**SipTilSend – Improving fasting times for surgery through a quality improvement initiative**

**Background**

In 1946 Curtis Lester Mendelson published a paper: ‘*The aspiration of stomach contents into the lungs during obstetric anesthesia’* (1). Over a 13 year period he found that the use of a combination of ether and nitrous oxide anaesthesia in non-intubated women during labour was associated with 66 cases of aspiration in a total of 44,016 deliveries – 0.15%. Of the five women who aspirated solid food stuffs, two died. All women who aspirated liquid recovered within 24-36hrs. Despite this low complication rate in an era without access to intensive respiratory support this paper became the mainstay guiding the approach to pre-operative fasting for decades.

In the last 2 decades, this dogma has been challenged with evidence demonstrating that prolonged fasting is not in the best interests of the patient and that contrary to the long held view, prolonged fasting did not reduce the volume of stomach contents when compared to a fast with clear fluids allowed until 2 hours before surgery. In patients where fluid fasting was over 4 hours, gastric pH was lower (more acidic) and patients were more likely to have issues with low blood sugars and experience hunger, thirst and nausea (2). This evidence has led to a more evidence informed approach to fasting which comprises fasting from all solids for 6 hours prior to surgery but intake of clear fluids permitted and encouraged until 2 hours prior to surgery. A recent international consensus statement on procedural sedation promotes intake of clear fluids until the start of a procedure (3).

Being able to implement a 2 hr clear fluid fasting rule has the potential to improve the overall patient experience including reduced thirst, hunger, anxiety and better physiological / metabolic status. However success is dependent on knowledge of the timing of the procedure. This is logistically very difficult to achieve, particularly in those on emergency / urgent operating lists. Recent quality improvement activity undertaken by the Prince of Wales Anaesthetic Department specifically attempted to reduce fasting times prior to surgery. In a project looking at an elective surgical population, the mean fasting time for clear fluids reduced from 8hrs and 18mins to 6hrs and 6mins through a process of encouraging patients to have a 200ml drink before leaving their home for their surgical procedure. A similar piece of work but this time focusing on an orthopaedic trauma setting, delivering and education and training intervention failed to have any significant impact on fluid fasting (8hrs and 32mins before and 8hrs and 7mins after intervention).

The challenges at Prince of Wales are not unique. In an attempt to address this ubiquitous problem, 2 hospital trusts in Glasgow, Scotland, introduced an innovative quality improvement initiative that successfully reduced fasting times for clear fluids from **7hrs and 30mins to 17mins** for all surgical wards without an increase in aspiration related complications – *SipTilSend.*

*durations*The implementation of the project did not see an increase in the incidence of aspiration syndrome and was associated with positive staff, patient and carer experience. SipTilSend is now being rolled out across a number of hospital sites in Scotland and England and the clinicians behind the project are happy to share their methodology, resources and expertise in assisting other sites to implement this work.

**Project Goal**

To reduce the average fasting time for clear fluids from approximately 480 mins to 30 mins

**Anticipated impact**

Improved patient experience

Improved staff satisfaction

A reduction in clinical review and rapid response – hypotension, reduced urine output

No increase in aspiration syndrome

No increase in clinical reviews or rapid responses for hypoxia / tachypnoea

**Implementation of the SipTilSend initiative**

We will adopt / adapt the process of implementation used in the original setting in Scotland. The lead anaesthetist (Dr Matthew Checketts) involved in the original SipTilSend project has indicated his willingness to support implementation at the Prince of Wales through providing clinical advice as well as sharing the many resources that were created to support implementation in Scotland.

