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Oral Intake in Labour

Evidence Summary:

Allowing food intake during routine uncomplicated labour may not increase the risk of maternal vomiting, caesarean birth, or operative vaginal birth, nor does it affect labour duration or incidence of labour dystocia.

Recommendations on solid food intake during active labour vary by professional organisation. Food intake is encouraged during uncomplicated active labour in intrapartum care guidance issued by NICE (2023) and the World Health Organisation (2018). Intake of solid foods during active labour however is not recommended by the American College of Obstetricians and Gynecologists (2019) or the American Society of Anesthesiologists (2022).

Source: DynaMed. Management of Routine Labor. EBSCO Information Services. Accessed 27 May 2025. https://www.dynamed.com/management/management-of-routine-labor

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1. **Effect of epidural labour analgesia on gastric emptying during labour: A prospective controlled study.**

   Item Type: Journal Article

   Authors: Bu W.;Wu W. and Cheng, J.

   Publication Date: 2025

   Journal: European Journal of Obstetrics and Gynecology and Reproductive Biology 308, pp. 169–173

   Abstract: Background: Epidural analgesia is frequently used to alleviate labour pain, and dietary management during labour is of crucial importance. Therefore, this study investigates the impact of epidural analgesia for labour on gastric emptying in parturient women. Method(s): A total of 70 full-term parturient women were recruited and divided into two groups: the epidural analgesia group (LA, n = 35) and the non-epidural analgesia group (NA, n = 35). Fasting gastric antrum cross-sectional area (CSA0) was assessed using B-mode ultrasonography at T0. Both groups then consumed 300 g of millet porridge (600KJ). Post-meal, CSAs were measured at 60 min (CSA1, T1), 90 min (CSA2, T2), and 120 min (CSA3, T3) using ultrasonography. Pain scores were recorded for both groups at these four time points, and gastric emptying time was noted. Result(s): The CSA in the NA group were larger than those in the LA group (CAS1:11.4 +/- 0.8 vs 10.2 +/- 0.6;CAS2:9.3 +/- 0.6 vs 8.3 +/- 0.5,CAS3:7.4 +/- 0.5 vs 6.5 +/- 0.4; P = 0.00). The gastric emptying time in the LA group was shorter than that in the NA group (197.5 +/- 27.2 vs. 220.9 +/- 29.2, P = 0.00). Conclusion(s): Epidural analgesia facilitates gastric emptying during labour. Therefore, the administration of epidural analgesia during labour does not adversely affect maternal dietary preferences. Plain language summary. During labour, women often endure severe pain, prompting the widespread use of epidural analgesia for pain relief. However, the dietary considerations for women opting for epidural analgesia during labour have increasingly garnered attention. Numerous studies have now corroborated that moderate food consumption can supply energy to women without posing any detrimental effects. Our research has observed that epidural analgesia can expedite gastric emptying during labour. Previous clinical experience suggested that patients should not eat before or after anesthesia, but this study shows that even if a parturient opts for epidural labor analgesia, she can still continue to consume a certain amount of semi-solid food to provide energy throughout the labor process, without needing to worry about an increased risk of vomiting. Copyright © 2025 The Author(s)

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2. **Should we restrict food intake during labor? A randomized controlled trial.**

Item Type: Journal Article

Authors: Maor G.S.;Greenfield R.B.;FarladanskyGershnabel S.;Mestechkin D.S.;Schreiber H.;BironShental T. and Weitzner, O.

Publication Date: 2024

Journal: Archives of Gynecology and Obstetrics 310(6), pp. 2983–2989

Abstract: Purpose: To evaluate whether consuming food during labor influences its outcomes. Method(s): This randomized controlled study included healthy, laboring patients at 37-41 weeks of gestation. After epidural anesthesia, patients were randomized into groups of eating at will versus drinking clear fluids only. The primary composite outcome included unplanned cesarean delivery, the need for general anesthesia, asphyxia, postpartum fever, and prolonged postpartum admission (more than 5 days). Secondary outcomes included the need for oxytocin, length of the second stage of labor, postpartum analgesia requirements, and early maternal and neonatal outcomes. Sample size analysis indicated that 126 patients needed to be randomized to detect a statistically significance difference between the groups. Result(s): A total of 129 patients were randomized: 58 to the fluids-only group and 71 to the food group. The groups had similar basic characteristics. The composite outcome of complications attributed to eating during labor and delivery was comparable between groups. Labor progression and the need for oxytocin augmentation were similar in both groups. The groups had comparable fetal heart rate tracings, modes of delivery, maternal and neonatal outcomes, and complications. None of the patients in the study experienced aspiration or an indication for general anesthesia. Conclusion(s): While our data suggest that eating during labor does not adversely affect labor progression or outcomes, we recommend a cautious approach, allowing patients autonomy while considering individual risk factors. Trial registration: The study has been registered in the primary clinical trial registry on 02/12/2023. ISRCTN trial number ISRCTN11794106, registration number 44513. https://www.isrctn.com/ISRCTN11794106.Copyright © The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature 2024.

3. **Less restrictive food consumption during labor in nulliparous habitual risk patients and obstetric outcomes: A systematic review.**

Item Type: Journal Article

Authors: Fagundes P.;de Vargas B.O.;Holand B.L.;Medina M.;Bosa V.L. and Drehmer, M.

Publication Date: 2025

Journal: Midwifery 143, pp. 104334

Abstract: OBJECTIVE: Childbirth is a natural process, and according to the World Health Organization, oral intake is recommended for patients at usual risk. However, due to rare cases of pulmonary aspiration (known as Mendelson's syndrome) during general anesthesia and the limited evidence supporting its benefits, this practice remains controversial. This systematic review summarizes evidence on interventions that recommend oral intake during labor compared to fasting, focusing on labor duration and perinatal complications. SOURCES: A literature search across PubMed, EMBASE, Lilacs, and Scielo identified randomized clinical trials involving habitual-risk patients, nulliparous women receiving oral diet interventions during labor. The RoB 2.0 tool was used to assess bias. SUMMARY OF THE FINDINGS: Six studies (3,333 patients) were included, with three showing low risk of bias. Patients in the intervention group were allowed to eat, while the control group only had access to water, ice chips, and non-energy drinks. Food intake was found to correlate with significantly shorter labor duration in one study (P CONCLUSION(S): Only one study found a significant difference in labor duration when offering a diet during labor to patients at usual risk compared to fasting. No differences were observed in other perinatal outcomes between the intervention and control groups.Copyright © 2025. Published by Elsevier Ltd.

URL: https://libkey.io/libraries/2828/openurl?genre=article&sid=OVID:embase&id=pmid:39956040&id=doi:10.1016%2Fj.midw.2025.104334&issn=1532-3099&isbn=&volume=143&issue=&spage=104334&pages=104334&date=2025&title=Midwifery&atitle=Less+restrictive+food+consumption+during+labor+in+nulliparous+habitual+risk+patients+and+obstetric+outcomes%3A+A+systematic+review&aulast=Fagundes&pid=%3Cauthor%3EFagundes+P.%3Bde+Vargas+B.O.%3BHoland+B.L.%3BMedina+M.%3BBosa+V.L.%3BDrehmer+M.%3C%2Fauthor%3E%3CAN%3E646623250%3C%2FAN%3E%3CDT%3EReview%3C%2FDT%3E

4. **ASRA pain medicine narrative review and expert practice recommendations for gastric point-of-care ultrasound to assess aspiration risk in medically complex patients undergoing regional anesthesia and pain procedures.**

   Item Type: Journal Article

   Authors: Haskins, Stephen C.;Bronshteyn, Yuriy S.;Ledbetter, Leila;Arzola, Cristian;Kalagara, Hari;Hardman, David;Panzer, Oliver;Weber, Marissa M.;Heinz, Eric R.;Boublik, Jan;Cubillos, Javier;Hernandez, Nadia;Zimmerman, Joshua and Perlas, Anahi

   Publication Date: 2025

   Journal: Regional Anesthesia & Pain Medicine
   Abstract: Gastric point-of-care ultrasound (POCUS) may offer clinical value in assessing aspiration risk among medically complex patients undergoing regional anesthesia and pain procedures. While the American Society of Anesthesiologists (ASA) preoperative fasting guidelines primarily apply to healthy individuals, medically complex populations often present with differing gastric emptying and aspiration risk. This narrative review, conducted by the American Society of Regional Anesthesia and Pain Medicine (ASRA-PM), adhered to PRISMA guidelines and was registered with PROSPERO. It focused on seven medically complex patient groups: those who are pregnant, obese, diabetic, have gastroesophageal reflux disease (GERD), are receiving emergency care, are enterally fed, or are taking GLP-1 receptor agonists (GLP-1RA). Study quality was assessed using the Mixed Methods Appraisal Tool (MMAT). Practice recommendations were developed using an iterative expert consensus process, with final recommendations based on evidence strength, clinical relevance, and expert agreement. Findings support the use of gastric POCUS in patients in active labor, those undergoing urgent cesarean sections, and those with diabetes. Conditional support is given for obesity, emergency care, enteral feeding, and GLP-1RA use. Routine use is not recommended in non-laboring pregnancies, elective cesarean delivery, or GERD. While gastric POCUS may aid with aspiration risk evaluation, its use should complement clinical judgment. Implementation may be limited by practical and training constraints, requiring individualized decision-making. These recommendations serve as a foundation for future research and potential clinical guideline development. PROSPERO registration number: CRD42023445927.

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5. **Gastric emptying in pregnancy and its clinical implications: a narrative review.**

Item Type: Journal Article

Authors: Lawson J.;Howle R.;Popivanov P.;Sidhu J.;Gordon C.;Leong M.;Onwochei D. and Desai, N.

