WHO recommendations on outpatient settings for induction of labour

Web Annex. Evidence-to-decision framework
The main guideline document, WHO recommendations on outpatient settings for induction of labour, is available at:
https://apps.who.int/iris/bitstream/handle/10665/363141/9789240055810-eng.pdf
1. Background

Induction of labour is only recommended when there are clear indications that continuing with a pregnancy poses greater risk to the mother or baby than the risk of inducing labour (1, 2).

Induction of labour usually takes place in a hospital, clinic or health-care facility setting using a range of interventions (3). Vaginal prostaglandin agents are the most commonly used induction agents (4). In recent times, there has been increasing interest in outpatient induction of labour. Outpatient induction is defined as “induction at home, or more commonly, after the induction process has been started in a hospital/health-care facility the woman spends time at home” (5). As an outpatient setting, the home environment has been reported to offer women a more positive experience of labour, in terms of providing increased autonomy, compared with induction in the hospital (6). Inpatient inductions are defined as “induction in health-care facilities (hospitals or birth centres, or midwifery-led units), where the woman remains there following induction and awaiting the start of labour” (5). Women are either induced at home or more commonly attend the hospital, clinic or health-care facility to receive the cervical ripening/induction agent (5). Initial assessments of maternal and fetal well-being are conducted in the hospital, clinic or health-care facility and then the woman returns home. Once regular contractions commence, or at a given time point, the woman returns to the hospital for the birth. If the woman experiences an adverse reaction or hyperstimulation, they return to the hospital/health-care facility straight away.

2. Question

In pregnant women requiring induction of labour (P), does outpatient care (I), compared with inpatient care (C), improve maternal and perinatal outcomes (O)?

**Problem:** Perinatal risks associated with the setting for induction of labour  
**Perspective:** Clinical practice recommendation – population perspective  
**Population (P):** In pregnant women requiring induction of labour  
**Intervention (I):** Outpatient care  
**Comparators (C):** Inpatient care  
**Setting:** Community settings/hospital settings

**Priority outcomes (O):**

**Critical outcomes:**

*Maternal*
- Vaginal delivery not achieved within 24 hours
- Caesarean section
- Uterine hyperstimulation with fetal heart rate changes
- Postpartum haemorrhage
- Uterine rupture
- Severe maternal morbidity or death

*Fetal/neonatal*
- Apgar score less than 7 at 5 minutes
- Admission to a neonatal intensive care unit (NICU)

1 These outcomes reflect the outcomes used in the 2011 WHO recommendations for induction of labour (available at: https://apps.who.int/iris/handle/10665/44531). An outcome ranked as 7 or more was considered “critical”, and an outcome ranked 4–6 was considered “important” (on a scale of 1 to 9, from not important to critical). The outcomes “maternal well-being” and “maternal satisfaction” have been added as part of this update.
• Neonatal encephalopathy
• Severe neonatal morbidity
• Disability in childhood
• Perinatal death

**Important outcomes:**

**Maternal**
- Cervix unfavourable or unchanged after 24 hours
- Oxytocin augmentation
- Epidural rate
- Uterine hyperstimulation without fetal heart rate changes
- Instrumental vaginal birth
- Meconium-stained amniotic fluid
- Maternal side-effects (all)
- Nausea
- Vomiting
- Diarrhoea
- Maternal well-being
- Women not satisfied with the care related to induction of labour (maternal satisfaction)
- Caregiver not satisfied with the care related to induction of labour.

3. **Assessment**

3.1 **Effects (desirable and undesirable)**

**Evidence on effectiveness and safety**

Evidence on the effectiveness and safety of induction of labour in an outpatient setting is derived from a Cochrane Systematic Review updated in 2020 assessing outpatient versus inpatient induction of labour for improving birth outcomes (5). The update included three new trials, providing evidence from an additional 238 women. The evidence base now includes a total of seven randomized controlled trials (RCTs), six of which provide data on 1610 women and their babies, with one trial providing no usable data. The trials were conducted between 1998 and 2015, and all were in high- or upper-middle-income countries: Australia (2 trials), Canada (2 trials), Portugal (1 trial) and the United States of America (USA) (1 trial). Most women in the trials were induced at term or beyond.

Two studies used vaginal prostaglandin E2 (PGE2) induction, one study used controlled-release vaginal PGE2, and three studies used balloon or Foley catheters for induction. The interventions examined in all of the studies involved induction and initial monitoring in hospital, with subsequent discharge home to await the start of labour or for a fixed period of time for women in the home induction group. The comparators were all with induction, labour and birth in the hospital.

No subgroup analyses were included in the Cochrane systematic review due to few studies contributing data to any of the three comparisons.

**Effects of interventions: Comparison 1 – Outpatient compared with inpatient induction of labour with vaginal PGE2 for improving birth outcomes**

Two studies involving 1028 women and babies (1022 providing data) compared outpatient versus inpatient induction with vaginal PGE2. Both studies used PGE2 for induction in the two settings. In
one study, women allocated to outpatient induction were able to go home after a satisfactory 40-minute electronic fetal monitoring (EFM) trace. They were instructed to return for reassessment in the morning or earlier if labour commenced, or if they had any concerns. If a second dose of prostaglandins was required in the morning, these women were given the option of going home again. Women allocated to inpatient induction were admitted to the labour ward in the evening for induction, had EFM, and were encouraged to rest overnight. Reassessment of women in the inpatient setting was planned for the morning unless labour commenced beforehand. Nulliparous women received 2 mg of PGE2, and parous women 1 mg of PGE2 in accordance with South Australia Perinatal Guidelines. The other study was a conference abstract and gave no details about the intervention.

