeon	72	9.79	8.95	10.64	
	Other	5	12.30	7.19	17.41	
Type of surgery						
Solids	Cardiac surgeries	40	9.60	9.09	10.11	0.0001
	Obstetric surgeries	53	10.60	10.02	11.19	
	ENT surgeries	83	13.47	12.74	14.20	
	Eye surgeries	23	11.39	10.23	12.55	
	Urology surgeries	40	9.88	9.33	12.25	
	Orthopedic surgeries	56	11.13	10.41	11.84	
	Vascular surgeries	23	11.09	9.93	12.25	
	General surgeries	72	11.93	11.31	12.55	
Liquids	Cardiac surgeries	40	7.48	6.41	8.54	0.0001
	Obstetric surgeries	53	9.53	8.95	10.11	
	ENT surgeries	83	12.43	11.65	13.20	
	Eye surgeries	23	8.74	7.11	10.36	
	Urology surgeries	40	7.93	7.23	8.62	
	Orthopedic surgeries	56	9.25	8.59	9.91	
	Vascular surgeries	23	8.91	7.95	9.88	
	General surgeries	72	9.79	9.07	10.51	

CI, Confidence interval; Min, Minimum; Max, Maximum; ASA, American Society of Anesthesiologists Classification; ENT: Ear, nose, and throat. Data presented as mean, 95% CI, Kruskal-Wallis test.

$P < 0.05$ , Statistically significant.

POF. This finding highlights the fact that people often obey the healthcare providers' advice, so the physician intervention is actually needed. It was noteworthy that the POF time for liquids was more acceptable among those participants whose POF time was determined by anesthesiologists. These findings underscore the need for further intervention by anesthesiologists in preoperative visits. Several benefits for preoperative clear liquids have been described, but most of the participants did not know the correct definition

Reviewing the literature, many developed and non-developed countries do not seem to follow modern guidelines, and the patients still suffer from an average POF duration of 16.5 hours (2). It should be noted that the reason for the significant differences in POF patterns among our hospitals is the presence or absence of afternoon clinics for elective surgeries. Because the patients are not screened on the basis of surgery time and the same protocol is applied to the last meal for everyone. To solve the problem, physicians should face several barriers and pay attention to the time of surgery, while, continuing the traditional practice may provide facilities for hospital staff. Insufficient knowledge and strictness of medical team lead to following old strategies. Another study from a referral hospital affiliated with Botswana university reported that the mean POF time was  $15.3 \pm 2.3$  hours among their elective surgeries (8). A study in Sweden reported that the average fasting time was four hours among children, and 33.3% of them suffered from a prolonged POF for more than 6 hours. They concluded that the rule of 2-4-6 hour for POF resulted in prolonged fasting times in children, and more flexible strategies were recommended (9). A multicenter study in Brazilian on 3715 patients from 16 public and private hospitals reported that individuals in all hospitals were at risk of prolonged POF. (10). Another study from Kenya evaluated individuals in a referral hospital and reported that 73.8% of them experienced prolonged POF time for more than 15 hours. 80% of participants reported receiving instructions from nurses, 15%, and 5% from anesthesiologists and surgeons, respectively (11). Studies indicate that educating patients about the correct POF time influences their adherence to the instruction. Sometimes, it is mistakenly believed that more hours of POF result in healthier and safer conditions. Therefore patients' attitude and knowledge must be improved (12). Studies have shown that patients who are unaware of the possibility of liquid intake two hours before surgery, experienced severe thirst (8,11). Sorry to declare the fact that fasting time for fluids and solid foods was almost the same in our cases. This study emphasizes that it is time to reject old concepts and stop resistance to changing the current practice. Physicians should be actively involved in policy develop to ensure that patients receive evidence-based care. Surgery staff who communicate with patients should also be aware of new guidelines and the adverse effects of POF (1).

## Conclusions

The results of this paper are summarized as follows; the vast majority of our participants experienced a prolonged fasting time that did not match with modern guidelines. Their knowledge were poor regarding the correct definition of clear liquids, and nurses were the main advisers for instructions on POF time. Definitely, a lot of effort should be made to improve this situation.

## Authors' Contribution

GB had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis; Concept and design: BNN and FF; Acquisition, analysis, or interpretation of data: SSK, SH and YC; Drafting of the manuscript: SGT and MRH; Critical revision of the manuscript for important intellectual content: All authors; Statistical analysis: ZAR; Supervision: GB.

## Conflict of Interests

Authors have no conflict of interest.

## Ethical Issues

The protocol study has been approved by the local ethics committee of Guilan University of Medical Sciences, Rasht, Iran (Code: IR.GUMS.REC.1397.210). Written Consent was obtained from all participants.

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