



# **Public Assessment Report**

**UKPAR**

**Loperamide 2 mg Capsules**

**(Loperamide hydrochloride)**

**UK Licence Number: PL 30684/0253**

**DAWA Limited.**

## LAY SUMMARY

### Loperamide 2 mg Capsules (loperamide hydrochloride, capsule, hard, 2 mg)

This is a summary of the Public Assessment Report (PAR) for Loperamide 2 mg Capsules (PL 30684/0253). It explains how Loperamide 2 mg Capsules were assessed and their authorisation recommended, as well as their conditions of use. It is not intended to provide practical advice on how to use Loperamide 2 mg Capsules.

This product will be referred to as Loperamide Capsules throughout the remainder of this public assessment report (PAR).

For practical information about using Loperamide Capsules, patients should read the package leaflet or contact their doctor or pharmacist.

#### **What are Loperamide Capsules and what are they used for?**

Loperamide Capsules are a 'generic medicine'. This means that Loperamide Capsules are similar to a 'reference medicine' already authorised in the European Union (EU) called Imodium Classic 2mg Capsules (McNeil Products Limited, UK).

Loperamide Capsules are used to treat two types of diarrhoea. The two types have different age limits:

##### 1) Short-term diarrhoea

- For adults and children aged **12 and over**.
- To treat attacks that last up to **48 hours**.

If the patient's attack lasts longer than 48 hours, they should talk to their doctor.

##### 2) Irritable Bowel Syndrome (IBS) diarrhoea

- For adults and young people aged **18 and over** who have been diagnosed with IBS.
- To treat attacks that last up to **48 hours**.

The patient can use this medicine **for up to 2 weeks** for repeated attacks, but if any one attack lasts continuously for **longer than 48 hours**, the patient should **talk to their doctor**.

#### **How do Loperamide Capsules work?**

This medicine contains the active ingredient loperamide hydrochloride, a substance that helps reduce diarrhoea by slowing down an overactive bowel. This allows water and salts that are usually lost in diarrhoea to be absorbed by the body.

#### **How are Loperamide Capsules used?**

The pharmaceutical form of this medicine is a capsule (hard) and the route of administration is oral (by mouth).

Check the information below to see how much medicine to take.

- Swallow the correct number of capsules whole with a drink of water. For oral use only.
- Do not use more than the dose shown below.
- The capsules are not for **long-term treatment**.

#### **Short-term diarrhoea**

##### **Adults and children aged 12 and over:**

- Take two capsules to start treatment.

- Take one capsule after each loose bowel movement.
- Do not take for attacks lasting longer than 48 hours.
- Do not take more than six capsules in a 24-hour period.
- Replace lost fluid by drinking more liquid than usual.
- Not for children aged under 12.

### **How to take Loperamide Capsules for short-term diarrhoea:**

#### **This medicine can be used for up to 48 hours**

If the attack last longer than 48 hours, the patient should stop taking Loperamide Capsules and **talk to their doctor**.

### **IBS diarrhoea**

#### **Adults and children aged 18 and over:**

- Take two capsules to start treatment.
- Take one capsule after each loose bowel movement (or as advised by a doctor).
- The patient can use this medicine for up to 2 weeks for repeated attacks, but they should not continue to take this medicine for any single attack lasting longer than 48 hours.
- Do not take more than six capsules in a 24-hour period.
- Replace lost fluid by drinking more liquid than usual.
- Not for children and young people aged under 18.

#### **The patient should stop taking this medicine and talk to their doctor:**

- If they have been using this medicine **continuously for 48 hours**.
- If they develop new IBS symptoms.
- If their IBS symptoms get worse.
- If their IBS symptoms have not improved **after 2 weeks**.

### **How long should Loperamide Capsules be taken for treatment of IBS diarrhoea?**

**The patient can use this medicine for up to 2 weeks** for repeated attacks of IBS diarrhoea. If a single attack lasts for **longer than 48 hours**, the patient should stop taking Loperamide Capsules and **talk to their doctor**.

Please read section 3 of the package leaflet for detailed dosing recommendations, the route of administration, and the duration of treatment.

For further information on how Loperamide Capsules are used, refer to the package leaflet and Summary of Product Characteristics (SmPC) available on the Medicines and Healthcare products Regulatory Agency (MHRA) website.

This medicine can be obtained without a prescription.

### **What benefits of Loperamide Capsules have been shown in studies?**

Because Loperamide Capsules are a generic medicine, studies have been limited to tests to determine that they are bioequivalent to the reference medicine Imodium Classic 2mg Capsules (McNeil Products Limited, UK). Two medicines are bioequivalent when they produce the same levels of the active substance in the body.

### **What are the possible side effects of Loperamide Capsules?**

Because Loperamide Capsules are a generic medicine and are bioequivalent to the reference medicine Imodium Classic 2mg Capsules (McNeil Products Limited, UK), their benefits and possible side effects are taken as being the same as the reference medicine.

For the full list of restrictions, see the package leaflet.

For the full list of all side effects reported with Loperamide Capsules, see section 4 of the package leaflet available on the MHRA website.

**Why were Loperamide Capsules approved?**

It was concluded that, in accordance with EU requirements, Loperamide Capsules have been shown to have comparable quality and to be bioequivalent to Imodium Classic 2mg Capsules (McNeil Products Limited, UK). Therefore, the MHRA decided that, as for Imodium Classic 2mg Capsules (McNeil Products Limited, UK), the benefits are greater than the risks and recommended that they can be approved for use.

**What measures are being taken to ensure the safe and effective use of Loperamide Capsules?**

A risk management plan (RMP) has been developed to ensure that Loperamide Capsules are used as safely as possible. Based on this plan, safety information has been included in the SmPC and the package leaflet for Loperamide Capsules including the appropriate precautions to be followed by healthcare professionals and patients.

Known side effects are continuously monitored. Furthermore, new safety signals reported by patients/healthcare professionals will be monitored/reviewed continuously.

**Other information about Loperamide Capsules**

A Marketing Authorisation was granted in the UK on 14 May 2018.

The full PAR for Loperamide Capsules follows this summary.

For more information about treatment with Loperamide Capsules, read the package leaflet, or contact your doctor or pharmacist.

This summary was last updated in June 2018.

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## I INTRODUCTION

Based on the review of the data on quality, safety and efficacy, the Medicines and Healthcare products Regulatory Agency (MHRA) granted DAWA Limited, a marketing authorisation for the medicinal product Loperamide Capsules (PL 30684/0253) on 14 May 2018. The product is a pharmacy (P) medicine and is indicated:

- For the symptomatic treatment of acute diarrhoea in adults and children aged 12 years and over.
- For the symptomatic treatment of acute episodes of diarrhoea associated with Irritable Bowel Syndrome in adults aged 18 years and over following initial diagnosis by a doctor.

