Management of Pregnancy after Loss

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KEYWORDS

• Pregnancy after stillbirth • Stillbirth • Perinatal death • Second trimester miscarriage • Perinatal grief

KEY POINTS

- Women with a history of stillbirth or late pregnancy loss face significantly higher risks in subsequent pregnancies, including recurrent pregnancy loss, preterm birth, and pre-eclampsia.
- Pregnancy after loss is emotionally complex for mothers and partners, marked by anxiety, grief, and trauma. Emotional support and validation throughout pregnancy are critical.
- Specialist pregnancy after loss clinics provide a multidisciplinary, personalized approach integrating medical surveillance, emotional support, and continuity of care.
- Preliminary data from pregnancy after loss clinics show improved pregnancy outcomes and high patient satisfaction.
- Future research into pregnancy after loss should be codesigned with families and focus on both biomedical and psychological outcomes to improve care and reduce recurrence.

INTRODUCTION

This article aims to provide an overview of the management of pregnancy after loss updated to include the most recent literature. To understand the reasons underpinning the need for additional focus on pregnancy after loss, the biomedical risks and the psychological, social, and economic consequences are outlined, and parents' experiences of care in pregnancy loss described. The article will then present a model of care for pregnancy after loss, including the key components for provision of optimal antenatal care. Finally, the article will consider the key unanswered research questions in the management of pregnancy after loss.

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Abbreviations	
aOR	adjusted OR
CI	confidence interval
PTSD	posttraumatic stress disorder
RCTs	randomized controlled trials
TFMR	termination of pregnancy for medical reasons

Defining Pregnancy After Loss

There is no robustly established definition of pregnancy after loss (PAL); thus, it may mean different things when used by parents or professionals. For the purposes of this article, the term is used to define a pregnancy occurring after the death of a previous baby during or after the second trimester including stillbirth (fetal death occurring before birth), neonatal death (death in the first 28 days of life), and termination of pregnancy for medical reasons (TFMR). This is not to downplay the importance for some parents of pregnancy after loss following miscarriage in the first trimester, but the risks of subsequent loss, causes of underlying loss, and consequences for future pregnancies are different following pregnancy loss prior to the second trimester.

Biomedical Risks of Pregnancy After Loss

High-grade evidence (systematic-reviews of observational studies) demonstrates increased risks of recurrent stillbirth and second-trimester loss. Lamont and colleagues'[1] 2016 systematic review included 13 cohort and 3 case–control studies of 3,412,079 pregnancies. Of these, 99.3% ended in a previous live birth and 2541 (0.7%) in stillbirth (defined as per study location). The risk of subsequent stillbirth was 2.5% in women with a history of stillbirth and 0.4% in women with a history of live birth giving a pooled odds ratio (OR) of 4.83 (95% confidence interval [CI] 3.77–6.18). In addition, Black and colleagues[2] used the Aberdeen Maternity and Neonatal Databank to explore risks of other pregnancy complications in 364 women with a stillbirth in their first pregnancy compared to those with a live birth (n = 33,715). This study found that women with previous stillbirth had an increased risk of pre-eclampsia (OR 3.1, 95% CI 1.7–5.7), preterm birth (OR 2.8, 95% CI 1.9–4.2), low birthweight (OR 2.8, 95% CI 1.7–4.5), placental abruption (OR 9.4, 95% CI 4.5–19.7), and induction of labor (OR 3.2, 95% CI 2.4–4.2). A further study using the Swedish Medical Birth Registry demonstrated that increased risks of having a further stillbirth (adjusted OR [aOR] 2.35, 95% CI 1.68—3.28), small for gestational age infant (aOR 1.93, 95% CI 1.66–2.24), preterm birth (aOR 2.05, 95%CI 1.85–2.28) and pre-eclampsia (aOR 1.89, 95% 1.61–2.21) persisted in second and third pregnancies after a stillbirth compared to women who had a live birth.[3] Although, most of these studies were from high-resource, low-burden settings, more recent studies from Africa also show increased risk. A cohort study of 1091 women in Ethiopia demonstrated that 14.3% of women with a history of stillbirth developed gestational diabetes and 9.2% developed pregnancy-induced hypertension.[4] A cross-sectional study of stillbirths in Zimbabwe found that 39 out of 43 women who had a stillbirth had a prior history of stillbirth compared to 29 out of 1691 women who had a history of prior live births (aOR 2628.9, 95% CI 342.8–20,163.0).[5] These studies suggest that the increased risk of recurrent stillbirth and adverse pregnancy outcome persist in high-burden settings, and may even be greater than estimates derived from high-resource, low-burden countries.

