EAZA RMG

EAZA Reproductive Management Group

Primates: *Pongidae*

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Fact Sheet Reviewed by: Hester van Bolhuis

We would recommend assessing any contraceptive bout with behavioural and hormone monitoring. For more information on this, please contact contraception@chesterzoo.org

Contraceptive methods	GnRH agonist (implant)	GnRH agonist (injection)	Progestagen (implants)	Progestagen (implants)	Progestagen (injection)	Combination Birth-Control Pills	Progestagen only Birth-Control Pills	Surgical/ Permanent
Contraceptive Product:	Deslorelin acetate	Leuprolide acetate	Etonogestrel 68 mg	Levonorgestrel 2x 75mg	medroxyprogesterone acetate	Combinations of a synthetic progestagen and oestrogen at various doses are available	Oral synthetic progestagens without any oestrogen component	N/A
Commercial Name:	Suprelorin ®	Lupron ®	Implanon® Nexplanon®	Jadelle® Norplant 2®	Depo-Provera®, Depo-Progevera®,	Several commercial oral combination pills are available in the market for human use.	Several commertial oral progestagen pills are available in the market for human use. Norgestone® (30mcg Levonorgestrel) has been used successfully in gorillas.	Vasectomy
Product Availbility:	4.7mg ('Suprelorin 6') and 9.4 mg ('Suprelorin 12') widely available through veterinary drug distributors in the EU.	Leuprolide acetate licenced for human use	Manufactured by Organon. Available through human drug distributors	Manufactured by Organon. Available through human drug distributors	Manufactured by Pfizer. Widely avilable throughout Europe through human drug distributors.	Widely availabe in pharmacies for human use	Widely availabe in pharmacies for human use	N/A
Restrictions and/or permit required by Importing Country:	The EAZA RMG recommends: always check with your local licencing authority	Data deficient	The EAZA RMG recommends: always check with your local licencing authority	The EAZA RMG recommends: always check with your local licencing authority	The EAZA RMG recommends: always check with your local licencing authority	N/A	N/A	N/A
Mechanism of action:	GnRH agonist suppress the reproductive endocrine system, preventing production of pituitary and gonadal hormones. As an agonist of the GnRH initially stimulates the reporductive system -which can result in oestrus and ovulation in females or temporary enhancement of testosterone and spermatogenesis in males- therefore additional contraception needed during this time. Please see below and refer to Deslorelin datasheet for detailed information	GnRH agonist suppress the reproductive endocrine system, preventing production of pituitary and gonadal hormones	Interference with fertilization by thickening cervical mucus, interrupting gamete transport, disruption of implantation, inhibition of LH surge necessary for ovulation	Interference with fertilization by thickening cervical mucus, interrupting gamete transport, disruption of implantation, inhibition of LH surge necessary for ovulation	Anti-estrogenic activity. Interference with fertilization by thickening cervical mucus, interrupting gamete transport, disruption of implantation, inhibition of LH surge necessary for ovulation	Inhibit follicular development and LH surge preventing ovulation. Progestagen part also blocks fertilisation and/or implantation.	Interference with fertilization by thickening cervical mucus, interrupting gamete transport. Disruption of implantation. Inhibition of the LH surge necessary for ovulation. These mechanisms are dose dependant, typically higher dose of synthetic progestagens are required to block ovulation than to block fertilisatio and/or implantation.	Surgical procedure in which the ductus deferens are cut, tied, cauterized, or otherwise interurrupted
Insertion/Placement:	Sub-cutaneous, in a place where it can be easily detected or seen for removal at a later date (I.e.upper inner arm); refer Suprelorin fact sheet for effective method of implant (tunnelisation)	Injectable	Intramuscular or subcutaneous. The EAZA RMG recommends sub-cutaneous, upper inner arm for visibility (aid for later removal)	Intramuscular or subcutaneous. The EAZA RMG recommends sub-cutaneous, upper inner arm for visibility (aid for later removal)	Injectable intramuscular	Oral	Oral	Surgical
