ANNEX I

SUMMARY OF PRODUCT CHARACTERISTICS

1. NAME OF THE VETERINARY MEDICINAL PRODUCT

Sedadex 0.1 mg/ml solution for injection for dogs and cats

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Each ml contains:

Active substance:

Dexmedetomidine hydrochloride	0.1 mg
(equivalent to dexmedetomidine	0.08 mg)

Excipients:

Qualitative composition of excipients and other constituents	**Quantitative composition if that information is essential for proper administration of the veterinary medicinal product**
Methyl parahydroxybenzoate (E 218)	2.0 mg
Propyl parahydroxybenzoate	0.2 mg
Sodium chloride	
Sodium hydroxide (E 524) (for pH adjustment)	
Hydrochloric acid (E 507) (for pH adjustment)	
Water for injections	

Clear, colourless solution, practically free from particles.

3. CLINICAL INFORMATION

3.1 Target species

Dogs and cats.

3.2 Indications for use for each target species

Non-invasive, mildly to moderately painful, procedures and examinations which require restraint, sedation and analgesia in dogs and cats.

Deep sedation and analgesia in dogs in concomitant use with butorphanol for medical and minor surgical procedures.

Premedication in dogs and cats before induction and maintenance of general anaesthesia.

3.3 Contraindications

Do not use in animals with cardiovascular disorders.
Do not use in animals with severe systemic disease or in animals that are moribund.
Do not use in cases of hypersensitivity to the active substance or to any of the excipients.

3.4 Special warnings

The administration of the veterinary medicinal product to puppies younger than 16 weeks and kittens younger than 12 weeks has not been studied.

3.5 Special precautions for use

Special precautions for safe use in the target species:
Treated animals should be kept warm and at a constant temperature, both during the procedure and recovery.

It is recommended that animals are fasted for 12 hours prior to the administration of the veterinary medicinal product. Water may be given.

After treatment, the animal should not be given water or food before it is able to swallow.

Corneal opacities may occur during sedation. The eyes should be protected by a suitable eye lubricant.

To be used with precaution in elderly animals.

Nervous, aggressive or excited animals should be given the possibility to calm down before initiation of treatment.

Frequent and regular monitoring of respiratory and cardiac function should be performed. Pulse oximetry may be useful but is not essential for adequate monitoring. Equipment for manual ventilation should be available in case of respiratory depression or apnoea when dexmedetomidine and ketamine are used sequentially to induce anaesthesia in cats. It is also advisable to have oxygen readily available, should hypoxaemia be detected or suspected.

Sick and debilitated dogs and cats should only be premedicated with the veterinary medicinal product before induction and maintenance of general anaesthesia based on a risk-benefit assessment.

Use of the veterinary medicinal product as a premedicant in dogs and cats significantly reduces the amount of induction medicinal product required for induction of anaesthesia. Attention should be given during the administration of intravenous induction medicinal products to effect. Volatile anaesthetic requirements for maintenance anaesthesia are also reduced.

Special precautions to be taken by the person administering the veterinary medicinal product to animals:
The veterinary medicinal product is a sedative and sleep inducing drug. Care should be taken to avoid self-injection. In case of accidental ingestion or self-injection, seek medical advice immediately and show the package leaflet to the physician but DO NOT DRIVE as sedation and changes in blood pressure may occur.

Pregnant women should administer the veterinary medicinal product with special caution to avoid self-injection since uterine contractions and decreased foetal blood pressure may occur after accidental systemic exposure.

Avoid skin, eye or mucosal contact; the use of impermeable gloves is advisable. In case of accidental skin or mucosal contact, wash the exposed skin immediately after exposure with large amounts of water and remove contaminated clothes that are in direct contact with skin. In case of accidental eye contact, rinse abundantly with fresh water. If symptoms occur, seek the advice of a physician.

People with known hypersensitivity to the active substance or any of the excipients should administer the veterinary medicinal product with caution.

Advice to physicians: the veterinary medicinal product is an α2-adrenoceptor agonist, symptoms after absorption may involve clinical effects including dose-dependent sedation, respiratory depression, bradycardia, hypotension, a dry mouth, and hyperglycaemia. Ventricular arrhythmias have also been

reported. Respiratory and haemodynamic symptoms should be treated symptomatically. The specific α2–adrenoceptor antagonist atipamezole, which is approved for use in animals, has been used in humans only experimentally to antagonise dexmedetomidine-induced effects.

Special precautions for the protection of the environment:
Not applicable.

3.6 Adverse events

Dogs:

Very common (> 1 animal / 10 animals treated)	Bradycardia Pale mucous membranes [1] Cyanotic mucous membranes [1]
Common (1 to 10 animals / 100 animals treated):	Arrhythmia [2]
Rare (1 to 10 animals / 10,000 animals treated):	Pulmonary oedema Supraventricular and nodal arrhythmia [2], Premature ventricular contractions [2], Heart block [2]
Very rare (<1 animal / 10,000 animals treated, including isolated reports):	Excitation [2] High blood pressure [3], Low blood pressure [3] Hypersalivation [2], Vomiting [4] Muscle tremor, Paddling [2], Twitching [2],Sedation prolonged [2] Bradypnoea [2,5], Decreased respiratory rate, Irregular breathing [2], Tachypnoea [2,5] Erythema [2] Decreased body temperature Urination [2]
Undetermined frequency (cannot be estimated from the available data):	Corneal opacityDecreased pulse oxygenation [2] Retching [2]

[1]Due to peripheral vasoconstriction and venous desaturation in the presence of normal arterial oxygenation.
[2]When dexmedetomidine and butorphanol are used concomitantly
[3]Blood pressure will increase initially and then return to normal or below normal
[4]May occur 5–10 minutes after injection. Some dogs may also vomit at the time of recovery.
[5]When dexmedetomidine is used as a premedicant.

When dexmedetomidine and butorphanol are used concomitantly in dogs, brady- and tachyarrhythmias have been reported. These may include profound sinus bradycardia, 1st and 2nd degree AV block, sinus arrest or pause, as well as atrial, supraventricular and ventricular premature complexes.

When dexmedetomidine is used as a premedicant brady- and tachyarrhythmias have been reported and include profound sinus bradycardia, 1st and 2nd degree AV block and sinus arrest. Supraventricular

and ventricular premature complexes, sinus pause and 3rd degree AV block may be observed in rare cases.

Cats:

Very common (> 1 animal / 10 animals treated):	Arrhytmia [1] Bradycardia Heart block [2] Vomiting [3] Pale mucous membranes [4] Cyanotic mucous membranes [4]
Common (1 to 10 animals / 100 animals treated):	Supraventricular and nodal arrhythmia [1] Retching [1] Decreased pulse oxygenation [2] Decreased body temperature [2]
Uncommon (1 to 10 animals / 1000 animals treated)	Apnoea [2]
Rare (1 to 10 animals / 10,000 animals treated):	Pulmonary oedema Extrasystole [2]
Very rare (<1 animal / 10,000 animals treated, including isolated reports):	High blood Pressure [5], Low blood pressure [5] Bradypnoea [2], Decreased respiratory rate, Hypoventilation [2], Irregular breathing [2] Muscle tremor Agitation [2]
Undetermined frequency (cannot be estimated from the available data):	Corneal opacity

[1]When dexmedetomidine is used as a premedicant.
[2]When dexmedetomidine and ketamine are used sequentially.
[3]May occur 5–10 minutes after injection. Some cats may also vomit at the time of recovery.
[4]Due to peripheral vasoconstriction and venous desaturation in the presence of normal arterial oxygenation.
[5]Blood pressure will increase initially and then return to normal or below normal.

Intramuscular dosing at 40 micrograms/kg (followed by ketamine or propofol) frequently resulted in sinus bradycardia and sinus arrhythmia, occasionally resulted in 1st degree atrioventricular block, and rarely resulted in supraventricular premature depolarizations, atrial bigeminy, sinus pauses, 2nd degree atrioventricular block, or escape beats/rhythms.

Reporting adverse events is important. It allows continuous safety monitoring of a veterinary medicinal product. Reports should be sent, preferably via a veterinarian, to either the marketing authorisation holder or the national competent authority via the national reporting system. See the package leaflet for respective contact details.

3.7 Use during pregnancy, lactation or lay

Pregnancy and lactation:

The safety of the veterinary medicinal product has not been established during pregnancy and lactation in the target species. Therefore, the use of the veterinary medicinal product during pregnancy and lactation is not recommended.

Fertility:
The safety of the veterinary medicinal product has not been established in males intended for breeding.

3.8 Interaction with other medicinal products and other forms of interaction

The use of other central nervous system depressants is expected to potentiate the effects of the veterinary medicinal product and therefore an appropriate dose adjustment should be made. Anticholinergics should be used with caution with dexmedetomidine.

Administration of atipamezole after dexmedetomidine rapidly reverses the effects and thus shortens the recovery period. Within 15 minutes, dogs and cats are normally awake and standing.

Cats: After administration of 40 micrograms dexmedetomidine/kg bodyweight (bw) intramuscularly concurrently with 5 mg ketamine/kg bw to cats, the maximum concentration of dexmedetomidine increased twofold but there was no effect on T_{max}. The mean half-life of elimination of dexmedetomidine increased to 1.6 h and the total exposure (AUC) increased by 50 %.

A dose of 10 mg ketamine/kg used concurrently with 40 micrograms dexmedetomidine/kg may cause tachycardia.

Atipamezole does not reverse the effect of ketamine.

3.9 Administration routes and dosage

The veterinary medicinal product is intended for:

- Dogs: intravenous or intramuscular use;
- Cats: intramuscular use.

The veterinary medicinal product is not intended for repeat injections.

Dexmedetomidine, butorphanol and/or ketamine can be mixed in the same syringe as they have been shown to be pharmaceutically compatible.

The following doses are recommended:

Dogs:
Dexmedetomidine doses are based on body surface area:

For non-invasive, mildly to moderately painful procedures and examinations requiring restraint, sedation and analgesia:

Intravenously: up to 375 micrograms/square metre body surface area.
Intramuscularly: up to 500 micrograms/square metre body surface area.

