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ORIGINAL ARTICLE

Frequency and Appropriateness of Fasting Orders in the Hospital

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Abstract

Objective: To evaluate the frequency and appropriateness of nil per os (nothing by mouth) (NPO) orders and determine the number of meals missed because of these orders among hospitalized patients.

Patients and Methods: We retrospectively analyzed inpatient NPO orders at an academic institution in the United States. The frequency and duration of NPO orders and the number of meals missed because of these orders were assessed for adult patients admitted to the hospital medicine services from January 1, 2013, through December 31, 2013, with a hospital stay of 2 or more and 30 or fewer days. Two blinded reviewers assessed if the order could be avoided or the period shortened for a random sample of NPO orders of 120 or more minutes' duration that were written for patients on the general medicine ward.

Results: A total of 3641 NPO orders were identified. At least one NPO order was placed in 46.6% of the admissions (2211 of 4743). The median duration of NPO orders was 12.8 hours (interquartile range, 9.2-17.3 hours), resulting in 2 (interquartile range, 1-4) missed meals. Of 1130 NPO orders reviewed, 263 (23.3%; 95% CI, 20.9%-25.8%) were deemed avoidable (κ statistic, 0.68), and 482 (42.7%) were unavoidable but led to more missed meals than needed. Taken together, patients could have had 44.8% of the meals (1085 of 2424; 95% CI, 42.8%-46.7%) missed due to NPO orders.

Conclusion: Approximately half of the patients admitted to the hospital medicine services experienced a period of fasting. One in 4 NPO orders and nearly half of missed meals could have been avoided. Further study is warranted to assess the generalizability of our findings.

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Patients are commonly kept fasting by nil per os (nothing by mouth) (NPO) orders in the hospital. These orders are written for clinical reasons such as bowel obstruction, acute pancreatitis, or aspiration risk after stroke[1-3] and for imaging studies, procedures, or operations, either to acquire optimal results[4,5] or to prevent complications such as vomiting and aspiration.[6,7] Although the indications for NPO orders seem broad, recent studies have questioned the traditionally liberal use of these orders.[8,9] The frequent and prolonged fasting from NPO orders may not only lead to patient dissatisfaction[10-12] but may also cause malnutrition and adversely affect patient outcomes.[13,14] Especially given the heightened risk for malnutrition in hospitalized patients,[15] NPO orders should be used only when necessary and for minimum duration.

Several studies have suggested that patients are frequently kept fasting for too long. For example, although current anesthesiology guidelines allow clear liquids from 6 hours up to 2 hours before interventions and recommend only 2 hours of fasting,[16,17] many physicians still order NPO after midnight before elective operations.[18-20] Franklin et al[21] reported that 22.6% of patients admitted to a university hospital were kept fasting or receiving only a clear liquid diet for 3 days or more, and only 58.6% of the prolonged NPO orders were deemed appropriate. Lamb et al[22] found that in the gastrointestinal wards of a tertiary referral hospital, average fasting time before endoscopy was 14 hours compared with the official

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requirement of 6 hours, and the fasting time after major gastrointestinal surgical procedures was 58 hours compared with the recommended 24 hours.

Despite the importance of this issue in health care quality and patient experience, limited data exist on the frequency and appropriateness of NPO orders among hospitalized patients. Specifically, systematic evaluation of current practices for these orders is lacking. Furthermore, NPO orders may have different impact on nutrition and patient experience depending on the time of day. For example, although an NPO order from midnight to 6 AM would probably not affect any meals, ie, energy intake, one from 7 AM to 1 PM could lead to missing 2 meals, even though both orders are 6 hours in duration. No previous studies have evaluated the impact of NPO orders from this perspective. In this study, we aimed to evaluate the frequency and appropriateness of NPO orders and determine the number of meals missed because of these orders among hospitalized patients.

PATIENTS AND METHODS

Study Design, Setting, and Participants

This retrospective study was conducted at a single medical center in the United States. Patients who were admitted to the medicine services at Mayo Clinic's Saint Marys campus (1265 certified beds) in Rochester, Minnesota, from January 1, 2013, through December 31, 2013, were included in the data set. Patients who declined authorization to use their medical records for research and those whose hospital length of stay (LOS) was less than 2 days or more than 30 days were excluded. The study protocol was approved by the Mayo Clinic Institutional Review Board.

Data Source and Processing

We obtained admission data from an electronic database. From 6028 admissions to the medicine service in 2013, we excluded 436 admissions (7.2%) of patients who declined authorization for research, 799 admissions (13.3%) with LOS of less than 2 days, and 50 admissions (0.8%) with LOS of more than 30 days. Consequently, 4743 admissions were included in the study.

To identify time periods when the patients were on general medicine services, service transfer orders to and from other services were retrieved from the computerized physician order entry (CPOE). We considered that the transfer occurred when the order was placed. We also obtained data for intensive care unit (ICU) stays from the critical care databases.[23] We retrieved a total of 3743 NPO orders with starting and ending time for included admissions from the CPOE. We combined orders that overlapped in time and had a time gap of 30 minutes or less in between, resulting in 3641 orders.

We defined standard meal opportunities as 3 per day (breakfast at 7:30 AM, lunch at noon, and dinner at 6:00 PM) and calculated the number of opportunities for each admission from time of admission to discharge. We then determined the patients' service at each meal opportunity (general medicine services, ICU, and other services) from the CPOE and critical care databases. Meals were considered "missed" if an NPO order was in effect at the time of the meal opportunities.

Assessment of NPO Orders

To determine avoidable NPO orders that had meaningful impact on patients on the general medicine services, we excluded 146 of the total 3641 orders (4.0%) that were 120 minutes or less in duration and 746 orders (20.5%) that did not involve any meal opportunity on the general medicine services. We then chose a random sample of 1200 from the 2749 remaining orders for review, using simple randomization (Figure). Two blinded reviewers assessed whether the order could have been avoided or the NPO period shortened based on the guideline described in the next paragraph. Disagreement was resolved by consensus or review by a third investigator.

The NPO guideline was developed to determine the necessity and required duration of NPO orders by indication. We categorized the indication of NPO orders as clinical reason, imaging study, procedure, and operation. For imaging study, procedure, and operation, we determined the required duration of NPO orders according to the policy of institutional services that perform the indicated interventions. For clinical reasons, we developed a guiding framework to judge the necessity and required duration of NPO orders based on the current guidelines and recommendations from professional societies.[1,2,24-27] After the draft

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