

# New Zealand Datasheet

## 1 PRODUCT NAME

DIFFERIN™

## 2 QUALITATIVE AND QUANTITATIVE COMPOSITION

Adapalene 0.1% topical gel

## 3 PHARMACEUTICAL FORM

DIFFERIN topical gel is a smooth white gel containing 1 mg/g adapalene.

## 4 CLINICAL PARTICULARS

### 4.1 Therapeutic indications

DIFFERIN topical gel 0.1% is indicated for the topical treatment of comedo, papular and pustular acne (acne vulgaris) of the face, chest or back.

### 4.2 Dosage and method of administration

A thin film of DIFFERIN topical gel should be applied to the affected areas once a day before bedtime and after washing avoiding the eyes lips and mucous membranes. The affected areas should be dry before application.

Clinical improvement is expected to be evident in four to eight weeks of treatment, with further improvement to be expected with continued use. Cutaneous safety of DIFFERIN topical gel has been demonstrated in 85 patients for up to 26 weeks of treatment. Since it is customary to alternate therapies in the treatment of acne vulgaris, it is recommended that the physician assess continued treatment of the patient with DIFFERIN topical gel after three months of use.

The safety and effectiveness of DIFFERIN products have not been studied in children below 12 years of age.

### 4.3 Contraindications

Not to be used in patients who are hypersensitive to the active substance or any of the excipients. Safety and effectiveness have not been established in severe pustular and deep cystic nodular acne (acne conglobulata).

Pregnancy.

Women planning a pregnancy.

### 4.4 Special warnings and precautions for use

DIFFERIN topical gel should not come into contact with the eyes, lips, mouth and mucous membranes, angles of the nose or broken skin (cuts and abrasions), sunburn or eczematous skin, nor should it be used in patients with severe acne involving large areas of the body. If product enters the eye, wash immediately with warm water. Because of a potential for increased irritation DIFFERIN topical gel should not be used by patients with eczema, seborrhoeic dermatitis or severe acne involving large areas of the body.

If a reaction suggesting severe irritation occurs, discontinue use of the medication. If the irritation is not severe, use the medication less frequently, discontinue use temporarily until symptoms subside, or discontinue use altogether.

If patients use cosmetics, these should be non-comedogenic and non-astringent. Only oil-free moisturisers should be used to relieve dry facial skin.

Because DIFFERIN topical gel may cause some irritation, it is possible that simultaneous use of abrasive cleansers, astringents or strong drying agents or irritant products may cause additive irritant effects.

DIFFERIN Gel contains methyl parahydroxybenzoate (E218) that can cause allergic reactions (can arise after the treatment is completed) and propylene glycol that can be irritating to the skin.

Animal studies on compounds with a similar mode of action to adapalene have suggested that these may enhance the development of skin cancers caused by UV light. Adapalene is essentially stable to oxygen and light and is chemically non-reactive. Whilst short term studies have shown no phototoxic to photoallergic potential of adapalene, small numbers of reactions consistent with phototoxicity were reported in clinical studies, the safety of using adapalene during long or repeated exposures to sunlight or UV radiation has not been established in animals or humans. Exposure to sunlight or UV irradiation (including sunlamps) should be avoided during treatment with adapalene. Use of sunscreen products and protective clothing over treated areas is recommended when exposure cannot be avoided.

Efficacy and safety in the treatment of severe pustular or deep cystic acne (acne conglobulata) have not been studied.

#### **Use in Children**

Safety and efficacy in children below the age of 12 years have not been studied.

#### **Genotoxicity**

Adapalene did not demonstrate mutagenic or clastogenic activity in *in vitro* tests with bacterial and mammalian cells and showed no clastogenic activity in mammalian cells *in vitro* and an *in vitro* test in mice.

#### **Carcinogenicity**

Lifetime studies with adapalene have been completed in mice at topical doses of 0.6, 2 and 6 mg/kg and in rats at oral doses of 0.15, 0.5, and 1.5 mg/kg. Phaeochromocytomas were observed in the adrenal medulla of male rats dosed at 1.5 mg/kg but not at the lower doses. This finding was not observed in female rats or in mice. The relevance of the finding in male rats to the use of DIFFERIN topical gel in *acne vulgaris* is not known.

### **4.5 Interaction with other medicines and other forms of interaction**

There are no known interactions with other medications which might be used topically and concurrently with DIFFERIN topical gel; however other retinoids or drugs with a similar mode of action should not be used concurrently with adapalene. Exposure of adapalene to other topical anti-acne drugs such as erythromycin, clindamycin phosphate or benzoyl peroxide does not produce any mutual degradation.

Absorption of adapalene through human skin is low (see Pharmacokinetics) and therefore interaction with systemic medication is unlikely.

DIFFERIN topical gel has potential for local irritation and it is possible that concomitant use of peeling agents, astringents or irritant products may produce additive irritant effects.

### **4.6 Fertility, Pregnancy and lactation**

## **Use in Pregnancy**

(Category D)

Orally administered retinoids have been associated with congenital abnormalities. When used in accordance with the prescribing information, topically administered retinoids are generally assumed to result in low systemic exposure due to minimal dermal absorption. However, there could be individual factors (e.g. damaged skin barrier, excessive use) that contribute to an increased systemic exposure.

