For central **precocious puberty** the usual dose is the equivalent of nafarelin 800 micrograms intranasally (400 micrograms in each nostril) twice daily. If adequate suppression is not achieved at this dose it may be increased to 600 micrograms three times daily in alternate nostrils (1800 micrograms daily).

Regimens for **oocyte collection for IVF** use gonadorelin analogues for pituitary desensitisation before ovulation induction with gonadotrophins; the equivalent of 400 micrograms of nafarelin is given intranasally twice daily, beginning either in the early follicular phase (day 2) or midluteal phase (day 21) of the menstrual cycle. Therapy should be continued until downregulation is achieved; if this does not occur within 12 weeks therapy should be withdrawn. Once downregulation occurs gonadotrophin treatment is added to nafarelin therapy until an appropriate stage of follicular development, when both are withdrawn and chorionic gonadotrophin is given to induce ovulation.

Nafarelin has also been given in other sex hormone-related conditions.

Benign prostatic hyperplasia. For a discussion of the management of benign prostatic hyperplasia, including mention of the use of gonadorelin analogues and the view that they are unsatisfactory for indefinite therapy, see p.2178.

Prostate size decreased by a mean of 24.2% in 9 men treated for benign prostatic hyperplasia for 6 months with nafarelin acetate 400 micrograms daily subcutaneously.[1] Six months after the end of treatment, prostate size approached that of pretreatment values.

1. Peters CA, Walsh PC. The effect of nafarelin acetate, a luteinizing-hormone-releasing hormone agonist, on benign prostatic hyperplasia. *N Engl J Med* 1987; **317:** 599–604.

Endometriosis. Gonadorelin analogues are effective in the management of endometriosis (p.2091), but the need for long-term therapy to prevent recurrence limits their value because of the risk of osteoporosis; 'add-back' therapy (hormone replacement) can be used to prevent this.

References to the use of nafarelin.

1. Henzl MR, *et al.* Administration of nasal nafarelin as compared with oral danazol for endometriosis: a multicenter double-blind comparative clinical trial. *N Engl J Med* 1988; **318:** 485–9.
2. Burry KA. Nafarelin in the management of endometriosis: quality of life assessment. *Am J Obstet Gynecol* 1992; **166:** 735–9.
3. Hornstein MD, *et al.* Retreatment with nafarelin for recurrent endometriosis symptoms: efficacy, safety, and bone mineral density. *Fertil Steril* 1997; **67:** 1013–18.
4. Adamson GD, *et al.* Therapeutic efficacy and bone mineral density response during and following a three-month re-treatment of endometriosis with nafarelin (Synarel). *Am J Obstet Gynecol* 1997; **177:** 1413–18.
5. Agarwal SK, *et al.* Nafarelin vs. leuprolide acetate depot for endometriosis: changes in bone mineral density and vasomotor symptoms. *J Reprod Med* 1997; **42:** 413–23.
6. Zhao SZ, *et al.* Impact of nafarelin and leuprolide for endometriosis on quality of life and subjective clinical measures. *J Reprod Med* 1999; **44:** 1000–1006.
7. Bergqvist A, *et al.* A comparative study of the acceptability and effect of goserelin and nafarelin on endometriosis. *Gynecol Endocrinol* 2000; **14:** 425–32.

Fibroids. Gonadorelin analogues have been tried as an adjunct or alternative to surgery in the treatment of uterine fibroids (see p.2107), although there has been some concern that this might complicate the diagnosis of malignancy.

References to the use of nafarelin.

1. Minaguchi H, *et al.* Clinical use of nafarelin in the treatment of leiomyomas: a review of the literature. *J Reprod Med* 2000; **45:** 481–9.

Infertility. Gonadorelin analogues are used in the treatment of infertility (p.2080). As well as being used directly they are employed in regimens to induce superovulation to enable ova collection and IVF. A meta-analysis[1] found that the outcome of IVF treatment using nafarelin was equivalent to that using other gonadorelin analogues, but that nafarelin was associated with a shorter time needed for ovarian stimulation and a reduced gonadotrophin requirement.

1. Wong JM, *et al.* Efficacy of nafarelin in assisted reproductive technology: a meta-analysis. *Hum Reprod Update* 2001; **7:** 92–101.

Porphyria. Nafarelin nasal spray was used to prevent menstrual exacerbations of acute intermittent porphyria (p.1448) in 2 sisters.[1]

1. McNulty SJ, Hardy KJ. Two patients with acute intermittent porphyria treated with nafarelin to prevent menstrual exacerbations. *J R Soc Med* 2000; **93:** 429–30.