When administering in conjunction with butorphanol (0.1 mg/kg) for deep sedation and analgesia, the intramuscular dose of dexmedetomidine is 300 micrograms/square metre body surface area.

The premedication dose of dexmedetomidine is 125 – 375 micrograms/square metre body surface area, administered 20 minutes prior to induction for procedures requiring anaesthesia. The dose should be adjusted to the type of surgery, length of procedure and patient temperament.

Concomitant use of dexmedetomidine and butorphanol produces sedative and analgesic effects beginning no later than 15 minutes after administration. The peak sedative and analgesic effects are reached within 30 minutes after administration. Sedation lasts for at least 120 minutes post administration and analgesia lasts for at least 90 minutes. Spontaneous recovery occurs within 3 hours.

Premedication with dexmedetomidine will significantly reduce the dose of the induction agent required and will reduce volatile anaesthetic requirements for maintenance anaesthesia. In a clinical study, the requirement for propofol and thiopental was reduced by 30 % and 60 % respectively. All anaesthetic agents used for induction or maintenance of anaesthesia should be administered to effect. In a clinical study, dexmedetomidine contributed to postoperative analgesia for 0.5 – 4 hours. However, this duration is dependent on a number of variables and further analgesia should be administered in accordance with clinical judgement.

The corresponding doses based on body weight are presented in the following tables. Use of an appropriately graduated syringe is recommended to ensure accurate dosing when administering small volumes.

For non-invasive, mildly to moderately painful procedures and examinations requiring restraint, sedation and analgesia and for premedication						
Dog Weight (kg)	**Dexmedetomidine 125 micrograms/m²**		**Dexmedetomidine 375 micrograms/m²**		**Dexmedetomidine 500 micrograms/m²***	
	(mcg/kg)	**(ml)**	**(mcg/kg)**	**(ml)**	**(mcg/kg)**	**(ml)**
2-3	9.4	0.2	28.1	0.6	40	0.75
3.1-4	8.3	0.25	25	0.85	35	1
4.1-5	7.7	0.35	23	1	30	1.5
5.1-10	6.5	0.5	19.6	1.45	25	2
10.1-13	5.6	0.65	16.8	1.9		
13.1-15	5.2	0.75				
15.1-20	4.9	0.85				

*only IM

For deep sedation and analgesia with butorphanol		
Dog Weight (kg)	**Dexmedetomidine 300 micrograms/m² intramuscularly**	
	(mcg/kg)	**(ml)**
2-3	24	0.6
3.1-4	23	0.8
4.1-5	22.2	1
5.1-10	16.7	1.25
10.1-13	13	1.5
13.1-15	12.5	1.75

For higher weight ranges, use Sedadex 0.5 mg/ml and its dosing tables.

Cats:
The dose for cats is 40 micrograms dexmedetomidine hydrochloride/kg bw equal to a dose volume of 0.4 ml of veterinary medicinal product/kg bw when used for non-invasive, mildly to moderately painful procedures requiring restraint, sedation and analgesia.

When dexmedetomidine is used for premedication in cats, the same dose is used. Premedication with dexmedetomidine will significantly reduce the dose of the induction agent required and will reduce

volatile anaesthetic requirements for maintenance anaesthesia. In a clinical study, the requirement for propofol was reduced by 50 %. All anaesthetic agents used for induction or maintenance of anaesthesia should be administered to effect.

Anaesthesia can be induced 10 minutes after premedication by intramuscular administration of a target dose of 5 mg ketamine/kg bw or by intravenous administration of propofol to effect. Dosing for cats is presented in the following table.

Cat Weight (kg)	Dexmedetomidine 40 micrograms/kg intramuscularly	
	(mcg/kg)	(ml)
1-2	40	0.5
2.1-3	40	1

For higher weight ranges, use Sedadex 0.5 mg/ml and its dosing table.

Dogs and cats:
The expected sedative and analgesic effects are reached within 15 minutes after administration and are maintained up to 60 minutes after administration. Sedation may be reversed with atipamezole (see section 3.10). Atipamezole should not be administered prior to 30 minutes following ketamine administration.

3.10 Symptoms of overdose (and where applicable, emergency procedures and antidotes)

Dogs:
In cases of overdose, or if the effects of dexmedetomidine become potentially life-threatening, the appropriate dose of atipamezole is 10 times the initial dose of dexmedetomidine (micrograms/kg bw or micrograms/ square meter body surface area). The dose volume of atipamezole at the concentration of 5 mg/ml is one fifth (1/5) of the dose volume of Sedadex 0.1 mg/ml that was given to the dog, regardless of route of administration of the veterinary medicinal product.

Cats:
In cases of overdose, or if the effects of dexmedetomidine become potentially life-threatening, the appropriate antagonist is atipamezole, administered by intramuscular injection, at the following dose: 5 times the initial dose of dexmedetomidine in micrograms/kg bw. The dose volume of atipamezole at the concentration of 5 mg/ml is one-tenth (1/10) the volume of Sedadex 0.1 mg/ml that was given to the cat.

After concurrent exposure to an overdose of dexmedetomidine (3 times the recommended dose) and 15 mg ketamine/kg, atipamezole can be administered at the recommended dose level for reversal of effects induced by dexmedetomidine.

3.11 Special restrictions for use and special conditions for use, including restrictions on the use of antimicrobial and antiparasitic veterinary medicinal products in order to limit the risk of development of resistance

Not applicable.

3.12 Withdrawal periods

Not applicable.

4. PHARMACOLOGICAL INFORMATION

4.1 ATCvet code: QN05CM18

4.2 Pharmacodynamics

The veterinary medicinal product contains dexmedetomidine as the active substance, which produces sedation and analgesia in dogs and cats. The duration and depth of the sedation and analgesia are dose-dependent. At maximal effect, the animal is relaxed, recumbent and does not respond to external stimuli.

Dexmedetomidine is a potent and selective α2-adrenoceptor agonist that inhibits the release of noradrenaline from noradrenergic neurons. Sympathetic neurotransmission is prevented and the level of consciousness decreases. Reduced heart rate and temporary AV-block can be seen after administration of dexmedetomidine. Blood pressure decreases to normal or below normal levels after an initial increase. Respiration rate can occasionally decrease. Dexmedetomidine also induces a number of other α2-adrenoceptor-mediated effects, which include piloerection, depression of motor and secretory functions of the gastrointestinal tract, diuresis, and hyperglycaemia.
A slight decrease in temperature may be observed.

4.3 Pharmacokinetics

As a lipophilic compound, dexmedetomidine is well absorbed after intramuscular administration.

Dexmedetomidine is also rapidly distributed in the body and penetrates the blood-brain barrier readily. According to studies in rats, the maximum concentration in the central nervous system is several times that of the corresponding concentration in plasma. In the circulation, dexmedetomidine is largely bound to plasma proteins (> 90%).

Dogs: After an intramuscular dose of 50 micrograms/kg a maximum concentration in plasma of about 12 nanograms/ml is reached after 0.6 hours. The bioavailability of dexmedetomidine is 60 % and the apparent volume of distribution (Vd) is 0.9 l/kg. The elimination half-life ($t_{1/2}$) is 40-50 minutes.

Major bio-transformations in the dog include hydroxylation, glucuronic acid conjugation and N-methylation in the liver. All known metabolites lack pharmacological activity. Metabolites are excreted mainly in the urine and to a lesser extent in the faeces. Dexmedetomidine has a high clearance and its elimination depends on the hepatic blood flow. A prolonged elimination half-life is therefore expected with overdoses or when dexmedetomidine is co-administered with other substances, which affect hepatic circulation.

Cats: After a 40 micrograms/kg bw intramuscular dose the C_{max} is 17 ng/ml. The maximum plasma concentration is reached about 0.24 h after intramuscular administration. The apparent volume of distribution (Vd) is 2.2 l/kg and the elimination half-life ($t_{1/2}$) is one hour.

Bio-transformations in the cat occur by hydroxylation in the liver. Metabolites are excreted mainly in the urine (51 % of the dose), and to a lesser extent in the faeces. As in dogs dexmedetomidine has a high clearance in cats and its elimination depends on the hepatic blood flow. A prolonged elimination half-life is therefore expected with overdoses or when dexmedetomidine is co-administered with other substances, which affect hepatic circulation.

5. PHARMACEUTICAL PARTICULARS

5.1 Major incompatibilities

The veterinary medicinal product is compatible with butorphanol and ketamine in the same syringe at least for two hours.

In the absence of other compatibility studies, this veterinary medicinal product must not be mixed with other veterinary medicinal products.

5.2 Shelf life

Shelf life of the veterinary medicinal product as packaged for sale: 2 years.
Shelf life after first opening the immediate packaging: 56 days.

5.3 Special precautions for storage

This veterinary medicinal product does not require any special storage conditions.

5.4 Nature and composition of immediate packaging

Colourless Type I glass vials of 10 ml closed with a coated bromobutyl rubber stopper and aluminium cap in a carton box.

Pack size: carton box with 1 vial of 10 ml.

5.5 Special precautions for the disposal of unused veterinary medicinal products or waste materials derived from the use of such products

Medicines should not be disposed of via wastewater or household waste.

Use take-back schemes for the disposal of any unused veterinary medicinal product or waste materials derived thereof in accordance with local requirements and with any national collection systems applicable to the veterinary medicinal product concerned.

6. NAME OF THE MARKETING AUTHORISATION HOLDER

Le Vet Beheer B.V.

7. MARKETING AUTHORISATION NUMBER(S)

EU/2/16/198/001

8. DATE OF FIRST AUTHORISATION

Date of first authorisation: 12/08/2016.

9. DATE OF THE LAST REVISION OF THE SUMMARY OF THE PRODUCT CHARACTERISTICS

{DD/MM/YYYY}

10. CLASSIFICATION OF VETERINARY MEDICINAL PRODUCTS

Veterinary medicinal product subject to prescription.