**Maternal outcomes**

**Critical:**

**Vaginal delivery not achieved within 24 hours** (outcome in review was spontaneous vaginal birth): It is uncertain whether a policy of outpatient induction of labour has any effect on spontaneous vaginal birth or uterine hyperstimulation when compared with inpatient induction (both very-low-certainty evidence).

**Caesarean section:** A policy of outpatient induction of labour has little or no effect on caesarean section when compared with inpatient induction (2 trials, 522 women; relative risk [RR] 1.01, 95% confidence interval [CI] 0.81 to 1.28; low-certainty evidence).

**Postpartum haemorrhage:** A policy of outpatient induction of labour has little or no effect on postpartum haemorrhage (≥ 500 ml) when compared with inpatient induction (1 trial, 821 women; RR 1.10, 95% CI 0.76 to 1.58; low-certainty evidence).

**Important:**

**Oxytocin administration:** A policy of outpatient induction of labour probably has little or no effect on oxytocin administration when compared with inpatient induction (2 trials, 522 women; RR 1.01, 95% CI 0.90 to 1.15; moderate-certainty evidence).

**Spinal analgesia:** A policy of outpatient induction of labour probably has little or no effect on spinal analgesia when compared with inpatient induction (2 trials, 522 women; RR 1.01, 95% CI 0.93 to 1.10; moderate-certainty evidence).

**Instrumental vaginal birth:** It is unclear whether a policy of outpatient induction of labour has any effect on instrumental vaginal birth when compared with inpatient induction (very-low-certainty evidence).

**Maternal satisfaction with care:** A policy of outpatient induction of labour makes little to no difference on women’s experiences (satisfaction with care) up to 8 weeks, when compared with inpatient induction (1 trial, 399 women; mean difference [MD] 0.16, 95% CI 0.02 to 0.34; low-certainty evidence).

**Fetal/neonatal outcomes**

**Critical:**

**Apgar score less than 7 at 5 minutes:** It is uncertain whether a policy of outpatient induction of labour has any effect on Apgar score < 7 at 5 minutes when compared with inpatient induction (very-low-certainty evidence).

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2 Not clear from review or the trial what tool or scale was used to measure satisfaction.
Admission to a neonatal intensive care unit (NICU): It is uncertain whether a policy of outpatient induction of labour has any effect on NICU admission when compared with inpatient induction (very-low-certainty evidence).

Perinatal mortality: It is uncertain whether a policy of outpatient induction of labour has any effect on perinatal mortality when compared with inpatient induction (very-low-certainty evidence).

The following outcomes were not reported:
- uterine rupture
- severe maternal morbidity or death
- cervix unfavourable/unchanged after 24 hours
- uterine hyperstimulation without fetal heart rate changes
- meconium-stained amniotic fluid
- maternal side-effects (nausea, vomiting, diarrhoea)
- women not satisfied with the care related to induction of labour
- neonatal encephalopathy
- severe neonatal morbidity
- disability in childhood
- perinatal death.

Effects of interventions: Comparison 2 – Outpatient compared with inpatient induction of labour with controlled-release vaginal PGE2 for improving birth outcomes

One study involving 300 women and their babies (299 providing data) compared outpatient versus inpatient induction with controlled-release vaginal prostaglandin. Women received 10 mg controlled-release vaginal PGE2 (CR-PGE2), and were monitored in the antenatal ward for one hour prior to discharge home. After initial monitoring women were discharged home to return when in labour. If they were not in labour 24 hours later they returned to hospital for induction of labour as an inpatient. Women were in telephone contact with a nurse every four hours and were given detailed instructions on seeking help if required. They were asked to remain within easy travelling distance of the hospital. Women in the inpatient group were induced and then monitored on the antenatal ward for one hour and remained on the antenatal ward throughout and were managed in a similar way to the outpatient group.

Maternal outcomes

Critical:

Vaginal delivery not achieved within 24 hours (outcome in review was spontaneous vaginal birth): A policy of outpatient induction of labour has little or no effect on spontaneous vaginal birth when compared with inpatient induction (1 trial, 299 women; RR 0.94, 95% CI 0.77 to 1.14; low-certainty evidence).

Caesarean section: It is uncertain whether a policy of outpatient induction of labour has any effect on caesarean section (very-low-certainty evidence).

Uterine hyperstimulation with fetal heart rate changes: It is uncertain whether a policy of outpatient induction of labour has any effect on uterine hyperstimulation with fetal heart rate changes (very-low-certainty evidence).
**Important:**

**Spinal analgesia:** A policy of outpatient induction of labour has little or no effect on spinal analgesia when compared with inpatient induction (1 trial, 299 women; RR 1.02, 95% CI 0.91 to 1.16; low-certainty evidence).

**Oxytocin administration:** It is uncertain whether a policy of outpatient induction of labour has any effect on oxytocin administration when compared with inpatient induction (very-low-certainty evidence).

**Instrumental vaginal birth:** It is uncertain whether a policy of outpatient induction of labour has any effect on instrumental vaginal birth when compared with inpatient induction (very-low-certainty evidence).

**Neonatal outcomes**

**Critical:**

**Admission to an NICU:** It is uncertain whether a policy of outpatient induction of labour has any effect on admission to an NICU when compared with inpatient induction (very-low-certainty evidence).