Compared to the risk of recurrence of late stillbirth, less is known about the risks of recurrence for second trimester pregnancy loss and TFMR. A systematic review

included 10 studies that reported on 12,004 subsequent pregnancies after a second trimester pregnancy miscarriage.[6] Meta-analysis of cohort studies generated estimated outcome frequencies for women with a previous second trimester loss as follows: live birth 81% (95% CI: 64–94), miscarriage 15% (95% CI: 4–30), and preterm birth 13% (95% CI: 6–23). The pooled OR for preterm birth in subsequent pregnancy after second trimester loss in case–control studies was 4.52 (95% CI: 3.03–6.74).[6] A case–control study using the Aberdeen Maternity and Neonatal Database including 65,592 women with first and second pregnancies recorded from 1950 until 2017 found that second trimester miscarriage (aOR 2.25, 95%CI 1.53–3.19), pre-eclampsia (aOR 2.24, 95%CI 1.91–2.61) and spontaneous preterm birth were significantly higher in the second pregnancy following an initial second trimester miscarriage (aOR 2.55 [95% CI 1.81–3.50]; $P < .01$).[7] A study using the same data-source found women who had a TFMR in their first pregnancy were significantly more likely to have a subsequent TFMR in their next pregnancy (aOR 6.59 [95% CI 2.54–13.99]; $P < .01$), but there was no increased risk of spontaneous preterm birth, pre-eclampsia, antepartum hemorrhage, early miscarriage or small for gestational age neonate in second pregnancies.[8]

The reasons for the increased risks in subsequent pregnancies following a prior pregnancy ending in pregnancy loss are incompletely understood. However, the increased risk of adverse outcomes are likely to be affected by the persistence or worsening of maternal medical conditions (such as hypertension and diabetes) or risk factors (raised maternal body mass index), recurrent placental disease (eg, maternal vascular malperfusion, fetal vascular malperfusion, and inflammatory conditions), or genetic conditions (including chromosomal disorders and single gene disorders).[9–11] The increased risks of recurrence justify increased screening for maternal medical complications (hypertension and gestational diabetes) and fetal growth restriction in pregnancies following stillbirth or second trimester pregnancy loss.

Given the increased risks of pregnancy after loss, parents are frequently counseled to delay subsequent conception, assuming that extending the interpregnancy interval will reduce the likelihood of subsequent pregnancy complications. However, data from Australia, Finland, Norway, and the United States indicate that there is no relationship between interpregnancy interval and the risk of preterm birth, pre-eclampsia and a small for gestational age infant and interpregnancy intervals less than 24 months.[12] However, a survey of 275 parents from the United States found that the majority of parents received information about a recommended interpregnancy interval, with a median recommendation of 6 months (interquartile ratio: 2–9); for the 27% of respondents who gave birth by Caesarean section, the recommended interpregnancy interval was a median of 9 months, with the primary reason for IPI reported as the need to heal (74%).[13] Practitioners should be aware that the duration of interpregnancy interval does not affect biomedical risk of adverse pregnancy outcome and amend their counseling accordingly.

Psychological Consequences of Pregnancy After Loss for Mothers and Partners

The psychological consequences of pregnancy loss for mothers have been extensively studied; the full description of which is beyond this article. A systematic review and metasynthesis of 14 studies regarding women's experiences in pregnancy after loss identified 3 main themes: coexistence of emotions, helpful and unhelpful coping activities, and seeking reassurance through interactions with care providers, their baby, and technology.[14] More recently, studies of partners' experiences have described two themes: "If she's happy, I'm happy, feeling supported" where partners described taking on the role as the supporter to the birthing mother, and "Guided

…out of the shadows" where partners expressed the need to feel included in maternity care and to also have access to support.[15]

Subsequent studies have reinforced the challenging experience of pregnancy after loss for mothers. Thematic analysis of 1065 threads posted on Reddit emphasized the central impact of uncertainty, generated by the trauma of their pregnancy loss and the possibility of future loss.[16] The positive feelings of others (about the pregnancy of loss) contrasted with this uncertainty leaving parents needing to manage multiple emotions simultaneously, and in some cases, they were uncertain what they "should be feeling." Parents described navigating this uncertainty by information seeking from health care professionals or peers, developing mantras and reducing the periods in between appointments and having a clear plan for their pregnancy after loss.[16]

Studies employing quantitative approaches to describe anxiety, depression and posttraumatic stress disorder (PTSD) have found high levels of anxiety, depression, and PTSD in women and their partners during pregnancy after loss.[17,18] For mothers, the levels of anxiety and depression appear to be highest in early pregnancy and fall reaching lowest levels in the postnatal period, whereas levels of PTSD were unchanged and persisted into the postnatal period. Partners were more likely to hide their emotions in pregnancy after loss.[18] A study of 29 women found that negative psychological symptoms such as active grief, difficulty coping, and despair were influenced by prenatal psychological state, social connectedness, and perception of self-blame.[19] These findings emphasize the importance of counseling and social support after the death of a baby and into a subsequent pregnancy.

