



## Module 1921

# Oral hormonal contraceptives: how they work and common side effects

From this pharmacy CPD module you will learn about:

- How oral contraceptives work
- Different types of oral contraceptives
- Common side effects
- Useful resources to keep your knowledge up to date

### LEANNE MAY, PHARMACIST

Contraceptive choices can be confusing for patients. As pharmacy professionals, it is important that we are able to explain the options clearly and support patients with any questions they may have.

### How oral contraceptives work

Oral contraceptives are available in two forms:

#### Combined oral hormonal contraceptives

(CHCs) contain both oestrogen and progestogen in varying combinations and strengths:

- oestrogen: as ethinylestradiol, estradiol or mestranol
- progestogen: as desogestrel, dienogest, drospirenone, gestodene or norgestrol.

#### Progestogen-only pills (POPs) contain only

progestogen as either desogestrel, levonorgestrel or norethisterone.

The traditional POPs containing norethisterone (eg Noriday),<sup>1</sup> or levonorgestrel (eg Norgeston)<sup>2</sup> exert their main effect by thickening the viscosity of the cervical mucus, reducing the entry to sperm and affecting the structure of the endometrium, causing it to become an unfavourable environment for implantation. They may also delay the tubal transport of ova.

CHCs and desogestrel-containing POP

contraceptives both act to inhibit ovulation as their main mechanism of action. This occurs when they suppress the synthesis and secretion of follicle stimulating hormone (FSH) and the mid-cycle surge of luteinising hormone (LH), thus inhibiting the development of ovarian follicles and ovulation (see Update module 1907 *Menstrual problems: dysmenorrhoea and menorrhagia*, for more information about the menstrual cycle). They also change the consistency of cervical mucus in the neck of the womb and thin the endometrium to prevent implantation, to further enhance their action.

### Different types of oral contraceptives

CHCs can be further classified by the varying amounts of oestrogen and progestogen within the tablet pack.<sup>3</sup>

#### Monophasic

These CHCs contain a fixed amount of oestrogen and progestogen in each active tablet. They are normally taken for 21 days, followed by a seven-day pill-free break (21/7) or as a 28-day option with seven placebo pills at the end of the pack – which serve to help keep patients in a routine and are not essential to maintain contraceptive cover. Some examples of monophasic pills include Microgynon, Marvelon and Cilest.

There is also a monophasic pill called Zoely that consists of 24 combined hormone tablets followed by four placebo pills.<sup>4</sup> This brings the advantage of shorter and lighter withdrawal bleeding and a higher incidence of absent withdrawal bleeds. It has its own missed pill advice due to the variation in regimen.

January 2019 guidance from the Faculty of Sexual and Reproductive Healthcare (FSRH) states: "There are no health benefits to patients of having monthly withdrawal bleeds. All women should therefore be advised of all CHC regimes, both standard and tailored, and allowed to choose which one they prefer."<sup>5</sup>

The options for tailored regimens are outside of the manufacturers' licences, but are supported by the FSRH. They include:

- shortened hormone-free interval: four pill-free days, instead of seven, in between packs

- tricycling: 3×21 active pills consecutively, followed by a four- or seven-day pill-free break
- continuous use: no pill-free break between 21-day packs; this can result in an increase in intermenstrual bleeding, but settles with time
- flexible extended use: continuous use of CHC, with no gap between packs until breakthrough bleeding occurs for three to four days, followed by a four-day hormone-free interval.

Pharmacists and pharmacy technicians should be aware of this new guidance.

#### Triphasic

Triphasic CHCs have varying amounts of oestrogen and progestogen, in three phases, marked carefully in the pack. It is important that they are taken in the correct order to prevent breakthrough bleeding. They are taken for 21 days followed by a seven-day pill-free break, or



they can be given as a 28-day pack (eg Logynon ED), which is to be taken every day and includes seven placebo tablets at the end.

Phased preparations are generally reserved for women who either do not have withdrawal bleeding or who have breakthrough bleeding with monophasic products. There are no biphasic products currently on the market.

### Quadriphasic

Qlaira is the only brand of quadriphasic pill. It has varying strengths of oestrogen and progestogen over four phases that are taken for 26 days, followed by two white tablets, which are placebos. This 26/2 break means the withdrawal bleed is lighter or non-existent. Qlaira is especially suitable for women who experience heavy bleeding during their periods (not related to other physical problems). It has its own missed pill advice, due to the complexity of the regimen.

### Progestogen-only pills (mini-pill)

POPs are taken at the same time every day, with no pill breaks.<sup>6</sup> They are a suitable alternative to CHCs when oestrogens are contraindicated.

