Miscarriage

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Miscarriage

- Spontaneous
- Recurrent
- Induced

Spontaneous misc

- Definition:

The spontaneous loss of a pregnancy prior to viability (23w+6d)

- Overall rate is about 20%, most of which occurs in 1st TM
- 2nd TM misc account for 1-4% of all misc
- 45% of clinically dxed complete misc revealed retained products by u/s

Definition of misc:

- Miscarriage can be further classified, on ultrasound findings, into loss of an empty gestation sac (loss of pregnancy before 10 weeks' gestation) or loss of fetus (loss of a pregnancy after visualization of fetal heart activity)
- The European Society of Human Reproduction and Embryology defines biochemical losses as a transient positive pregnancy test without ultrasonic visualization of the pregnancy

U/S classification of miscarriage:

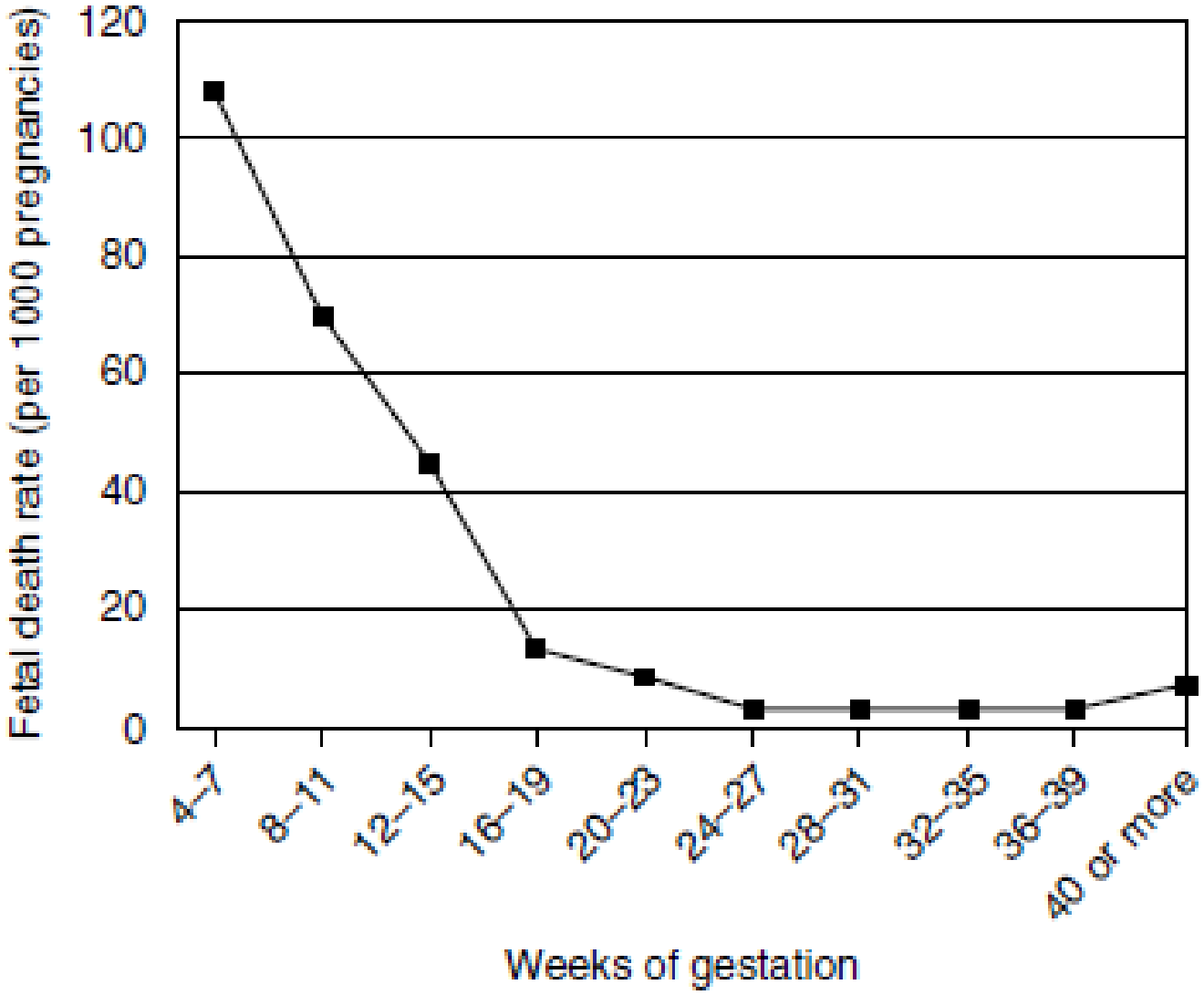
Type of miscarriage	Gestation range (weeks)	Fetal heart activity	Ultrasound findings
First trimester			
Biochemical	0–6	Never	Not visualized
Empty gestation sac	4–10	Never	Empty gestation sac or large sac with minimal structures without fetal heart activity
Fetal	6–12	Lost	Crown–rump length and fetal heart activity previously identified
Second trimester	12–24	Lost	Fetus identified of size equivalent to 12–24 weeks' gestation

