Primates: Brown spider monkey

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	GnRH agonist (implant)	GnRH agonist (injection)	Progestagen (implants)	Progestagen (implant)	Progestagen (injection)	Combination Birth-Control Pills	Surgical Techniques
Contraceptive Product:	Deslorelin acetate	Luprolide acetate	Etonogestrel 68 mg	Levonorgestrel 2x 75mg	medroxyprogesterone acetate	Combinations of a synthetic progestagen and oestrogen at various doses are available	N/A
Commercial Name:	Suprelorin®	Lupron®	Implanon® Nexplanon®	Jadelle®	Depo-Provera®, Depo-Progevera®	Several commercial oral combination pills are available in the market for human use.	Ovariectomy/Ovariohysterectomy/ Tubal ligation/Vasectomy
Product Availbility:	4.7mg ('Suprelorin 6') and 9.4 mg ('Suprelorin 12') widely available through veterinary drug distributors in the EU. 9.4 mg ('Suprelorin 12') is also available through Peptech and Virbac.	Luprolide acetate licenced for human use	Manufactired by Bayer Schering Pharma AG. Available through human drug distributors	Manufactired 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	N/A
Restrictions and/or permit required by Importing Country:	EGZAC reccommends: always check with your local licencing authority	**Data deficient**	EGZAC reccommends: always check with your local licencing authority	EGZAC recommends: always check with your local licencing authority	EGZAC reccommends: always check with your local licencing authority	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	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.	**Vasectomy:** Surgical procedure in which the ductus deferens are cut, tied, cauterized, or otherwise interurrupted; Ovariohysterectomy: removal of one or both ovaries and the uterus; **Ovariectomy:** removal of the ovaries; **Ovariohysterectomy**: removal of one or both ovaries and the uterus; **Tubal ligation:** Surgical procedure in which the fallopian tubes 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 placement (tunnelisation)	Injectable	Intramuscular or subcutaneous. EGZAC recommends sub-cutaneous, upper inner arm for visibility (aid for later removal)	Intramuscular or subcutaneous. EGZAC recommends sub-cutaneous, upper inner arm for visibility (aid for later removal)	Injectable intramuscular	Oral	Surgical
Females		**Data deficient**					
Dose	Dosages and duration of efficacy have not been well established for primate species. As a guide for spider monkeys: 1 x 4.7 mg or 1 x 9.4 mg should be sufficient for most females. **DO NOT CUT IMPLANT**	Dosing information is not available; extrapolation from human literature is likely the best place to start	Recommended 1/2 rod; Contact EGZAC advisory pannel for more information on particular cases. Doses not well established	1x 75mg implant is recommended. Contact EGZAC advisory pannel for more information on particular cases. Doses not well established.	20mg/kg BW of Depo-Provera is recommended, effective for approximately 30 days however, **effects can last up to 2 years in some individuals**.	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.	N/A
Latency to effectiveness:	Once implanted the initial stimulation phase can last up to 3-4 weeks where initial oestrus and ovulation can occur. Additional contraception needed during this time **(PLEASE see product data sheet)**. In spider monkeys, 5mg Megestrol acetate pills daily 7 days before and 7 days after implant have 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.• Depo-Provera injection can be used to prevent the post-partum oestrus until a suitable longer term implant can be placed or as longer term contraception.	Treatment can begin at any time throughout the female's cycle however the pill may not be effective in the first month of treatment if it begins close to the time of ovulation, it is therefore recommended to separate the sexes for approximately 2 weeks.	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 osetrus 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.	Oestrus is inhibited. Menstruation in non-human primates are more or less present with regular cyclicity. This is an individual and dose-dependent response.	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)	N/A
Use during pregnancy:	**Not recommended**	**Not recommended**	In non-human primates progestagens normally do not interfere with parturition. However in other species progestagens are not recommended for use in pregnant animals because of the risk of prolonged gestation, stillbirth or abortion.	In non-human primates progestagens normally do not interfere with parturition. However in other species progestagens are not recommended for use in pregnant animals because of the risk of prolonged gestation, stillbirth or abortion.	Progestagens are not recommended in pregnant animals because of the possibility of prolonged gestation, stillbirth, abortion, etc. in some species, although the effect may depend on dose. Progestagens in late pregnancy seem not to interfere with parturition in primates, but this is a taxon-specific phenomenon.	Not recommended - risk to foetus unknown	N/A