In pregnant rats and rabbits, adapalene administered orally at relatively high doses ( $\geq 25$  mg/kg leading to exposures  $\geq 25$  times that anticipated clinically based on AUC) was found to induce foetal abnormalities. In addition, the incidences of various skeletal variations were increased at lower oral doses in rats. Topical administration at doses up to 6 mg/kg, resulting in an exposure level about 45 times greater (based on AUC) than that anticipated clinically, was not associated with teratogenicity. Nevertheless, increased incidences of various naturally occurring skeletal variations were still observed following topical administration to rats at 2mg/kg (AUC exposure about 13 times that anticipated clinically); topical no effect levels were 0.6 and 2mg/kg respectively (AUC about 5 times that anticipated clinically).

Because of the risk of teratogenicity shown in animals, and since there are no adequately controlled studies in pregnant women, adapalene should not be used by women who are pregnant or who plan to become pregnant during treatment. DIFFERIN should not be used during pregnancy. In case of unexpected pregnancy, treatment should be discontinued.

## **Use in lactation**

It is not known whether adapalene is excreted in human milk. Therefore, the preparation should be used with caution in nursing mothers, and only on areas away from the chest. DIFFERIN can be used during breastfeeding. To avoid contact exposure of the infant, application of DIFFERIN to the chest should be avoided when used during breast-feeding.

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

DIFFERIN Gel has no influence on the ability to drive and use machines.

## **4.8 Undesirable effects**

A feeling of warmth, burning, pruritus, dryness, scaling or slight stinging may occur following application. Local adverse events may persist despite cessation of therapy. No systemic reactions have been attributed to the application of the gel to date. The allergic potential of adapalene has not been established.

The most frequent side effects reported at some point in time during three to six month clinical trials were erythema which ranged from 6% to 27% in different studies; dryness (6% to 37%); scaling (4% to 63%); pruritus (4% to 11%); and burning after application (7% to 33%). Most reactions occurred within one month of the initiation of therapy and were generally observed to resolve with continued use of the product or temporary adjustment of the treatment schedule. The proportion of patients withdrawing from the trials because of these topical effects was 1.6%. Reactions consistent with phototoxicity have been reported in the clinical studies.

Other infrequent cutaneous adverse events reported which may be related to the application of adapalene included contact dermatitis/eczema, skin discomfort, skin exfoliation, vesiculobullous eruptions, sunburn, herpes labialis, acne flare, conjunctivitis and eyelid oedema.

## Post Marketing Data

DIFFERIN topical cream 0.1% and DIFFERIN topical gel 0.1% are two formulations with the same active ingredient, adapalene. The gel formulation was first marketed in France in September 1995. The post marketing data detailed below refer to reports collected from the world wide sales with the gel formulation.

### **Body as a Whole**

Rare (> 0.01% and < 0.1%): Allergic reaction  
Lack of drug effect

### **Skin and Subcutaneous Tissue Disorders**

Common ( $\geq$  1% and < 10%): Irritation  
Redness  
Dry skin  
Burning sensation at the site of application  
Erythema

Uncommon (> 0.1% and < 1%): Contact eczema  
Contact dermatitis  
Transient worsening of acne  
Exfoliative dermatitis - predominantly associated with mechanical abrasion such as waxing  
Skin discomfort  
Sunburn  
Pruritus  
Skin exfoliation  
Acne.  
  
eyelid irritation, eyelid erythema, eyelid pruritus, eyelid swollen

Unknown\*: Dermatitis allergic (allergic contact dermatitis)  
Pain of skin  
Skin swelling

**Eye disorders:** Eyelid irritation  
Eyelid erythema  
Eyelid pruritus  
Eyelid swollen

\*Post marketing surveillance data

These events often spontaneously resolve upon adaptation to therapy regimen.

## 4.9 Overdose

DIFFERIN topical gel is intended for topical use only. If the medication is applied excessively, no more rapid or better results will be obtained and marked redness, peeling or discomfort may occur.

DIFFERIN topical gel is not to be taken orally. The oral route toxicity for DIFFERIN topical gel in mice is greater than 10 mL/kg. Unless the amount accidentally ingested is small, an appropriate method of gastric emptying should be considered.

## 5 PHARMACOLOGICAL PROPERTIES

### 5.1 Pharmacodynamic properties

Pharmacotherapeutic Group: D10A Anti-Acne Preparations for Topical Use - ATC code: D10AD03

Adapalene is a chemically stable compound with retinoid-like pharmacological activity. Biochemical and pharmacological profile studies have demonstrated that adapalene is a potent modulator of cellular differentiation, keratinisation and inflammatory processes all of which represent important features in the pathology of acne vulgaris.

