



Feidhmeannacht na Seirbhíse Sláinte  
Health Service Executive



INSTITUTE OF OBSTETRICIANS  
& GYNAECOLOGISTS

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

## **CLINICAL PRACTICE GUIDELINE**

### **MANAGEMENT OF EARLY PREGNANCY MISCARRIAGE**

Institute of Obstetricians and Gynaecologists,  
Royal College of Physicians of Ireland and  
Directorate of Strategy and Clinical Programmes,  
Health Service Executive

Version 1.0  
Guideline No. 10

Date of publication: April 2012  
Revision date: April 2014

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## Key Recommendations

1. It is important that all relevant staff in the maternity services are familiar with the chronological ultrasound features of early pregnancy to accurately diagnose an early pregnancy loss.
2. This guideline should be read in conjunction with Clinical Practice Guideline: Ultrasound Diagnosis of Early Pregnancy Miscarriage (January 2011).
3. Women are sensitive about references to pregnancy loss. As their loss is not out of choice, use of language like "abortion" can be sometimes offensive at a vulnerable time. Hence, discussion or documentation of management of early pregnancy loss should be worded appropriately.
4. At all times women should be supported in making informed choices about their care and management. Adequate explanations supplemented with written information should be given.
5. Surgical management of miscarriage should be offered to women who make a specific request, women who change their mind during the course of conservative or medical management, women who have heavy bleeding and/or severe pain, when gestational trophoblastic disease is suspected or if infected intrauterine tissue is present.
6. Conservative management of miscarriage is an effective and acceptable method to offer women. Women should be counselled that complete resolution may take several weeks and that overall efficacy rates may be lower than medical or surgical interventions.
7. Outpatient medical management should be reserved to women with a mean gestational sac diameter < 50mm as increased vaginal bleeding may be encountered. Misoprostol is given sublingually in two 600µg doses three hours apart.
8. All professionals should be aware of the psychological sequelae associated with pregnancy loss and should provide support, follow-up and access to formal counselling when necessary. Furthermore, a system must be in place for informing all relevant primary care professionals.

## 1. Purpose and Scope

The purpose of this guideline is to improve the management of women with early pregnancy loss, defined as a loss within the first 12 completed weeks of pregnancy. It mainly reviews management of spontaneous miscarriage but is also relevant to women affected by ectopic pregnancy and gestational trophoblastic disease. However, specific recommendations for both these conditions are not covered in this guideline.

The guideline is intended to be primarily used by health personnel working in the area of early pregnancy which includes obstetricians, midwife sonographers, radiographers, radiologists and general practitioners. All of the groups should be familiar with the various diagnostic tools necessary to help delineate a viable from a non-viable pregnancy. It should be read in conjunction with the Clinical Practice Guideline: Ultrasound Diagnosis of Early Pregnancy Miscarriage. This guideline aids clinical judgement and does not replace it. In individual cases a healthcare professional may, after careful consideration, decide not to follow the guideline if it is deemed to be in the best interest of the woman.

## 2. Background and Introduction

Spontaneous miscarriage is the commonest complication of pregnancy. It occurs in up to 20% of clinical pregnancies equating to approximately 14,000 miscarriages per annum in Ireland [Poulose et al, 2006]. Historically, the majority of women who miscarried underwent 'routine' surgical uterine evacuation; that is, evacuation of retained products of conception (ERPC). In the last 10 years, standard management has changed with the development of more refined diagnostic techniques and therapeutic interventions allowing more treatment to be carried out on an outpatient basis.

## 3. Methodology

This guideline was adapted from the Green-top Guideline No.25, Management of Early Pregnancy loss, October 2006, produced by the Royal College of Obstetrician and Gynaecologists (RCOG) of the United Kingdom [Green Top Guideline 25 (RCOG), 2006]. Furthermore, Medline, EMBASE and Cochrane Database of Systematic Reviews were searched using the terms 'miscarriage', 'spontaneous abortion', 'uterine evacuation' and 'prostaglandin (misoprostol)'. Searches were limited to humans and restricted to the titles of English language articles published between August 1991 and August 2011. Relevant meta-analyses, systematic reviews, intervention and observational studies were reviewed.

### Abbreviations

ERPC: Evacuation of Retained Products of Conception  
EPAU: Early pregnancy assessment unit  
HCG: Human Chorionic Gonadotrophin  
Ig: Immunoglobulin  
MGSD: Mean gestational sac diameter

LMP: Last menstrual period  
PUL: Pregnancy of unknown location  
TAS: Transabdominal ultrasound scan  
TVS: Transvaginal ultrasound scan  
WMD: Weighted mean difference

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## 4. Service Provision

- *All maternity units should provide a dedicated EPAU for the assessment of women with an early pregnancy loss.*

The EPAU should open for at least two hours every day Monday to Friday for both planned and emergency appointments in the morning. In larger hospitals, longer opening hours may be necessary.

Outside normal working hours, every unit should have at least one Obstetrician and Gynaecologist available to assess women presenting with early pregnancy emergencies.

- *The EPAU service should be comprehensive and ideally sited in a dedicated area with appropriate staffing. There should be direct access for GPs and selected patient groups.*

Each EPAU should have at least one properly furnished single room that ensures the couple's privacy is respected. The clinical session should be staffed by a midwife sonographer/ radiographer who have been trained in early pregnancy ultrasound and a receptionist/ secretary dedicated to the session. A senior obstetrician should be also available for clinical decisions during each session.

