CROSS HEALTH CARE BOUNDARIES MATERNITY CLINICAL GUIDELINE

<p>| Title of Guideline (must include the word “Guideline” (not protocol, policy, procedure etc) | Guidelines for eating and drinking in labour, before elective Caesarean section, and in the early postpartum period. |
| Implementation date | April 2019 |
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| Supersedes | Dr DM Levy, Consultant Anaesthetist, 2014 |
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| Explicit definition of patient group to which it applies (e.g. inclusion and exclusion criteria, diagnosis) | Women giving birth |
| Abstract | Strategies for oral intake for women in labour, women awaiting Caesarean section, and women who have undergone operative delivery. |
| Key Words | Oral intake; non-carbonated calorific sports drinks; water; dehydration, fluid balance, hyponatraemia, ketones, labour, caesarean section. |
| Statement of the evidence base of the guideline – has the guideline been peer reviewed by colleagues? | 1b: Peer reviewed &amp; ratified by Maternity guideline group. |
| Evidence base – state highest level from (1-5) | 1a | meta analysis of randomised controlled trials |
| | 1b | at least one randomised controlled trial |
| | 2a | at least one well-designed controlled study without randomisation |
| | 2b | at least one other type of well-designed quasi-experimental study |
| | 3 | well –designed non-experimental descriptive studies (ie comparative / correlation and case studies) |</p>
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<th>expert committee reports or opinions and / or clinical experiences of respected authorities</th>
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<td>recommended best practise based on the clinical experience of the guideline developer</td>
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**Consultation Process**

- Peer-reviewed by doctors and midwives. Submitted for ratification by Maternity guideline group

**Target audience**

- Midwives, obstetricians, anaesthetists, Health Care Assistants.

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This guideline has been registered with the trust. However, clinical guidelines are guidelines only. The interpretation and application of clinical guidelines will remain the responsibility of the individual clinician. If in doubt contact a senior colleague or expert. Caution is advised when using guidelines after the review date.

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1. Eating and Drinking in Labour

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<th>LOW RISK LABOUR</th>
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<td>Light diet &amp; drinks</td>
<td>Water/ clear fluids and low residue foods e.g. isotonic sports drinks / jelly / ice lollies / jelly-sweets</td>
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What can women eat & drink in labour?

- **Drinks:**
  - Water
  - Clear fluids e.g.
  - Squash
  - Isotonic Sports Drinks (e.g. Powerade, Lucozade Sport, Oasis)

- **Low residue foods**
  - Jelly
  - Ice lollies
  - Jelly-sweets

- **Light Diet:**
  - Biscuits
  - Cereal
  - Toast
  - Low-fat yoghurt, Low-fat ice cream
  - Ice lollies
  - Jelly
  - Sweets
What is a **high-risk labour**?

- A high-risk labour is where there is an increased chance of the woman requiring an operative intervention.
- Women with epidurals and no other risk factors are not high risk. There is no evidence to suggest that women with an epidural in are more likely to have a Caesarean section, though they are at a slightly increased risk of assisted vaginal delivery. As long as they do not have any additional risk factors, they should be treated as low risk.
- Women with epidurals should be prescribed ranitidine 150 mg orally, 6 hourly.
- If transfer to theatre (for whatever reason) is impending - sips of water only.

- **Antenatal Risk Factors:**
  - Preterm <37/40
  - Intra-uterine growth restriction
  - Multiple gestation
  - Breech
  - Pre-eclampsia
  - Previous postpartum haemorrhage/Retained placenta
  - Previous Caesarean section/
  - Uterine scar
  - Medical Condition (Diabetes Mellitus, Drug Misuse)
  - Booking BMI > 40 kg.m$^{-2}$
  - Previous difficult Intubation

- **Intra-Partum Risk Factors:**
  - Non reassuring cardiocotogram
  - Fetal blood sampling
  - Meconium-stained liquor
  - Antepartum haemorrhage
  - Oxytocin augmentation
  - Failure to progress
  - Opioids (pethidine/diamorphine)
Fluid balance, ketonuria and hyponatraemia (see peripartum hyponatraemia guidelines)

- **Women should be encouraged to drink to thirst.** Avoiding dehydration must be balanced with the risk of hyponatraemia. Excessive fluid intake can lead to maternal hyponatraemia.

