WHO recommendation on induction of labour for women beyond 41 weeks of gestation

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Recommendation

Induction of labour is recommended for women who are known with certainty to have reached 41 weeks (>40 weeks + 7 days) of gestation.

(low-certainty evidence, conditional recommendation)

Publication history

First published: February 2011

Updated: updated in 2018

Remarks

- This recommendation does not apply to settings where the gestational age cannot be reliably estimated.
- The potential need for induction of labour for women with a post-term pregnancy should be discussed with women in advance, so that they have an opportunity to ask questions and understand the benefits and possible risks.

Background

Induction of labour is defined as the process of artificially stimulating the uterus to start labour. It is usually performed by administering oxytocin or prostaglandins to the pregnant woman or by manually rupturing the amniotic membranes. Induction of labour is not riskfree, and many women find it uncomfortable. Over the past several decades, the incidence of inducing labour for shortening the duration of pregnancy has continued to rise. In high-income countries, the proportion of infants delivered at term following induction of labour can be as high as one in four births. In low- and middle-income countries the rates are generally lower, but in some settings, they can be as high as those observed in high-income countries.

Improving care for women around the time of childbirth is a necessary step towards the achievement of the health targets of the Sustainable Development Goals (SDGs). Efforts to prevent and reduce morbidity and mortality during pregnancy and childbirth could help address the profound inequities in maternal and perinatal health globally. To achieve these aims, healthcare providers, health managers, policy makers and
other stakeholders need up-to-date and evidence-based recommendations to inform clinical policies and practices.

In 2017, the Executive Guideline Steering Group (GSG) on the World Health Organization’s (WHO) maternal and perinatal health recommendations prioritized the updating of the existing WHO recommendations on the induction of labour at or beyond term in response to important new evidence on this intervention. These recommendations are a revalidation of the previous recommendations issued in 2011 in the WHO recommendations on induction of labour.

Methods

The updating of these recommendations was guided by standardized operating procedures in accordance with the process described in the WHO handbook for guideline development.

The recommendations were initially developed using this process, namely:

(i) identification of the priority question and critical outcomes; (ii) retrieval of evidence; (iii) assessment and synthesis of evidence; (iv) formulation of the recommendation; and (v) planning for the dissemination, implementation, impact evaluation and updating of the recommendations.

The scientific evidence supporting the recommendations was synthesized using the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) approach. This systematic review was used to prepare evidence profiles for the prioritized question. WHO convened an online meeting on 2 May 2018 where an international group of experts – the Guideline Development Group (GDG) – reviewed and approved the recommendations.

Recommendation question

For this recommendation, we aimed to answer the following question:

- in pregnant women at or beyond term (P), does induction of labour (I), compared to no intervention, (C), improve maternal and perinatal outcomes (O)?

Evidence Summary

Evidence relating to induction of labour at term and beyond term was extracted from one updated Cochrane systematic review of 30 randomized controlled trials involving 12,479 women (15). One trial involving 248 women did not contribute data to the meta-analysis. Most of the trials were judged by the Cochrane review authors to have a moderate risk of bias, largely due to unclear methods of random sequence generation and allocation concealment.

The review evaluated the effect of inducing labour at 37–42 weeks, <41 weeks, and ≥41 weeks. The intervention was compared with expectant management with fetal monitoring at varying intervals. Trials were conducted in either hospitals or large medical centres in Austria (1), Canada (1), China (3), Finland (1), France (1), India (2), the Netherlands (1), Norway (3), Spain (1), Sweden (2), Thailand (2), Tunisia (1), Turkey (1), United Kingdom (4), and United States (6).

The trials used a combination of methods of induction: most trials used oxytocin infusion in some or all of the women in the intervention group, with or without artificial rupture of membranes, and with or without
additional methods. Some trials used prostaglandin E2 in gel or pessary form and one used laminaria tents. Some trials used only prostaglandin E2, without oxytocin infusion. One trial had three treatment arms (vaginal misoprostol, oxytocin, and Foley catheter). Two trials did not report the method used. For the majority of trials, expectant management protocols included various combinations of fetal heart rate monitoring, ultrasound for amniotic fluid measurements and, in earlier studies, biochemical tests.

Labour induction compared to expectant management for improving birth outcomes for women at or beyond term (all trials)

Effects of interventions

Maternal outcomes

Caesarean section: Moderate-certainty evidence suggests that induction between 37-42 weeks of gestation probably slightly reduces the caesarean section rate compared with expectant management (27 trials, 11 738 women; 980/6004 vs 1056/5734; RR 0.92, 95% CI 0.85 to 0.99).

Instrumental vaginal birth: Moderate-certainty evidence suggests that induction probably makes little or no difference to the number of women with an operative vaginal birth (forceps or ventouse) (18 trials, 9281 women; 984/4775 vs 869/4506; RR 1.07, 95% CI 0.99 to 1.16).