The following outcomes were not reported:
- postpartum haemorrhage
- uterine rupture
- severe maternal morbidity or death
- cervix unfavourable/unchanged after 24 hours
- uterine hyperstimulation without fetal heart rate changes
- maternal side-effects (nausea, vomiting, diarrhoea)
- women not satisfied with the care related to induction of labour
- caregiver not satisfied with the care related to induction of labour
- Apgar score < 7 at 5 minutes
- neonatal encephalopathy
- severe neonatal morbidity
- disability in childhood or perinatal death.

**Effects of interventions: Comparison 3 – Outpatient compared with inpatient induction of labour with balloon or Foley catheter for improving birth outcomes**

Three studies involving 289 women and their babies compared outpatient versus inpatient induction with either a single balloon Foley catheter or a double balloon catheter (1 study, Australia). In all three studies, women in the outpatient induction group only went home following the insertion of the catheter after a reassuring cardiotocogram trace. They were given written instructions on when to return to hospital. In the Australian study, women who had not started labour by the following morning were given further induction of labour with amniotomy and oxytocin infusion on returning to hospital. The pathway for both inpatient and outpatient women was the same the following morning. In the Portuguese study, women in the inpatient group were monitored and oriented in accordance with the Department’s protocol. In the USA study, women in the inpatient group were admitted to the labour ward following induction.

**Maternal outcomes**

**Critical:**

**Spontaneous vaginal birth:** It is uncertain whether a policy of outpatient induction of labour has any effect on spontaneous vaginal birth when compared with inpatient induction (very-low-certainty evidence).
Caesarean section: It is uncertain whether a policy of outpatient induction of labour has any effect on caesarean section when compared with inpatient induction (very-low-certainty evidence).

Uterine stimulation with fetal heart rate changes: It is uncertain whether a policy of outpatient induction of labour has any effect on uterine hyperstimulation with fetal heart rate changes when compared with inpatient induction (very-low-certainty evidence).

Important:
Spinal analgesia: A policy of outpatient induction of labour has little or no effect on spinal analgesia when compared with inpatient induction (1 trial, 159 women; RR 0.99, 95% CI 0.91 to 1.09; low-certainty evidence).

Oxytocin administration: It is uncertain whether a policy of outpatient induction of labour has any effect on oxytocin administration when compared with inpatient induction (very-low-certainty evidence).

Instrumental vaginal birth: It is uncertain whether a policy of outpatient induction of labour has any effect on instrumental vaginal birth when compared with inpatient induction (very-low-certainty evidence).

Meconium aspiration: It is uncertain whether a policy of outpatient induction of labour has any effect on meconium aspiration when compared with inpatient induction (very-low-certainty evidence).

**Neonatal outcomes**

Critical:
Apgar score less than 7 at 5 minutes: It is uncertain whether a policy of outpatient induction of labour has any effect on Apgar score < 7 at 5 minutes when compared with inpatient induction (very-low-certainty evidence).

Admission to an NICU: It is uncertain whether a policy of outpatient induction of labour has any effect on NICU admission when compared with inpatient induction (very-low-certainty evidence).

Severe neonatal morbidity: It is uncertain whether a policy of outpatient induction of labour has any effect on severe neonatal morbidity when compared with inpatient induction (very-low-certainty evidence).

Perinatal mortality: It is uncertain whether a policy of outpatient induction of labour has any effect on perinatal mortality when compared with inpatient induction (very-low-certainty evidence).

The following outcomes were not reported:
- postpartum haemorrhage
- uterine rupture
- severe maternal morbidity or death
- cervix unfavourable/unchanged after 24 hours
- uterine hyperstimulation without fetal heart rate changes
- maternal side-effects (nausea, vomiting, diarrhoea)
- women not satisfied with the care related to induction of labour
- caregiver not satisfied with the care related to induction of labour
- neonatal encephalopathy
- disability in childhood.
Additional considerations

None.

Judgement on desirable effects
How substantial are the desirable anticipated effects of outpatient settings for induction of labour?

Judgement

Don’t know  Varieties  Trivial  Small  Moderate  Large

Judgement on undesirable effects
How substantial are the undesirable anticipated effects of outpatient settings for induction of labour?

Judgement

Don’t know  Varieties  Large  Moderate  Small  Trivial

Certainty of the evidence
What is the overall certainty of the evidence on effects of outpatient settings for induction of labour to improve maternal and infant outcomes?

Judgement

No included studies  Very low  Low  Moderate  High

3.2 Values

Evidence on values
A 2019 qualitative evidence synthesis (QES) of women’s experiences of labour induction (Coates et al., 2019) (7) was selected for inclusion on the basis of quality (high) and inclusion of the greatest breadth of qualitative primary studies compared with two other eligible QES (8, 9) and one scoping review (10). Primary studies not included in Coates et al. (2019) were screened for additional relevant findings and/or income settings and/or clinician’s views. Five additional studies were identified and relevant findings extracted (11-15).

The QES identified that the key outcomes of interest for women in relation to labour induction in general were:

- the well-being of their baby
- the duration of the process between induction and delivery
- the likelihood and severity of pain
- the likelihood of caesarean delivery.

Women placed great value on knowing about the potential benefits and harms of labour induction.
Women who underwent outpatient induction of labour had additional safety concerns about going home, particularly that the onset of labour might be very sudden, and whether they would be able to recognize if something was wrong.

### Additional considerations

None.

