



## Indications for induction of labour

Induction of labour refers to ‘a procedure to artificially start the process of labour by way of medical, surgical or medical and surgical means’ (AHMAC 2012). It is generally undertaken when the risks of continuing the pregnancy are greater than the risks associated with delivery (McDonnell 2011).

Induction is a common intervention that has the potential to act as a cascading factor for further interventions. It is associated with increased fetal and maternal risks and decreased maternal satisfaction, so it is important for clinicians to identify and justify the reasons for induction (McCarthy & Kenny 2013). Maternal factors such as wellbeing, cervical assessment, parity and previous mode of delivery, and fetal factors such as gestational age, growth and wellbeing of the fetus, need to be considered when deciding whether labour should be induced (McCarthy & Kenny 2013). These factors also assist in determining the method of induction, which can be surgical (including artificial rupture of membranes) and medical (including use of prostaglandins and/or oxytocin) (AHMAC 2012; Queensland Maternity and Neonatal Clinical Guidelines Program 2011).

There are numerous indications for induction of labour; in addition, clinical guidelines for induction can vary, both nationally and internationally (Gülmezoglu et al. 2012; NICE 2008; Queensland Maternity and Neonatal Clinical Guidelines Program 2011). Prolonged pregnancy is the most common indication for induction, with births after 42 weeks associated with an increased risk for the baby and a greater number of perinatal deaths (Gülmezoglu et al. 2012). It is widely recommended that induction should be offered for women of 41–42 weeks gestation (Gülmezoglu et al. 2012; NICE 2008 Queensland Maternity and Neonatal Clinical Guidelines Program 2011). Induction of labour may also be recommended for other reasons, including but not limited to: hypertensive disorders; premature rupture of membranes; maternal age; obesity; ethnicity; diabetes; intrauterine growth restriction; fetal distress and fetal death (Mozurkewich et al. 2009; Queensland Maternity and Neonatal Clinical Guidelines Program 2011). Nonetheless, some common indications for induction are not supported by strong evidence—a deficiency that should be remedied in order to obtain a clearer picture of the risks and benefits associated with these interventions (Mozurkewich et al. 2009).

## Significance of induction to maternal and fetal morbidity and mortality

Induction of labour is associated with increased fetal and maternal risks, and less maternal satisfaction (AIHW National Perinatal Epidemiology and Statistics Unit 2013). Different methods of induction carry their own risks (McCarthy & Kenny 2013; Queensland Maternity and Neonatal Clinical Guidelines Program 2011).

Women who undergo induction with prostaglandins may experience uterine hyperstimulation and increased rates of instrumental delivery compared with those who deliver spontaneously. Rates of chorioamnionitis and uterine atony are also increased with induction of labour, with each of these associated with an increased rate of postpartum haemorrhage. Artificial rupture of membranes (ARM) carries an increased risk of cord prolapse, and prolonged exposure to high dose oxytocin in combination with excess administration of hypotonic intravenous fluids puts women at risk of hyponatremia (low blood sodium levels). Induced women with a history of uterine surgery (including caesarean section) are at increased risk of uterine rupture (McCarthy & Kenny 2013; McDonnell 2011; Queensland Maternity and Neonatal Clinical Guidelines Program 2011).

Under the appropriate circumstances, however, induction of labour decreases the maternal and fetal morbidity and mortality risks associated with numerous indications for induction of labour—for example, risks associated with perinatal morbidity and mortality due to prolonged pregnancy, oligohydramnios, suspected intrauterine growth restriction (IUGR) and fetal gastroschisis; and risks associated with maternal morbidity and mortality, such as cardiac disease and hypertensive disorders. Induction may also be undertaken due to fetal macrosomia and pre-labour rupture of membranes (PROM) at term, which affect both maternal and fetal morbidity and mortality (Mozurkewich et al. 2009).

Induction of labour between 41 and 42 completed weeks has been found to result in fewer perinatal deaths, as well as a decreased risk of meconium aspiration syndrome, compared with longer gestations (Gülmezoglu et al. 2012; McCarthy & Kenny 2013).

An increased caesarean section rate has been linked to induction of labour in the past. This is not substantiated by research, however, and recent evidence has shown that for common indications for induction of labour such as prolonged pregnancy, hypertensive disorders and IUGR, the incidence of caesarean section is lower among women who are induced at term or post-term (ACHS 2013; Gülmezoglu et al. 2012; Mishanina et al. 2014). Also, a recent systematic meta-analysis of randomised controlled trials found that induction of labour in women with intact membranes reduced the risk of caesarean section compared with expectant management (Wood et al. 2014). The authors noted that the association between induction of labour and caesarean delivery is largely based on the findings of observational studies, where complications of pregnancy may have independently increased the risk of caesarean section (Wood et al. 2014).