Postpartum haemorrhage: Low-certainty evidence suggests that induction may make little or no difference to the number of women with postpartum haemorrhage (five trials, 3315 women; 218/1649 vs 203/1666; RR 1.09, 95% CI 0.92 to 1.30).

Maternal satisfaction with the care related to induction of labour: Two outcomes were indicators of maternal satisfaction. In one trial, moderate-certainty evidence suggests that women who had an induction are probably more likely to want to be randomized to the same trial arm in future trials (one trial, 496 women; 184/250 vs 94/246; RR 1.93, 95% CI 1.62 to 2.30). In another trial, it is uncertain whether women in the induction or expectant management group preferred their allocation because the certainty of evidence is very low.

Infant outcomes

Serious neonatal morbidity: Low-certainty evidence suggests induction may make little or no difference to neonatal trauma (three trials, 4255 neonates; 26/2128 vs 22/2127; RR 1.18, 95% CI 0.68 to 2.05) or neonatal convulsions (three trials, 4365 neonates; 3/2178 vs 6/2187; RR 0.54, 95% CI 0.15 to 1.97). Moderate-certainty evidence suggests induction probably slightly reduces the number of neonates with meconium aspiration syndrome (11 trials, 7781 neonates; 133/3887 vs 173/3894; RR 0.77, 95% CI 0.62 to 0.96).

Perinatal death: Moderate-certainty evidence suggests that induction between 37-42 weeks of gestation probably slightly reduces the number of perinatal deaths (20 trials, 9960 neonates; 2/4988 vs 16/4972; RR 0.33, 95% CI 0.14 to 0.78) and stillbirths (20 trials, 9960 neonates; 1/4988 vs 10/4972; RR 0.33, 95% CI 0.11 to 0.96). Low-certainty evidence suggests little or no difference in the number of neonatal deaths (19 trials, 9776 neonates; 1/4896 vs 6/4880; RR 0.37, 95% CI 0.10 to 1.38).

Apgar score less than 7 at 5 minutes: Moderate-certainty evidence suggests that induction probably slightly reduces the number of neonates with Apgar scores of less than 7 at 5 minutes (16 trials, 9047 neonates; 52/4523 vs 76/4524; RR 0.70, 95% CI 0.50 to 0.98).
Admission to neonatal intensive care unit: Moderate-certainty evidence suggests that induction probably makes little or no difference to the number of neonates admitted to intensive care (13 trials, 8531 neonates; 320/4271 vs 363/4260; RR 0.88, 95% CI 0.77 to 1.01).

Labour induction compared to expectant management for improving birth outcomes for women at or beyond term (gestational age at induction < 41 weeks and ≥ 41 weeks)

Effects of interventions

Maternal outcomes

Caesarean section < 41 weeks: Moderate-certainty evidence suggests that induction before 41 weeks probably makes little or no difference to the caesarean section rate (nine trials, 2806 women; 191/1532 vs 175/1274; RR 1.04, 95% CI 0.87 to 1.24).

Caesarean section ≥ 41 weeks: Moderate-certainty evidence suggests that induction after and including 41 weeks probably slightly reduces the caesarean section rates (17 trials, 8803 women; 774/4407 vs 857/4396; RR 0.90, 95% CI 0.83 to 0.98).

Instrumental vaginal birth < 41 weeks: Moderate-certainty evidence suggests that induction before 41 weeks probably increases operative vaginal birth (forceps or ventouse) (seven trials, 2401 women; 304/1327 vs 198/1074; RR 1.27, 95% CI 1.08 to 1.48).

Instrumental vaginal birth ≥ 41 weeks: Moderate-certainty evidence suggests that induction after and including 41 weeks probably makes little or no difference to operative vaginal birth (forceps or ventouse) (10 trials, 6751 women; 668/3383 vs 665/3368; RR 1.00, 95% CI 0.91 to 1.10).

Infant outcomes

Perinatal death < 41 weeks: It is uncertain whether induction before 41 weeks reduces perinatal death because the certainty of evidence is very low.

Perinatal death ≥ 41 weeks: Moderate-certainty evidence suggests that induction after and including 41 weeks probably slightly reduces perinatal mortality (15 trials, 8408 neonates; 2/4217 vs 13/4191; RR 0.33, 95% CI 0.13 to 0.87).

Stillbirth < 41 weeks: It is uncertain whether induction before 41 weeks reduces stillbirth because the certainty of evidence is very low.

Stillbirth ≥ 41 weeks: Low-certainty evidence suggests that induction after and including 41 weeks might make little or no difference to stillbirth (15 trials, 8408 neonates; 1/4217 vs 7/4191; RR 0.34, 95% CI 0.09 to 1.24).