Table 40.1 Definitions of terms in common usage.

Term	Definition
Threatened miscarriage	Vaginal bleeding in the presence of a viable pregnancy
Inevitable miscarriage	Vaginal bleeding in the presence of an open cervical os and pregnancy-associated tissue still present*
Incomplete miscarriage	Vaginal bleeding that is ongoing where pregnancy tissue has already been passed but ultrasound suggests the presence of further tissue within the uterine cavity
Complete miscarriage	Clinical definition: cessation of bleeding and a closed cervix following miscarriage Ultrasound definition: an empty uterus with a falling hCG where an intrauterine pregnancy was previously confirmed
Missed miscarriage/early fetal demise	Miscarriage occurring in the absence of symptoms or minimal symptoms, where the empty gestation sac or non-viable embryo is still visible within the uterus
Recurrent miscarriage	Three or more consecutive early pregnancy losses
Biochemical pregnancy loss	Pregnancy not located on scan where there is/has been a positive pregnancy test which subsequently becomes negative
Empty sac	A gestation sac with absent or minimal structures
Pregnancy of unknown location (PUL)	Positive pregnancy test where the location of the pregnancy is not currently identifiable using transvaginal ultrasonography†
Pregnancy of unknown viability (PUV)	The presence of intrauterine structures confirming the location of the pregnancy, but where no embryo heartbeat has been seen to confirm its viability. By definition the measurements of the embryo or gestation sac do not meet the criteria for the diagnosis of a missed miscarriage. In this circumstance a repeat scan at an interval is required to confirm viability (see section on ultrasound diagnosis)

- pregnancy is a dynamic process and a diagnosis of viability early on in the first trimester does not necessarily signify that the pregnancy will continue,
- although if a fetal heart pulsation is detected at 6 weeks, there is a 90% chance that the pregnancy will continue beyond the first trimester
- At 4^{th} wks 50% of bioch preg will fail
- At 6^{th} wks 20% of preg will fail

The rate of miscarriage varies depending on the gestational age & maternal age



Causes of misc

- 1st TM:

1//Majority due to chm abnor, 95% of chm abnor will end by misc

- Types of chm abnor:
- 68% are trisomies: 16, 21, 22
- 17% triploidy
- 10% monosomy XO

2// maternal dis, DM, APLS, Thyroid

3// infection varicella, rubella,….

4// ut abnor like fibroids….

5// drugs: methotrexate, anti-epileptics

Causes of misc

- 2nd TM misc causes:

1//Cervical causes: injury, cone, LLETZ

2// infections: either local +/- ruptured membranes, or systemic infections

3// Ut abnor: distorted ut cavity by submucous fibroid, ut septae, ….