- *All staff members working in the EPAU should be aware of the importance of good communication in early pregnancy care, and written information should be available in every EPAU.*

## 5. Clinical guideline

### 5.1. Terminology

Women feel sensitive about the way we refer to pregnancy loss. As their loss is not out of choice, use of language like "abortion" can be sometimes offensive to women at this vulnerable time. Hence documentation and discussion of early pregnancy loss should be worded appropriately.

All women attending the EPAU should be given a diagnosis and grouped under respective diagnostic groups, such as: viable pregnancy, pregnancy of uncertain viability, early pregnancy loss, incomplete miscarriage, complete miscarriage, pregnancy of unknown location (PUL), ectopic pregnancy and hydatidiform mole.

• *Viable intrauterine pregnancy:*

Is when there is a normally sited gestational sac with a fetal pole and clearly identified cardiac activity. Demonstration of fetal heart activity is generally associated with a successful pregnancy rate of 85-97%, depending on the period of gestation [Johns et al, 2003]. A follow up appointment may be required in the following situations: there is significant vaginal bleeding, a subchorionic haematoma is noted, fetal bradycardia is noted, for reassurance at patient's request because of previous miscarriages or after intrauterine contraceptive device removal.

• *Pregnancy of uncertain viability:*

Is when there is a normally sited gestational sac and the mean gestational sac diameter (MGSD)  $\leq 20$  mm and no fetal pole is seen or when there is a normally sited gestational sac with a fetal pole  $\leq 7$  mm present and no fetal heart pulsation is seen on a TVS [Clinical Practice Guideline, 2011)]. In woman with a pregnancy of uncertain viability a follow up repeat scan needs to be organised at least 7 days from the original scan to assess growth of the gestation sac or embryo and to establish whether fetal heart activity develops.

• *Early pregnancy loss (delayed miscarriage):*

Is when the:

- MGSD  $> 20$  mm with no fetal pole on TVS or a MGSD  $> 25$  mm with no fetal pole on transabdominal scan (TAS)
- Fetal pole  $> 7$  mm with no fetal heart pulsation on TVS or a Fetal pole  $> 8$  mm with no fetal heart pulsation on TAS
- When the MGSD is  $\leq 20$  mm with no fetal pole or if the fetal pole is  $\leq 7$  mm and no fetal heart pulsation is seen and a repeat TVS organised at least 7 days from the original scan demonstrates little or no change in the dimensions
- When the MGSD is  $\leq 25$  mm with no fetal pole or if the fetal pole is  $\leq 8$  mm and no fetal heart pulsation is seen and a repeat TAS organised at least 7 days from the original scan demonstrates little or no change in the dimensions.

However it is important to keep in mind when making a diagnosis that the inter and intraobserver variability of the MGSD and fetal pole measurements reveals, for MGSD, the limits of agreement to be  $\pm 18\%$  [Pexsters et al, 2011]. So, a MGSD measurement of 20 mm by one examiner may translate to a measurement of anywhere between 17 and 25 mm for a second examiner. Taking inter- and intraobserver variation of measurements into account, an empty MGSD cut-off of 25 mm and a CRL cut-off of 7 mm could be introduced and, based on the available evidence, would be associated with a minimal risk of a false-positive diagnosis of miscarriage [Abdallah et al, 2011]. Emphasis should be placed on the need to repeat scans when measurements are around the decision boundaries.

***Incomplete miscarriage:***

Is when on ultrasound scan the intrauterine tissue diameter is  $\geq 15$  mm

- *Complete miscarriage*

Is when on ultrasound scan the endometrial thickness is  $< 15$ mm and there was previous evidence of an intrauterine gestational sac or retained products of conception.

- *Pregnancy of unknown location:*

Is when there are no signs of either intra- or extrauterine pregnancy or retained products of conception in a woman with a positive pregnancy test. There could be three reasons for a scan result to be classified as a PUL: a very early intrauterine pregnancy or a complete miscarriage or an early ectopic pregnancy. At subsequent follow up visits the diagnosis may become clear.

Even with expert use of TVS using agreed criteria, it may not be possible to confirm if a pregnancy is intrauterine or extrauterine in 8–31% of cases at the first visit [Conduis et al, 2003]. In specialised scanning units, the overall incidence of PUL is as low as 8–10%.

## **5.2. Clinical examination in the EPAU**

- *A brief history should be taken to include:*

- Previous obstetric history, LMP and a urine pregnancy test in this pregnancy
- If there is pain and, if so, its description
- If there is bleeding and, if so, the amount and whether products of conception were passed

- *Clinical examination should be considered if appropriate*

In the absence of a clinical indication, pregnant women should be discouraged from presenting for an ultrasound scan before 8 weeks gestation. Examples of a clinical indication include pelvic pains, vaginal bleeding or a previous ectopic pregnancy. Pregnant women with a long menstrual cycle should be discouraged from presenting for a scan until two weeks after their first positive pregnancy test. If a scan is performed too early in pregnancy in an asymptomatic woman simply for reassurance, it may generate more anxiety than it alleviates if the findings are unequivocal.

## **5.3. Diagnosis and investigation**

- *TVS will be required in the majority of women referred to an EPAU.*

The procedure and the reasons for the scan should be explained to the patient. TVS is found to be extremely well tolerated as a technique by most women [Russell et al, 2005]. The woman's wishes should be respected if she strongly declines a TVS and if the gender of the professional is particularly important to her.