Precocious puberty. Nafarelin preserved adult height potential in girls with idiopathic precocious puberty (p.2081) having a poor initial height prognosis.[1] However, reviewers have noted that results from earlier studies into other features of precocious puberty have been equivocal.[2]

1. Kreiter M, *et al.* Preserving adult height potential in girls with idiopathic true precocious puberty. *J Pediatr* 1990; **117:** 364–70.
2. Chrisp P, Goa KL. Nafarelin: a review of its pharmacodynamic and pharmacokinetic properties, and clinical potential in sex hormone-related conditions. *Drugs* 1990; **39:** 523–51.

Preparations

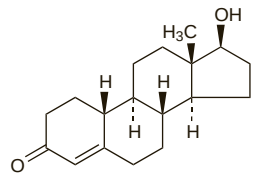
Proprietary Preparations (details are given in Part 3)
Arg.: Synrelin; ***Austral.:*** Synarel; ***Braz.:*** Synarel; ***Canad.:*** Synarel; ***Cz.:*** Synarel; ***Denm.:*** Synarela; ***Fin.:*** Synarela; ***Fr.:*** Synarel; ***Ger.:*** Synarela; ***Hong Kong:*** Synarel†; ***Hung.:*** Synarel†; ***India:*** Nasarel; ***Irl.:*** Synarel; ***Israel:*** Synarel; ***Mex.:*** Synarel†; ***Neth.:*** Synarel; ***Norw.:*** Synarela; ***NZ:*** Synarel†; ***Pol.:*** Synarel; ***S.Afr.:*** Synarel; ***Spain:*** Synarel; ***Swed.:*** Synarela; ***Switz.:*** Synrelina; ***Turk.:*** Synarel; ***UK:*** Synarel; ***USA:*** Synarel.

Nandrolone *(BAN, rINN)* ⊗

Estrenolona; Hidroxiestrenona; Nandrolon; Nandrolona; Nandroloni; Nandrolonum; Norandrostenolona; 19-Nortestosterone; Nortestrionato. 17β-Hydroxyestr-4-en-3-one; 3-Oxoestr-4-en-17β-yl.

Нандролон

$C_{18}H_{26}O_2$ = 274.4.
CAS — 434-22-0.
ATC — A14AB01; S01XA11.
ATC Vet — QA14AB01; QS01XA11.



Nandrolone Cyclohexylpropionate *(BANM, rINNM)* ⊗

Ciclohexilpropionato de nandrolona; Nandrolone Cyclohexanepropionate; Nandrolone, Cyclohexylpropionate de; Nandroloni Cyclohexylpropionas; Nortestosterone Cyclohexylpropionate. 3-Oxoestr-4-en-17β-yl 3-cyclohexylpropionate; 17β-Hydroxyestr-4-en-3-one cyclohexylpropionate.

Нандролона Циклогексилпропионат

$C_{27}H_{40}O_3$ = 412.6.
CAS — 912-57-2.
ATC — A14AB01; S01XA11.
ATC Vet — QA14AB01; QS01XA11.

Nandrolone Decanoate *(BANM, USAN, rINNM)* ⊗

Decanoato de nandrolona; Nandrolon-dekanoát; Nandrolone, décanoate de; Nandroloni decanoas; Nandrolonu dekanonian; Nortestosterone Decanoate; Nortestosterone Decylate. 3-Oxoestr-4-en-17β-yl decanoate; 17β-Hydroxyestr-4-en-3-one decanoate.

Нандролона Деканоат

$C_{28}H_{44}O_3$ = 428.6.
CAS — 360-70-3.
ATC — A14AB01; S01XA11.
ATC Vet — QA14AB01; QS01XA11.

Pharmacopoeias. In *Eur.* (see p.vii) and *US.*
Ph. Eur. 6.2 (Nandrolone Decanoate). A white or almost white, crystalline powder. M.p. 34° to 38°. Practically insoluble in water; very soluble in alcohol and in dichloromethane. Store under nitrogen at 2° to 8°. Protect from light.
USP 31 (Nandrolone Decanoate). A white to creamy-white fine crystalline powder, odourless or may have a slight odour. Practically insoluble in water; soluble in alcohol, in acetone, in chloroform, and in vegetable oils. Store at 2° to 8° in airtight containers. Protect from light.