Publication Date: 2025

Journal: British Journal of Anaesthesia 134(1), pp. 124–167

Abstract: Delayed gastric emptying increases the risk of pulmonary aspiration during anaesthesia for Caesarean delivery. Our aim in conducting this narrative review was to consider the effect of pregnancy on gastric emptying. The indices of gastric emptying after liquids, solids, or both and when fasted in the various trimesters of pregnancy, at the time of Caesarean delivery, in labour, and the postpartum period were assessed. We considered 32 observational studies, one nonrandomised controlled study, and 22 randomised controlled trials. The evidence indicates that, compared with the nonpregnant state, gastric emptying is decreased in the first but not the second and third trimesters. Before elective Caesarean delivery, carbohydrate drink or tea with milk leads to no difference in gastric cross-sectional area at 2 h relative to fasting or water. Following a standard fast for elective Caesarean delivery, patients may still have high-risk gastric contents. Compared with the nonpregnant state and third trimester, gastric emptying is delayed in labour, although the choice of analgesia has modifying effects. Systemic opioids delay gastric emptying. Epidural analgesia increases gastric emptying, but not back to baseline. Intrathecal analgesia delays gastric emptying relative to epidural analgesia. Women in labour who have eaten solids in the last 8 h still have high-risk gastric contents present in the stomach. The evidence with respect to the postpartum period is conflicting. In conclusion, inconsistencies in the literature reflect the unpredictability of gastric emptying in pregnancy and underline the potential value of gastric ultrasound in women who are pregnant.Copyright © 2024 The Author(s)

6. **Pulmonary aspiration during pregnancy or immediately postpartum in the UK: A population-based case-control study.**

Item Type: Journal Article

Authors: Lucas, Nuala;Gooda, Alison;Tunn, Ruth and Knight, Marian

Publication Date: 2025

Journal: NIHR Open Research 5, pp. 2

Abstract: Background: Pulmonary aspiration of gastric contents is the most frequent cause of death associated with complications of airway management during general anaesthesia. Pregnancy increases aspiration risk owing to factors including delayed gastric emptying and increased intragastric pressure. We describe the incidence, risk factors, management, and outcomes of maternal pulmonary aspiration in pregnancy in the UK. Methods: We conducted a population-based surveillance and case-control study. Between September 2013 and August 2016, all UK consultant-led obstetric units prospectively identified cases of pulmonary aspiration among parturient women using a pre-defined case definition, and reported them via the UK Obstetric Surveillance System (UKOSS). Controls (n=1982) were obtained from four UKOSS studies conducted between 2005 and 2014. We calculated the incidence of pulmonary aspiration using 2013-2015 maternities as the denominator. We explored potential risk factors for aspiration using univariable logistic regression and described outcomes. Results: We identified 12 cases of pulmonary aspiration, giving an incidence of 5.2 per 1,000,000 maternities (95% CI 2.69-9.09). Cases were significantly less likely than controls to be multiparous (unadjusted odds ratio [uOR] 0.255, 95% CI 0.069-0.946), and significantly more likely to undergo caesarean section (uOR 24.89, 95% CI 3.18-194.85) and to receive general anaesthetic for caesarean section (p Conclusions: Pulmonary aspiration is rare in UK obstetric anaesthetic practice; however, it remains a risk of general anaesthesia. Despite a large study population, our analyses lacked power to evaluate many potential risk factors. Future research should focus on developing methods to accurately identify pregnant women at risk of aspiration. Copyright: © 2025 Lucas N et al.; plain-language-summary Pulmonary aspiration is a condition in which stomach contents are inhaled into the windpipe and lungs. This most commonly occurs in patients under general anaesthesia, and can be fatal. Pregnancy increases the risk of pulmonary aspiration because of physical and hormonal changes it causes in the digestive system. Therefore, pregnant women giving birth under general anaesthetic are at particularly high risk. We wanted to understand how common pulmonary aspiration is among pregnant women in the UK, and how women affected by this condition differ from other women. We also investigated how the condition was managed, and how affected women and their babies fared. The UK Obstetric Surveillance System (UKOSS) collects information from all UK maternity units about pregnant women with certain conditions. We used UKOSS to collect anonymous information about all women who experienced pulmonary aspiration during a three-year period. We compared these women with pregnant women who did not experience pulmonary aspiration. During the three years, 12 pregnant women in the UK experienced pulmonary aspiration when giving birth. Based on this, we estimated that approximately 5.5 women were affected per million women giving birth. As expected, women who aspirated were more likely than unaffected women to give birth by caesarean section under general anaesthesia. They were also more likely to be first-time mums, and to give birth earlier (at 37.6 weeks on average, compared with 39 weeks for unaffected women). The results of our study suggest that pulmonary aspiration is reassuringly uncommon among women giving birth in the UK, including among the higher-risk group of women giving birth under general anaesthesia. However, when it did occur, women were more likely to need to be admitted to intensive care; and the babies of affected women

typically needed additional medical support and there was an increased risk of stillbirth. Better methods are needed to identify women who are at risk of pulmonary aspiration. Language: English

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7. **Impact of Erythromycin and Metoclopramide on Gastric Emptying of Solids in Term Pregnant Women Scheduled for Elective Cesarean Delivery: A Randomized Controlled Trial.**

Item Type: Journal Article

Authors: Wahdan, Amr Samir;Elrefai, Nesrine Abdelrahman;Elzayat, Nashwa Samy;Aziz, Ayman Salaheldin and Mohamed, Mennatallah Magdi

Publication Date: May 14 ,2025

Journal: Anaesthesia Critical Care & Pain Medicine 101544
Abstract: BACKGROUND: We hypothesized that the preoperative administration of oral erythromycin and metoclopramide would reduce the risk of high gastric volume and contents, evaluated by bedside gastric ultrasonography in non-laboring pregnant subjects preparing for elective cesarean delivery. METHODS: This randomized double-blinded study included 150 parturients undergoing elective cesarean delivery. They received flavored water with oral erythromycin 400 mg (group E), oral metoclopramide 10 mg (group M), or placebo (group C) after standard meal ingestion, followed by ultrasonography measurement of gastric volume before and hourly after drug administration. The primary outcome was the mean gastric volume after six hours of fasting. Secondary outcomes included measuring gastric contents hourly until a safe level and assessing aspiration risk. RESULTS: Significant differences in mean (+/-SD) gastric volume (mL/kg) were observed after six hours among groups C, E, and M, with values of 1.05 +/- 0.49, 0.71 +/- 0.46, and 0.75 +/- 0.48, respectively (p : Significant differences in mean (+/-SD) gastric volume (mL/kg) were observed after six hours among groups C, E, and M, with values of 1.05 +/- 0.49, 0.71 +/- 0.46, and 0.75 +/- 0.48, respectively (p CONCLUSIONS: Premedication with oral erythromycin or metoclopramide before elective cesarean delivery accelerated gastric emptying and may reduce aspiration risk after a standard meal. Copyright © 2025. Published by Elsevier Masson SAS.

URL: https://libkey.io/libraries/2828/openurl?genre=article&sid=OVID:medline&id=pmid:40379098&id=doi:10.1016%2Fj.accpm.2025.101544&issn=2352-5568&isbn=&volume=&issue=&spage=101544&pages=101544&date=2025&title=Anaesthesia+Critical+Care+%26+Pain+Medicine&atitle=Impact+of+Erythromycin+and+Metoclopramide+on+Gastric+Emptying+of+Solids+in+Term+Pregnant+Women+Scheduled+for+Elective+Cesarean+Delivery%3A+A+Randomized+Controlled+Trial.&aulast=Wahdan&pid=%3Cauthor%3EWahdan+AS%3BElrefai+NA%3BElzayat+NS%3BAziz+AS%3BMohamed+MM%3C%2Fauthor%3E%3CAN%3E40379098%3C%2FAN%3E%3CDT%3EJournal+Article%3C%2F

DT%3E

8. **Incidence and clinical impact of aspiration during cesarean delivery: A multi-center retrospective study.**

Item Type: Journal Article

Authors: Binyamin Y.;OrbachZinger S.;Ioscovich A.;Reina Y.Y.;Bichovsky Y.;Gruzman I.;Zlotnik A. and Brotfain, E.

Publication Date: 2024

Journal: Anaesthesia Critical Care and Pain Medicine 43(2) (pagination), pp. Article Number: 101347. Date of Publication: 01 Ar 2024

Abstract: Background: The risk of aspiration during general anesthesia for cesarean delivery has long been thought to be increased due to factors such as increased intra-abdominal pressures and delayed gastric emptying in pregnant patients. However, recent studies have reported normal gastric emptying in pregnant patients, suggesting that the risk of aspiration may not be as high as previously believed. Method(s): We conducted a retrospective study of 48,609 cesarean deliveries, of which 22,690 (46.7%) were performed under general anesthesia at two large tertiary medical centers in Israel. The study aimed to examine the incidence of potentially severe aspiration during cesarean delivery, both under general and neuraxial anesthesia. Result(s): Among the patients included in the study, three were admitted to the intensive care unit due to suspected pulmonary aspiration. Two of these cases occurred during induction of general anesthesia for emergency cesarean delivery associated with difficult intubation and one under deep sedation during spinal anesthesia. The incidence of aspiration during cesarean delivery during general anesthesia in our study was 1 in 11,345 patients, and the incidence of aspiration during neuraxial anesthesia was 1 in 25,929 patients. No deaths due to aspiration were reported during the study period. Conclusion(s): Our findings provide another contemporary analysis of aspiration rates in obstetric patients, highlighting increased risks during the management of difficult airways during general anesthesia and deep sedation associated with neuraxial anesthesia. Copyright © 2024 Societe francaise d'anesthesie et de reanimation (Sfar)

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9. **Prevalence and factors associated with high-risk gastric contents in women admitted to the maternity unit for childbirth: a prospective multicentre cohort study.**

Item Type: Journal Article

Authors: Bouvet L.;Fabre J.;Roussin C.;Nadal C.;Dezavelle S.;Vial F.;Le Gouez A.;Soued M.;Keita H.;Zein W.;Desgranges F.P.;Thuet V.;Boucekine M.;Duclos G.;Leone M. and Zieleskiewicz, L.