- **Ketonuria should be treated primarily with sugary food and limited sugary drinks.**
  - **Low risk labour** – Light diet especially sugary foods.
  - **High risk labour** - Jelly based sweets, jelly, water based ice lollies and limited quantities of clear sugary drinks e.g. isotonic sports drinks
2. Eating and Drinking before Elective Caesarean section

All women, regardless of planned mode of anaesthesia, may:

- **Eat** until 02:00
- **Drink** until 07:00 on the morning of surgery (permissible fluids below).
  
  Coffee/tea with semi-skimmed milk
  Water
  Clear fluids e.g. fruit squash, isotonic sports drinks (eg Powerade, Lucozade Sport, Oasis)
- **Have sips (< 50 ml water or clear fluids/hour) until called to theatre.**

A woman awaiting (elective or emergency) for a Caesarean section where there are two or more Caesarean sections ahead of her on the list (i.e. operation will not be undertaken in the next 2 hours) can have hot or cold drinks from the list of permissible fluids (see box above).

Women booked for an afternoon elective Caesarean section should be advised to have a light breakfast before 08:00 and permissible drink until noon.
3. Eating and Drinking in the early post-partum period

**Normal vaginal birth**
- No restrictions on eating & drinking

**Uncomplicated assisted vaginal birth or C Section**
- On labour suite/in Recovery (post-anaesthetic care unit):
  - No restriction on drinking:
    - Water or clear fluid e.g. fruit squash
    - Isotonic sports drink
  - Light diet (see above)
- On return to the ward:
  - Eat & drink normally.

**Complicated vaginal birth or C Section**
- Risk of bleeding or return to theatre: e.g. uterine atony/postpartum haemorrhage
  - 3rd degree tear
  - Retained placenta
- Sips of water only
Appendix 1
Eating and Drinking in Labour:
Evidence

Anaesthetists’ principal concern about women eating in labour is the potential risk of pulmonary aspiration of gastric contents, should general anaesthesia be needed. The triennial maternal mortality reports (Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK, MBRRACE-UK) indicate that the incidence of pulmonary aspiration has declined considerably in the past 20 years, despite an increasingly liberal attitude to oral intake during labour. This is associated with the increasing use of regional anaesthesia for operative deliveries and measures to prevent acid aspiration under general anaesthesia such as sodium citrate, ranitidine and rapid sequence induction/intubation with cricoid pressure. In the 2013-5 report (Knight, 2017), two direct anaesthesia related deaths were reported among over 2 million deliveries and none were associated with aspiration.

A policy of fasting during labour was widely adopted after Mendelson published his description of pulmonary acid aspiration in 1946 (Mendelson, 1946). However, over recent years, this rule has been relaxed in Europe. An OAA approved-survey of 108 units found that 93% of low-risk women had either light or unrestricted diet (Combeer, 2014). Denial of food can be seen as authoritarian and intimidating, which may, for some women, increase feelings of fear and apprehension during labour. In addition, parturient are more likely to have a longer and more painful labour (Singata, 2013). This review also noted that most women do not actually want to eat during active labour, but they appreciate the option.

Current Evidence
A Cochrane review (Singata, 2013) of 5 studies, including >3000 women identified no benefits or harms of restricting foods and fluids during labour in women at low risk of needing anaesthesia. There were no studies identified on women at increased risk of needing anaesthesia. Thus, recommended low-risk women should be free to eat and drink in labour, or not, as they wish.
A UK two-year national descriptive study examining pulmonary aspiration during pregnancy and the immediate postpartum period found an overall incidence of only 6.0 per 1,000,000 maternities. In seven out of the nine women aspiration occurred in association with general anaesthesia, representing an estimated incidence of 2.2 cases per 10,000 general anaesthetics (Knight M, 2016).

A large study included 2426 nulliparous women in labour, who were randomised to ‘eating’ or ‘water only’ groups (O’Sullivan et al., 2009). There was no difference in the spontaneous vaginal delivery rate, which was 44% in both groups. There was no difference in the duration of labour, instrument delivery rate, Caesarean section rate or use of oxytocin. The incidence of vomiting was similar in the two groups. Neonatal outcomes were also similar. However, in a subgroup of women who completed a postpartum questionnaire, those in the ‘eating’ group rated their experience of labour more positively on account of being allowed to eat. The authors concluded that low risk women should be allowed a light diet in labour provided there are no risk factors suggesting the need for general anaesthesia.