Nandrolone Laurate *(BANM, rINNM)* ⊗

Dodecanoato de nandrolona; Laurato de nandrolona; Nandrolone Dodecanoate; Nandrolone, Laurate de; Nandroloni Lauras; Nortestosterone Laurate. 3-Oxoestr-4-en-17β-yl dodecanoate; 17β-Hydroxyestr-4-en-3-one dodecanoate.

Нандролона Лаурат

$C_{30}H_{48}O_3$ = 456.7.
CAS — 26490-31-3.
ATC — A14AB01; S01XA11.
ATC Vet — QA14AB01; QS01XA11.

Pharmacopoeias. In *BP(Vet).*
BP(Vet) 2008 (Nandrolone Laurate). A white to creamy-white crystalline powder. Practically insoluble in water; freely soluble in alcohol, in chloroform, in ether, in fixed oils, and in esters of fatty acids. Store at 2° to 8°. Protect from light.

Nandrolone Phenylpropionate *(BANM, rINNM)* ⊗

Fenilpropionato de nandrolona; Nandrolone Hydrocinnamate; Nandrolone Phenpropionate; Nandrolone, Phénylpropionate de; Nandroloni Phenylpropionas; Nandrolonu fenylopropionian; 19-Norandrostenolone Phenylpropionate; Nortestosterone Phenylpropionate; NSC-23162. 3-Oxoestr-4-en-17β-yl 3-phenylpropionate; 17β-Hydroxyestr-4-en-3-one 3-phenylpropionate.

Нандролона Фенилпропионат

$C_{27}H_{34}O_3$ = 406.6.
CAS — 62-90-8.
ATC — A14AB01; S01XA11.
ATC Vet — QA14AB01; QS01XA11.

NOTE. The following terms have been used as 'street names' (see p.vi) or slang names for various forms of nandrolone phenylpropionate:
Iron Brew.

Pharmacopoeias. In *Br.*, *Chin.*, *Pol.*, and *US.*
BP 2008 (Nandrolone Phenylpropionate). A white to creamy-white crystalline powder with a characteristic odour. Practically insoluble in water; soluble in alcohol. Protect from light.
USP 31 (Nandrolone Phenpropionate). Store in airtight containers. Protect from light.

Nandrolone Sodium Sulfate *(rINNM)* ⊗

Nandrolone Sodium Sulphate *(BANM)*; Nandrolone, Sulfate Sodique de; Nandroloni Natrii Sulfas; Nortestosterone Sodium Sulphate; Sulfato sódico de nandrolona. 3-Oxoestr-4-en-17β-yl sodium sulphate; 17β-Hydroxyestr-4-en-3-one sodium sulphate.

Нандролона Натрия Сульфат

$C_{18}H_{25}O_5SNa$ = 376.4.
CAS — 60672-82-4.
ATC — A14AB01; S01XA11.
ATC Vet — QA14AB01; QS01XA11.

Nandrolone Undecylate *(rINNM)* ⊗

Nandrolone Undecanoate *(BANM)*; Nandrolone, Undécylate de; Nandroloni Undecylas; Nortestosterone Undecanoate; Undecilato de nandrolona. 3-Oxoestr-4-en-17β-yl undecanoate; 17β-Hydroxyestr-4-en-3-one undecanoate.

Нандролона Ундесилат

$C_{29}H_{46}O_3$ = 442.7.
CAS — 862-89-5.
ATC — A14AB01; S01XA11.
ATC Vet — QA14AB01; QS01XA11.

Adverse Effects and Precautions

As for androgens and anabolic steroids in general (see Testosterone, p.2130).

Abuse. Nandrolone, like other anabolic compounds, has been abused by athletes and bodybuilders. However, controversy has arisen over the methods used to detect abuse, and there is some evidence that metabolites of nandrolone may be produced endogenously (see under Precautions of Testosterone, p.2131).

Effects on the liver. Intrahepatic cholestasis occurred in a patient receiving nandrolone cyclohexylpropionate.[1]

1. Gil VG, *et al.* A non-C17-alkylated steroid and long-term cholestasis. *Ann Intern Med* 1986; **104:** 135–6.

Porphyria. Nandrolone has been associated with acute attacks of porphyria and is considered unsafe in porphyric patients.

Interactions

As for androgens and anabolic steroids in general (see Testosterone, p.2131).

