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## Management of stillbirth delivery

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### ABSTRACT

Stillbirth is a common adverse outcome of pregnancy. Management should be individualized based on gestational age, maternal condition, prior uterine surgery, availability of skilled professionals, and maternal desires. This article discusses available data on management by gestational age and prior uterine surgery. Expectant management is a viable option for women and families who desire it and do not have any contraindications. In the second trimester, misoprostol induction and dilatation and evacuation are effective in the evacuation of the uterus. In the third trimester, induction of labor with prostaglandins, mechanical dilators, and augmentation with oxytocin is appropriate. Care should be taken with women with prior cesarean delivery; prostaglandins ideally should be avoided. Delivery by cesarean section should be performed selectively, i.e., when there is a maternal indication.

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### Introduction

Stillbirth, defined as fetal death at 20 weeks or more of gestation, is a common adverse outcome of pregnancy.<sup>1</sup> Annually, 2% of deliveries worldwide result in a stillbirth accounting for 3.2 million stillbirths at or beyond 28 weeks of gestation with the majority being in low- and middle-income countries.<sup>2</sup> In the U.S., stillbirth occurs in 1 of 160 pregnancies with close to 26,000 stillbirths annually. The stillbirth rate is 6.05/1000 births (2012) and has remained unchanged since 2006.<sup>3</sup> Third trimester stillbirths have declined slightly in the US from 1990 to 2012, from 4.3 per 1000 births to 2.97 per 1000 births while second trimester stillbirths have remained stable at 3.11 per 1000 births.<sup>3</sup>

Specific etiology of the majority of stillbirths may be unexplained. There are known risk factors for stillbirths,

including maternal, fetal, or placental etiology. Maternal factors such as age, race/ethnicity, obesity, infections, pre-eclampsia, diabetes, and autoimmune diseases have been associated with stillbirths.<sup>4,5</sup> Chromosomal abnormalities, red cell alloimmunization, structural anomalies, and fetal-maternal hemorrhage also contribute to the risks of stillbirth along with several placental causes such as cord pathology, infection, and multifetal gestation.<sup>4–6</sup>

Management of stillbirth is based on gestational age, suspected etiology, maternal history of previous uterine scars, and maternal wishes.<sup>1,7</sup> Care should be individualized and involve the woman and her family in the decision-making process.<sup>7</sup> Many women will prefer to have an immediate delivery. However, some may prefer expectant management or delayed delivery. Between 80% and 90% of women will spontaneously labor within 1–2 weeks of diagnosis of the

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stillbirth. In rare cases, when the latency period is prolonged beyond 4 weeks, retention of a stillbirth may lead to a chronic consumptive coagulopathy due to gradual release of tissue factor from the decidua or placenta into the maternal circulation.<sup>8</sup> Coagulation abnormalities occur in about 3–4% of patients with uncomplicated stillbirth  $\geq 24$  weeks with expectant management more than 3 weeks, and is increased with the presence of placental abruption or uterine perforation.<sup>8</sup> A disadvantage of expectant management is the potential long interval between fetal death and spontaneous labor, which limits the information that can be obtained about the cause of death from a postmortem examination of the stillbirth.<sup>4</sup> In women opting for spontaneous labor (especially with greater than 4-week interval between fetal death and time of delivery) surveillance is recommended such as weekly office visits, home assessment of maternal temperature, and patient reporting of abdominal pain, bleeding, or other concerning symptoms.<sup>7</sup> The benefit of serial laboratory tests, such as fibrinogen or platelet count for the follow-up of patients with expectant management is uncertain. Screening for coagulopathy (fibrinogen level, platelet count, prothrombin time, and activated partial thromboplastin time measurement) should be obtained prior to invasive procedures as well as neuraxial anesthesia.<sup>8</sup>

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### Management of second trimester stillbirth

Numerous studies have examined the management options for uterine evacuation in the second trimester, primarily extrapolated from management of second trimester terminations.<sup>1</sup> Summary of protocols for stillbirth delivery are summarized in the [Table](#).