Mechanistically, adapalene binds to specific retinoic acid nuclear receptors but unlike tretinoin, does not bind to the cytosolic receptor protein. Although the exact mode of action of adapalene is unknown current evidence suggests that topical adapalene normalises the differentiation of follicular epithelial cells resulting in decreased microcomedone formation. Adapalene inhibits the chemotactic (directional) and chemokinetic (random) responses of human polymorphonuclear leucocytes in *in vitro* assay models. It also inhibits the metabolism of arachidonic acid by lipoxygenation, to inflammatory mediators.

### 5.2 Pharmacokinetic properties

In clinical trials adapalene was seldom detected in plasma, and then only in trace amounts following chronic topical application with an analytical limit of quantification of 0.25 nanograms/mL. Studies with the radiolabelled drug in the gel have not been performed. After administration of (<sup>14</sup>C)-adapalene to rats, rabbits and dogs, radioactivity was distributed in several tissues, the highest levels being found in liver, spleen, adrenals and ovaries. Metabolism in animals is maintained by O-demethylation, hydroxylation and conjugation, and excretion is primarily by the biliary route.

In a human study performed using the gel formulation in which male volunteers followed a course of exaggerated topical application, 30 g (a full tube) was applied all over the body each day for seven consecutive days, the resultant circulating plasma levels were below the limit of detection (0.15 nanogram mL<sup>-1</sup>). There were low quantities of the parent substance in the faeces. In another study healthy volunteers used radiolabelled adapalene 0.1% topical gel, four of the subjects received 14 daily topical applications of non-radiolabelled adapalene 0.1% topical gel prior to the single application of radiolabelled adapalene 0.1% topical gel. The other four subjects received a single topical application of the radiolabelled product. Levels of radioactivity in all plasma, urine, faeces and skin strip samples analysed were below the limits of reliable quantification, indicating that either very little or no radioactivity was absorbed through the skin.

A further study carried out to investigate the distribution of adapalene in the adipose tissue of women after repeated daily application of adapalene gel for three months, found that there was no evidence of circulating adapalene in the plasma (limit of detection 0.15 nanogram mL<sup>-1</sup>). On day 90, adapalene levels in the adipose tissue were not quantifiable in five of the six volunteers (limit of detection 1 nanogram g<sup>-1</sup>). In the sixth volunteer the mean concentration at three sites was 1.1, 1.3 and 5.5 nanogram.g<sup>-1</sup>. These concentrations were no longer evident when re-evaluated at the same sites in this subject one month after the cessation of treatment.

### 5.3 Preclinical safety data

In animal studies, adapalene was well tolerated on cutaneous application for periods of up to six months in rabbits and for up to two years in mice. The major symptom of toxicity found in all animal species by the oral route were related to a hypervitaminosis A syndrome, and included bone dissolution, elevated alkaline phosphatase and a slight anaemia. Large oral doses of adapalene produced no adverse neurological, cardiovascular or respiratory effects

in animals. Adapalene is not mutagenic. Lifetime studies with adapalene have been completed in mice at cutaneous doses of 0.6, 2 and 6 mg/kg/day and in rats at oral doses of 0.15, 0.5 and 1.5 mg/kg/day. The only significant finding was a statistically significant increase of benign phaeochromocytomas of the adrenal medulla among male rats receiving adapalene at 1.5 mg/kg/day. These changes are unlikely to be of relevance to the cutaneous use of adapalene.

Adapalene produces teratogenic effects by the oral route in rats and rabbits. At cutaneous doses up to 200-fold the therapeutic dose, producing circulating plasma levels of adapalene at least 35 to 120 times higher than plasma levels demonstrated in therapeutic use, adapalene increased the incidence of additional ribs in rats and rabbits, without increasing the incidence of major malformations.

It is not known whether adapalene is secreted in animal or human milk. In animal studies, infant rats suckled by mother with circulating levels of adapalene at least 300 times those demonstrated in clinical use developed normally.

## **6 PHARMACEUTICAL PARTICULARS**

### **6.1 List of excipients**

Carbomer 940, propylene glycol, poloxamer, disodium edetate, methyl hydroxybenzoate, phenoxyethanol, sodium hydroxide and purified water.

### **6.2 Incompatibilities**

Not applicable

### **6.3 Shelf life**

36 months.

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

Store below 25°C. Keep out of reach of children. Avoid exposure to excessive heat. Replace cap tightly after use.

The product should not be used beyond the date indicated on the label on the carton.

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

Product is packaged in a low density polyethylene tube containing 30g or 50g of gel and fitted with a white polypropylene screw cap.

### **6.6 Special precautions for disposal**

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

## **7 MEDICINE SCHEDULE**

Prescription Medicine except in medicines containing 1 milligram or less per millilitre or gram and when supplied by a pharmacist in a pack containing not more than 30 grams for the treatment of comedo, papular and pustular acne (acne vulgaris) of the face, chest or back.

## **8 SPONSOR**

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**9 DATE OF FIRST APPROVAL**

3 July 1997

**10 DATE OF REVISION OF THE TEXT**

10 August 2018

## SUMMARY TABLE OF CHANGES

<b>Section changed</b>	<b>Summary of new information</b>
4.3	Pregnancy added as a contraindication.
4.6	Additional pregnancy warnings added