Appropriate infection control measures must be taken when disinfecting transvaginal ultrasound probes and facilities must ensure that there is strict adherence to current standards of disinfection.

- *It is important that all relevant health personnel are familiar with the chronological ultrasound features of early pregnancy [Clinical Practice Guideline, 2011].*

A clear explanation should be given by the Gynaecologist/Sonographer performing the scan as to the possible diagnosis. Appropriate pictures should be taken for the records and the findings need to be filled onto an Early Pregnancy Report form [Appendix 5] or entered into the Hospital's database.

It is recommended that a second scan is considered in the following circumstances:

- (i) The first scan was performed before 8 weeks gestation.
- (ii) The first scan was performed by a healthcare professional who is not formally trained in early pregnancy ultrasound.
- (iii) There is a concern about the reliability of the first scan, for example, a transabdominal scan in an obese woman.
- (iv) If a woman has a long or irregular menstrual cycle, a second scan in an asymptomatic woman should be offered at least seven days after the first scan.
- (v) The woman requests a second scan because she believes that the first scan may be unreliable.

Particular caution should be taken in recommending a surgical or medical intervention for the diagnosis of miscarriage before 8 weeks gestation especially if a woman is asymptomatic.

- *Serial serum hCG is particularly useful in the diagnosis of asymptomatic ectopic pregnancy.*

The majority of women attending an EPAU can be managed using urine based hCG tests. Modern monoclonal antibody based kits can detect hCG at 25iu/l, a level reached 9 days post conception (day 23 of a day 28 cycle) [Braunstein et al, 1976]. Unit specific discriminatory zones for serum hCG should be defined to exclude possible ectopic pregnancy. At levels above 1500 iu/l, an ectopic pregnancy will usually be visualised with TVS [Conduis et al, 2003]. Serum hCG levels need to be interpreted with caution. In cases of twin pregnancy or heterotopic pregnancy, a suboptimal rise may be misleading.

Serial hCG is also useful in the management of PULs and also in circumstances where a complete miscarriage is diagnosed in the absence of previous ultrasonographic evidence of an intrauterine pregnancy. In a study of 152 women with a history and TVS findings suggestive of a complete miscarriage, serial hCG assessment revealed a 5.9% incidence of ectopic pregnancy [Conduis et al, 2005].

- *Serum progesterone can be a useful adjuvant when ultrasound suggests a PUL.*

Serum progesterone levels below 25 nmol/l are associated with pregnancies subsequently confirmed to be non-viable [Conduis et al, 2003]. Progesterone levels above 25 nmol/l are likely to indicate and above 60 nmol/l are strongly associated with ongoing pregnancies. Care must be taken in terms of active intervention based

on initial low progesterone level as viable pregnancies have been reported with low levels [Hahlin et al, 1995; Banjeree et al, 2001].

## 5.4. Conservative management of a miscarriage

- *Conservative management is an effective and acceptable method to offer women who miscarry provided there are no signs of infection (vaginal discharge), excessive bleeding, pyrexia or abdominal pain. Women should be counselled on what to expect, the likely amount of blood loss and what analgesics to take.*
- *Follow up scans may be arranged at 2 weekly intervals, until a diagnosis of complete miscarriage is made. However, if the woman requests a surgical or medical approach to their management at any stage it should be arranged.*

Patient counselling is particularly important for those women with an intact sac who wish to adopt an expectant approach. They should be aware that complete resolution may take several weeks and that overall efficacy rates are lower. Success rates are higher with prolonged follow-up. For incomplete miscarriage expectant management results in complete uterine evacuation over three days in 79% of cases [Nielsen et al, 1999]. The efficacy is reduced to 37% after seven days when expectant management is used to treat women with an intact sac (early pregnancy loss) [Wieringa-de Waard et al, 2002].

A meta-analysis consisting of seven studies comparing expectant with medical management showed that the overall success rate with expectant management was 39% and that medical management was 2.8-fold more likely to induce complete evacuation of products of conception [Sotiriadis et al, 2005]. There was a suggestion for lower incidence of moderate or severe bleeding with medical management. However, medical management seemed to be associated with an increase risk for nausea and diarrhoea but this did not reach statistical significance. No differences existed in the risk of pelvic infection, blood transfusion and emergency curettage.

A Cochrane review looking at expectant-care versus surgical treatment for first trimester miscarriage found that women in the expectant group were more likely to have retained products of conception or incomplete miscarriage by the end of the study period (RR 5.4; 95% CI 2.6-11.2) [Nanda et al, 2006]. The need for unplanned surgical treatment was greater for the expectant-care group (RR 4.8 95% CI 2.0-11.5). The expectant-care group had more days of bleeding (WMD 1.6 95% CI 0.7-2.4) and a greater amount of bleeding (WMD 1.0 95% CI 0.6-1.4). The incidence of gynaecological infection after surgical, expectant and medical management of first trimester miscarriage is low (2-3%) and no evidence exists of a difference by the method of management [Trinder et al, 2006].