Uses and Administration

Nandrolone is an anabolic steroid with some androgenic properties (see Testosterone, p.2131). It is usually given as the decanoate ester in the form of oily intramuscular injections. The hexyloxyphenylpropionate, propionate, phenylpropionate, and undecylate esters have also been used.

Doses of nandrolone decanoate 25 to 100 mg once every 3 to 4 weeks have been used as an anabolic after debilitating illness, for postmenopausal osteoporosis, and for postmenopausal metastatic breast carcinoma. Doses of between 50 and 200 mg weekly have been suggested for the treatment of anaemia of chronic renal failure, and doses of 50 to 150 mg weekly for aplastic anaemia.

Nandrolone sodium sulfate has been used topically in the treatment of corneal damage.

Nandrolone cyclohexylpropionate, laurate, and phenylpropionate are used in veterinary medicine.

Cachexia. Nandrolone increased lean body-mass in patients with HIV-associated wasting[1-4] (p.858) and in one study[5] was found to have greater effect than testosterone on body-weight and BMI but a similar effect on lean body-mass. Nandrolone has also increased lean body-mass in patients with end-stage renal failure undergoing dialysis.[6,7] Although caution is generally advised with the use of androgenic and anabolic steroids in patients with renal impairment (see Testosterone, p.2131), a study[8] of nandrolone given for 3 months to patients with predialysis chronic renal impairment found that lean body-mass increased without

fluid retention or adverse effect on renal function or serum-lipids. In these reports, intramuscular doses of nandrolone decanoate have ranged from 100 mg once every 2 weeks[4] up to 600 mg weekly,[2] and treatment has generally been given for 12 to 24 weeks.

1. Gold J, *et al.* Safety and efficacy of nandrolone decanoate for treatment of wasting in patients with HIV infection. *AIDS* 1996 **10:** 745–52.
2. Sattler FR, *et al.* Effects of pharmacological doses of nandrolone decanoate and progressive resistance training in immunodeficient patients infected with human immunodeficiency virus. *J Clin Endocrinol Metab* 1999; **84:** 1268–76.
3. Storer TW, *et al.* A randomized, placebo-controlled trial of nandrolone decanoate in human immunodeficiency virus-infected men with mild to moderate weight loss with recombinant human growth hormone as active reference treatment. *J Clin Endocrinol Metab* 2005; **90:** 4474–82.
4. Mulligan K, *et al.* Effect of nandrolone decanoate therapy on weight and lean body mass in HIV-infected women with weight loss: a randomized, double-blind, placebo-controlled, multicenter trial. *Arch Intern Med* 2005; **165:** 578–85.
5. Gold J, *et al.* Effects of nandrolone decanoate compared with placebo or testosterone on HIV-associated wasting. *HIV Med* 2006; **7:** 146–55.
6. Johansen KL, *et al.* Anabolic effects of nandrolone decanoate in patients receiving dialysis: a randomized controlled trial. *JAMA* 1999; **281:** 1275–81.
7. Johansen KL, *et al.* Effects of resistance exercise training and nandrolone decanoate on body composition and muscle function among patients who receive hemodialysis: a randomized, controlled trial. *J Am Soc Nephrol* 2006; **17:** 2307–14.
8. Eiam-Ong S, *et al.* Nutritional effect of nandrolone decanoate in predialysis patients with chronic kidney disease. *J Ren Nutr* 2007; **17:** 173–8.

Male contraception. Preliminary findings showed that nandrolone suppressed spermatogenesis,[1-3] suggesting potential as a male contraceptive (p.2070), but later studies seem to have favoured other androgens.

1. Schürmeyer T, *et al.* Reversible azoospermia induced by the anabolic steroid 19-nortestosterone. *Lancet* 1984; **i:** 417–20.
2. Knuth UA, *et al.* Combination of 19-nortestosterone-hexyloxyphenyl-propionate (Anadur) and depot-medroxyprogesterone-acetate (Clinovir) for male contraception. *Fertil Steril* 1989; **51:** 1011–18.
3. WHO Task Force on Methods for the Regulation of Male Fertility. Comparison of two androgens plus depot-medroxyprogesterone acetate for suppression to azoospermia in Indonesian men. *Fertil Steril* 1993; **60:** 1062–8.

Preparations

BP 2008: Nandrolone Decanoate Injection; Nandrolone Phenylpropionate Injection;
USP 31: Nandrolone Decanoate Injection; Nandrolone Phenpropionate Injection.