There is a smaller window of opportunity to remember to take the POPs without counting as a missed pill; three hours for Norgeston and Noriday and 12 hours for desogestrel-based brands such as Cerazette, so they are only suitable for women who have good routines and are not likely to forget their pill.

### How effective are oral contraceptives?

With perfect use, both CHCs and POPs are more than 99% effective.<sup>7</sup> However, not everyone can take their pill perfectly all the time and occasionally there are interactions or possibly malabsorption, so with typical use there is a 9% risk of pregnancy.

### At what age can a woman start hormonal oral contraception?

Although special care needs to be taken with females under the age of 16 years, oral

contraception may be started any time after menarche.<sup>8</sup> Consent from their parents is not a legal requirement under 16 years old, but it is encouraged. The prescriber would need to take into account the Fraser guidelines (see more on the Family Planning Association website at [tinyurl.com/CDFraserguideline](http://tinyurl.com/CDFraserguideline)).<sup>9</sup>

### Where can a woman obtain contraception on the NHS?

If a person requires signposting to their nearest sexual health service provision, they can be referred using the NHS website (see more at [tinyurl.com/CDsexualhealthservice](http://tinyurl.com/CDsexualhealthservice)).

With the updated FSRH guidance,<sup>5</sup> there is a move towards carrying out oral contraceptive appointments online instead of face-to-face, as long as the required patient information (eg eligibility, drug history, adherence, method

satisfaction, body mass index and blood pressure (BP)) is still recorded and appropriate advice is still provided to the patient. The new guidance recommends increasing the prescribing to 12 monthly prescriptions, although the dispensing provision will remain as three months at a time.

### Common side effects of oral contraceptives

CHC side effects can include:

- breakthrough bleeding,<sup>10</sup> which is common in the early days with CHCs and should subside
- nausea, sore breasts, tiredness, headache and mood changes; these side effects usually go away within days or weeks of starting the pill. If they persist, you should refer patients back to their prescriber, as a different brand of pill may suit them better

- increase in BP. This should be recorded annually and the CHC pill may need to be stopped if a person's BP remains raised. Weight gain is commonly assumed to be a CHC side effect. However, Cochrane reviews have failed to show any evidence that significant weight gain is in fact a side effect.

With POPs, the most commonly reported adverse reaction is disruption to the menstrual cycle, as the bleed may be lighter, more frequent, cause spotting or stop completely. However, other common side effects with the progestogen-only pill include:<sup>11</sup>

- acne
- breast tenderness
- cysts on the ovaries (which are harmless and will decrease over time)
- decreased libido
- headache
- mood changes
- nausea and vomiting.

All of these are likely to occur in the first few months, but you can reassure the patient that these generally improve over a few months. If they do not subside then they should be referred back to their prescriber for an alternative.

### Interactions

#### Reduced contraceptive efficacy

CHCs and POPs could have their efficacy decreased by enzyme-inducing drugs, such as:<sup>12,13</sup>

- antibacterials eg rifabutin and rifampicin (highest risk)
- antiretrovirals eg efavirenz and nevirapine; the antiretroviral ritonavir reduces the bioavailability of oestrogen and may reduce the bioavailability of progestogens by inducing glucuronidation
- antiepileptics eg carbamazepine, eslicarbazepine, fosphenytoin, oxcarbazepine, phenobarbital, phenytoin, primidone, rufinamide and topiramate
- herbal medicines eg St John's wort



Common side effects of progestogen-only pills include acne, headache, and nausea and vomiting

- other, less common medicines, such as modafinil, bosentan, aprepitant and lumacaftor.

Lamotrigine and griseofulvin are not thought to be enzyme-inducing drugs; however, contraceptive efficacy may be reduced by concurrent use. The clinical significance of this effect is unknown.

### Advice you can provide to patients

You should advise patients taking a medication that reduces contraceptive efficacy that they may need to change to another form of contraception, such as an intrauterine device (IUD) or parenteral progesterone, and continue this for the duration of treatment and for 28 days after stopping. However, if the patient wishes to continue their hormonal contraception then the following action may be appropriate:

**Short course** (two months or less of an enzyme-inducing drug): Continued use of the CHC or POP, while using condoms consistently and carefully for the duration of treatment and for 28 days after stopping the enzyme-inducing drug.

**Long term** (over two months of an enzyme inducing drug): Women taking rifampicin, rifabutin and griseofulvin should always be advised to change to an alternative method. For all other enzyme inducers, if a woman wishes to continue their CHC, the prescriber may consider recommending a minimum 50mcg (30mcg + 20mcg) ethinylestradiol monophasic pill during treatment and for a further 28 days, with a continuous or tricycling regimen plus pill-free interval of four days. Doses can be increased up to a maximum of 70mcg after specialist advice.