Use during lactation:	No contraindications once lactation established	No contraindications once lactation established	Considered safe for nursing infant.	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.	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	N/A
Use in seasonal breeders:	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 12 months.	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	2.5-3 years in various primates. The duration will also be dose dependent.	2-3 years in various primates	Dose dependant: 30 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.	N/A
Reversibilty	Considered reversible but every species has not been tested. We have 7 records of reversal following contraception, with time to conception ranging from 2-7 years after estimated implant expiry (however, these females were not granted continuous mate access, and therefore may have reversed prior to introduction to a breeding male). Duration to reversibility will show individual variation. Removal of the implant is recommended to aid reversibility.	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. We currently do not hold any records of reversals.	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. We hold 3 records of reversals in spider monkeys, with duration to conception ranging from 1-3 years following the estimated expiry date.	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.	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.** Possible weight gain and some antibiotics (e.g rimfampicin, ampicillin, doxycycline) may make the pill less effective. Mood changes might occur.	N/A

Effects on sexual physical characteristics	Similar to gonadectomy.	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	N/A
Males	**Data deficient**	**Data deficient see comment for deslorelin**	**Not Recommended**	**Not Recommended**	**Not Recommended**	N/A	Reported
Dose	Dosages and duration of efficacy have not been well established for primate species. As a guide for spider monkeys: 2 x 4.7 mg or 2 x 9.4 mg should be sufficient for most males however, some males may need additional implants for full suppression. **DO NOT CUT IMPLANT**	Usually a higher dose than in females are required in males. **Data deficient**	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 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 the sexes should be separated.	Depending on the species there may be fertile sperm present in vas deferens for 6-8 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 separtion of the sexes	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	**Data deficient**
Use in seasonal breeders:	N/A	N/A	N/A	N/A	N/A	N/A	
Duration and Reversibility	No data yet but deslorelin is considered reversible. **Data deficient** in this group, see product information sheet.	No data yet but lupron is considered reversible. **Data deficient** in this group, see product information sheet.	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 likley to decrease. **Data deficient** in this group, see product information sheet.	Testosterone related aggression is likley to decrease. **Data deficient** in this group, see product information sheet.	N/A	N/A	N/A	N/A	Vasectomy will not affect androgen-dependant behaviours

Effects on sexual physical characteristics	Some dichromatic species may change colour if testosterone ralated. Decrease in body size, feminisation of males.	Some dichromatic species may change colour if testosterone ralated. Decrease in body size, feminisation of males.	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. EGZAC 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. EGZAC recommends always reading the manufacturer's data sheet	Long term use is not recommended since it can have possible deleterious effects on the uterus and mammary tissue. Progestins are likely to cause weight gain in all 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.) EGZAC recommends always reading the manufacturer's data sheet.	Weight gain and mood changes might occur.	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. EGZAC 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. EGZAC 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. EGZAC 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. **EGZAC recommends always reading the manufacturer's data sheet.**	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 Cebidae family it is recommended that all individuals on contraception be reported to EGZAC

References:

1) Wildlife Contraception: Issues, Methods, and Applications. Edited by Cheryl S. Asa and Ingrid J. Porton. 2005. The John Hopkins University Press.

2) Noah Compedium of data sheets - Delvosteron - http://www.noahcompendium.co.uk

Disclaimer: EGZAC endeavours to provide correct and current information on contraception from various sources. As these are prescription only medicines it is the responsibility of the veterinarian to determine the dosage and best treatment for an individual