The application was submitted under Article 10(1) of Directive 2001/83/EC, as amended, as a generic application. The reference medicinal product for this application is Imodium Classic 2mg Capsules (PL 15513/0309) which was first authorised to McNeil Products Limited on 15 December 2009 as an informed consent application under Article 10c of Directive 2001/83/EC, as amended, with its reference product being Imodium Capsules 2mg (PL 00242/0028). The latter Marketing Authorisation was submitted with a full dossier and was granted to Janssen-Cilag Limited on the 17 March 1975.

Loperamide binds to the opiate receptor in the gut wall, reducing propulsive peristalsis, increasing intestinal transit time and enhancing resorption of water and electrolytes. Loperamide increases the tone of the anal sphincter, which helps reduce faecal incontinence and urgency.

One bioequivalence study (conducted under fasting conditions) was submitted to support this application. The applicant has stated that the bioequivalence study was conducted in accordance with good clinical practice (GCP).

With the exception of the bioequivalence study, no new non-clinical or clinical data were submitted, which is acceptable given that this application was based on being a generic medicinal product of an originator product that has been in clinical use for over 10 years.

The MHRA has been assured that acceptable standards of Good Manufacturing Practice (GMP) are in place for this product type at all sites responsible for the manufacture and assembly of this product.

No new or unexpected safety concerns arose during the review of information provided by the Marketing Authorisation Holder and it was, therefore, judged that the benefits of taking Loperamide Capsules outweigh the risks and a Marketing Authorisation was granted.

## II QUALITY ASPECTS

### II.1 Introduction

Each capsule contains 2 mg loperamide hydrochloride, as the active ingredient. Other ingredients consist of the pharmaceutical excipients lactose monohydrate, maize starch, talc and magnesium stearate.

The empty capsule cap is comprised of:

Patent blue (E131), iron oxide yellow (E172), erythrosine (E127), titanium dioxide (E171), gelatin, sodium lauryl sulphate and purified water.

The empty capsule body is comprised of:

Patent blue (E131), iron oxide yellow (E172), erythrosine (E127), titanium dioxide (E171), gelatin, sodium lauryl sulphate and purified water.

The finished product is packaged in blisters consisting of plain aluminium foil and polyvinyl chloride (PVC)/ polyvinylidene chloride (PVdC) film in pack sizes of 2, 4, 6, 8, 10, 12, 18 and 30 capsules. Not all pack sizes may be marketed.

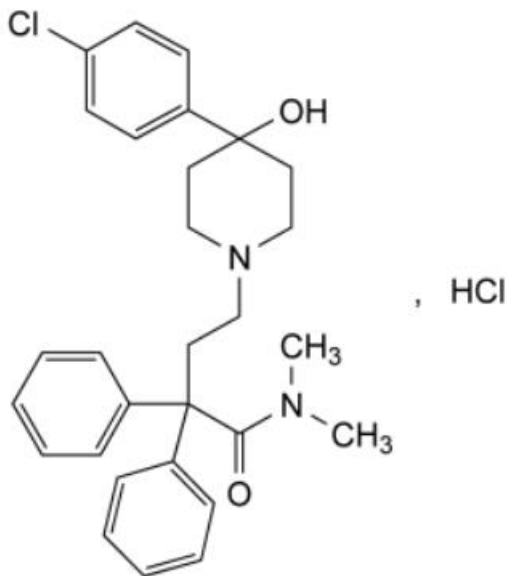
Satisfactory specifications and Certificates of Analysis have been provided for all packaging components.

### II.2 Drug Substance

INN: Loperamide hydrochloride

Definition: 4-[4-(4-Chlorophenyl)-4-hydroxypiperidin-1-yl]-*N,N*-dimethyl-2,2-diphenylbutanamide hydrochloride.

Structure:



Molecular formula:  $C_{29}H_{34}Cl_2N_2O_2$ ,

Molecular weight: 513.5 g/mol

Description: White or almost white powder.

Solubility: Slightly soluble in water, freely soluble in ethanol (96 per cent) and in methanol.

Loperamide hydrochloride is the subject of a European Pharmacopoeia monograph.

All aspects of the manufacture and control of the active substance, loperamide hydrochloride, are covered by a European Directorate for the Quality of Medicines and Healthcare (EDQM) Certificate of Suitability.

Appropriate stability data have been generated supporting a suitable retest period when stored in the proposed packaging.

### **II.3. Medicinal Product**

#### **Pharmaceutical Development**

The objective of the development programme was to formulate safe, efficacious capsules containing 2 mg loperamide hydrochloride per capsule, that are generic versions of the reference product Imodium Classic 2mg Capsules (McNeil Products Limited, UK). A satisfactory account of the pharmaceutical development has been provided.

Comparative *in vitro* dissolution profiles have been provided for the proposed and originator products.

All excipients comply with their respective European Pharmacopoeia monographs with the exception of the empty capsule caps and body which are controlled to suitable in-house specifications. Satisfactory Certificates of Analysis have been provided for all excipients. Suitable batch analysis data have been provided for each excipient.

With the exception of lactose monohydrate and gelatin, none of the excipients used contain material of animal or human origin. The supplier of lactose monohydrate has confirmed that it is sourced from healthy animals under the same conditions as milk for human consumption. The suppliers of gelatin have provided Certificates of Suitability from the EDQM to show that they are manufactured in line with the current European guideline concerning the minimising of risk of transmission of Bovine Spongiform Encephalopathy/Transmissible Spongiform Encephalopathies (BSE/TSE).

This product does not contain or consist of genetically modified organisms (GMO).

#### **Manufacture of the product**

As satisfactory batch formula has been provided for the manufacture of the product, along with an appropriate account of the manufacturing process. The manufacturing process has been validated at commercial scale batch size and has shown satisfactory results.

#### **Finished Product Specification**

The finished product specification proposed is acceptable. Test methods have been described that have been adequately validated. Batch data have been provided which comply with the release specification. Certificates of Analysis have been provided for all working standards used.

#### **Stability of the Product**

Finished product stability studies were performed in accordance with current guidelines on batches of the finished product in the packaging proposed for marketing. The data from these studies support a shelf life of 36 months with the storage conditions 'Store in the original package.'

Suitable post approval stability commitments have been provided to continue stability testing on batches of finished product.

### **II.4 Discussion on chemical, pharmaceutical and biological aspects**

There are no objections to the approval of this application from a pharmaceutical viewpoint.



### **III NON-CLINICAL ASPECTS**

#### **III.1 Introduction**

As the pharmacodynamic, pharmacokinetic and toxicological properties of loperamide hydrochloride are well-known, no new non-clinical studies are required and none have been provided. An overview based on the literature review is, thus, appropriate.

The applicant's non-clinical expert report has been written by an appropriately qualified person and is satisfactory, providing an appropriate review of the relevant non-clinical pharmacology, pharmacokinetics and toxicology.

#### **III.2 Pharmacology**

Not applicable for this product type. Refer to section 'III.1; Introduction' detailed above.

#### **III.3 Pharmacokinetics**

Not applicable for this product type. Refer to section 'III.1; Introduction' detailed above.

#### **III.4 Toxicology**

Not applicable for this product type. Refer to section 'III.1; Introduction' detailed above.

