

## SUMMARY OF PRODUCT CHARACTERISTICS

### 1. NAME OF THE MEDICINAL PRODUCT

[Nationally approved name] 10 mg/ml solution for injection in cartridge

### 2. QUALITATIVE AND QUANTITATIVE COMPOSITION

1 ml contains 10 mg apomorphine hydrochloride hemihydrate.

Each 3 ml cartridge contains 30 mg apomorphine hydrochloride hemihydrate.

Excipients with known effect:

Sodium metabisulphite (E223) 1 mg per ml

Sodium less than 2.3 mg per ml

For the full list of excipients, see section 6.1.

### 3. PHARMACEUTICAL FORM

Solution for injection in cartridge

The solution is clear, colourless to slightly yellow and free of particles.

pH of 3.0 – 4.0.

Osmolality: 62,5 mOsm/kg

### 4. CLINICAL PARTICULARS

#### 4.1 Therapeutic indications

Treatment of motor fluctuations (“on-off” phenomena) in patients with Parkinson's disease which are not sufficiently controlled by oral anti-Parkinson medication.

#### 4.2 Posology and method of administration

##### ***Selection of patients suitable for [Nationally approved name] 10 mg/ml solution for injection in cartridge:***

Patients selected for treatment with [Nationally approved name] should be able to recognise the onset of their “off” symptoms and be capable of injecting themselves or else have a responsible carer able to inject for them when required.

Patients treated with apomorphine will usually need to start domperidone at least two days prior to initiation of therapy. The domperidone dose should be titrated to the lowest effective dose and discontinued as soon as possible. Before the decision to initiate domperidone and apomorphine treatment, risk factors for QT interval prolongation in the individual patient should be carefully assessed to ensure that the benefit outweighs the risk (see section 4.4).

Apomorphine should be initiated in the controlled environment of a specialist clinic. The patient should be supervised by a physician experienced in the treatment of Parkinson's disease (e.g. neurologist). The patient's treatment with levodopa, with or without dopamine agonists, should be optimised before starting treatment with [Nationally approved name].

## *Adults*

### Method of administration

[Nationally approved name] solution for injection in cartridge is intended for multidose use by subcutaneous intermittent bolus injection using only the dedicated D-mine-Pen.

Patients and caregivers must receive detailed instructions in the preparation and injection of doses, with particular attention paid to the correct use of the required dosing pen (see instructions for use included with the dosing pen). There are differences in the dosing pen of this product and other apomorphine products on the market. Therefore when a patient has received a particular pen and is trained on it, a switch to a different product should be accompanied by re-training under the supervision of a health care professional.

Any remaining air in the cartridge should be removed before use (see Instructions for Use of the dosing pen).

### **Apomorphine must not be used via the intravenous route.**

Do not use if the solution has turned green. The solution should be inspected visually prior to use. Only clear, colourless to slightly yellow and free of particles solution should be used.

### ***Determination of the threshold dose***

The appropriate dose for each patient is established by incremental dosing schedules. The following schedule is suggested:

1 mg of apomorphine hydrochloride hemihydrate (0.1 ml), that is approximately 15-20 micrograms/kg, may be injected subcutaneously during a hypokinetic, or "off" period and the patient is observed over 30 minutes for a motor response.

If no response, or an inadequate response, is obtained a second dose of 2 mg of apomorphine hydrochloride hemihydrate (0.2 ml) is injected subcutaneously and the patient observed for an adequate response for a further 30 minutes.

The dosage may be increased by incremental injections with at least a forty minute interval between succeeding injections until a satisfactory motor response is obtained.

### ***Establishment of treatment***

Once the appropriate dose is determined a single subcutaneous injection may be given into the lower abdomen or outer thigh at the first signs of an 'off' episode. It cannot be excluded that absorption may differ with different injection sites within a single individual. Accordingly, the patient should then be observed for the next hour to assess the quality of their response to treatment. Alterations in dosage may be made according to the patient's response.

The optimal dosage of apomorphine hydrochloride hemihydrate varies between individuals but, once established, remains relatively constant for each patient.