## 5.5. Medical management of a miscarriage

- *Misoprostol is an effective and acceptable method to offer women who miscarry provided there are no signs of infection (vaginal discharge), excessive bleeding, pyrexia or abdominal pain. Women should be counselled on what to expect, the likely amount of blood loss and what analgesics to take. Women undertaking medical management need to be informed that in case of heavy bleeding an ERPC*

*may be required and an information leaflet on medical management should be provided.*

Medical management is an alternative technique that complements, but does not replace, surgical evacuation. Its availability has led to an improvement in choice for women who miscarry [Graziosi et al, 2006; Winikoff et al, 2005]. The success rate of medical management of miscarriage quoted in much of the literature is in the region of 80-91% [Wood et al, 2002; Zhang et al, 2005; Bragratee et al, 2004]. Side effects of medical treatment include nausea, vomiting, cramping and diarrhoea. In a study to compare acceptability of medical versus surgical management of early pregnancy failure, although women in the medical treatment group reported greater pain acceptability was similar between the groups [Harwood et al, 2008]. Acceptability was influenced by success or failure of medical treatment.

The incidence of gynaecological infection after surgical, expectant and medical management of first trimester miscarriage is low (2-3%) and no evidence exists of a difference by the method of management [Trinder et al, 2006].

- *Misoprostol is a cheap, highly effective prostaglandin analogue that is active orally or vaginally. Since progesterone levels are low in a non-viable pregnancy mifepristone is not required. Suggested protocol of administration: two sublingual/vaginal doses of Misoprostol 600µg at least three hourly [Weeks et al, 2007; Tang et al, 2007]. Its use for treatment of early pregnancy failure in women with prior uterine surgery is safe. A follow up scan needs to be arranged after 2 weeks from the treatment.*

A meta-analysis of four studies found that vaginal and oral administration of misoprostol did not differ significantly in the rates of successful treatment, need for blood transfusion, nausea, and vomiting [Sotiriadis et al, 2005]. A study comparing efficacy, acceptability and safety in subjects with history (n=78) or absence (n=410) of uterine surgery receiving misoprostol 800 µg vaginally found that expulsion rates were similar. Pain, bleeding, complications and acceptability did not differ and no uterine ruptures occurred [Chen et al, 2008].

Outpatient medical management should be reserved to women with a MGSD < 50mm as increased bleeding may be encountered. In the case of a pregnancy occurring with an IUCD in-situ the device should be removed before administration of misoprostol. Women with uterine infections, severe anaemia, cardiovascular and cerebrovascular diseases, coagulopathy or current therapy with anticoagulants, severe hypertension or asthma were excluded from some clinical studies. In these cases, use of misoprostol should be evaluated on a case by case basis.

## **5.6. Surgical management of a miscarriage**

- *Surgical uterine evacuation (ERPC) should be offered to women that prefer that option. Clinical indications for offering ERPC include persistent excessive bleeding, haemodynamic instability, evidence of infected retained tissue and suspected gestational trophoblastic disease.*

ERPC has been the standard treatment offered to women who miscarry. This was based on an assumption that retained tissue increases the risk of infection and haemorrhage, however, studies have shown that the incidence of gynaecological infection after surgical, expectant and medical management of first trimester miscarriage is low (2-3%) and no evidence exists of a difference by the method of management [Trinder et al, 2006]. ERPC remains the treatment of choice if there is persistent bleeding, if vital signs are unstable or in the presence of retained infected tissue.

- *Surgical evacuation should be performed using suction curettage and be preferably managed as a day case procedure unless there is heavy bleeding when the woman should be admitted.*

A Cochrane review concluded that vacuum aspiration is preferable to sharp curettage in cases of incomplete miscarriage. Two trials were included. Vacuum aspiration was associated with less blood loss, less pain and shorter duration of the procedure [Forna et al, 2001]. Routine use of a metal curette after suction is not required. Use of oxytocin at the time of the ERPC is also associated with less blood loss (17.6 vs 24.5 ml) [Ali et al, 1996].

Consider screening for infection (such as for Chlamydia trachomatis, Neisseria gonorrhoea or bacterial vaginosis) if clinically indicated in women undergoing ERPC. There is insufficient evidence to recommend routine antibiotic prophylaxis prior to ERPC. Antibiotic prophylaxis should be given on individual clinical indications. Where infection is suspected, delaying ERPC for 12 hours is recommended to allow intravenous antibiotic administration.

- *ERPC is associated with anaesthetic and uncommon surgical risks and informed written consent need to be obtained. Risks that need to be mentioned when obtaining consent include uterine perforation (1%), cervical tears, intra-abdominal trauma (0.1%), haemorrhage and infection. An information leaflet on surgical management of a miscarriage should also be provided to women undergoing an ERPC.*

Practitioners may consider oral or vaginal cervical preparation prior to the procedure based on individual patient circumstance. The advantages of prostaglandin administration are well established, with significant reductions in dilatation force, haemorrhage and uterine/cervical trauma. Suggested dose of misoprostol for cervical priming is 400 µg (vaginally/orally) three hours before the procedure [Weeks et al, 2007].

## **5.7. Histological examination of tissue**

- *Products of conception obtained should be sent for histological examination.*
- In a study where 468 women underwent an ERPC for miscarriage, there were two cases of ectopic pregnancy (0.4%), neither of these two cases was suspected on scan but histology obtained has reported 'decidua only' [Chen et al, 2008]. In view of maternal risks associated with ectopic and molar pregnancy, it is recommended that practitioners should always consider sending tissue obtained at miscarriage for histological examination. This may confirm the diagnosis of miscarriage and can help exclude ectopic pregnancy or gestational trophoblastic disease.