Detailed information on this veterinary medicinal product is available in the Union Product Database (*https://medicines.health.europa.eu/veterinary*).

1. NAME OF THE VETERINARY MEDICINAL PRODUCT

Sedadex 0.5 mg/ml solution for injection for dogs and cats

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Each ml contains:

Active substance:
Dexmedetomidine hydrochloride 0.5 mg
(equivalent to dexmedetomidine 0.42 mg)

Excipients:

Qualitative composition of excipients and other constituents	**Quantitative composition if that information is essential for proper administration of the veterinary medicinal product**
Methyl parahydroxybenzoate (E 218)	1.6 mg
Propyl parahydroxybenzoate	0.2 mg
Sodium chloride	
Sodium hydroxide (E 524) (for pH adjustment)	
Hydrochloric acid (E 507) (for pH adjustment)	
Water for injections	

Clear, colourless solution, practically free from particles.

3. CLINICAL INFORMATION

3.1 Target species

Dogs and cats.

3.2 Indications for use for each target species

Non-invasive, mildly to moderately painful, procedures and examinations which require restraint, sedation and analgesia in dogs and cats.

Deep sedation and analgesia in dogs in concomitant use with butorphanol for medical and minor surgical procedures.

Premedication in dogs and cats before induction and maintenance of general anaesthesia.

3.3 Contraindications

Do not use in animals with cardiovascular disorders.
Do not use in animals with severe systemic disease or in animals that are moribund.
Do not use in cases ofhypersensitivity to the active substance or to any of the excipients.

3.4 Special warnings

The administration of the veterinary medicinal product to puppies younger than 16 weeks and kittens younger than 12 weeks has not been studied.

3.5 Special precautions for use

Special precautions for safe use in the target species:
Treated animals should be kept warm and at a constant temperature, both during the procedure and recovery.

It is recommended that animals are fasted for 12 hours prior to the administration of the veterinary medicinal product. Water may be given.

After treatment, the animal should not be given water or food before it is able to swallow.

Corneal opacities may occur during sedation. The eyes should be protected by a suitable eye lubricant.

To be used with precaution in elderly animals.

Nervous, aggressive or excited animals should be given the possibility to calm down before initiation of treatment.

Frequent and regular monitoring of respiratory and cardiac function should be performed. Pulse oximetry may be useful but is not essential for adequate monitoring. Equipment for manual ventilation should be available in case of respiratory depression or apnoea when dexmedetomidine and ketamine are used sequentially to induce anaesthesia in cats. It is also advisable to have oxygen readily available, should hypoxaemia be detected or suspected.

Sick and debilitated dogs and cats should only be premedicated with the veterinary medicinal product before induction and maintenance of general anaesthesia based on a risk-benefit assessment.

Use of the veterinary medicinal product as a premedicant in dogs and cats significantly reduces the amount of induction medicinal product required for induction of anaesthesia. Attention should be given during the administration of intravenous induction medicinal products to effect. Volatile anaesthetic requirements for maintenance anaesthesia are also reduced.

Special precautions to be taken by the person administering the veterinary medicinal product to animals:
The veterinary medicinal product is a sedative and sleep inducing drug. Care should be taken to avoid self-injection. In case of accidental ingestion or self-injection, seek medical advice immediately and show the package leaflet to the physician but DO NOT DRIVE as sedation and changes in blood pressure may occur.

Pregnant women should administer the veterinary medicinal product with special caution to avoid self-injection since uterine contractions and decreased foetal blood pressure may occur after accidental systemic exposure.

Avoid skin, eye or mucosal contact; the use of impermeable gloves is advisable. In case of accidental skin or mucosal contact, wash the exposed skin immediately after exposure with large amounts of water and remove contaminated clothes that are in direct contact with skin. In case of accidental eye contact, rinse abundantly with fresh water. If symptoms occur, seek the advice of a physician.

People with known hypersensitivity to the active substance or any of the excipients should administer the veterinary medicinal product with caution.

Advice to physicians: the veterinary medicinal product is an α2-adrenoceptor agonist, symptoms after absorption may involve clinical effects including dose-dependent sedation, respiratory depression, bradycardia, hypotension, a dry mouth, and hyperglycaemia. Ventricular arrhythmias have also been reported. Respiratory and haemodynamic symptoms should be treated symptomatically. The specific

α2–adrenoceptor antagonist, atipamezole, which is approved for use in animals, has been used in humans only experimentally to antagonise dexmedetomidine-induced effects.

Special precautions for the protection of the environment:
Not applicable.

3.6 Adverse events

Dogs:

Very common (> 1 animal / 10 animals treated)	Bradycardia Pale mucous membranes [1] Cyanotic mucous membranes [1]
Common (1 to 10 animals / 100 animals treated):	Arrhythmia [2]
Rare (1 to 10 animals / 10,000 animals treated):	Pulmonary oedema Supraventricular and nodal arrhythmia [2], Premature ventricular contractions [2], Heart block [2]
Very rare (<1 animal / 10,000 animals treated, including isolated reports):	Excitation [2] High blood pressure [3], Low blood pressure [3] Hypersalivation [2], Vomiting [4] Muscle tremor, Paddling [2], Twitching [2],Sedation prolonged [2] Bradypnoea [2,5], Decreased respiratory rate, Irregular breathing [2], Tachypnoea [2,5] Erythema [2] Decreased body temperature Urination [2]
Undetermined frequency (cannot be estimated from the available data):	Corneal opacity Decreased pulse oxygenation [2]Retching [2]

[1]Due to peripheral vasoconstriction and venous desaturation in the presence of normal arterial oxygenation.
[2]When dexmedetomidine and butorphanol are used concomitantly
[3]Blood pressure will increase initially and then return to normal or below normal
[4]May occur 5–10 minutes after injection. Some dogs may also vomit at the time of recovery.
[5]When dexmedetomidine is used as a premedicant.

When dexmedetomidine and butorphanol are used concomitantly in dogs, brady- and tachyarrhythmias have been reported. These may include profound sinus bradycardia, 1st and 2nd degree AV block, sinus arrest or pause, as well as atrial, supraventricular and ventricular premature complexes.

When dexmedetomidine is used as a premedicant brady- and tachyarrhythmias have been reported and include profound sinus bradycardia, 1st and 2nd degree AV block and sinus arrest. Supraventricular

and ventricular premature complexes, sinus pause and 3rd degree AV block may be observed in rare cases.

Cats:

Very common (> 1 animal / 10 animals treated):	Arrhytmia [1] Bradycardia Heart block [2] Vomiting [3] Pale mucous membranes [4] Cyanotic mucous membranes [4]
Common (1 to 10 animals / 100 animals treated):	Supraventricular and nodal arrhythmia [1] Retching [1] Decreased pulse oxygenation [2] Decreased body temperature [2]
Uncommon (1 to 10 animals / 1000 animals treated)	Apnoea [2]
Rare (1 to 10 animals / 10,000 animals treated):	Pulmonary oedema Extrasystole [2]
Very rare (<1 animal / 10,000 animals treated, including isolated reports):	High blood Pressure [5], Low blood pressure [5] Bradypnoea [2], Decreased respiratory rate, Hypoventilation [2], Irregular breathing [2] Muscle tremor Agitation [2]
Undetermined frequency (cannot be estimated from the available data):	Corneal opacity

[1]When dexmedetomidine is used as a premedicant.
[2]When dexmedetomidine and ketamine are used sequentially.
[3]May occur 5–10 minutes after injection. Some cats may also vomit at the time of recovery.
[4]Due to peripheral vasoconstriction and venous desaturation in the presence of normal arterial oxygenation.
[5]Blood pressure will increase initially and then return to normal or below normal.

Intramuscular dosing at 40 micrograms/kg (followed by ketamine or propofol) frequently resulted in sinus bradycardia and sinus arrhythmia, occasionally resulted in 1st degree atrioventricular block, and rarely resulted in supraventricular premature depolarizations, atrial bigeminy, sinus pauses, 2nd degree atrioventricular block, or escape beats/rhythms.

Reporting adverse events is important. It allows continuous safety monitoring of a veterinary medicinal product. Reports should be sent, preferably via a veterinarian, to either the marketing authorisation holder or the national competent authority via the national reporting system. See the package leaflet for respective contact details.

3.7 Use during pregnancy, lactation or lay

Pregnancy and lactation:

The safety of the veterinary medicinal product has not been established during pregnancy and lactation in the target species. Therefore, the use of the veterinary medicinal product during pregnancy and lactation is not recommended.

Fertility:
The safety of the veterinary medicinal product has not been established in males intended for breeding.

3.8 Interaction with other medicinal products and other forms of interaction

The use of other central nervous system depressants is expected to potentiate the effects of the veterinary medicinal product and therefore an appropriate dose adjustment should be made. Anticholinergics should be used with caution with dexmedetomidine.

Administration of atipamezole after dexmedetomidine rapidly reverses the effects and thus shortens the recovery period. Within 15 minutes, dogs and cats are normally awake and standing.

Cats: After administration of 40 micrograms dexmedetomidine/kg bodyweight (bw) intramuscularly concurrently with 5 mg ketamine/kg bw to cats, the maximum concentration of dexmedetomidine increased twofold but there was no effect on T_{max}. The mean half-life of elimination of dexmedetomidine increased to 1.6 h and the total exposure (AUC) increased by 50 %.

A dose of 10 mg ketamine/kg used concurrently with 40 micrograms dexmedetomidine/kg may cause tachycardia.

Atipamezole does not reverse the effect of ketamine.

3.9 Administration routes and dosage

The veterinary medicinal product is intended for:

- Dogs: intravenous or intramuscular use;
- Cats: intramuscular use.

The veterinary medicinal product is not intended for repeat injections.

Dexmedetomidine, butorphanol and/or ketamine can be mixed in the same syringe as they have been shown to be pharmaceutically compatible.

The following doses are recommended:

Dogs:
Dexmedetomidine doses are based on body surface area:

For non-invasive, mildly to moderately painful procedures and examinations requiring restraint, sedation and analgesia:

Intravenously: up to 375 micrograms/square metre body surface area.
Intramuscularly: up to 500 micrograms/square metre body surface area.