Publication Date: 2024

Journal: British Journal of Anaesthesia 132(3), pp. 553–561

Abstract: Background: This multicentre prospective observational study sought to determine the prevalence and the factors associated with high-risk gastric contents in women admitted to the maternity unit for childbirth, and to identify the clinical situations in which ultrasound assessment of gastric contents would be most helpful (i.e. when the prevalence of high-risk gastric contents is close to 50%). Method(s): Ultrasound assessments of gastric contents were performed within the first hour after admission to the maternity unit. The prevalence of high-risk gastric contents was calculated and variables associated with high-risk gastric contents were identified using logistic regression analyses. Result(s): A total of 1003 parturients were analysed. The prevalence of high-risk gastric contents was 70% (379/544; 95% confidence interval: 66-74%) in women admitted in spontaneous labour and 65% (646/1003; 95% confidence interval: 61-67%) in the whole cohort. Lower gestational age, increased fasting duration for solids, and elective Caesarean delivery were independently associated with reduced likelihood of high-risk gastric contents. In women admitted in spontaneous labour and in the whole cohort, the prevalence of high-risk gastric contents ranged from 85% to 86% for fasting duration for solids =12 h. Conclusion(s): Around two-thirds of parturients had high-risk gastric contents within the first hour after admission to the maternity unit. Our results suggest that gastric emptying for solids continues in labouring women, and that gastric ultrasound would be most helpful when fasting duration is >=8 h.Copyright © 2023 British Journal of Anaesthesia

10. **Ultrasound evaluation of gastric emptying of high-energy semifluid solid beverage in parturients during labor at term: a randomized controlled trial.**

Item Type: Journal Article

Authors: Ni X.;Li J.;Wu Q.W.;Zhou S.Q.;Xu Z.D. and Liu, Z. Q.

Publication Date: 2024

Journal: Journal of Anesthesia 38(1), pp. 29–34

Abstract: Purpose: What to intake during labor is controversial. The purpose of this study was to compare the gastric emptying of high-energy semifluid solid beverage (HESSB) versus that of carbohydrate (CHO) solution of equal calories and volume by evaluating the gastric antral cross-sectional area (CSA) using ultrasonography in parturients during labor at term. Method(s): The study was conducted at a maternity and infant hospital between June and October 2020. Forty parturients scheduled for epidural labor analgesia during labor at term were randomly assigned to receive HESSB (300 mL, n = 20) or CHO (300 mL, n = 20). Gastric antral CSA was measured at baseline and 5, 30, 60, 90, and 120 min after consumption of the drink. The primary outcome was gastric antral CSA at 120 min in the HESSB group and CHO group. Result(s): The gastric antral CSA between the HESSB group and CHO group at 120 min was not statistically significant (2.73 cm2 +/- 0.55 vs. 2.55 cm2 +/- 0.72, P = 0.061). All patients returned to baseline at 120 min after intake of 300 mL isocaloric HESSB and CHO, confirmed by evaluation of gastric antral CSA. The visual analog scale score for satiety was higher in the HESSB group (P +/- 0.72, P = 0.061). All patients returned to baseline at 120 min after intake of 300 mL isocaloric HESSB and CHO, confirmed by evaluation of gastric antral CSA. The visual analog scale score for satiety was higher in the HESSB group (P +/- 0.72, P = 0.061). All patients returned to baseline at 120 min after intake of 300 mL isocaloric HESSB and CHO, confirmed by evaluation of gastric antral CSA. The visual analog scale score for satiety was higher in the HESSB group (P Conclusion(s): The change of gastric antral cross-sectional area after HESSB is similar to the corresponding calories and volume of CHO and the gastric emptying of HESSB can be emptied within 2 h with better taste satisfaction and satiety in pregnant women under labor analgesia.Copyright © 2023, The Author(s) under exclusive licence to Japanese Society of Anesthesiologists.

11. **Effects of Preoperative Oral Carbohydrate on Perioperative Maternal Outcomes Undergoing Cesarean Section: A Systematic Review and Meta-Analysis.**

Item Type: Journal Article

Authors: Shi H.;Zheng C. and Zhu, B.

Publication Date: 2024

Journal: Anesthesiology Research and Practice 2024(pagination), pp. Article Number: 4660422. Date of Publication: 2024

Abstract: Purpose. Preoperative oral carbohydrate (CHO) is a rapid postoperative rehabilitation protocol that improves perioperative outcomes and is widely used in adult surgical patients. However, pregnant women are excluded because of the possibility of aspiration due to delayed gastric emptying. This meta-analysis was conducted to evaluate the efficacy of preoperative oral CHO in elective cesarean section. Methods. PubMed, Embase, Web of Science, and the Cochrane Library were searched from inception to July 2023. Randomized controlled trials were included. The risk of bias was assessed using the Cochrane tool. Risk ratios and 95% confidence intervals were calculated. Meta-analysis was performed using random-effects models to estimate risk ratios and mean differences (MDs) with 95% confidence intervals (CIs). The outcomes included thirst and hunger scores, incidence of vomiting and nausea, time to flatus, and homeostatic model assessment of insulin resistance (HOMA-IR). Results. A total of nine studies with 1211 patients were included in the analysis. The levels of thirst and hunger were evaluated using a 10-point visual analog scale, with 0 representing the best and 10 representing the worst. The severity of hunger (weighted mean difference (WMD: -2.34, 95% CI: -3.13 to -1.54), time to flatus (WMD: -3.51 hours, 95% CI: -6.85 to -0.17), and HOMA-IR (WMD: -1.04, 95% CI: -1.31 to -0.77) were significantly lower in the CHO group compared to the control group. However, there were no significant differences in the severity of thirst or the incidence of vomiting and nausea between the CHO and control groups. Conclusion. Preoperative oral CHO during cesarean section alleviates thirst and hunger, shortens the time of postoperative flatus, and reduces HOMA-IR. However, the available evidence is insufficient to reach a clear consensus on the benefits or harms of preoperative oral CHO during cesarean section. Therefore, it is premature to make a definitive recommendation for or against its routine use.Copyright © 2024 Haibin Shi et al.

12. **Effects of an Oral Multi-vitamin Carbohydrate Beverage on Intraoperative Nausea and Vomiting in Women Converted from Vaginal Delivery to Cesarean Section.**

Item Type: Journal Article

Authors: Xu J.;Shen M.;Shen J.;Han B.;Huang Q. and Chen, Y.

Publication Date: 2024

Journal: Clinical and Experimental Obstetrics and Gynecology 51(6) (pagination), pp. Date of Publication: 01 Jun 2024

Abstract: Background: Nausea and vomiting are common and unpleasant symptoms for pregnant women during cesarean section, which can lead to aspiration, a serious complication that can cause pneumonia. This study aimed to evaluate the effects of oral multi-vitamin carbohydrate beverage on maternal intraoperative nausea and vomiting by gastric ultrasound. Method(s): This was a single-center, randomized controlled trial. According to their diet, pregnant women who were converted from vaginal delivery to cesarean section were divided into two groups: the observation group (multi-vitamin carbohydrate beverage) or the control group (semi-solid food). The cross-sectional area (CSA) of the gastric antrum was measured by ultrasound before cesarean section, and the occurrence of intraoperative nausea, vomiting, and aspiration was recorded in both groups. Result(s): The CSA of the gastric antrum at 1 h, 2 h, after eating, and before cesarean section in the observation group was significantly smaller than that in the control group. This suggests that an oral multi-vitamin carbohydrate beverage needs less gastric emptying time. The incidence of vomiting in the observation group was significantly lower than that in the control group. Moreover, the pH of the vomited fluid in the observation group was higher than that in the control group, indicating that oral multi-vitamin carbohydrate beverage may reduce the acidity of stomach contents, which can further reduce the risk and severity of vomiting. Conclusion(s): Oral multi-vitamin carbohydrate beverage can promote gastric emptying and reduce the incidence and harm of vomiting during urgent cesarean section. This dietary intervention may be a simple and effective way to improve maternal outcomes during cesarean section. Clinical Trial Registration: The study has been registered on https://classic.clinicaltrials.gov/ (registration number: NCT06333626).Copyright: © 2024 The Author(s).

13. **To Eat or Not to Eat? A Review of Current Practices Regarding Food in Labor.**

Item Type: Journal Article

Authors: Fiszer E. and Weiniger, C. F.

Publication Date: 2023

Journal: Current Anesthesiology Reports 13(1), pp. 1–6

Abstract: Purpose of Review: Significant changes in the perception of women's birth experience and increased importance of maternal satisfaction have questioned fasting policies in labor. This review presents current guidelines and developments regarding food in labor, highlighting the importance of finding a safe compromise between liberal and restrictive policies. Recent Findings: Aspiration of gastric contents in the pregnant population is exceedingly rare, despite liberal food policies. Little evidence suggests epidural analgesia affects the risk for aspiration. No evidence supports benefits of eating for obstetric outcomes; however, eating increases maternal satisfaction. Gastric ultrasound may be a useful tool for evaluating a woman's stomach content and aspiration risk. Summary: Our interpretation of the literature supports that women at low risk for aspiration, peripartum surgery, or need for general anesthesia should be permitted light food during labor. It may be advisable to recommend that women at high risk for peripartum surgery avoid food and restrict consumption to carbohydrate-rich drinks. Gastric ultrasound may be useful to tailor patient-specific recommendations in the delivery ward.Copyright © 2023, The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature.

14. **Ultrasonographic assessment of metoclopramide effect on gastric volume in parturients females undergoing Caesarean section: a randomized double blind study.**

Item Type: Journal Article

Authors: Hamed, Esam;Hamza, Wafaa S.;Farghaly, Tarek A. and Hamed, Rasha

Publication Date: 2023

Journal: Minerva Anestesiologica 89(6), pp. 529–535

Abstract: BACKGROUND: The prokinetic effect of metoclopramide promotes gastric emptying and decreases stomach capacity. The aim of the present study was to assess the efficacy of metoclopramide in reducing gastric contents and volume using gastric point-of-care ultrasonography (PoCUS) in parturients females prepared for elective Cesarean section under general anesthesia. METHODS: A total of 111 parturient females were randomly allocated to one of two groups. The intervention group (Group M; N.=56) received 10 mg metoclopramide diluted in 10 mL 0.9% normal saline. The control group (Group C; N.=55): received 10 mL 0.9% normal saline. The cross-sectional area and volume of stomach contents were measured using ultrasound before and one hour after the administration of metoclopramide or saline. RESULTS: Statistically significant differences in mean antral cross-sectional area and gastric volume were observed between the two groups (P: Statistically significant differences in mean antral cross-sectional area and gastric volume were observed between the two groups (PCONCLUSIONS: Metoclopramide decreases gastric volume, reduces postoperative nausea and vomiting, and may lower the risk of aspiration when used as premedication before obstetric surgery. Preoperative gastric PoCUS has utility in objectively assessing stomach volume and contents.