Practitioners should be aware of their Unit guidelines related to the appropriate disposal of fetal remains, should the woman request to take the remains home. Medical staff should be able to provide current and sensitive information to ensure proper burial or cremation.

## 5.8. Rhesus anti-D prophylaxis

- *Non-sensitised Rhesus (Rh) negative women should receive prophylactic anti-D Immunoglobulin (Ig) in the following situations: ectopic pregnancy, all miscarriages over 12 week's gestation (including threatened) and all miscarriages where the uterus is evacuated surgically.*
- *Anti-D immunoglobulin should only be given for threatened miscarriage under 12 weeks gestation when bleeding is heavy or associated with pain. It is not required for cases of complete miscarriage under 12 week's gestation where there has been no surgical intervention.*

There is minimal evidence that administering anti-D Ig for first trimester vaginal bleeding prevents maternal sensitization or development of haemolytic disease of the newborn. The risk of immunisation before 12 weeks' gestation is negligible when there has been no instrumentation to evacuate the products of conception and anti-D Ig is not required in these circumstances [Hannafin et al, 2006].

## 5.9. Psychological aspects of miscarriage

- *All professionals should be aware of the psychological sequelae associated with pregnancy loss and should provide support, follow-up and access to formal counselling when necessary. There also needs to be a system must be in place for informing all relevant primary care professionals in cases of pregnancy loss.*

The negative psychological impact of early pregnancy loss can be both severe and protracted and affects both women and their families and may be different for every couple [Turner et al, 1989, Thapar et al, 1992; Neugebauer et al, 1992]. Each woman's (and couple's, as appropriate) needs should be identified and acknowledged, assistance and referral given to facilitate the grieving process.

## 6. References

- Abdallah Y, Daemen A, Kirk E, Pexsters A, Naji O, Stalder C, Goulds D, Ahmed S, Guha S, Syed S, Bottomley C, Timmerman D, Bourne T. Limitations of current definitions of miscarriage using mean gestational sac diameter and crown-rump length measurements: a multicenter observational study. *Ultrasound Obstet Gynecol* 2011;38:497-502.
- Ali PB, Smith G. The effect of syntocinon on blood loss during first trimester suction curettage. *Anaesthesia* 1996; 51:483-5.
- Bagratee JS, Khullar V, Regan L, Moodley J, Kagoro H. A randomized controlled trial comparing medical and conservative management of first trimester miscarriage. *Hum Reprod* 2004; 19:266-71.
- Banjeree S, Aslam N, Woelfer B, Lawrence A, Elson J, Jurkovic D. Expectant management of pregnancies of unknown location: a prospective evaluation of methods to predict spontaneous resolution of pregnancy. *BJOG* 2001; 108:158-63.
- Braunstein GD, Rasor J, Adler D, Danzer H, Wade ME. Serum human chorionic Gonadotrophin levels throughout normal pregnancy. *Am J Obstet Gynecol* 1976; 126: 678-81.
- Chen BA, Reeves MF, Creinin MD, Gilles JM, Barnhart K, Westhoff C, Zhang J, and for the National Institute of Child Health and Human Development of Early Pregnancy Failure Trial. Misoprostol for treatment of early pregnancy failure in women with prior uterine surgery. *Am J Obstet Gynecol* 2008; 198:626 e1-5.
- Clinical Green Top Guideline 25: The Management of Early Pregnancy Loss. RCOG, October 2006
- Clinical Practice Guideline 1: Ultrasound Diagnosis of Early Pregnancy Miscarriage. Institute of Obstetricians and Gynaecologists, Royal College of Physicians of Ireland and Directorate of Quality and Clinical Care, Health Service Executive.
- Condous G, Okaro E, Khalid A, Bourne T. Do we need to follow up complete miscarriages with serum human chorionic Gonadotrophin levels? *BJOG* 2005; 112:827-9.
- Condous G, Okaro E, Bourne T. The conservative management of early pregnancy complications: a review of the literature. *Ultrasound Obstet Gynecol* 2003; 22:420-30.
- Forna F, Gulmezoglu AM. Surgical procedures to evacuate incomplete abortion. *Cochrane Database Syst Rev* 2001; (1): CD001993.
- Graziosi GC, Bruinse HW, Reuwer PJ, Mol BW. Women's preferences for misoprostol in case of early pregnancy failure. *Eur J Obstet Gynecol Reprod Biol* 2006; 124: 184-6.

Hahlin M, Thorburn J, Bryman I. The expectant management of early pregnancy of uncertain site. *Hum Reprod* 1995; 10: 1223-7.

Hannafin B, Lovecchio F, Blackburn P. Do Rh-negative women with first trimester spontaneous abortions need Rh immune globulin? *American Journal of Emergency Medicine* 2006; 24:487-9.

Harwood B, Nansel T for the National Institute of Child Health and Human Development Management of Early Pregnancy Failure Trial. Quality of life and acceptability of medical versus surgical management of early pregnancy failure. *BJOG* 2008; 155:501-8.

Heath V, Chadwick V, Cooke I, Manek S, MacKenzie IZ. Should tissue from pregnancy termination and uterine evacuation routinely be examined histologically? *BJOG* 2000; 107:727-30.

Johns J, Hyett J, Jauniaux E. Obstetric outcome after threatened miscarriage with or without a haematoma on ultrasound. *Obstet Gynecol* 2003; 102: 483

Nanda K, Pelligia A, Grimes D, Lopez L, Nanda G. Expectant care versus surgical management for miscarriage. *Cochrane Database Syst Rev* 2006; 2: CD003518.