Admission to neonatal intensive care unit < 41 weeks: It is uncertain whether induction before 41 weeks reduces admission to neonatal intensive care units because the certainty of evidence is very low.

Admission to neonatal intensive care unit ≥ 41 weeks: Moderate-certainty evidence suggests that induction after and including 41 weeks probably makes little or no difference to admissions to neonatal intensive care (nine trials, 7397 neonates; 307/3704 vs 350/3693; RR 0.88, 95% CI 0.76).
Values

Is there important uncertainty about, or variability in, how much women value the main outcomes associated with induction of labour?

Research evidence

We did not identify any evidence that addressed this question directly.

Additional considerations

Evidence from a qualitative systematic review of what women want from antenatal care showed that healthy pregnant women from high-, medium- and low-resource settings valued maintenance of optimal health for mother and baby (17). Evidence from a separate qualitative systematic review found that while women place a high value on a physiological labour and birth experience, they also acknowledge that birth can be unpredictable. Even where an intervention (such as induction of labour) is needed or wanted, women usually wish to retain a sense of personal achievement and control by being involved in decision-making (18). The GDG considered it likely that women in different settings would consider the outcomes of stillbirth and perinatal mortality very important.

A 2011 systematic review assessed women’s preferences for caesarean section and included 38 studies (19 403 women) from a range of countries (19). The overall pooled preference for caesarean section was 15.6% (95% CI 12.5 – 18.9) – only a minority of women in a wide variety of countries expressed a preference for caesarean section.

Resources

How large are the resource requirements (costs) of induction of labour at ?41 weeks?

Research evidence

A 2011 cost-effectiveness analysis from the USA compared induction of labour at 41 weeks vs expectant management in nulliparous women (20). The authors reported that induction of labour was cost-effective, with an incremental cost of $10 945 per quality-adjusted life year gained. A trial in Canada (included in the Cochrane review) randomly assigned 3418 women with uncomplicated pregnancies of 41 or more weeks gestation to induction of labour or serial antenatal monitoring (21). While the trial did not show clear differences in perinatal mortality and neonatal morbidity, the mean cost per patient with a post-term pregnancy managed through monitoring was $3132 (95% CI $3090 to $3,174) compared to $2939 (95% CI $2898 to $2981), a difference of $193 per patient (22). Additional costs in the monitoring arm were due mainly to the costs of additional monitoring and higher caesarean section rates.

Additional considerations

A 2016 systematic review assessed the effectiveness, safety and cost-effectiveness of different labour induction methods (23). The cost-effectiveness analysis compared only 20 induction interventions. Findings suggest that most interventions have similar utility but differ in cost. The authors report that titrated misoprostol solution and buccal or sublingual misoprostol have the highest likelihood of being cost-effective, though this is uncertain.

Certainty of evidence on required resources: low
Equity

What would be the impact of induction of labour at >41 weeks on health equity?

*Research evidence*

No direct evidence was identified to address this question.

*Additional considerations*

In LMICs, women who are poor, least educated, and residing in rural areas have lower health intervention coverage and worse health outcomes than more advantaged women (24). Safe, effective, equitable implementation of this intervention to prevent perinatal mortality and morbidity could therefore reduce health inequities.

Acceptability

Is the intervention acceptable to key stakeholders?

*Research evidence*

In one trial of 496 women (25) that was included in the Cochrane review, more women in the induction group said that they would choose the same arm in a future trial, compared with women in the expectant management group (RR 1.93, 95% CI 1.62 to 2.30). In an older trial of 184 women, similar numbers of women indicated that they preferred the group they had been allocated to (RR 0.90, 95% CI 0.72 to 1.13) (26).

*Additional considerations*

A 1991 survey of 500 pregnant women in the UK showed that at 37 weeks of gestation, 45% of women preferred conservative management. Of women undelivered by 41 weeks, 31% desired conservative management (27). In a 2009 study, 23 primigravid women in Australia (18 of whom were induced) were interviewed before and after induction (28). The women described feeling that induction was being imposed externally, with hospital policy defining “when time was up”. Being booked for induction required a shift in women’s expectations on what would happen during labour and birth. Women reported a lack of meaningful information given to them and some were afraid of the increased interventions. After birth, induced women were generally positive about the outcome of a healthy baby, if not necessarily positive about the induction experience.

Feasibility

Is the intervention feasible to implement?

*Research evidence*

No direct evidence was identified to address this question.

*Additional considerations*
Labour induction is a common practice worldwide. Induction rates exceed 20% in some high-income countries, however it is also widely used in hospitals in lower-income countries. A WHO multi-country, facility-based survey reported hospital induction rates of 11.4% in eight Latin American countries, 4.4% in seven African countries and 12.1% in nine Asian countries. Hospitals in some low-income countries (such as Sri Lanka and Cuba) had induction rates comparable to high-income countries. (29)

More information on Evidence support and GRADE tables here

Dissemination and implementation

The dissemination and implementation of these recommendations is to be considered by all stakeholders and organizations involved in the provision of care for pregnant women at the international, national and local levels. There is a vital need to increase access and strengthen the capacity of health centres to provide high quality services to all women giving birth. It is therefore crucial that these recommendations are translated into antenatal and intrapartum care packages and programmes at country and health facility levels (where appropriate).