#### **III.5 Ecotoxicity/environmental risk assessment (ERA)**

Since Loperamide Capsules are intended for generic substitution, this will not lead to an increased exposure to the environment. An environmental risk assessment is therefore not deemed necessary.

#### **III.6 Discussion on the non-clinical aspects**

There are no objections to the approval of this application from a non-clinical viewpoint.

### **IV CLINICAL ASPECTS**

#### **IV.1 Introduction**

The clinical pharmacology of loperamide hydrochloride is well-known. With the exception of data from the bioequivalence study detailed below, no new pharmacodynamics or pharmacokinetic data are provided or are required for this application.

No new efficacy or safety studies have been performed and none are required for this type of application. A comprehensive review of the published literature has been provided by the applicant, citing the well-established clinical pharmacology, efficacy and safety of loperamide hydrochloride.

Based on the data provided, Loperamide Capsules can be considered bioequivalent to Imodium Classic 2mg Capsules (McNeil Products Limited, UK).

## IV.2 Pharmacokinetics

In support of this application, the applicant submitted the following bioequivalence study:

### STUDY

A randomised, open-label, two-treatment, two-period, two-sequence, single-dose, crossover bioequivalence study of the applicant's test product Loperamide 2 mg Capsules (DAWA Limited) versus the reference product Imodium Classic 2mg Capsules (McNeil Products Limited, UK) in healthy adult subjects under fasting conditions.

Subjects were administered a single dose (2 x 2 mg capsule) of the test or reference product after an overnight fast of at least 10 hours. The dosage of two capsules of 2 mg loperamide was chosen to achieve sufficient analyte plasma levels to characterise the pharmacokinetic profile.

Blood samples were collected for plasma levels before dosing and up to and including 72 hours after each administration. The washout period between the treatment phases was 10 days. The pharmacokinetic results are presented below:

**Table: Summary of pharmacokinetic data for loperamide (ratio and 90% confidence intervals of test versus reference product):**

Pharmacokinetic Parameters (Units)	Ln- transformed			90% Confidence Interval (Parametric)	
	Geometric Least Squares Mean			Lower	Upper
	Test Product (T)	Reference Product (R)	T/R (%)		
$C_{max}$ (ng/mL)	1.1928	1.2618	94.53	87.17	102.51
$AUC_{0-t}$ (ng.hr/mL)	22.0631	22.1127	99.78	91.20	109.15

$AUC_{0-t}$  area under the plasma concentration-time curve from zero to t hours  
 $C_{max}$  maximum plasma concentration

### Conclusion

The 90% confidence intervals of the test/reference ratio for AUC and  $C_{max}$  values for loperamide lie within the acceptable limits of 80.00% to 125.00%, in line with the 'Guideline on the Investigation of Bioequivalence (CPMP/EWP/QWP/1401/98 Rev 1/Corr\*\*'. Thus, the data support the claim that the applicant's test product Loperamide 2 mg Capsules (DAWA Limited), is bioequivalent to the reference product Imodium Classic 2mg Capsules (McNeil Products Limited, UK).

### IV.3 Pharmacodynamics

No new pharmacodynamic data were submitted and none were required for an application of this type.

### IV.4 Clinical efficacy

No new efficacy data were submitted and none were required for an application of this type.

### IV.5 Clinical safety

No new safety data were submitted and none are required.

### IV.6 Risk Management Plan (RMP) and Pharmacovigilance System

The Marketing Authorisation Holder (MAH) has submitted a risk management plan, in accordance with the requirements of Directive 2001/83/EC as amended.

There are no differences from the reference product in terms of proposed uses, maximum pack size / strength or pharmaceutical form / formulation that would have any implications for safety.

In line with the reference product, the applicant proposes only routine pharmacovigilance and routine risk minimisation measures for all safety concerns (labelling in the SmPC and the PIL). This is agreed.

The MAH shall perform the required pharmacovigilance activities and interventions detailed in the agreed RMP presented in Module 1.8.2 of the Marketing Authorisation and any agreed subsequent updates of the RMP.

An updated RMP should be submitted:

- At the request of the MHRA;
- Whenever the risk management system is modified, especially as the result of new information being received that may lead to a significant change to the benefit/risk profile or as the result of an important (pharmacovigilance or risk minimisation) milestone being reached.

If the dates for submission of a PSUR and the update of a RMP coincide, they can be submitted at the same time, but via different procedures.

#### **IV.7 Discussion on the clinical aspects**

The grant of a marketing authorisation is recommended for this application from a clinical viewpoint.

#### **V User consultation**

The package leaflet has been evaluated via a user consultation study in accordance with the requirements of Articles 59(3) and 61(1) of Directive 2001/83/EC. The language used for the purpose of user testing the PIL was English.

The results show that the package leaflet meets the criteria for readability as set out in the guideline on the readability of the label and package leaflet of medicinal products for human use.

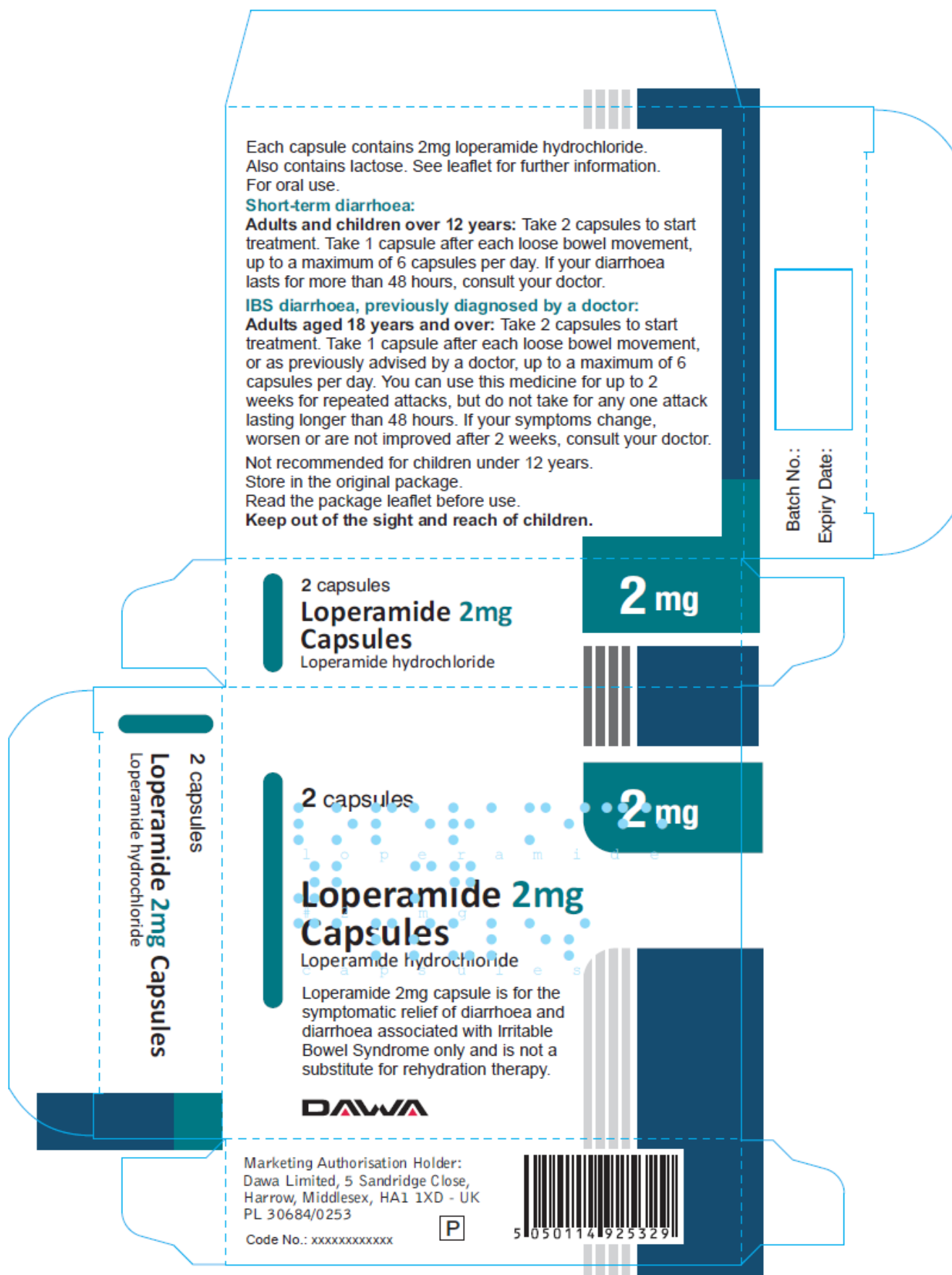
#### **VI Overall conclusion, benefit/risk assessment and recommendation**