PARENTING A LIVE BABY AFTER PAL

Parenting following perinatal death, specifically stillbirth, is underresearched, but in terms of the ongoing impact of PAL, it forms a critical part of parents' experience. A qualitative study of couples, who were the biological parents of a stillborn baby and at least one subsequent live baby aged under 5 years employed interpretative phenomenological analysis to describe 6 parents' experiences.[20] The study described 4 main themes, first, "Back to the starting line: pregnancy as a means to an end" captured parents' desire to bring a live baby home with pregnancy being experienced alongside fear, trauma, and grief. To protect themselves from further hurt, parents described how they often referred to their baby in hypothetical terms during subsequent pregnancies, if they made it home. Due to fear of future loss, all parents spoke of a lack of fetal attachment in pregnancy, impacting on the connection with their baby. The second theme "Reality hits" encapsulated the experience of arriving home and feeling overwhelmed by the demands of a newborn baby. All participants spoke of a pressure to be grateful for their subsequent baby, which was often conflicted with the struggles of parenting. Guilt was spoken of as multifaceted; triggered by finding the experience of caring for a live baby difficult or frustrating, and further triggered by having less time to dedicate to their stillborn baby. The third theme "Being a living and loss parent" captured the experience of being a parent to both a living and nonliving baby. Some parents described managing the demands of their liveborn well, and others described feeling torn between parenting both babies. The feeling of sorrow was described to run in parallel with joy when parenting, which also contributed to parents' feelings of guilt. The final theme was "Protection: 'I need him there next to me, so I know he's alive'" represented the fear some parents felt when parenting. This theme includes descriptions of how parents managed their own anxiety or sense of risk, particularly in parenting strategies or behaviors, such as being overcautious when their child is exploring or limiting experiences that may hold risk. This study

highlights the complexities of being a parent to a live baby after a stillborn baby with difficulties arising in bonding, and managing emotional distress linked to trauma and grief. Importantly, psychological therapy to manage well-being was noted by some participants to be beneficial, though further research into psychological interventions designed to support families following previous stillbirth is needed.

PARENTS EXPERIENCES OF CARE IN PREGNANCY AFTER LOSS

Parents' experiences of care in pregnancy after loss varies widely. Wojcieszek and colleagues[21] described a survey of 2716 parents from 40 high-income and middle-income countries. The most common interventions were additional antenatal visits and ultrasound scans that were provided for 67% and 70% of all parents. However, care addressing parents' psychosocial needs were less frequent. Only 47% to 63% of respondents felt that elements of quality, respectful care were consistently applied, for example, being given information they needed, spending enough time with parents, involvement in decision-making, and being listened to. Furthermore, these proportions varied with geographic location, being highest in North America and lowest in Latin America. Importantly, parents whose stillbirth occurred at 30 weeks' or greater were more likely to receive additional care, particularly the option for early delivery after 37 weeks' gestation.

A survey of 547 women in the United Kingdom found that respondents saw a range of professionals at their first appointment, with 42.2% seeing a consultant obstetrician.[22] However, only 51.7% women felt at least "well prepared" for their pregnancy after attending their first antenatal visit. About 73.5% of respondents considered that the frequency of their antenatal appointments was appropriate, although 21.9% wanted to be seen more often; only 2 women believed that they had too many appointments. Overall, 74.7% of respondents had additional surveillance including additional ultrasound scans and antenatal appointments (68.5%). Only a small proportion of women reported input from specialist midwives (12.6%), attending standard or specialist antenatal classes (10.6%), or accessing bereavement counseling (8.2%). In addition, many women (56.9%) contacted health professionals such as hospital maternity triage or day units, with concerns about their own or the baby's health during pregnancy. Non–health care support and information was accessed by 41.9% of women during their pregnancy indicating that some parents sought alternative sources when antenatal care did not meet their needs.[22]

