Contraception for healthy women

Shreelata Datta

Abstract
A wide variety of methods of contraception are available, all of which are generally extremely safe and essential to allow parents to decide the size and timing of their family. However, not all methods are suitable for everyone and the choice of contraception is often influenced by several factors. Female sterilization and intrauterine devices are the most popular methods in developing countries, whilst contraceptive pills, intrauterine devices and condoms are the most subscribed methods in developed countries. A holistic approach to contraception involves the individual's sexual and reproductive needs and the ideal contraceptive method is one that is safe, effective and appropriate to the patient. This review uses case presentations through three key reproductive stages to highlight a pragmatic approach to contraception and appropriate choices. There is also an overview of other types of contraception which are commonly requested and used.

Keywords Mirena coil; oral contraceptive pill; sterilization

Introduction
The proportion of couples in the UK choosing to have children later in life or not at all is rising and contraception may be used by women or their partners for over 30 consecutive years. The options for contraception have never been so widely available, safe or efficacious. However, not all methods are suitable for everyone and the choice of contraception is often influenced by several factors, for example the need for frequent clinic visits and the cost to the individual. Female sterilization and intrauterine devices are the most popular methods in developing countries, whilst contraceptive pills, intrauterine devices and condoms are the most subscribed methods in developed countries. Knowledge of the methods available, their benefits and limitations are essential for appropriate counselling and management of patients presenting in an outpatient or emergency setting. The World Health Organization defines four types of patient requiring counselling on contraception:

1. Returning patients with no problems
2. Returning patients with problems
3. New patients with a method in mind
4. New patients with no method in mind.

This review discusses commonly encountered methods of contraception at three key stages in the reproductive lifecycle in detail, highlighting current approaches to counselling and long-term management.

Initial assessment
A careful history is essential to elicit any contraindications for particular methods of contraception. The minimum requirement is take a clinical history for personal and family history of thrombosis, including details of sexual and reproductive health. Relevant medical conditions include hypertension, venous thromboembolism, ischaemic heart disease, diabetes, migraine, liver disease, gallbladder disease and breast cancer. Past contraceptive use and the length of use, a full menstrual history and any recent pregnancies (if lactating) should also be noted. Non-prescription medications and lifestyle are also important factors to consider when advising on contraceptive methods.

The patient’s BMI and a baseline blood pressure should be recorded, with the blood pressure monitored at follow-up appointments. A pelvic examination is particularly important in patients using invasive methods of contraception — for example, the copper intrauterine device or the diaphragm. The abdomen should be examined for tenderness (suggestive of infection) and masses (suggestive of fibroids or ovarian cysts). The uterus should be palpated by bimanual examination to assess its size, consistency, mobility and axis.

Routine vaginal and cervical swabs are not indicated unless the patient is at high risk of infection or symptomatic.

Case 1: contraception for adolescents
A 16-year-old teenage girl has attended for an ERPC following an incomplete surgical termination of pregnancy. This was an unplanned pregnancy with her first partner, with whom she was using barrier contraception. You are asked to review her post-operatively and consider her contraceptive needs.

What would you ask?
Teenage conception rates in the UK remain amongst the highest in the developed countries. Failure to use contraception at all or to use it effectively and consistently is often used as an indicator of unplanned pregnancy. As well as taking a full medical history, it is important to ascertain the patient’s expectations and ability to comply with medication to select the most appropriate contraceptive method. Awareness of the risk of sexually transmitted infections is also important.

What are the options for this patient?
The most common option for adolescents is the combined oral contraceptive pill, which can be used from menarche to the menopause in healthy women. This contains oestrogen (usually ethinyl oestradiol) and a progestogen (a synthetic progesterone) and works as a 21 day regime which inhibits ovulation and increases the viscosity of cervical mucus. It is over 99% effective at preventing pregnancy if used consistently and correctly. Table 1 lists the WHO medical eligibility criteria for hormonal contraceptive use.

More recently, transdermal and injectable preparations have become available. Their efficacy and safety remain similar regardless of the route of administration, although their efficacy is reduced by poor compliance and several drugs (Box 1). Where this is the case, additional protection, such as a barrier method should be used until 4 weeks after discontinuing the drug. Ideally, the combined oral contraceptive pill should be stated on
day 1 of the menstrual cycle, although it can be started up to day 5 of the cycle.