Females	**Data deficient**	**Data deficient**						
Dose	Dosages and duration of efficacy have not been well established. As a guide: 1-2 x 4.7 mg; 1-2 x 9.4 mg	Dosing information is not available; extrapolation from human literature is likely the best place to start	Doses not well established. Recommended 1/2 to 1 implant, depending on species and weight	Recommended 2 rods. Doses not well established .	2.5-5 mg/kg body weight every 45-90 respectively days has been effective in most NHP secies	1 whole pill daily. The most commonly used combination of oral contraceptive products are: 1/35 (1mg Progesterone and 35ug Ethinyl Oestradiol) formulations (some may be able to use a 1/20 and others might need to go up to 1/50 formulation). It is recommended using the lowest oestrogen dose that effectively suppresses bleeding, possible swelling and oestrus behaviour.	1 whole pill a day	N/A
Latency to effectiveness:	3 weeks average as GnRH agonist initially stimulates the reporductive system- **please refer to Deslorelin datasheet for detailed information -** additional contraception needed during this time (see product data sheet. ~2mg/kg Megestrol acetate pills daily 7 days before and 8 days after has been used)	Same as deslorelin with an initial stimulation phase and suppression should then occur 3-4 weeks later (please refer to deslorelin and lupron datasheet for more details)	In general inhibition of ovulation after 1 day when inserted on day 1-5 of cycle or when replacing oral progestogen. As the right stage during menstrual cycle is often unknown, it is advised to use other contraceptive methods for at least 7-14 days after insertion of the implant depending on administration route (IM or SC)	In general inhibition of ovulation after 1 day when inserted on day 1-5 of cycle or when replacing oral progestogen. As the right stage during menstrual cycle is often unknown, it is advised to use other contraceptive methods for at least 7-14 days after insertion of the implant depending on administration route (IM or SC)	1-3 days post injection. However, if the cycle stage is not known then extra time must be allowed; therefore, separation of the sexes or alternative contraception should be used for at least 1 week.	1 to 2 weeks but can take up to one month if treatment starts near the time of ovulation (refer to product insert for exact information on this)	1 to 2 weeks, although this varies depending on the brand. **Please read the packet insert.** The packet will outline when to start and how long to use secondary protection and/or how long the individual may need to be separated.	N/A
Oestrus cycles during contraceptive treatment:	Initial oestrus and ovulation (during the 3 weeks of stimulation) then no oestrus cycle. To supress the initial oestrus and ovulation you can follow the megestrol acetate protocol mentioned above.	Same as deslorelin.	Oestrus is inhibited. Menstruation in non-human primates are more or less present with regular cyclicity. This is an individual and dose-dependent response. Some will swell during treatment and some will not.	Oestrus is inhibited. Menstruation in non-human primates are more or less present with regular cyclicity. This is an individual and dose-dependent response. Some will swell during treatment and some will not.	Oestrus behaviour may be observed. Ovulation and cycling can occur in adequately contracepted individuals (but is unlikely and the degree of suppression is dose dependent).	Sings of oestrus can occur druing the placebo week if treatment not administer continuously (placebo week not necessary)	Oestrus behaviour may be observed. Ovulation and cycling can occur in adequately contracepted individuals (but is unlikely and the degree of suppression is dose dependent). Be aware that progestagen-only pills are not being as effective at suppression oestrus as the combination pills.	N/A
Use during pregnancy:	Not recommended	Not recommended	In non-human primates progestagens normally do not interfere with parturition.	In non-human primates progestagens normally do not interfere with parturition.	In non-human primates progestagens normally do not interfere with parturition.	Not recommended - risk to foetus unknown	In non-human primates progestagens normally do not interfere with parturition.	N/A