RESOURCE USE AND ECONOMIC IMPACT OF PAL

Due to the increased biomedical risks and incidence of psychological symptoms in pregnancy after loss it is unsurprising that care for pregnancy after loss has an economic impact. Roseingrave and colleagues[23] reviewed 145 pregnancies following stillbirth in a tertiary center in Ireland. They found the number of antenatal appointments was twice that expected (10 vs 5), and women had a median of 5 ultrasound scans (range 0–29). Induction of labor and Caesarean Section (CS) rates were higher than rates for women who did not have a history of stillbirth (48.1% vs 26.4% and 40.5% vs 30.9%, respectively). In addition, the high rates of preterm birth (22.9%) and neonatal unit admission (25.5%) have important resource implications for the neonatal period. A survey of 174 women in Norway who had completed a pregnancy after stillbirth, 362 who had a prior live birth, and 365 nulliparous women echoed these findings; women with a history of stillbirth had more frequent antenatal visits (10 vs 6 contacts). They were 2.5 times more likely to have a planned CS and 9.5 times more likely to have induction of labor than women who had a history of live birth.[24]

The increased rate of antenatal consultation and birth intervention have important implications for resource use and economic cost of delivering care in pregnancy after loss. A 2013 study modeling the economic impact of stillbirth found that costs in the pregnancy following a stillbirth were greater than the costs of providing care for the initial loss.[25] The cost in the next pregnancy following a stillbirth was at least 1.5 times greater than for a woman who had a live birth in a previous pregnancy, and stillbirth due to a recurrent or an unknown cause was almost 16% greater than the pregnancy following a stillbirth due to a known nonrecurrent cause.[25] A model of care which is able to meet parents' psychological needs and reduce the risk of preterm birth and neonatal unit admission would not only improve outcome, but could reduce the resource use and consequent economic impact of care after stillbirth.

DESCRIPTION OF RAINBOW CLINIC MODEL OF CARE

The Rainbow Clinic model of care was initially established in 2013 based upon description of parents' positive experiences of care in pregnancy after loss combined with enhanced screening for placental-mediated disease; the model of care has subsequently undergone iterative development (**Fig. 1**).[26] Ideally, the care pathway commences following the initial loss, ensuring appropriate investigations are undertaken to determine the cause of the pregnancy loss. The panel of investigations should be individualized to the circumstances of the loss, but autopsy, histopathological examination of the placenta and genetic analysis are among the most informative investigations for spontaneous pregnancy losses and stillbirth.[27] The results of these investigations should then be fed back to the parents at a postnatal appointment. If the parents wish, this can include planning for a future pregnancy. If they wish to do this, it is good practice to write to the parents, using appropriate language, to summarize the results of the investigations, the cause for their baby's death (if known) and a plan for a future pregnancy.[27]

Early engagement with antenatal care should be encouraged so that the location of the pregnancy can be confirmed, the mother's history reviewed, and any therapy (eg, aspirin or low molecular weight heparin) can be commenced in the knowledge there is a viable intrauterine pregnancy. Where necessary women should be referred to smoking cessation services, as it is recognized that women with a history of stillbirth are more likely to stop smoking than those who have had a live birth.[28] In subsequent engagements, parents value continuity of care so that they do not have to repeatedly describe their pregnancy history to new health care professionals.[29,30] Routine care including first trimester dating ultrasound scans, nuchal translucency assessment, aneuploidy screening, routine screening for anemia and infections, and fetal anomaly ultrasound scan should be undertaken. In addition, women are offered placental assessment by uterine artery Doppler screening, assessment of placental size and morphology, assessment of fetal growth, and umbilical artery Doppler at approximately 23 weeks' gestation. In some instances, this may be undertaken earlier (at approximately 17 weeks' gestation when decisions may be made about therapies, eg, reducing prednisolone in the case of chronic histiocytic intervillositis[31]). If the ultrasound scan shows normal fetal size, uterine artery Doppler and placental size, then subsequent scans are planned to check fetal growth throughout pregnancy usually at 28, 31, 34, and 36 weeks' gestation.[26] If fetal size is less than 10th centile or uterine artery Doppler or placental morphology is abnormal, the likelihood of early onset placental disease (fetal growth restriction or pre-eclampsia) is increased,[32] so growth scans are commenced from 26 weeks' gestation and continued at regular intervals.