15. **Oral Carbohydrate Administration was Suitable for Cesarean Section-A Systematic Review and Meta-Analysis of Randomized Trials.**

Item Type: Journal Article

Authors: Hu Y.;Song X.H.;Wang L.B.;Wang Z.Q.;Zhou Z.F.;Xu L.J.;Xu M.Y. and He, G. J.

Publication Date: 2023

Journal: Current Research in Nutrition and Food Science 11(2), pp. 456–469

Abstract: The use of carbohydrate (CHO) drinks prior to elective cesarean section has gained momentum, but its effect on maternal and neonatal outcomes remains controversial. The aim of this meta-analysis was to assess the effect of an oral CHO load prior to cesarean delivery on insulin sensitivity, insulin resistance, maternal glycemia, neonatal glycemia, and breastfeeding. As of May 21, 2023, we searched through five databases for English-language experimental studies on pre-cesarean oral CHO. A total of 3,940 citations were received, of which seven were selected. The concentrations of CHO used in these studies ranged from 5.9% to 14.2%, and the amounts used were 300-400 ml. We found that pre-cesarean CHO loading reduced maternal insulin resistance and increased maternal glucose levels. CHO loading activates the insulin pathway of critical enzymes to some extent, increasing glucose utilization by peripheral tissues and ultimately reducing postoperative insulin resistance. Of course, this is also beneficial in improving maternal blood sugar. We did not find that CHO increased maternal insulin sensitivity or neonatal blood glucose levels. Future prospective randomized controlled trials can use nutritional load to increase colostrum production after Caesarean section to enhance the confidence of these mothers in breastfeeding. In addition, our preoperative beverage could be more individualized to accommodate diabetic women.

URL: https://libkey.io/libraries/2828/openurl?genre=article&sid=OVID:embase&id=pmid:&id=doi:10.12944%2FCRNFSJ.11.2.01&issn=2347-467X&isbn=&volume=11&issue=2&spage=456&pages=456-469&date=2023&title=Current+Research+in+Nutrition+and+Food+Science&atitle=Oral+Carbohydrate+Administration+was+Suitable+for+Cesarean+Section-A+Systematic+Review+and+Meta-Analysis+of+Randomized+Trials&aulast=Hu&pid=%3Cauthor%3EHu+Y.%3BSong+X.H.%3BWang+L.B.%3BWang+Z.Q.%3BZhou+Z.F.%3BXu+L.J.%3BXu+M.Y.%3BHe+G.J.%3C%2Fauthor%3E%3CAN%3E2025759883%3C%2FAN%3E%3CDT%3EArticle%3C%2FDT%3E

16. **Gastric Emptying Velocity After Labor Analgesia Assessed by Sonography: A Prospective Controlled Observational Study.**

Item Type: Journal Article

Authors: Liu Y.;Wang Q. and Zuo, Q.

Publication Date: 2023

Journal: Therapeutics and Clinical Risk Management 19, pp. 475–484

Abstract: Objective: The effect of labor analgesia on gastric emptying rate will affect the management of fasting during the perinatal period. To evaluate gastric emptying after labor analgesia using the gastric antrum ultrasound examination. Method(s): From September 2022 to January 2023, a prospective controlled observational study was conducted. The Study group (epidural analgesia group) and Observation group (pharmacological and non-pharmacological interventions group) were successively enrolled and grouped using the random envelope method. However, labor analgesia was supplied according to maternal women's wishes, and intention-to-treat (ITT) and per-protocol (PP) analyses were performed to establish its effect on stomach emptying. The gastric emptying rate during the first stage of labor was considered to be the primary outcome. Result(s): From September 2022 to January 2023, 120 persons were studied, 90 in the Study group and 30 in the Observation group. 33 people's analgesic selection was discordant with the grouped one. ITT analysis showed that the Study group's cross-sectional area (CSA) fell from baseline (624.19 +/- 92.70 mm2) to 334.64 +/- 46.32 mm2 after 1 hour and to 217.26 +/- 29.90 mm2 after 2 hours. In the Observation group, the CSA similarly dropped from 620.10 +/- 100.73 mm2 to 331.30 +/- 51.19 mm2 and 214.70 +/- 28.73 mm2, p0.05. The PP analysis also indicated no significant changes in the CSA between the two groups at 3 time-points, p>0.05. At the first hour, the Study and Observation group had stomach emptying speeds of 300.05 +/- 103.74 mm2 /h and 259.50 +/- 125.25 mm2 /h, respectively, which were greater than those at the second hour (115.75 +/- 43.51 mm2/h vs 124.36 +/- 58.98 mm2 /h), p /h), pConclusion(s): Epidural analgesia, pharmacological, and non-pharmacological labor analgesia had little effect on gastric emptying, and gastric antrum ultrasonography can be utilized to monitor maternal gastric volume changes.Copyright © 2023 Liu et al.

URL: https://libkey.io/libraries/2828/openurl?genre=article&sid=OVID:embase&id=pmid:&id=doi:10.2147%2FTCRM.S410984&issn=1176-6336&isbn=&volume=19&issue=&spage=475&pages=475-484&date=2023&title=Therapeutics+and+Clinical+Risk+Management&atitle=Gastric+Emptying+Velocity+After+Labor+Analgesia+Assessed+by+Sonography%3A+A+Prospective+Controlled+Observational+Study&aulast=Liu&pid=%3Cauthor%3ELiu+Y.%3BWang+Q.%3BZuo+Q.%3C%2Fauthor%3E%3CAN%3E2024484858%3C%2FAN%3E%3CDT%3EArticle%3C%2FDT%3E

17. **Pregnancy and Labor Epidural Effects on Gastric Emptying: A Prospective Comparative Study.**

Item Type: Journal Article

Authors: Bouvet L.;Schulz T.;Piana F.;Desgranges F.P. and Chassard, D.

Publication Date: 2022

Journal: Anesthesiology 136(4), pp. 542–550

Abstract: Background: The lack of reliable data on gastric emptying of solid food during labor has led to some discrepancies between current guidelines regarding fasting for solid food in the parturient. This prospective comparative study aimed to test the hypothesis that the gastric emptying fraction of a light meal would be reduced in parturients receiving epidural analgesia and with no labor analgesia compared with nonpregnant and pregnant women. Method(s): Ten subjects were enrolled and tested in each group: nonpregnant women, term pregnant women, parturients with no labor analgesia, and parturients with epidural labor analgesia. After a first ultrasound examination was performed to ensure an empty stomach, each subject ingested a light meal (125 g yogurt; 120 kcal) within 5 min. Then ultrasound measurements of the antral area were performed at 15, 60, 90, and 120 min. The fraction of gastric emptying at 90 min was calculated as [(antral area90 min/ antral area15 min) - 1] x 100, and half-time to gastric emptying was also determined. For the Parturient-Epidural group, the test meal was ingested within the first hour after the induction of epidural analgesia. Result(s): The median (interquartile range) fraction of gastric emptying at 90 min was 52% (46 to 61), 45% (31 to 56), 7% (5 to 10), and 31% (17 to 39) for nonpregnant women, pregnant women, parturients without labor analgesia, and parturients with labor epidural analgesia, respectively (P Result(s): The median (interquartile range) fraction of gastric emptying at 90 min was 52% (46 to 61), 45% (31 to 56), 7% (5 to 10), and 31% (17 to 39) for nonpregnant women, pregnant women, parturients without labor analgesia, and parturients with labor epidural analgesia, respectively (P Conclusion(s): Gastric emptying in parturients after a light meal was delayed, and labor epidural analgesia seems not to worsen but facilitates gastric emptying. This should be taken into consideration when allowing women in labor to consume a light meal.

URL: https://libkey.io/libraries/2828/openurl?genre=article&sid=OVID:embase&id=pmid:35103759&id=doi:10.1097%2FALN.0000000000004133&issn=0003-3022&isbn=&volume=136&issue=4&spage=542&pages=542-550&date=2022&title=Anesthesiology&atitle=Pregnancy+and+Labor+Epidural+Effects+on+Gastric+Emptying%3A+A+Prospective+Comparative+Study&aulast=Bouvet&pid=%3Cauthor%3EBouvet+L.%3BSchulz+T.%3BPiana+F.%3BDesgranges+F.-P.%3BChassard+D.%3C%2Fauthor%3E%3CAN%3E2017207365%3C%2FAN%3E%3CDT%3EArticle%3C%2FDT%3E

18. **Prevalence of risk stomach in laboring women allowed to unrestrictive oral intake: a comparative cross-sectional study.**

Item Type: Journal Article

Authors: Chang X.Y.;Wang L.Z.;Xia F. and Zhang, Y. F.