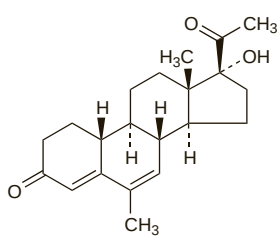
Proprietary Preparations (details are given in Part 3)
Arg.: Deca-Durabolin; Keratyl†; ***Austral.:*** Deca-Durabolin; ***Austria:*** Deca-Durabolin; ***Belg.:*** Deca-Durabolin; ***Braz.:*** Deca-Durabolin; ***Canad.:*** Deca-Durabolin; ***Chile:*** Anaprolina; Deca-Durabolin; Nandrosande; ***Cz.:*** Deca-Durabolin†; Keratyl†; Superanabolon; ***Fin.:*** Deca-Durabolin; ***Fr.:*** Keratyl†; ***Ger.:*** Deca-Durabolin; Keratyl†; ***Gr.:*** Anaboline Depot; Deca-Durabolin; Extraboline; Nurezan†; ***Hong Kong:*** Deca-Durabolin; ***Hung.:*** Retaboli; ***India:*** Deca-Durabolin; Decaneurabol†; Durabolin; Metabol; Metadec; Neurabol; ***Indon.:*** Deca-Durabolin; ***Ital.:*** Deca-Durabolin; Dynabolon†; ***Malaysia:*** Deca-Durabolin; ***Mex.:*** Deca-Durabolin; ***Neth.:*** Deca-Durabolin; Durabolin; ***Norw.:*** Deca-Durabolin; ***NZ:*** Deca-Durabolin; ***Pol.:*** Deca-Durabolin; ***Port.:*** Deca-Durabolin; Nandain†; ***Rus.:*** Retabolil (Ретаболил); ***S.Afr.:*** Deca-Durabolin; ***Singapore:*** Deca-Durabolin; ***Spain:*** Deca-Durabolin; ***Swed.:*** Deca-Durabol; ***Switz.:*** Deca-Durabolin; Keratyl; ***Thai.:*** Deca-Durabolin; Keratyl; ***UK:*** Deca-Durabolin; ***USA:*** Androlone-D; Deca-Durabolin; Durabolin; Hybolin; Neo-Durabolic; ***Venez.:*** Deca-Durabolin.

Multi-ingredient: ***Arg.:*** Dexatopic†; ***Indon.:*** Dexatopic; ***Neth.:*** Dexatopic†.

Nomegestrol Acetate *(BANM, rINNM)*

Acetato de nomegestrol; Nomegestrol acetát; Nomégestrol, acétate de; Nomegestrol Asetat; Nomegestrolacetat; Nomegestroli acetas; Nomegestroliasetaatti; Nomegestrolio acetatas; Nomegesztrol-acetát. 17-Hydroxy-6-methyl-19-norpregna-4,6-diene-3,20-dione acetate.

Номегестрола Ацетат
$C_{23}H_{30}O_4$ = 370.5.
CAS — 58691-88-6 (nomegestrol); 58652-20-3 (nomegestrol acetate).
ATC — G03DB04.
ATC Vet — QG03DB04.



(nomegestrol)

Pharmacopoeias. In *Eur.* (see p.vii).
Ph. Eur. 6.2 (Nomegestrol Acetate). A white or almost white crystalline powder. Practically insoluble in water; soluble in alcohol; freely soluble in acetone. Protect from light.

Profile

Nomegestrol acetate is a progestogen structurally related to progesterone (p.2125) that has been used in the treatment of menstrual disorders and as the progestogen component of menopausal HRT (p.2071). Typical oral doses are 5 mg daily for 10 to 14 days of a 28-day cycle. A subdermal implant is under investigation as a long-acting progestogen-only contraceptive.

◊ References.

1. Coutinho EM, *et al.* Multicenter clinical trial on the efficacy and acceptability of a single contraceptive implant of nomegestrol acetate, Uniplant. *Contraception* 1996; **53:** 121–5.
2. Devoto L, *et al.* Hormonal profile, endometrial histology and ovarian ultrasound assessment during 1 year of nomegestrol acetate implant (Uniplant). *Hum Reprod* 1997; **12:** 708–13.
3. Barbosa IC, *et al.* Carbohydrate metabolism in sickle cell patients using a subdermal implant containing nomegestrol acetate (Uniplant). *Contraception* 2001; **63:** 263–5.
4. Arowojolu AO, Ladipo OA. Nonmenstrual adverse events associated with subdermal contraceptive implants containing normegestrel [sic] and levonorgestrel. *Afr J Med Med Sci* 2003; **32:** 27–31.
5. Barbosa IC, *et al.* Effects of a single Silastic contraceptive implant containing nomegestrol acetate (Uniplant) on endometrial morphology and ovarian function for 1 year. *Contraception* 2006; **74:** 492–7.

