EAZA RMG

EAZA Reproductive Management Group

Genus name: *Cercocebus*

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Last Updated: May 2020
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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 (implant)	Progestagen (injection)	Surgical/ Permanent
Contraceptive Product:	Deslorelin acetate	Leuprolide acetate	Etonogestrel 68 mg	Levonorgestrel 2x 75mg	Medroxyprogesterone acetate	**N/A**
Commercial Name:	Suprelorin ®	Lupron ®	Implanon® Nexplanon®	Jadelle®	Depo-Provera®, Depo-Progevera®	**Males:** Castration/Vasectomy **Females:** Hysterectomy/Tubal ligation/ Ovariectomy/ Ovariohysterectomy
Product Availability:	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 (subsidiary of Merck & Co.). Widely available throughout Europe through human drug distributors.	Manufactured by Bayer Pharmaceuticals. Widely available throughout Europe through human drug distributors.	Manufactured by Pfizer. Widely available throughout Europe through human drug distributors.	**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**
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 reproductive 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	**Castration:** surgical removal of the testes. **Vasectomy:** surgical procedure in which the ductus deferens are cut, tied, cauterized, or otherwise interrupted. **Hysterectomy:** surgical removal of the uterus. **Tubal ligation:** Fallopian tubes are tied, cut, or blocked to prevent pregnancy. **Ovariectomy:** surgical removal of one or both ovaries. **Ovariohysterectomy:** surgical removal of both ovaries, uterine horns, and the body of the uterus.
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 placement (tunnelisation)	Injectable	Subcutaneous. The EAZA RMG recommends sub-cutaneous, upper inner arm for visibility (aid for later removal)	Subcutaneous. The EAZA RMG recommends sub-cutaneous, upper inner arm for visibility (aid for later removal)	Injectable intramuscular	Surgical
Females		**Data deficient; see comment for deslorelin**				
Dose	1 implant is recommended.	Dosing information is not available; extrapolation from human literature is likely the best place to start	Recommended 1/3 to 1/2 implant, depending on body weight.	Recommended 2/3 to 1 rods.	5 mg/kg body weight every 90 respectively days has been effective in most mangabey species.	**N/A**
Latency to effectiveness:	3 weeks average as GnRH agonist initially stimulates the reproductive system- **please refer to Deslorelin datasheet for detailed information**- additional contraception needed during this time (see product data sheet. ~2mg/kg Megestrol acetate orally daily 7 days before and 8 days after has been used to suppress initial stimulation phase)	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 separate from the opposite sex 7-14 days after insertion of the implant.	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 separate from the opposite sex 7-14 days after insertion of the implant.	1-3 days post injection. However, if the cycle stage is not known then extra time must be allowed; therefore, separation of the sexes should be used for at least 1 week.	**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. However folliculogenesis might not be fully suppressed in some individuals and oesturs signs and partial sexuial swellings might still be present.	Oestrus is inhibited. However folliculogenesis might not be fully suppressed in some individuals and oesturs signs and partial sexuial swellings might still be present.	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).	**N/A**
Use during pregnancy:	**Not recommended**	**Not recommended**	In non-human primates no interference with parturition has been observed.	In non-human primates no interference with parturition has been observed.	In non-human primates no interference with parturition has been observed.	**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	**N/A**
Use in prepubertals or juveniles:	**Data deficient**- see product information sheet. Possible long-term effects in fertility have not been assessed and its used in this age classs should be considered with caution.	**Data deficient**- 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.	**N/A**

Use in seasonal breeders:	**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 12 months. Anecdotally, suppression for 1x4.7mg implants can last up to three years.	Not well established, duration of effect being likely related to the dose. Higher doses result in longer duration of effect. **This is extremely 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.	**N/A**
Reversibility	Designed to be reversible but data of every species is lacking. Duration to reversibility extremely variable. Removal of implant to aid reversibility is recommended. We have one reversal of a red-capped mangabey who conceived 12 years after the insertion of 1x4.7 mg implant. It is unknown whether the implant was removed and whether she had continued mate access.	Considered reversible but every species has not been tested. duration to reversibility extremely variable.	Designed to be fully reversible but individual variations can occur. For full reversibility implants must be removed.	Designed to be fully reversible but individual variation can occur. For full reversibility implants must be removed.	Designed to be fully reversible but individual variations can occur.	**Permanent**
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. 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.	**N/A**
Effects on sexual physical characteristics	Similar to gonadectomy	Similar to gonadectomy	There might be some degree of sexual swelling and menstruation might occur. Ovulation may also occur even though pregnancy does not ensue.	There might be some degree of sexual swelling and menstruation might occur. Ovulation may also occur even though pregnancy does not ensue.	See above	**N/A**
Males	**Data deficient**	**Data deficient; see comment for deslorelin**	**Not Recommended**	**Not Recommended**	**Not Recommended**	
Dose	1-2 implants are recommended. Usually a higher dose is required in males than in females. **Data deficient.**	Usually a higher dose than in females are required in males. **Data deficient**	**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 8-12 weeks post treatment or even longer. 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**	Depending on species and individual, perhaps as long as 3 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**	Data deficient
Use in seasonal breeders:	**Data deficient.** Should start at least 2 months prior the breeding season.	**Data deficient.** Should start at least 2 months prior the breeding season.	**N/A**	**N/A**	**N/A**	N/A
Duration and Reversibility	**Data deficient** in this group, but deslorelin is considered reversible. See product information sheet. We have one reversal in a red-capped mangabey in which the male sired offspring immediately after gaining mate access, 1.5 years after the insertion of 1 x 94 mg implant. The implant was not removed.	**Data deficient** in this group, yet but lupron is considered reversible. See product information sheet.	**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**	Vasectomy will not affect androgen-dependant behaviours
Effects on sexual physical characteristics	Decrease in body size, decrease testicular size, feminisation of males.	Some dichromatic species may change colour if testosterone related. Decrease in body size, feminisation of males.	**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. Some dichromatic species may change colour.	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. The EAZA RMG recommends always reading the manufacturer's data sheet	Progestins are likely to cause weight gain in all species. Possible deleterious effects on uterine and mammary tissues vary greatly by species; (see taxon sheets). 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.	**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.	Levonorgestrel has been linked to endometrial cystic hyperplasia and pyometras in guenons but no side effect has been reported in mangabey species. 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 (other contraception such as deslorelin acetate is preferred/recommended) 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.	Infection of the surgical wound might occur. Intradermal closure of the skin is advised together with prophylactic antibiotic treatment and NSAID
Reporting Requirements: In order to increase our knowledge of the efficacy of contraception methods in cercopithecidae 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.