Publication Date: 2022

Journal: BMC Anesthesiology 22(1) (pagination), pp. Article Number: 41. Date of Publication: 01 Dec 2022

Abstract: Background: Although restricting food intake during labor is recommended by guidelines, intrapartum starvation has not been popular in some regions. We conducted this comparative cross-sectional study to determine the prevalence of risk stomach in non-fasted laboring women compared with fasted non-laboring women using gastric ultrasound. Method(s): Ultrasound examination of the antrum was performed in 50 term fasted non-laboring women before elective cesarean delivery and 50 laboring women allowed to eat and drink during active labor. Examinations consisted of the qualitative (antral grades, 0-3) and quantitative evaluation (antral cross-sectional area and calculated gastric volume) in the supine and right lateral decubitus (RLD) position. A risk stomach was defined as an antral grade >= 2 or grade 1 with gastric volume >= 1.5 ml. kg- 1. Result(s): No non-laboring women had grade >= 2, while 34 (68%) laboring women had grade >= 2. Nine (18%) non-laboring and 40 (80%) laboring women presented risk stomach (P Result(s): No non-laboring women had grade >= 2, while 34 (68%) laboring women had grade >= 2. Nine (18%) non-laboring and 40 (80%) laboring women presented risk stomach (P 2 vs.350 mm2 in supine, 571 mm2 vs.480 mm2 in RLD, P in RLD, P 2 vs. 453 mm2 in supine, 670 mm2 vs. 605 mm2 in RLD). Conclusion(s): This study confirms a higher prevalence of risk stomach presents in laboring women under a liberal eating policy, gastric ultrasound is therefore useful for this risk population if general anesthesia is required unexpectedly.Copyright © 2022, The Author(s).

URL: https://libkey.io/libraries/2828/openurl?genre=article&sid=OVID:embase&id=pmid:35130855&id=doi:10.1186%2Fs12871-022-01582-z&issn=1471-2253&isbn=&volume=22&issue=1&spage=41&pages=&date=2022&title=BMC+Anesthesiology&atitle=Prevalence+of+risk+stomach+in+laboring+women+allowed+to+unrestrictive+oral+intake%3A+a+comparative+cross-sectional+study&aulast=Chang&pid=%3Cauthor%3EChang+X.-Y.%3BWang+L.-Z.%3BXia+F.%3BZhang+Y.-F.%3C%2Fauthor%3E%3CAN%3E2014976968%3C%2FAN%3E%3CDT%3EArticle%3C%2FDT%3E

19. **The effect of high-dose versus low-dose epidural fentanyl on gastric emptying in nonfasted parturients: A double-blinded randomised controlled trial.**

Item Type: Journal Article

Authors: Fiszer, Elisheva;Aptekman, Boris;Baar, Yuval and Weiniger, Carolyn F.

Publication Date: 2022

Journal: European Journal of Anaesthesiology 39(1), pp. 50–57

Abstract: BACKGROUND: Epidural fentanyl doses above 100 mcg have been shown, using the paracetamol absorption test, to reduce gastric emptying in fasted labouring women. OBJECTIVE: To investigate the effect of fentanyl dose on gastric emptying in nonfasted labouring women using gastric ultrasonography. DESIGN: A double-blinded randomised controlled study. SETTING: A tertiary medical centre in Tel Aviv, Israel between 30 July 2020 and 11 October 2020. PATIENTS: Eighty labouring women with cervical dilation 5 cm or less, at least 18 years age, at least 37 weeks gestation with a singleton pregnancy and cephalad foetus. INTERVENTIONS: Women randomised to high (>100 mcg) or low (: Women randomised to high (>100 mcg) or low (MAIN OUTCOME MEASURES: The primary outcome was CSA at T2 h comparing high-dose versus low-dose fentanyl. Secondary outcomes included change in CSA between baseline and T2 h. Sub-group analysis compared stomach content at T2 h according to baseline stomach content, empty (CSA =381 mm2), and high-dose versus low-dose fentanyl. RESULTS: Data from 80 women were analysed; 63 had empty and 17 had full stomach at baseline. There was no significant difference in CSA at T2 h between high-dose, mean 335 +/- SD 133 mm2, versus low-dose fentanyl, mean 335 +/- SD 172 mm2, P = 0.991. Change in CSA baseline to T2 h was 46 +/- SD 149 mm2 for high and 49 +/- SD 163 mm2 for low-dose group, P = 0.931. The subgroup analysis according to baseline stomach content showed no statistically significant differences in CSA at T2 h. CONCLUSION: The CSA at T2 h was similar for women who received high-dose versus low-dose epidural fentanyl, measured by ultrasound, in our nonfasted labouring cohort. TRIAL REGISTRATION: Clinicaltrials.gov number: NCT04202887. Copyright © 2021 European Society of Anaesthesiology and Intensive Care. Unauthorized reproduction of this article is prohibited.

20. **Limiting Oral Intake during Labor: Do We Have It Right?**

Item Type: Journal Article

Authors: Palmer C.M. and Jiang, Y.

Publication Date: 2022

Journal: Anesthesiology 136(4), pp. 528–530

URL: https://libkey.io/libraries/2828/openurl?genre=article&sid=OVID:embase&id=pmid:35226722&id=doi:10.1097%2FALN.0000000000004170&issn=0003-3022&isbn=&volume=136&issue=4&spage=528&pages=528-530&date=2022&title=Anesthesiology&atitle=Limiting+Oral+Intake+during+Labor%3A+Do+We+Have+It+Right%3F&aulast=Palmer&pid=%3Cauthor%3EPalmer+C.M.%3BJiang+Y.%3C%2Fauthor%3E%3CAN%3E2017207363%3C%2FAN%3E%3CDT%3EEditorial%3C%2FDT%3E

21. **Effect of Preoperative Oral Carbohydrate Administration on Patients Undergoing Cesarean Section with Epidural Anesthesia: A Pilot Study.**

Item Type: Journal Article

Authors: Shi, Yuan;Dong, Beibei;Dong, Qingyun;Zhao, Zhili and Yu, Yonghao

Publication Date: Feb ,2021

Journal: Journal of PeriAnesthesia Nursing 36(1), pp. 30–35

Abstract: PURPOSE: The aim of this study was to evaluate the effect of preoperative oral carbohydrate administration on patients undergoing Cesarean section with epidural anesthesia. DESIGN: Randomized controlled clinical study. METHODS: A total of 75 patients undergoing Cesarean section (American Society of Anesthesiologists physical status grade I-II) were randomized to preparation with a carbohydrate drink (CHO group), flavored water (placebo group), or to the fasting group. The CHO and placebo groups were double-blinded and given 300 mL of the drink 2 hours before surgery. Visual analog scores of the patient were assessed to evaluate thirst, hunger, and anxiety level, and the gastric antral cross-sectional areas were recorded by ultrasonography during the operative period. Insulin resistance was calculated on the basis of the blood glucose and insulin levels assessed before administration and after surgery. FINDINGS: The CHO and placebo groups did not show an increase in gastric fluid volumes in terms of gastric antral cross-sectional area, and there were no adverse events. The visual analog scale scores at preoperative baseline were not different between groups . During the preoperative waiting period, preparation with CHO reduced not only thirst and anxiety more efficiently than water (placebo) but also hunger (P CONCLUSIONS: Preoperative administration of CHO decreases postoperative insulin resistance and enhances pregnant women's comfort, leading to a reduced sense of thirst, hunger, and anxiety during the preoperative period for Cesarean section. Copyright © 2020 American Society of PeriAnesthesia Nurses. Published by Elsevier Inc. All rights reserved.

URL: https://libkey.io/libraries/2828/openurl?genre=article&sid=OVID:medline&id=pmid:33239219&id=doi:10.1016%2Fj.jopan.2020.05.006&issn=1089-9472&isbn=&volume=36&issue=1&spage=30&pages=30-

35&date=2021&title=Journal+of+PeriAnesthesia+Nursing&atitle=Effect+of+Preoperative+Oral+Carbohydrate+Administration+on+Patients+Undergoing+Cesarean+Section+with+Epidural+Anesthesia%3A+A+Pilot+Study.&aulast=Shi&pid=%3Cauthor%3EShi+Y%3BDong+B%3BDong+Q%3BZhao+Z%3BYu+Y%3C%2Fauthor%3E%3CAN%3E33239219%3C%2FAN%3E%3CDT%3EJournal+Article%3C%2FDT%3E

22. **Perioperative fasting and feeding in adults, obstetric, paediatric and bariatric population: Practice Guidelines from the Indian Society of Anaesthesiologists.**

Item Type: Journal Article

Authors: Dongare P.A.;Bala Bhaskar S.;Harsoor S.S.;Garg R.;Kannan S.;Goneppanavar U.;Ali Z.;Gopinath R.;Sood J.;Mani K.;Bhatia P.;Rohatgi P.;Das R.;Ghosh S.;Mahankali S.;Singh Bajwa S.;Gupta S.;Pandya S.;Keshavan V.;Joshi M., et al

Publication Date: 2020

Journal: Indian Journal of Anaesthesia 64(7), pp. 556–584

URL: https://libkey.io/libraries/2828/openurl?genre=article&sid=OVID:embase&id=pmid:&id=doi:10.4103%2Fija.IJA_735_20&issn=0019-5049&isbn=&volume=64&issue=7&spage=556&pages=556-584&date=2020&title=Indian+Journal+of+Anaesthesia&atitle=Perioperative+fasting+and+feeding+in+adults%2C+obstetric%2C+paediatric+and+bariatric+population%3A+Practice+Guidelines+from+the+Indian+Society+of+Anaesthesiologists&aulast=Dongare&pid=%3Cauthor%3EDongare+P.A.%3BBala+Bhaskar+S.%3BHarsoor+S.S.%3BGarg+R.%3BKannan+S.%3BGoneppanavar+U.%3BAli+Z.%3BGopinath+R.%3BSood+J.%3BMani+K.%3BBhatia+P.%3BRohatgi+P.%3BDas+R.%3BGhosh+S.%3BMahankali+S.%3BSingh+Bajwa+S.%3BGupta+S.%3BPandya+S.%3BKeshavan+V.%3BJoshi+M.%3BMalhotra+N.%3C%2Fauthor%3E%3CAN%3E632340792%3C%2FAN%3E%3CDT%3EArticle%3C%2FDT%3E

23. **Gastric emptying of carbohydrate drinks in term parturients before elective caesarean delivery: an observational study.**

Item Type: Journal Article

Authors: Popivanov P.;Irwin R.;Walsh M.;Leonard M. and Tan, T.