When administering in conjunction with butorphanol (0.1 mg/kg) for deep sedation and analgesia, the intramuscular dose of dexmedetomidine is 300 micrograms/square metre body surface area.

The premedication dose of dexmedetomidine is 125 – 375 micrograms/square metre body surface area, administered 20 minutes prior to induction for procedures requiring anaesthesia. The dose should be adjusted to the type of surgery, length of procedure and patient temperament.

Concomitant use of dexmedetomidine and butorphanol produces sedative and analgesic effects beginning no later than 15 minutes after administration. The peak sedative and analgesic effects are reached within 30 minutes after administration. Sedation lasts for at least 120 minutes post administration and analgesia lasts for at least 90 minutes. Spontaneous recovery occurs within 3 hours.

Premedication with dexmedetomidine will significantly reduce the dose of the induction agent required and will reduce volatile anaesthetic requirements for maintenance anaesthesia. In a clinical study, the requirement for propofol and thiopental was reduced by 30 % and 60 % respectively. All anaesthetic agents used for induction or maintenance of anaesthesia should be administered to effect. In a clinical study, dexmedetomidine contributed to postoperative analgesia for 0.5 – 4 hours. However, this duration is dependent on a number of variables and further analgesia should be administered in accordance with clinical judgement.

The corresponding doses based on body weight are presented in the following tables. Use of an appropriately graduated syringe is recommended to ensure accurate dosing when administering small volumes.

For non-invasive, mildly to moderately painful procedures and examinations requiring restraint, sedation and analgesia and for premedication						
Dog Weight (kg)	**Dexmedetomidine 125 micrograms/m^2**		**Dexmedetomidine 375 micrograms/m^2**		**Dexmedetomidine 500 micrograms/m^2***	
	(mcg/kg)	**(ml)**	**(mcg/kg)**	**(ml)**	**(mcg/kg)**	**(ml)**
2-3	9.4	0.04	28.1	0.12	40	0.15
3.1-4	8.3	0.05	25	0.17	35	0.2
4.1-5	7.7	0.07	23	0.2	30	0.3
5.1-10	6.5	0.1	19.6	0.29	25	0.4
10.1-13	5.6	0.13	16.8	0.38	23	0.5
13.1-15	5.2	0.15	15.7	0.44	21	0.6
15.1-20	4.9	0.17	14.6	0.51	20	0.7
20.1-25	4.5	0.2	13.4	0.6	18	0.8
25.1-30	4.2	0.23	12.6	0.69	17	0.9
30.1-33	4	0.25	12	0.75	16	1.0
33.1-37	3.9	0.27	11.6	0.81	15	1.1
37.1-45	3.7	0.3	11	0.9	14.5	1.2
45.1-50	3.5	0.33	10.5	0.99	14	1.3
50.1-55	3.4	0.35	10.1	1.06	13.5	1.4
55.1-60	3.3	0.38	9.8	1.13	13	1.5
60.1-65	3.2	0.4	9.5	1.19	12.8	1.6
65.1-70	3.1	0.42	9.3	1.26	12.5	1.7
70.1-80	3	0.45	9	1.35	12.3	1.8
>80	2.9	0.47	8.7	1.42	12	1.9

*only IM

	For deep sedation and analgesia with butorphanol	
Dog Weight (kg)	**Dexmedetomidine 300 micrograms/m^2 intramuscularly**	
	(mcg/kg)	**(ml)**
2-3	24	0.12
3.1-4	23	0.16
4.1-5	22.2	0.2

5.1-10	16.7	0.25
10.1-13	13	0.3
13.1-15	12.5	0.35
15.1-20	11.4	0.4
20.1-25	11.1	0.5
25.1-30	10	0.55
30.1-33	9.5	0.6
33.1-37	9.3	0.65
37.1-45	8.5	0.7
45.1-50	8.4	0.8
50.1-55	8.1	0.85
55.1-60	7.8	0.9
60.1-65	7.6	0.95
65.1-70	7.4	1
70.1-80	7.3	1.1
>80	7	1.2

Cats:
The dose for cats is 40 micrograms dexmedetomidine hydrochloride/kg bw equal to a dose volume of 0.08 ml of veterinary medicinal product/kg bw when used for non-invasive, mildly to moderately painful procedures requiring restraint, sedation and analgesia.

When dexmedetomidine is used for premedication in cats, the same dose is used. Premedication with dexmedetomidine will significantly reduce the dose of the induction agent required and will reduce volatile anaesthetic requirements for maintenance anaesthesia. In a clinical study, the requirement for propofol was reduced by 50 %. All anaesthetic agents used for induction or maintenance of anaesthesia should be administered to effect.

Anaesthesia can be induced 10 minutes after premedication by intramuscular administration of a target dose of 5 mg ketamine/kg bw or by intravenous administration of propofol to effect. Dosing for cats is presented in the following table.

Cat Weight (kg)	**Dexmedetomidine 40 micrograms/kg intramuscularly**	
	(mcg/kg)	**(ml)**
1-2	40	0.1
2.1-3	40	0.2
3.1-4	40	0.3
4.1-6	40	0.4
6.1-7	40	0.5
7.1-8	40	0.6
8.1-10	40	0.7

Dogs and cats:
The expected sedative and analgesic effects are reached within 15 minutes after administration and are maintained up to 60 minutes after administration. Sedation may be reversed with atipamezole (see section 3.10). Atipamezole should not be administered prior to 30 minutes following ketamine administration.

3.10 Symptoms of overdose (and where applicable, emergency procedures and antidotes)

Dogs:

In cases of overdose, or if the effects of dexmedetomidine become potentially life-threatening, the appropriate dose of atipamezole is 10 times the initial dose of dexmedetomidine (micrograms/kg bw or micrograms/square meter body surface area). The dose volume of atipamezole at the concentration of 5 mg/ml equals the dose volume of Sedadex 0.5 mg/ml that was given to the dog, regardless of route of administration of the veterinary medicinal product.

Cats:
In cases of overdose, or if the effects of dexmedetomidine become potentially life-threatening, the appropriate antagonist is atipamezole, administered by intramuscular injection, at the following dose: 5 times the initial dose of dexmedetomidine in micrograms/kg bw. The dose volume of atipamezole at the concentration of 5 mg/ml is one-half the volume of Sedadex 0.5 mg/ml that was given to the cat.

After concurrent exposure to an overdose of dexmedetomidine (3 times the recommended dose) and 15 mg ketamine/kg, atipamezole can be administered at the recommended dose level for reversal of effects induced by dexmedetomidine.

3.11 Special restrictions for use and special conditions for use, including restrictions on the use of antimicrobial and antiparasitic veterinary medicinal products in order to limit the risk of development of resistance

Not applicable.

3.12 Withdrawal periods

Not applicable.

4. PHARMACOLOGICAL INFORMATION

4.1 ATCvet code: QN05CM18.

4.2 Pharmacodynamics

The veterinary medicinal product contains dexmedetomidine as the active substance, which produces sedation and analgesia in dogs and cats. The duration and depth of the sedation and analgesia are dose-dependent. At maximal effect, the animal is relaxed, recumbent and does not respond to external stimuli.

Dexmedetomidine is a potent and selective α2-adrenoceptor agonist that inhibits the release of noradrenaline from noradrenergic neurons. Sympathetic neurotransmission is prevented and the level of consciousness decreases. Reduced heart rate and temporary AV-block can be seen after administration of dexmedetomidine. Blood pressure decreases to normal or below normal levels after an initial increase. Respiration rate can occasionally decrease. Dexmedetomidine also induces a number of other α2-adrenoceptor-mediated effects, which include piloerection, depression of motor and secretory functions of the gastrointestinal tract, diuresis, and hyperglycaemia.
A slight decrease in temperature may be observed.

4.3 Pharmacokinetics

As a lipophilic compound, dexmedetomidine is well absorbed after intramuscular administration. Dexmedetomidine is also rapidly distributed in the body and penetrates the blood-brain barrier readily. According to studies in rats, the maximum concentration in the central nervous system is several times that of the corresponding concentration in plasma. In the circulation, dexmedetomidine is largely bound to plasma proteins (> 90%).

Dogs: After an intramuscular dose of 50 micrograms/kg a maximum concentration in plasma of about 12 nanograms/ml is reached after 0.6 hours. The bioavailability of dexmedetomidine is 60 % and the apparent volume of distribution (Vd) is 0.9 l/kg. The elimination half-life ($t_{1/2}$) is 40-50 minutes.

Major bio-transformations in the dog include hydroxylation, glucuronic acid conjugation and N-methylation in the liver. All known metabolites lack pharmacological activity. Metabolites are excreted mainly in the urine and to a lesser extent in the faeces. Dexmedetomidine has a high clearance and its elimination depends on the hepatic blood flow. A prolonged elimination half-life is therefore expected with overdoses or when dexmedetomidine is co-administered with other substances, which affect hepatic circulation.

Cats: After a 40 micrograms/kg bw intramuscular dose the C_{max} is 17 ng/ml. The maximum plasma concentration is reached about 0.24 h after intramuscular administration. The apparent volume of distribution (Vd) is 2.2 l/kg and the elimination half-life ($t_{1/2}$) is one hour.

Bio-transformations in the cat occur by hydroxylation in the liver. Metabolites are excreted mainly in the urine (51 % of the dose), and to a lesser extent in the faeces. As in dogs dexmedetomidine has a high clearance in cats and its elimination depends on the hepatic blood flow. A prolonged elimination half-life is therefore expected with overdoses or when dexmedetomidine is co-administered with other substances, which affect hepatic circulation.

5. PHARMACEUTICAL PARTICULARS

5.1 Major incompatibilities

The veterinary medicinaal product is compatible with butorphanol and ketamine in the same syringe at least for two hours.

In the absence of other compatibility studies, this veterinary medicinal product must not be mixed with other veterinary medicinal products.