### Judgement on values

Is there any important uncertainty or variability about values relating to outpatient induction?

**Judgement**

<table>
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### 3.3 Effects and values

**Judgement on the balance of effects and values**

Does the balance between desirable and undesirable effects favour outpatient induction or inpatient induction?

**Judgement**

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### 3.4 Resources

**Evidence on resources**

Economic evidence is very limited, derived from a single trial-based primary study of outpatient versus inpatient labour induction using vaginal PGE2 gel conducted in a high-income setting (16). Any conclusions drawn from this study should be viewed as extremely tentative.

Adelson et al. (2013) undertook a cost analysis from an Australian hospital perspective in the period from priming until maternal or neonatal discharge. Overall cost data were extrapolated from the actual costs at one participating hospital and expressed in 2010–2011 Australian dollars (16). Effectiveness data were derived from the OPRA study (Wilkinson et al., 2015), an RCT conducted over three years (2008–2011) in two Australian hospitals comparing outpatient versus inpatient of labour using vaginal PGE2 gel in 823 low-risk women with prolonged pregnancy. The median gestational age at priming was 40 weeks and 6 days (17).

Wilkinson et al. (2015) is included in the 2020 Cochrane review of home versus inpatient induction of labour for improving birth outcomes (5).
Cost
It is uncertain whether outpatient labour induction results in in-hospital cost savings ($319 Australian dollars; 95% CI 104 to 702). It is also uncertain if the outpatient labour induction results in overall cost savings once the cost of the outpatient priming clinic is taken into account ($156 Australian dollars; 95% CI –588 to 870). The authors noted that approximately half the women in the outpatient group were either not discharged home following priming with PGE2 gel or they were discharged but they returned to the hospital on the same day (16).

Overall budget impact
Overall budget impacts of a policy of outpatient labour induction in women at low risk of complications at or beyond term were not analysed in Adelson et al. (2013).

Value-for-money analyses
The included study did not undertake value-for-money analyses (e.g. cost-effectiveness, cost-benefit or cost-utility).

Additional considerations
None.

Main resource requirements

<table>
<thead>
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<th>Resource</th>
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<tbody>
<tr>
<td>Staff</td>
<td>• Staff for placement/insertion of induction agent (gel or balloon) &lt;br&gt;• Staff for initial monitoring until women return home &lt;br&gt;• Staff for intermittent contact/monitoring of women at home &lt;br&gt;• Staff for rapid assessment of women who return to inpatient setting due to concerns/complications</td>
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<tr>
<td>Training</td>
<td>• Training in performance and monitoring of labour induction</td>
</tr>
<tr>
<td>Supplies</td>
<td>• Induction agents (e.g. controlled-release PGE2, Foley or Cook’s catheter) &lt;br&gt;• Ultrasound gel</td>
</tr>
<tr>
<td>Equipment and infrastructure</td>
<td>• Tools to accurately estimate gestational age (e.g. antenatal ultrasound, gestational age wheel) &lt;br&gt;• Clinical protocol for safe labour induction &lt;br&gt;• Electronic fetal heart rate monitors, oxytocin infusion pumps &lt;br&gt;• Equipment for vaginal birth &lt;br&gt;• Availability of appropriate space, beds or both for women undergoing induction &lt;br&gt;• Capacity to perform caesarean section (if required)</td>
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<tr>
<td>Time</td>
<td>• Time to deliver information on process, risks and benefits of labour induction (preferably during late pregnancy ANC visit) &lt;br&gt;• 20 minutes for initial assessment &lt;br&gt;• Time for placement/insertion of induction agent</td>
</tr>
<tr>
<td>Supervision and monitoring</td>
<td>• Monitoring after administration of induction agent prior to discharge home &lt;br&gt;• Intermittent contact/monitoring of women at home &lt;br&gt;• Intermittent monitoring/assessment until delivery following return to inpatient setting</td>
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Judgement on costs
What is the impact on costs of outpatient settings for induction of labour?

Judgement

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Certainty of the evidence
What is the certainty of the evidence on costs?

Judgement

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Judgement on cost-effectiveness
Is the intervention cost-effective?

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<th>Probably favours outpatient induction of labour</th>
<th>Favours outpatient induction of labour</th>
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3.5 Equity

Evidence on equity
No direct evidence was identified to address this question.

Additional considerations

The QES findings indicate that women have a range of views regarding the acceptability of outpatient induction of labour. While some women view outpatient induction as more favourable, others are less confident of safety and risk management in this setting (see 3.6 Acceptability).

Issues of inequity may arise if women’s choices about induction location are not fully supported. Barriers to active participation in decision-making include status and power differentials between health professionals and women making decisions about undergoing labour induction; differing beliefs, expectations, knowledge, values and preferences; and having the confidence and/or ability to challenge or confirm medical opinions and navigate the health system (18). These barriers can be more complex for women from non-dominant cultural backgrounds and/or where the dominant language spoken is not their first language.
Equitable health-care delivery and outcomes require that the health system ensures women are able to make independent, well informed choices about location of induction. This means supporting all women to have access to full, timely, accessible information; to use their own social networks to assist them to understand the information if needed; and to ensure a woman’s health-care provider is aware of her needs, values and preferences (18).

Women living in low- or middle-income settings and/or remote or rural areas may be less likely to have access to these facilities or to comprehensive ANC to enable accurate gestational age estimation and risk assessment (19, 20).

