



*The Royal College of*  
**Midwives**

# Evidence Based Guidelines *for* *Midwifery-Led Care in Labour*

## Nutrition in Labour



## Practice Points

---

While there are no risk factors suggesting the need for general anaesthesia, women should be free to eat and drink in labour or not, as they wish (Singata et al. 2010).

Eating and drinking allows a woman to feel normal and healthy. Denial of food can be seen as authoritarian, intimidating, and increase feelings of apprehension (Singata et al. 2010; Frye 1994; Simkin 1986).

There is insufficient evidence to support the practice of starving women in labour in order to lessen the risk of gastric acid aspiration (Singata et al. 2010; ACNM 2008; NICE 2007; Baker 1996; Johnson et al. 1989).

Fasting may result in dehydration and acidosis, which combined with fatigue can increase the likelihood of augmentation, instrumental delivery and postpartum partum blood loss (Broach and Newton 1988; Foulkes and Dumoulin 1985).

Mild maternal ketosis is a physiological part of normal labour and might even be beneficial (Toohill et al. 2008; Sommer et al. 2000; Anderson 1998; Keppler 1988).

Narcotics appear to be the major factor in delaying stomach emptying. If these are used, then women should stop eating, and drinking be reduced to sips of water (NICE 2007; Holdsworth 1978; Nimmo et al. 1975).

The desire to eat would appear to be most common in early labour (Singata et al. 2010). As women do not usually wish to eat in active labour, it is inappropriate to be encouraging them to do so against their natural instincts (Odent 1994).

Non fizzy isotonic drinks can increase a woman's energy levels by providing a relatively small calorific intake. They maybe more beneficial than water (NICE 2007).

The practice of restricting fluids and foods during labour has been common practice in many countries for several years (Singata et al. 2010). The explanation for this is the concern that eating and drinking in labour increases the risk of regurgitation and aspiration of the stomach contents if there is need for general anaesthesia. The most specific worry is of acidic gastric aspiration (Mendelson 1946). The absolute level of the risk of aspiration has always been low, and it is clear that aspiration of gastric contents plays a very small role in both absolute and relative terms as a cause of maternal death (Johnson et al. 1989). It has been frequently noted, however, that anaesthetic technique is the major reason that deaths from aspiration still occur (DH 1991; Ludka 1987; Crawford 1986; Morgan 1986). Johnson et al. (1989, p 828) state that most cases of aspiration “could be prevented by a combination of decreasing the frequency of procedures that require anaesthesia, the use of regional anaesthesia wherever feasible, and meticulous attention to safe anaesthetic technique”. Obstetric anaesthesia has changed considerably with improved general anaesthetic techniques and greater use of regional anaesthesia.

No presently known practices can ensure that a labouring woman’s stomach is empty, or that her gastric juices will have a pH greater than 2.5 (Johnson et al. 1989). Fasting during labour does not guarantee an empty stomach should general anaesthesia become necessary; no time interval since the last meal can ensure a stomach volume of less than 100 ml. Nor can fasting during labour be relied on to lower the acidity of the gastric contents (Roberts and Shirley 1976). Scrutton et al.’s (1999) randomised controlled trial assessing the risks and benefits of eating a light diet in labour found that it increased the residual gastric volume.

Broach and Newton (1988) state that it is the administration of narcotics that appears to be the major factor in delaying stomach emptying (Nimmo et al. 1975; Holdsworth 1978). This would suggest that either other forms of analgesia should be considered, or that oral intake of food should cease when narcotics are given (NICE 2007; Grant 1990).

The gradual fall in glucose levels and increase in free fatty acids occurring in pregnancy results in increased likelihood of ketosis (Anderson 1998). Metzger et al. (1982) showed that women in the late pregnancy experience a state of “accelerated starvation” if denied food and drink. This state results in the accelerated productions of ketones (O’Sullivan and Scrutton 2003). It has been argued that ketosis is a normal physiological response in labour (Toohill et al. 2008; Sommer et al. 2000; Anderson 1998; Keppler 1988). However, ketosis, combined with starvation and fatigue, can lead to inefficient uterine action, increase the need for active management and lead to instrumental delivery (Broach and Newton 1988; Foulkes and Dumoulin 1985).