In comparing induction of labor and dilation and evacuation (D&E) procedures, complete delivery within 24 h and complication rates are used as measures. In the hands of experienced providers, D&E is associated with lower rates of complications<sup>7</sup> in a study of women undergoing termination of pregnancy between 14 and 24 weeks of gestation; there was a 4% rate of complications with surgical termination compared to 29% in women undergoing labor induction.<sup>9</sup> Surgical evacuation was associated with less failure of the initial method for delivery and retained products of conception. Surgical termination and labor induction were similar with regard to the need for blood transfusion, infection, or readmission. Placement of laminaria is associated with a lower risk of complications from D&E. In a cost effectiveness analysis, D&E was less expensive and more effective than misoprostol induction of labor for second trimester delivery.<sup>10</sup> The rate of complications appears not to be increased in subsequent pregnancies after D&E, although studies are limited.<sup>11,12</sup>

In a review of the literature of the benefits and harms of labor of induction for stillbirth, the best protocol for induction was a combination of mifepristone and misoprostol with the shortest induction–expulsion time and increased rates of complete emptying of the uterus within 24 h.<sup>13</sup> A Cochrane review of misoprostol use for induction of labor, found that vaginal misoprostol was as effective as other prostaglandins

and more effective than oral administration.<sup>14</sup> The vaginal route has more advantages including reaching a sustained level for long duration and fewer side effects.<sup>14</sup> In a descriptive retrospective study examining the management of 171 stillbirth pregnancies in the second or third trimester, misoprostol had a shorter mean induction to delivery interval and required a lower total dose of misoprostol than misoprostol and oxytocin in women with unfavorable cervix.<sup>15</sup> For induction of labor less than 28 weeks' gestation, misoprostol is the most efficient method of induction, regardless of Bishop score.<sup>1,16</sup> Typical dosing of vaginal misoprostol is 200–400  $\mu\text{g}$  every 4–12 h in women without prior uterine scars.<sup>1,16</sup> Misoprostol use is associated with a lower complication rate in women undergoing medical termination.<sup>7</sup> In a systematic review of multiple induction methods performed by Ponce de Leon and Wing in 2009, oral and vaginal misoprostol each had a 100% success rate in uterine evacuation at 48 h. Though differing doses were used in most of the studies, one trial comparing 400  $\mu\text{g}$  dose to 600  $\mu\text{g}$  did not show a statistical difference in time to uterine evacuation.<sup>17</sup>

In a prospective cohort study, the grief response after induction of labor or D&E in women undergoing termination of pregnancy for fetal anomalies was assessed and there were no significant differences in grief resolution among patients who chose either method.<sup>18</sup> The method of delivery should be based on the patient's wishes as long as provider experience and gestational age allows D&E to be a viable option.

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### Management of third trimester stillbirth

The ideal management for stillbirths that occur after 28 weeks' gestation has not been determined; however, cesarean delivery should be avoided unless medically necessary for maternal indications. ACOG recommends that induction of labor be managed according to usual obstetrical protocols.<sup>1</sup> Medications such as oxytocin and/or prostaglandins administered for induction of labor can be given according to standard obstetric protocols.<sup>1,16</sup> Cervical ripening is indicated if the cervix is unfavorable based on Bishop's score. Cervical ripening agents such as prostaglandins and mechanical dilators such as laminaria and Foley catheters have been used, though comparison studies are insufficient.<sup>1,16</sup> Although, misoprostol has been well studied in the second trimester terminations and stillbirth, it has been poorly studied in the third trimester. Most studies have variable doses, routes, and frequency of misoprostol for labor induction in women diagnosed with stillbirth, which makes identifying a standard regimen difficult. A recent study by Gawron and Kiley<sup>19</sup> compared the different induction methods for efficacy and adverse outcomes. A review of the management of 74 women who were diagnosed with stillbirth at one institute over a 3-year period was performed comparing oxytocin and amniotomy, misoprostol alone, misoprostol for induction followed by oxytocin and amniotomy, mechanical ripening with Foley catheter followed by oxytocin and amniotomy, amniotomy alone, mifepristone in and out of the hospital. Oxytocin and amniotomy was most frequently used in older women, later gestational age, and more favorable

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