Preparations

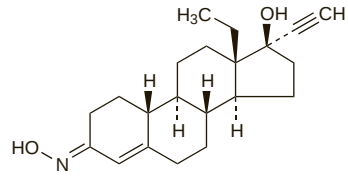
Proprietary Preparations (details are given in Part 3)
Arg.: Lutenyl; ***Belg.:*** Lutenyl; ***Braz.:*** Lutenil; ***Chile:*** Lutenyl; ***Cz.:*** Lutenyl†; ***Hong Kong:*** Lutenyl; ***Indon.:*** Lutenyl; ***Ital.:*** Lutenyl; ***Mex.:*** Luvenyl; ***Mon.:*** Lutenyl; ***Pol.:*** Lutenyl; ***Port.:*** Lutenyl; ***Turk.:*** Lutenyl; ***Venez.:*** Lutenyl†.

Multi-ingredient: ***Ital.:*** Naemis; ***Mon.:*** Naemis; ***Neth.:*** Naemis; ***Port.:*** Naemis.

Norelgestromin *(BAN, USAN, rINN)*

17-Deacylnorgestimate; Norelgestromiini; Norelgestromina; Norelgestromine; Norelgestrominum; RWJ-10553. 13-Ethyl-17-hydroxy-18,19-dinor-17α-pregn-4-en-20-yn-3-one oxime.

Норэльгестромин
$C_{21}H_{29}NO_2$ = 327.5.
CAS — 53016-31-2.



Profile

Norelgestromin is a progestogen (see Progesterone, p.2125); it is the primary active metabolite of norgestimate (p.2121). Norelgestromin is used as the progestogenic component of a combined contraceptive transdermal patch. A dose of 150 micrograms of norelgestromin is released daily with ethinylestradiol. A new patch is applied each week for 3 weeks of a 4-week cycle. Norelgestromin exposure from such a patch may be greater than that resulting from a comparable oral contraceptive.

◊ References.

1. Audet M-C, *et al.* Evaluation of contraceptive efficacy and cycle control of a transdermal contraceptive patch vs an oral contraceptive: a randomized controlled trial. *JAMA* 2001; **285:** 2347–54.
2. Abrams LS, *et al.* Pharmacokinetics of norelgestromin and ethinyl estradiol from two consecutive contraceptive patches. *J Clin Pharmacol* 2001; **41:** 1232–7.
3. Abrams LS, *et al.* Pharmacokinetics of norelgestromin and ethinyl estradiol delivered by a contraceptive patch (Ortho Evra /Evra) under conditions of heat, humidity, and exercise. *J Clin Pharmacol* 2001; **41:** 1301–9.
4. Abrams LS, *et al.* Pharmacokinetics of a contraceptive patch (Evra /Ortho Evra) containing norelgestromin and ethinyloestradiol at four application sites. *Br J Clin Pharmacol* 2002; **53:** 141–6.
5. Burkman RT. The transdermal contraceptive system. *Am J Obstet Gynecol* 2004; **190** (suppl): S49–S53.
6. Devineni D, *et al.* Pharmacokinetics and pharmacodynamics of a transdermal contraceptive patch and an oral contraceptive. *J Clin Pharmacol* 2007; **47:** 497–509.
7. Jick S, *et al.* Further results on the risk of nonfatal venous thromboembolism in users of the contraceptive transdermal patch compared to users of oral contraceptives containing norgestimate and 35 μg of ethinyl estradiol. *Contraception* 2007; **76:** 4–7.