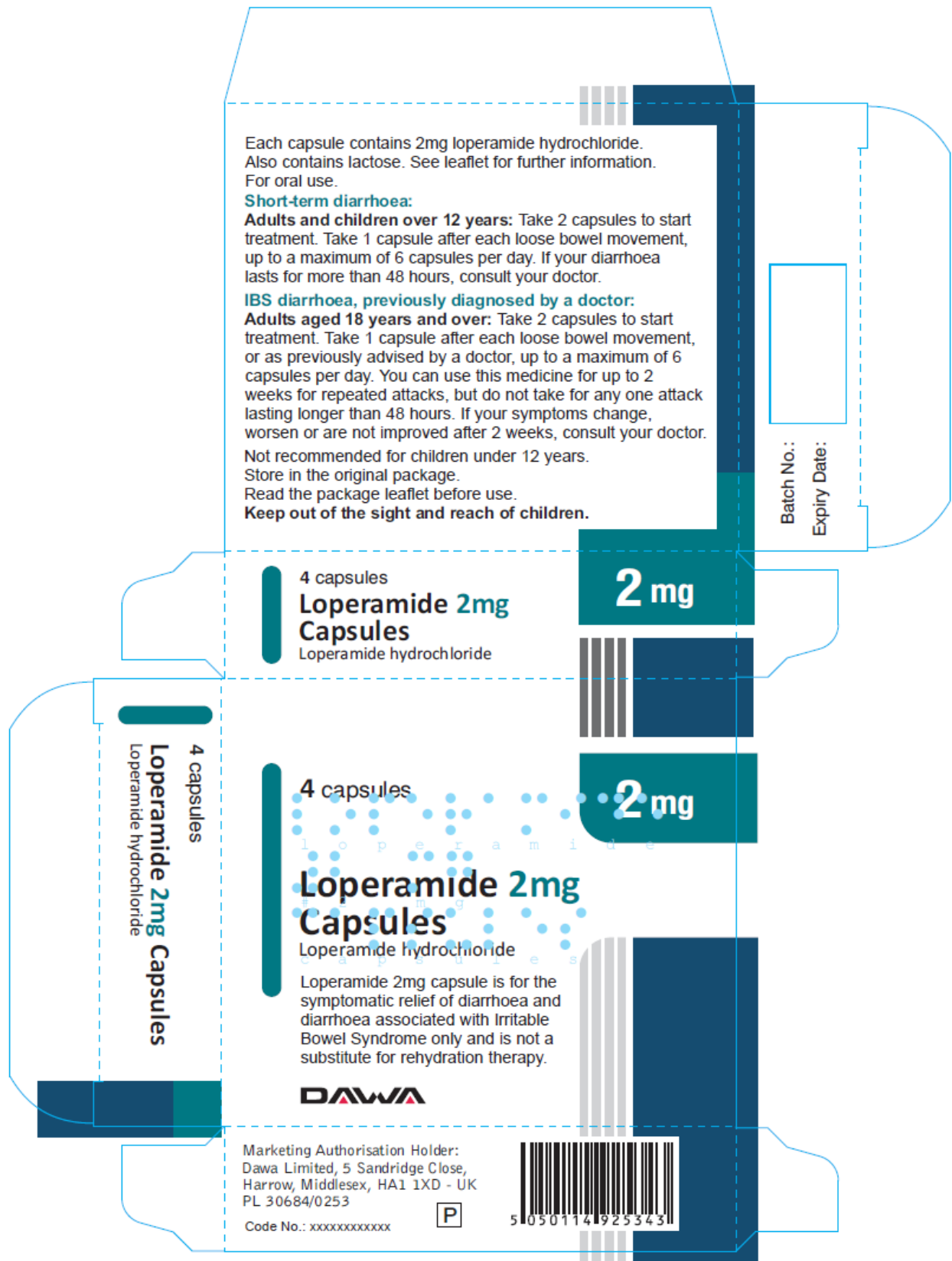
The quality of the product is acceptable, and no new non-clinical or clinical safety concerns have been identified. Extensive clinical experience with loperamide hydrochloride is considered to have demonstrated the therapeutic value of the compound. The product is bioequivalent to the marketed reference product and its risk-benefit balance is considered similar and positive. The benefit-risk is, therefore, considered to be positive.