A systematic review and meta-analysis (Ciardulli et al) including 10 trials and 3982 low-risk singleton pregnancy labouring women found that women who were allowed to eat during labour had significantly shorter duration of labour, with no other harms in obstetric, neonatal or aspiration complications noted.

**Interventions to prevent ketosis**

Urinary ketones in labour are a common occurrence due to increased physical stress. They are the body’s response to starvation. The effect of urinary ketones on the mother and baby during labour is unclear and it is uncertain as to whether it is a normal physiological response or whether women with urinary ketones require treatment. Scrutton et al.’s (1999) randomised controlled trial assessing the risks and benefits of eating a light diet in labour found that it prevented the development of ketosis but significantly increased the residual gastric volume.

O’Sullivan et al.’s (2009) randomised controlled trial of 2426 nulliparous women assessed the effect eating a low-fat, low residue diet during labour on spontaneous vaginal delivery rates. The women
who ate the light diet had similar lengths of labour and operative delivery rates to those who only drank water.

A systematic review and meta-analysis in 2016 assessing the effect of carbohydrate supplementation on duration of labour found that there was no impact on labour outcome (Malin et al).

One small randomised controlled trial (Kubli et al. 2002) evaluated the effect of isotonic “sports drinks” during labour. Mean plasma glucose remained unchanged in the sports drink group but decreased significantly in the water only group. The calorific intake was also higher in the sports drink group. There was no difference in the measurements used for gastrointestinal tract absorption.

**Hyponatraemia**

Women are at risk of developing peripartum dilutional hyponatraemia due to the physiological changes of labour, augmentation of labour, and the total volume of fluid intake during labour (oral and intravenous). As the volume of fluid received during labour increases, the risk of maternal hyponatraemia becomes greater. Moen et al found that women receiving less than 1 litre of fluid are less likely to develop hyponatraemia compared to those who received more than 2.5 litres (1% vs 26%). The association between augmented labour and hyponatraemia has long since been recorded (McKenna et al), however, there is increasing evidence of hyponatraemia occurring in non-augmented labours. The importance of strict fluid balance has been highlighted in the guidance from RQIA/GAIN as a result.
Isotonic sports drinks
In a controlled trial, 60 women were randomized to receive isotonic sports drinks or water only in labour (Kubli et al., 2002). The mean quantity of liquid drunk in the sports group was 925mls which was significantly greater than in the water group (478 ml). The calorie intake by the sports drink group was 47 kcal/hr. By the end of labour plasma β-hydroxybutyrate and non-esterified fatty acids were significantly increased and plasma glucose significantly decreased in the water only group. Stomach cross sectional area measured within 45 mins of delivery was not significantly different between the groups. There were no differences in the number of episodes of vomiting or the volume vomited. Isotonic drinks reduced maternal ketosis during labour without increasing gastric contents.
The authors concluded that a small calorific intake prevents the development of ketosis and isotonic sports drinks are rapidly emptied from the stomach in a labouring mother. For isotonicity, the caloric load of such drinks should be limited to approximately 30 kcal/100ml.

NICE Guidelines: Intrapartum Care Sept 2007
NICE recommendations on eating and drinking in labour (NICE, 2008) are as follows:
1. All women may drink in established labour, and should be informed that isotonic drinks may be more beneficial than water.
2. Women may eat a light diet in established labour unless they have received opioids or develop risk factors that make GA more likely.
Appendix 2
Eating and Drinking before Elective Caesarean section: Evidence

Although fasting from midnight has been standard practice to avoid pulmonary aspiration in elective surgery, a Cochrane review of 22 randomised controlled trials in adults provides evidence that reducing the pre-operative fasting period for clear fluids to 2 hours does not increase complications (Brady 2003).