Advantages of the combined contraceptive pill include its high efficacy if used correctly, low cost and simplicity. Its non-contraceptive benefits are also well known. Side effects include breakthrough bleeding, mastalgia and fluid retention. The main risks of hormonal contraception are an increased risk of deep venous thrombosis and pulmonary embolism. This is related to the dose of oestrogen and the type of progesterone. Women with a BMI over 30 should be counselled on the increased risk of thrombosis and consider alternative contraceptive methods. Other risks include stroke, gallbladder disease, hypertension, myocardial infarction, carcinoma of the cervix, hepatocellular carcinoma and breast cancer.

Whilst there is evidence for an increased relative risk of breast and cervical cancer and cardiovascular disease in association with hormonal contraception the absolute risk remains very small.

What counselling would you provide?

She should be advised that the oral contraceptive pill should be taken within 12 hours of the same time every day for 21 consecutive days. Box 2 shows the classification of the combined oral contraceptive pill.

She should be reassured that contraception is still provided during the routine hormone free days. If she misses a pill, she should take the dose as soon as possible and continue her usual pill-taking schedule. If three or more 30 µg oestradiol pills or two or more 20 µg oestradiol pills are missed, additional protection will be required for 7 consecutive days. If more than three pills are missed, alternative long-term contraceptive methods should be considered as well as additional protection and emergency contraception. She should be provided with appropriate written and verbal instructions regarding rules of missed or late pills, vomiting and the use of new medications. A follow-up visit with the GP after 3 months of use will allow further assessment of any problems. Return to fertility on stopping the pill is immediate, with no evidence of long-term effect on fertility.

She asks you about the methods of emergency contraception. What do you advise?

Emergency contraception affects implantation and should be taken as soon as possible after unprotected intercourse. The emergency contraceptive pill (levonorgestrel-only) is a single-dose tablet which is available over the counter but must be taken within 72 hours after unprotected intercourse. 84% of expected pregnancies are prevented if levonorgestrel is taken within this timeframe. The standard formulation contains 1.5 mg of levonorgestrel as a single tablet. However, liver enzyme inducing drugs may increase its metabolism and decrease its efficacy. The main contraindication to levonorgestrel is gestational trophoblast neoplasia, with abnormal HCG levels. The copper bearing IUD is an alternative method but must be inserted within 5 days of unprotected intercourse. Contraindications to its use include current venous thromboembolism requiring anticoagulation, the immediate post-partum period (first 4 weeks) and gestational trophoblast disease (with abnormal levels of HCG).

After using emergency contraception, a reliable long-term method of contraception should be commenced. As well as preventing at least 99% of expected pregnancies, administering

### Common drugs which interact with hormonal contraceptives

- Barbiturates
- Carbamazepine
- Phenytoin
- Rifampicin
- Griseofulvin
- Lamotrigine
- Cyclosporin

### Classification of the combined oral contraceptive pill

1. By oestrogen dose — 20, 30, 35 µg oestrogen
2. By variation of oestrogen dose in the cycle
   i. Monophasic (21 day pills)
   ii. Everyday pills
3. By type of progestogen
   i. 2nd generation progestogen containing pills: Levonorgestrel and Norethisterone
   ii. 3rd generation progestogen containing pills: Desogestrel
the Cu-IUD as an emergency contraceptive has the advantage of providing long-term contraception.

**Case 2: post-partum contraception**

You are asked to review a 33-year-old lady on the post-natal ward following the forceps delivery of her fourth child. Her recovery has been unremarkable and she is medically fit. She tells you that this pregnancy was the result of poor compliance with the combined contraceptive pill and that she is in a stable relationship. She asks for your advice on the most appropriate method of contraception.

**What would you ask?**

It is important to ascertain whether this patient is breastfeeding, as breastfeeding is in itself a form of contraception and a relative contraindication for the combined contraceptive pill, although the progesterone only pill can be considered directly after delivery. In addition, it is important to establish whether her family is complete or whether she wishes to have more children in the future.

**What are the options for this patient?**

In the short-term, the lactational amenorrhoea method prevents conception in over 98% of women in the first 6 months after childbirth if used correctly. Breastfeeding reduces the release of gonadotrophins, thereby suppressing ovulation and resulting in amenorrhoea. However, the baby must be exclusively breastfed on demand and this method is valid for approximately 6 months only.

