Project report

Author

Jinseok Kim
MCN(Education), BN, RN
Clinical Nurse Educator in Operating Theatres and Perioperative Services, Sydney and Sydney Eye Hospital
urbanrwk@gmail.com

Transforming pre-operative fasting practice: A nurse-led liberal fluid fasting regimen

Abstract

Introduction: Traditional pre-operative fasting practice often involves extended periods without fluids, and can be a source of discomfort and anxiety for patients. This can lead to negative experiences and potentially contribute to complications. Evidence suggests that these practices may not be necessary to minimise the risk of pulmonary aspiration during surgery. This quality improvement project implemented a nurse-led liberal fluid fasting regimen for pre-operative patients. The aim was to improve patient comfort and wellbeing while maintaining safety.

Process: Utilising the 'knowledge-to-action' framework for implementation science, the project implemented a nurse-led liberal fluid fasting regimen. This involved reviewing relevant literature, developing the regimen, educating staff and addressing potential barriers. Monitoring and evaluation included tracking adverse events and collecting surveys. The project ensures sustainability through ongoing staff training and observational audits.

Outcomes: The project demonstrated the safety of the regimen, with no reported cases of pulmonary aspiration or other serious adverse events. Statistically significant outcomes were observed in changes in nurses' perceptions of patient wellbeing ($p < 0.001$), reduction in clinical signs and symptoms of dehydration ($p < 0.001$) and patients' reports of emotional distress related to waiting times ($p < 0.001$).

Discussion: The project has not only addressed longstanding challenges in pre-operative fluid fasting practices but has also set a new standard for patient-centred care. It has demonstrated effectiveness in achieving a delicate balance between patient safety and enhanced comfort while fostering a culture of compassionate care provision, placing patient wellbeing at the forefront. This evidence-based approach offers a patient-centred alternative to traditional fasting practices and has the potential to be adopted by other healthcare facilities seeking to improve patient experience and streamline pre-operative care.

Keywords: nurse-led, pre-operative, liberal, pre-operative fluid, clear fluid, fasting

Identified problem

Pulmonary aspiration, although rare, remains a significant risk in anaesthesia practice, with seven fatalities reported in Australia between 2015 and 2017[1]. Adherence to fasting guidelines is crucial to reduce stomach contents and acidity, thereby lowering aspiration risks[2]. Regulatory bodies such as the Agency for Clinical Innovation (ACI) and the Australian and New Zealand College of Anaesthetists (ANZCA) recommend fasting from food up to six hours and fluids up to two hours before surgery[1,3].

However, the author has identified daily challenges faced by anaesthetists and pre-operative patients, including inconsistent communication by health-care professionals leading to varied patient comprehension and adherence to fasting guidelines. The unpredictable nature of surgical schedules exacerbates this issue[4], resulting in unnecessarily prolonged fluid fasting, which negatively impacts patients' wellbeing[5].

Prolonged fasting increases the risk of adverse events related to dehydration[6], particularly in vulnerable populations like the elderly and paediatric patients[7], who are more susceptible to post-operative delirium[8]. Research indicates that prolonged fasting can worsen post-operative complications, due to an increased metabolic response[9], while patients commonly report discomforts

DOI: 10.26550/2209-1092.1370

including thirst, hunger, nausea and weakness[10].

Local data reveals a wide range of actual fasting durations among patients, from two to twelve hours, suggesting disparities in understanding and adhering to fasting instructions. On average, emergency surgery patients, whose fasting instructions come from referring physicians, fasted longer suggesting a gap in patient education. This disparity highlights the need for improved practices across healthcare providers to ensure consistent adherence to fasting guidelines. Addressing these challenges requires a collaborative effort to establish and implement an improved pre-operative fasting regimen.

