

Authors

Jessica Muscat

MClinN (Acute Care Nursing), RN

Dr Paula Foran

PhD, RN, FACORN, FACPAN, MACN

Corresponding author

Jessica Muscat

jessica.muscat@health.nsw.gov.au

To drink or not to drink, that is the question: A discussion paper about traditional verses newer fasting guidelines

Abstract

Introduction: Australia has seen a rapid increase in the number of hospitals reviewing their pre-operative fasting times. However, many hospitals still adhere to traditional fasting protocols, and in many cases, even when updated guidelines are implemented, fasting times are often extended in clinical practice resulting in poorer patient outcomes. This highlights the need for greater understanding of how longer fasting contributes to adverse symptoms and outcomes including thirst, dehydration, dry mouth, post-operative nausea and vomiting, haemodynamic instability and prolonged hospital stays.

Discussion: This discussion paper aims to shine a light on the adverse outcomes associated with traditional fasting protocols, compared to the benefits of more liberal fasting practices such as those provided by The Australian and New Zealand College of Anaesthetists (ANZCA) fasting guidelines. It also aims to provide greater understanding for all nurses providing pre-operative care of how to ensure the safe implementation and ongoing adherence to these changes in fasting practice.

Conclusion: Due to the many variables in patients' conditions and pharmacological treatments, it is no longer appropriate to have a 'one size fits all' traditional approach to pre-operative fasting. Despite robust evidence supporting the safety of clear fluids two hours before surgery, patients being prepared for surgery are often still denied fluids for longer periods of time by nurses. Nurses from any specialty, including day of surgery admissions, accident and emergency, intensive care and medical or surgical wards, who care for patients pre-operatively, all need to understand the concepts and theoretical background behind traditional and more liberal fasting protocols so they can provide informed, safe care and more comfortable perioperative outcomes by following the ANZCA fasting guidelines.

Keywords: fasting, anaesthesia, SipTilSend, pre-operative care, surgical nursing, perioperative nursing

Introduction

Australia has seen a rapid increase in the number of hospitals reviewing their pre-operative fasting times¹. This is for two reasons. First, there are many adverse outcomes associated with extended fasting – including thirst, dehydration, dry mouth, post-operative nausea and vomiting and haemodynamic instability² – and support is growing for protocols that allow shorter fasting times. Second, the popularity and increased prescription and administration of weight loss medications that delay gastric emptying, e.g. glucagon-

like peptide (GLP-1) receptor agonists, has created the need for variations to standard fasting times^{3,4}.

Traditional pre-operative fasting has been defined as '... patients undergoing surgery or other medical procedures ... refrain from eating or drinking anything for a certain amount of time ... to stop stomach contents from getting into the lungs'^{5, p.47}. The Australian and New Zealand College of Anaesthetists (ANZCA) publish guidelines for pre-operative fasting prior to anaesthesia in Australia and New Zealand^{4,6} which take a liberal fasting approach – six hours for solids and two

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hours for clear fluid – and introduce the concept of SipTilSend, a protocol that allows selected patients to have an amount of clear fluids up until the time they are called to surgery.

Part of the pre-operative nurse's role is to assist in the successful implementation of pre-operative fasting protocols⁷ while navigating individual patient needs. Safe pre-operative fasting will require all nurses who are caring for a pre-operative patient to be fully cognisant of the advantages of and risks associated with alterations to fasting protocols, thus education will be imperative for the successful implementation of more liberal or relaxed fasting guidelines and the SipTilSend protocol⁷⁻⁹.

This discussion paper aims to provide important information to help nurses implement pre-operative fasting regimes that reduce both the risk of intra-operative aspiration of stomach contents and the incidence of adverse outcomes associated with traditional longer fasting practices.

Discussion

Following extensive reading and thematic analysis of scholarly literature and Australian standards relevant to reducing perioperative fasting times, the discussion in this paper will be presented under three themes:

1. traditional verses liberal fasting guidelines
2. ANZCA updated fasting guidelines
3. pre-operative nurses' role in the implementation of, adherence to and ongoing compliance with fasting guidelines.

Traditional verses liberal fasting guidelines

The risk of delayed gastric emptying and subsequent aspiration pneumonitis, or Mendelson's syndrome, from insufficient fasting are considered relatively low¹⁰; however, intra-operative aspiration remains a dangerous but well-managed anaesthesia risk^{11,12}.

Traditional fasting practices are 'nil by mouth' from midnight² for morning surgery and from 6.00 am following a light breakfast for afternoon surgery. Significant disadvantages of these

practices have been reported for some time¹³. The presence and quantity of solid and particulate matter in the stomach is the main cause of a heightened risk of aspiration⁴, but this concern has also led to more than 100 years of prolonged fasting times¹⁴ despite a lack of evidence supporting this traditional practice¹³.