### ***Precautions on continuing treatment***

The daily dose of [Nationally approved name] varies widely between patients, typically within the range of 3-30 mg, given as 1-10 injections and sometimes as many as 12 separate injections per day.

It is recommended that the total daily dose of apomorphine hydrochloride hemihydrate should not exceed 100 mg and that individual bolus injections should not exceed 10 mg.

The D-*mine* Pen that is required for the application of [Nationally approved name] solution for injection in cartridge is not suitable for patients needing doses above 6 mg/bolus. For these patients, other products have to be used.

In clinical studies it has usually been possible to make some reduction in the dose of levodopa; this effect varies considerably between patients and needs to be carefully managed by an experienced physician.

Once treatment has been established, domperidone therapy may be gradually reduced in some patients but successfully eliminated only in a few, without any vomiting or hypotension.

#### *Paediatric population*

[Nationally approved name] 10 mg/ml solution for injection in cartridge is contraindicated for children and adolescents under 18 years of age (see section 4.3).

#### *Elderly*

The elderly are well represented in the population of patients with Parkinson's disease and constitute a high proportion of those studied in clinical trials of apomorphine. The management of elderly patients treated with apomorphine has not differed from that of younger patients. However, extra caution is recommended during initiation of therapy in elderly patients because of the risk of postural hypotension.

#### *Renal impairment*

A dose schedule similar to that recommended for adults, and the elderly, can be followed for patients with renal impairment (see section 4.4).

### **4.3 Contraindications**

Hypersensitivity to the active substance or to any of the excipients listed in section 6.1.

In patients with respiratory depression, dementia, psychotic diseases or hepatic insufficiency.

Apomorphine hydrochloride hemihydrate must not be administered to patients who have an “on” response to levodopa which is marred by severe dyskinesia or dystonia.

Concomitant use with ondansetron (see section 4.5)

[Nationally approved name] 10 mg/ml solution for injection is contraindicated for children and adolescents under 18 years of age.

### **4.4 Special warnings and precautions for use**

Apomorphine hydrochloride hemihydrate should be given with caution to patients with renal, pulmonary or cardiovascular disease and persons prone to nausea and vomiting.

Extra caution is recommended during initiation of therapy in elderly and/or debilitated patients.

Since apomorphine may produce hypotension, even when given with domperidone pre-treatment, care should be exercised in patients with pre-existing cardiac disease or in patients taking vasoactive medicinal products such as antihypertensives, and especially in patients with pre-existing postural hypotension.

Since apomorphine, especially at high dose, may have the potential for QT prolongation, caution should be exercised when treating patients at risk for torsades de pointes arrhythmia.

When used in combination with domperidone, risk factors in the individual patient should be carefully assessed. This should be done before treatment initiation, and during treatment. Important risk factors include serious underlying heart conditions such as congestive cardiac failure, severe hepatic impairment or significant electrolyte disturbance. Also medication possibly affecting electrolyte balance, CYP3A4 metabolism or QT interval should be assessed. Monitoring for an effect on the QTc interval is advisable. An ECG should be performed:

- prior to treatment with domperidone
- during the treatment initiation phase
- as clinically indicated thereafter

The patient should be instructed to report possible cardiac symptoms including palpitations, syncope, or near-syncope. They should also report clinical changes that could lead to hypokalaemia, such as gastroenteritis or the initiation of diuretic therapy.

At each medical visit, risk factors should be revisited.

Apomorphine is associated with local subcutaneous effects. These can sometimes be reduced by the rotation of injection sites or possibly by the use of ultrasound (if available) in order to avoid areas of nodularity and induration.

Haemolytic anaemia and thrombocytopenia have been reported in patients treated with apomorphine. Haematology tests should be undertaken at regular intervals as with levodopa, when given concomitantly with apomorphine.

Caution is advised when combining apomorphine with other medicinal products, especially those with a narrow therapeutic range (see section 4.5).

Neuropsychiatric problems co-exist in many patients with advanced Parkinson's disease. There is evidence that for some patients neuropsychiatric disturbances may be exacerbated by apomorphine. Special care should be exercised when apomorphine is used in these patients.