Drugs that cause severe vomiting and diarrhoea (eg orlistat) can affect the absorption of oral contraceptive pills. While there is no need to avoid concomitant administration in any of these cases, the missed pill advice would need to be followed if these effects occurred. The same advice applies to all antibiotics, except the enzyme inducers.

### Increased risk of side effects

There is a risk certain drugs will inhibit enzymes that normally metabolise oral contraceptives. While this will not affect the contraceptive efficacy, it may result in an increase of hormone levels, putting the patient at greater risk of contraceptive side effects and possibly have an effect on control of the condition, requiring extra monitoring.

The following enzyme inhibitors are known to increase these risks:

- antibacterials eg erythromycin
- antiretrovirals eg atazanavir
- antifungals eg fluconazole, itraconazole, ketoconazole, posaconazole and voriconazole
- immunosuppressants eg tacrolimus
- non-steroidal anti-inflammatories eg etoricoxib
- statins eg atorvastatin and rosuvastatin
- vasodilators eg sitaxentan sodium
- grapefruit juice, which is an enzyme inhibitor, can increase the side effects of the contraceptive pill if consumed regularly, so is best avoided.

Not only can other drugs affect hormone levels, but oral contraceptives may also affect the metabolism of other medicines. This often results in increasing the requirements for monitoring in certain conditions or for certain treatments. Examples of medicines and potential impacts include:

- antiepileptics – CHCs moderately reduce lamotrigine exposure.<sup>14</sup> This results in a potential risk of reduced seizure control while taking the CHC, and a potential for toxicity in the CHC-free week. Contrarily, desogestrel might increase lamotrigine levels and adverse effects, and ethinylestradiol may modestly reduce sodium valproate levels
- antihypertensives – increased BP
- antidiabetics – the control of diabetes may be affected in some women while taking hormonal contraceptives, but it is unusual for it to be seriously disturbed
- anxiolytics and hypnotics – oestrogens



**Grapefruit juice, an enzyme inhibitor, can increase the side effects of the contraceptive pill**

- and progestogens may reduce plasma concentration of lorazepam, oxazepam and temazepam
- thyroid hormones – oestrogens may increase the requirements for thyroid hormones in hypothyroidism, so an increase in monitoring will be required
  - immunosuppressants – ethinylestradiol might increase tacrolimus concentrations, so levels can be monitored by the woman's specialist if required. Theoretically, tacrolimus might also increase hormonal contraceptive exposure. Ciclosporin levels may be increased by oestrogens and progestogens
  - dopaminergics – selegiline levels are potentially increased by oestrogens and progestogens, resulting in an increased risk of toxicity. Manufacturers advise avoiding concurrent use. Ethinylestradiol reduces the clearance of ropinirole by about a third
  - ulipristal – no hormonal contraceptives should be used within five days of taking this emergency contraception, as it could affect the efficacy of current oral contraception, while the pill could affect ulipristal efficacy.

### Further resources

There are many useful resources that can help you to keep up to date with the ever changing contraceptive advice available. By ensuring that you have the relevant signposting information in your pharmacy and that your team are trained to deal discretely and confidentially with the sensitive conversations around oral contraception, you can provide a safe and valuable support service for your local population.

Further resources include:

- Behind the Headlines – NHS news checker, found at [tinyurl.com/CDcontraceptive1](https://tinyurl.com/CDcontraceptive1)
- BNF – hormonal contraceptives, found at [tinyurl.com/CDcontraceptive2](https://tinyurl.com/CDcontraceptive2)
- British Association for Sexual Health and HIV, found at [tinyurl.com/CDcontraceptive3](https://tinyurl.com/CDcontraceptive3)
- Brook Young People Charity – for its contraceptive decision-making tool, found at [tinyurl.com/CDcontraceptive4](https://tinyurl.com/CDcontraceptive4)
- Nice clinical knowledge summary – CHC, found at [tinyurl.com/CDcontraceptive5](https://tinyurl.com/CDcontraceptive5)
- Faculty of Sexual and Reproductive Healthcare, found at [tinyurl.com/CDcontraceptive6](https://tinyurl.com/CDcontraceptive6)