5.2 Shelf life

Shelf life of the veterinary medicinal product as packaged for sale: 2 years.
Shelf life after first opening the immediate packaging: 56 days.

5.3 Special precautions for storage

This veterinary medicinal product does not require any special storage conditions.

5.4 Nature and composition of immediate packaging

Colourless Type I glass vials of 10 ml closed with a coated bromobutyl rubber stopper and aluminium cap in a carton box.

Pack size: carton box with 1 vial of 10 ml.

5.5 Special precautions for the disposal of unused veterinary medicinal products or waste materials derived from the use of such products

Medicines should not be disposed of via wastewater or household waste.

Use take-back schemes for the disposal of any unused veterinary medicinal product or waste materials derived thereof in accordance with local requirements and with any national collection systems applicable to the veterinary medicinal product concerned.

6. NAME OF THE MARKETING AUTHORISATION HOLDER

Le Vet Beheer B.V.

7. MARKETING AUTHORISATION NUMBER(S)

EU/2/16/198/002

8. DATE OF FIRST AUTHORISATION

Date of first authorisation: 12/08/2016.

9. DATE OF THE LAST REVISION OF THE SUMMARY OF THE PRODUCT CHARACTERISTICS

{DD/MM/YYYY}

10. CLASSIFICATION OF VETERINARY MEDICINAL PRODUCTS

Veterinary medicinal product subject to prescription.

Detailed information on this veterinary medicinal product is available in the Union Product Database (*https://medicines.health.europa.eu/veterinary*).

ANNEX II

OTHER CONDITIONS AND REQUIREMENTS OF THE MARKETING AUTHORISATION

None

ANNEX III

LABELLING AND PACKAGE LEAFLET

A. LABELLING

PARTICULARS TO APPEAR ON THE OUTER PACKAGE

CARDBOARD BOX

1. NAME OF THE VETERINARY MEDICINAL PRODUCT

Sedadex 0.1 mg/ml solution for injection

2. STATEMENT OF ACTIVE SUBSTANCES

Each ml contains:

Dexmedetomidine hydrochloride	0.1 mg
(equivalent to dexmedetomidine	0.08 mg)

3. PACKAGE SIZE

10 ml

4. TARGET SPECIES

Dogs and cats.

5. INDICATIONS

6. ROUTES OF ADMINISTRATION

Dogs: intravenous or intramuscular use.
Cats: intramuscular use.

7. WITHDRAWAL PERIODS

8. EXPIRY DATE

Exp. {mm/yyyy}
Once broached use within 56 days.

9. SPECIAL STORAGE PRECAUTIONS

10. THE WORDS "READ THE PACKAGE LEAFLET BEFORE USE"

Read the package leaflet before use.

11. THE WORDS “FOR ANIMAL TREATMENT ONLY”

For animal treatment only.

12. THE WORDS “KEEP OUT OF THE SIGHT AND REACH OF CHILDREN”

Keep out of the sight and reach of children.

13. NAME OF THE MARKETING AUTHORISATION HOLDER

Le Vet Beheer B.V.

14. MARKETING AUTHORISATION NUMBERS

EU/2/16/198/001

15. BATCH NUMBER

Lot {number}

PARTICULARS TO APPEAR ON THE OUTER PACKAGE

CARDBOARD BOX

1. NAME OF THE VETERINARY MEDICINAL PRODUCT

Sedadex 0.5 mg/ml solution for injection

2. STATEMENT OF ACTIVE SUBSTANCES

Each ml contains:

Dexmedetomidine hydrochloride	0.5 mg
(equivalent to dexmedetomidine	0.42 mg)

3. PACKAGE SIZE

10 ml

4. TARGET SPECIES

Dogs and cats.

5. INDICATIONS

6. ROUTES OF ADMINISTRATION

Dogs: intravenous or intramuscular use
Cats: intramuscular use

7. WITHDRAWAL PERIODS

8. EXPIRY DATE

Exp. {mm/yyyy}
Once broached use within 56 days.

9. SPECIAL STORAGE PRECAUTIONS

10. THE WORDS "READ THE PACKAGE LEAFLET BEFORE USE"

Read the package leaflet before use.

11. THE WORDS “FOR ANIMAL TREATMENT ONLY”

For animal treatment only.

12. THE WORDS “KEEP OUT OF THE SIGHT AND REACH OF CHILDREN”

Keep out of the sight and reach of children.

13. NAME OF THE MARKETING AUTHORISATION HOLDER

Le Vet Beheer B.V.

14. MARKETING AUTHORISATION NUMBERS

EU/2/16/198/002

15. BATCH NUMBER

Lot {number}

MINIMUM PARTICULARS TO APPEAR ON SMALL IMMEDIATE PACKAGING UNITS

GLASS VIAL

1. NAME OF THE VETERINARY MEDICINAL PRODUCT

Sedadex

2. QUANTITATIVE PARTICULARS OF THE ACTIVE SUBSTANCES

0.1 mg/ml dexmedetomidine hydrochloride

3. BATCH NUMBER

Lot {number}

4. EXPIRY DATE

Exp. {mm/yyyy}

Once broached use by: __/__/____.

MINIMUM PARTICULARS TO APPEAR ON SMALL IMMEDIATE PACKAGING UNITS

GLASS VIAL

1. NAME OF THE VETERINARY MEDICINAL PRODUCT

Sedadex

2. QUANTITATIVE PARTICULARS OF THE ACTIVE SUBSTANCES

0.5 mg/ml dexmedetomidine hydrochloride

3. BATCH NUMBER

Lot {number}

4. EXPIRY DATE

Exp. {mm/yyyy}

Once broached use by: __/__/____.

B. PACKAGE LEAFLET

PACKAGE LEAFLET

1. Name of the veterinary medicinal product

Sedadex 0.1 mg/ml solution for injection for dogs and cats

2. Composition

Each ml contains:

Active substance:

Dexmedetomidine hydrochloride	0.1 mg
(equivalent to dexmedetomidine	0.08 mg)

Excipients:

Methyl parahydroxybenzoate (E 218)	2.0 mg
Propyl parahydroxybenzoate	0.2 mg

Clear, colourless solution for injection, practically free from particles.

3. Target species

Dogs and cats.

4. Indications for use

Non-invasive, mildly to moderately painful, procedures and examinations which require restraint, sedation and analgesia in dogs and cats.

Deep sedation and analgesia in dogs in concomitant use with butorphanol for medical and minor surgical procedures.

Premedication in dogs and cats before induction and maintenance of general anaesthesia.

5. Contraindications

Do not use in animals with cardiovascular disorders.
Do not use in animals with severe systemic disease or in animals that are moribund.
Do not use in cases of hypersensitivity to the active substance or to any of the excipients.

6. Special warnings

Special warnings:
The administration of the veterinary medicinal product to puppies younger than 16 weeks and kittens younger than 12 weeks has not been studied.

Special precautions for safe use in the target species:
Treated animals should be kept warm and at a constant temperature, both during the procedure and recovery.

It is recommended that animals are fasted for 12 hours prior to the administration of the veterinary medicinal product. Water may be given.

After treatment, the animal should not be given water or food before it is able to swallow.

Corneal opacities may occur during sedation. The eyes should be protected by a suitable eye lubricant. To be used with precaution in elderly animals.

Nervous, aggressive or excited animals should be given the possibility to calm down before initiation of treatment.

Frequent and regular monitoring of respiratory and cardiac function should be performed. Pulse oximetry may be useful but is not essential for adequate monitoring. Equipment for manual ventilation should be available in case of respiratory depression or apnoea when dexmedetomidine and ketamine are used sequentially to induce anaesthesia in cats. It is also advisable to have oxygen readily available, should hypoxaemia be detected or suspected.

Sick and debilitated dogs and cats should only be premedicated with the veterinary medicinal product before induction and maintenance of general anaesthesia based on a risk-benefit assessment.

Use of the veterinary medicinal product as a premedicant in dogs and cats significantly reduces the amount of induction medicinal product required for induction of anaesthesia. Attention should be given during the administration of intravenous induction medicinal products to effect. Volatile anaesthetic requirements for maintenance anaesthesia are also reduced.

Special precautions to be taken by the person administering the veterinary medicinal product to animals:
The veterinary medicinal product is a sedative and sleep inducing drug. Care should be taken to avoid self-injection. In case of accidental ingestion or self-injection, seek medical advice immediately and show the package leaflet to the physician but DO NOT DRIVE as sedation and changes in blood pressure may occur.

Pregnant women should administer the veterinary medicinal product with special caution to avoid self-injection since uterine contractions and decreased foetal blood pressure may occur after accidental systemic exposure.

Avoid skin, eye or mucosal contact; the use of impermeable gloves is advisable. In case of accidental skin or mucosal contact, wash the exposed skin immediately after exposure with large amounts of water and remove contaminated clothes that are in direct contact with skin. In case of accidental eye contact, rinse abundantly with fresh water. If symptoms occur, seek the advice of a physician.

People with known hypersensitivity to the active substance or any of the excipients should administer the veterinary medicinal product with caution.

Advice to physicians: the veterinary medicinal product is an α2-adrenoceptor agonist, symptoms after absorption may involve clinical effects including dose-dependent sedation, respiratory depression, bradycardia, hypotension, a dry mouth, and hyperglycaemia. Ventricular arrhythmias have also been reported. Respiratory and haemodynamic symptoms should be treated symptomatically. The specific α2–adrenoceptor antagonist, atipamezole, which is approved for use in animals, has been used in humans only experimentally to antagonise dexmedetomidine-induced effects.

Pregnancy and lactation:
The safety of the veterinary medicinal product has not been established during pregnancy and lactation in the target species. Therefore, the use of the veterinary medicinal product during pregnancy and lactation is not recommended.

Fertility:

The safety of the veterinary medicinal product has not been established in males intended for breeding.

Interaction with other medicinal products and other forms of interaction:
The use of other central nervous system depressants is expected to potentiate the effects of the veterinary medicinal product and therefore an appropriate dose adjustment should be made.
Anticholinergics should be used with caution with dexmedetomidine.
Administration of atipamezole after dexmedetomidine rapidly reverses the effects and thus shortens the recovery period. Within 15 minutes, dogs and cats are normally awake and standing.