Neugebauer R, Kline J, O'Connor P, Shrout P, Johnson J, Skodol A. Depressive symptoms in women in the six months after miscarriage. *Am J Obstet Gynecol* 1992; 166:104-9.

Nielsen S, Hahlin M, Platz-Christensen J. Randomized trial comparing expectant with medical management for first trimester miscarriages. *Br J Obstet Gynaecol* 1999; 106:804-7.

Pexsters A, Luts J, Van Schoubroeck D, Bottomley C, Van Calster B, Van Huffel S, Abdallah Y, D'Hooghe T, Lees C, Timmerman D, Bourne T. Clinical implications of intra and interobserver reproducibility of transvaginal sonographic measurement of gestational sac and crown-rump length at 6-9 weeks' gestation. *Ultrasound Obstet Gynecol* 2011; 38: 510-515.

Poulose T, Richardson R, Ewings P, Fox R. Probability of early pregnancy loss in women with vaginal bleeding and a singleton live fetus at ultrasound scan. *J Obstet Gynecol* 2006; 26: 782-4.

Russell M. Does patient ethnicity or sonographer gender have any bearing on patient acceptability of transvaginal ultrasound? *Ultrasound* 2005; 13:170-2

Sotiriadis A, Makrydimas G, Papatheodorou S, Ioannidis A. Expectant, medical, or surgical management of first-trimester miscarriage: a meta-analysis. *Obstet Gynecol* 2005; 105:1104-13.

Tang OS, Gemzell-Danielson K, Cho P. Misoprostol: Pharmokinetic profile, effects on the uterus and side-effects. In *J Gynecol Obstet* 2007; 99: S160-7.

Thapar AK, Thapar A. Psychological sequelae of miscarriage: a controlled study using the general health questionnaire and the hospital anxiety and depression scale. *Br J Gen Pract* 1992;42:94-6.

Towey M, O'Brien A. Review of the HSE ultrasound diagnosis of early pregnancy miscarriage clinical practice guideline (Dec 2010). *BEAI Spectrum* Summer 2011;13-15.

Trinder J, Brocklehurst P, Porter R, Read M, Vyas S, Smith L. Management of miscarriage: expectant, medical or surgical? *BMJ* 2006; 332:1235-38.

Turner MJ. Spontaneous miscarriage: this hidden grief. *Ir Med J* 198;82: 145.

Weeks A and Faundes A. Misoprostol dosages for reproductive health. *Int J Gynecol Obstet* 2007;99:S156-9.

Wieringa-de Waard M, Vos J, Bonsel GJ, Bindel PJ, Ankum WM. Management of miscarriage: a randomised controlled trial of expectant management versus surgical evaluation. *Hum Reprod* 2002; 17:2445-50.

Winikoff B. Pregnancy failure and misoprostol – time for a change. *N Engl J Med* 2005; 353:834-6.

Wood SL, Brain PH. Medical management of missed abortion: a randomized clinical trial. *Obstet Gynecol* 2002; 99: 563-6.

Zhang J, Gilles JM, Barnhart K, Creninin MD, Westhoff C, Frederick MM et al. A comparison of medical management with misoprostol and surgical management for early pregnancy failure. *New Engl J Med* 2005; 353: 761-9.

## 7. Implementation Strategy

- Distribution of guideline to all members of the Institute and to all maternity and gynaecology units.
- Implementation through HSE Obstetrics and Gynaecology programme local implementation boards.
- Distribution to other interested parties and professional bodies.

## 8. Key Performance Indicators

- First visit: return visit ratio.
- Uptake rates for medical, surgical and expectant interventions.
- Complications of the various interventions (including failure rates).
- Compliance with anti-D prophylaxis.

## 9. Qualifying Statement

- These guidelines have been prepared to promote and facilitate standardisation and consistency of practice, using a multidisciplinary approach.
- Clinical material offered in this guideline does not replace or remove clinical judgement or the professional care and duty necessary for each pregnant woman.
- Clinical care carried out in accordance with this guideline should be provided within the context of locally available resources and expertise.

## Appendices

### Appendix 1

#### Patient Information Leaflet: Threatened Miscarriage

An ongoing pregnancy associated with vaginal bleeding is called a threatened miscarriage. The first symptoms are usually vaginal bleeding with or without mild period type pain. The bleeding can occur at any time after a missed period. It is often noticed when going to the toilet as a smear of pink, brown or red loss on the toilet paper. The amount of bleeding may vary from just spotting to a gush with clots.

The diagnosis of threatened miscarriage is made with the help of an ultrasound scan. At 6 weeks of pregnancy the ultrasound scan will be able to visualise your tiny baby and the scan will also show a heart beat, particularly if it is a vaginal scan. Sometimes the scan may show up a small haematoma (blood clot) around the pregnancy sac, which identifies the source of the bleeding, but more often nothing abnormal is seen.

It is not possible to give an explanation as to why this bleeding occurs. In most cases the pregnancy continues safely. The baby will come to no harm even if the bleeding is heavy. The likely causes of bleeding may be:

- 1) The implantation site: As the placenta of your baby tries to burrow itself into the lining of the womb, it may cause some blood vessels of the womb to bleed.
- 2) The cervix: During pregnancy, tissues become rich in blood supply and softer as a result of this any slight trauma to the cervix can provoke bleeding
- 3) The vagina. Thrush or any other infection may cause bleeding from the inflamed vagina in the form of spotting.