Publication Date: 2020

Journal: International Journal of Obstetric Anesthesia 41, pp. 29–34

Abstract: Background: Pre-operative carbohydrate (CHO) drinks have shown some benefits peri-operatively and have been incorporated into many Enhanced Recovery after Surgery (ERAS) programmes. We assessed the gastric emptying of pre-operative CHO drinks prior to elective caesarean delivery using ultrasonography. Method(s): After a standard overnight fast, non-labouring pregnant women awaiting elective caesarean delivery underwent a standardised gastric ultrasound assessment at baseline and then every 20 min for 2 h after consuming 400 mL of a CHO drink. The gastric emptying was determined at each time-point both qualitatively and quantitatively. The primary outcome was the time taken for participants to return to a qualitative fasted Perlas grade of 0 or 1. Result(s): The gastric emptying of 40 participants was analysed. At baseline, all patients had a qualitative grade of either 0 or 1. All patients had returned to either grade 0 or 1 by 100 min. At 120 min the antral right lateral decubitus (RLD) cross-sectional area (CSA) was 8.03 cm2 (95th percentile; 95% CI 7.4 to 8.3 cm2) and gastric volume per kg was 1.57 mL/kg (95th percentile; 95% CI 1.4 to 2.2). At 120 min there was no statistically significant difference from baseline for the RLD CSA (P=0.38) or gastric volume per kg (P=0.27). Conclusion(s): The gastric emptying of this cohort of pregnant women suggests that 400 mL of a CHO drink can be safely consumed up to two hours before elective surgery. This study can help inform future peri-operative fasting guidelines for pregnant patients.Copyright © 2019 Elsevier Ltd

URL: https://libkey.io/libraries/2828/openurl?genre=article&sid=OVID:embase&id=pmid:31473017&id=doi:10.1016%2Fj.ijoa.2019.07.010&issn=0959-289X&isbn=&volume=41&issue=&spage=29&pages=29-34&date=2020&title=International+Journal+of+Obstetric+Anesthesia&atitle=Gastric+emptying+of+carbohydrate+drinks+in+term+parturients+before+elective+caesarean+delivery%3A+an+observational+study&aulast=Popivanov&pid=%3Cauthor%3EPopivanov+P.%3BIrwin+R.%3BWalsh+M.%3BLeonard+M.%3BTan+T.%3C%2Fauthor%3E%3CAN%3E2002711533%3C%2FAN%3E%3CDT%3EArticle%3C%2FDT%3E

24. **Influence of different preoperative fasting times on women and neonates in cesarean section: a retrospective analysis.**

Item Type: Journal Article

Authors: Li, Yi;Su, Danchen;Sun, Yijuan;Hu, Zurong;Wei, Zaomei and Jia, Jie

Publication Date: Mar 29 ,2019

Journal: BMC Pregnancy & Childbirth 19(1), pp. 104

Abstract: BACKGROUND: This study was to evaluate the impact of different preoperative fasting conditions on women and neonates through a retrospective analysis. METHODS: A total of 1599 women were divided into 5 groups according to different preoperative fasting times: group A: solid food >=8 h; clear fluids >=6 h; B: solid food >=8 h; clear fluids >=2 h =6 h =6 h =2 h =2 h =2 h =2 h =2 h RESULTS: Incidence rate of vomiting of women was lower in group C (solid food >=6 h : Incidence rate of vomiting of women was lower in group C (solid food >=6 h : Incidence rate of vomiting of women was lower in group C (solid food >=6 h 8 h and clear fluids > 2 h at least), the incidence rate of hypoglycemia and acidosis of neonates in group C displayed a certain decrease (P 8 h and clear fluids > 2 h at least), the incidence rate of hypoglycemia and acidosis of neonates in group C displayed a certain decrease (P 8 h and clear fluids > 2 h at least), the incidence rate of hypoglycemia and acidosis of neonates in group C displayed a certain decrease (P CONCLUSION: The preoperative fasting of solid food >=6 h < 8 h and clear fluids < 2 h reduces the incidence of vomiting in women's anesthesia and the risk of hypoglycemia and acidosis in neonates.

25. **Practice Guidelines for Obstetric Anesthesia: An Updated Report by the American Society of Anesthesiologists Task Force on Obstetric Anesthesia and the Society for Obstetric Anesthesia and Perinatology**

Item Type: Journal Article

Authors: Apfelbaum J.L.;Hawkins J.L.;Agarkar M.;Bucklin B.A.;Connis R.T.;Gambling D.R.;Mhyre J.;Nickinovich D.G.;Sherman H.;Tsen L.C. and Yaghmour, E. T. A.

Publication Date: 2016

Journal: Anesthesiology 124(2), pp. 270–300

URL: https://libkey.io/libraries/2828/openurl?genre=article&sid=OVID:embase&id=pmid:26580836&id=doi:10.1097%2FALN.0000000000000935&issn=0003-3022&isbn=&volume=124&issue=2&spage=270&pages=270-300&date=2016&title=Anesthesiology&atitle=Practice+Guidelines+for+Obstetric+Anesthesia%3A+An+Updated+Report+by+the+American+Society+of+Anesthesiologists+Task+Force+on+Obstetric+Anesthesia+and+the+Society+for+Obstetric+Anesthesia+and+Perinatology+*&aulast=Apfelbaum&pid=%3Cauthor%3EApfelbaum+J.L.%3BHawkins+J.L.%3BAgarkar+M.%3BBucklin+B.A.%3BConnis+R.T.%3BGambling+D.R.%3BMhyre+J.%3BNickinovich+D.G.%3BSherman+H.%3BTsen+L.C.%3BYaghmour+E.T.A.%3C%2Fauthor%3E%3CAN%3E606982053%3C%2FAN%3E%3CDT%3EReview%3C%2FDT%3E

26. **Restriction of oral intake during labor: whither are we bound?.**

Item Type: Journal Article

Authors: Sperling, Jeffrey D.;Dahlke, Joshua D. and Sibai, Baha M.

Publication Date: 2016

Journal: American Journal of Obstetrics & Gynecology 214(5), pp. 592–596

Abstract: In 1946, Dr Curtis Mendelson suggested that aspiration during general anesthesia for delivery was avoidable by restricting oral intake during labor. This suggestion proved influential, and restriction of oral intake in labor became the norm. These limitations may contribute to fear and feelings of intimidation among parturients. Modern obstetrics, especially in the setting of advances in obstetric anesthesia, does not mirror the clinical landscape of Mendelson; hence, one is left to question if his findings remain relevant or if they should inform current recommendations. The use of general anesthesia at time of cesarean delivery has seen a remarkable decline with increased use of effective neuraxial analgesia as the standard of care in modern obstetric anesthesia. While the American College of Obstetricians and Gynecologists now endorses clear liquids during labor, current recommendations continue to suggest that solid food intake should be avoided. Recent evidence from a systematic review involving 3130 women in active labor suggests that oral intake should not be restricted in women at low risk of complications, given there were no identified benefits or harms of a liberal diet. Aspiration and other adverse maternal outcomes may be unrelated to oral intake in labor and as such, qualitative measures such as patient satisfaction should be paramount. It is time to reassess the impact of oral intake restriction during labor given the minimal risk of aspiration during labor in the setting of modern obstetric anesthesia practices.

27. **Ultrasonographic evaluation of gastric content during labour under epidural analgesia: a prospective cohort study.**

Item Type: Journal Article

Authors: Bataille, A.;Rousset, J.;Marret, E. and Bonnet, F.

Publication Date: Apr ,2014

Journal: British Journal of Anaesthesia 112(4), pp. 703–707

Abstract: BACKGROUND: Women in labour are considered at risk of gastric content aspiration partly because the stomach remains full before delivery. Ultrasonographic measurement of antral cross-sectional area (CSA) is a validated method of gastric content assessment. Our aim was to determine gastric content volume and its changes in parturients during labour under epidural analgesia using bedside ultrasonography. METHODS: The cut-off value corresponding to an increased gastric content was determined by ultrasound measurement of antral CSA in six pregnant women in late pregnancy before and after ingestion of 250 ml of non-clear liquid. Antral CSA was then measured twice in 60 parturients who presented in spontaneous labour: when the anaesthesiologist was called for epidural analgesia catheter placement, and at full cervical dilatation. Patient-controlled epidural analgesia was performed with a solution of ropivacaine and sufentanil. RESULTS: After liquid ingestion, antral CSA (mm(2)) increased from 90 (range, 80-151) to 409 (range, 317-463). A CSA of 320 was taken as cut-off value. The feasibility rate of antral CSA determination was 96%. CSA decreased from 319 [Q1 158-Q3 469] to 203 [Q1 123-Q3 261] during labour (P=2x10(-7)). CSA was >320 in 50% of parturients at the beginning of labour vs 13% at full cervical dilatation (P=0.006). CONCLUSIONS: Bedside ultrasonographic antral CSA measurement is feasible in pregnant women during labour and easy to perform. The observed decrease in antral CSA during labour suggests that gastric motility is preserved under epidural anaesthesia. The procedure could be used to assess individual risk of gastric content aspiration during labour.

URL: https://libkey.io/libraries/2828/openurl?genre=article&sid=OVID:medline&id=pmid:24401801&id=doi:10.1093%2Fbja%2Faet435&issn=0007-0912&isbn=&volume=112&issue=4&spage=703&pages=703-7&date=2014&title=British+Journal+of+Anaesthesia&atitle=Ultrasonographic+evaluation+of+gastric+content+during+labour+under+epidural+analgesia%3A+a+prospective+cohort+study.&aulast=Bataille&pid=%3Cauthor%3EBataille+A%3BRousset+J%3BMarret+E%3BBonnet+F%3C%2Fauthor%3E%3CAN%3E24401801%3C%2FAN%3E%3CDT%3EEvaluation+Study%3C%2FDT%3E

28. **Restricting oral fluid and food intake during labour**

Item Type: Journal Article

Authors: Singata, Mandisa;Tranmer, Joan and Gyte, Gillian M. L.