4// thrombophilias

5// chm abnor

diagnosis

- History: LMP, symptoms & pain, past ob & gyn hx, PMH &PSH, and finally drug history.
- General (vital signs & pallor) and abdominal exam: fundal ht, pelvic mass, evidence of intraperit bleeding, site of pain
- p/v exam & speculum: os closed or open, amount of bleeding, if any visible tissue in cervix or vagina..
- Any local causes of bleeding seen by speculum

Differential diagnosis

	Uterine size*	Cervix	Blood loss	Pain
Threatened miscarriage	Equivalent to dates	Closed	Any	Variable
Incomplete miscarriage	Smaller than dates	Open	Usually heavy	Present
Complete miscarriage	Smaller than dates	Closed	Previously heavy, now settling	Previously present, now absent
Missed miscarriage	Variable	Closed	Variable	Variable

*Remember that the presence of fibroids may give a distorted assessment of uterine size or large body habitus may make this difficult to accurately assess.

Diagnostic tools

- U/S
- hCG
- progesterone

- Transvaginal ultrasound has helped identify the early ultrasonographic features seen in a normal early intrauterine pregnancy.
- The ultrasound landmarks visible on transvaginal scan are as follows.

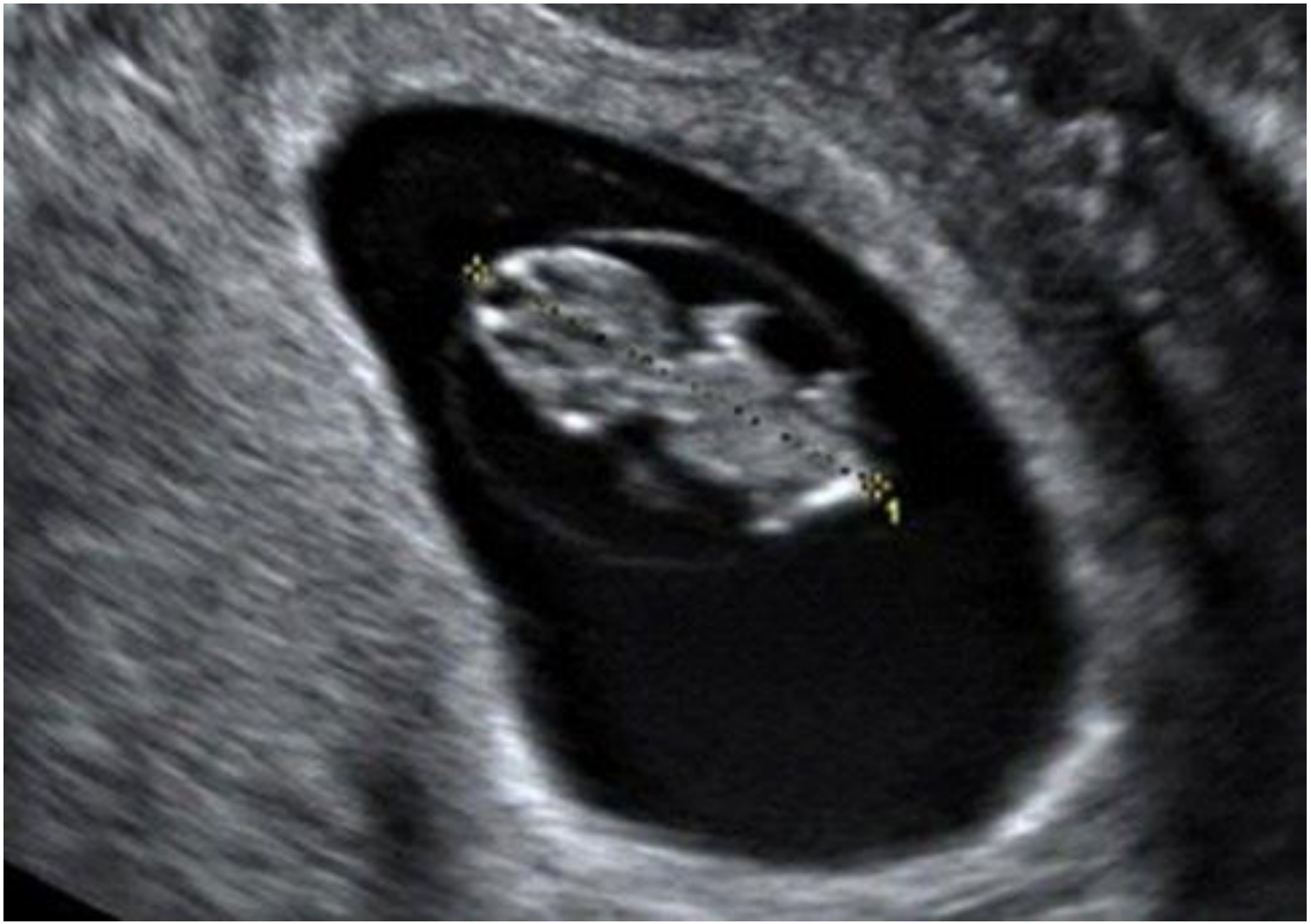
❑Week 5: visible gestation sac.