---

There has been little published research into examining the effects of oral intake in labour (ACNM 2008). A frequently cited study is that reported by Ludka (1987) from the North Central Bronx Hospital in New York. This was a hospital where women were allowed to eat and drink throughout normal labour as desired. In ten years and throughout 20,000 births not one case of aspiration was noted. For a six month period the liberal practice was discontinued. During this time they had one case of maternal aspiration in a woman who had fasted for 36 hours: instrumental delivery increased by 35%; caesarean section increased by 38%; the need for intensive care of newborns increased by 69% and the chemical stimulation of labour increased fivefold. An audit such as this cannot prove cause and effect but is clearly useful as an indicator of the need for more studies (Pengelly and Gyte 1996). 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. The study was too small to show any effect on the outcome of labour. 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. Death or significant morbidity from pulmonary aspiration is so rare that the use of randomised controlled trials to examine this outcome is impossible.

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.

It is important to recognise that the withholding of food and drink in labour is very much a hospital practice; when women opt for a home birth there is no such restriction (Baker 1996).

As Baker (1996) suggests, there is insufficient evidence to support the practice of starving women in labour and this position is reflected in the NICE guidelines (NICE 2007). While there are no risk factors suggesting the need for general anaesthesia, women should be free to eat and drink in labour or not, as they wish (Singata et al. 2010). Frye (1994) says that eating in labour allows the woman to feel normal and healthy, it keeps her energy up and can minimise complications caused by maternal exhaustion. The psycho-social aspect of fasting should also be considered. The provision of food and drink can be reassuring and comforting: denial can be seen as authoritarian and intimidating and may increase feelings of apprehension. Simkin's survey (1986) into new mother's assessments of emotional stress associated with obstetric interventions found that 57% of those whose oral fluids were restricted and 27% of those whose oral intake of food was restricted reported these practices to be "moderately" or "most" stressful.

There has been little published work exploring women's views about whether or not they would eat in labour if given the choice. Armstrong and Johnston (2000) found that a significant minority (30%) of women would wish to eat in labour. Newton and Champion's study (1997) found that women appreciated having the option of eating and drinking, even if they chose not to do so.

The desire to eat, however, would appear to be most common in early labour (Singata et al. 2010). As Odent (1994) points out, women do not usually wish to eat in active labour and it is inappropriate to be encouraging them to do so, against their natural instincts. This is another area in which we should be responding to what the woman feels she needs, and allowing her to make the decision and take control (DH 1993).

## References

---

- American College of Nurse Midwives (ACMN) (2008) Providing Oral Nutrition to Women in Labor *Journal of Midwifery & Women's Health* **53**(3): 276-273
- Armstrong S, Johnston Q (2000) Which women want food during labour?: Results of an audit in a Scottish DGH *Health Bulletin* **58**: 141-144
- Anderson T (1998) Is ketosis in labour pathological? *Practising Midwife* **1**: 22-26
- Baker C (1996) Nutrition and hydration in labour. *British Journal of Midwifery* **4**: 568-572
- Broach J, Newton N (1988) Food and beverages in labour. Part II: the effects of cessation of oral intake during labour. *Birth* **15**: 88-92
- Crawford JS (1986) Maternal mortality from Mendelson's syndrome. *The Lancet* **1**: 920-921
- Department. of Health (1991) Report on the Confidential Enquiries into Maternal Deaths in the UK 1985-1987. London: HMSO
- Department. of Health (1993) Changing Childbirth: Report of the Expert Maternity Group. London: HMSO
- Department. of Health (2001) Report on the Confidential Enquiries into Maternal Deaths in the UK 1997-1999. London: HMSO
- Frye A (1994) Nourishing the mother. *Midwifery Today* **31** (Autumn): 25-26
- Foulkes J, Dumoulin J (1985) The effects of ketonuria in labour. *British Journal of Clinical Practice* **39**: 59-62
- Grant J (1990) Nutrition and hydration in labour. In: Alexander J, Levy V, and Roch S (Eds) *Midwifery Practice Intrapartum Care: A research-based approach*. London: Macmillan Education
- Holdsworth J (1978) Relationship between stomach contents and analgesia in labour. *British Journal of Anaesthesia* **50**: 1145-8
- Johnson C, Keirse M, Enkin MJN, Chalmers I (1989) Nutrition and hydration in labour. In: Chalmers I, Enkin M and Keirse MJN (Eds). *Effective care in pregnancy and childbirth*. Vol 2. Oxford: Oxford University Press: 827-32
- Keppler A (1988) The use of intravenous fluids during labour. *Birth* **15**: 75-9
- Kubli M, Scrutton M, Seed P (2002) An evaluation of isotonic "sports drinks" during labour. *Anesthesia and Analgesia* **94**(2): 404-8.
- Ludka L (1987) Fasting during labour. In: Proceedings of the International Confederation of Midwives 21st International Congress. Hague: ICM, 26 August: 41-44
- Mendelson C (1946) The aspiration of stomach contents into the lungs during obstetric anaesthesia. *American Journal of Obstetrics and Gynecology* **52**: 191-205
- Metzger B, Vileisis R, Ramikar V et al. (1982) Accelerated starvation and the skipped breakfast in late normal pregnancy. *Lancet* **1**: 588-92
- Morgan M (1986) The Confidential Enquiry into Maternal Deaths. *Anaesthesia* **41**: 689-691
- Newton C, Champion P (1997) Oral intake in labour: Nottingham's policy formulated and audited. *British Journal of Midwifery* **5**: 418-22
- National Institute of Clinical Excellence (NICE) (2007) *Intrapartum Care: care of healthy women and their babies*. London: NICE