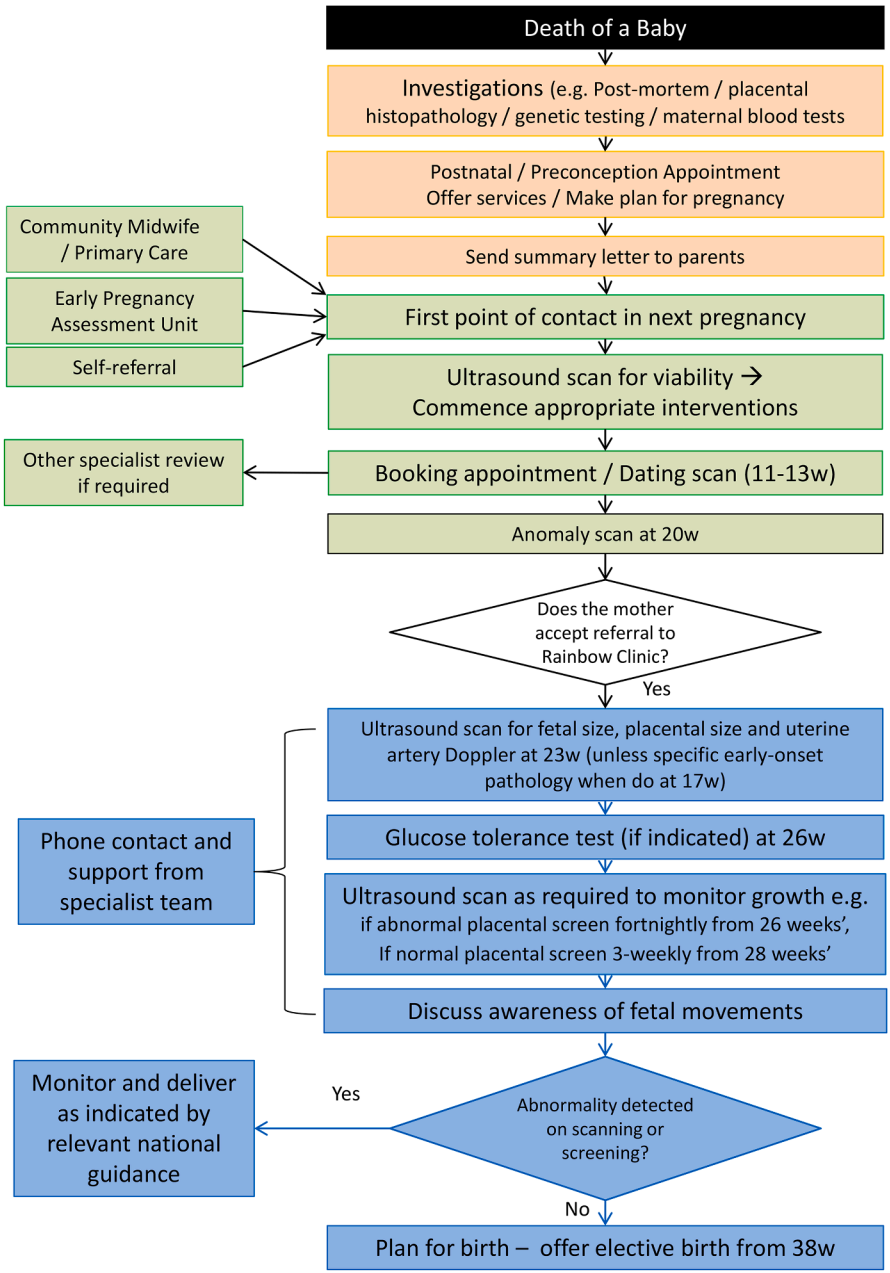

Fig. 1. Pathway indicating how parents are cared for in pregnancy after loss. The onset of care begins after the death of a baby and initial involves determining the cause of the death and planning for subsequent pregnancies informed by the postnatal investigations (orange boxes). Following the onset of pregnancy initial interventions are completed (green boxes) and then parents are seen in a specialist pregnancy after loss service (blue boxes). (Graham N, Stephens L, Heazell AEP. Care in pregnancies subsequent to stillbirth or perinatal death. The Obstetrician & Gynaecologist 2021; 23: 48–59. https://doi.org/10.1111/tog.12708.)

Using serial scanning preliminary data indicates that prediction of adverse pregnancy outcome improves with information from additional scanning.[33] At each appointment, blood pressure and urine should be checked to identify hypertension or proteinuria. In the third trimester, women should be given information about fetal movements, and what to do in the event of reduced fetal movement. Parents value the opportunity for additional monitoring of fetal growth and fetal heart rate monitoring if indicated (**Table 1**).