## Maternal risk factors for induction of labour

Maternal risk factors for stillbirth such as advanced maternal age, obesity, diabetes and hypertension provide a foundation for indications for induction of labour (Drysdale et al. 2012). Rates of obesity and average maternal age have risen dramatically in recent years, and both have been linked to increased rates of fetal mortality with prolonged pregnancy (Haavaldsen et al. 2010; RCOG 2013; Yao et al. 2014).

Diabetes in pregnancy is also associated with adverse maternal and fetal outcomes. Conditions such as pre-eclampsia, hypertension and preterm labour are more likely in pregnant women with pre-existing diabetes (NICE 2008). Further, diabetes is accompanied by an increased risk of miscarriage, stillbirth, congenital defects, and neonatal morbidity and death

(Greuter et al. 2012)—all of which are indications for induction of labour. In fact, among the most commonly cited reasons for induction of labour in Australia are hypertension/pre-eclampsia and diabetes (AIHW 2015).

Maternal obesity is associated with numerous pregnancy-related complications including diabetes, hypertensive disorders and a delay in the onset of spontaneous labour, which lead to increased rates of induction of labour (Yao et al. 2014). Obesity is also a risk factor for stillbirth, with a risk that is 2.5 times as high in obese women as in women of normal body mass index (BMI). The risk of stillbirth that is associated with obesity increases with gestational age (Yao et al. 2014); however the risk of stillbirth also increases between each obesity class. For example Yao and others (2014) found that the gestational age at which the risk of stillbirth exceeds the published neonatal death rates is 41 weeks for normal weight and overweight women, 38 weeks for class I obese women, 37 weeks for class II and III obese women, and 36 weeks for women with BMI >50 kg/m<sup>2</sup>. However, the authors noted that more research needs to be done on weight classes and induction times.

In terms of maternal age, older women have been found to experience the highest risk of fetal death throughout pregnancy, particularly in term and post-term pregnancies. Compared with women in their late 20s, the risk of stillbirth at 39–40 weeks gestation is doubled for women aged 40 or more (RCOG 2013). Another study found that the risk of fetal death was 1.4 times as high in women 40–44 years old than in women aged 20–24 in mid pregnancy, and 2.8 times as high at term. The risk was 5.1 times as high at 42–43 weeks in mothers 40 or over (Haavaldsen et al. 2010).

Current clinical guidelines do not recommend induction of labour on maternal request—but this intervention is becoming more prevalent (WHO 2011). Interestingly, the increasing rate of induction is disproportionate to the rate of complications in pregnancy—this disparity may be influenced by induction of labour at maternal request (WHO 2011). Commonly-cited factors for mothers requesting this intervention include patient preferences/convenience, inadequate communication, fear, pressure/influence, trust, external influences and accessibility of technology (Moore & Low 2012). Nonetheless, there is currently very limited evidence of the risks and benefits of elective induction of labour without medical indications (Moore & Low 2012). To have an appropriate response to rising rates of induction of labour it will first be necessary to establish a consistent system of indications for induction.

Induction of labour may be warranted in instances of fetal death in utero or for the termination of pregnancy due to fetal congenital anomalies. This intervention may be used as an alternative to other interventions such as Dilatation and Evacuation (D&E) for reasons such as patient preference, the need for an intact fetus, and if surgical interventions are not accessible (Vargas & Diedrich 2009). In developed nations, the rate of second-trimester abortions is increasing. This has been attributed to developments in pre-natal screening programs for the detection of serious abnormalities and malformations (Vargas & Diedrich 2009; Lalitkumar et al. 2007).

Ethnicity has also been flagged as an indication for induction, with one study finding that the relative risk of stillbirth in South Asian-born women compared with Australian-born women increased progressively with gestation; however, further investigation is needed to determine the mechanisms as to why this may be the case (Drysdale et al. 2012).

## Prevalence/incidence, mortality and trends

The incidence of induction of labour has increased over recent decades, mainly due to an increase in the evidence-base highlighting the risks to both the mother and the baby of not inducing for particular indications, particularly prolonged pregnancy (McCarthy & Kenny 2013).

The incidence of induction of labour varies from country to country, ranging from approximately 6% in third world countries such as Nigeria to approximately 20% in the United Kingdom in 2004–05 (McCarthy & Kenny 2013).

Over one-quarter (28%) of all labours in Australia were induced in 2012 (AIHW 2015). The rate in 1991 was 20%. The leading indication for induction of labour reported in the *Australia's mothers and babies 2013* report (AIHW 2015) was prolonged pregnancy, with rates ranging from 16% to 24% across jurisdictions. This was followed by premature rupture of membranes (ranging from 9% to 16%). Five jurisdictions supplied data.