The 2015 WHO report on inequality in reproductive, maternal, newborn and child states that “the poorest, the least educated and those residing in rural areas have lower health intervention coverage and worse health outcomes than the more advantaged” (19, p. xii). The report also found that preventing and reducing morbidity and mortality in childbirth can play a key role in reducing overall health inequities. Safe, effective and equitable implementation of labour induction for improved maternal and neonatal health outcomes could contribute to reducing inequities in maternal and perinatal health.

### Judgement on equity
What is the impact on equity of outpatient settings for induction of labour?

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### 3.6 Acceptability

**Evidence on acceptability**

**Acceptability to women**

In the Coates et al. (2019) QES, some women undergoing outpatient labour induction reported valuing the access to social support that was enabled by being at home. Some women also valued a sense of control that was partly due to the freedom to move around as they needed. It was important for them to be able to carry on with their daily activities, or activities of their own choice, while waiting for the onset of labour. These women reported that being comfortable at home, including “eating, sleeping, moving and bathing in familiar ways” (7, p 25), helped distract them from being “in limbo” while waiting for labour to start. Outpatient induction also meant women could continue with their usual caregiving and spend time with older children before their birth. Women said that being able to continue with these aspects of daily life also helped them cope with their contractions.

Some women who underwent outpatient induction of labour had additional safety concerns about going home, particularly that the onset of labour might be very sudden, and whether they would be able to recognize if something was wrong.

The QES authors found that “outpatient induction of labour is not preferable for all women, and individuals will have preferences about what constitutes a comfortable and safe environment for labour” (7, p 26).

**Acceptability to implementers**

No direct evidence was identified to address this question.
**Additional considerations**

**Acceptability to women**
The QES and additional primary studies indicate that for labour induction generally:

- Women have varying (and sometimes contradictory) views on the acceptability of labour induction.
- Labour induction is widely acceptable to women when there is a recognized need to avert harm to the baby.
- Acceptability varies according to women’s trust in their health-care provider, their perception of birth as a natural process, their need for certainty, and the duration of waiting.

Many women in the Westfall and Benoit (2004) study preferred interventions they could employ themselves to medical induction of labour. This included use of interventions such as castor oil, essential oil suppositories, homeopathic preparations or having intercourse (14). Women in the Wessberg et al. (2017) study reported that the perceived acceptability of labour induction changed as their pregnancy progressed, particularly as their concern for the well-being of their baby increased (13).

**Acceptability to implementers**
There is limited evidence available on the acceptability of labour induction to clinicians, and more research would be useful to inform recommendations.

A study of obstetrician and midwife opinions on labour induction found that obstetricians felt there was a lack of clear evidence on the risks and benefits of labour induction to guide their decision-making. They were particularly concerned about neonatal safety and the potential for medical litigation, and were uncertain about the optimal timing for induction and the risks of caesarean birth following induction (15).

**Human rights and health**
To exercise their rights to make a competent and well-informed decision about induction of labour, the women included in the QES and additional primary studies wanted more complete and balanced information about the risks and benefits, and process, of labour induction. They wanted to receive this information at a time and in a context that allowed them to process the information before a decision was required. Women suggested that receiving this information and discussing labour induction with their health-care provider during a third trimester ANC visit would be beneficial.

In terms of other experiences of care that uphold and protect health rights (21), women also valued continuity of care and confidence that their situation was being consistently monitored and communicated within the care team. Women also valued the ability to move freely, have privacy and a sense of security. This allowed them to feel more in control and maintain their dignity. Feeling secure was enhanced by having a support person present; systems which enabled this support to continue from induction to delivery; and by having rapid access to the clinical expertise and equipment that might be needed.
Judgement on acceptability

Is outpatient induction of labour acceptable?

Judgement

☐ Don’t know ☒ Varies ☐ No ☐ Probably No ☐ Probably Yes ☐ Yes

3.7 Feasibility

Evidence on feasibility

No direct evidence was identified to address this question.

Additional considerations

Need for, usage of and impact on health workforce and human resources

For outpatient labour induction, there may be a greater need for staff who are available to answer questions, monitor and assess women remotely, and/or organize care or transfer for women who experience adverse reactions at home, such as uterine hyperstimulation (5).

Health-care worker shortages in low- and middle-income country settings may require staff to attend to much higher numbers of women on the labour ward than in other settings. Providing the required level of support, assessment and monitoring in these settings may be challenging and impact on responsiveness (22).

Availability of surgical obstetric and operating theatre staff (and staff to transfer women to facilities with these capabilities) for women who require caesarean delivery if labour induction is not successful may also impact on feasibility. A higher number of induction deliveries are attended by medical doctors than non-induction deliveries (23). This has implications for the distribution and productivity of medical doctors, particularly in under-resourced settings.

Antenatal care

ANC visits are an important opportunity to provide (20):

- one scan before 24 weeks’ gestation for accurate estimation of gestational age
- post-term pregnancy risk assessment
- information to women about the process, risks and benefits of labour induction.

Time constraints can be a barrier to information provision in ANC clinics (15). In low- and middle-income country settings, trained health-care worker shortages may also reduce the feasibility of performing ANC ultrasound scans and other risk assessment (19).

Need for, usage of and impact on infrastructure

Labour induction is widely implemented in high-, middle- and low-income settings. In high-income settings, 2013 rates ranged from 14% to 36% of all births (24). Secondary analyses of WHO Global Survey on Maternal and Neonatal Health data reported 2004–2005 hospital induction rates in Latin America ranging from 5% to 20% (25), and in African countries from 1% to 7% (23), with significant unmet need for non-elective inductions on the African continent (22). In Asian countries, 2007–2008 labour induction rates ranged from 3% to 36% (23).