Cats: After administration of 40 micrograms dexmedetomidine/kg bodyweight (bw) intramuscularly concurrently with 5 mg ketamine/kg bw to cats, the maximum concentration of dexmedetomidine increased twofold but there was no effect on T_{max}. The mean half-life of elimination of dexmedetomidine increased to 1.6 h and the total exposure (AUC) increased by 50 %.

A dose of 10 mg ketamine/kg used concurrently with 40 micrograms dexmedetomidine/kg may cause tachycardia.

Atipamezole does not reverse the effect of ketamine.

Overdose:
Dogs:
In cases of overdose, or if the effects of dexmedetomidine become potentially life-threatening, the appropriate dose of atipamezole is 10 times the initial dose of dexmedetomidine (micrograms/kg bw or micrograms/square meter body surface area). The dose volume of atipamezole at the concentration of 5 mg/ml is one fifth (1/5) of the dose volume of Sedadex 0.1 mg/ml that was given to the dog, regardless of route of administration of the veterinary medicinal product.

Cats:
In cases of overdose, or if the effects of dexmedetomidine become potentially life-threatening, the appropriate antagonist is atipamezole, administered by intramuscular injection, at the following dose: 5 times the initial dose dexmedetomidine in micrograms/kg bw. The dose volume of atipamezole at the concentration of 5 mg/ml is one-tenth (1/10) the volume of Sedadex 0.1 mg/ml that was given to the cat.
After concurrent exposure to an overdose of dexmedetomidine (3 times the recommended dose) and 15 mg ketamine/kg, atipamezole can be administered at the recommended dose level for reversal of effects induced by dexmedetomidine.

Major incompatibilities:
The veterinary medicinal productis compatible with butorphanol and ketamine in the same syringe at least for two hours.

In the absence of other compatibility studies, this veterinary medicinal product must not be mixed with other veterinary medicinal products.

7. Adverse events

Dogs:

Very common (> 1 animal / 10 animals treated)	Bradycardia Pale mucous membranes [1] Cyanotic mucous membranes [1]
Common (1 to 10 animals / 100 animals treated):	Arrhythmia [2]

Rare (1 to 10 animals / 10,000 animals treated):	Pulmonary oedema Supraventricular and nodal arrhythmia [2], Premature ventricular contractions [2], Heart block [2]
Very rare (<1 animal / 10,000 animals treated, including isolated reports):	Excitation [2] High blood pressure [3], Low blood pressure [3], Hypersalivation [2], Vomiting [4] Muscle tremor, Paddling [2], Twitching [2],Sedation prolonged [2] Bradypnoea [2,5], Decreased respiratory rate, Irregular breathing [2], Tachypnoea [2,5] Erythema [2] Decreased body temperature Urination [2]
Undetermined frequency (cannot be estimated from the available data):	Corneal opacity Decreased pulse oxygenation [2]Retching [2]

[1]Due to peripheral vasoconstriction and venous desaturation in the presence of normal arterial oxygenation.
[2]When dexmedetomidine and butorphanol are used concomitantly
[3]Blood pressure will increase initially and then return to normal or below normal
[4]May occur 5–10 minutes after injection. Some dogs may also vomit at the time of recovery.
[5]When dexmedetomidine is used as a premedicant.

When dexmedetomidine and butorphanol are used concomitantly in dogs, brady- and tachyarrhythmias have been reported. These may include profound sinus bradycardia, 1st and 2nd degree AV block, sinus arrest or pause, as well as atrial, supraventricular and ventricular premature complexes.

When dexmedetomidine is used as a premedicant brady- and tachyarrhythmias have been reported and include profound sinus bradycardia, 1st and 2nd degree AV block and sinus arrest. Supraventricular and ventricular premature complexes, sinus pause and 3rd degree AV block may be observed in rare cases.

Cats:

Very common (> 1 animal / 10 animals treated):	Arrhytmia [1] Bradycardia Heart block [2] Vomiting [3] Pale mucous membranes [4] Cyanotic mucous membranes [4]
Common (1 to 10 animals / 100 animals treated):	Supraventricular and nodal arrhythmia [1] Retching [1] Decreased pulse oxygenation [2] Decreased body temperature [2]
Uncommon (1 to 10 animals / 1000 animals treated)	Apnoea [2]

Rare (1 to 10 animals / 10,000 animals treated):	Pulmonary oedema Extrasystole [2]
Very rare (<1 animal / 10,000 animals treated, including isolated reports):	High blood Pressure [5], Low blood pressure [5] Bradypnoea [2], Decreased respiratory rate, Hypoventilation [2], Irregular breathing [2] Muscle tremor Agitation [2]
Undetermined frequency (cannot be estimated from the available data):	Corneal opacity

[1]When dexmedetomidine is used as a premedicant.
[2]When dexmedetomidine and ketamine are used sequentially.
[3]May occur 5–10 minutes after injection. Some cats may also vomit at the time of recovery.
[4]Due to peripheral vasoconstriction and venous desaturation in the presence of normal arterial oxygenation.
[5]Blood pressure will increase initially and then return to normal or below normal.

Intramuscular dosing at 40 micrograms/kg (followed by ketamine or propofol) frequently resulted in sinus bradycardia and sinus arrhythmia, occasionally resulted in 1st degree atrioventricular block, and rarely resulted in supraventricular premature depolarizations, atrial bigeminy, sinus pauses, 2nd degree atrioventricular block, or escape beats/rhythms.

Reporting adverse events is important. It allows continuous safety monitoring of a product. If you notice any side effects, even those not already listed in this package leaflet, or you think that the medicine has not worked, please contact, in the first instance, your veterinarian. You can also report any adverse events to the marketing authorisation holder using the contact details at the end of this leaflet, or via your national reporting system: {national system details}.

8. Dosage for each species, routes and method of administration

The veterinary medicinal product is intended for:

- Dogs: intravenous or intramuscular use;
- Cats: intramuscular use.

The veterinary medicinal product is not intended for repeat injections.

Dexmedetomidine, butorphanol and/or ketamine can be mixed in the same syringe as they have been shown to be pharmaceutically compatible.

The following doses are recommended:

Dogs:
Dexmedetomidine doses are based on body surface area:

For non-invasive, mildly to moderately painful procedures and examinations requiring restraint, sedation and analgesia:
Intravenously: up to 375 micrograms/square metre body surface area.
Intramuscularly: up to 500 micrograms/square metre body surface area.

When administering in conjunction with butorphanol (0.1 mg/kg) for deep sedation and analgesia, the intramuscular dose of dexmedetomidine is 300 micrograms/square metre body surface area.

The premedication dose of dexmedetomidine is 125 – 375 micrograms/square metre body surface area, administered 20 minutes prior to induction for procedures requiring anaesthesia. The dose should be adjusted to the type of surgery, length of procedure and patient temperament.

Concomitant use of dexmedetomidine and butorphanol produces sedative and analgesic effects beginning no later than 15 minutes after administration. The peak sedative and analgesic effects are reached within 30 minutes after administration. Sedation lasts for at least 120 minutes post administration and analgesia lasts for at least 90 minutes. Spontaneous recovery occurs within 3 hours.

Premedication with dexmedetomidine will significantly reduce the dose of the induction agent required and will reduce volatile anaesthetic requirements for maintenance anaesthesia. In a clinical study, the requirement for propofol and thiopental was reduced by 30 % and 60 % respectively. All anaesthetic agents used for induction or maintenance of anaesthesia should be administered to effect. In a clinical study, dexmedetomidine contributed to postoperative analgesia for 0.5 – 4 hours. However, this duration is dependent on a number of variables and further analgesia should be administered in accordance with clinical judgement.

The corresponding doses based on body weight are presented in the following tables. Use of an appropriately graduated syringe is recommended to ensure accurate dosing when administering small volumes.

For non-invasive, mildly to moderately painful procedures and examinations requiring restraint, sedation and analgesia and for premedication						
Dog Weight (kg)	**Dexmedetomidine 125 micrograms/m^2**		**Dexmedetomidine 375 micrograms/m^2**		**Dexmedetomidine 500 micrograms/m^2***	
	(mcg/kg)	**(ml)**	**(mcg/kg)**	**(ml)**	**(mcg/kg)**	**(ml)**
2-3	9.4	0.2	28.1	0.6	40	0.75
3.1-4	8.3	0.25	25	0.85	35	1
4.1-5	7.7	0.35	23	1	30	1.5
5.1-10	6.5	0.5	19.6	1.45	25	2
10.1-13	5.6	0.65	16.8	1.9		
13.1-15	5.2	0.75				
15.1-20	4.9	0.85				

*only IM

For deep sedation and analgesia with butorphanol		
Dog Weight (kg)	**Dexmedetomidine 300 micrograms/m^2 intramuscularly**	
	(mcg/kg)	**(ml)**
2-3	24	0.6
3.1-4	23	0.8
4.1-5	22.2	1
5.1-10	16.7	1.25
10.1-13	13	1.5
13.1-15	12.5	1.75

For higher weight ranges, use Sedadex 0.5 mg/ml and its dosing tables.

Cats:
The dose for cats is 40 micrograms dexmedetomidine hydrochloride/kg bw equal to a dose volume of 0.4 ml of veterinary medicinal product/kg bw when used for non-invasive, mildly to moderately painful procedures requiring restraint, sedation and analgesia.
When dexmedetomidine is used for premedication in cats, the same dose is used. Premedication with dexmedetomidine will significantly reduce the dose of the induction agent required and will reduce volatile anaesthetic requirements for maintenance anaesthesia. In a clinical study, the requirement for propofol was reduced by 50 %. All anaesthetic agents used for induction or maintenance of anaesthesia should be administered to effect.
Anaesthesia can be induced 10 minutes after premedication by intramuscular administration of a target dose of 5 mg ketamine/kg bw or by intravenous administration of propofol to effect. Dosing for cats is presented in the following table.