Use during lactation:	No contraindications once lactation established	No contraindications once lactation established	Considered safe for nursing; Does not affect lactation, but etonogestrel is excreted in milk.	Considered safe for nursing infant.	Considered safe for nursing infant.	Not recommended - may interfere with milk production and affect the developing infant. Progestin-only birth control pills can be used instead.	Considered safe for the nursing infant	N/A
Use in prepubertals or juveniles:	**Data deficient** in this group, see product information sheet	**Data deficient** in this group, see product information sheet	The use of synthetic progestagens in pre-pubertals or juveniles has not been fully assessed. Possible long-term effects on fertility are not known.	The use of synthetic progestagens in pre-pubertals or juveniles has not been fully assessed. Possible long-term effects on fertility are not known.	The use of synthetic progestagens in pre-pubertals or juveniles has not been fully assessed. Possible long-term effects on fertility are not known.	Not recommended - **Data deficient** and potential long-term effects in fertility	The use of synthetic progestagens in pre-pubertals or juveniles has not been fully assessed. Possible long-term effects on fertility are not known.	N/A
Use in seasonal breeders:	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Duration	Duration of efficacy has not been well established as a guide: -4.7 mg implants will suppress for a **minimum** of 6 months; 9.4mg will be effective for a **minimum** of 12months	Not well established, duration of effect being likely related to the dose. Higher doses result in longer duration of effect. **Data deficient**	2-3 years in various primates	2-3 years in various primates	Dose dependant: 45-90 days in general. However, effects could last 1-2 years in some individuals.	More than 1 day as effective during the placebo week in human. Duration for other species not fully established.	Not more than one day. Pills need to be administered daily (follow packet insert instructions if one day is missed).	N/A
Reversibilty	Considered reversible but every species has not been tested. duration to reversibility extremely variable. Removal of implant to aid reversibility is recommended.	Considered reversible but every species has not been tested. Duration to reversibility extremely variable.	Designed to be fully reversible but individual variations can occur. -To increase potential for full reversibility implants must be removed.	Designed to be fully reversible but individual variations can occur. To increase potential for full reversibility implants must be removed.	Designed to be fully reversible but individual variations can occur	Reversibility presumably would occur after cessation of treatment, although return to cycling can vary per individual. Even in humans, it may take several months (cycles) before normal ovulation returns.	It should be reversible after cessation of treatment, although return to cycling can vary per individual. Even in humans, it may take several months (cycles) before normal ovulation returns.	N/A
Effects on Behaviour	None observed except lack of libido. There are anecdotal reports of change of hierarchy with the behavioural implications that this may have.	Same as deslorelin	Effects on behaviour have not been studied, every individual may react differently. Because progestagens can suppress ovulation it can be expected that courtship and mating behaviour will be affected in some way. Further research in the subject is necessary.	Effects on behaviour have not been studied, every individual may react differently. Because progestagens can suppress ovulation it can be expected that courtship and mating behaviour will be affected in some way. At high doses can have masculinising effect. Further research in the subject is necessary.	Effects on behaviour have not been studied, every individual may react differently. Because it binds readily to androgen receptors and is antiestrogenic, females may experience male-like qualities (increased aggression , development of male secondary sex characteristics, etc.) Further research in the subject is necessary.	**Data deficient.** Mood changes might occur.	Effects on behaviour have not been studied, every individual may react differently. Further research in the subject is necessary.	N/A
Effects on sexual physical characteristics	Similar to gonadectomy; especially weight gain.	Some dichromatic species may change colour.	Some signs of oestrus behaviour might occur. Ovulation may also occur even though pregnancy does not ensue.	Some signs of oestrus behaviour might occur. Ovulation may also occur even though pregnancy does not ensue.	See above	Data deficient	Females with sexual perineal skin may exhibit partial to normal swellings on birth-control pills. With the continuous use of pills, swelling may not occur. It depends what formulation is chosen.	N/A
Males	**Data deficient**	**Data deficient see comment for deslorelin**	**Not Recommended**	**Not Recommended**	**Not Recommended**	N/A	N/A	Reported
Dose	Usually a higher dose than in females are required in males. **Data deficient**	Usually a higher dose than in females are required in males. **Data deficient**	N/A	N/A	N/A	N/A	N/A	N/A
Latency to effectiveness:	Depending on the species there may be fertile sperm present in vas deferens for 6-8 weeks post treatment. Testosterone decreases after 3-4 weeks but sperm can stay fertile for many weeks after. Additional contraception needed during this time or separation of the sexes.	Depending on the species there may be fertile sperm present in vas deferens for 6-8 weeks post treatment. Testosterone decreases after 3-4 weeks but sperm can stay fertile for many weeks after. Additional contraception needed during this time or separation of the sexes.	N/A	N/A	N/A	N/A	N/A	Depending on species and individual, perhaps as long as 2 months or more
Use in prepubertals or juveniles:	**Data deficient** in this group, see product information sheet	**Data deficient** in this group, see product information sheet	N/A	N/A	N/A	N/A	N/A	Data deficient
Use in seasonal breeders:	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Duration and Reversibility	**Data deficient**, but deslorelin is considered reversible. See product information sheet.	**Data deficient**, but lupron is considered reversible. See product information sheet.	N/A	N/A	N/A	N/A	N/A	The procedure should not be used in males likely to be recommended for subsequent breeding as reversal is unlikely
Effects on Behaviour	Testosterone related aggression is likely to decrease. **Data deficient** in this group, see product information sheet.	Testosterone related aggression is likely to decrease. **Data deficient** in this group, see product information sheet.	N/A	N/A	N/A	N/A	N/A	Vasectomy will not affect androgen-dependant behaviours
Effects on sexual physical characteristics	Decrease in body size, decrease testicular size, feminisation of males. Anaemia can occur in human males treated for prostate cancer with GnRH agonists - this has not observed in great apes or other NHP.	Decrease in body size, feminisation of males. Anaemia can occur in human males treated for prostate cancer with Lupron - this has not observed in great apes or other NHP	N/A	N/A	N/A	N/A	N/A	None observed in non-human primates
General:								
Side effects	Similar to gonadectomy; especially weight gain.	Similar to gonadectomy; especially weight gain.	Possible weight gain, possible increased or decreased frequency of bleeding during menstruation. The EAZA RMG recommends always reading the manufacturer's data sheet	Possible weight gain, possible increased or decreased frequency of bleeding during menstruation. At high doses can have masculinising effect. The EAZA RMG recommends always reading the manufacturer's data sheet	Progestagens are likely to cause weight gain in all species. Possible deleterious effects on uterine and mammary tissues vary greatly by species; In the human literature, Depo-Provera® has been linked to mood changes. Because it binds readily to androgen receptors and is anti-estrogenic, females may experience male-like qualities (increased aggression, development of male secondary sex characteristics, etc.) The EAZA RMG recommends always reading the manufacturer's data sheet	Weight gain is less likely than with the progestagen only pills. Mood changes might occur.	Progestagens likely cause weight gain in all species. Possible deleterious effects on uterine and mammary tissues vary greatly by species. To date, few studies have shown link between synthetic progestagen treatment and serious health risk in non-human primates.	N/A