There is, however, robust evidence for the contribution longer fasting has made to delayed recovery and poorer patient outcomes¹³. This highlights the need for vigilance and individualised, appropriate fasting times for each patient before surgery to reduce possible complications^{5,10}.

In research by Islam et al.¹¹ normal gastric emptying time was shown to be under two hours for clear fluids less than 200 ml, and three to six hours for solid foods. It was also revealed that when liberal fasting was applied in healthy patients, they showed minimal gastric residual volume without experiencing any adverse symptoms after anaesthesia. In their comparative study, Farooq et al.¹⁵ found that when the 'six-four-one' regimen was implemented pre-operatively, there was a statistically significant reduction in risks and adverse symptoms ($p < 0.001$). The 'six-four-one' regimen is similar to the SipTilSend protocol. Farooq et al.¹⁵ also found that using liberal fluid fasting protocols resulted in significant reduction of intravenous therapy during admission and reduced length of stay in hospital.

Two studies by Anas et al. and Tsukamoto et al. looked at the haemodynamic status of fasted patients. Their research revealed that patients who fasted from solids and fluids for 12 hours or longer were more likely to require inotropic support intra-operatively for hypotension compared to patients with a shorter fasting time whose haemodynamic stability was better maintained^{5,16}. These findings are supported by a retrospective study of paediatric patients by Simpao et al.¹⁷ who found an association between haemodynamic instability and prolonged fasting.

Huang et al.¹⁸ reported that pre-operative fasting times for children were longer than fasting times recommended by the American Society of Anesthesiology, and that children with prolonged fasting for adenotonsillectomy surgery were

more likely to experience adverse symptoms post-operatively ($p < 0.001$)¹⁸. A recent scoping review conducted by Australian researchers Dulay et al.¹⁹ explained that paediatric patients were disproportionately affected by longer periods of fasting as they have, smaller energy reserves, immature organ systems and a diminished capacity to compensate during longer fasting periods.

A large prospective study ($n = 76\,451$) of fasting regimes in adult patients, by Marsman et al., compared traditional prolonged fasting with a liberal fluid fasting policy. Participants in the liberal fluid fasting cohort reported a statistically significant decrease in thirst ($p < 0.001$) and post operative nausea and vomiting ($p < 0.001$), and an associated decrease in the use of antiemetics ($p < 0.001$)²⁰.

ANZCA updated fasting guidelines

The updated ANZCA fasting guidelines recommend a more liberal approach to fasting in an attempt to balance minimising aspiration risk while also preventing adverse events by improving physiological outcomes and patient comfort^{4,6}. Thus, the duration of fasting is required to be sufficient to minimise gastric volume and reduce the potential for significant regurgitation and aspiration, while remembering that 'prolonged deprivation of clear liquids, for more than two hours in adults and more than one hour in children, may have deleterious metabolic effects'^{4, p.8}. Interestingly, drinking clear fluids, especially those containing carbohydrates, may improve gastric emptying⁴.

For nurses to fully understand these guidelines they should refer directly to the ANZCA 'PG07BP Guideline on pre-anaesthesia consultation and patient preparation'⁴ and the related background paper²¹, in particular, Appendix 1 – Fasting guideline of both these documents. However, a brief overview follows. Adults for 'elective surgery', over 16 years of age, may have solids in the form of a low carbohydrate 'light meal' up to six hours prior to anaesthesia and clear fluids (up to 170 ml/hour) should be encouraged up to two hours prior to anaesthesia⁴. Specific instructions from the treating anaesthetist would be required for

patients deemed at increased risk, such as all patients with an increased risk of regurgitation or vomiting, paediatric patients and those taking medications that delay gastric emptying⁴.

An emerging practice seen in many Australian hospitals is 'SipTilSend' which allows specific patients to have clear liquids (typically water) right up until the time they are called to the operating suite. Simply, SipTilSend is applied as a 'six-four-one' fasting regime^{4,22,23}. That is:

- six hours of fasting from solids (ideally, low calorific solids or light meals)
- four hours of fasting from milk products or formula for infants. For children older than 12 months, formula and non-human milk should be regarded as similar to solids with a fasting time of six hours, while breast milk should be encouraged until three hours prior to surgery.
- one-hour of fasting from clear fluids^{4,22} – for adults up to 200 ml per hour, for children up to 3 ml/kg of body weight per hour^{4,24} until they are transferred to surgery.