Oxytocin alone remains the most frequently used labour induction method in all income settings. The higher cost of prostaglandins other than misoprostol may limit their affordability in low-income settings (22).
Performing induction of labour safely requires availability of appropriate medicines or mechanical devices, monitoring equipment and access to facilities for safe caesarean section. Inconsistent supply or lack of medicines and medical equipment and availability of appropriate facilities may be an issue in some settings.

**Judgement on feasibility**
Is outpatient induction of labour feasible?

**Judgement**

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<thead>
<tr>
<th></th>
<th>Don’t know</th>
<th>Varies</th>
<th>No</th>
<th>Probably No</th>
<th>Probably Yes</th>
<th>Yes</th>
</tr>
</thead>
</table>


### 4. GRADE Summary of Judgements table

**Summary of Judgements Table C.1: Outpatient induction of labour**

<table>
<thead>
<tr>
<th>Desired effects</th>
<th>Don’t know</th>
<th>✓</th>
<th>Varies</th>
<th>Trivial</th>
<th>Small</th>
<th>Moderate</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undesirable effects</td>
<td>Don’t know</td>
<td>✓</td>
<td>Varies</td>
<td>Large</td>
<td>Moderate</td>
<td>Small</td>
<td>Trivial</td>
</tr>
<tr>
<td>Certainty of the evidence</td>
<td>No included studies</td>
<td></td>
<td></td>
<td>Very low</td>
<td>✓</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Values</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Important uncertainty or variability</td>
<td>Possibly important uncertainty or variability</td>
</tr>
<tr>
<td>Balance of effects</td>
<td>Don’t know</td>
<td>Varies</td>
<td>Favours inpatient induction of labour</td>
<td>Probably favours inpatient induction of labour</td>
<td>✓</td>
<td>Does not favour either</td>
<td>Probably favours outpatient induction of labour</td>
</tr>
<tr>
<td>Resources required</td>
<td>Don’t know</td>
<td>Varies</td>
<td>Large costs</td>
<td>Moderate costs</td>
<td>✓</td>
<td>Negligible costs or savings</td>
<td>Moderate savings</td>
</tr>
<tr>
<td>Certainty of the evidence on required resources</td>
<td>No included studies</td>
<td>✓</td>
<td>Very low</td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Cost-effectiveness</td>
<td>✓</td>
<td>Don’t know</td>
<td>Varies</td>
<td>Favours inpatient induction of labour</td>
<td>Probably favours inpatient induction of labour</td>
<td>Does not favour either</td>
<td>Probably favours outpatient induction of labour</td>
</tr>
<tr>
<td>Equity</td>
<td>Don’t know</td>
<td>✓</td>
<td>Varies</td>
<td>Reduced</td>
<td>Probably reduced</td>
<td>Probably no impact</td>
<td>Probably increased</td>
</tr>
<tr>
<td>Acceptability</td>
<td>Don’t know</td>
<td>✓</td>
<td>Varies</td>
<td>No</td>
<td>Probably No</td>
<td>Probably Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Feasibility</td>
<td>Don’t know</td>
<td>✓</td>
<td>Varies</td>
<td>No</td>
<td>Probably No</td>
<td>Probably Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
## 5. GRADE Summary of Findings tables

**Summary of Findings Table C.1: Home induction versus inpatient induction with vaginal prostaglandin E2**

**Question:** Should home induction versus inpatient induction with vaginal prostaglandin E2 (PGE2) be used for improving birth outcomes?