Proposed solution

Nurses, as patient advocates, strive to ensure safe fasting practices that minimise discomfort. However, current inconsistencies in fasting information and adherence to guidelines create challenges in achieving this balance. Therefore, the author proposes a solution that addresses these concerns – a nurse-led liberal fluid fasting regimen. Adult patients are encouraged to consume 200ml of clear fluids per hour, while paediatric patients can drink 3ml of clear fluids per kilogram per hour. Acceptable options include water, ice chips, apple juice, black coffee or plain tea without milk. In the perioperative unit, the nurse will explain this regimen and encourage patients to drink their chosen clear fluids. This evidence-based and patient-centred approach addresses the inconsistencies in current practices and promotes patient autonomy while ensuring safe care. It allows nurses to prioritise patient comfort while mitigating aspiration risk. Ultimately, this project report not only promotes a positive and supportive patient experience but also has the potential to improve post-operative outcomes.

This liberal regimen aligns with recent research findings that question the traditional fluid fasting guidelines. Studies suggest that extended periods of fluid fasting do not necessarily reduce the volume or acidity of gastric content, nor do they lower aspiration risk[6,11]. Conversely, shorter fasting periods do not result in larger residual gastric volumes[11]. Studies investigating gastric emptying rates in healthy patients support this argument, demonstrating rapid and exponential gastric emptying after clear fluid intake[12–14].

Moreover, orthopaedic trauma centres in Scotland have adopted a more liberal approach, allowing patients to sip small amounts of water until surgery[7]. This approach has been proven successful and has been adopted in over 50 hospitals across the United Kingdom and internationally since 2021[7]. Checketts[7] reported that the number of adverse events has not risen in over 12 000 patients despite this change. Additionally, a large-scale study by Marsman et al.[15] demonstrated a reduction in post-operative complications with a liberal drinking regimen. Similarly, a study by Harnett et al.[4] supports this liberal drinking regimen for elective caesarean surgery patients, demonstrating its non-inferiority to the fully fasting regimen.

Project plan

The project employed the 'knowledge-to-action' framework by Graham et al.[16] for implementation science. A literature review was conducted, to synthesise existing research, and supplemented by an analysis of clinical data to assess safety and effectiveness. This process revealed a problem –fluid fasting times within the author's hospital varied from two to twelve hours. To address this inconsistency, a new regimen was developed, advocating for patients to consume small amounts of clear fluids until transfer to the operating theatre.

Moving into the adaptation phase, the project involved developing and pitching a proposal, identifying potential collaborators and securing buy-ins. Anticipated barriers to implementation were considered, including management indifference, staff knowledge gaps and logistical challenges. Strategies to overcome these barriers included contextualising the intervention, highlighting evidence-based benefits and emphasising the patient-centred approach.

Subsequently, the project focused on selecting, tailoring and implementing change, with effective stakeholder engagement being deemed imperative. This engagement included all perioperative leadership team members, consultant and trainee anaesthetists, and surgeons. Educational sessions were conducted for nursing and medical staff to ensure comprehensive understanding of and adherence to the new regimen. Clear communication channels and readily available resources were established to facilitate seamless implementation and ongoing support. Informative posters detailing the regimen, specifically for nurses, aided in reinforcing key messages.

Moreover, monitoring mechanisms were established to track staff attendance at education sessions, assess knowledge retention and monitor any adverse events resulting from the regimen. The project engaged the Clinical Practice Improvement Unit for clinical governance oversight. Evaluation was conducted with research ethics approval, involving quantitative data collection from medical records (primary outcome measurement: analysis of adverse events and incidents). Secondary outcome measurement involved a survey to evaluate perceptions of nursing staff and patient experiences, with both outcomes measured at two months, six months and one year post-implementation.

Finally, sustainability measures were implemented, including regimen integration into new staff training, regular compliance audits, annual refresher training and knowledge dissemination to other hospitals within the local health district.