Publication Date: 2013

Journal: Cochrane Database of Systematic Reviews, pp. (8)CD–2013 Aug 22

Abstract: BACKGROUND: Restricting fluids and foods during labour is common practice across many birth settings with some women only being allowed sips of water or ice chips. Restriction of oral intake may be unpleasant for some women, and may adversely influence their experience of labour. OBJECTIVES: To determine the benefits and harms of oral fluid or food restriction during labour. SEARCH METHODS: We searched the Cochrane Pregnancy and Childbirth Group's Trials Register (30 June 2013) and reference lists of retrieved studies. SELECTION CRITERIA: Randomised controlled trials (RCTs) and quasi-RCTs of restricting fluids and food for women in labour compared with women free to eat and drink. DATA COLLECTION AND ANALYSIS: Two review authors independently assessed the studies for inclusion, assessed risk of bias and carried out data extraction. MAIN RESULTS: We identified 19 studies of which we included five, involving 3130 women. We excluded eight studies, one awaits classification and five are ongoing studies. All the included studies looked at women in active labour and at low risk of potentially requiring a general anaesthetic. One study looked at complete restriction versus giving women the freedom to eat and drink at will; two studies looked at water only versus giving women specific fluids and foods and two studies looked at water only versus giving women carbohydrate drinks.When comparing any restriction of fluids and food versus women given some nutrition in labour, the meta-analysis was dominated by one study undertaken in a highly medicalised environment. There were no statistically significant differences identified in: caesarean section (average risk ratio (RR) 0.89, 95% confidence interval (CI) 0.63 to 1.25, five studies, 3103 women), operative vaginal births (average RR 0.98, 95% CI 0.88 to 1.10, five studies, 3103 women) and Apgar scores less than seven at five minutes (average RR 1.43, 95% CI 0.77 to 2.68, four studies, 2902 infants), nor in any of the other outcomes assessed. Women's views were not assessed. The pooled data were insufficient to assess the incidence of Mendelson's syndrome, an extremely rare outcome. Other comparisons showed similar findings, except one study did report a significant increase in caesarean sections for women taking carbohydrate drinks in labour compared with water only, but these results should be interpreted with caution as the sample size was small. AUTHORS' CONCLUSIONS: Since the evidence shows no benefits or harms, there is no justification for the restriction of fluids and food in labour for women at low risk of complications. No studies looked specifically at women at increased risk of complications, hence there is no evidence to support restrictions in this group of women. Conflicting evidence on carbohydrate solutions means further studies are needed and it is critical in any future studies to assess women's views.

URL: https://libkey.io/libraries/2828/openurl?genre=article&sid=OVID:medline&id=pmid:23966209&id=doi:10.1002%2F14651858.CD003930.pub3&issn=1361-6137&isbn=&volume=&issue=8&spage=CD003930&pages=CD003930&date=2013&title=Cochrane+Database+of+Systematic+Reviews&atitle=Restricting+oral+fluid+and+food+intake+during+labour.&aulast=Singata&pid=%3Cauthor%3ESingata+M%3BTranmer+J%3BGyte+GM%3C%2Fauthor%3E%3CAN%3E23966209%3C%2FAN%3E%3CDT%3EJournal+Article%3C%2FDT%3E

29. **Eating and drinking in labor: Should it be allowed?**

Item Type: Journal Article

Authors: Maharaj, D.

Publication Date: 2009

Journal: European Journal of Obstetrics and Gynecology and Reproductive Biology 146(1), pp. 3–7

Abstract: Eating and drinking in labor is a controversial subject with practice varying widely by practitioners, within facilities, and around the world. The risk of aspiration pneumonitis and anesthesia-related deaths at cesarean section has resulted in adherence to historical practices of starving women in labor. Studies have shown that the risk of this anesthetic-related complication is low. It is the fear of the birth-attendant to bear full responsibility if a patient inhales gastric contents when giving in to demands for liberal fluid and food regimes during labor that governs practice. While the bulk of evidence supports fluid intake in labor, there are insufficient published studies to draw conclusions about the relationship between fasting times and the risk of pulmonary aspiration during labor. Whether or not allowing food and fluid throughout labor is beneficial or harmful can only be determined by further research. A computerized search was done of MEDLINE, PUBMED, SCOPUS and CINAHL, as well of historical articles, texts, articles from indexed journals, and references cited in published works.

URL: https://libkey.io/libraries/2828/openurl?genre=article&sid=OVID:embase&id=pmid:19428169&id=doi:10.1016%2Fj.ejogrb.2009.04.019&issn=0301-2115&isbn=&volume=146&issue=1&spage=3&pages=3-7&date=2009&title=European+Journal+of+Obstetrics+and+Gynecology+and+Reproductive+Biology&atitle=Eating+and+drinking+in+labor%3A+Should+it+be+allowed%3F&aulast=Maharaj&pid=%3Cauthor%3EMaharaj+D.%3C%2Fauthor%3E%3CAN%3E50518361%3C%2FAN%3E%3CDT%3EReview%3C%2FDT%3E

30. **A comparison of the effect of intrathecal and extradural fentanyl on gastric emptying in laboring women.**

Item Type: Journal Article

Authors: Kelly M.C.;Carabine U.A.;Hill D.A. and Mirakhur, R. K.

Publication Date: 1997

Journal: Anesthesia and Analgesia 85(4), pp. 834–838

Abstract: We studied gastric emptying, using acetaminophen absorption, in 105 women in labor divided into three equal groups of 35 each, after intrathecal (IT) (25 mug, Group S) or extradural (50 mug, Group E) fentanyl in combination with bupivacaine and compared with a control group (Group C) receiving extradural bupivacaine only. The time to maximal acetaminophen concentration (tCa(max)), maximal acetaminophen concentration (C(max)) and areas under the acetaminophen concentration-time curve at 90 and 120 min (AUC90 anti AUC120, respectively) were determined. Median (range) tCa(max) values were 120 (15-180), 82.5 (15-180), and 90 (15-180) min in Groups S, E, and C, respectively (P , respectively) were determined. Median (range) tCa(max) values were 120 (15-180), 82.5 (15-180), and 90 (15-180) min in Groups S, E, and C, respectively (P , respectively) were determined. Median (range) tCa(max) values were 120 (15-180), 82.5 (15-180), and 90 (15-180) min in Groups S, E, and C, respectively (P 90 and AUC120 were also significantly smaller in Group S than in the other two groups (430 +/- 616, 736 +/- 504, and 672 +/- 453; and 649 +/- 592, 1063 +/- 627, and 1053 +/- 616 mug . mL-1 . min-1 in Groups S, E, and C, respectively). We conclude that the administration of fentanyl 25 mug IT delays gastric emptying in labor compared with both extradural fentanyl 50 mug with bupivacaine and extradural bupivacaine alone. Implications: We examined emptying of the stomach in women in labor after administration of analgesics by the spinal or the epidural route. We observed that the analgesic, fentanyl, administered by the spinal route, although relieving pain rapidly, may delay emptying of the stomach. In theory, delayed gastric emptying may increase the chance of vomiting and aspiration of gastric contents.

URL: https://libkey.io/libraries/2828/openurl?genre=article&sid=OVID:embase&id=pmid:9322465&id=doi:10.1097%2F00000539-199710000-00022&issn=0003-2999&isbn=&volume=85&issue=4&spage=834&pages=834-838&date=1997&title=Anesthesia+and+Analgesia&atitle=A+comparison+of+the+effect+of+intrathecal+and+extradural+fentanyl+on+gastric+emptying+in+laboring+women&aulast=Kelly&pid=%3Cauthor%3EKelly+M.C.%3BCarabine+U.A.%3BHill+D.A.%3BMirakhur+R.K.%3C%2Fauthor%3E%3CAN%3E27418889%3C%2FAN%3E%3CDT%3EArticle%3C%2FDT%3E

31. **The influence of epidural administration of fentanyl infusion on gastric emptying in labour.**

Item Type: Journal Article

Authors: Porter J.S.;Bonello E. and Reynolds, F.

Publication Date: 1997

Journal: Anaesthesia 52(12), pp. 1151–1156

Abstract: The effect of epidural infusions containing fentanyl on maternal gastric emptying in labour was examined using the rate of paracetamol absorption. Women were randomly allocated to receive one of two epidural infusions, bupivacaine 0.125% alone or bupivacaine 0.0625% with fentanyl 2.3 mug.ml-1 at a rate of 10-12 ml.h-1. Paracetamol 1.5 g was given orally to women after either 30 ml of the infusion solution had been given (mean time 2.5 h, study A) or 40-50 ml (mean time 4.5 h, study B). Six venous blood samples were taken over the next 90 min for measurement of plasma paracetamol concentration. There were no significant differences in maximum plasma paracetamol concentration, time to maximum paracetamol concentration and area under the concentration-time curve between the two groups for study A. In study B the time to maximum plasma paracetamol concentration was significantly delayed in women receiving > 100 mug fentanyl compared with controls ($p < 0.05$). We conclude that the dose of fentanyl that may delay gastric emptying when given by epidural infusion is greater than 100 mug.

URL: https://libkey.io/libraries/2828/openurl?genre=article&sid=OVID:embase&id=pmid:9485967&id=doi:10.1111%2Fj.1365-2044.1997.238-az0373.x&issn=0003-2409&isbn=&volume=52&issue=12&spage=1151&pages=1151-1156&date=1997&title=Anaesthesia&atitle=The+influence+of+epidural+administration+of+fentanyl+infusion+on+gastric+emptying+in+labour&aulast=Porter&pid=%3Cauthor%3EPorter+J.S.%3BBonello+E.%3BReynolds+F.%3C%2Fauthor%3E%3CAN%3E27511252%3C%2FAN%3E%3CDT%3EArticle%3C%2FDT%3E

32. **Adding fentanyl 0.0002% to epidural bupivacaine 0.125% does not delay gastric emptying in laboring parturients.**

Item Type: Journal Article

Authors: Zimmermann D.L.;Breen T.W. and Fick, G.