**Settings:** Canada, Australia


<table>
<thead>
<tr>
<th>No. of studies</th>
<th>Study design</th>
<th>Risk of bias</th>
<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>No. of patients</th>
<th>Inpatient induction with vaginal PGE2</th>
<th>Relative risk (95% CI)</th>
<th>Absolute (95% CI)</th>
<th>Certainty</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spontaneous vaginal birth</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>randomized trials</td>
<td>seriousa</td>
<td>seriousb</td>
<td>not serious</td>
<td>seriousc</td>
<td>none</td>
<td>279/502 (55.6%)</td>
<td>296/520 (56.9%)</td>
<td>RR 0.91 (0.69 to 1.21)</td>
<td>51 fewer per 1000 (from 176 fewer to 120 more)</td>
<td>@@@@@ VERY LOW</td>
<td>CRITICAL</td>
</tr>
<tr>
<td><strong>Uterine hyperstimulation</strong></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>randomized trials</td>
<td>seriousd</td>
<td>not serious</td>
<td>not serious</td>
<td>very seriouse</td>
<td>none</td>
<td>7/407 (1.7%)</td>
<td>6/414 (1.4%)</td>
<td>RR 1.19 (0.40 to 3.50)</td>
<td>3 more per 1000 (from 9 fewer to 36 more)</td>
<td>@@@@@ VERY LOW</td>
<td>CRITICAL</td>
</tr>
<tr>
<td><strong>Caesarean birth</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2</td>
<td>randomized trials</td>
<td>seriousa</td>
<td>not serious</td>
<td>not serious</td>
<td>seriousc</td>
<td>none</td>
<td>11/502 (22.1%)</td>
<td>113/520 (21.7%)</td>
<td>RR 1.01 (0.81 to 1.28)</td>
<td>2 more per 1000 (from 41 fewer to 61 more)</td>
<td>@@@ LOW</td>
<td>CRITICAL</td>
</tr>
<tr>
<td><strong>Oxytocin administration</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td>randomized trials</td>
<td>seriousa</td>
<td>not serious</td>
<td>not serious</td>
<td>not serious</td>
<td>none</td>
<td>253/502 (50.4%)</td>
<td>259/520 (49.8%)</td>
<td>RR 1.01 (0.90 to 1.15)</td>
<td>5 more per 1000 (from 50 fewer to 75 more)</td>
<td>@@ MODERATE</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>No. of studies</td>
<td>Study design</td>
<td>Risk of bias</td>
<td>Inconsistency</td>
<td>Indirectness</td>
<td>Imprecision</td>
<td>Other considerations</td>
<td>No. of patients</td>
<td>Home</td>
<td>Effect</td>
<td></td>
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</tr>
<tr>
<td>Spinal analgesia</td>
<td>2 randomized trials</td>
<td>serious*</td>
<td>not serious</td>
<td>not serious</td>
<td>not serious</td>
<td>none</td>
<td>338/502 (67.3%)</td>
<td>348/520 (66.9%)</td>
<td>RR 1.01 (0.93 to 1.10)</td>
<td>7 more per 1000 (from 47 fewer to 67 more)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instrumental vaginal birth</td>
<td>2 randomized trials</td>
<td>serious*</td>
<td>serious*</td>
<td>not serious</td>
<td>serious*</td>
<td>none</td>
<td>113/502 (22.5%)</td>
<td>110/520 (21.2%)</td>
<td>RR 1.22 (0.67 to 2.22)</td>
<td>47 more per 1000 (from 70 fewer to 258 more)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postpartum haemorrhage (≥ 500 ml or as defined by trialists)</td>
<td>1 randomized trials</td>
<td>serious*</td>
<td>not serious</td>
<td>not serious</td>
<td>serious*</td>
<td>none</td>
<td>53/407 (13.0%)</td>
<td>49/414 (11.8%)</td>
<td>RR 1.10 (0.76 to 1.58)</td>
<td>12 more per 1000 (from 28 fewer to 69 more)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women’s experiences (satisfaction with care) up to 8 weeks</td>
<td>1 randomized trials</td>
<td>serious*</td>
<td>not serious</td>
<td>not serious</td>
<td>serious*</td>
<td>none</td>
<td>197</td>
<td>202</td>
<td>MD 0.16 higher (0.02 lower to 0.34 higher)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perinatal mortality</td>
<td>1 randomized trials</td>
<td>serious*</td>
<td>not serious</td>
<td>not serious</td>
<td>very serious*</td>
<td>none</td>
<td>1/407 (0.2%)</td>
<td>0/414 (0.0%)</td>
<td>RR 3.05 (0.12 to 74.69)</td>
<td>0 fewer per 1000 (from 0 fewer to 0 fewer)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of studies</td>
<td>Study design</td>
<td>Risk of bias</td>
<td>Inconsistency</td>
<td>Indirectness</td>
<td>Imprecision</td>
<td>Other considerations</td>
<td>No. of patients</td>
<td>Inpatient induction with vaginal PGE2</td>
<td>Relative risk (95% CI)</td>
<td>Absolute (95% CI)</td>
<td>Certainty</td>
<td>Importance</td>
</tr>
<tr>
<td>----------------</td>
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</tr>
<tr>
<td><strong>Apgar score &lt; 7 at 5 minutes</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>randomized trials</td>
<td>serious&lt;sup&gt;a&lt;/sup&gt;</td>
<td>not serious</td>
<td>not serious</td>
<td>very serious&lt;sup&gt;*&lt;/sup&gt;</td>
<td>none</td>
<td>13/502 (2.6%)</td>
<td>10/520 (1.9%)</td>
<td>RR 1.34 (0.59 to 3.02)</td>
<td>7 more per 1000 (from 8 fewer to 39 more)</td>
<td>★★★★★ VERY LOW</td>
<td>CRITICAL</td>
</tr>
<tr>
<td><strong>Admission to a neonatal intensive care unit (NICU)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2</td>
<td>randomized trials</td>
<td>very serious&lt;sup&gt;b&lt;/sup&gt;</td>
<td>not serious</td>
<td>not serious</td>
<td>very serious&lt;sup&gt;*&lt;/sup&gt;</td>
<td>none</td>
<td>10/502 (2.0%)</td>
<td>9/520 (1.7%)</td>
<td>RR 1.2 (0.5 to 2.9)</td>
<td>3 more per 1000 (from 9 fewer to 33 more)</td>
<td>★★★★★ VERY LOW</td>
<td>CRITICAL</td>
</tr>
</tbody>
</table>

CI: confidence interval; RR: relative risk; MD: mean difference.

- a. Majority of data provided by studies with design limitations (−1).
- b. Substantial statistical heterogeneity (I² > 60%) (−1).
- c. Wide CIs (−1).
- d. All data provided by study with design limitations (−1).
- e. Wide CIs and few events (−2).
- f. Small single study (−1).
- g. Single study, with few events and wide CI (−2).
- h. Majority of data provided by studies with very serious design limitations (−2).
**Summary of Findings Table C.2: Home induction versus inpatient induction with controlled-release prostaglandin E2**

**Question:** Should home induction versus inpatient induction with controlled-release prostaglandin E2 (PGE2) be used for improving birth outcomes?