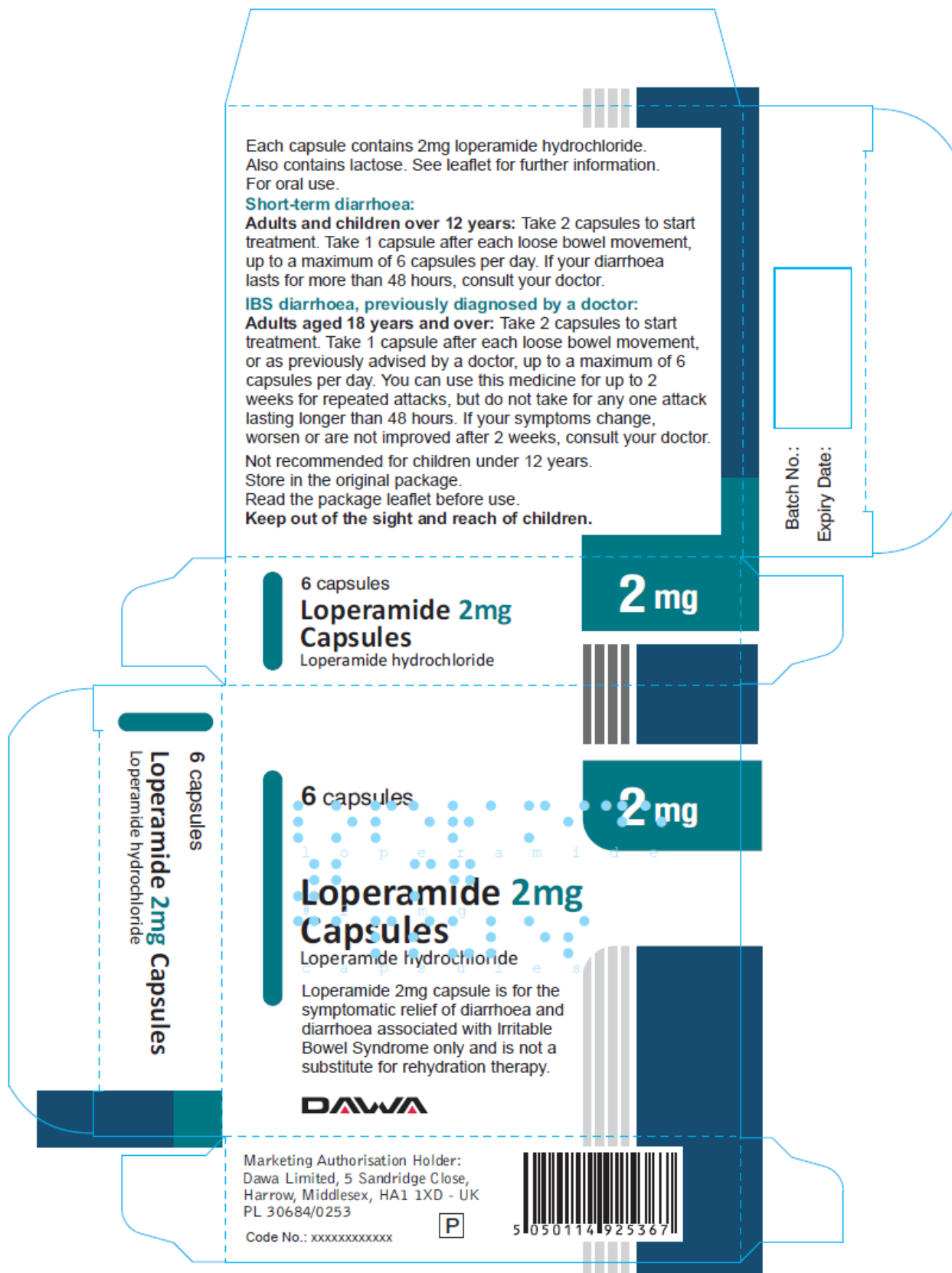
**Summary of Product Characteristics (SmPC), Patient Information Leaflet (PIL) and Labels**

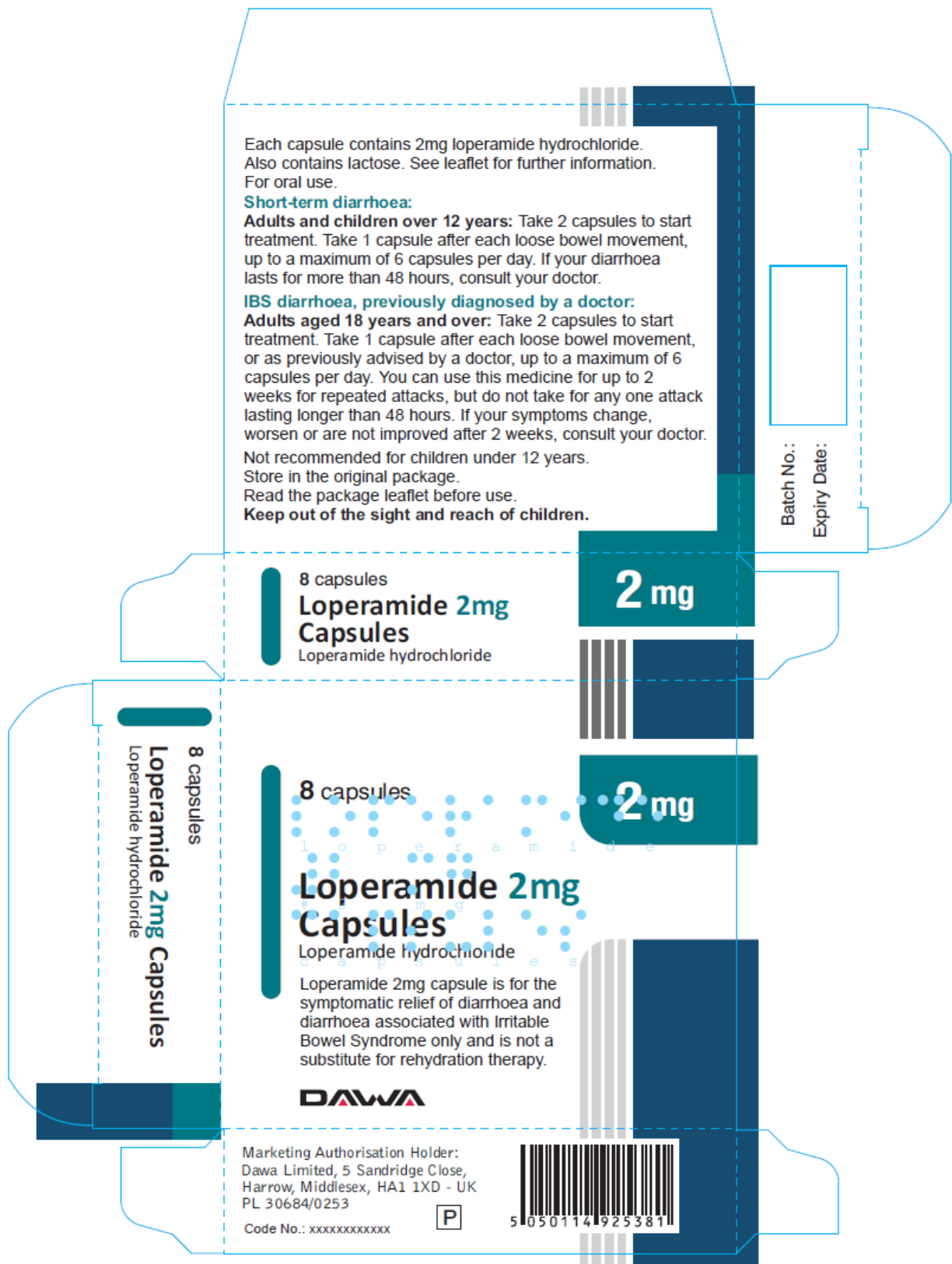
In accordance with Directive 2010/84/EU the Summaries of Product Characteristics (SmPC) and Patient Information Leaflets (PIL) for products granted Marketing Authorisations at a national level are available on the MHRA website.