Apomorphine has been associated with somnolence, and episodes of sudden sleep onset, particularly in patients with Parkinson's disease. Patients must be informed of this and advised to exercise caution while driving or operating machines during treatment with apomorphine. Patients who have experienced somnolence and/or an episode of sudden sleep onset must refrain from driving or operating machines. Furthermore, a reduction of dosage or termination of therapy may be considered.

#### *Impulse control disorders*

Patients should be regularly monitored for the development of impulse control disorders. Patients and carers should be made aware that behavioural symptoms of impulse control disorders including pathological gambling, increased libido, hypersexuality, compulsive spending or buying, binge eating and compulsive eating can occur in patients treated with dopamine agonists including apomorphine. Dose reduction/tapered discontinuation should be considered if such symptoms develop.

Dopamine dysregulation Syndrome (DDS) is an addictive disorder resulting in excessive use of the product seen in some patients treated with apomorphine. Before initiation of treatment, patients and caregivers should be warned of the potential risk of developing DDS.

[Nationally approved name] 10 mg/ml solution for injection in cartridge contains sodium metabisulphite which may rarely cause severe hypersensitivity reactions and bronchospasm.

This medicinal product contains less than 1 mmol sodium (23 mg) per 10 ml, i.e. essentially "sodium-free".

#### **4.5 Interaction with other medicinal products and other forms of interaction**

Patients selected for treatment with apomorphine hydrochloride hemihydrate are almost certain to be taking concomitant medications for their Parkinson's disease. In the initial stages of apomorphine hydrochloride hemihydrate therapy, the patient should be monitored for unusual side-effects or signs of potentiation of effect.

Neuroleptic medicinal products may have an antagonistic effect if used with apomorphine. There is a potential interaction between clozapine and apomorphine, however clozapine may also be used to reduce the symptoms of neuropsychiatric complications.

The possible effects of apomorphine on the plasma concentrations of other medicinal products have not been studied. Therefore caution is advised when combining apomorphine with other medicinal products, especially those with a narrow therapeutic range.

##### Antihypertensive and Cardiac Active Medicinal Products

Even when co-administered with domperidone, apomorphine may potentiate the antihypertensive effects of these medicinal products (see section 4.4)

It is recommended to avoid the administration of apomorphine with other drugs known to prolong the QT interval.

Based on reports of profound hypotension and loss of consciousness when apomorphine was administered with ondansetron, the concomitant use of apomorphine with ondansetron is contraindicated.

#### **4.6 Fertility, pregnancy and lactation**

##### Pregnancy

There is no experience of apomorphine usage in pregnant women.

Animal reproduction studies do not indicate any teratogenic effects, but doses given to rats which are toxic to the mother can lead to failure to breathe in the newborn. The potential risk for humans is unknown. See section 5.3.

[Nationally approved name] should not be used during pregnancy unless clearly necessary.

##### Breast-feeding

It is not known whether apomorphine is excreted in breast milk. A decision on whether to continue/discontinue breast-feeding or to continue/discontinue therapy with [Nationally approved name] should be made taking into account the benefit of breast-feeding to the child and the benefit of [Nationally approved name] to the woman.

#### **4.7 Effects on ability to drive and use machines**

Apomorphine hydrochloride hemihydrate has minor or moderate influence on the ability to drive and use machines.

Patients being treated with apomorphine and presenting with somnolence and/or sudden sleep episodes must be informed to refrain from driving or engaging in activities (e.g. operating machines) where impaired alertness may put themselves or others at risk of serious injury or death until such recurrent episodes and somnolence have resolved (see also section 4.4).