The combined oral contraceptive pill should be avoided in the first 6 weeks after delivery as it may affect the amount of breast milk produced. The progesterone only pill, however, can be used before this time period. As this pregnancy was the result of poor compliance with the contraceptive pill, it is unlikely that this patient will be a suitable candidate for the progesterone only pill, which requires a high compliance rate. In addition, the combined oral contraceptive pill should not be considered until 21 days after delivery due to the increased risk of thrombosis post-partum and the reduction of breast milk production.

She tells you she has completed her family and wishes to have a permanent method of contraception. What would you advise her?

Long-term reversible contraception includes the intrauterine devices or implants. The levonorgestrel releasing intrauterine device can be used by women who are breastfeeding and are at least 4 weeks postpartum. The primary method of permanent contraception is sterilization or vasectomy, although long-acting reversible contraceptives rely the least on the user and are as effective as sterilization. Appropriate patient selection is vital, as the experience of regret after the procedure is highest in women under the age of 30. The most common reason for regret in the UK is the formation of a new sexual relationship. Interval sterilization (ie. at least 6 weeks following pregnancy) has a higher success rate than sterilization at the time of delivery and the most commonly used method is laparoscopic tubal occlusion, usually with Filshie clips. The lifetime failure rate of tubal occlusion is 1:200 procedures and there are no absolute contraindications to sterilization. Ideally, the procedure should be performed within the first 10 days of the menstrual cycle to avoid a luteal phase pregnancy, where conception has occurred in the same menstrual cycle as the operation. This can be avoided by advising the women to use contraception between their last menstrual period and their operation date. She should also be counselled on the increased risk of ectopic pregnancy, and sterilization should be considered an irreversible form of contraception. The risk of laparotomy in those with previous abdominal surgery or obesity should be discussed. A less invasive alternative is hysteroscopic sterilization, but availability is currently limited in the UK. Vasectomy is also an effective method of contraception, with a success rate which is 10 times higher than female sterilization.

**Case 3: contraception for the perimenopausal period**

A 48-year-old lady presents with a 1 year history of increasingly irregular and scanty periods, although she has no other symptoms of the menopause. On investigating her symptoms, FSH and LH levels are normal, as is a transvaginal ultrasound of her ovaries and uterus. She is reassured, but enquires about the need to use contraception, as she has just started a new relationship.

**What would you ask?**

Taking a thorough medical, menstrual and social history is important prior to deciding on the best contraceptive method. This includes any history of malignancy, thrombosis, smoking and previous use of contraceptives. Women with stroke, migraine with aura or cardiovascular disease should avoid hormonal contraception. Blood pressure should be checked prior to and at least 6 months after initiating a woman aged over 40 years on hormonal contraception.

**What are the options for this patient?**

Given that the FSH and LH levels have confirmed that the menopause is not imminent, contraception must be taken and

**Absolute (WHO 4) and relative contraindications (WHO 3) to the Cu-IUD and levonorgestrel releasing intrauterine system. WHO categories: WHO 1, unrestricted use; WHO 2, benefits usually outweigh risks; WHO 3, risks usually outweigh benefits; WHO 4 unacceptable health risks**

<table>
<thead>
<tr>
<th>Medical condition</th>
<th>Cu-IUD</th>
<th>Mirena coil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current breast cancer</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Current endometrial cancer</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Current cervical cancer</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Current malignant trophoblast disease</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Current thromboembolic disease (DVT or PE)</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Migraine with focal symptoms</td>
<td>1</td>
<td>2 (initially); 3 (continuing)</td>
</tr>
<tr>
<td>Liver disease: active viral hepatitis</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Active cirrhosis</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Liver tumours</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

**Table 2**
discontinued only when the menopause is confirmed. As women approach the menopause, declining fertility, an increasing tendency towards menstrual irregularity and increasing background risks of both cardiovascular disease and breast cancer influence contraceptive choice and eligibility. No contraceptive method is absolutely contraindicated by age alone. Common options include the intrauterine devices (IUDs), which are long-acting, effective and require very little compliance. There are two types of IUDs: the copper intrauterine device (Cu-IUD) and the levonorgestrel releasing intrauterine system (Mirena coil). Table 2 summarizes the conditions where the risks of the Cu-IUD and the levonorgestrel releasing intrauterine system are outweighed by the benefits.