❑Week 6: visible yolk sac.

❑Week 6: visible embryo.

❑Week 7: visible amnion.

A viable fetus of 7 weeks gestation with amniotic sac clearly visible.



ultrasound criteria for the diagnosis of miscarriage on initial scan are based on:

- an empty gestational sac of mean sac diameter (MSD) ≥25 mm; *or*
- an embryo with a crown–rump length (CRL) ≥7 mm and no heartbeat.

These findings should be confirmed with a second opinion or repeat scan performed 7 days after the initial scan.

- Where neither of these criteria has been satisfied on the initial ultrasound scan, the pregnancy should be classified as a pregnancy of unknown viability (PUV) and an ultrasound scan then performed at an interval in order to definitively comment on viability.
- If >/= 12 mm sac diam with empty sac or <7mm embryo with no FH so repeat after 7 dd
- If </= 12 mm empty sac so repeat after 14 dd to 100% confirm misc if mean sac diam not doubled

Serum β-human chorionic gonadotrophin

- There is little evidence to support the role of β-human chorionic gonadotrophin (β-hCG) in determining viability after the visualization of an intrauterine gestation sac and yolk sac, as considerable variation exists in the normal increase in β-hCG and occasionally falls are identified in the presence of subsequently viable pregnancy.
- However, serum measurements of β-hCG do have a role in managing pregnancy of unknown location (PUL)

Serum β-human chorionic gonadotrophin in pregnancy of unknown location (PUL)

- a rise of 66% over 48 hours is associated with a viable intrauterine pregnancy;
- levels between a 65% increase and a 13% decrease are associated with a possible ectopic pregnancy;
- and a decrease of more than 13% is associated with a failing pregnancy

Progesterone

- The main role of progesterone lies in the assistance it provides in determining the likely outcome of PUL rather than in diagnosing miscarriage
- accuracy of single progesterone measurement to predict early pregnancy outcome in symptomatic women revealed that progesterone level equal to or below 10 ng/mL predicted a non-viable pregnancy in 96.8% of cases

Management

- **Type of miscarriage**.
- **Gestation** at which miscarriage is diagnosed: care needs to be taken where miscarriage is diagnosed at later gestations. At 11 weeks and above where there is a missed miscarriage and an embryo measuring significantly less than expected, these patients are at risk of heavier bleeding compared with earlier gestations and should be warned of such. **Surgical evacuation** may be preferable as the first line of treatment. If the **preference** is for medical evacuation, then this may be more appropriately carried out in an inpatient setting.
- **Facilities available** at individual units: out-of-hours access to emergency care and advice in case of heavy bleeding with medical or expectant management; capacity of units to offer inpatient medical management.
- **Medical history**, for example cardiac disease and sickle cell anaemia. The risks are increased in the presence of haemorrhage and so generally among these patients, surgical evacuation, being associated with less blood loss, is the most appropriate choice. The same applies if there is evidence of infection.
- **Patient choice.**
- **Cost.**
- **NICE guidance**

treatment

- Expectant, medical and surgical management of miscarriage are all viable options for the management of first-trimester miscarriage and choice should be based on patient wishes as well as the clinical situation.
- The incidence of infection is not significantly higher in any management group.
- Blood loss is heaviest in medical and expectant management compared with surgical, though with no increased risk of blood transfusion, and this should be taken into account when counselling certain groups, for example patients with sickle cell anaemia, in whom blood loss should be kept to a minimum.