## 4.8 Undesirable effects

Very common	( $\geq 1/10$ )
Common	( $\geq 1/100$ to $< 1/10$ )
Uncommon	( $\geq 1/1,000$ to $< 1/100$ )
Rare	( $\geq 1/10,000$ to $< 1/1,000$ )
Very rare	( $< 1/10,000$ )
Not known	(cannot be estimated from the available data)

<b>Blood and lymphatic system disorders</b>	<p><b>Uncommon:</b> Haemolytic anaemia and thrombocytopenia have been reported in patients treated with apomorphine.</p> <p><b>Rare:</b> Eosinophilia has rarely occurred during treatment with apomorphine hydrochloride hemihydrate.</p>
<b>Immune system disorders</b>	<p><b>Rare:</b> Due to the presence of sodium metabisulphite, allergic reactions (including anaphylaxis and bronchospasm) may occur.</p>
<b>Psychiatric disorders</b>	<p><b>Very common:</b> Hallucinations</p> <p><b>Common:</b> Neuropsychiatric disturbances (including transient mild confusion and visual hallucinations) have occurred during apomorphine hydrochloride hemihydrate therapy.</p> <p><b>Not known:</b> Impulse control disorders: Pathological gambling, increased libido, hypersexuality, compulsive spending or buying, binge eating and compulsive eating can occur in patients treated with dopamine agonists including apomorphine (see section 4.4). Aggression, agitation.</p>
<b>Nervous system disorders</b>	<p><b>Common:</b> Transient sedation with each dose of apomorphine hydrochloride hemihydrate at the start of therapy may occur; this usually resolves over the first few weeks. Apomorphine is associated with somnolence. Dizziness/light-headedness have also been reported.</p> <p><b>Uncommon:</b> Apomorphine may induce dyskinesias during “on” periods which can be severe in some cases, and in a few patients may result in cessation of therapy. Apomorphine has been associated with sudden sleep onset episodes (see section 4.4)</p> <p><b>Unknown:</b> Syncope <u>Headache</u></p>
<b>Vascular disorders</b>	<p><b>Uncommon:</b> Postural hypotension is seen infrequently and is usually transient (see section 4.4)</p>
<b>Respiratory, thoracic and mediastinal disorders</b>	<p><b>Common:</b> Yawning has been reported during apomorphine therapy</p> <p><b>Uncommon:</b> Breathing difficulties have been reported.</p>
<b>Gastrointestinal disorders</b>	<p><b>Common:</b></p>

	Nausea and vomiting, particularly when apomorphine treatment is first initiated, usually as a result of the omission of domperidone (see section 4.2).
<b>Skin and subcutaneous tissue disorders</b>	<b>Uncommon:</b> Local and generalised rashes have been reported.
<b>General disorders and administration site conditions</b>	<b>Very common:</b> Most patients experience injection site reactions, particularly with continuous use. These may include subcutaneous nodules, induration, erythema, tenderness and panniculitis. Various other local reactions (such as irritation, itching, bruising and pain) may also occur. <b>Uncommon:</b> Injection site necrosis and ulceration have been reported. <b>Not Known:</b> Peripheral oedema has been reported.
<b>Investigations</b>	<b>Uncommon:</b> Positive Coombs' tests have been reported for patients receiving apomorphine.

#### Reporting of suspected adverse reactions

Reporting suspected adverse reactions after authorisation of the medicinal product is important. It allows continued monitoring of the benefit/risk balance of the medicinal product. Healthcare professionals are asked to report any suspected adverse reactions via the national reporting system listed in Appendix V.

### 4.9 Overdose

There is little clinical experience of overdose with apomorphine by this route of administration. Symptoms of overdose may be treated empirically as suggested below:

Excessive emesis may be treated with domperidone.

Respiratory depression may be treated with naloxone.

Hypotension: appropriate measures should be taken, e.g. raising the foot of the bed.

Bradycardia may be treated with atropine.

## 5. PHARMACOLOGICAL PROPERTIES

### 5.1 Pharmacodynamic properties

Pharmacotherapeutic group: Anti-Parkinson drugs, dopaminergic agents, dopamine agonists

ATC code: N04B C07

#### Mechanism of action

Apomorphine is a direct stimulant of dopamine receptors and while possessing both D1 and D2 receptor agonist properties does not share transport or metabolic pathways with levodopa.

Although in intact experimental animals, administration of apomorphine suppresses the rate of firing of nigro-striatal cells and in low dose has been found to produce a reduction in locomotor activity (thought to represent pre-synaptic inhibition of endogenous dopamine release) its actions on parkinsonian motor disability are likely to be mediated at post-synaptic receptor sites. This biphasic effect is also seen in humans.