The approved labelling for this medicine is presented below:

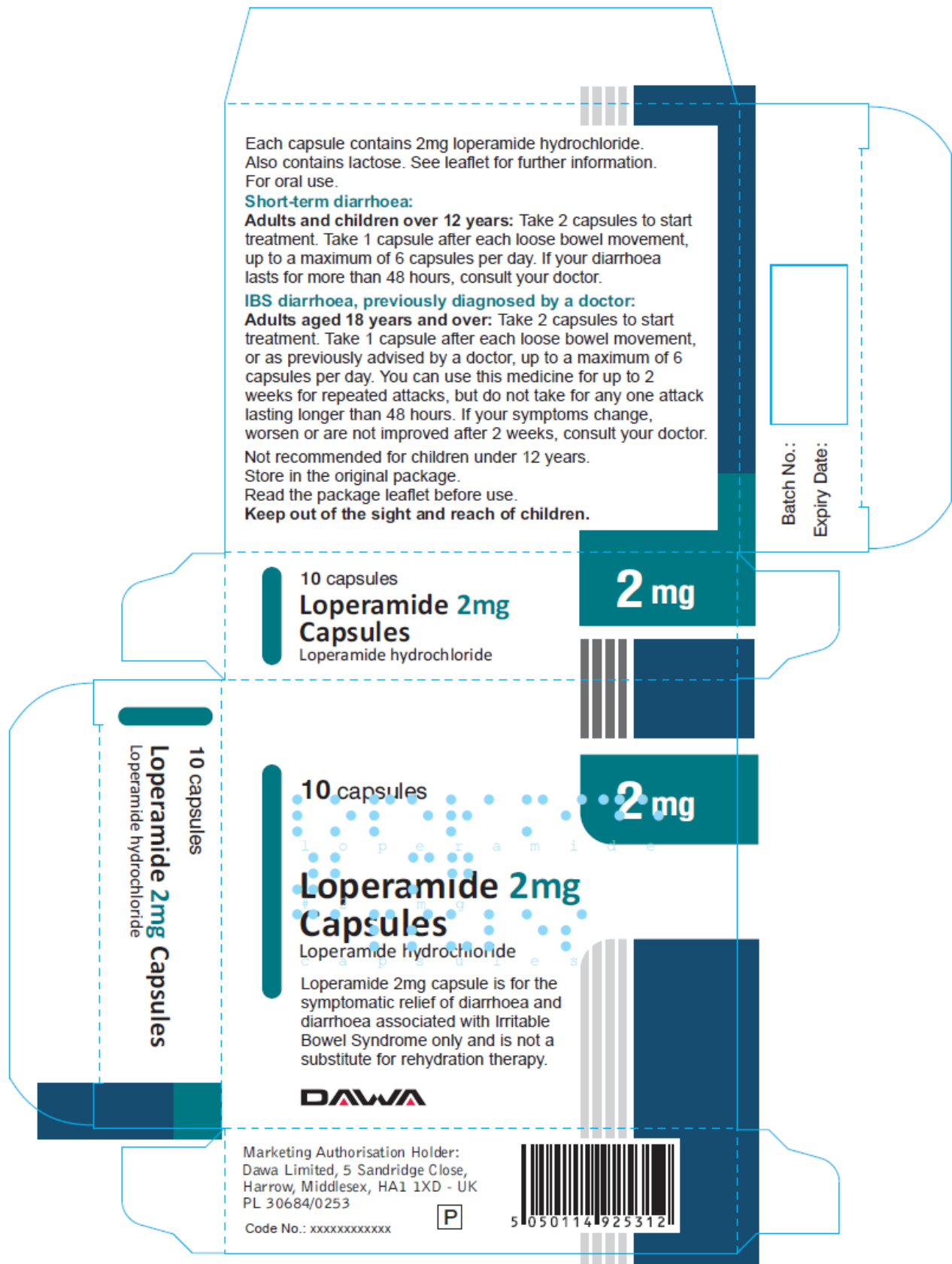


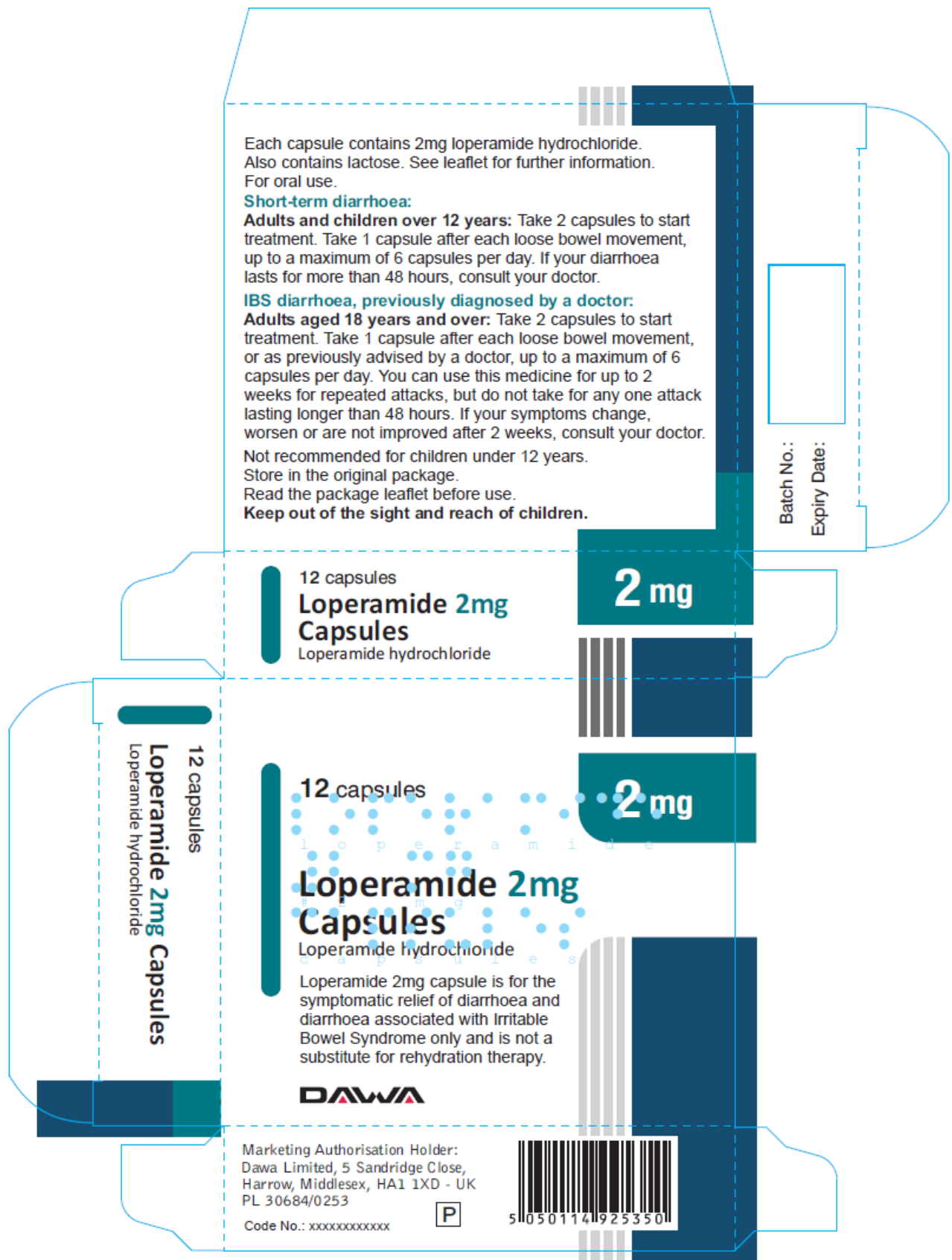


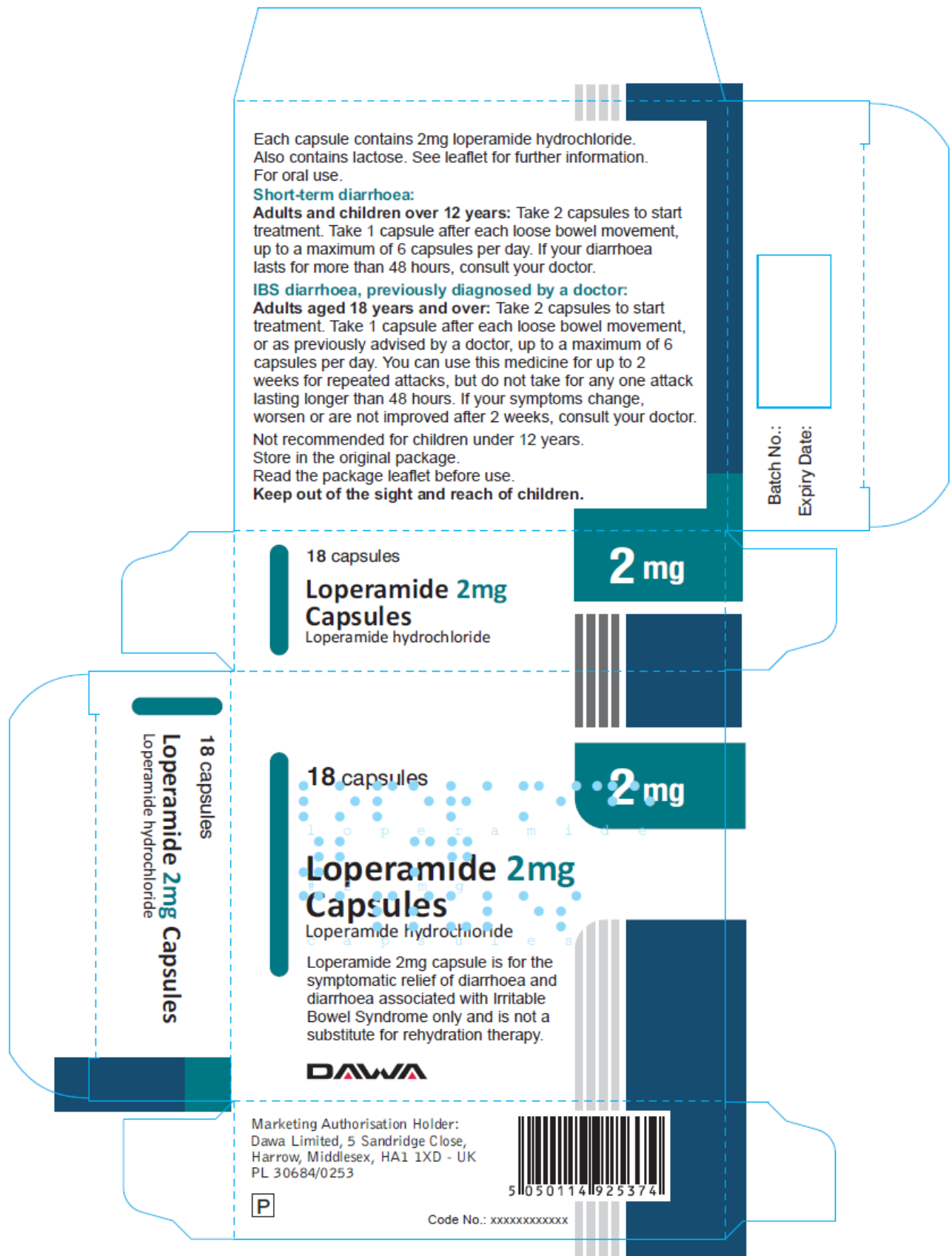


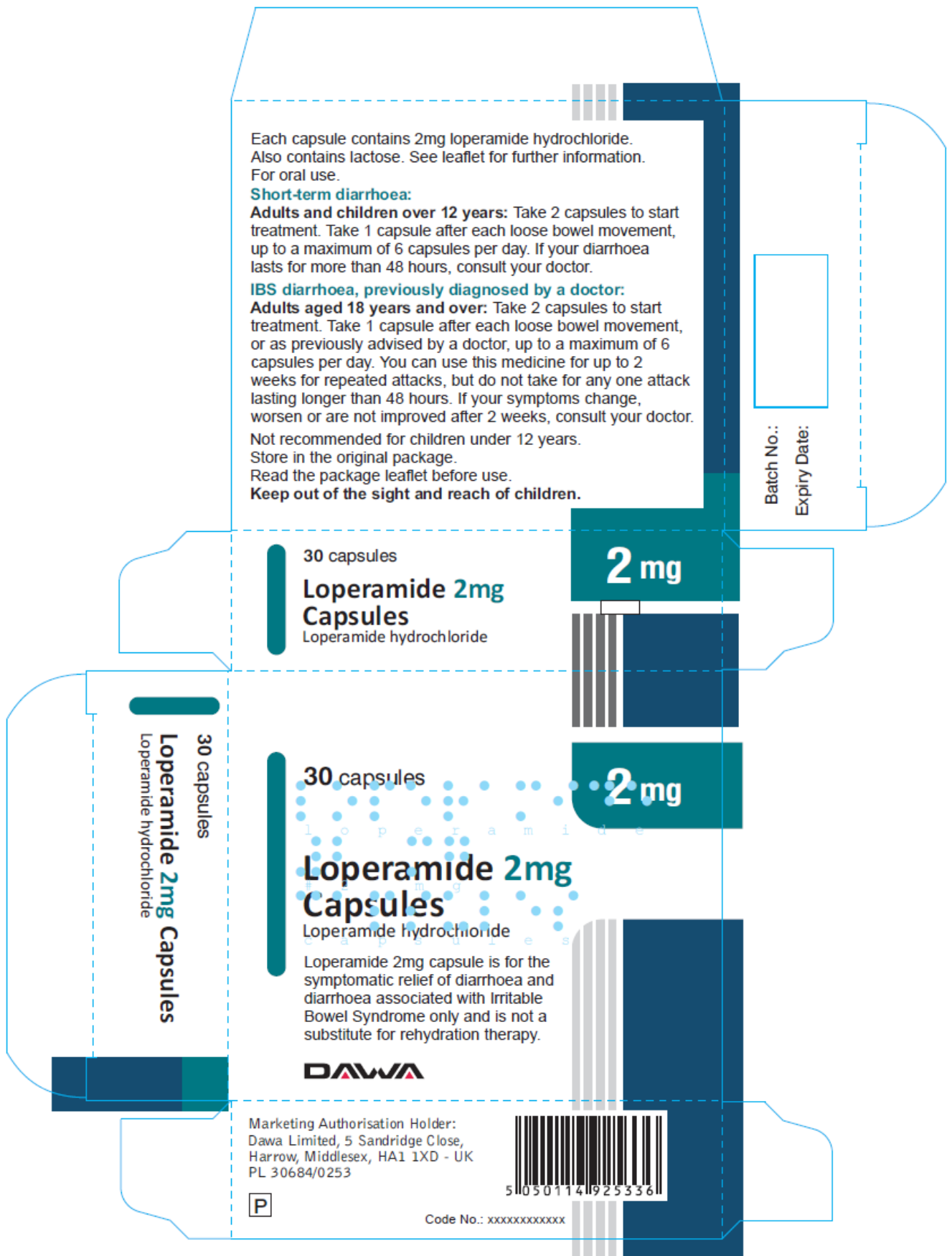