- In expectant mx 85% of patient will resolve within 3 wks of dx
- Surgical by dil & suction after cx ripening by misoprostol at least 1 hr before procedure
- Medical by uterotonic: misoprostol or gemeprost with or without mifepristone.
- Overall, the success rate of medical management(72–93%) is similar to that of expectant management (75–85%) but medical management has the advantage that patients can control the course of events by timing medication to allow miscarriage to take place.
- However, these success rates are dependent on how much time has elapsed following treatment: the longer the wait, the higher the success rate.

Anti-D prophylaxis

Not recommended for:

- Spont complete miscarriage<12wks
- Medical rx of ectopic or miscarriage
- threatened miscarriage
- PUL.
- NICE recommend 250 iu for 1st TM misc with surgical intervention

Anti-D prophylaxis

Prophylaxis is Recommended before 12 wks for:

- Ectopic,
- Molar,
- pregnancy with repeated bleeding, heavy bleeding or those associated with abdominal pain
- There is no need to perform a Kleihauer test to assess the volume of fetomaternal haemorrhage prior to prophylaxis.

Summary of anti-D and miscarriage

- Anti-D immunoglobulin is required in the following circumstances for non-sensitized RhD-negative women.
- Spontaneous miscarriage at 12 weeks' gestation and beyond.
- Miscarriage at any gestation where there has been surgical intervention or, if spontaneous, where the bleeding has been heavy or repeated.
- Threatened miscarriage at 12 weeks and beyond. If repeat episodes, repeat anti-D at 6-week intervals.

Recurrent misc

- The Royal College of Obstetricians and Gynaecologists (RCOG) defines recurrent miscarriage as the loss of three or more consecutive pregnancies before viability, (includes all pregnancy losses from the time of conception until 24 weeks of gestation).
- Three or more losses affect 1–2% of women of reproductive age.
- Two or more losses affect around 5%.
- Despite extensive investigation of women with three or more miscarriages, the cause of recurrent pregnancy loss remains unknown in the majority of cases.
- Unexplained rec misc has 70% chance of live birth rate in subsequent pregnancies

Advancing maternal age & high BMI are associated with miscarriage

Age-related miscarriage rates are as follows:

- 12–19 years, 13%;
- 20–24 years, 11%;
- 25–29 years, 12%;
- 30–34 years, 15%;
- 35–39 years, 25%;
- 40–44 years, 51%;
- and 45 or more years, 93%.

➢ So maternal age above 35 associated with high misc rate.

➢ Paternal age over 40 also increases the risk.

➢ BMI above 30 kg/m2 associated with rec misc

➢ The same as with underweight mothers

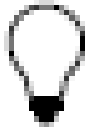
Summary box 41.1

- Recurrent miscarriage is defined as three consecutive pregnancy losses.
- Miscarriages should be further classified on the basis of ultrasound findings into biochemical, empty gestation sac, fetal or second trimester.
- In women with recurrent miscarriage, poor prognostic factors for further miscarriage include number of previous losses, maternal age and obesity.

Aetiology:
Structural genetic factors

- Fetal & parental chromosomal abnormalities
- Fetal chm abn are seen in 70% of abortions in 1^{st} TM & 20% in 2^{nd} TM (trisomy, polyploidy & monosomies)
- Parental chm abn and mainly balanced translocation is seen in 2% of rec misc

Fetal & parental genetic study



Summary box 41.2

- Recurrent miscarriage is associated with parental balanced translocations. **2%**
- In the presence of a balanced translocation, couples still have a 70% live birth rate in a subsequent pregnancy.
- Only 1% of offspring from couples with balanced translocations have unbalanced translocations.
- Parental karyotyping is no longer thought to be cost-effective.