Recommendation dissemination and evaluation

A shorter document containing the recommendations, remarks, implementation considerations and research priorities will be formulated for public dissemination. This document will have annexes (also made publicly available) containing all the information in this document, including methods, evidence-to-decision frameworks and GRADE tables.

The recommendations will be disseminated through WHO regional and country offices, ministries of health, professional organizations, WHO collaborating centres, other United Nations agencies and nongovernmental organizations, among others. These recommendations will be also available on the WHO website and in the WHO Reproductive Health Library. Updated recommendations are also routinely disseminated during meetings or scientific conferences attended by WHO MPH staff.

The recommendation document will be translated into the six UN languages and disseminated through the WHO regional offices. Technical assistance will be provided to any WHO regional office willing to translate the full recommendations into any of these languages.

Implementation considerations

• The successful introduction of recommendations into national programmes and healthcare services depends on well-planned and participatory consensus-driven processes of adaptation and implementation. The adaptation and implementation processes may include the development or revision of existing national guidelines or protocols based on these recommendations;

• The recommendations should be adapted into a locally appropriate document that can meet the specific needs of each country and health service. Any changes should be made in an explicit and transparent manner;

• A set of interventions should be established to ensure that an enabling environment is created for the use of the recommendations (including, for example, the availability of induction agents and monitoring capacity), and that the behaviour of the healthcare practitioner changes towards the use of this evidence-based practice;
• In this process, the role of local professional societies is important and an all-inclusive and participatory process should be encouraged;

• Providers and implementers should consider discussing with women the potential need for induction of labour at ≥41 weeks during antenatal care contacts. This would provide women with the opportunity to ask questions, understand the benefits and possible risks of available options and allow them to make informed decisions should post-term pregnancy occur;

• In 2016, WHO recommended the routine use of one ultrasound scan before 24 weeks of gestation (30). Implementation of these recommendations can assist in improving the accuracy of gestational age estimation, to ensure that the recommendations on induction of labour at ≥41 weeks are used appropriately;

• Other WHO resources (such as the clinical handbook Managing Complications of Pregnancy and Childbirth) provide further guidance on applying these recommendations in clinical settings (17).

**Research implications**

The GDG identified important knowledge gaps that need to be addressed through primary research, which may have an impact on these recommendations.

The following questions were identified as those that demand urgent priority:

• What risks (for both the mother and the fetus) are associated with induction of labour and, in terms of those risks, how does induction of labour compare with elective caesarean section?

• What is the role of caesarean section in the management of women in whom induction of labour has failed?

• In settings where reliable gestational age determination is problematic, what should be the policy for labour induction at term and post-term?

• Is further research required on the experience of women undergoing labour induction, and how much women value the main outcomes associated with labour induction?

**Applicability issues**

Anticipated impact on the organization of care and resources

Implementing these evidence-based recommendations will require resources to ensure it is done safely, including staff time for monitoring of women undergoing induction of labour. The GDG noted that updating training curricula and providing training would increase impact and facilitate implementation. Standardization of care by including recommendations into existing maternity care packages and protocols can encourage healthcare provider behaviour change.

Monitoring and evaluating guideline implementation
Implementation should be monitored at the health-service level as part of broader efforts to monitor and improve the quality of maternal and newborn care. For example, interrupted time series, clinical audits or criterion-based clinical audits can be used to obtain data related to the induction of labour. Clearly defined review criteria and indicators are needed and these could be associated with locally agreed targets and aligned with the standards and indicators described in the WHO document Standards for improving quality of maternal and newborn care in health facilities (31).

**Updating the recommendations**

The Executive GSG convenes annually to review WHO’s current portfolio of maternal and perinatal health recommendations and to advise WHO on prioritization of new and existing questions for recommendation development and updating. Accordingly, these recommendations will be reviewed and prioritized by the Executive GSG. In the event that new evidence that could potentially impact the current evidence base is identified, the recommendations may be updated. If no new reports or information is identified, the recommendations may be revalidated. Following publication and dissemination of the updated recommendations, any concern about the validity of the recommendations will be promptly communicated to the guideline implementers, in addition to any plans to update the recommendations. WHO welcomes suggestions regarding additional questions for inclusion in the updated recommendations. Please email your suggestions to mpa-info@who.int.

**Related Links**

- [Pregnancy, Childbirth, Postpartum and Newborn Care: A guide for essential practice](https://www.who.int)

**Supporting systematic review/s:**


**References**


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