**Stage 1 (Months 1-3)**

* Appoint medical (0.2 FTE) and nursing (0.2 FTE) project leads – 9 months
* Ethics approval via a quality improvement initiative
* Establish a clinical expert working group with representation from the key stakeholders impacted by any planned change to the fasting process for surgery – anaesthetists, surgeons, perioperative medicine, nursing and theatre staff etc
* Clinical expert working group to meet with the Scottish team via Zoom to talk through the logistics of implementation and learn from the Scottish experience
* Review all existing policies and clinical guidelines that might be impacted by the change in practice

**Stage 2 (Months 3-6)**

* Survey key stakeholders (surgeons, anaesthetists and nurses) to determine willingness to participate in this implementation project and identify any potential opportunities or barriers to implementation (In Scotland, 90% of those surveyed were supportive)
* Write a policy for the introduction of SipTilSend along with an implementation plan (adapted from the Scottish policy) including educational resources
* Develop an evaluation framework to measure the impact of the project including qualitative data that looks at the patient and staff experience (adapted from the Scottish policy). Quantitative measures likely to include – duration of fasting, nausea requiring antiemetic, aspiration syndrome, clinical reviews and rapid responses, hospital acquired complications
* Baseline data collection using existing data sets – electronic medical record, anaesthetic sheets, coded hospital data

**Stage 3 (Months 7-9)**

* Period for education for staff including in-services, provision of written information, lanyards, posters, T-shirts etc (key aspect of success in the Scottish experience)
* Roll out of SipTilSend across surgical specialities
* Initial evaluation of the impact using agreed performance measures

**Stage 4** (Month 10 onward) – an automated process of reviewing key performance indicators will be in place to ensure the ongoing safety / efficacy and cost-effectiveness of the project.

**Draft Evaluation Framework**

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|  | **Process / outcome** | **How to measure** | **Expected outcome** |
| **Primary Measure of Efficacy** | Duration of fasting from clear fluids | Sample of patients over an agreed number of days – reported time of last sips of fluid before arriving in anaesthetic bay (surgical check in sheet) | Significant reduction in the number of minutes of fasting from clear fluids prior to arriving in the anaesthetic bay |
| **Secondary Measures of Efficacy** | Episodes of hypoglycaemia | Blood sugar <4.6 (EMR) | Decrease in events |
|  | Nausea | Use of antiemetics within 24hrs of surgery - EMR | Decrease in events |
|  | Tachycardia, hypotension, low urine output | Clinical reviews and rapid responses for tachycardia, hypotension and low urine output | Decrease in events |
|  | Acute kidney injury | Decline in renal function (EMR) | Decrease in events |
|  | Inappropriate fasting periods | Documentation by teams of Nil by Mouth from Midnight | Decrease in events |
| **Safety** | Aspiration and regurgitation | Per-operative desaturation – anaesthetic sheet  Documented aspiration pneumonitis – (EMR)  Documented aspiration pneumonia requiring antibiotics – (EMR) | No change in expected number of events |
|  | Hypoxia / tachypnoea | Clinical reviews and rapid responses for hypoxia and tachypnoea - EMR | No change in events |
| **Patient satisfaction** | Patients reporting satisfaction with period of fasting – thirst, hunger, nausea, anxiety | Patient / carer questionnaire via Redcap survey | Improved satisfaction |
| **Staff satisfaction** | Staff satisfaction with implementing SipTilSend | Staff questionnaire via Redcap survey |  |
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**References**

1. Mendelson CL. The aspiration of stomach contents into the lungs during obstetric anesthesia. Am J Obstet Gynecol. 1946;52:191-205.

2. Practice Guidelines for Preoperative Fasting and the Use of Pharmacologic Agents to Reduce the Risk of Pulmonary Aspiration: Application to Healthy Patients Undergoing Elective Procedures: An Updated Report by the American Society of Anesthesiologists Task Force on Preoperative Fasting and the Use of Pharmacologic Agents to Reduce the Risk of Pulmonary Aspiration\*. Anesthesiology. 2017;126(3):376-93.

3. Green SM, Leroy PL, Roback MG, Irwin MG, Andolfatto G, Babl FE, et al. An international multidisciplinary consensus statement on fasting before procedural sedation in adults and children. Anaesthesia. 2020;75(3):374-85.