## Data collection and analysis issues

Induction of labour is captured in the Perinatal National Minimum Data Set (NMDS) item 'Birth event—labour onset type, code N'—therefore all jurisdictions collect this item in a standardised manner and data are comparable across jurisdictions.

For indications for induction of labour, however, there is no Perinatal NMDS item, so data collection is not mandatory for jurisdictions. Although most states and territories capture this item in some form, data collection practices are not standard across jurisdictions and data are therefore not comparable. Some jurisdictions capture indications for induction using a list of response categories while others use a free text field. Some jurisdictions request a main item, while others allow multiple responses. The list of indications also varies between jurisdictions, which makes comparisons even more difficult.

Of those jurisdictions that do collect indications for induction of labour, the 'Other' field is over-used, with rates ranging from 29.3% of records in the Northern Territory to 42.9% in South Australia (AIHW 2015). This limits the usefulness of the data analysis. Any list of indications for induction needs to separately identify the reasons considered important in relation to changing rates of induction of labour. For example, it may be important to isolate those inductions that are for termination due to fetal congenital anomaly or death from other reasons for induction.

Another issue that needs to be kept in mind with collection of this data item is that there are many indications for induction of labour. A long list can be a burden for clinicians and can be difficult for those jurisdictions with paper forms that have little room left for additional data items.

## Data development undertaken through the National Maternity Data Development Project

Following stakeholder consultations in 2011–12 conducted as part of the National Maternity Data Development Project (NMDDP), the data item *Indications for induction of labour* was nominated as a high priority for national standardised collection (AIHW 2014). The need for a standardised list of indications was highlighted as important through these consultations, as well as the need to reduce the heavy population of the ‘other’ and ‘social’ categories used in some jurisdictions.

This data item also received support from all jurisdictions to be taken forward for national standardisation, and was subsequently included on the NMDDP priority data item list for data development. See *Foundations for enhanced maternity data collection and reporting in Australia: National maternity data development project—Stage 1* (AIHW 2014) for more information on the NMDDP priority data item list.

Data development began in 2014 and included consultations with a Clinical and Data Reference Group (CDRG), the NMDDP Advisory Group and jurisdictional stakeholders.

Two national health data standards were developed:

*Birth event—main indication for induction of labour, code N[N] (METeOR identifier 569595)*

*Birth event—additional indication for induction of labour, code N[N] (METeOR identifier 573654).*

(More information about METeOR, the AIHW’s metadata registry, is available on the AIHW website at <http://meteor.aihw.gov.au/content/index.phtml/itemId/181162>.)

The first data element records the main indication for induction. The main indication is specified as the indication that the clinician attending the birth believes to be the primary reason for the induction being performed. Additional indications for induction of labour are conditional on there being more than one reason for which the induction was performed. Up to two additional indications can be recorded. (See Appendix Table 1 for the list of indications.)

The national data standards are included in the National Health Data Dictionary (AIHW 2012) and were included for the first time in the Perinatal Data Set Specification (DSS) 2015–16, for jurisdictions to collect from 1 July 2015 where feasible. While currently optional for collection, it is expected that the data elements will be included in a future Perinatal National Minimum Data Set (NMDS), making them mandatory items for collection once all jurisdictions are able to implement the necessary processes in their collections.



## **Importance of national collection of these data items**

Induction of labour is associated with increased fetal and maternal risks, but is beneficial to both the mother and baby if carried out under the appropriate circumstances. It is important for clinicians to identify and justify the indication for induction of labour to ensure it is warranted.

When all jurisdictions implement the new national standards, collection and reporting of national data will help with monitoring maternal and perinatal outcomes associated with induction of labour and may lead to a better understanding of the determinants for use of the procedure. This will be useful in informing clinical practice and assist in planning health service delivery.

## Appendix

**Table 1: Indications listed in *Birth event*—main indication for induction of labour, code N[N] (METeOR identifier 569595)**

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**Indications for induction of labour**

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Prolonged pregnancy  
 Prelabour rupture of membranes  
 Diabetes  
 Hypertensive disorders  
 Multiple pregnancy  
 Chorioamnionitis (includes suspected)  
 Cholestasis of pregnancy  
 Antepartum haemorrhage  
 Maternal age  
 Body Mass Index (BMI)  
 Maternal mental health indication  
 Previous adverse perinatal outcome  
 Other maternal obstetric or medical indication  
 Fetal compromise (includes suspected)  
 Fetal growth restriction (includes suspected)  
 Fetal macrosomia (includes suspected)  
 Fetal death  
 Fetal congenital anomaly  
 Administrative or geographical indication  
 Maternal choice in the absence of any obstetric, medical, fetal, administrative or geographical indication  
 Other indication not elsewhere classified  
 Not stated/inadequately described

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