A baby's heartbeat on ultrasound is reassuring. In the presence of a heart beat there is an 85-97% chance of your pregnancy continuing. If a collection of blood around the sac is seen on ultrasound scan you will be given an appointment for a rescan within 1-2 weeks. Alternatively this may be checked at your booking scan in the antenatal clinic which is usually around 11-13 weeks of pregnancy. When there is no recognisable cause of bleeding found a follow up is usually not required.

Although bed rest was routinely advised in the past for threatened miscarriage it did not affect the outcome. If you feel that going to bed may reassure you then do go to bed. There is no specific treatment to stop your bleeding. There may be at times increased bleeding noted when you get up to go to the toilet. It is simply due to pooling of blood in the vagina from lying down that comes out on standing as a result of gravity. Having sexual intercourse during pregnancy does not have any adverse outcomes. However it would be sensible to avoid sex until the bleeding has completely stopped because of the risk of infection. We would advise you not to work as long as the bleeding continues so that you can rest. If you need a sick certificate your GP will be able to issue one. Bright red blood suggests that it is fresh, whereas brown blood suggests that it is stale blood that is tracking down. If bleeding becomes bright red or heavier get in touch with your doctor for advice.

## Appendix 2

### Patient Information Leaflet: Miscarriage

Loss of a pregnancy can be a sad and distressing experience, but it is not uncommon. Over one in four pregnancies ends in miscarriage. The information given in this leaflet may help you to cope with the loss of your pregnancy at this difficult time. We have provided answers to some of the questions you are likely to have. If, however you do not wish to make a decision now, you may take this leaflet with you and contact us at a suitable time with your decision.

- *What happens now?*

Some miscarriages are complete and require no further action. A blood loss, like a period, may continue for several days until the lining of the womb is all shed. Others may be incomplete with various amounts of tissue being kept within the womb. Yet another type of miscarriage is where the pregnancy is still intact but not growing any longer. This is called an early pregnancy loss or a missed miscarriage. There are three ways of dealing with a miscarriage. A brief outline of each of these methods is given. Should you wish to know more about a particular method please ask the clinic staff for further information.

- *"Wait and see approach" (conservative approach)*

In the past an operation was routinely performed in all cases of miscarriage as there was no way to know how much tissue, if any, was still left behind in the womb. Nowadays with modern ultrasound it has become possible to adopt a "wait and see approach". In order to check if all the tissue has come away naturally, we will give you an appointment for a repeat scan before you leave the unit.

- *If I decide to wait how long will it take for me to miscarry?*

Although the length of time taken for a miscarriage to be complete is difficult to predict, in the majority of cases a pregnancy will miscarry within two-three weeks. The contractions of the womb are usually felt as strong period-like pains. If you are bleeding heavily you might need to be admitted into hospital.

- *Is there a risk of infection if I decide to wait?*

Risk of infection is small. However if you have any of the following symptoms you should contact your doctor or the hospital: excessive bleeding, unpleasant discharge, lasting pain, high temperature or fever.

- *Medical approach*

Medicines may be used to start a miscarriage if you prefer not to wait. You will be given tablets that help relax the cervix (neck of the womb) and speed up the process. You may also need tablets for pain relief. The bleeding is heavy initially for a couple of hours. You may pass some clots but soon the bleeding will settle down and continue like a period for up to 7-10 days.

In most cases the above treatment is all that is needed. In order to check if all the tissue has come away, we will give you an appointment for a repeat scan before you leave the unit. In a small group of cases (5-10%) an operation may be necessary should there still be some tissue left within the womb or the bleeding becomes heavier.

- *Surgical approach (Evacuation Of Retained Products Of Conception-ERPC)*

We dilate the cervix (neck of womb) and by using a suction device we suck out the pregnancy tissue. This is carried out under a general anaesthetic. This is done vaginally and you will have no cut/stitches. Like all operations small anaesthetic and surgical risks are involved. There is a small risk of infection or injury to the womb and cervix.

- *Will the method of treatment I choose affect my chances of becoming pregnant again?*

No. Generally your chances of having a successful pregnancy in the future are just as good whichever method you choose.

- *How long will I bleed after a natural miscarriage or an operation?*

Following all the different approaches, you are likely to have a period-like loss for up to 14 days. This is quite normal and should diminish over the period of time.

- *What you may need to know after a miscarriage*

The chances of becoming pregnant again after a spontaneous miscarriage irrespective of whether it was managed by conservative, medical or surgical treatment are just as good

- It is usually difficult to give a definite answer as to what caused a miscarriage. It is extremely unlikely that anything you did caused your miscarriage. Do not blame yourself or anyone else. About 60% of all miscarriages occur because of some chromosome abnormalities. Only in a small number of women with recurrent (three or more) miscarriages a definite cause can be determined.

- It is natural to feel low and depressed. Give yourself and your body time to recover. It may help to talk over things with your partner, friends and other members of the family. If you would like to talk further we can arrange for a follow up appointment for you in the miscarriage clinic.

- After one miscarriage most women will go on to have a normal pregnancy. Even after several miscarriages, there is a good chance of a successful pregnancy.

- *How long should I wait before trying for another baby?*

You may try again when you feel ready. We advise that you wait until you have had a normal period, which you should have 3-4 weeks after a miscarriage, provided your periods were regular before. However it is best not to have intercourse until the bleeding has completely stopped after the miscarriage.