---

Nimmo W, Wilson J, Prescott LF (1975) Narcotic analgesics and delayed gastric emptying during labour. *The Lancet* **1**(7912): 890-93

Odent M (1994) Labouring women are not marathon runners. *Midwifery Today* 31 (Autumn): 23-51

O'Sullivan G, Liu B, Hart D, et al. (2009) Effect of food intake during labour on obstetric outcome: randomised controlled trial. *British Medical Journal* **338**: b784

O'Sullivan G, Scrutton M (2003) NPO during labor: Is there any scientific validation? *Anesthesiology Clinics of North America* **21**: 87-98

Pengelly L, Gyte G (1996) Eating and drinking in labour (II) A summary of medical research to facilitate informed choice about the care of mother and baby. *Practising Midwife* **1**: 27-9

Roberts RB, Shirley MA (1976) The obstetrician's role in reducing the risk of aspiration pneumonia, with particular reference to the use of oral antacids. *American Journal of Obstetrics and Gynecology* **124**: 611-17

Scrutton M, Metcalfe G, Lowy C, et al. (1999) Eating in labour: A randomised controlled trial assessing the risks and benefits. *Anaesthesia* **54**: 329-34

Singata M, Tranmer J, Gyte G (2010) Restricting oral fluid and food intake during labour. *Cochrane Database of Systematic Reviews*, Issue 1. Chichester: John Wiley & Sons

Simkin P (1986) Stress, pain and catecholamines in labour. Part 2. Stress associated with childbirth events: a pilot survey of new mothers. *Birth* **13**: 234-40

Sommer P, Norr K, Roberts J (2000) Clinical decision making regarding intravenous hydration in normal labor in a birth centre setting. *Journal of Midwifery and Women's Health* **35**: 505-13

Toohill J, Soong B, Flenady V (2008) Interventions for ketosis during labour *Cochrane Database of Systematic Reviews*, Issue 3. Chichester: John Wiley & Sons

---

This updated guideline was authored by:

Jane Munro, Quality and Audit Development Advisor, RCM, Mervi Jokinen,  
Practice and Standards Development Advisor, RCM

And peer reviewed by:

Dr Tracey Cooper, Consultant Midwife – Normal Midwifery, Lancashire Teaching  
Hospitals NHS Foundation Trust.

Dr Fiona Fairlie, Consultant Obstetrician and Gynaecologist, Sheffield Teaching  
Hospitals NHS Foundation Trust.

Anne-Marie Henshaw, Lecturer (Midwifery and Women's Health)/ Supervisor of  
Midwives, University of Leeds

Helen Shallow, Consultant Midwife & Head of Midwifery, Calderdale & Huddersfield  
NHS Foundation Trust.

The guidelines have been developed under the auspices of the RCM Guideline  
Advisory Group with final approval by the Director of Learning Research and Practice  
Development, Professional Midwifery Lead.

The guideline review process will commence in 2016 unless evidence requires  
earlier review.

© The Royal College of Midwives Trust 2012

## Appendix A

---

### Sources

The following electronic databases were searched: The Cochrane Database of Systematic Reviews, MEDLINE, Embase and MIDIRS. As this document is an update of research previously carried out, the publication time period was restricted to 2008 to March 2011. The search was undertaken by Mary Dharmachandran, Project Librarian (RCM Collection), The Royal College of Obstetricians and Gynaecologists.

### Search Terms

Separate search strategies were developed for each section of the review. Initial search terms for each discrete area were identified by the authors. For each search, a combination of MeSH and keyword (free text) terms was used.

### Journals hand-searched by the authors were as follows:

- Birth
- British Journal of Midwifery
- Midwifery
- Practising Midwife
- Evidence-based Midwifery