## 5.2 Pharmacokinetic properties

### Distribution and Elimination

After subcutaneous injection of apomorphine its fate can be described by a two-compartment model, with a distribution half-life of 5 ( $\pm 1.1$ ) minutes and an elimination half-life of 33 ( $\pm 3.9$ ) minutes. Clinical response correlates well with levels of apomorphine in the cerebrospinal fluid; the active substance distribution being best described by a two-compartment model.

### Absorption and Metabolism

Apomorphine is rapidly and completely absorbed from subcutaneous tissue, correlating with the rapid onset of clinical effects (4-12 minutes), and that the brief duration of clinical action of the active substance (about 1 hour) is explained by its rapid clearance. The metabolism of apomorphine is by glucuronidation and sulphonation to at least ten per cent of the total; other pathways have not been described.

## 5.3 Preclinical safety data

Repeat dose subcutaneous toxicity studies reveal no special hazard for humans, beyond the information included in other sections of the SmPC.

In vitro genotoxicity studies demonstrated mutagenic and clastogenic effects, most likely due to products formed by oxidation of apomorphine. However, apomorphine was not genotoxic in the in vivo studies performed.

The effect of apomorphine on reproduction has been investigated in rats. Apomorphine was not teratogenic in this species, but it was noted that doses which are toxic to the mother can cause loss of maternal care and failure to breathe in the newborn.

No carcinogenicity studies have been performed.

## 6. PHARMACEUTICAL PARTICULARS

### 6.1 List of excipients

Sodium metabisulphite (E223)  
Hydrochloric acid (for pH-adjustment)  
Sodium hydroxide (for pH-adjustment)  
Water for injections

### 6.2 Incompatibilities

This medicinal product must not be mixed with other medicinal products.

### 6.3 Shelf life

Unopened: 18 months

After first opening: Chemical and physical in-use stability has been demonstrated for 15 days at 25°C.

From a microbiological point of view, unless the method of opening and further handling precludes the risk of microbial contamination, the product should be used immediately. If not used immediately, in-use storage times and conditions are the responsibility of the user.



#### **6.4 Special precautions for storage**

Do not store above 25°C.

Do not refrigerate or freeze.

Keep the container in the outer carton in order to protect from light.

The product should be stored at the same conditions after opening and between withdrawals.

For storage conditions after first opening of the medicinal product, see section 6.3.

#### **6.5 Nature and contents of container**

Clear glass cartridges, type I with bromobutyl rubber stopper and an aluminium cap with bromobutyl/synthetic polyisoprene rubber seal, containing a clear solution for injection.

Each cartridge contains 3 ml of solution for injection.

Packs containing: 5, 10, 30, 2 x 5 (bundle pack), 6 x 5 (bundle pack) and 3 x 10 (bundle pack) of 3 ml cartridges in a moulded plastic tray in an outer cardboard carton.

Not all pack sizes may be marketed.

#### **6.6 Special precautions for disposal and other handling**

Do not use if the solution has turned green.

The solution should be inspected visually prior to use. Only clear, colourless to slightly yellow solutions free of particles in undamaged containers should be used.

Any unused medicinal product or waste material should be disposed of in accordance with local requirements.

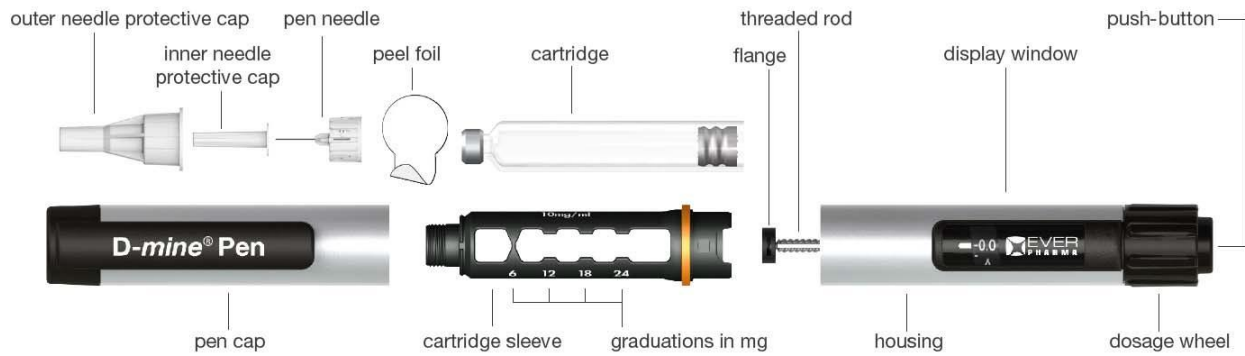
Discard each cartridge with any unused content not later than 15 days after first opening.