Cat Weight (kg)	**Dexmedetomidine 40 micrograms/kg intramuscularly**	
	(mcg/kg)	**(ml)**
1-2	40	0.5
2.1-3	40	1

For higher weight ranges, use Sedadex 0.5 mg/ml and its dosing table.

9. Advice on correct administration

The expected sedative and analgesic effects are reached within 15 minutes after administration and are maintained up to 60 minutes after administration. Sedation may be reversed with atipamezole (see section “Overdose”). Atipamezole should not be administered prior to 30 minutes following ketamine administration.

10. Withdrawal periods

Not applicable.

11. Special storage precautions

Keep out of the sight and reach of children.

This veterinary medicinal product does not require any special storage conditions.

Do not use this veterinary medicinal product after the expiry date which is stated on the carton and the vial label after Exp. The expiry date refers to the last day of that month.

Shelf life after first opening the immediate packaging: 56 days.

12. Special precautions for disposal

Medicines should not be disposed of via wastewater or household waste.

Use take-back schemes for the disposal of any unused veterinary medicinal product or waste materials derived thereof in accordance with local requirements and with any applicable national collection systems. These measures should help to protect the environment.

Ask your veterinary surgeon or pharmacist how to dispose of medicines no longer required.

13. Classification of veterinary medicinal products

Veterinary medicinal product subject to prescription.

14. Marketing authorisation numbers and pack sizes

EU/2/16/198/001

Colourless Type I glass vials of 10 ml closed with a coated bromobutyl rubber stopper and aluminium cap in a carton box.

Pack size: carton box with 1 vial of 10 ml.

15. Date on which the package leaflet was last revised

{DD/MM/YYYY}

Detailed information on this veterinary medicinal product is available in the Union Product Database (*https://medicines.health.europa.eu/veterinary*).

16. Contact details

Marketing authorisation holder and contact details to report suspected adverse reactions:
Le Vet Beheer B.V.
Wilgenweg 7
3421 TV Oudewater
The Netherlands
Tel: +31 348 563 434

Manufacturer responsible for batch release:
Produlab Pharma B.V.
Forellenweg 16
4941 SJ Raamsdonksveer
The Netherlands

PACKAGE LEAFLET

1. Name of the veterinary medicinal product

Sedadex 0.5 mg/ml solution for injection for dogs and cats

2. Composition

Each ml contains:

Active substance:

Dexmedetomidine hydrochloride	0.5 mg
(equivalent to dexmedetomidine	0.42 mg)

Excipient(s):

Methyl parahydroxybenzoate (E 218)	1.6 mg
Propyl parahydroxybenzoate	0.2 mg

Clear, colourless solution for injection, practically free from particles.

3. Target species

Dogs and cats.

4. Indications for use

Non-invasive, mildly to moderately painful, procedures and examinations which require restraint, sedation and analgesia in dogs and cats.

Deep sedation and analgesia in dogs in concomitant use with butorphanol for medical and minor surgical procedures.

Premedication in dogs and cats before induction and maintenance of general anaesthesia.

5. Contraindications

Do not use in animals with cardiovascular disorders.
Do not use in animals with severe systemic disease or in animals that are moribund.
Do not use in cases of hypersensitivity to the active substance or to any of the excipients.

6. Special warnings

Special warnings:
The administration of the veterinary medicinal product to puppies younger than 16 weeks and kittens younger than 12 weeks has not been studied.

Special precautions for safe use in the target species:
Treated animals should be kept warm and at a constant temperature, both during the procedure and recovery.

It is recommended that animals are fasted for 12 hours prior to the administration of the veterinary medicinal product. Water may be given.

After treatment, the animal should not be given water or food before it is able to swallow.

Corneal opacities may occur during sedation. The eyes should be protected by a suitable eye lubricant. To be used with precaution in elderly animals.

Nervous, aggressive or excited animals should be given the possibility to calm down before initiation of treatment.

Frequent and regular monitoring of respiratory and cardiac function should be performed. Pulse oximetry may be useful but is not essential for adequate monitoring. Equipment for manual ventilation should be available in case of respiratory depression or apnoea when dexmedetomidine and ketamine are used sequentially to induce anaesthesia in cats. It is also advisable to have oxygen readily available, should hypoxaemia be detected or suspected.

Sick and debilitated dogs and cats should only be pre-medicated with the veterinary medicinal product before induction and maintenance of general anaesthesia based on a risk-benefit assessment.

Use of the veterinary medicinal product as a premedicant in dogs and cats significantly reduces the amount of induction medicinal product required for induction of anaesthesia. Attention should be given during the administration of intravenous induction medicinal products to effect. Volatile anaesthetic requirements for maintenance anaesthesia are also reduced.

Special precautions to be taken by the person administering the veterinary medicinal product to animals:
The veterinary medicinal product is a sedative and sleep inducing drug. Care should be taken to avoid self-injection. In case of accidental ingestion or self-injection, seek medical advice immediately and show the package leaflet to the physician but DO NOT DRIVE as sedation and changes in blood pressure may occur.

Pregnant women should administer the veterinary medicinal product with special caution to avoid self-injection since uterine contractions and decreased foetal blood pressure may occur after accidental systemic exposure.

Avoid skin, eye or mucosal contact; the use of impermeable gloves is advisable. In case of accidental skin or mucosal contact, wash the exposed skin immediately after exposure with large amounts of water and remove contaminated clothes that are in direct contact with skin. In case of accidental eye contact, rinse abundantly with fresh water. If symptoms occur, seek the advice of a physician.

People with known hypersensitivity to the active substance or any of the excipients should administer the veterinary medicinal product with caution.

Advice to physicians: the veterinary medicinal product is an α2-adrenoceptor agonist, symptoms after absorption may involve clinical effects including dose-dependent sedation, respiratory depression, bradycardia, hypotension, a dry mouth, and hyperglycaemia. Ventricular arrhythmias have also been reported. Respiratory and haemodynamic symptoms should be treated symptomatically. The specific α2–adrenoceptor antagonist, atipamezole, which is approved for use in animals, has been used in humans only experimentally to antagonise dexmedetomidine-induced effects.

Pregnancy and lactation:
The safety of the veterinary medicinal product has not been established during pregnancy and lactation in the target species. Therefore, the use of the veterinary medicinal product during pregnancy and lactation is not recommended.

Fertility:

The safety of the veterinary medicinal product has not been established in males intended for breeding.

Interaction with other medicinal products and other forms of interaction:
The use of other central nervous system depressants is expected to potentiate the effects of the veterinary medicinal product and therefore an appropriate dose adjustment should be made.
Anticholinergics should be used with caution with dexmedetomidine.
Administration of atipamezole after dexmedetomidine rapidly reverses the effects and thus shortens the recovery period. Within 15 minutes, dogs and cats are normally awake and standing.

Cats: After administration of 40 micrograms dexmedetomidine/kg bodyweight (bw) intramuscularly concurrently with 5 mg ketamine/kg bw to cats, the maximum concentration of dexmedetomidine increased twofold but there was no effect on T_{max}. The mean half-life of elimination of dexmedetomidine increased to 1.6 h and the total exposure (AUC) increased by 50 %.

A dose of 10 mg ketamine/kg used concurrently with 40 micrograms dexmedetomidine/kg may cause tachycardia.

Atipamezole does not reverse the effect of ketamine.

Overdose:
Dogs:
In cases of overdose, or if the effects of dexmedetomidine become potentially life-threatening, the appropriate dose of atipamezole is 10 times the initial dose of dexmedetomidine (micrograms/kg bw or micrograms/square meter body surface area). The dose volume of atipamezole at the concentration of 5 mg/ml equals the dose volume of Sedadex 0.5 mg/ml that was given to the dog, regardless of route of administration of the veterinary medicinal product.

Cats:
In cases of overdose, or if the effects of dexmedetomidine become potentially life-threatening, the appropriate antagonist is atipamezole, administered by intramuscular injection, at the following dose: 5 times the initial dose dexmedetomidine in micrograms/kg bw. The dose volume of atipamezole at the concentration of 5 mg/ml is one-half (1/2) the volume of Sedadex 0.5 mg/ml that was given to the cat.

After concurrent exposure to an overdose of dexmedetomidine (3 times the recommended dose) and 15 mg ketamine/kg, atipamezole can be administered at the recommended dose level for reversal of effects induced by dexmedetomidine.

Major incompatibilities:
The veterinary medicinal product is compatible with butorphanol and ketamine in the same syringe at least for two hours.

In the absence of other compatibility studies, this veterinary medicinal product must not be mixed with other veterinary medicinal products.

7. Adverse events

Dogs:

Very common (> 1 animal / 10 animals treated)	Bradycardia Pale mucous membranes [1] Cyanotic mucous membranes [1]
Common	Arrhythmia [2]

(1 to 10 animals / 100 animals treated):	
Rare (1 to 10 animals / 10,000 animals treated):	Pulmonary oedema Supraventricular and nodal arrhythmia [2], Premature ventricular contractions [2], Heart block [2]
Very rare (<1 animal / 10,000 animals treated, including isolated reports):	Excitation [2] High blood pressure [3], Low blood pressure [3], Hypersalivation [2], Vomiting [4] Muscle tremor, Paddling [2], Twitching [2],Sedation prolonged [2] Bradypnoea [2,5], Decreased respiratory rate, Irregular breathing [2], Tachypnoea [2,5] Erythema [2] Decreased body temperature Urination [2]
Undetermined frequency (cannot be estimated from the available data):	Corneal opacity Decreased pulse oxygenation [2]Retching [2]

[1]Due to peripheral vasoconstriction and venous desaturation in the presence of normal arterial oxygenation.
[2]When dexmedetomidine and butorphanol are used concomitantly
[3]Blood pressure will increase initially and then return to normal or below normal
[4]May occur 5–10 minutes after injection. Some dogs may also vomit at the time of recovery.
[5]When dexmedetomidine is used as a premedicant.