Anatomical factors

- **Congenital uterine anomaly**: septated ut, bicornuate and arcuated ut are seen in about 6.7% of general population and in 17% of women with rec misc.
- Septated ut when treated hysteroscopically demonstrated improved live birth rate
- **Cervical weakness** assoc with 2nd TM misc. may benefits from circlage but with possible risk of surgery and stimulating ut cont
- **Acquired uterine anomaly** like submucous fibroid distorting the cavity cause 2nd TM misc respond well to hysteroscopic resection of fibroid from 21% to 0%, Asherman synd is another acquired disorder

Prothrombotic factors

- **APS** present in 15% of women with rec misc
- rec misc in 1st TM or 1 2nd TM misc are one of diagnostic criteria of APS
- Rx options LDA, LMWH, IVIG & prednisolone
- LDA & LMWH are recommended by RCOG for Rx but no supporting evidence of benefit.
- **Thrombophilia:** factor V Leiden mutation, activated protein C resistance, prothrombin gene G20210A mutation and protein S deficiency, have been significantly associated with recurrent miscarriage

Endocrinological factors

- Polycystic ovarian syndrome: due to high androgen and insulin resistance, you can advise her to reduce weight , she may be given metformin especially if she has impaired GT
- Abnormalities of glucose metabolism and thyroid disorders: If well controlled there is no risk of rec misc, so routine screening is not recommended in the absence of symptoms.

Immunological factors

- **Antithyroid antibodies:**

  Patient with positive antibodies with rec misc may get benefit from levothyroxine therapy
- **Natural killer cells:** whether peripheral or endometrial are both associated with rec misc
- Different immunological therapy are shown of no benefit in Rx: such as paternal cell immunization, third party-donor-cell immunization, trophoblast membrane infusion and intravenous immune globulin, showed no significant beneficial effect over placebo in improving live birth rates