Project successes

Decreased number of clinical emergency response system calls

The project successfully achieved its primary goal of minimising adverse events. During the implementation period, there were no reported cases of pulmonary aspiration or other serious adverse events. Analysis of medical records revealed a 16 per cent decrease in the number of perioperative clinical emergency response system (CERS) calls compared to the pre-implementation period. Additionally, there was a 26 per cent reduction of hypotension events. Notably, there were significant reductions in hypoglycaemia and ketonaemia events,

with decreases of 75 per cent and 83 per cent, respectively. Although the sample size is small, these findings suggest that the regimen did not compromise patient safety. Figure 1 shows the pre-operative, post-operative and total number of perioperative CERS calls, and figure 2 shows the breakdown of the reasons for the CERS calls.

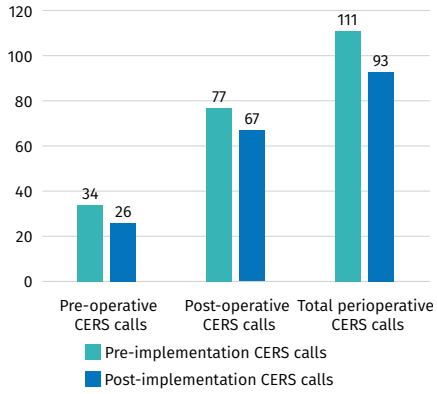

Figure 1: Perioperative CERS calls

Improved nurse perception and patient experience

The survey was completed by 16 of 21 nurses (76% response rate) with an average of 14.5 years of experience. Statistical analysis using paired samples t-tests revealed a slight increase in confidence in patient education delivery post-implementation ($p = 0.054$). Statistically significant changes were observed in nurses' perceptions of patient wellbeing ($p < 0.001$), indicating reduced concern about potential dehydration complications. Moreover, there was a statistically significant reduction in clinical signs and symptoms of dehydration ($p < 0.001$) and patients' reports of emotional distress related to waiting times ($p < 0.001$), suggesting the regimen improved patient physical and emotional conditions. Furthermore, data showed a significant increase in patient adherence to the regimen, and a decrease in the need for patient re-education regarding the fasting instructions.

Nursing staff praised the clarity and effectiveness of the regimen, highlighting its positive impact on patient comfort and pre-operative experience. Survey responses mentioned positive feedback from patients (n = 6), reduced instances of hunger-related aggression (n = 5) and decreased patient anxiety and stress levels (n = 5). Notably, the need for intravenous interventions due to hypoglycaemia (n = 4) and dehydration (n = 3) also decreased. These findings suggest that the regimen not only improved patient experience but also streamlined nursing care practices. Table 1 (see page 15) shows the results of paired samples t-tests for perceptions of nursing staff and patient experiences before and after the regimen was implemented.

Opportunities for improvement

The initial implementation phase highlighted the importance of ongoing communication and education efforts.

Knowledge gaps

During the implementation phase some medical professionals expressed concerns about the safety of the liberal fluid fasting regimen, with one medical professional mentioning potential risks associated with caffeinated beverages. This highlights the need for targeted education to address knowledge gaps and misconceptions regarding the new regimen. Disseminating evidence-based information and guidelines to all medical professionals can ensure a clear understanding of the benefits and safety of liberal fluid fasting.

Patient education

Pre-existing beliefs and past experiences sometimes made patients hesitant to follow the new regimen. The project will develop robust patient education materials delivered through a multimedia approach to address these concerns. These resources will emphasise the safety and benefits of the regimen for patient comfort and wellbeing, directly addressing common myths and anxieties patients may have.

Stakeholder input

Finally, the project will continue to gather feedback from clinicians, patients and caregivers. This ongoing process will be crucial for identifying and addressing any emerging challenges, ensuring the continued success of the program.

Recommendations

The project has not only addressed longstanding challenges in pre-operative fluid fasting practices but has also set a new standard for patient-centred care. It has achieved a delicate balance between patient safety and enhanced comfort while fostering a culture of compassionate care provision, placing patient wellbeing at the forefront. Healthcare facilities seeking to improve their pre-operative fasting practices are encouraged to consider adopting a similar evidence-based approach, tailored to their specific context. The demonstrated benefits of this approach in enhancing patient comfort and safety are evident in the author's facility and should be mirrored in yours.