However, the increased number of people taking GLP-1 receptor agonists for weight loss and management of diabetes has introduced a new risk associated with liberal fasting regimes as these medications are known to delay gastric emptying. For patients prescribed GLP-1 receptor agonists, ANZCA²⁵ recommends an individualised fasting regime aligned with new fasting standards, a GLP-1 receptor agonist medication administration plan in preparation for anaesthesia and full stomach precautions applied by the anaesthetist³ throughout anaesthesia. Due to the currently limited amount of research into this issue, the ANZCA guidelines²⁵ also suggest GLP-1 receptor agonist medication administration times should be reviewed by the anaesthetist prior to surgery.

Pre-operative nurses' role in the implementation of, adherence to and ongoing compliance with fasting guidelines

Multiple factors contribute to prolonged fasting times²⁶, such as human factors^{7,24,26} surgery schedules⁹ and unclear fasting instructions²⁴. Hence, support for implementation of updated fasting

practices that better maintain patient safety and wellbeing and improve patient outcomes should be considered.

Despite robust evidence supporting the safety of clear fluids two hours before anaesthesia, patients being prepared for surgery are often still denied fluids for long periods of time²⁷. Zhu et al.²⁷ conducted research in China looking into the adherence of nurses and anaesthetists to more liberal fasting guidelines. Findings revealed that, despite the implementation of new guidelines and an understanding of them, nurse-instructed fasting durations were longer than the durations nurses knew were optimal. Anaesthetists also reported that they prescribed longer fasting times than the evidence-based minimum fasting guidelines recommended²⁷.

This highlights the difficulties in successful implementation of and ongoing compliance with practice change, particularly when the practice has been firmly embedded in surgical patient care for over 100 years¹. Given that evidence exists that nurses are aware of the fasting guidelines and know they are best practice, but are not following them, there is an opportunity for an intervention informed by implementation science. Implementation science was developed in response to the slow uptake of and poor adherence to healthcare practices based on robust research evidence and aims to achieve more successful implementation of evidence-based practice to improve patient care²⁸.

Implementation science is fundamentally about closing the evidence–practice gap and offers theories, models and frameworks not only to guide the implementation process, but also to ensure ongoing compliance and sustainability. In the context of pre-operative fasting, where old behaviours have become entrenched, using a determinant framework, such as the Theoretical Domains Framework (TDF), should be considered to achieve sustained implementation of the ANZCA fasting guidelines. The TDF looks at the barriers to implementation, then links to a behaviour wheel to identify strategies or enablers informed by behavioural science to mitigate the old behaviours, allowing successful implementation of and

ongoing compliance with new evidence-based practice²⁹.

In order to achieve success with fasting guidelines, nurses and anaesthetists must work together to ensure that updated fasting instructions are successfully implemented into routine clinical practice²⁷. One of the biggest risks facing the ANZCA guidelines is non-adherence by clinical staff.

Pre-operative nurses are at the coalface of care with patients as they prepare for their surgical journey. They are well placed to take a lead role in the implementation of and adherence to these new evidence-based regimes. Therefore, it is recommended that nurses consider the use of an implementation science model, such as TDF. This may ensure more effective implementation and improved adherence²⁷.

Conclusion

This discussion paper highlights the adverse outcomes associated with traditional longer pre-operative fasting practices and presents the benefits of liberal fasting regimes. It is also hoped that this discussion has provided greater understanding of the important role nurses can play in preventing these adverse outcomes by doing as ANZCA has suggested and encouraging their patients to have clear fluids (up to 170 ml/hour) for up to two hours prior to anaesthesia.

Traditional prolonged fasting has become an outdated practice, with no benefit to the reduction of anaesthetic-based risks. Robust evidence exists supporting the contribution longer fasting plays in delayed recovery and poorer patient outcomes, in both the adult and paediatric populations. There is also a plethora of scholarly literature supporting the beneficial effects and safe practice of reduced fasting times.

Due to variability in patients' conditions and pharmacological treatments, it is no longer appropriate to have a 'one size fits all' approach to pre-operative fasting. Nurses from any speciality, including those from day of surgery admissions, accident and emergency, intensive care, and medical or surgical wards, who provide pre-operative care for patients, all need to understand this concept and should review the ANZCA fasting

guidelines. Unless otherwise instructed by the treating anaesthetist, nurses should encourage clear fluids (usually water up to 170 ml/hour) until two hours prior to anaesthesia.

It is also recommended that implementation science be used to guide implementation of evidence-based fasting protocols. It is further recommended, due to the lack of research on this topic, that pre- and post-implementation studies be conducted to provide deeper understanding, achieve better long-term compliance and help pave the way for future successful practice change. This will provide safer and more comfortable patient care.

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