The British consensus guidelines on intravenous fluid therapy for adult surgical patients (GIFTASUP3) recommend that:

‘In patients without disorders of gastric emptying undergoing elective surgery clear particulate oral fluids should not be withheld for more than two hours prior to the induction of anaesthesia’ Evidence Level 1a (BAPEN, 2011)

Pre-operative nutrition
Relaxation of the imposed duration of pre-operative fasting has led to studies of the effects of nutrients upon patient well-being and surgical outcomes. The metabolic implication of carbohydrate (CHO) administration is preservation of normal endogenous release of insulin (an anabolic hormone) and prevention of the catabolic response to fasting. Administration of a 400 ml flavoured iso-osmolar CHO drink (containing 200 kcal) was compared with the same volume of placebo 2 hr before anaesthesia in patients undergoing laparoscopic cholecystectomy or colorectal surgery (Hausel, 2001). Residual gastric volume and pH were similar between the groups; there were no instances of aspiration. Patients who received the CHO drink experienced less hunger, thirst and anxiety. Plasma glucose and serum insulin concentrations were both increased in the CHO group.

Data from randomised controlled trials indicate accelerated recovery and shorter hospital stay in patients receiving pre-operative carbohydrate loading in colorectal surgery (Noblett, 2006). The GIFTASUP paper recommends that ‘In the absence of disorders of gastric emptying or diabetes, pre-operative administration of carbohydrate rich beverages 2-3 hours before induction of anaesthesia may improve patient wellbeing and facilitate recovery from surgery. It should be considered in the routine preparation for elective surgery’ – Evidence Level 2a. In NUH, pre-operative
carbohydrate drinks are included as part of the Enhanced Recovery Programme.

**Obstetrics**

There is published evidence (from NUH) that a regimen of unrestricted sips of water appears to be safe for women awaiting elective Caesarean section under regional block or GA (Levy, 2004). This policy has been adopted in a number of UK obstetric units. Women awaiting elective Caesarean section are commonly delayed (sometimes for many hours) by emergency cases from the delivery suite. The concentration of maternal urinary ketones increases with duration of starvation (Braham, 2010). In the absence of pain or opioid intake, gastric emptying is not delayed in the third trimester of pregnancy (Macfie, 1991). Many studies have shown that residual gastric volume is, if anything, decreased when the fasting interval for fluids is reduced. Gastric emptying (measured by both acetaminophen absorption and gastric ultrasound) was faster in pregnant women at term after ingestion of 300 ml compared with 50 ml of water (Wong, 2002). This study was repeated in obese (BMI 41±9 kg m\(^{-2}\)), term pregnant women and showed no evidence of delayed gastric emptying (Wong, 2007). Gastric emptying is a surrogate marker for risk of aspiration and increased morbidity.

Mendelson's syndrome, defined from his series of labouring women, is the spectre that haunts moves to liberalize preoperative oral fluid regimens (Levy 2006). The only two deaths, in an era that predated respiratory intensive therapy by decades, were from airway obstruction by solid, undigested food.

The risk of aspiration in the event of loss of consciousness (secondary to unintentionally high regional block or vasovagal/Bezold–Jarisch reflex) or GA has not been quantified, but must be extremely small. Analyses of aspiration incidents have not identified recent preoperative oral fluid ingestion as a risk factor (Kluger, 1999).
Appendix 3
Eating and Drinking in the early post-partum period:
Evidence

There is growing evidence that early oral fluids and light diet after
anaesthesia and surgery are beneficial to the mother in terms of
resumption of normal gastro-intestinal function. Maternal satisfaction
can be improved by reducing hunger and thirst without imposition of
increased risk (Singata, 2013).
In one study, mothers who were encouraged to start drinking as soon
as they felt thirsty had significantly earlier return of bowel sounds than
mothers restricted to intravenous fluids for the first 24 hours. There
were no adverse side effects in the oral hydration group (Abd Rabbo,
1995). Other studies have shown that food can be started within the
first 6-8 hours without detriment and shorter time to return to normal
gastro-intestinal function (Kovavisarach, 2005).
A Cochrane review (Mangesi, 2002) has stated that there is no
evidence to support the withholding of oral fluids after uncomplicated
Caesarean section, and that early oral intake may speed gastro-
intestinal recovery. However, it would seem unwise to allow mothers
to eat and drink if there is a significant risk of returning to theatre for
re-operation.
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