Conflict of interest and funding statement

The author has declared no competing interests with respect to the research, authorship and publication of this article.

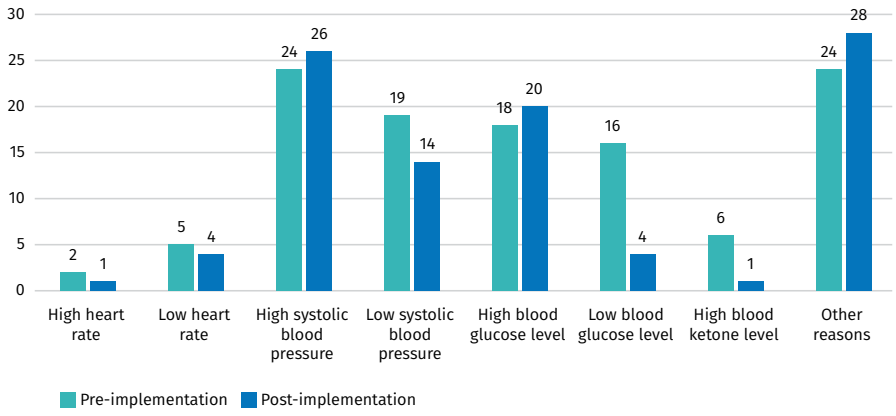

Figure 2: Breakdown of reasons for CERS calls

Table 1: Pre- and post-implementation paired samples t-test (N = 16)

Pairs	Paired differences				t	df	Significance	
	Mean	SD	SEM	95% CI of the MD			One-sided p	Two-sided p
1. Confidence in patient education (pre- and post-implementation)	-0.375	0.719	0.180	-0.758–0.008	-2.087	15	0.027	0.054
2. Level of patient understanding (pre- and post-implementation)	0.438	1.315	0.329	-0.263–1.138	1.331	15	0.102	0.203
3. Concern for patient health (pre- and post-implementation)	1.938	1.482	0.370	1.148–2.727	5.230	15	<0.001	<0.001
4. Showing clinical signs and symptoms (pre- and post-implementation)	1.813	1.167	0.292	1.191–2.434	6.211	15	<0.001	<0.001
5. Showing emotional discomfort (pre- and post-implementation)	2.250	1.065	0.266	1.683–2.817	8.454	15	<0.001	<0.001

t= test statistic, df = degrees of freedom, SD = standard deviation, SEM = standard error of mean, CI = confidence interval, MD = difference in means