An individualized plan for birth should be discussed which should consider the gestation of the initial stillbirth, the cause, fetal growth, maternal complications in the current pregnancy, and parents' wishes. As noted earlier, women in pregnancy after loss have increased rates of induction of labor and CS birth, which may reflect a desire to avoid a repeat adverse outcome (eg, placental abruption or intrapartum stillbirth) or to avoid the pregnancy continuing to the gestation of loss (eg, in a postterm stillbirth). Women should be provided with evidence-based information to make an informed choice about the mode and timing of delivery as this can help them to feel empowered in the decisions about their birth.[22] Written birth plans are used to aid communication with the professionals providing inpatient and intrapartum care, with the aim of increasing staff awareness of the families' journey in pregnancy after loss and their needs with regard to additional reassurance and communication at this time.[34] It may also be beneficial to offer a visit to the labor suite or maternity theaters to reduce women's anxiety around birth.

Although there have not been any comparative studies, qualitative studies of parents' experiences in pregnancy after loss highlighted staff behaviors that are valued (shown in **Table 1**). These include sensitive communication such as engaging with all family members, acknowledgment of the impact of the prior loss and validation of their feelings and using their dead baby's name (if given). A qualitative study of 16 women in a pregnancy after loss described that patient-centered communication in this context represents a philosophy of care that recognizes not only acknowledging the prior losses but also understanding how that loss influences their current experience. This study highlighted the value of active listening, exploration of parents' feelings and therapeutic action (communicated reassurance, resources, and information provision). All these aspects of communication need to be embedded within compassionate care. Valued aspects of service organization include continuity of carer, ease of access to the service, for example, phone or email contact, identification of pregnancy after loss within the health care record, provision of information, and access to peer support. Identification of a pregnancy after loss is achieved by adding an icon or sticker to the health care record to alert other professionals to the woman's loss to try and avoid any insensitive discussions or repeating of her history, as this may cause additional anxiety or distress.[14]

ROLE OF DIFFERENT MEMBERS OF THE MULTIDISCIPLINARY TEAM IN RAINBOW CLINIC

As the Rainbow Clinic model of care involves different elements of care including pharmacologic interventions, ultrasound scanning, psychological and emotional support, and birth planning it needs to be delivered by a trained, multidisciplinary team. The members of the multidisciplinary team will change depending on the health care system. In the United Kingdom, the care is predominantly given by obstetricians or maternal fetal medicine specialists and midwives, with support from physicians, counsellors, mental health care teams and health psychologists when required.[26] In the United States, nurses and social workers may also be involved.

Table 1
Summary of health professional's behaviors and approaches identified by positive service user experience in pregnancies after stillbirth

Area	Approach/Behavior
Knowledge	Appreciation of the psychological impacts of pregnancy after loss (anxiety, depression, and PTSD) and access to mitigating strategies for example, counseling, psychological support
	Understanding of causal pathways for stillbirth, how these impact on risk of adverse outcome in subsequent pregnancies and provide relevant therapeutic approaches to reduce risk (eg, aspirin, and low molecular weight heparin)
Sensitive communication and conduct	Engagement with other family members, partner, living children, and so forth
	Acknowledgment and discussion of previous loss
	Use of previous baby's name
	Emotionally supportive relationship with carers; ability to address uncertainty parents feel about the outcome of prior pregnancy
	Validation that similar feelings were experienced by other parents with a history of previous pregnancy loss
Organization of services	Easy to access by various means (call/text/email)
	Continuity of carer (obstetrician and midwife)
	Flexibility of appointments in terms of number and timing of contacts
	Provision of accessible information
	Access to tools to assess maternal psychological state and bonding with her baby; access to specialist services when a problem is identified
	Ability to avoid contact with pregnant women with no history of loss
	Access to peer support/Signposting to relevant organizations
	Involvement of partner and wider family members if desired by mother
Monitoring and surveillance	Increased visits for cardiotocography/nonstress test or blood pressure tests
	Increased access to ultrasound scans

Alexander E.P. Heazell et al., Care in pregnancy after stillbirth, Seminars in Perinatology, 48 (1), 2024, 151872, https://doi.org/10.1016/j.semperi.2023.151872.

The Rainbow Clinic Specialist Midwife is the named contact for the caseload of women receiving care with the Rainbow Clinic and provides flexible holistic support for families within and alongside their main appointments. Women contact the Rainbow midwife at the time of finding out about their new pregnancy; the midwife then arranges the initial scan and a booking appointment. The Rainbow Clinic midwife is available via telephone and email for emotional support, and questions or concerns that may be raised by women at any time during their pregnancy. As parents are at an

increased risk of experiencing depression, anxiety, PTSD, and bonding difficulties in pregnancy after loss,[18] the Rainbow Clinic midwife can direct women and their families to sources of social and psychological support specific to pregnancy after loss as well as arranging referrals to mental health and counseling services with their consent if this is indicated.

