

# New Zealand Datasheet

## Name of Medicine

DIFFERIN™ topical gel

Adapalene 0.1%

## Presentation

DIFFERIN topical gel is a smooth white gel containing 1 mg/g adapalene. The gel contains carbomer 980, propylene glycol, poloxamer, disodium edetate, methyl hydroxybenzoate, phenoxyethanol, sodium hydroxide and purified water.

## Uses

### Actions

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 lipoxidation, to inflammatory mediators.

### Pharmacokinetics

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, 30g (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.

### **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.

### **Dosage and 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.

### **Contraindications**

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

### **Warnings and Precautions**

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). If product enters the eye, wash with warm water. Because of a potential for increased irritation DIFFERIN topical gel should not be used by patients with eczema or seborrhoeic dermatitis.

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.

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 excessive sunlight or UV irradiation (including sunlamps) should be avoided during treatment with adapalene.

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.

### **Use in Pregnancy**

(Category D)

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.

### **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.

### **Mutagenic and Carcinogenic Potential**

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.

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.

### **Adverse Effects**

A feeling of warmth, burning, pruritis, dryness, scaling or slight stinging may occur following application.

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%); pruritis (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.

Local adverse events may persist despite cessation of therapy.

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 and eyelid oedema.

The allergic potential of adapalene has not been established.

No systemic reactions have been attributed to the application of the gel to date.

### **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 Appendages Disorders

Very common (> 10%): Irritation  
Redness  
Dry skin  
Burning sensation at the site of application

Uncommon (> 0.1% and < 1%): Contact eczema  
Contact dermatitis  
Transient worsening of acne  
Exfoliative dermatitis - predominantly associated with mechanical abrasion such as waxing.  
Pain of skin, skin swelling, eyelid irritation, eyelid erythema, eyelid pruritus, eyelid swollen

These events often spontaneously resolve upon adaptation to therapy regimen.

### **Interactions**

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.

## **Overdosage**

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.

## **Pharmaceutical Precautions**

Store below 25°C. Keep out of reach of children. Do not freeze.

## **Medicine Classification**

Prescription Medicine.

## **Package Quantities**

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

## **Further Information**

Nil.

## **Name and Address**

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