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

References

1. Safety of anaesthesia: A review of anaesthesia-related mortality reporting in Australia and New Zealand 2015–2017 [Internet]. Melbourne: ANZCA; 2021 [cited 2024 Sep 5]. Available from: https://www.anzca.edu.au/getContentAsset/9ec13653-fe57-4288-96db-ae789eae4a8f/80feb437-d24d-46b8-a858-4a2a28b9b970/Safety-of-Anaesthesia-report-(2015-2017).PDF?language=en&view=1
2. Joshi GP, Abdelmalak BB, Weigel WA, Harbell MW, Kuo CI, Soriano SG et al. 2023 American Society of Anesthesiologists practice guidelines for preoperative fasting: Carbohydrate-containing clear liquids with or without protein, chewing gum, and pediatric fasting duration-a modular update of the 2017 American Society of Anesthesiologists practice guidelines for preoperative fasting [Internet]. Anesthesiology. 2023[cited 2024 Sep 5];138(2):132–51. DOI: 10.1097/ALN.0000000000004381
3. Agency for Clinical Innovation (ACI). Pre-operative fasting in NSW public hospitals. Sydney: ACI; 2016.
4. Harnett C, Connors J, Kelly S, Tan T, Howle R. Evaluation of the 'sip til send' regimen before elective caesarean delivery using bedside gastric ultrasound: A paired cohort pragmatic study [Internet]. Eur J Anaesthesiol. 2023[cited 2024 Sep 5];41(2):129–35. DOI: 10.1097/EJA.0000000000001926
5. Zeraatkar D, Shanthanna H, Mbuagbaw L, Morgan RL, Reddy D, Couban R et al. Preoperative fasting for prevention of perioperative complications in adults [Internet]. Cochrane Database of Systematic Reviews. 2020(10) [cited 2024 Sep 5]. DOI: 10.1002/14651858.CD013772
6. Morrison CE, Ritchie-McLean S, Jha A, Mythen M. Two hours too long: Time to review fasting guidelines for clear fluids [Internet]. Br J Anaesth. 2020[cited 2024 Sep 5];124(4):363–6. DOI: 10.1016/j.bja.2019.11.036
7. Checketts MR. Fluid fasting before surgery: the ultimate example of medical sophistry? [Internet] Anaesthesia. 2023[cited 2024 Sep 5];78(2):147–9. DOI: 10.1111/anae.15925. Epub 2022 Dec 8
8. Khanna P, Saini K, Sinha R, Nisa N, Kumar S, Maitra S. Correlation between duration of preoperative fasting and emergence delirium in pediatric patients undergoing ophthalmic examination under anesthesia: A prospective observational study [Internet]. Pediatr Anaesth. 2018[cited 2024 Sep 5];28(6):547–51. DOI: 10.1111/pan.13381
9. Zhou G, Zhu F, An Y, Qin L, Lv J, Zhao X et al. Prolonged preoperative fasting and prognosis in critically ill gastrointestinal surgery patients [Internet]. Asia Pac J Clin Nutr. 2020[cited 2024 Sep 5];29(1):41–7. DOI: 10.6133/apjcn.202003_29(1).0006
10. Van Noort HHJ, Lamers CR, Vermeulen H, Huisman-de Waal G, Witteman BJM. Patient education regarding fasting recommendations to shorten fasting times in patients undergoing esophagogastroduodenoscopy: A controlled pilot study [Internet]. Gastroenterol Nurs. 2022[cited 2024 Sep 5];45(5):342–53. DOI: 10.1097/SGA.0000000000000678
11. Aschkenasy G, Leder O, Pardes R, Nir EA, Shteyer E, Orlanski-Meyer E et al. Preoperative clear fluid fasting and endoscopy-measured gastric fluid volume in children [Internet]. Paediatr Anaesth. 2023[cited 2024 Sep 5];33(7):532–8. DOI: 10.1111/pan.14662
12. Beck CE, Chandrakumar T, Sümpelmann R, Nickel K, Keil O, Heiderich S et al. Ultrasound assessment of gastric emptying time after intake of clear fluids in children scheduled for general anesthesia: A prospective observational study [Internet]. Pediatr Anaesth. 2020[cited 2024 Sep 5];30(12):1384–9. DOI: 10.1111/pan.14029
13. Grimm M, Aude P, Feldmüller M, Keßler R, Scheuch E, Tzvetkov MV et al. Comparing the gastric emptying of 240 mL and 20 mL water by MRI and caffeine salivary tracer technique [Internet]. Eur J Pharm Biopharm. 2023;184:150–8. DOI: 10.1016/j.ejpb.2023.01.021
14. Taye S, Mohammed S, Bhatia P, Kumar M, Chhabra S, Kumar R et al. Gastric emptying time of two different quantities of clear fluids in children: A double-blinded randomized controlled study [Internet]. Pediatric Anesthesia. 2021;31(11):1187–93. DOI: 10.1111/pan.14261
15. Marsman M, Kappen TH, Vernooij LM, van der Hout EC, van Waes JA, van Klei WA. Association of a liberal fasting policy of clear fluids before surgery with fasting duration and patient well-being and safety [Internet]. JAMA surgery. 2023;158(3):254–63. DOI: 10.1001/jamasurg.2022.5867
16. Graham ID, Logan J, Harrison MB, Straus SE, Tetroe J, Caswell W et al. Lost in knowledge translation: Time for a map? [Internet] J Contin Educ Health Prof. 2006;26(1):13–24. DOI: 10.1002/chp.47