**Setting:** Canada


<table>
<thead>
<tr>
<th>Certainty assessment</th>
<th>No. of patients</th>
<th>Effect</th>
<th>Certainty</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of studies</td>
<td>Study design</td>
<td>Risk of bias</td>
<td>Inconsistency</td>
<td>Indirectness</td>
</tr>
<tr>
<td>Spontaneous vaginal birth</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>randomized trials</td>
<td>serious*</td>
<td>not serious</td>
<td>not serious</td>
</tr>
<tr>
<td>Uterine hyperstimulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>randomized trials</td>
<td>serious*</td>
<td>not serious</td>
<td>not serious</td>
</tr>
<tr>
<td>Caesarean birth</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>randomized trials</td>
<td>serious*</td>
<td>not serious</td>
<td>not serious</td>
</tr>
<tr>
<td>Oxytocin administration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>randomized trials</td>
<td>serious*</td>
<td>not serious</td>
<td>not serious</td>
</tr>
<tr>
<td>No. of studies</td>
<td>Study design</td>
<td>Risk of bias</td>
<td>Inconsistency</td>
<td>Indirectness</td>
</tr>
<tr>
<td>----------------</td>
<td>-----------------------</td>
<td>--------------</td>
<td>---------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Spinal analgesia</td>
<td>1 randomized trials</td>
<td>serious&lt;sup&gt;a&lt;/sup&gt;</td>
<td>not serious</td>
<td>not serious</td>
</tr>
<tr>
<td>Instrumental vaginal birth</td>
<td>1 randomized trials</td>
<td>serious&lt;sup&gt;a&lt;/sup&gt;</td>
<td>not serious</td>
<td>not serious</td>
</tr>
<tr>
<td>Admission to a neonatal intensive care unit (NICU)</td>
<td>1 randomized trials</td>
<td>serious&lt;sup&gt;a&lt;/sup&gt;</td>
<td>not serious</td>
<td>not serious</td>
</tr>
</tbody>
</table>

CI: confidence interval; RR: relative risk
a. All data provided by study with design limitations (−1).
b. Single small study (−1).
c. Single small study with wide CIs (−2).
d. Single small study with few events and wide CIs (−2).
Summary of Findings Table C.3: Home induction versus inpatient induction with balloon or Foley catheter

**Question:** Should home induction versus inpatient induction with balloon or Foley catheter be used for improving birth outcomes?

**Settings:** Australia, Portugal, USA


<table>
<thead>
<tr>
<th>Certainty assessment</th>
<th>No. of patients</th>
<th>Effect</th>
<th>Certainty</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Study design</td>
<td>Risk of bias</td>
<td>Inconsistency</td>
<td>Indirectness</td>
</tr>
<tr>
<td><strong>Spontaneous vaginal birth</strong></td>
<td>1 randomized trials</td>
<td>seriousᵃ</td>
<td>not serious</td>
<td>not serious</td>
</tr>
<tr>
<td><strong>Uterine hyperstimulation with fetal heart rate changes</strong></td>
<td>1 randomized trials</td>
<td>seriousᵃ</td>
<td>not serious</td>
<td>not serious</td>
</tr>
<tr>
<td><strong>Caesarean birth</strong></td>
<td>2 randomized trials</td>
<td>seriousᵃ</td>
<td>not serious</td>
<td>not serious</td>
</tr>
<tr>
<td>No. of studies</td>
<td>Study design</td>
<td>Risk of bias</td>
<td>Inconsistency</td>
<td>Indirectness</td>
</tr>
<tr>
<td>----------------</td>
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<td>---------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Oxytocin administration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>randomized trials</td>
<td>serious(a)</td>
<td>not serious</td>
<td>not serious</td>
</tr>
<tr>
<td>Spinal analgesia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>randomized trials</td>
<td>serious(a)</td>
<td>not serious</td>
<td>not serious</td>
</tr>
<tr>
<td>Instrumental vaginal birth</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>randomized trials</td>
<td>serious(a)</td>
<td>not serious</td>
<td>not serious</td>
</tr>
<tr>
<td>Meconium aspiration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>randomized trials</td>
<td>serious(a)</td>
<td>not serious</td>
<td>not serious</td>
</tr>
<tr>
<td>Serious neonatal morbidity or mortality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>randomized trials</td>
<td>serious(a)</td>
<td>not serious</td>
<td>not serious</td>
</tr>
<tr>
<td>No. of studies</td>
<td>Study design</td>
<td>Risk of bias</td>
<td>Inconsistency</td>
<td>Indirectness</td>
</tr>
<tr>
<td>---------------</td>
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<td>---------------</td>
<td>--------------</td>
</tr>
<tr>
<td>2</td>
<td>randomized trials</td>
<td>serious(^a)</td>
<td>not serious</td>
<td>not serious</td>
</tr>
<tr>
<td>1</td>
<td>randomized trials</td>
<td>serious(^a)</td>
<td>not serious</td>
<td>not serious</td>
</tr>
<tr>
<td>2</td>
<td>randomized trials</td>
<td>serious(^a)</td>
<td>not serious</td>
<td>not serious</td>
</tr>
</tbody>
</table>

CI: confidence interval; RR: relative risk
\(a\). All data provided by study/studies with design limitations (–1).
\(b\). Small single study with few events and wide CIs (–2).
\(c\). Small sample size with wide CIs (–2).
\(d\). Small single study (–1).
\(e\). Small sample size (–1).
\(f\). No events (–2).
6. References