When women attend the Rainbow Clinic for their scheduled appointments and ultrasound scans, the Rainbow Clinic midwife is present alongside the obstetrician for the duration of the appointment to perform routine antenatal checks and contribute to holistic support given to the family. This multidisciplinary approach to appointments ensures that the midwife is up to date with the discussions so that they are aware of any developments in the woman's care and are fully informed of any concerns ahead of any contact they may have with the woman outside of the clinic. In addition, women can arrange additional appointments with the Rainbow midwife outside of their obstetric appointments for emotional support; this is flexible to the women's needs, for example, around the gestation of their loss and can be as much or as little as each individual needs but is highly valued by women.[34]

The Rainbow Clinic service has also included a clinical psychologist who was based in clinic alongside medical colleagues. They offered specialist psychological support to families on the pathway and were able to manage risk with liaison by mental health midwives in the hospital. Onward referrals were also facilitated following a triage assessment of an individual's needs; an initial period of direct psychological support proved effective with good qualitative feedback.

Continuity of carers in pregnancy after loss has been frequently cited as a significant positive factor in women's care and the value of being seen by a trusted, empathetic specialist clinician is considered highly for these families.[35] The importance of a multidisciplinary approach is emphasized by a feasibility study of continuity of midwifery-care in isolation in pregnancy after loss, which did not show improvements in biomedical or psychological outcomes for participants.[36] Although, the intervention was acceptable to service users and staff, its effectiveness was limited by wider service pressures, staff turnover, and challenges with maintaining direct contact with service users. Future evaluations should evaluate a complete multidisciplinary service model as this appears to be valued in qualitative descriptions of specialist pregnancy after loss care.

BIOMEDICAL OUTCOME OF RAINBOW CLINIC MODEL OF CARE

Initial analysis indicates that applying a specialist model of care in pregnancy after loss is associated with improvements in pregnancy outcome. Using a prepost evaluation comparing 94 women with a history of perinatal death prior to the introduction of Rainbow Clinic and 84 women afterward.[37] On average, women had 5 appointments in Rainbow Clinic (range 1–10), 51 (61%) had aspirin and 10 (12%) had low molecular weight heparin.

Two out of the 94 pregnancies before Rainbow Clinic ended in stillbirth, whereas none occurred in women who attended Rainbow Clinic. Prior to Rainbow Clinic, 12% of infants were small for gestational age and 20 out of 94 (21%) were born preterm. After Rainbow Clinic, 8 out of 84 (10%) were born preterm with an average gestation of 37 weeks 5 days (range 28–40 weeks); 6 infants needed neonatal unit admission (7%). Thirty nine out of 84 women opted for IOL (46%), and 14 elective CS (17%).[37] A more recent study from Birmingham in the United Kingdom, which included 64 participants prior to the inception of Rainbow Clinic and 87 after Rainbow Clinic. This study demonstrated increased gestational age at birth (38 weeks 0 days vs

37 weeks 3 days, $P = .004$) and fewer preterm births less than 32 weeks' gestation (2% vs 13%, $P = .02$). Overall, women who attended Rainbow Clinic had fewer adverse pregnancy outcomes (18% vs 33%, $P = .04$).[38] This study was strengthened by additional analysis of women (n = 15) who were eligible for Rainbow Clinic, but who continued with routine antenatal care. These women had higher rates of preterm birth (20%), postpartum hemorrhage (27%) and neonatal unit admission (33%) than women who attended Rainbow Clinic.[38] These small single-center studies provide preliminary data regarding the effectiveness of a model of specialist pregnancy after loss care. Larger scale comparative studies incorporating health economic analyses are needed to determine the effectiveness of specific models of care.