Preparations

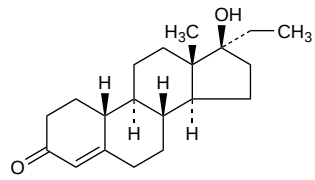
Proprietary Preparations (details are given in Part 3)

Multi-ingredient: ***Arg.:*** Evra; ***Belg.:*** Evra; ***Braz.:*** Evra; ***Canad.:*** Evra; ***Chile:*** Evra; ***Cz.:*** Evra; ***Denm.:*** Evra; ***Fin.:*** Evra; ***Fr.:*** Evra; ***Ger.:*** Evra; ***Gr.:*** Evra; ***Hong Kong:*** Evra; ***Hung.:*** Evra; ***Irl.:*** Evra; ***Israel:*** Evra; ***Ital.:*** Evra; ***Mex.:*** Evra; ***Neth.:*** Evra; ***Norw.:*** Evra; ***Philipp.:*** Evra; ***Pol.:*** Evra; ***Port.:*** Evra; ***Rus.:*** Evra (Евра); ***S.Afr.:*** Evra; ***Singapore:*** Evra; ***Spain:*** Evra; ***Swed.:*** Evra; ***Switz.:*** Evra; ***Thai.:*** Evra; ***UK:*** Evra; ***USA:*** Ortho Evra; ***Venez.:*** Evra.

Norethandrolone *(BAN, rINN)* ⊗

17α-Ethyl-17β-hydroxyestr-4-en-3-one; 17β-Hydroxy-19-nor-17α-pregn-4-en-3-one; Noretandrolona; Noréthandrolone; Norethandrolonum.

Норэтандролон
$C_{20}H_{30}O_2$ = 302.5.
CAS — 52-78-8.
ATC — A14AA09.
ATC Vet — QA14AA09.



Adverse Effects and Precautions

As for androgens and anabolic steroids in general (see Testosterone, p.2130). As with other 17α-alkylated compounds, norethandrolone may produce hepatotoxicity and liver function should be monitored. It should probably be avoided in patients with impaired liver function, and certainly if this is severe.

Uses and Administration

Norethandrolone is an anabolic steroid with some androgenic properties (see Testosterone, p.2131). It is given in the treatment of aplastic anaemia in an oral dose of 0.25 to 2 mg/kg daily.

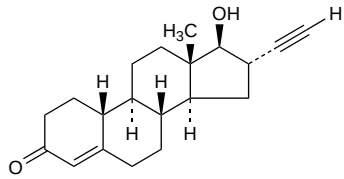
Preparations

Proprietary Preparations (details are given in Part 3)
Fr.: Nilevar.

Norethisterone *(BAN, pINN)*

Ethinylnortestosterone; Etinil hidroxiestrona; Etinilnortestosterona; Norethindrone; Norethisteron; Noréthistérone; Norethisteronum; Noretindrona; Noretisteron; Noretisterona; Noretisteronas; Noretisterone; Noretisteroni; Noretiszteron; Noretysteron; Norpregneninolona; Norpregneninolone; NSC-9564. 17β-Hydroxy-19-nor-17α-pregn-4-en-20-yn-3-one.

Норэтистерон
$C_{20}H_{26}O_2$ = 298.4.
CAS — 68-22-4.
ATC — G03AC01; G03DC02.
ATC Vet — QG03AC01; QG03DC02.



Pharmacopoeias. In *Chin.*, *Eur.* (see p.vii), *Int.*, *Jpn*, and *US.*
Ph. Eur. 6.2 (Norethisterone). A white or yellowish-white crystalline powder. Practically insoluble in water; sparingly soluble in dehydrated alcohol and in acetone; soluble in dichloromethane.
USP 31 (Norethindrone). A white to creamy-white odourless crystalline powder. Practically insoluble in water; sparingly soluble in alcohol; soluble in chloroform and in dioxan; slightly soluble in ether.

Norethisterone Acetate *(BANM, pINNM)*

Acetato de noretisterona; Norethindrone Acetate; Norethisteron-acetát; Noréthistérone, acétate de; Norethisteroni acetas; Noretisteron Asetat; Noretisteronacetat; Noretisteroniasetaatti; Noretisterono acetatas; Noretiszteron-acetát. 17β-Hydroxy-19-nor-17α-pregn-4-en-20-yn-3-one acetate; 3-Oxo-19-nor-17α-pregn-4-en-20-yn-17β-yl acetate.

Норэтистерона Ацетат
$C_{22}H_{28}O_3$ = 340.5.
CAS — 51-98-9.
ATC — G03AC01; G03DC02.
ATC Vet — QG03AC01; QG03DC02.

Pharmacopoeias. In *Eur.* (see p.vii), *Int.*, and *US.*
Ph. Eur. 6.2 (Norethisterone Acetate). A white or yellowish-white crystalline powder. It exhibits polymorphism. Practically insoluble in water; soluble in alcohol; freely soluble in dichlo-