- *What can I do to stop having a miscarriage?*

There is nothing in particular that we can suggest. Just be sensible and avoid strenuous activity. Continue taking folic acid if you are planning to conceive soon.

## Appendix 3

### Patient Information Leaflet: Surgical Management of a Miscarriage

Once you have been diagnosed with a miscarriage your doctor will talk to you about the options on management. In the surgical management we dilate the cervix (neck of womb) and by using a suction device we remove the pregnancy tissue. This is carried out under a general anaesthetic. This is done vaginally and you will have no cut/stitches. It is important to remember that you do not have to make an immediate decision.

Like all operations small anaesthetic and surgical risks are involved. Rarely, some women bleed significantly from the uterus during the procedure and under very occasional circumstances it may be necessary to administer blood. There is approximately 1% risk of making a small hole in the uterus (perforation) with the instruments that are used to remove the tissue. This usually does not require any intervention, however, in some cases we may need to do a key-hole surgery to check for internal bleeding and to rule out any bowel injury. There is a low risk (2%) of infection of the womb which may require a course of antibiotics.

If you have chosen the surgical management arrangements will be made for you to come into the ward for this procedure. You will be advised on the time and day to come in and also on when to stop eating or drinking. The doctor will organise for you to have some blood tests prior to coming in to check your blood count and blood group. You may also be given some tablets to take by mouth three hours prior to the procedure and these help to soften the neck of the womb.

- *On the day*

You will need to come to the admission office. You will then be directed to the ward that you will be admitted to. On the ward, a nurse will show you where the facilities are and prepare you for theatre. The anaesthetist will normally visit you in the ward and introduce himself/herself and to ask a few questions. When you go to theatre, a nurse will accompany you to the anaesthetic room. Your anaesthetist will put a small needle into a vein on the back of your hand through which the anaesthetic is given. You "go to sleep" and when you wake up after the operation you have little memory of what had happened. Most people feel groggy when they wake up, but others feel sick or even weepy. These reactions are normal. They are unlikely to last for very long. On the ward, you can start drinking and eating gradually when you feel well enough, usually after 1-2 hours. If everything is well you can go home after this. It is advisable to have an escort if you go home on the same day of the operation.

- *What to expect after the operation?*

It is usual to have some bleeding and this gradually becomes less over a course of 7-10 days. If the bleeding becomes heavy (heavier than a period) or if you develop a high temperature then you should contact your GP or our emergency department. Many women find that they have a slight crampy period like pain for a day or so and this can be helped by taking a mild painkiller.

It is best to use sanitary towels rather than tampons until your next period to help avoid infection. We also advise you to avoid having sexual intercourse until the bleeding stops. You can bath or shower as normal. Most women find that they are able to return to their usual activities within 48-72 hours. However, you may want to take a few days off work to rest and our staff can give you a sick certificate.

- *How long should I wait before trying for another baby?*

You may try again when you feel ready. We advise that you wait until you have had a normal period, which you should have 3-4 weeks after a miscarriage, provided your periods were regular before.

## Appendix 4

### Patient Information Leaflet: Medical Management of a Miscarriage

Once you have been diagnosed with a miscarriage your doctor will talk to you about the options on management. Medicines may be used to start a miscarriage if you prefer not to wait for events to happen naturally. The tablet we use is called misoprostol (cytotec). It works by softening the neck of the womb and also by stimulating the muscles of the womb to contract.

The dose we use is 600mcgs (3 tablets) and that is usually taken by mouth and repeated in 4 hours time. Recognised side effects associated with misoprostol include diarrhoea, nausea, vomiting, hot flushes and chills. These should not be a cause for concern but please contact the hospital if you are worried. After taking the tablets you will have crampy period like pains for which you may need some painkillers. You will also have bleeding that is heavy initially for a couple of hours. You may pass some clots but soon the bleeding will settle down and continue like a period for up to 7-10 days.

If you feel weak or if the bleeding continues to be very heavy and you are concerned please do not hesitate to come into our emergency department. If you are bleeding and develop a high temperature you should contact your GP or our emergency department. It is best to use sanitary towels rather than tampons until you next period to help avoid infection. We also advise you to avoid having sexual intercourse until the bleeding stops. You can bath or shower as normal.

In most cases the above treatment is all that is needed. In order to check if all the tissue has come away, we will give you an appointment for a repeat scan before you leave the unit. In a small group of cases (5-10%) an operation may be necessary should there still be some tissue left within the womb or the bleeding becomes heavier.

Most women find that they are able to return to their usual activities within 48-72 hours. However, you may want to take a few days off work to rest and our staff can give you a sick certificate. If you are going to try for another baby we advise that you wait until you have had a normal period, which you should have 3-4 weeks after a miscarriage, provided your periods were regular before.

## Appendix 5

### Early Pregnancy Assessment Report

Date:

Hospital Number:

Name:

Date of Birth:

LMP:

Gestation by LMP:

**Ultrasound scan findings** (Probe: )

- Uterine findings:

Endometrial thickness:

Gestational sac:

Location	Endometrial reaction		
Diameters D1	D2	D3	
MGSD			
Yolk sac present			
Fetal pole	Fetal heart activity seen		
Amnion present			
Other:			

- Pouch of Douglas:

- Right adnexa:

- Left adnexa:

**Diagnosis:**

**Follow-up:**

**Doctor/ Sonographer:**