PSYCHOLOGICAL OUTCOMES OF RAINBOW CLINIC MODEL OF CARE

In addition to evaluation of the maternal and neonatal outcomes of infants, parents' experiences of attending Rainbow Clinics has been described. Four-hundred and fifty-six participants completed a 13 item questionnaire between July 2016 and June 2021. This demonstrated a high mean patient experience score per quarter of 21.1 out of 25 ($\pm$3.0).[39] Content analysis of free-text responses demonstrated service-users felt positively about the antenatal care received. Identified areas for improvement included "more awareness of the [Rainbow] sticker" to ensure women with previous loss are identified, increased publicity of the Rainbow Clinic services and continuing specialist input into intrapartum care. This was echoed by qualitative studies of women attending specialist pregnancy after loss services in Australia and the United Kingdom who recognized the value of the additional support for themselves and their partners, with the emotionally supportive relationships with staff instilling hope for a positive outcome in their subsequent pregnancy and allowing women to regain control over their situation.[29,30]

FURTHER RESEARCH QUESTIONS

A systematic review to assess the effects of different interventions or models of care prior to and during subsequent pregnancies found a paucity of data from randomized controlled trials (RCTs; 10 studies including 222 participants).[40] All of the studies assessed pharmacologic interventions and were underpowered to detect adverse outcomes; thus, the quality of evidence was graded as very low to low. This highlights an urgent need to conduct high-quality studies to evaluate interventions in pregnancy after loss.

An international research priority setting exercise involving 79 health care professionals, researchers and advocates identified 5 topics that were rated as "important and urgent" by a significant proportion of respondents, these were medical therapies for placental dysfunction (81%); additional antepartum fetal surveillance (80%); the development of a core outcomes dataset for stillbirth research (79%); targeted antenatal interventions for women who have risk factors (79%); and calculating the risk of recurrent stillbirth according to specific causes of index stillbirth (79%).[41] There was a recognition that while RCTs were the "best way" to evaluate medical therapies (by 72% of respondents), fewer respondents thought that this approach was ethical (63%) or feasible (52%). Respondents indicated that RCTs were not the best way to evaluate models of care or psychological support for parents in pregnancy after loss.[41] Given the challenges of feasibility and ethical conduct of studies in pregnancy after loss, it is essential to involve people with lived experience of pregnancy loss to codesign studies and determine research priorities for pregnancy after stillbirth.

SUMMARY

In conclusion, pregnancy after loss presents complex biomedical, psychological, and social challenges that demand a nuanced and compassionate approach to care. There is consistent evidence that a prior history of pregnancy loss increases risks of adverse outcomes, including recurrent loss, preterm birth, and placental complications, which justifies enhanced surveillance and tailored interventions. However, equally important are the psychological impacts on parents who navigate grief, anxiety, and uncertainty throughout subsequent pregnancies and into parenting.

The Rainbow Clinic model provides an example of a multidisciplinary, patient-centered approach that addresses both medical and emotional needs, offering continuity of care, specialized monitoring, and empathetic support. Preliminary data suggest improvements in pregnancy outcomes and high levels of patient satisfaction, underscoring the value of such integrated services. However, significant gaps remain in the evidence base, particularly regarding the effectiveness of specific pharmacologic interventions, specific psychological interventions, and models of care.

The lack of robust RCTs and ethical challenges in conducting such research highlight the need for innovative methodologies and codesigned studies with bereaved families. Future research must prioritize understanding the mechanisms of recurrent pregnancy loss, evaluating psychological support strategies, and assessing the cost-effectiveness of specialist services.

Best Practices

What is the current practice for pregnancy after loss?

Current practice for pregnancy after loss is highly varied, practitioners may offer additional antenatal visits and ultrasound scans. A significant proportion of parents do not feel that elements of quality, respectful care were consistently applied in pregnancy after loss.

Best practice objective(s)

To provide access to specialist maternity services that mitigate the increased risk of adverse biomedical outcomes and negative psychological impacts of pregnancy after loss.

What changes in current practice are likely to improve outcomes?

Provision of specialist, multidisciplinary care that addresses the cause of the initial loss and screens appropriately for maternal and fetal complications in a subsequent pregnancy. Addressing parents' psychological needs including addressing anxiety and uncertainty about subsequent pregnancy outcome, by providing an individualized plan of care.

Is there a clinical algorithm?

The article describes a template of specialist care in a dedicated pregnancy after loss service.

Pearls/Pitfalls at the point-of-care

Health care professionals may not be aware of parents' pregnancy history, which leads to a loss of trust and parents needing to explain their history of loss repeatedly. The cause of loss should be reviewed and used to inform the care plan for a subsequent pregnancy.

Major recommendations

Clinicians should be aware that pregnancies after stillbirth and second trimester miscarriage have higher rates of complications. Specialist pregnancy after loss clinics provide a multidisciplinary, individualized approach integrating medical surveillance, emotional support, and continuity of carer. Preliminary data show improved pregnancy outcomes and high patient satisfaction with specialist services, though larger studies are needed.

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DISCLOSURE

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