When dexmedetomidine and butorphanol are used concomitantly in dogs, brady- and tachyarrhythmias have been reported. These may include profound sinus bradycardia, 1st and 2nd degree AV block, sinus arrest or pause, as well as atrial, supraventricular and ventricular premature complexes.

When dexmedetomidine is used as a premedicant brady- and tachyarrhythmias have been reported and include profound sinus bradycardia, 1st and 2nd degree AV block and sinus arrest. Supraventricular and ventricular premature complexes, sinus pause and 3rd degree AV block may be observed in rare cases.

Cats:

Very common (> 1 animal / 10 animals treated):	Arrhytmia [1] Bradycardia Heart block [2] Vomiting [3] Pale mucous membranes [4] Cyanotic mucous membranes [4]
Common (1 to 10 animals / 100 animals treated):	Supraventricular and nodal arrhythmia [1] Retching [1] Decreased pulse oxygenation [2] Decreased body temperature [2]
Uncommon (1 to 10 animals / 1000 animals treated)	Apnoea [2]

Rare (1 to 10 animals / 10,000 animals treated):	Pulmonary oedema Extrasystole [2]
Very rare (<1 animal / 10,000 animals treated, including isolated reports):	High blood Pressure [5], Low blood pressure [5] Bradypnoea [2], Decreased respiratory rate, Hypoventilation [2], Irregular breathing [2] Muscle tremor Agitation [2]
Undetermined frequency (cannot be estimated from the available data):	Corneal opacity

[1]When dexmedetomidine is used as a premedicant.
[2]When dexmedetomidine and ketamine are used sequentially.
[3]May occur 5–10 minutes after injection. Some cats may also vomit at the time of recovery.
[4]Due to peripheral vasoconstriction and venous desaturation in the presence of normal arterial oxygenation.
[5]Blood pressure will increase initially and then return to normal or below normal.

Intramuscular dosing at 40 micrograms/kg (followed by ketamine or propofol) frequently resulted in sinus bradycardia and sinus arrhythmia, occasionally resulted in 1st degree atrioventricular block, and rarely resulted in supraventricular premature depolarizations, atrial bigeminy, sinus pauses, 2nd degree atrioventricular block, or escape beats/rhythms.

Reporting adverse events is important. It allows continuous safety monitoring of a product. If you notice any side effects, even those not already listed in this package leaflet, or you think that the medicine has not worked, please contact, in the first instance, your veterinarian. You can also report any adverse events to the marketing authorisation holder using the contact details at the end of this leaflet, or via your national reporting system: {national system details}.

8. Dosage for each species, routes and method of administration

The veterinary medicinal product is intended for:

- Dogs: intravenous or intramuscular use;
- Cats: intramuscular use.

The veterinary medicinal product is not intended for repeat injections.

Dexmedetomidine, butorphanol and/or ketamine can be mixed in the same syringe as they have been shown to be pharmaceutically compatible.

The following doses are recommended:

Dogs:
Dexmedetomidine doses are based on body surface area:

For non-invasive, mildly to moderately painful procedures and examinations requiring restraint, sedation and analgesia:
Intravenously: up to 375 micrograms/square metre body surface area.
Intramuscularly: up to 500 micrograms/square metre body surface area

When administering in conjunction with butorphanol (0.1 mg/kg) for deep sedation and analgesia, the intramuscular dose of dexmedetomidine is 300 micrograms/square metre body surface area.

The premedication dose of dexmedetomidine is 125 – 375 micrograms/square metre body surface area, administered 20 minutes prior to induction for procedures requiring anaesthesia. The dose should be adjusted to the type of surgery, length of procedure and patient temperament.

Concomitant use of dexmedetomidine and butorphanol produces sedative and analgesic effects beginning no later than 15 minutes after administration. The peak sedative and analgesic effects are reached within 30 minutes after administration. Sedation lasts for at least 120 minutes post administration and analgesia lasts for at least 90 minutes. Spontaneous recovery occurs within 3 hours.

Premedication with dexmedetomidine will significantly reduce the dosage of the induction agent required and will reduce volatile anaesthetic requirements for maintenance anaesthesia. In a clinical study, the requirement for propofol and thiopental was reduced by 30 % and 60 % respectively. All anaesthetic agents used for induction or maintenance of anaesthesia should be administered to effect. In a clinical study, dexmedetomidine contributed to postoperative analgesia for 0.5 – 4 hours. However, this duration is dependent on a number of variables and further analgesia should be administered in accordance with clinical judgement.

The corresponding doses based on body weight are presented in the following tables. Use of an appropriately graduated syringe is recommended to ensure accurate dosing when administering small volumes.

For non-invasive, mildly to moderately painful procedures and examinations requiring restraint, sedation and analgesia and for premedication						
Dog Weight (kg)	**Dexmedetomidine 125 micrograms/m²**		**Dexmedetomidine 375 micrograms/m²**		**Dexmedetomidine 500 micrograms/m²***	
	(mcg/kg)	**(ml)**	**(mcg/kg)**	**(ml)**	**(mcg/kg)**	**(ml)**
2-3	9.4	0.04	28.1	0.12	40	0.15
3.1-4	8.3	0.05	25	0.17	35	0.2
4.1-5	7.7	0.07	23	0.2	30	0.3
5.1-10	6.5	0.1	19.6	0.29	25	0.4
10.1-13	5.6	0.13	16.8	0.38	23	0.5
13.1-15	5.2	0.15	15.7	0.44	21	0.6
15.1-20	4.9	0.17	14.6	0.51	20	0.7
20.1-25	4.5	0.2	13.4	0.6	18	0.8
25.1-30	4.2	0.23	12.6	0.69	17	0.9
30.1-33	4	0.25	12	0.75	16	1.0
33.1-37	3.9	0.27	11.6	0.81	15	1.1
37.1-45	3.7	0.3	11	0.9	14.5	1.2
45.1-50	3.5	0.33	10.5	0.99	14	1.3
50.1-55	3.4	0.35	10.1	1.06	13.5	1.4
55.1-60	3.3	0.38	9.8	1.13	13	1.5
60.1-65	3.2	0.4	9.5	1.19	12.8	1.6
65.1-70	3.1	0.42	9.3	1.26	12.5	1.7
70.1-80	3	0.45	9	1.35	12.3	1.8
>80	2.9	0.47	8.7	1.42	12	1.9

*only IM

	For deep sedation and analgesia with butorphanol	
Dog Weight (kg)	**Dexmedetomidine 300 micrograms/m^2 intramuscularly**	
	(mcg/kg)	**(ml)**
2-3	24	0.12
3.1-4	23	0.16
4.1-5	22.2	0.2
5.1-10	16.7	0.25
10.1-13	13	0.3
13.1-15	12.5	0.35
15.1-20	11.4	0.4
20.1-25	11.1	0.5
25.1-30	10	0.55
30.1-33	9.5	0.6
33.1-37	9.3	0.65
37.1-45	8.5	0.7
45.1-50	8.4	0.8
50.1-55	8.1	0.85
55.1-60	7.8	0.9
60.1-65	7.6	0.95
65.1-70	7.4	1
70.1-80	7.3	1.1
>80	7	1.2

Cats:
The dose for cats is 40 micrograms dexmedetomidine hydrochloride/kg bw equal to a dose volume of 0.08 ml of veterinary medicinal product/kg bw when used for non-invasive, mildly to moderately painful procedures requiring restraint, sedation and analgesia.
When dexmedetomidine is used for premedication in cats, the same dose is used. Premedication with dexmedetomidine will significantly reduce the dose of the induction agent required and will reduce volatile anaesthetic requirements for maintenance anaesthesia. In a clinical study, the requirement for propofol was reduced by 50 %. All anaesthetic agents used for induction or maintenance of anaesthesia should be administered to effect.
Anaesthesia can be induced 10 minutes after premedication by intramuscular administration of a target dose of 5 mg ketamine/kg bw or by intravenous administration of propofol to effect. Dosing for cats is presented in the following table.

Cat Weight (kg)	**Dexmedetomidine 40 micrograms/kg intramuscularly**	
	(mcg/kg)	**(ml)**
1-2	40	0.1
2.1-3	40	0.2
3.1-4	40	0.3
4.1-6	40	0.4
6.1-7	40	0.5
7.1-8	40	0.6
8.1-10	40	0.7

9. Advice on correct administration

The expected sedative and analgesic effects are reached within 15 minutes after administration and are maintained up to 60 minutes after administration. Sedation may be reversed with atipamezole (see section "*Overdose"*). Atipamezole should not be administered prior to 30 minutes following ketamine administration.

10. Withdrawal periods

Not applicable.

11. Special storage precautions

Keep out of the sight and reach of children.
This veterinary medicinal product does not require any special storage conditions.
Do not use this veterinary medicinal product after the expiry date which is stated on the carton and the vial label after Exp. The expiry date refers to the last day of that month.

Shelf life after first opening the immediate packaging: 56 days.

12. Special precautions for disposal

Medicines should not be disposed of via wastewater or household waste.

Use take-back schemes for the disposal of any unused veterinary medicinal product or waste materials derived thereof in accordance with local requirements and with any applicable national collection systems. These measures should help to protect the environment.

Ask your veterinary surgeon or pharmacist how to dispose of medicines no longer required.

13. Classification of veterinary medicinal products

Veterinary medicinal product subject to prescription.

14. Marketing authorisation numbers and pack sizes

EU/2/16/198/002

Colourless Type I glass vials of 10 ml closed with a coated bromobutyl rubber stopper and aluminium cap in a carton box.

Pack size: carton box with 1 vial of 10 ml.

15. Date on which the package leaflet was last revised

{DD/MM/YYYY}

Detailed information on this veterinary medicinal product is available in the Union Product Database (*https://medicines.health.europa.eu/veterinary*).

16. Contact details

Marketing authorisation holder and contact details to report suspected adverse reactions:
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Wilgenweg 7
3421 TV Oudewater
The Netherlands
Tel: +31 348 563 434

Manufacturer responsible for batch release:
Produlab Pharma B.V.
Forellenweg 16
4941 SJ Raamsdonksveer
The Netherlands