Warnings	Causes initial gonadal stimulation; correct administration essential - see product information sheet	Causes initial gonadal stimulation	Interaction with other drugs are known to occur and may influence protection against pregnancy. In some diabetic animals progestagens has led to an increased insulin requirement, it is advised that the product be used with caution in diabetic animals and that urine glucose levels are carefully monitored during the month after dosing. The EAZA RMG recommends always reading the manufacturer's data sheet.	Interaction with other drugs are known to occur and may influence protection against pregnancy. In some diabetic animals progestagens has led to an increased insulin requirement, it is advised that the product be used with caution in diabetic animals and that urine glucose levels are carefully monitored during the month after dosing. The EAZA RMG recommends always reading the manufacturer's data sheet.	Interaction with other drugs are known to occur and may influence protection against pregnancy. In some diabetic animals progestagens has led to an increased insulin requirement, it is advised that the product be used with caution in diabetic animals and that urine glucose levels are carefully monitored during the month after dosing. The EAZA RMG recommends always reading the manufacturer's data sheet.	Interaction with other drugs are known to occur and may influence protection against pregnancy. In some diabetic animals progestagens has led to an increased insulin requirement, it is advised that the product be used with caution in diabetic animals and that urine glucose levels are carefully monitored during the month after dosing. The EAZA RMG recommends always reading the manufacturer's data sheet.	Progestagen only contraceptive pills can fail in obese animals. Be aware that progestagen-only pills are not being as effective at suppression oestrus as the combination pills. In some diabetic animals progestagens has led to an increased insulin requirement, it is advised that the product be used with caution in diabetic animals and that urine glucose levels are carefully monitored during the month after dosing.	Infection of the surgical wound might occur. Intradermal closure of the skin is advised together with prophilactic antibiotic treatment and NSAID

Reporting Requirements: In order to increase our knowledge of the efficacy of contraception methods in the Pongidae family it is recommended that all individuals on contraception be reported to the EAZA RMG

References:

1) Asa, C.S. & Porton, I.J. (eds.) (2005) Wildlife Contraception: Issues, Methods, and Applications. The Johns Hopkins University press: Baltimore.