The patient should be advised how to safely discard the needle after each injection.

Note: This pack does NOT include the pen or pen needles.

[Nationally approved name] cartridges are designed to be used only with the dedicated D-*mine* Pen and disposable pen-needles as specified in the Instructions for Use of the pen.

#### **Description of the pen**



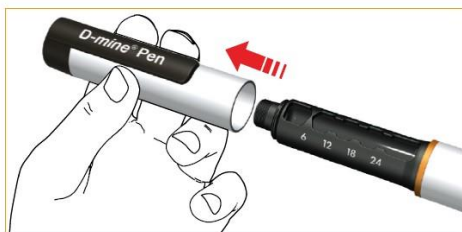
- A new needle for each injection has to be used to prevent contamination.
- Needles and pen must not be shared.
- Before using [Nationally approved name], the pen and the pen manual has to be studied to familiarise with the correct handling.
- If the pen is damaged or not working properly (due to mechanical defects), please refer to the Instructions for Use of the pen.

Where and how to inject [Nationally approved name]

- First hands need to be washed.
- Before using the pen some surgical wipes and one needle in its protective cone will be needed.
- The instructions in the pen manual have to be followed.

### Pen preparation / changing cartridge

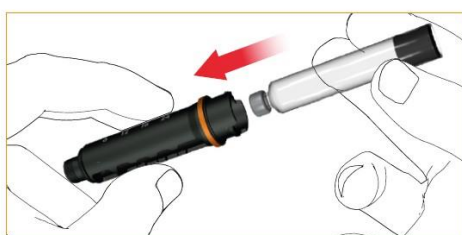
Take the Pen out of its case and remove the pen cap.



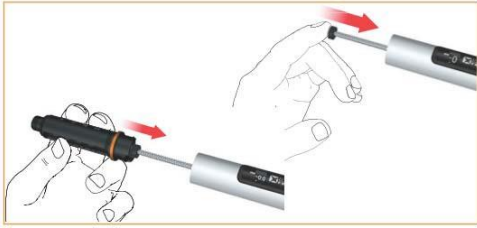
Remove the cartridge sleeve by twisting it clockwise.



Insert the new cartridge into the cartridge sleeve.



Push the threaded rod back completely. This is best performed using your finger tip.

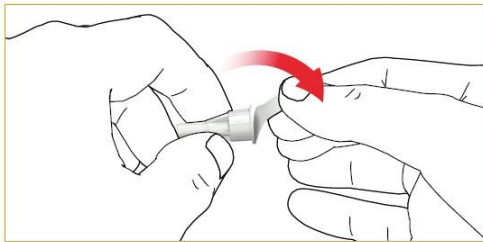


Push the cartridge sleeve into the housing and turn anti-clockwise to lock.



### Attachment of pen needle

Follow the instructions for use of your pen needle. Pull off the peel foil.



Click on / twist on the pen needle to the cartridge sleeve.



Remove the outer needle protective cap. Keep the outer needle protective cap to safely remove and dispose of the pen needle after use.



Remove and dispose the inner needle protective cap.



### Priming / function check

Any remaining air in the cartridge should be removed before use. Dial the test dose forward by turning the dosage wheel. Check the dialed dose by looking vertically from above and not at an angle onto the display, so that the symbol “◆” is clearly displayed. This is called “priming” and is important because it ensures you get a full dose when you use the pen.