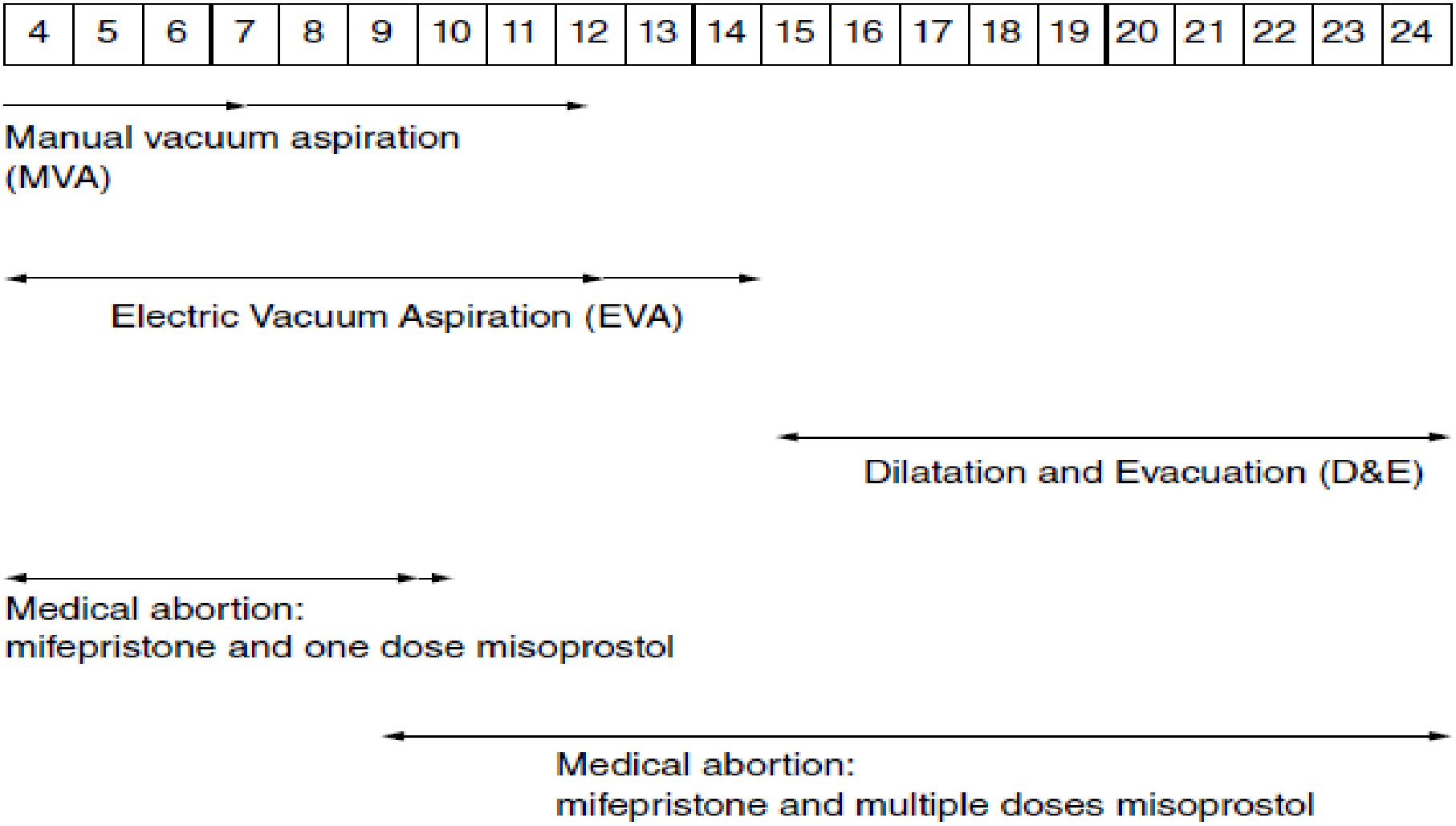
Endometrial factors

- Defective implantation due to depleted endometrial stem cells
- Chronic endometritis : improved live birth rate seen in treated cases

Idiopathic recurrent miscarriage management:

- Tender loving care: reassurance by regular reassuring scans and psychological support
- 75% 0f idiopathic cases will have live births in subsequent pregnancies
- Aspirin, progesterone & hCG are not proved of benefit in idiopathic rec misc and not improved live birth rate.

Methods of abortion by gestational age in weeks. For termination of pregnancy



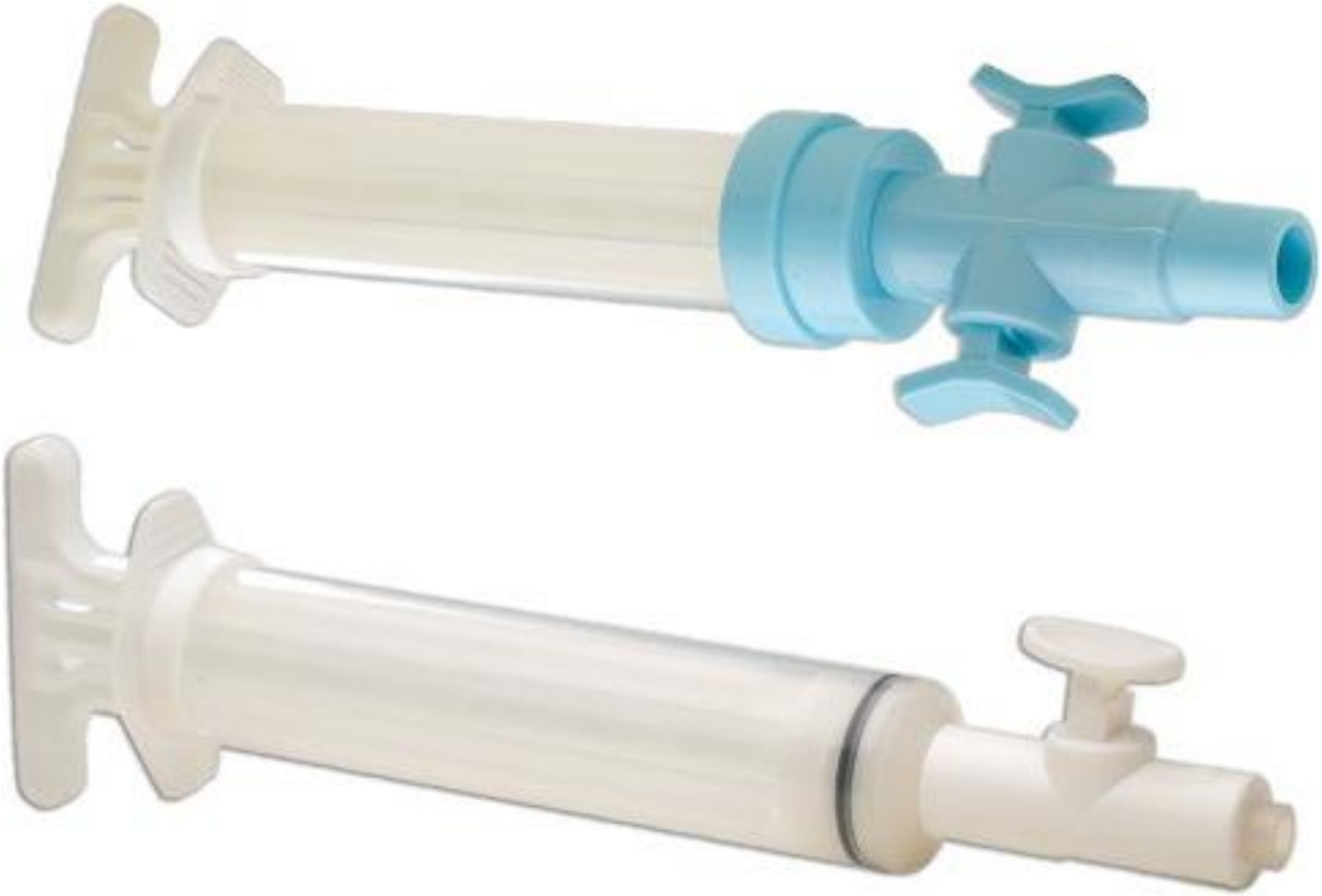
Preparation for surgical termination:

- Misoprostol is the most commonly used agent for cervical preparation before first-trimester surgical abortion. A dose of 400 μg is effective when administered per vagina 3 hours before the evacuation or sublingually 1 or 2 hours before surgery
- Mifepristone is better tolerated and achieves greater baseline cervical dilation than misoprostol, but requires administration at least 24 hours preoperatively and is significantly more expensive.
- Gemeprost is licensed in the UK for cervical priming but is no longer considered a first-line preparatory agent because it requires refrigeration, is expensive and may only be given per vagina

Pain management

- Local cervical anasth by lidocaine inj 20 ml at 4 deep paracervical injections
- Or iv propofol & fentanyl for GA without intubation
- For women who want greater pain and anxiety management than local anaesthesia provides but do not want to be asleep, low-dose intravenous fentanyl and midazolam can be provided to achieve a state of conscious sedation.
- Women's preference, risk factors for anaesthetic complications, setting and resources should be considered when choosing a method of pain control during surgical abortion.

Single- and double-valve manual vacuum aspirators.



Complications of surgical evac

- 8/1000 minor
- 1/1000 major require hospitalization
- 2/100 re-aspiration
- A history of two or more caesarean deliveries is the strongest predictor of a major complication with D&E
- Uterine perforation during vacuum aspiration ranges from 0.1 to 4 per 1000 procedures
- With D&E, perforation occurs in 2–3 per 1000 procedures
- Cervical tears occur in 0.1–10 per 1000 procedures.
- Serious he e require bl transf due to atony 1/1000

Medical termination of preg

- Mifepristone and misoprostol is the most effective regimen for first- and second-trimester medical abortion and has the shortest induction-to-abortion interval.
- Early medical abortion with mifepristone and misoprostol may be safely undertaken in a non-clinical environment; after 9-10 weeks' gestation, admission to a clinical facility is typically required.
- Complications are mainly due to retained tissue and bleeding and may require surgical managment.

Mifepristone

- Mifepristone causes cervical softening, decidual necrosis and increased myometrial sensitivity to prostaglandins.
- when administered 24–48 hours before a prostaglandin analogue, efficacy increased to nearly 100%.
- Contraindications to mifepristone/misoprostol
- chronic adrenal failure,
- inherited porphyria,
- coagulopathy,
- hypersensitivity to the medicines,
- And known or suspected ectopic pregnancy.
- Mifepristone is an anti-glucocorticoid, and thus caution is also advised for women using long-term corticosteroids or with conditions that may require steroid treatment in case of exacerbation such as severe, poorly controlled asthma.
- Caution is advised with hepatic or renal failure or malnutrition
- If Hb < 9-10 gm/dl
- IUCD should be removed before commence the termination