The Cu-IUD is known to have the highest efficacy and the lowest cost overall. It works by preventing fertilization and inhibiting sperm motility. The copper ions are toxic to sperm, altering sperm motility and viability in cervical mucus. It can be inserted at any time during the menstrual cycle once pregnancy has been excluded and can be used for 5 to 10 years, depending on the size of the device and the copper content. In women over the age of 40, once inserted, the Cu-IUD can remain in situ up to the menopause. Ideally, the device should remain in place at least a year after the last menstrual period. Fertility returns rapidly following IUD removal.

The main disadvantage of the Cu-IUD is the risk of menorrhagia and dysmenorrhoea. Other risks include spontaneous expulsion, perforation, pelvic infection and ectopic pregnancy. Whilst the risk of perforation is rare (approximately 1 in 1000 insertions), the risk of infection is greatest around the time of insertion in the presence of sexually transmitted infections. Although routine screening for Chlamydia is not required at the time of insertion, screening for those at high risk of an infection should be considered. The risk of an ectopic pregnancy is higher than that associated with other contraceptives but lower than if no contraception is used at all.

The levonorgestrel releasing intrauterine system (Mirena coil) can also be considered and is active for up to 5 years. It reduces menstrual loss and is therefore particularly useful for those with a history of menorrhagia. Although it is effective in managing menorrhagia in the presence of fibroids, it should not be used if fibroids are distorting the uterine cavity. Its primary mechanism of action is to inhibit sperm migration and inhibit implantation and its main advantage is that systemic release of progesterone is very low. However, a significant proportion of women may find that they become amenorrhoeic, although they may continue to ovulate. Other side effects include mastalgia, acne and mood swings.

As fertility diminishes with age, methods with a lower efficacy such as the diaphragm may be considered as the primary method of contraception in this age group.

How would you counsel her?
Women should be warned of the risk of pain at the time of inserting an intrauterine device. The possibility of uterine perforation or expulsion is rare (less than 1 in 1000 insertions) but should still be discussed. All women should have a bimanual pelvic examination prior to insertion and ideally, intrauterine devices should be inserted between day 1 to day 7 of the menstrual cycle. Heart rate should be documented after insertion. The most likely cause of failure is expulsion (1 in 20 insertions), which is most likely within the first 3 months of insertion. The Cu-IUD can increase menstrual blood flow and dysmenorrhoea and patients should be warned of this risk. The
levonorgestrel releasing intrauterine system may cause spotting and intermittent bleeding in the first 6 months in particular, with a risk of functional ovarian cysts. Hormonal symptoms may be reported with the levonorgestrel releasing intrauterine system, but these are not significantly different from Cu-IUD users. Amenorrhoea is seen in 20% of women after a year following insertion. Women should be advised to attend their GP 6 weeks after insertion of an IUD to check for IUD threads and should be shown how to self-examine.

Other uses for contraception
The non-contraceptive health benefits of different contraceptive methods may have a significant positive impact on health, particularly as a growing number of conditions are managed medically. Common conditions include dysfunctional uterine bleeding, dysmenorrhoea secondary to endometriosis and menorrhagia. It is important to consider the individual patient’s needs when prescribing contraception for alternative therapeutic benefits, for example, treating irregular periods due to a diagnosis of PCOS with the oral contraceptive pill is not appropriate in a patient who is looking to conceive. Table 3 summarizes the non-contraceptive medical benefits of hormonal contraceptives.

Conclusion
Counselling for contraception should include sexually transmitted infection prevention messages. Ideally, the risk of sexually transmitted infections should be assessed and opportunistic Chlamydia testing offered when appropriate. The effective use of condoms for women not in an exclusive sexual relationship should also be considered. Table 4 provides an overview of other commonly prescribed contraceptive methods which may also be considered.

As attitudes towards contraception change and women increase their use of contraception, it is imperative that the most reliable and appropriate methods of contraception are selected. The challenge for future years will be to develop effective yet more diverse methods of contraception and to tailor the strategies that are currently available further to the individual’s need.

FURTHER READING
Contraception: RCOG consensus views arising from the 49th RCOG Study Group.
Faculty of Sexual and Reproductive Healthcare clinical guidance. Contraception for women aged over 40 years. July 2010.