- Find the nearest NHS sexual health services, at [tinyurl.com/CDcontraceptive7](http://tinyurl.com/CDcontraceptive7)
- Fraser Guidelines, found at [tinyurl.com/CDcontraceptive8](http://tinyurl.com/CDcontraceptive8)
- HIV interactions checker, found at [tinyurl.com/CDcontraceptive9](http://tinyurl.com/CDcontraceptive9)
- NHS UK – Combined pill, found at [tinyurl.com/CDcontraceptive10](http://tinyurl.com/CDcontraceptive10)
- NHS UK – The progestogen-only pill, found at [tinyurl.com/CDcontraceptive11](http://tinyurl.com/CDcontraceptive11)
- Patient.info – Combined oral contraceptive pill, found at [tinyurl.com/CDcontraceptive12](http://tinyurl.com/CDcontraceptive12)
- Public Health England – NHS UK One You, found at [tinyurl.com/CDcontraceptive13](http://tinyurl.com/CDcontraceptive13)
- The Family Planning Association, for factsheets and resources, at [tinyurl.com/CDcontraceptive14](http://tinyurl.com/CDcontraceptive14).

## References

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2. Bayer plc (2018) Norgeston. Summary of product characteristics. Electronic Medicines Compendium.
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6. FSRH of the Royal College of Obstetricians and Gynaecologists (2019) clinical guidance: Progestogen-only pills. [www.fsrh.org/standards-and-guidance/documents/cec-ceu-guidance-pop-mar-2015/](http://www.fsrh.org/standards-and-guidance/documents/cec-ceu-guidance-pop-mar-2015/)
7. www.nhs.uk (2017) Your contraception guide. How effective is contraception at preventing pregnancy?
8. www.nhs.uk (2018) Sexual health. Getting contraception.
9. The Family Planning Association (2016) Under-16s: consent and confidentiality in sexual health services.
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12. British National Formulary (2019) Contraceptives, interactions.
13. FSRH of the Royal College of Obstetricians and Gynaecologists (2018) Clinical guidance: drug interactions with hormonal contraception.
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## Oral contraceptives CPD – planned learning

### What are you planning to learn?

I want to learn more about oral hormonal contraceptives, including how they work, the different types available and common side effects associated with taking them. I also want to improve my knowledge of useful resources that I can recommend to patients or use to keep my own knowledge up to date.

This learning will help me to refresh and maintain existing skills and knowledge about oral contraceptives, to be able to confidently provide advice to patients and carers and know when to refer.

### How are you planning to learn it?

- I plan to find out more about combined oral contraceptives on the Patient website at [tinyurl.com/contraceptive1](http://tinyurl.com/contraceptive1).
- I plan to read more about progesterone-only pills on the Patient website at [tinyurl.com/contraceptive2](http://tinyurl.com/contraceptive2).
- I plan to improve my knowledge of the different types of oral contraceptives available by checking the BNF website at [tinyurl.com/contraceptive3](http://tinyurl.com/contraceptive3).
- I plan to find out about reliable sources of information about oral contraceptives for patients, such as the Brook website at [tinyurl.com/contraceptive4](http://tinyurl.com/contraceptive4)

### Give an example of how this learning has benefited the people using your services

A young woman presented with a prescription for a combined oral contraceptive and asked for some advice, as she couldn't remember all the information the nurse prescriber had told her. I was able to talk her through how to take it, discuss common side effects and recommend some websites for further information.

## Take the 5-minute test online

1. Combined oral hormonal contraceptives (CHCs) contain both oestrogen and progestogen in various combinations and strengths.  
**True or false**
  2. The main mechanism of action of traditional progestogen-only pills (POPs) containing levonorgestrel or norethisterone is to inhibit ovulation.  
**True or false**
  3. Tricycling a CHC involves 3×21 packs of active pills being taken consecutively, followed by a four- or seven-day pill-free break.  
**True or false**
  4. With perfect use, both CHCs and POPs are more than 99% effective.  
**True or false**
  5. Parental consent is a legal requirement for females aged under 16 years old before oral contraception can be started.  
**True or false**
  6. New guidance from the Faculty of Sexual and Reproductive Healthcare recommends prescribing CHCs and POPs three months at a time.  
**True or false**
  7. Common side effects of CHCs include acne, cysts on the ovaries and decreased libido.  
**True or false**
  8. The efficacy of CHCs and POPs can be reduced by enzyme-inducing drugs.  
**True or false**
  9. CHCs decrease the requirements for thyroid hormones in hypothyroidism, so an increase in monitoring is required.  
**True or false**
  10. Hormonal contraceptives should not be used within five days of taking the emergency contraception ulipristal.  
**True or false**
- You can complete the quiz and logsheet by visiting [bit.ly/UPDATE-PLUS](http://bit.ly/UPDATE-PLUS) and searching: 1921**