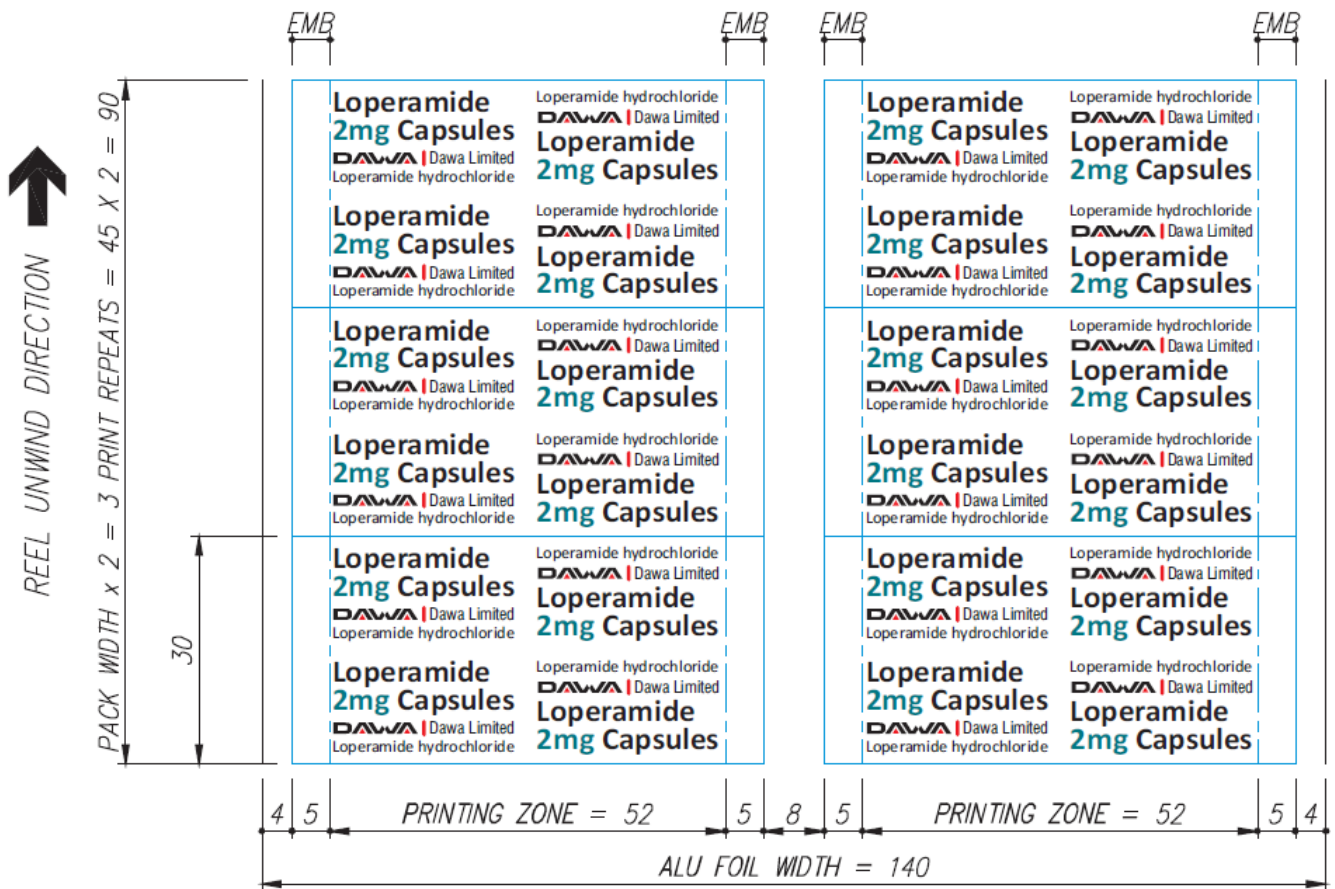
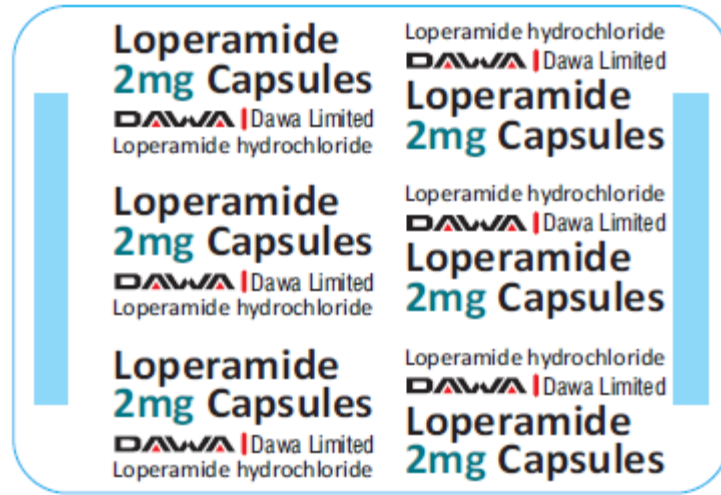












## Annex 1

### Table of content of the PAR update

Steps taken after the initial procedure with an influence on the Public Assessment Report (Type II variations, PSURs, commitments)

<b>Scope</b>	<b>Procedure number</b>	<b>Product information affected</b>	<b>Date of start of the procedure</b>	<b>Date of end of procedure</b>	<b>Approval/ non approval</b>	<b>Assessment report attached Y/N (version)</b>