Publication Date: 1996

Journal: Anesthesia and Analgesia 82(3), pp. 612–616

Abstract: Previous studies have shown that bolus doses of fentanyl (50 and 100 mug) with epidural bupivacaine delay gastric emptying by up to 45 min. We studied the effect of the addition of small-dose fentanyl to epidural bupivacaine infusions on gastric emptying during labor. The acetaminophen absorption technique was used to infer gastric emptying. Twenty-eight patients in established labor consented to participate in the study. They were randomized to receive either 1) 10 mL bupivacaine 0.125% followed by an infusion of 0.125% bupivacaine at 10 mL/h or 2) 10 mL bupivacaine 0.125% with 50 mug fentanyl followed by an infusion of 0.125% bupivacaine and 0.0002% fentanyl at 10 mL/h. Two hours after initiation of epidural analgesia, each patient ingested 20 mg/kg acetaminophen in a suspension of 150 mL water. Venous blood samples were drawn for a baseline and then every 15 min for 2 1/2 h. There were no significant demographic differences between the groups. There were no differences detected between groups in the peak plasma concentrations of acetaminophen, the time to achieve the peak plasma concentrations, or the area under the curve at 45 and 90 min. Our results indicate that epidural infusions for labor analgesia using 0.125% bupivacaine and 0.0002% fentanyl do not delay gastric emptying compared to infusions of bupivacaine 0.125% alone.

URL: https://libkey.io/libraries/2828/openurl?genre=article&sid=OVID:embase&id=pmid:8623970&id=doi:10.1097%2F00000539-199603000-00032&issn=0003-2999&isbn=&volume=82&issue=3&spage=612&pages=612-616&date=1996&title=Anesthesia+and+Analgesia&atitle=Adding+fentanyl+0.0002%25+to+epidural+bupivacaine+0.125%25+does+not+delay+gastric+emptying+in+laboring+parturients&aulast=Zimmermann&pid=%3Cauthor%3EZimmermann+D.L.%3BBreen+T.W.%3BFick+G.%3C%2Fauthor%3E%3CAN%3E26072970%3C%2FAN%3E%3CDT%3EArticle%3C%2FDT%3E

33. **Effect of epidural opioids on gastric emptying in labour.**

Item Type: Journal Article

Authors: Ewah B.;Yau K.;King M.;Reynolds F.;Carson R.J. and Morgan, B.

Publication Date: 1993

Journal: International Journal of Obstetric Anesthesia 2(3), pp. 125–128

Abstract: The effect of epidural opioids on gastric emptying was studied in 36 women in labour. Women who had received one dose of epidural bupivacaine were randomised to receive 10 ml of bupivacaine 0.25% alone (n=8) with fentanyl 50 mug (n=8) or with diamorphine 2.5 mg (n=8), or 10 ml of bupivacaine 0.125% alone (n=4) or with fentanyl 100 mug (n=4) or with diamorphine 5 mg (n=4) when they first requested a top-up. Mean +/- SD fentanyl concentrations measured at delivery were, in maternal venous plasma (MV) 0.72 +/- 0.19 ng/ml and in umbilical venous plasma (UV) 0.75 +/- 0.3 ng/ml. The mean dose-delivery interval was 280 min (range 107-608 min) and there was a negative correlation between UV/MV and dose-delivery interval. Gastric emptying was assessed by measuring paracetamol absorption following an oral dose of 1.5 g given 30 minutes after the study top-up. Time to peak plasma paracetamol concentration was significantly delayed in the groups given fentanyl 50 and 100 mug and diamorphine 5 mg, compared to the groups given bupivacaine alone, and peak concentration was significantly reduced in the group given diamorphine 5 mg. It is concluded that epidural fentanyl 50 and 100 mg and epidural diamorphine 5 mg delay gastric emptying. The addition of 2.5 mg diamorphine has no significant effect.

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34. **Gastric emptying during lumbar extradural analgesia in labour: Effect of fentanyl supplementation.**

Item Type: Journal Article

Authors: Wright P.M.C.;Allen R.W.;Moore J. and Donnelly, J. P.

Publication Date: 1992

Journal: British Journal of Anaesthesia 68(3), pp. 248–251

Abstract: We measured gastric emptying (by paracetamol absorption) and duration of analgesia in 30 women in labour after extradural injection of 0.375% bupivacaine 10ml either alone or combined with fentanyl 100mug. Treatment was administered double blind by random allocation after the first request for analgesia. The median (range) times to maximal serum concentration of paracetamol were 60 (15-90) min and 75 (30-180) min after administration in the control and fentanyl groups, respectively (P=0.026), and corresponding mean (95% confidence interval) maximal concentrations of paracetamol were 27.3 (18.8-35.8) mugml-1 and 18.0 (15.1-20.9)mugml-1 (P=0.020). Mean duration of analgesia, from the first extradural bolus until return of pain in those given bupivacaine alone was 113 (87-139) min and 154 (131-176) min when fentanyl was added to the local anaesthetic (P=0.016). These results confirm the prolongation of analgesia after fentanyl supplementation of lumbar extradural analgesia, but indicate that it results in delayed gastric emptying.

URL: https://libkey.io/libraries/2828/openurl?genre=article&sid=OVID:embase&id=pmid:1547045&id=doi:&issn=0007-0912&isbn=&volume=68&issue=3&spage=248&pages=248-251&date=1992&title=British+Journal+of+Anaesthesia&atitle=Gastric+emptying+during+lumbar+extradural+analgesia+in+labour%3A+Effect+of+fentanyl+supplementation&aulast=Wright&pid=%3Cauthor%3EWright+P.M.C.%3BAllen+R.W.%3BMoore+J.%3BDonnelly+J.P.%3C%2Fauthor%3E%3CAN%3E22092783%3C%2FAN%3E%3CDT%3EArticle%3C%2FDT%3E

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Search Strategy

Ovid MEDLINE(R) ALL <1946 to May 23, 2025>

1	exp Eating/	83172
2	exp Drinking/	15009
3	drinking.tw,kw.	142866
4	(oral* adj3 fluid*).tw,kw.	4606
5	exp Food/	1572801
6	food.tw,kw.	629250
7	1 or 2 or 3 or 4 or 5 or 6	2195936
8	"labo*r*".m_titl.	139600
9	exp Labor, Obstetric/	50010
10	8 or 9	171780
11	exp Analgesia, Obstetrical/ or exp Analgesia, Epidural/	11185
12	(spinal adj3 analgesi*).tw,kw.	2032
13	epidural*.tw,kw.	51119
14	exp Anesthesia, Epidural/	14436
15	(spinal adj3 an?esthes*).tw,kw.	15092
16	11 or 12 or 13 or 14 or 15	70955
17	7 and 10 and 1638	
18	from 17 keep 1-3,6	4
19	exp Gastric Emptying/	11077
20	gastric emptying.tw,kw.	14816
21	19 or 20	17848
22	7 and 10 and 2116	
23	from 22 keep 1-2	2
24	exp Analgesia, Obstetrical/	4612
25	exp Anesthesia, Obstetrical/	13826
26	24 or 25	17870
27	21 and 26	51
28	from 27 keep 1-3,5-6,8,19,21,27,29	10

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29	18 or 23 or 28	12	
30	(c?esarean* or c-section*).tw,kw.	81683	
31	exp Cesarean Section/	56346	
32	30 or 31	94354	
33	21 and 32	48	
34	from 29 keep 1-12	12	
35	from 33 keep 1-7,11,13,19	10	
36	7 and 32	1989	
37	exp Preoperative Period/	10256	
38	(preoperative* or pre-operative*).m_titl.	64343	
39	37 or 38	69525	
40	36 and 39	14	
41	from 40 keep 9-10	2	
42	exp Fasting/	40247	
43	fasting.m_titl.	17107	
44	42 or 43	43883	
45	36 and 44	33	
46	from 45 keep 1-2,5,7,9,13,16,218		

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Embase <1974 to 2025 May 23>

1	*eating/	11037
2	*drinking/	7456
3	*food/ or *food aspiration/	27564
4	*food intake/	34238
5	*fluid intake/	5248
6	(oral* adj3 fluid*).tw,kw.	5940
7	(eating or drinking).tw,kw.	328681
8	1 or 2 or 3 or 4 or 5 or 6 or 7	397545
9	"labo?r*".m_titl.	151519
10	exp labor/	42266
11	9 or 10	177282
12	exp epidural anesthesia/ or exp epidural analgesia/	43295
13	epidural*.tw,kw.	72816
14	exp obstetric anesthesia/	14393
15	exp obstetric analgesia/	5794
16	12 or 13 or 14 or 15	93306
17	8 and 11 and 1639	
18	from 17 keep 3-4,7,9	4
19	exp stomach emptying/	24721
20	gastric emptying.tw,kw.	23074
21	19 or 20	31030
22	11 and 16 and 21	56
23	limit 22 to english language	54
24	from 18 keep 1-4	4
25	from 23 keep 4-8,35,37-38,46,48	10
26	exp cesarean section/	142865
27	(c?esarean* or c-section*).tw,kw.	121490
28	26 or 27	166751
29	8 and 28	555
30	21 and 28	124

31	limit 30 to english language	116
32	from 18 keep 1-4	4
33	from 25 keep 1-10	10
34	from 31 keep 10-11,18,22-24,26,46,80	9
35	gastric aspiration.tw,kw.	580
36	11 and 16 and 35	2
37	(food or diet or drinking or oral carbohydrates).m_titl.	314387
38	11 and 16 and 37	11
39	from 34 keep 1-9	9
40	from 38 keep 1-3	3
41	28 and 37	417
42	food intake.m_titl.	10596
43	28 and 42	15
44	from 40 keep 1-3	3
45	from 43 keep 2,7,11	3
46	14 or 15	14393
47	21 and 46	81
48	limit 47 to english language	78
49	from 48 keep 2,4-5,7,48,51,53	7
50	exp food aspiration/ or exp food intake/	458039
51	46 and 50	251
52	limit 51 to english language	232
53	from 49 keep 1-7	7
54	from 52 keep 54	1
55	*food aspiration/ or *aspiration/ or *liquid aspiration/	6073
56	11 and 16 and 55	6
57	28 and 55	76