For the function check, hold the pen pointing upwards and gently tap the cartridge sleeve, so that the air can rise to the top.



Press the push-button.



A few drops of medicine will emerge from the pen needle tip. If no drops emerge, repeat the step.



### Setting the dose

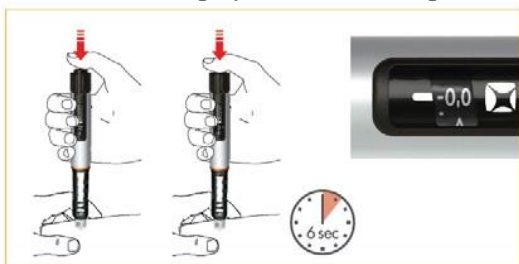
Dial the required dose by turning the dosage wheel clockwise. Correct the dose by turning in anti-clockwise direction.



### Injection

- Using a surgical wipe, the area of skin has to be cleaned where it is planned to inject the medicine and around it.
- The [Nationally approved name] has to be injected into an injection site on the front of the waist (abdomen) or the outer thighs under the skin (subcutaneously).
- Use the injection technique as recommended by your physician and/or health care Professional.

Press the push-button in fully for injection. Hold the push-button fully down during medication discharge. After the medication has been completely discharged, wait for 6 seconds and then pull out the pen needle slowly. You may either keep the push-button pressed or release it during the 6 seconds. Check that the display is at the “0,0” position to confirm full dose delivery.

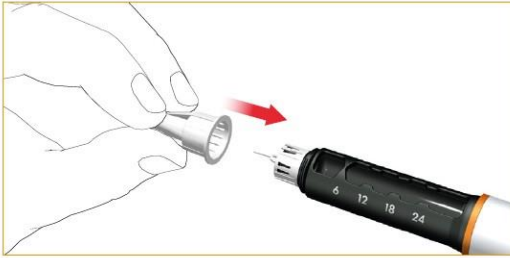


- The injection site has to be changed each time the [Nationally approved name] is used. This will lower the chances of having a skin reaction at the site where injected the [Nationally approved name]. The [Nationally approved name] must not be injected into an area of skin that is sore, red, infected or damaged.
- The pen must never be injected directly into a vein (intravenously) or muscle (intramuscularly).

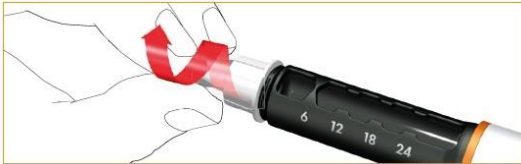
### Removal of pen needle after each injection

The needle has to be removed and discarded after each injection.

Carefully attach the outer needle protective cap on the pen needle.



Twist off the pen needle by turning the outer shield clockwise and dispose it correctly.

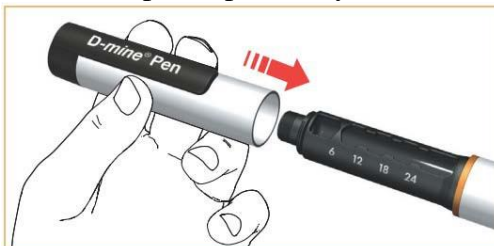


Optional:

Place the outer pen needle shield in the appropriate left notch of your carrying case. The opening of the needle shield should be pointing up. Carefully insert the needle (attached to the pen) into the opening of the shield. Without holding onto the shield, push down firmly and turn counter-clockwise to twist off the pen needle.



Attach the pen cap securely after each use.



- The cartridge remains in the pen.

- A new cartridge can be used for up to 15 days (for more information please refer to 6.3. “Shelf Life”)
- If there is not enough solution left for the next dose, the cartridge has to be removed and discarded.
- Dispose of the needle safely, as described in the Instructions for Use of the pen.

**7.       MARKETING AUTHORISATION HOLDER**

[to be completed nationally]

**8.       MARKETING AUTHORISATION NUMBER(S)**

[To be completed nationally]

**9.       DATE OF FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION**

{DD month YYYY}

[To be completed nationally]

**10.     DATE OF REVISION OF THE TEXT**

MM/YYYY